LA-UR-07-2853
May 2007
EP2007-0250

Groundwater Background Investigation Report, Revision 3

Los Alamos
NATIONAL LABORATORY
EST. 1943

Prepared by the Environmental Programs Directorate

EXECUTIVE SUMMARY

The March 1, 2005, Compliance Order on Consent (the Consent Order) signed by the New Mexico Environment Department (NMED), the Department of Energy, the Regents of the University of California, and the State of New Mexico Attorney General requires Los Alamos National Laboratory (the Laboratory) to prepare and submit a groundwater background investigation report. The Consent Order was issued pursuant to the New Mexico Hazardous Waste Act, New Mexico Statutes Annotated (NMSA) 1978, § 74-4-10, and the New Mexico Solid Waste Act, NMSA 1978, § 74-9-36(D). This report describes work completed to satisfy the Consent Order requirement.

This report presents background concentrations for naturally occurring metals and general chemistry parameters in groundwater and provides the bases for these concentrations. It provides a validated database of inorganic and radionuclide analyses of groundwater samples collected from 29 background springs and wells located in and around the Laboratory. Background values were determined for the three groundwater types—alluvial, perched intermediate, and the regional aquifer occurring beneath the Pajarito Plateau and the Laboratory.

This background investigation report is an evaluation of the applicability of background sampling locations, the quality of background data from those locations, and the distinguishing characteristics of the aquifer types sampled. Results of this investigation, including hydrostratigraphic descriptions, multiple chemical analyses, and statistical evaluations of multiyear data sets, provide a technically defensible background database for candidate groundwater sampling locations for the Pajarito Plateau and Sierra de los Valles. These locations were selected to be free of Laboratory and other anthropogenic influences and are considered to be valid background locations with respect to the Laboratory. The aquifers studied exhibit specific chemical characteristics that will be used for future data screening and comparisons.

The number of locations has been expanded from the 15 locations in the original report (Groundwater Background Investigation Report, Rev. 0, LANL 2005, 090580). Some of the original locations were eliminated because of anthropogenic influences; other locations were added to describe more completely the statistical variations found in the regional aquifer in and around the Laboratory.

A principal component analysis (PCA) and cluster statistical analysis was performed prior to the final selection of background locations to group different regional water types statistically. An additional Student's *t*-test indicated differences between facies or locations based on sample variances. In particular, because of long residence times (longer evolution time), some regional sampling locations tend to have higher total dissolved solids and other solute concentrations than locations with shorter residence times (less evolution). Waters nearer the Sierra de los Valles tend to be less evolved than waters discharging to wells and springs near the Rio Grande. This observation follows tritium dating indicating that these are older water facies that have occupied flow paths for much longer residence times.

The PCA delineated similarities in regional groundwater chemistry among locations on the Pajarito Plateau. The PCA also distinguished several locations that sample different, and likely more evolved, hydrochemical facies in locations near the plateau (e.g., wells near San Ildefonso Pueblo or the Rio Grande). These locations were eliminated from further consideration in the final background data set per NMED. Further discussion with NMED eliminated other locations that may exhibit anthropogenic contamination. The remaining locations were combined to create the final set of regional locations, which blends the different chemistries beneath the plateau.

In this final selection of locations, the alluvial groundwater is represented by well LAO-B and Pine Spring. The perched intermediate groundwater is represented by Seven Springs, Water Canyon Gallery, Cañon de Valle-5.0 Spring, Barbara Spring, Campsite Springs, and well LAOI-1.1(a). The regional aquifer is

represented by Springs 1, 5B, 6, 6A, 8A, 9, 9A, 9B, Sacred Spring, Ancho Spring; and wells G-1A, G-2A, G-3A, G-4A, and G-5A, PM-2, PM-4, PM-5, R-1, R-13, and R-21. Since the writing of version 2 of this report in February 2007, new data for well R-18 have indicated RDX contamination. Therefore, per discussion with NMED on May 4, 2007, R-18 was removed as a background location.

A set of location-screening parameters and data-quality criteria were developed for this revision of the report. In addition, the data used for this revision were selected from data sets measured largely after January 2000. These data are derived from documented sampling and analytical methods. The expanded number of background locations provides a better basis for statistical analysis and a more accurate picture of the range of natural inorganic chemical and radionuclide values within the different groundwater facies near the Laboratory than in Revision 0.

The term “background” is used in this report to refer to natural groundwaters that have not been contaminated by the Laboratory or other municipal or industrial sources; that occur at springs or are penetrated by wells; and that are representative of groundwater discharging from their respective host rocks or aquifer material. The locations were sampled for chemical and radiochemical analyses. As a group, groundwater samples from alluvial or perched intermediate sources sampled as part of this investigation have low dissolved concentrations of major ions and trace elements (for example, chloride, nitrate, sulfate, boron, and natural uranium). In the regional aquifer, total dissolved solids and, thus, metals and major ions varied systematically and geographically, with the highest concentrations in the most evolved water discharging nearest the river and the lowest concentrations in younger waters that are the least evolved geochemically. Spring sites are located around the periphery of the Laboratory. One spring site (Seven Springs) was chosen because it occurs roughly 30 km west of the Laboratory and discharges from the Bandelier Tuff (the most common rock type within Laboratory boundaries). Seven Springs water contains low concentrations of chemical solutes and anthropogenic tritium at levels approximately equal to that of precipitation in this region.

There are differences in the hydrochemistries of background alluvial; perched intermediate groundwaters; and the regional aquifer groupings. Variations in natural groundwater compositions within the three aquifer types are controlled by adsorption/desorption and precipitation/dissolution reactions, aquifer composition of reactive minerals and amorphous solids, types of microbial populations, and the residence time along groundwater flow paths. Groundwater compositions include calcium-bicarbonate type water for alluvial and perched intermediate locations. The regional aquifer ranges from a calcium-sodium-bicarbonate to a sodium-calcium-bicarbonate type of water. Alluvial and perched-intermediate groundwaters occur within the vadose zone above the regional water table.

Native alluvial groundwater contains calcium, sodium, silica, and bicarbonate as the dominant solutes. Background activities of tritium exceed 30 pCi/L within alluvial groundwater.

Background perched intermediate groundwater stations within the Sierra de los Valles sampled during this investigation contain tritium derived from the atmosphere (cosmogenic and residual bomb pulse). Perched intermediate groundwater beneath the Pajarito Plateau, however, contains background activities of tritium less than 2 pCi/L. Native groundwater within the regional aquifer most commonly contains less than 1 pCi/L of tritium.

The natural aqueous geochemistry of the regional aquifer is characterized by residence times exceeding 10,000 years. The regional aquifer generally contains the highest natural concentrations of calcium, sodium, barium, boron, and uranium in comparison to alluvial or perched intermediate groundwater.

The statistical analyses of the background data included the evaluation of normal quantile plots, box plots, time series analysis, and statistical data summaries. The evaluation identified data not representative of background, relationships between analytes, sample distributions (normal, lognormal, or bimodal), relationships between sampling locations, relationships between aquifer types, parametric and nonparametric statistical modeling options, and the frequency of nondetected values by analyte and by potential data subpopulations. No outlier identification was performed for this analysis, and outlier data were retained with each data set.

While some specific trends were noted, the typical general chemistry and metals values reported here for data from 2000 through 2006 did not tend to be significantly different than was reported in Revision 1 of this report (data from 1997 through 2000). The expanded list of locations for the perched-intermediate and regional aquifers generally did not have different typical median values.

When distinct regional geochemical populations are combined, as in Revision 2 and this revision, higher screening values are derived for some constituents than if the populations had been separated.

The values illustrated in Figures ES-1a and b are maximum screening values that represent uncontaminated groundwater across the Pajarito Plateau. These are conservative values in that at least 95% of detections are below these values (upper tolerance limits or maximum values). They illustrate the summation of water quality, including general chemistry and metals analyses and parameters from a large data set. They are derived from a large geographical area beneath the Pajarito Plateau, from recharge and discharge zones, and across the three groundwater types including the regional aquifer, which is most strongly represented.

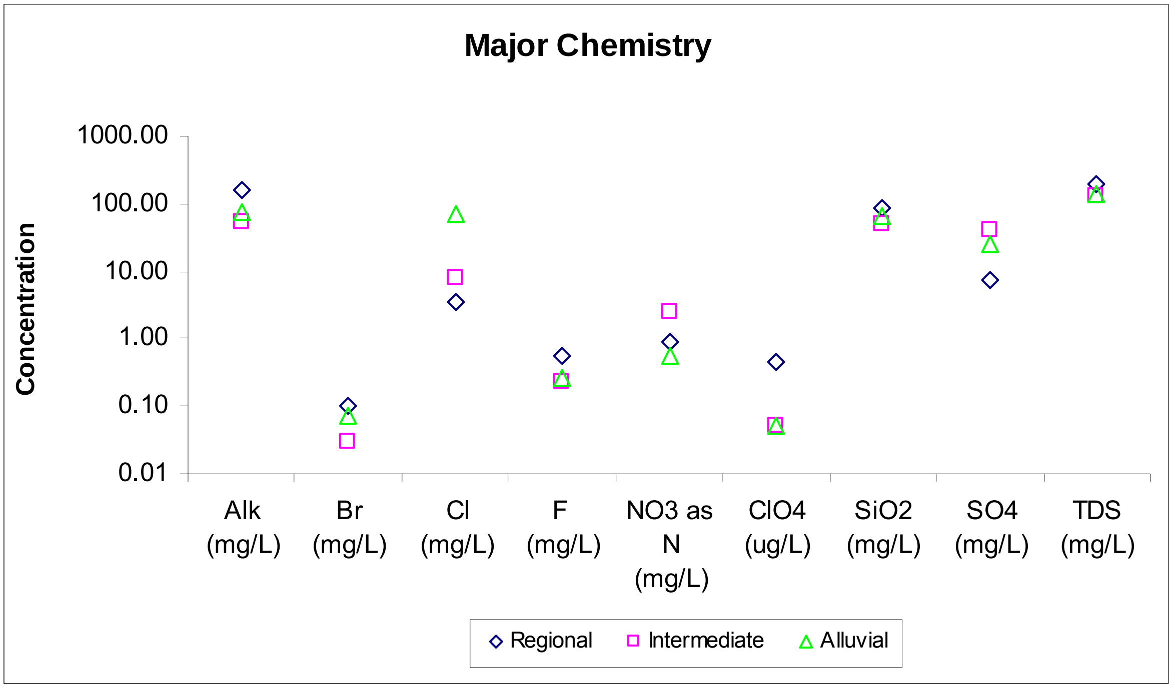
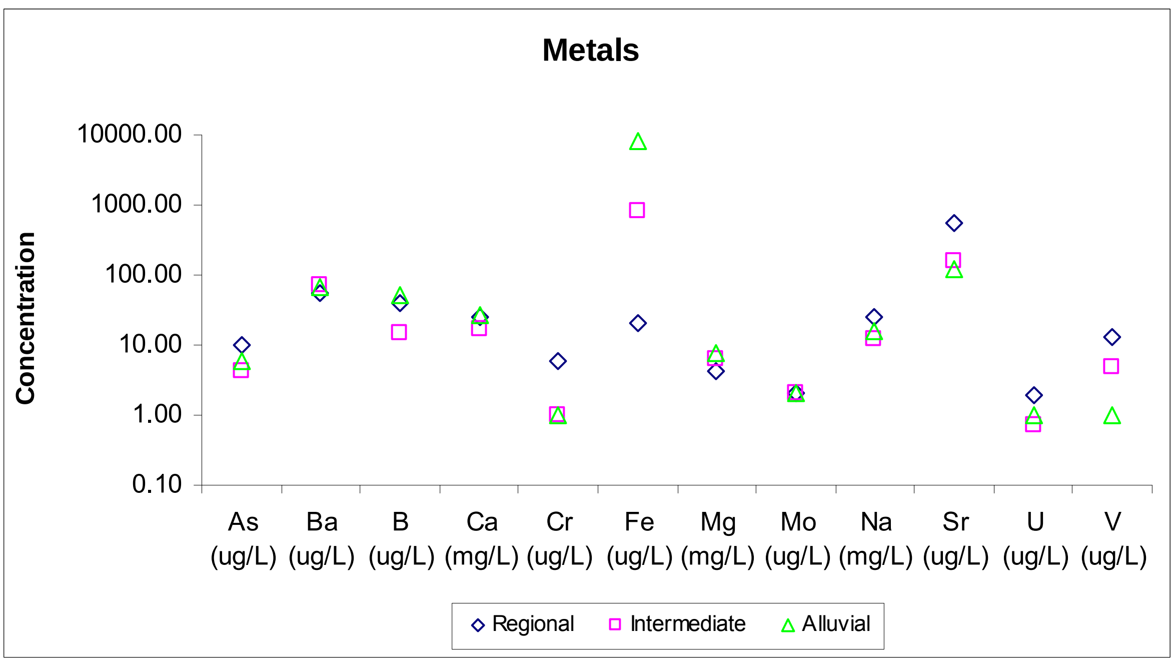


Figure ES-1a. Screening values for selected major chemical constituents for regional, perched intermediate, and alluvial groundwaters



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List of Acronyms and Abbreviations

AA	atomic absorption
ANOVA	analysis of variance
CA	cluster analysis
CdV-5.0	Cañon de Valle Spring
CL	contract laboratory
CV	coefficient of variation
CVAA	cold vapor atomic absorption
DO	dissolved oxygen
DOC	dissolved organic carbon
DOE	Department of Energy
DQO	data-quality objective
EDA	exploratory data analysis
EES-6	Earth and Environmental Science Division (Hydrology, Geochemistry, and Geology group)
EP-ERSS	Environmental Programs—Environmental Remediation and Surveillance Program
EP-WSP	Environmental Programs–Water Stewardship Program
EPA	(U.S.) Environmental Protection Agency
ER	Environmental Restoration (Project)
ERDB	Environmental Remediation Data Base
ESP	Environmental Surveillance Program
ET	evapotranspiration
FIMAD	Facility for Information Management, Analysis, and Display
GEL/GELC	General Engineering Laboratories
GFAA	graphite furnace atomic absorption
GPS	global positioning system
HAA	hydride atomic absorption
HCA	hierarchical cluster analysis
HE	high explosives
HFO	hydrous ferric oxide

IC	ion chromatography
ICPAES	inductively coupled plasma atomic (optical) emission spectroscopy
ICPMS	inductively coupled plasma mass spectroscopy
IDL	instrument detection limit
IRMS	isotope ratio mass spectrometry
JMWL	Jemez Mountains (meteoric) water line
KMC	K-means clustering
Laboratory	Los Alamos National Laboratory
LANL	Los Alamos National Laboratory
LC-MS/MS	liquid chromatography/mass spectrometry/mass spectrometry
LCS	laboratory control samples
LIKPA	laser-induced kinetic phosphorimetric analysis
Ma	million years ago
MCL	maximum contaminant level
µg/L	micrograms per liter
µS/cm	microsieverts per centimeter
MRGB	Middle Rio Grande Basin
NATU	natural uranium
NC	not calculated
NMED	New Mexico Environment Department
NMSA	New Mexico Statutes Annotated
NMTI	New Mexico Technical Institution
NURE	Natural Uranium Resource Evaluation
NTU	nephelometric turbidity unit
OB	(New Mexico) Oversight Bureau
PC	principal component
PCA	principal component analysis
PCBs	polychlorinated biphenyls
ppb	parts per billion
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RDX	research department explosive
RPD	relative percent differences
RPF	Records Processing Facility
SI	saturation index
SOW	Statement of Work
TA	technical area
TDS	total dissolved solids
TNT	trinitrotoluene
TOC	total organic carbon

TSS	total suspended solids
TU	tritium unit
TUICPMS	total uranium inductively coupled plasma mass spectrometry
TULIKPA	total uranium laser-induced kinetic phosphorimetric analysis
UMTL	University of Miami Tritium Laboratory
UNM	University of New Mexico
USGS	U.S. Geological Survey
UTL	upper tolerance limit
UWM	University of Western Michigan
WQDB	Water Quality Database
WSP	Water Stewardship Program
WMWL	worldwide meteoric water line

Metric to U.S. Customary Unit Conversions

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

1.0 INTRODUCTION

1.1 Rationale for Investigation

The March 1, 2005, Compliance Order on Consent (the Consent Order) signed by NMED, the U.S. Department of Energy (DOE), the Regents of the University of California, and the State of New Mexico Attorney General requires Los Alamos National Laboratory (LANL or the Laboratory) to prepare and submit a groundwater background investigation report. The Consent Order was issued pursuant to the New Mexico Hazardous Waste Act, NMSA 1978, § 74-4-10, and the New Mexico Solid Waste Act, NMSA 1978, § 74-9-36(D). This report describes work completed to satisfy the Consent Order requirement. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with DOE policy.

This report presents background concentrations for naturally occurring metals and general chemistry parameters in multiple groundwater facies in and near the Laboratory and provides the sampling, analytical, and statistical basis for these concentrations. Background hydrogeochemical data requirements are also addressed in the “Hydrogeologic Workplan,” sections 1.0 and 4.0 (LANL 1998, 059599), and within individual work plans prepared by the Environmental Programs–Water Stewardship Program (EP-WSP). This background investigation is further addressed in the Groundwater Protection Management Program Plan, section 4.0, Groundwater Protection Efforts at the Laboratory, and section 5.0, Issues and Solutions (LANL 1996, 070215).

Background hydrogeochemical data with corresponding statistical information are required to distinguish between contaminated and uncontaminated waters for environmental investigations conducted at the Laboratory. Background hydrogeochemical data also provide information for environmental risk assessments; for Resource Conservation and Recovery Act (RCRA) site investigations; for evaluating hydrogeochemical processes occurring along groundwater flow paths; for defining recharge and discharge zones and hydrological pathways; and for establishing cleanup levels during the remediation of contaminated waters at the Laboratory.

1.2 Scope of Report

This report provides background hydrogeochemical data for the alluvial, perched intermediate, and regional groundwater systems beneath the Pajarito Plateau and the Laboratory. It includes a validated database of major, minor, and trace elements, metals, and radionuclide analyses of groundwater samples collected from 29 background locations including 16 springs and 13 wells. The term “background” as used here refers to natural waters that have not been contaminated by Laboratory effluent or other municipal or industrial activities, that are discharged by springs or penetrated by wells, and that are representative of groundwater discharging from its respective aquifer material.

The region considered in this investigation extends from the western edge of the Jemez Mountains eastward to the Rio Grande and from Frijoles Canyon northward to Garcia Canyon. Figure 1.2-1 shows the stations sampled for this investigation. The choice of sampling sites was made using previously published knowledge of the Jemez Mountains/Pajarito Plateau region (Vuataz and Goff 1986, 073687; Shevenell et al. 1987, 006673; Adams et al. 1995, 059066; Blake et al. 1995, 049931; Shevenell and Goff 1995, 073689). The locations of sampling sites were discussed with NMED in 2005 (Dale 2005, 088774) and approved in 2006 (NMED 2006, 094447). Based on these discussions, 16 springs and 13 wells were chosen, and the sites were separated into three aquifer material types: alluvium, perched intermediate-depth volcanic rocks, and the regional aquifer units.

The sampling stations and associated aquifer types are listed in Table 3.1-2, and are briefly discussed below. Revision 2 of this report includes a larger and somewhat different set of locations than Revision 1.

Alluvium

Well LAO-B and Pine Spring were selected as being representative of alluvial groundwater. Although a portion of groundwater that discharges at Pine Spring flows through the Puye Formation and lavas of the Keres Group, water samples were collected from the alluvium at the point of discharge.

Perched Intermediate Volcanic Rocks

Five springs or groups of springs (e.g., the Water Canyon Gallery) and one well were selected as being representative of groundwaters in the perched intermediate system. These locations primarily sample waters originating in the Bandelier Tuff or Tschicoma Formation and include the Water Canyon Gallery (Bandelier Tuff), Seven Springs (Bandelier Tuff), Campsite and Barbara Springs (Tschicoma Formation and Tschicoma and Bandelier contact), Cañon de Valle-5.0 Spring (Bandelier Tuff near the contact with the Tschicoma Formation) (previously described as Upper Cañon de Valle Spring), and well LAOI-1.1(a) (Bandelier Tuff).

Regional Aquifer

Ten springs and 11 wells were selected as being representative of groundwaters in the regional aquifer. They include Springs 1, 5B, 6, 6A, 8A, 9, 9A, 9B, Sacred Spring, and Ancho Spring; and wells G-1A, G-2A, G-3A, G-4A, G-5A, PM-2, PM-4, PM-5, R-1, R-13, and R-21. The corresponding geologic units are shown in Table 3.1-2. Note that since the publication of Revision 2 of this report in February 2007, well R-18 has shown contamination with RDX, and, therefore, has been removed from Revision 3. In addition, Doe Spring was removed from this report version because of low and inconsistent flow.

1.3 Objectives

The primary objective of Revision 3 of this report is to provide background hydrogeochemical concentrations for naturally occurring metals and general chemistry analytes for the three groundwater systems beneath the Pajarito Plateau and the Laboratory. Secondary objectives of this investigation include the following:

- compiling groundwater data from background stations (springs and wells) sampled primarily from 2000 to 2006 for alluvial and perched intermediate groundwater and the regional aquifer; and
- providing statistical distributions and analyses for the different analytes occurring within alluvial, perched intermediate, and regional aquifer groundwater facies.

1.4 Approach

Field and analytical methods are discussed in detail in section 3.0. For most data collected between 2000 and 2006, filtered and nonfiltered water samples were collected and analyzed for chemical constituents and parameters. Additional data collected during or prior to 1997-2000 also were used when later data were not available (Pine Spring and Spring 9B). Inorganic compounds analyzed included major ions, minor elements, and trace elements; and natural and fallout-derived radionuclides. The analytes fall into one or more of the following three categories: RCRA metal or other target metal analytes; general chemical indicators of hydrochemical facies relevant to a geochemical conceptual model; and other analytes that are not RCRA metals. These three categories are based on regulatory and scientific perspectives that support decisions regarding the nature and extent of contamination and provide an understanding of geochemical reactions occurring along flowpaths within alluvial and perched intermediate groundwater and within the regional aquifer.

For each sample station, results of statistical analyses are provided in this report for 18 major ion species; 30 metals including uranium; tritium; 6 radionuclides; gross-alpha, -beta, and -gamma radiological measurements; and two field parameters. Anthropogenic organic compounds such as trichloroethane, high-explosives (HE) compounds, polychlorinated biphenyls (PCBs), and other volatile and semivolatile chemicals were not included as part of this investigation because they were deemed to be introduced and are not indicative of background or natural values. Because technetium-99 is synthetically prepared, it also was not included in this investigation. The presence of these anthropogenic constituents was used as part of the initial screening to remove potentially impacted locations from the candidate location list.

A two-step screening was performed to select the best locations to represent background for this report. Locations included in the original "Groundwater Background Investigation Report," Revision 0 (LANL 2005, 090580) were included for evaluation, along with additional possible locations for all three aquifer types. Locations that were clearly impacted by Laboratory-sourced constituents or other anthropogenic activities, such as road-salt contamination, were excluded from this listing. Locations with data obtained between 2000 and 2006 were included in the listing. Older data (1997 to 2000 or earlier if necessary) were used only if no data were available for 2000 to 2006. Locations were then screened for criteria such as age, location up- or down-gradient in unimpacted areas, mode of occurrence, availability of data, length of sampling record, data quality, consistency of sampling location for springs, and the ability to meet well-screen criteria for wells (section 3.1.2).

The resulting list of 29 locations was then screened for evidence of corrosion in wells. Levels of iron, chromium, nickel, manganese, and copper were evaluated. For example, wells LA-5 and LA-3 were subsequently eliminated because of high levels of copper (greater than three standard deviations from the mean of other well values and at least three to 10 times the concentration in other evaluated wells).

In addition, classification of groundwater with respect to the aquifer unit was based on well depth, hydrogeologic units penetrated, depth to the zone of saturation sampled and observed, or the projected position of the regional water table at that location.

Various statistical methods were used for the assessment of the background data. Section 4 of this report provides details and results of statistical analyses of groundwater samples used. Graphs presented in Appendix C provide an overview of the data set for each constituent. These graphs compare filtration type, groundwater group, location, and trend over time. Methodology and results of cluster analysis (CA) and principal component analysis (PCA) are discussed in section 4. The assessment also includes data to meet certain U.S. Environmental Protection Agency (EPA) and NMED regulations that require a statement of the locations, frequency of sampling, and laboratory analytical methods for groundwater monitoring.

Interlaboratory comparisons of data collected between 1997 and 2000 for a subset of the current reported locations are included in Appendix F. These comparisons were made to support the use of Earth and Environmental Sciences-6 (EES-6) analyzed data instead of data analyzed under contract with analytical laboratories. As a quality measure for the investigation, the differences between field duplicate measurements for all water-chemistry analytes were assessed by comparing concentrations of samples and their duplicates. The laboratories used different analytical methods for some analytes (e.g., uranium, tritium, and trace metals). Contract and EES-6 analytical laboratory sample results for seven inorganic chemicals and four water-quality parameters (anions, cations, silica, and total dissolved solids [TDS]) were compared and are presented in the appendix.

The Cerro Grande fire burned several major watersheds west of and within the Laboratory in May 2000. These watersheds included Guaje Canyon, Pueblo Canyon, Los Alamos Canyon, Sandia Canyon, Water Canyon, Mortandad Canyon, Pajarito Canyon, and Cañon de Valle. Section 2.2.2.4 discusses the short-term impact of the fire on springs and wells in those canyons. Sampling of springs, surface water, and alluvial groundwater from 2001 to 2003 showed that most analytes had decreased to concentration levels measured before the fire (Gallaher and Koch 2004, 088747). Data from more recent sampling events (included in this report) also show concentrations near pre-fire levels.

1.5 Changes in Revision 1

The original version (Revision 0) of this report was submitted to NMED on June 30, 2005 (LANL 2005, 090580). Revision 1 of this report incorporated changes made in response to NMED comments in a notice of deficiency (NOD) dated July 3, 2006 (NMED 2006, 092742). Revision 1 was submitted to NMED on September 1, 2006 (LANL 2006, 094637). The interpretations of results and conclusions were revised to reflect data reported in tables and depicted in Appendix C of Revision 1. The hydrogeochemical model was expanded to acknowledge additional processes and influences on groundwater chemistry. The most significant change was the reduction from 15 to 12 background locations, with the deletion of Sacred Spring, Pajarito Spring, and La Mesita Spring. Sacred Spring was deleted because of potential source contamination in pre-2000 data. Pajarito Spring showed anthropogenic contamination, and La Mesita Spring was located east of the Rio Grande.

1.6 Changes in Revision 2

Revision 2 of this report replaced the previous data set in Revision 1 with a more recent, larger data set that incorporated the newest sampling and analytical methods, and, in some cases, lowered detection limits. Older data (1997-2000) were retained only if newer data (2000-2006) were not available for a particular location. Locations were added to improve the description of the regional and perched-intermediate groundwaters. The total number of locations increased from 12 to 30; Apache Spring was deleted because of road-salt contamination; well Otowi-4 and Doe Spring were deleted at NMED's request (NMED 2006, 094447); well Guaje-5 was replaced by the newer Guaje-5A; and Sacred Spring was reinstated from Revision 0 after data were verified to match the precise source at the spring. A larger data set was not proposed for the alluvial groundwater because data indicate that individual recharge areas, such as specific canyons or watersheds, yield variable constituent results that tend to be more dependent upon geographic locale and less dependent upon aquifer geology or flowpath evolution (NMED 2006, 094447).

The previous data set was very small and generally insufficient for robust statistical analysis. Comments on Revision 0 indicated a need for better statistical descriptions of the background results. In response, expanded and improved statistical analysis methods appropriate to large areas and large regional data sets (PCA and CA) were added to distinguish more closely the statistical similarities between regional aquifer locations. As a result, three statistically different location groupings, reflecting different facies within the regional aquifer, are discussed in section 4.0. However, in response to comments by NMED (NMED 2006, 094447), one location grouping was dropped and the other two groupings were combined to yield one final regional data set.

The hydrogeochemical conceptual model was streamlined. The report was reorganized to emphasize the characterization of metals and inorganic constituents per the Consent Order, while retaining in the appendices discussions of secondary topics such as interlaboratory comparisons and other historical data.

1.7 Changes in Revision 3

Revision 3 was prepared in response to NMED comments provided in the department's "approval with direction" on Revision 2. The most substantial changes involved reclassifying the water supply wells as unfiltered and removing R-18 from the data set because of recently detected RDX contamination. These changes required revisions to Tables 4.2-3 and 4.2-4. In addition, the Student's *t*-test was replaced by the Mann-Whitney *U*-test. Other changes were made for clarification and consistency.

2.0 BACKGROUND

2.1 Regional Geologic Framework and Conceptual Hydrogeologic Framework

A technically defensible conceptual hydrogeologic model is essential for characterizing background hydrochemistry, selecting suitable sampling sites, and correctly ascribing the sites to various parts of the hydrologic system. To develop the conceptual hydrogeologic model presented in section 2.1.5, it is necessary to understand the geologic framework of the region and how it controls the occurrence and movement of groundwater. This geologic framework is presented below in sections 2.1.1 through 2.1.4. The hydrogeologic setting of springs and wells and controls on the mode of groundwater occurrence (alluvial, perched intermediate, and regional aquifer) place constraints on groundwater residence times (more rapid fracture versus slower porous media flow). The chemical composition of groundwater is controlled by recharge and precipitation inputs, equilibration and partial equilibration with different rock formations, climate, topography, and time. Near the Laboratory, complex topography, variation in rock types, distinct recharge and discharge zones, and evapotranspirative effects of a dry climate on recharge are factors defining the different hydrologic facies that occur beneath and near the Pajarito Plateau. Climate differences (near alpine to high desert), hydrologic regimes (porous flow to fractured rock), different geologic environments (alluvial valley fill, fractured volcanic, mineralized zones, and sedimentary rocks) vary widely within the region, leading to a variety of groundwater facies that reflect changes in geochemical composition along flow paths.

2.1.1 Previous Work, Regional Geology

The Pajarito Plateau lies on the east flank of the Jemez Mountains and on the western margin of the Española Basin (Figure 2.1-1). For the hydrogeologic discussions that follow, the Pajarito Plateau and underlying rock units are considered as a geologic feature of the Española Basin segment of the Rio Grande rift (Manley 1979, 011714). The upper surface of the Pajarito Plateau, however, is composed primarily of the eroded top of the Tshirege Member of the Bandelier Tuff, a large-volume rhyolitic ash-flow tuff (ignimbrite) erupted from the Valles Caldera of the Jemez volcanic field (Smith and Bailey 1966, 021584).

Regional geologic maps that cover all or part of the Pajarito Plateau include those of Griggs (1964, 092516) for hydrogeologic investigations centered on Los Alamos; Smith et al. (1970, 009752) for volcanologic investigations of the Jemez Mountains; Kelley (Kelley 1978, 011659) for tectonic investigations associated with the Rio Grande rift; and Rogers (1995, 054419) for Laboratory waste management studies. Several geologic maps of nearby areas focus on a variety of subjects in the

Española Basin/Pajarito Plateau region. They include those of Galusha and Blick (1971, 021526); Aubele (1978, 086539); Dethier and Manley (1985, 021506); Goff et al. (1990, 021574; 2002, 088776); and Dethier (1997, 049843).

Detailed geologic studies of the Bandelier Tuff are found in Broxton and Eller (1995, 058207). Syntheses of geology and tectonics on the Pajarito Plateau have been published by Dransfield and Gardner (1985, 006612) and Gardner and House (1987, 006682) as part of Laboratory investigations of the seismic hazard potential. Gardner et al. (1993, 012582; 1998, 063496) described drilling results around the Laboratory and high-precision mapping along the Pajarito fault zone. Collections of papers discussing geologic, geochemical, geophysical, and environmental aspects of the Jemez Mountains, Pajarito Plateau, and Rio Grande rift are found in Riecker (1979, 021502); Baldridge et al. (1984, 088745); Keller (1986, 088740); and McLin (1996, 056025). Geology and cross sections of the Frijoles 7.5-min quadrangle, on which most of the Laboratory is found, was published by Goff et al. (2002, 088776).

2.1.2 Regional Tectonic Setting

The Pajarito Plateau lies on the west side of the Española Basin, one of several late Tertiary basins of the Rio Grande rift (Chapin 1979, 021502). Figure 2.1-2 shows generalized geologic relations beneath the Pajarito Plateau. As a generalized cross section, this does not refer to a specific geologic map. Specific, related cross sections and the associated maps can be found in Collins et al. (2005, 092028) and the Hydrogeologic Site Atlas (LANL 2006, 093196). The rift is a major tectonic feature stretching from Colorado to northern Mexico and first developed about 25 to 30 million years ago (Ma). The Rio Grande rift is characterized by crustal extension with predominantly normal faults, elevated seismicity along faults within and along margins of the basins, large negative gravity anomalies indicating thick basin fill, high conductive heat flow (to 120 megawatts/meter^2 [MW/m^2]), and localized basaltic volcanism. Within the Pajarito Plateau region, the rift is bounded on the west by the Colorado Plateau and on the east by the Sangre de Cristo range, part of the southern Rocky Mountains (Aldrich 1986, 021497) (Figure 2.1-1). Because of similarities in age and tectonic style, the rift is considered by some to be a part of the southern Basin and Range tectonic province (Kelley 1978, 011659).

The transverse structural zone separating the Española Basin from the southern end of the San Luis Basin (Figure 2.1-3) (Broxton and Vaniman 2005, 090038) is called the Embudo fault zone. This fault is but one structural element of a major northeast-trending crustal discontinuity called the Jemez Lineament. As originally defined, the Jemez Lineament consists of an alignment of Miocene to Quaternary volcanic centers stretching from western Arizona to southeastern Colorado (Mayo 1958, 021573). No systematic trends in eruption ages or magma compositions are apparent among the various volcanic centers. By far the largest collection of volcanic centers is the Jemez volcanic field, which has formed at the intersection of the Jemez Lineament and the Rio Grande rift.

The transverse structural zone separating the Española Basin from the northern Albuquerque-Belen Basin (sometimes called the Santo Domingo Basin) is the northwest-trending La Bajada fault zone (CCFZ in Figure 2.1-3). The largest zone of rift-related basaltic volcanism occurs in the Cerros del Rio volcanic field located primarily north of and along the La Bajada fault zone (Figure 2.1-3). The Cerros del Rio field, referred to in some reports as "Basalt of Chino Mesa," is considered by some to be a peripheral part of the greater Jemez volcanic field (Smith et al. 1970, 009752). Volcanic rocks from both the Cerros del Rio and Jemez volcanic centers interfinger with sedimentary rocks filling the Española Basin beneath the Pajarito Plateau.

2.1.3 Regional Volcanism

The evolution of the Jemez and Cerros del Rio volcanic fields (Figure 2.1-1) has been outlined by Gardner and Goff (1984, 044021); Gardner et al. (1986, 059104); Self et al. (1986, 021579); Goff and Sayer (1980, 073686); Dunker et al. (1991, 088739); and WoldeGabriel et al. (1996, 054427). Volcanic rocks of the Jemez Mountains can be subdivided into three major groups named from the oldest to the youngest: the Keres, Polvadera, and Tewa Groups (Figure 2.1-4) (Broxton and Vaniman 2005, 090038). Volcanic rocks of the Keres Group consist of mafic basalt through silicic rhyolite in composition, although the unit is dominated volumetrically by intermediate-composition andesite. Published ages for the Keres Group range from about 13 to 6 Ma (Gardner et al. 1986, 059104). Rocks of the Polvadera Group also consist of basalt through rhyolite, but the dominant rock type is dacite and the published ages range from about 14 to 2 Ma (Gardner et al. 1986, 059104). Rocks of the Tewa Group consist almost exclusively of rhyolite, and they range in age from 1.75 to 0.06 Ma (Goff and Sayer 1980, 073686; Gardner et al. 1986, 059104). In general, a progression can be seen from mostly mafic to exclusively rhyolitic compositions with time in the main (or central) Jemez volcanic field.

Rocks of the Cerros del Rio field are not formally included within the three major groups of Jemez volcanic rocks. Cerros del Rio rocks compositionally consist of basalt and subordinate evolved rocks (hawaiite, mugearite, benmoreite, and dacite) ranging in age from 4.6 to less than 1.2 Ma (Bachman and Mehnert 1978, 088741; Dunker et al. 1991, 088739; WoldeGabriel et al. 1996, 054427). The most comprehensive study to date has focused on White Rock Canyon, where the ages range from 2.8 to 2.3 Ma (WoldeGabriel et al. 1996, 054427). These authors have also dated a single lava flow at the bottom of the canyon just south of the mouth of Ancho Canyon at 9.3 Ma, a date consistent with ages of the Santa Fe Group.

Volcanism began in the Pajarito Plateau region about 16.5 to 14 Ma as small-volume eruptions of basalt that can be observed interbedded with older sedimentary rocks of the Española Basin both southwest and north of the plateau (Dethier and Manley 1985, 021506; Gardner et al. 1986, 059104; Aldrich and Dethier 1990, 049681; Goff et al. 1990, 021574). During the period from 10 to 7 Ma, the major volume of Jemez volcanic rocks was erupted, mostly as andesite domes and flows in the central and southern Jemez Mountains (estimated volume 1000 km^3). Smaller volumes, predominantly dacite (about 500 km^3), were vented during the period 7 to 2.5 Ma (Goff and Sayer 1980, 073686; Gardner et al. 1986, 059104). The Sierra de los Valles west of Los Alamos consists of these dacitic domes and flows. During these voluminous andesitic and dacitic phases, large debris aprons of volcaniclastic rocks (Cochiti and Puye Formations) were shed eastward into the Española Basin. These deposits interfinger with axial sediments of the basin. Lavas within the entire compositional range of the Cerros del Rio were erupted primarily from 4 to 2 Ma and formed cinder cones, shield lavas, intercanyon flows, and maar deposits. The latter interfinger with dacitic rocks, fan deposits, and fluvial sediments in the basin fill beneath the Pajarito Plateau.

2.1.4 Pajarito Plateau Stratigraphy

Figure 2.1-4 (Broxton and Vaniman 2005, 090038) shows the most recent representation of the stratigraphy of the Pajarito Plateau. Stratigraphic nomenclature on the Pajarito Plateau has been refined many times during the last 50 years (Denny 1940, 088738; Baltz et al. 1963, 008402; Spiegal and Baldwin 1963, 054259; Griggs and Hem 1964, 092516; Bailey et al. 1969, 021498; Galusha and Blick 1971, 021526; Manley 1979, 011714; Purtymun 1995, 045344). Griggs's nomenclature was based on mapping and lithologic descriptions of water well cuttings on Laboratory property. Griggs's nomenclature has continued to be used in later hydrogeologic investigations conducted by the Laboratory as additional water wells were drilled (Dransfield and Gardner 1985, 006612). These authors combined well data with geophysical investigations and surface mapping to produce a structure contour map of the top of the pre-Bandelier Tuff surface (ca 1.6 Ma). Dransfield and Gardner (1985, 006612) provide information that the pre-Bandelier topography beneath the Pajarito Plateau is dominated by dacitic rocks of the Polvadera Group in the west, fanglomerates of the Puye Formation in the northeast, and mafic shield volcanoes and flows of the Cerros del Rio volcanic field in the southeast.

The stratigraphy of three deep (more than 600 m) wells on the Pajarito Plateau was compiled by Goff (1995, 049682), based on lithologic descriptions of Stoker et al. (1992, 012017) and Purtymun et al. (1993, 015371). Detailed stratigraphy of several recent characterization wells has been documented in a series of Laboratory reports (i.e., Broxton et al. 2001, 071251; Broxton et al. 2001, 071252; Ball et al. 2002, 071471).

Generalized cross sections of Pajarito Plateau stratigraphy may be found in Turbeville et al. (1989, 021587), Purtymun (1995, 045344), and Collins et al. (2005, 092028). Four detailed cross sections projected through different sectors of the Pajarito Plateau are shown in Goff (1995, 049682). These sections use stratigraphic data from many of the observation wells. Goff (1995, 049682) also provides detailed lithologic descriptions of the primary rock units in the region (Table 2.1-1).

2.1.5 Conceptual Hydrogeologic Model

The current conceptual hydrogeologic model for the Pajarito Plateau is a synthesis of much previous hydrologic work spanning many years. The growth of the Laboratory, as well as Los Alamos townsite, led to various investigations that characterized general hydrology of the Pajarito Plateau and water chemistry of springs discharging within White Rock Canyon (Purtymun and Johansen 1974, 011835; Purtymun et al. 1980, 006048); the hydrogeology of the Bandelier Tuff and other rock units (Abeele et al. 1981, 006273; Rogers and Gallaher 1995, 055334) and water supply wells (Theis and Conover 1962, 037144; Griggs and Hem 1964, 092516; Cushman 1965, 008584; Purtymun and Cooper 1969, 011831; Purtymun 1975, 011787; Purtymun 1984, 006513). Concerns over the potential for groundwater contamination by waste-disposal practices at the Laboratory prompted additional hydrogeologic studies (Baltz et al. 1963, 008402; Purtymun et al. 1966, 009653; Devaurs and Purtymun 1985, 007415; Stoker et al. 1991, 007530). Pathway analysis (Geologic Inc. 1989, 031492) and numerical modeling studies have further contributed to understanding both shallow and deep, local and regional, unsaturated and saturated groundwater systems at Los Alamos (Hearne 1985, 088749; McAda and Wasiolek 1988, 088737; Umari and Szeliga 1989, 088735; Koenig and McLin 1991, 056029; Geddis 1992, 031592; Birdsell et al. 1995, 070012; Frenzel 1995, 056028; Stone 1995, 056043; Gray 1997, 058208; Dander 1998, 088743; Keating et al. 1999, 088746).

The conceptual hydrogeologic model for the Pajarito Plateau and the Laboratory is continuously being refined (Stone 1996, 063989; Collins et al. 2005, 092028).The 25 deep (regional aquifer) wells installed under the "Hydrogeologic Workplan" (LANL 1998, 059599) have contributed much-needed information (Collins et al. 2005, 092028). The next subsections provide an overview of the conceptual hydrogeologic model, including groundwater occurrence and movement, and serve as the framework for the conceptual hydrogeochemical model discussed in section 2.2.

2.1.5.1 Overview

The simplest conceptual hydrogeologic model for the Pajarito Plateau is of saturated porous media in which the surface of the saturated zone(s) roughly mimics topography. For example, the regional water table slopes eastward from a recharge zone in the Sierra de los Valles west of the Laboratory toward the Rio Grande groundwater discharge zone. Complicating this simple model, however, are zones of saturation perched above the regional water table in shallow alluvium and perched intermediate-depth volcanic rocks (Purtymun 1995, 045344).

2.1.5.2 Groundwater Occurrence

Groundwater occurrence is commonly described in terms of stratigraphy (the saturated hydrogeologic unit), hydrologic condition (unconfined or confined), and scale (local perched or regional saturation). At the Laboratory, groundwater has been observed to occur in three modes, depending on the location:

- perched at shallow depth (alluvium in canyon bottoms);
- perched at intermediate depth (the Guaje Pumice Bed, Bandelier Tuff, Cerros del Rio basalt, Tschicoma Formation, and Puye Formation); and
- mostly unconfined, but occasionally under confined conditions at greater depth within various units that make up the regional aquifer (Tschicoma Formation, Cerros del Rio basalt, Puye Formation, and Santa Fe Group).

The zone of saturation is more accessible in canyons than on mesas. Figure 2.1-5 depicts a conceptual hydrogeologic model for canyon settings, which includes alluvial and perched intermediate groundwater and the regional aquifer. Groundwater in the perched zones is generally unconfined. Groundwater in the regional zone of saturation is also generally unconfined, but confined conditions have been documented in older supply wells in lower Los Alamos Canyon (Purtymun 1995, 045344). Some springs discharging in and near lower Los Alamos Canyon (e.g., Spring 1) are also probably artesian.

Perching of groundwater in the shallow and intermediate-depth zones occurs in different ways. The occurrence of perched water in the alluvium is restricted to canyon floors, and saturation does not appear to extend beneath the adjacent mesas. In alluvial environments, infiltration and percolation of stream flow readily recharge the zone of perched saturation. Ephemeral streams, such as those occurring in canyons at the Laboratory, lose much water along their courses (transmission loss). The weathered Bandelier Tuff underlying the alluvium is less permeable and provides a perching layer or aquitard.

The occurrence of intermediate-depth perched groundwater in the Cerros del Rio basalt and other hydrostratigraphic units requires the downward percolation of groundwater through the alluvium and the Bandelier Tuff, a fact that suggests that the Bandelier Tuff is capable of transmitting groundwater. In places where the Bandelier Tuff is absent, having been scoured out by stream flow, no low-permeability barrier exists between the alluvium and underlying units. This is the case in Los Alamos Canyon east of the confluence with DP Canyon, where the Bandelier Tuff is missing and where alluvium rests directly on the permeable deposits of the Puye Formation (LANL 2004, 087390). Perching of intermediate-depth groundwater is caused by the local presence of less permeable material, including massive basalt and basaltic tephra, as observed at well R-9 (Broxton et al. 2001, 071250); clay-rich lake beds encountered at R-12 (Broxton et al. 2001, 071252); or clay-rich rock observed at R-15 (Longmire et al. 2001, 070103).

Although groundwater occurrence and productivity in supply wells vary with the hydrogeologic unit making up the regional aquifer, the depth to the water table is primarily the result of topography. The regional water table occurs within the Puye Formation and Santa Fe Group beneath the Pajarito Plateau. The slope of the regional water table decreases to the east (Figure 2.1-6) and is influenced by pumping wells. Groundwater in the regional aquifer discharges as springs in White Rock Canyon. The hydraulic gradient within the regional aquifer east of the Sierra de los Valles is downward, and overlying alluvial and perched intermediate groundwater systems provide recharge to the regional aquifer (Broxton et al. 2002, 076006). Groundwater flow rates within the regional aquifer vary, depending on the grain size of the aquifer material, hydraulic conductivity, and hydraulic gradient. Flow within the regional aquifer occurs under porous (wells R-25, R-19, R-15, R-13, R-14) and fracture (R-26, R-9, R-12) conditions (Collins et al. 2005, 092028).

2.1.5.3 Groundwater Movement

Several studies have dealt with groundwater movement beneath and around the Pajarito Plateau. In particular, Collins et al. (2005, 092028) gives a detailed summary of groundwater recharge, flow and discharge, anisotropic effects, conceptual models, and perched water occurrence. The following is a brief summary of some relevant ground water flow characteristics.

2.1.5.3.1 Recharge

Groundwater flows from areas of higher-pressure potentials (west) to areas of lower potentials (east) (Figure 2.1-6), indicating that recharge occurs in the higher elevations (Sierra de los Valles) west of the Laboratory, probably in response to the higher amounts of precipitation at these elevations. Recharge processes include the infiltration of rainfall, snowmelt, or runoff and then deep percolation of any moisture that escapes evapotranspiration. Recharge is especially effective along stream channels, where larger volumes of water occur at any given place and time. Recharge of the shallow, intermediate, and deep groundwater systems probably occurs at different rates (Kwicklis et al. 2005, 090069).

2.1.5.3.2 Flow

From limited hydrologic data and information, groundwater flow direction seems to be the same for the shallow, intermediate, and deep systems. In canyons where numerous wells have been drilled (such as in Mortandad Canyon), the water table for the shallow groundwater perched in the alluvium slopes toward the east as does the canyon floor (Stone 1995, 056043). The intermediate-depth perched groundwater zones are still too poorly bounded to characterize flow direction with any certainty. As shown by Figure 2.1-6, groundwater flow in the regional aquifer generally is to the east and southeast toward the Rio Grande.

The rate of groundwater flow depends on the hydraulic properties of the various saturated materials beneath the Pajarito Plateau. The actual flow rate or groundwater velocity (v) at a given point of interest depends on the saturated hydraulic conductivity (K) for the material, effective porosity (n_e), and the slope of the water table or hydraulic gradient (i), according to Darcy's law (Freeze and Cherry 1979, 088742):

$$v = Ki/n_e. \tag{1}$$

Hydraulic conductivity values, however, are a proxy for at least the potential rate of groundwater flow. Sparse data for K are available from hydrologic testing of observation, water supply, test, and regional characterization wells in the area. The mean K value for the alluvium in Los Alamos Canyon, based on slug tests in nine observation wells, is 9.6×10^{-3} cm/s with an error of ±10% (Gallaher 1995, 049679).

Laboratory testing of cores from two wells in Mortandad Canyon yielded saturated K values of 5×10^{-5} to 1×10^{-3} cm/s for the Tshirege Member (unit 1A) of the Bandelier Tuff and 7×10^{-5} to 1×10^{-3} cm/s for the Tsankawi Pumice Bed (Stoker et al. 1991, 007530). Aquifer performance data for deeper units are available from pumping tests conducted on water supply and test wells in a detailed report by McLin (2006, 092218). Some of the wells are screened across more than one stratum, and K values for specific geologic units at these locations are not always available. Hydraulic conductivity values obtained from pumping tests conducted on water supply and test wells screened in a single unit vary by one to two orders of magnitude: 4 to 241 gal./day/ft^2 for the Puye Formation and 3 to 50 gal./day/ft^2 for the Santa Fe Group (Purtymun 1995, 045344; McLin 2006, 092218). These are typical ranges of variation for K values in individual aquifers. Other testing in characterization wells installed under the "Hydrogeologic Workplan" (LANL 1998, 059599) has provided K values of 2.79×10^{-3} to 1.31×10^{-2} cm/s for intervals of the Cerros del Rio basalt at well R-9i (Broxton et al. 2001, 071251); 7.27×10^{-4} cm/s for the Puye Formation at well R-15 (Longmire et al. 2001, 070103); 6.17×10^{-3} and 6.91×10^{-3} cm/s for the Santa Fe Group at well R-19 (Broxton et al. 2001, 071254); 2.32×10^{-3} and 1.28×10^{-3} cm/s for the Cerros del Rio basalt at well R-31 (Vaniman et al. 2002, 072615); and 8.21×10^{-3} cm/s for the Puye Formation at well R-31 (Vaniman et al. 2002, 072615).

Radiocarbon dating of groundwater is another method of calculating flow rates, although it is difficult to collect groundwater samples not impacted by atmospheric carbon dioxide. Such dating of regional aquifer groundwater at the Laboratory suggests preliminary flow rates ranging from a minimum of 1.93×10^{-5} cm/s for the Tesuque Formation in lower Los Alamos Canyon to a maximum of 3.33×10^{-4} cm/s for the Puye Formation, in the area between Water Canyon and upper Ancho Canyon (Purtymun 1984, 006513).

2.1.5.3.3 Discharge

Alluvial, intermediate, and regional aquifer groundwaters discharge in different ways, depending on hydrogeologic conditions. Alluvial groundwater is either forced to the surface by bedrock highs where it supports stream flow for some distance downcanyon, or it seeps into the underlying hydrogeologic unit. Intermediate-depth perched groundwater either discharges eventually at downgradient springs along canyon walls or continues to percolate downward toward the regional water table. Regional groundwater discharges at springs within White Rock Canyon and may contribute to base flow within the Rio Grande or, possibly, continue beneath the river (Figure 2-11 in LANL 1998, 059599).

2.2 Conceptual Hydrogeochemical Model

This section presents a conceptual hydrogeochemical model for the Pajarito Plateau, which focuses on natural distributions of inorganic and organic solutes as dissolved species. This model is based on geochemical data collected to date and includes both water chemistry and mineralogy of aquifer materials. The contribution of biological and microbial effects to speciation and reactive transport is implicit in the chemical data and is discussed below.

The chemical composition of groundwater is controlled by many factors including precipitation chemistry and quantity, evapotranspirative effects, redox conditions, aquifer mineralogy, and residence time (Güler et al. 2002, 094417). Reactive constituents, such as $CaCO_3$ (calcite), $Fe(OH)_3$, clay minerals, and SiO_2 glass, and ion exchange-adsorption reactions are particularly important in controlling groundwater composition for major solutes and some trace elements. Interactions of groundwater with reactive minerals in different rock types, over space and time, lead to the development of different hydrochemical facies. These facies are expressed at discharge locations (springs or wells) and can then be correlated with locations along flow paths and with the history (aquifer rock type, residence time) of the facies (Güler et al. 2002, 094417). Analytical results for different locations are compared statistically in section 4.0 to distinguish the different facies for the Pajarito Plateau region based upon the chemical data.

2.2.1 Previous Work

The current conceptual hydrogeochemical model for the Pajarito Plateau is a synthesis of previous geochemical investigations conducted over the past several years and is summarized in Collins et al. (2005, 092028). Characterization of site geochemistry has taken place over the past decade with investigations conducted on mesa tops and within canyon bottoms surrounding the Laboratory (Adams et al. 1995, 059066; Blake et al. 1995, 049931; Broxton and Eller 1995, 058207; Longmire et al. 1996, 054168; Longmire and Goff 2002, 075905; Gallaher and Koch 2004, 088747). Concerns about the potential for groundwater contamination by waste-disposal practices at the Laboratory have prompted annual monitoring (annual Laboratory Environmental Surveillance Program [ESP] reports) since the 1950s and additional hydrogeochemical studies (2002, 072614; 2002, 072713; 2002, 072800; 2002, 073282; 2002, 073676; 2005, 088510). Geochemical modeling studies have further contributed to an understanding of geochemical processes occurring in shallow and deep, local and regional, unsaturated and saturated groundwater systems (Keating et al. 1999, 088746; Broxton et al. 2002, 076006).

2.2.2 Elements of the Conceptual Hydrogeochemical Model

This subsection summarizes different elements contributing to the conceptual hydrogeochemical model. The seven elements that follow represent conceptual hydrogeochemical processes. Geochemical processes occurring over time and space are implicit in this conceptual model. The elements include initial natural chemical compositions of groundwater, residence times, oxidation-reduction and microbially mediated conditions, reactive aquifer minerals, adsorption and precipitation reactions, radioactive decay, and colloid transport. Reactive minerals and adsorption-desorption processes are considered to be most important for controlling groundwater composition and solute mobility.

Geochemistry Element 1: **Initial composition** of water infiltrating into each aquifer unit. For example, water enters the alluvial groundwater via recharge from precipitation or outfalls from anthropogenic activities. This water interacts with the alluvium (alluvial facies) and then infiltrates the perched intermediate zone, where it again interacts with the volcanic rock in that zone to produce a new facies composition characteristic of that zone. Some alluvial recharge occurs from water sourced in the Sierra de los Valles and the mountain-front areas near the Pajarito fault zone. Springs discharging from these rocks contribute to perennial surface water that recharges the alluvium.

Geochemistry Element 2: **Residence times** of groundwater and chemical solutes (mass of water or solute/flux of water or solute) increase with depth and from west to east across the Pajarito Plateau based on delta deuterium (δD) and delta oxygen-18 ($\delta^{18}O$) ratios, and tritium (^3H) decay (Collins et al. 2005, 092028). The initial cosmogenic baseline for tritium is approximately 17 pCi/L (Clark and Fritz 1997, 059168). However, near Los Alamos, tritium in precipitation has been measured to vary from 20 pCi/L to 451 pCi/L (Adams et al. 1995, 059066). Current precipitation values tend to vary between 10 and 70 pCi/L. These levels decay to less than 1 pCi/L as water moves from the surface to the regional water table over several decades, with the exception of tritium release sites in Pueblo Canyon, Los Alamos Canyon, Sandia Canyon, Mortandad Canyon, Pajarito Canyon, and Cañon de Valle (LANL 2001, 071301; Longmire 2002, 073282; Longmire 2002, 072800; Longmire 2002, 073676; Longmire 2002, 072614; Collins et al. 2005, 092028; Longmire 2005, 088510). Accordingly, changes in concentrations of major ions and trace elements are observed along the flow paths from the alluvial to perched intermediate systems to the regional aquifer and within the regional aquifer as a result of reactions along flow paths. Calcium, sodium, and bicarbonate are major ion solutes that tend to vary with groundwater zone and along flow paths from west to east. For example, sodium tends to increase relative to calcium in spring discharges versus alluvial wells. One regional aquifer facies discussed in section 4.0 has characteristic higher TDS, indicative of older water and longer residence time.

In contrast, younger ages are indicated in a facies of groundwater within perched zones in the Sierra de los Valles and in a component of the regional aquifer. In these areas, groundwater is less than 60 yr old. This observation is based on measurable natural tritium considerably above 1 pCi/L (Broxton et al. 2001, 071252; Longmire et al. 2001, 070103; Broxton et al. 2002, 076006). Perched intermediate waters from this area thus tend to be lower in TDS.

Groundwater within a discharge zone, at the end of groundwater flow paths, generally has the highest mineral or solute content and also represents the oldest water, provided that mixing with younger groundwater has not taken place. The main groundwater discharge zone for the Sierra de los Valles occurs as springs and gaining reaches along the Rio Grande. Older groundwater within the regional aquifer tends to have higher concentrations of trace elements due to a combination of mineral dissolution and desorption processes (Collins et al. 2005, 092028). Many trace elements, including arsenic(III, V) and uranium(VI), form complexes and tend to desorb from mineral surfaces under basic pH conditions (Langmuir 1997, 056037). Water quality/geochemical data collected by NMED and by LANL indicate that dissolved concentrations of major cations and anions, arsenic, uranium, and other trace elements are higher in groundwater east of the Rio Grande. Collins et al. (2005, 092028) report values of natural uranium in groundwater up to 0.2 mg/L along the Rio Grande and eastward toward the Sangre de Cristo Mountains. In contrast, uranium concentrations in the regional aquifer beneath the Pajarito Plateau rarely exceed 1 µg/L.

Geochemistry Element 3: **Oxidation-reduction reactions** and other **microbially mediated reactions** are important in determining the speciation and subsequent reactivity, sorptivity, and solution concentration of solutes. Solutes such as uranium(VI), sulfate, nitrate, and chromate are mobile under oxidizing conditions but can precipitate or adsorb under reducing conditions. In addition, nutrients such as nitrate and other potentially metabolically active constituents such as perchlorate can cycle as part of microbial metabolism. Analytical data for the three aquifer types indicate that all are typically under oxidizing conditions. Special conditions, such as the presence of drilling fluids and bacteria in well bores, may alter these conditions locally.

Geochemistry Element 4: **Reactive constituents**, consisting of $CaCO_3$, Ca-smectite, Na-feldspar, amorphous SiO_2, and $Fe(OH)_3$, frequently control groundwater composition for the major solutes and selected trace elements, including iron and aluminum. Some of these constituents are undersaturated in particular locations (such as calcite in the alluvium), or will precipitate as minerals (such as calcite in the Santa Fe Group portion of the regional aquifer where higher concentrations of bicarbonate are found) (Collins et al. 2005, 092028). Adsorption processes generally dominate over **mineral precipitation** for removing metals and radionuclides from alluvial groundwater. However, in isolated cases where effluent discharges have changed major ion chemistry and pH, trace solutes such as strontium and barium may precipitate as $SrCO_3$ and $BaSO_4$ or coprecipitate as $(Sr\text{-}Ba)SO_4$ in alluvial sediments. Precipitation is also important in older waters with elevated levels of carbonate or sulfate and metals such as iron. Encrustation of well screens may result from these waters.

Geochemistry Element 5: **Adsorption** capacities of sediments and aquifer material affect concentrations of dissolved constituents over time and along flow paths. Adsorption is dependent upon solute speciation, aquifer mineralogy, and grain size. In general, adsorption of radionuclides and organic and inorganic species in the Bandelier Tuff decreases as follows: cesium-137 (highest sorption) = americium-241 > plutonium-238 = plutonium-239/240 > strontium-90 > uranium > nitrate = sulfate > chloride = perchlorate = trinitrotoluene (TNT) = research department explosive (RDX) > tritium (lowest sorption). Adsorption affinities are measured by experimental (Longmire et al. 1996, 056030) and field data collection and analysis (LANL 2000, 068661; LANL 2001, 071301). Non- and weakly adsorbing constituents (tritium, perchlorate, nitrate, chloride, fluoride, and uranium) can migrate from alluvial groundwater to perched intermediate zones and to the regional water table. These constituents can be used as nonreactive tracers in some cases.

Alluvial groundwater in some locations acts as a reservoir for effluent-discharged constituents due to sorption and subsequent desorption. These constituents include strontium-90, cesium-137, plutonium-238, plutonium-239/240, and americium-24. These constituents adsorb onto clay and silt-sized particles coated with clay minerals, manganese hydroxides, and ferric (oxy)hydroxides, forming a sorbent sink.

Geochemistry Element 6: **Activities** of naturally occurring, sorbing radionuclides in groundwater are controlled by desorption and dissolution reactions, while they are concurrently reduced by decay processes. Nonsorbing tritium, which can be sourced from natural precipitation or Laboratory-related releases, also decays during its residence time. Suspended nuclides (in solution or colloidal transport) such as uranium-238 and strontium-90 are reduced by decay processes downgradient along the groundwater flow path.

Geochemistry Element 7: **Colloid Transport.** Some constituents in groundwater occur as both dissolved solutes and as colloids. For example, transport of plutonium in groundwater is sometimes connected with colloid transport rather than involving a dissolved species. Colloids may include natural material (silica, clay minerals, organic matter, manganese hydroxides, and ferric (oxy)hydroxides) and possibly solid phases associated with treated Laboratory discharges. Most colloids greater than 0.45 microns in size are removed during filtration in the sampling process, but smaller colloids may pass through filters and contribute to dissolved solution concentrations after acidification, particularly with respect to metal constituents.

2.2.2.1 Natural Distribution of Solutes, Initial Conditions, Oxidation Conditions, and Residence Times (Elements 1, 2, and 3)

This section describes physical and chemical characteristics of recharge and subsurface zones and related groundwater chemistry characteristics.

Figures 2.2-1a through d show the average concentrations of several analytes at the stations sampled from 2000 to 2006. Figures 2.2-2a and b show comparisons of average concentrations of major constituents and metals among the regional, intermediate, and alluvial groundwater samples. A recharge zone occurs within the Sierra de Los Valles, and a discharge zone occurs in White Rock Canyon. Groundwater in the recharge zone is characterized by a calcium-sodium-bicarbonate ionic composition with a mean specific conductance of 138 μS/cm. Concentrations of barium, calcium, sodium, uranium, and strontium increase in groundwater from the Sierra de los Valles eastward toward the Rio Grande (Figures 2.2-1b and d). Figures 2.2-1a and c show concurrent increases in silica, bicarbonate, boron, and fluoride. Specific conductance and TDS also increase as noted in sections 4.2.2 and 4.3. Data from 1997 through 2000 (Appendix F) also show similar trends, and Figure D-1.4 (in Appendix D) shows the relationship between TDS and bicarbonate for pre-1997 baseline groundwater samples. These data indicate a clearly increasing trend from alluvium through the perched intermediate to the regional aquifer for several major ions, TDS and bicarbonate, and some metals. It should be noted that some metals and solutes show variable or decreasing trends between the perched intermediate and regional aquifer facies, including potassium, magnesium, chloride, and sulfate.

Background concentrations of dissolved uranium are typically less than 1 part per billion (ppb) in groundwater within volcanic rocks, sediments, and alluvium west of the Rio Grande. Variations in trace-element concentration depend on solute residence time and the extent of water-rock interactions. Older groundwater within the regional aquifer tends to have higher concentrations of trace elements as a result of desorption processes.

Some variation in silica can be found along projected flow paths, although generally, silica is high throughout the region, precluding a consistent trend. This ubiquity contributes to a flattening of the bicarbonate-TDS relationship, indicating the importance of bicarbonate. Silica tends to be lower in Santa Fe Group sediments than in the volcanic source rocks.

Revisions 0 and 1 of this report indicated that the Cerro Grande fire temporarily increased some constituents in the alluvium (e.g., well LAO-B), such as calcium, sodium, magnesium, and bicarbonate (Appendix F). This change was temporary and is not apparent in the current data for the perched intermediate locations.

Mean concentrations of dissolved iron and manganese are less than 0.12 and 0.007 mg/L, respectively, in the perched intermediate locations, a fact that suggests overall oxidizing conditions within the recharge zone. Revision 1 of this report (see Appendix F) noted that groundwater discharging from springs in this region is generally oxidizing because concentrations of chemical reductants, including hydrogen sulfide, methane, and ammonium, are less than detection. Not all of these constituents were analyzed for the current data set.

Revision 1 of this report included a more comprehensive set of tritium analyses for the alluvium. Concentrations of tritium are expected to vary in recharge water because of local and seasonal variations. Recharge water derived from precipitation near the Sierra de los Valles was noted to contain tritium (from 5 to 71 pCi/L in Pine Spring, for example). Current values for results from well LAOI-1.1(a) are up to 7.5 pCi/L, similar to previous values. Values in the regional discharge zone springs also are still similar, with values of less than 3 pCi/L noted (section 4.3). Concentrations of tritium at Spring 9B, discharging from the Cerros del Rio basalt in White Rock Canyon, are now less than 0.32 pCi/L. (Revision 1 showed 0.40 pCi/L in Appendix F.) These figures suggest that the age of this groundwater is greater than 60 yr. Values of tritium thus are still quite low, indicating that tritium contamination or dilution with younger water is not occurring for the locations in this report.

Groundwater under the Pajarito Plateau within perched intermediate zones and the regional aquifer is oxidizing. This fact is also generally true for alluvial groundwater, although dissolved organic carbon (DOC) may enhance localized reducing conditions within wetlands occupying some canyon reaches. Revision 1 of this report indicated that naturally occurring concentrations of dissolved oxygen (DO) were about 1 to 9 mg/L. Sulfate and nitrate are also indicative of oxidizing conditions (Collins et al. 2005, 092028). Current data show sulfate up to 30 mg/L in two perched intermediate locations, but much lower in most regional locations—except Sacred Spring (7 mg/L). Nitrate is typically less than 0.5 mg/L in most locations, with the exception of Cañon de Valle-5.0 Spring at 1 mg/L. Low inputs of nitrate in upgradient or recharge locations due to a lack of anthropogenic inputs or metabolic cycling of nitrogen are possible reasons for the lower values (Canter 1997, 093257).

Oxidation-reduction (redox) reactions and the microbial mediation of those reactions are very important in groundwater systems for controlling distributions of major constituents and trace elements. The main thrust of this report is to present geochemical trends in background locations. These trends should reflect biological and microbial influences in the subsurface, shown in the distribution and concentration of redox-sensitive solutes such as iron and manganese, mineralogy of aquifer material, presence or absence of DO, knowledge of microbial populations, and presence of electron donors (reducing agents, reductants), and electron acceptors (oxidizing agents, oxidants). Some couples are electrochemically reversible, including the iron(III)/iron(II) and hydrous ferric oxide/iron(II) pairs. However, most pairs are not reversible under normal groundwater conditions in the absence of microbes. These pairs include: dissolved oxygen/water, nitrogen(V)/nitrogen(0), nitrogen(V)/nitrogen(III), uranium(VI)/uranium(IV), sulfur(VI)/sulfur(-II), and carbon(IV)/carbon(0, -IV) (Collins et al. 2005, 092028).

Concentrations of trace elements within the three aquifer types are controlled by speciation (the form and structure of solute), oxidation state, and their affinity to adsorb onto aquifer material. Figure 2.2-3 shows calculated speciation of dissolved uranium(VI) at Spring 9B, in which uranyl dicarbonate dominates between pH values 6.6 and 8.4. Barium and strontium are predicted to occur as Ba^{2+} and Sr^{2+} and undergo cation exchange reactions. Boron is stable as the hydrolysis species $B(OH)_3^0$, and this neutrally charged solute does not adsorb onto aquifer material, making it an excellent tracer or nonreactive species. Fluoride and bromide are stable as F^- and Br^-, respectively, and these two anions are also excellent tracers. Other trace elements, including copper (II), form complexes with carbonate and sulfate, making them less adsorptive than the noncomplexed forms.

Trace-element concentrations and major ion ratios in the regional aquifer beneath the Pajarito Plateau are dramatically different from waters sampled in the western Valles Caldera region (Shevenell et al. 1987, 006673; Blake et al. 1995, 049931). Therefore, it can be concluded that the western half of the Valles Caldera is not a plausible recharge area for the regional aquifer beneath the Pajarito Plateau. Water samples collected in the western portion of the Sierra de los Valles, although sparse, are geochemically similar to Pajarito Plateau perched groundwater and the regional aquifer (Collins et al. 2005, 092028); thus, this region cannot be excluded from the potential recharge area based on geochemical evidence alone.

The temperature of the recharge water is generally less than 15°C, but with increasing depth, groundwaters in the perched intermediate zones within the Cerros del Rio basalt and Puye Formation and regional aquifer are generally greater than 15°C, reflecting the geothermal gradient associated with heat flow beneath the Jemez Mountains (see Appendix F).

Isotopic data ($\delta^{18}O$ and δD ratios) from cold springs discharging from the regional aquifer (Vuataz and Goff 1986, 073687; Blake et al. 1995, 049931; Longmire 2002, 072614; Longmire 2002, 072713; Longmire 2005, 088510) may be used to distinguish between recharge in the Valles Caldera, Sierra de los Valles, and possibly the Sangre de Cristo Mountains (for well samples near the Rio Grande). Paleotemperatures of colder climate indicative of the Pleistocene produce lighter δD and $\delta^{18}O$ values (Clark and Fritz 1997, 059168); isotopic temperature effects need to be considered in evaluating samples collected from deep wells in lower Los Alamos Canyon and on San Ildefonso Pueblo land. Available isotopic data do not support a hydrologic connection between the regional aquifer beneath the Pajarito Plateau and the Valles Caldera. (See Appendix F.)

The most likely source of recharge for the western part of the Pajarito Plateau occurs within the Sierra de los Valles. Major ion compositions of Cañon de Valle-5.0 Spring, surface water in both upper Cañon de Valle and Water Canyon, and the perched intermediate zone observed at wells R-25 and R-26 are very similar (calcium-sodium-bicarbonate ionic composition), suggesting common host rocks and a common recharge zone.

Residence times of groundwater and chemical solutes increase both with depth and from west to east across the Pajarito Plateau (Collins et al. 2005, 092028, Figure 3-1). Tritium derived from atmospheric deposition is one indicator of residence time. Waters near the Sierra de los Valles exhibit ages younger than 61 years based on ^3H activity, and waters in the regional aquifer normally show no tritium activity and thus much older ages. A recent component of groundwater, based on tritium observed within the perched zones and/or at the regional water table is observed at wells R-4, R-5, R-6, R-6i, R-8, R-9, R-9i, R-11, R-12, R-15, R-22, R-23, R-25, R-28, and MCOBT-4.4 (Collins et al. 2005, 092028). Tritium has been measured at these wells at concentrations above the initial cosmogenic baseline. Accordingly, increasing concentrations of major ions and trace elements are observed along the flow paths, but concentrations of tritium tend to decrease with depth (Appendix B). Residence times of the recharge groundwater may be short, based on the open fracture flow within the Bandelier Tuff, Tschicoma Formation, and Cerros del Rio basalt and within porous media flow in the coarse-grained alluvium in upper Los Alamos Canyon and other canyons. Increasing residence times occur within perched intermediate zones and in the regional aquifer.

2.2.2.2 Reactive Minerals and Mineral Precipitation (Element 4)

Geochemically reactive minerals and amorphous solids react with groundwater along flow paths to varying degrees. These solids approach equilibrium with groundwater when the residence time exceeds the reaction half time. These reactive constituents, consisting of calcite ($CaCO_3$), Na-feldspar, Ca-smectite, amorphous SiO_2, and $Fe(OH)_3$, may control groundwater composition for the major ions and selected trace elements, including iron and aluminum. Reactive minerals have varying adsorption capacities for trace elements, including arsenic, chromium, nickel, lead, selenium, and uranium. Each of the major reactive constituents along flow paths beneath the Pajarito Plateau is discussed below.

Calcite: Concentrations of dissolved calcium and bicarbonate increase in depth within perched intermediate zones and the regional aquifer, reflecting the increase in residence times within the deeper saturated zones. Figure 2.2-4 shows saturation indices for calcite versus calcium and bicarbonate concentrations (millimoles/liter) at selected Laboratory springs and wells (LANL 2000, 068661; LANL 2001, 071301; Longmire 2002, 072713; Longmire 2002, 072800; Longmire 2002, 073282).The saturation index (SI) is defined as the $\log_{10}$ (activity product/solubility product). The computer program MINTEQA2 (Allison et al. 1991, 049930) was used to perform SI calculations. For a given solid phase at equilibrium, saturation is equal to 0 ± 0.05. Oversaturation (positive SI) implies precipitation, but undersaturation (negative SI) implies dissolution. Alluvial and perched intermediate groundwaters are calculated to be undersaturated with respect to calcite, and dissolution of this mineral takes place. This calculation is consistent with the absence of calcite within the saturated alluvium upgradient of the Laboratory. Calcite is an important reactive mineral controlling dissolved concentrations of calcium and bicarbonate in the regional aquifer. The regional aquifer (Santa Fe Group sediments and basalt) is calculated to be in close equilibrium with respect to calcite. For example, groundwater samples collected at wells R-9, R-12, and Otowi-4 and La Mesita Spring generally have been saturated with respect to calcite, whereas the perched intermediate well LAOI-1.1(a) has not been. Activities of dissolved calcium and bicarbonate at well LAOI-1.1(a) have not been sufficient to allow for calcite precipitation.

Smectite: Extensive zones of smectite were encountered in the Puye Formation in core and cutting samples collected from wells R-9 and R-12 (Broxton et al. 2001, 071250; Broxton et al. 2001, 071252). Smectite has also been observed in rock samples collected from the Santa Fe Group sediments in lower Los Alamos Canyon. Figure 2.2-5 shows log activity H_4SiO_4 (silicic acid) versus log activity $Ca^{2+}/[H^+]^2$ at 25°C for wells R-9, Otowi-4, R-12 (screen #3), and LAOI-1.1(a) and La Mesita Spring. Groundwater samples collected from these stations predominantly plot within the stability field of calcium smectite, suggesting that most groundwater is oversaturated with respect to this mineral. One sample collected from La Mesita Spring, however, plots within the stability field for kaolinite because of the more acidic pH measured during the sampling round. Smectite increases the adsorption capacity of the aquifer material for cations (metals and radionuclides) under circumneutral pH conditions.

Silica: Silica glass derived from volcanic rocks is an important component of the Bandelier Tuff, pumice-rich zones of the Puye Formation, and Cerros del Rio basalt. Groundwater (alluvial, perched intermediate, and regional aquifer) reacting with silica glass produces dissolved silica in the form of silicic acid [$Si(OH)_4$]. Concentrations of dissolved silica vary as a function of the solubility of silica glass containing sodium, potassium, and calcium (Lindsay 1979, 071512). Groundwaters collected from selected wells and springs are oversaturated with respect to silica-rich soil and undersaturated with respect to SiO_2 glass (Figure 2.2-5). These groundwaters are also oversaturated with respect to quartz, cristobalite, and tridymite based on thermochemical data provided by Lindsay (1979, 071512). These SiO_2 phases are present within the Guaje Pumice Bed, as identified in core collected from borehole LAOI-1.1(a). La Mesita Spring is undersaturated with respect to silica-rich soil and silica glass because of lower concentrations of silica relative to those measured in groundwater samples collected at wells R-9, Otowi-4, R-12, and LAOI-1.1(a).

Na-Feldspar: Sodium-rich feldspar (albite) is present in the Santa Fe Group sediments, and over thousands of years, this phase has reacted with groundwater, releasing sodium and silica to solution under basic pH conditions. The mineral chemically alters to form clay minerals, including kaolinite and sodium-rich smectite (Langmuir 1997, 056037), although volcanic-derived silica glass is more reactive.

$Fe(OH)_3$: Hydrous ferric oxide (HFO) is ubiquitously found in hydrogeologic environments and is an important adsorbent for many trace elements, including arsenic, chromium, lead, and uranium. This phase has a specific surface area of 600 m^2/g (Langmuir 1997, 056037), which contributes to its high adsorptive capacity. HFO has been observed as a component of fracture-fill material at borehole R-9 within the Cerros del Rio basalt (Broxton et al. 2001, 071250). Chemical and mineralogical data collected from the borehole indicate that uranium is associated with HFO and smectite within the fracture-filling material. Oxidation-reduction reactions are also controlled by HFO and dissolved ferrous iron (Langmuir 1997, 056037) under acidic to neutral pH conditions. In addition to HFO, hydrous manganese oxide is an important adsorbent within volcanic and sedimentary rocks. Elemental analysis of core samples and nonfiltered water samples containing suspended particles has shown that this phase is found at lower concentrations than HFO.

2.2.2.3 Contaminant Distributions, Activities, and Transport (Elements 5 through 7)

Background distributions of chemicals in groundwater have direct relevance to defining the nature and extent of contamination. Geochemical processes controlling distributions of background solutes also occur in contaminated groundwater.

The largest mass distribution of adsorbing contaminants in Los Alamos Canyon and Mortandad Canyon occurs within the alluvium (Laboratory Environmental Surveillance Program [ESP] reports). Alluvial groundwater in both Los Alamos Canyon and Mortandad Canyon contains elevated concentrations of strontium-90, plutonium-238, plutonium-239/240, and americium-241 (LANL 2004, 087390)and LANL 2006, 094161). Most of these radionuclides, except uranium, tend to adsorb significantly onto aquifer material. Concentrations of adsorbing radionuclides and cationic metals generally decrease downgradient along the groundwater flow path. Concentrations of one or more of the nonadsorbing or weakly adsorbing constituents (e.g., tritium, perchlorate, chloride, nitrate, and uranium) have been measured at many wells, such as MCOBT-4.4, R-4, R-5, R-6, R-6i, R-8, R-9, R-9i, R-11, R-12, R-15, R-25, and R-28 (LANL 2005, 091121).

The presence of colloids may enhance the movement of contaminants, especially those that are adsorbed onto fine-grained particles in the shallow subsurface. Colloid transport in alluvial groundwater was proposed as a transport mechanism in Mortandad Canyon (Penrose et al. 1990, 011770); however, alternate reasons for this transport were proposed by Marty et al. (1997, 094765). Sources of colloids typically include natural materials (clay minerals, silica glass, manganese hydroxides, ferric (oxy)hydroxides, and solid organic matter) and possibly solid phases (silica glass and calcium carbonate). These colloids may partly influence the distribution of suspended radionuclides within alluvial groundwater in groundwater because constituents adsorbed onto colloids are transported more rapidly, with less retardation, than they would be transported as dissolved solutes.

2.2.2.4 Cerro Grande Fire

The Cerro Grande fire of May 2000 perturbed surface water and alluvial groundwater chemistry (Longmire et al. 2001, 070103; Gallaher and Koch 2004, 088747)(LANL 2001, 069055). Ash produced from the fire has been transported within canyon systems reacting with rain and surface water. Increasing concentrations of total organic carbon (TOC) and DOC, carbonate alkalinity, calcium, potassium, iron, manganese, and other solutes occurred in surface water and alluvial groundwater for a few years (2000 to 2003) after the Cerro Grande fire (Gallaher and Koch 2004, 088747). In most canyons, carbonate alkalinity in surface water increased by factors of three to six after the fire. Surface water and alluvial groundwater showed increases in turbidity from ash and enhanced erosion.

Storm events remobilized contaminated sediments, and desorption of contaminants took place, resulting in a redistribution of contaminants for several years (Gallaher and Koch 2004, 088747). Cation exchange reactions involving strontium-90 and calcium and complexation reactions of uranium and bicarbonate are examples of hypothesized geochemical processes occurring in surface water and alluvial groundwater since the fire. On the whole, metal, radionuclide, and anion concentrations have decreased and are approaching pre-Cerro Grande fire concentrations in alluvial groundwater (Gallaher and Koch 2004, 088747).

Oxidation and reduction reactions occurring between organic-rich ash and metals and radionuclides influence aqueous speciation of solutes and adsorption processes. It is hypothesized that DOC produced from the fire serves as an electron donor (reducing agent) during complete oxidation to bicarbonate and carbonic acid. Concurrently, iron(III) and manganese(IV) solids become electron acceptors (oxidizing agents) and are reduced to more soluble aqueous species. Geochemical data collected in Pueblo Canyon, Los Alamos Canyon, and Pajarito Canyon support the occurrence of these oxidation-reduction reactions with respect to DOC and dissolved iron and manganese (Gallaher and Koch 2004, 088747).

2.2.2.5 Summary of Conceptual Hydrogeochemical Model

The preceding conceptual hydrogeochemical model applies to both background and Laboratory-induced conditions. This model addresses initial composition, residence times, recharge and discharge zones, geochemical reactions, reaction half times, and temporal and spatial relationships.

Stable isotope ratios (δD and $\delta^{18}O$) (Appendix F of this report, Collins et al. 2005, 092028) support the conclusion that the Sierra de los Valles provides most of the recharge to groundwater beneath the Pajarito Plateau. This finding is based on similarities in isotopic ratios between springs discharging within the Sierra de los Valles and perched intermediate groundwater and the regional aquifer beneath the Pajarito Plateau. Recharge from the Valles Caldera to deep groundwater beneath the Pajarito Plateau is not significant. Additional recharge to the regional aquifer occurs along wet canyon bottoms on the Pajarito Plateau as determined by Kwicklis (2005, 090069).

According to Revisions 0 and 1 of this report and consistent with this Revision 2, measurable activities of tritium observed in springs discharging within the Sierra de los Valles (>10 pCi/L) suggest that a component of groundwater is less than 60 years old within this recharge zone. This report shows low or nondetectable levels of tritium in White Rock Canyon springs. (See Table 4.2-3 and Appendix B.) The age of groundwater probably ranges between 3000 and 10,000 years (Vuataz and Goff 1986, 073687, and Appendix F of this report).

Major ion chemistry of the regional aquifer varies from west to east across the Pajarito Plateau, from a calcium-sodium-bicarbonate to a sodium-calcium-bicarbonate ionic composition. Higher carbonate and bicarbonate concentrations in groundwaters at the eastern part of the Laboratory indicate the presence of calcite (Figures 2.2-1a and c).

Concentrations of trace elements generally increase from west to east within the regional aquifer as a result of increasing solute residence times and water/rock interactions. Concentrations of natural dissolved uranium are the highest within the regional aquifer, ranging from 0.5 μg/L at the Laboratory to more than 1800 μg/L east of the Rio Grande (Collins et al. 2005, 092028, Figure 3-11).

2.2.2.6 Limitations of the Conceptual Hydrogeochemical Model

Recent improvements in the sampling network, the addition of analytical data over time, better detection limits for some analytes, and improved hydrogeological knowledge from ongoing well drilling and sampling programs have served to improve the geochemical knowledge of the aquifer systems below the Pajarito Plateau and surrounding area. However, as with any model, there are limitations, such as the following.

- The number and distribution of background sampling points are limited as a result of natural occurrences of springs, topography, land use, and the stage of development of the monitoring network. An example is the limitation on determining the influence of Los Alamos Reservoir on well LAO-B. A better determination will be possible as the monitoring network is further improved.
- Development of patterns of geochemical changes between aquifer types is based on hypotheses of flow paths and data from available, nonideal sampling point locations. While these hypotheses are improving with time, the model must continue to evolve.
- The extent of influences of non-Laboratory, anthropogenic, and natural effects is imperfectly known. Examples include the variability of nitrate detections or regionwide perchlorate detections. The understanding of these external effects is improving with continued sampling and analysis.

3.0 SCOPE OF ACTIVITIES AND METHODS

This section discusses formulation of the investigation to collect groundwater background data, field and analytical laboratory methods, spatial and temporal parameters, descriptive statistics, data plots, and PCA/CA statistical methods.

3.1 Data-Quality Objectives

Before conducting this investigation, the Laboratory used the EPA data-quality objective (DQO) process (EPA 1992, 054947; EPA 1994, 050288; EPA 1997, 057589), a strategic planning approach for data collection. By using the DQO process, the Laboratory has ensured that the type, quantity, and quality of background hydrogeochemical data and information used in the decision-making process are appropriate to meet the objective of determining natural background concentrations of inorganic solutes and radionuclides in groundwater.

The DQO process used in this investigation consisted of seven steps, which are described below. The output from each step influences the choices made in the next steps of the DQO process. This process is iterative; therefore, the outputs from one step may lead to reconsideration of previous steps. The DQO process consists of the following: (1) problem definition, (2) data evaluation or decision criteria, (3) data input for the different aquifer types, (4) spatial and temporal boundaries for sample stations, (5) decision rules, (6) uncertainty (statistical testing), and (7) design optimization. Of these seven steps, all except the decision rules (number 5 above) changed for Revision 2 and are described in the following subsections.

3.1.1 Problem Definition

The ability to distinguish between natural, general anthropogenic, and Laboratory-impacted conditions is essential for assessing data collected during site investigations, establishing cleanup levels, and understanding hydrologic and geochemical processes. Adequate data to capture the systematic natural variations in water quality were generally lacking before 1997.

Although the Laboratory, U.S. Geological Survey (USGS), DOE, the University of New Mexico, and consulting companies had published hydrogeochemical data collected before 1997, there were problems with using these data to represent background groundwater conditions because of issues with consistency. For example, many of the groundwater samples collected by the Laboratory were not filtered before analyses. Subsequently, analytical accuracy and precision varied from sample to sample, depending on the amount of suspended solids.

In 1997, groundwater-quality databases were reviewed in terms of sample collection and preservation, chemistry, hydrogeology, time of sample collection, and completeness and accuracy of reported analytical results. Appendix D provides additional information on geochemical and statistical analyses using the pre-1997 hydrogeochemical data. The results of the review of data collected between 1997 and early 2000 are discussed in detail in Appendix F.

Since 1997, sample collection and analytical techniques have resulted in larger numbers of analytes per sampling event and more consistent analytical quality. For example, filtered and nonfiltered metals analyses are more routinely paired. The current data set from early 2000 to 2006 was used here to provide the most recent data collected from up-to-date sampling and analytical techniques.

3.1.2 Data Evaluation Criteria

For each sample station, results of statistical analyses are provided in this report for analytes listed in Table 4.2-1, -2, and -3, which include 18 major ion species; 30 metals; tritium; 6 radionuclides; gross-alpha, -beta, and -gamma radiological measurements; and 6 field parameters. Anthropogenic organic compounds such as trichloroethene, HE compounds, PCBs, and other volatile and semivolatile chemicals were not included as part of this investigation because they were deemed to be introduced and are not indicative of background or natural values. Because technetium-99 is synthetically prepared, it was not included in this investigation either. The presence of these anthropogenic constituents was used as part of the initial screening to remove potentially impacted locations from the candidate location list.

A two-step screening was performed to select the best candidate background locations for this report. Locations included in Revision 1 of this report were considered, along with additional probable locations for all three aquifer types. Locations that were clearly impacted by Laboratory-sourced constituents or constituents from other anthropogenic activities such as road-salt contamination were excluded from this listing. Locations at which data was obtained between 2000 and 2006 were included in the listing. Older data (1997 to 2000, or earlier if necessary) were used only if no data were available for the years between 2000 and 2006. Locations were then screened for the following criteria:

- the presence of groundwater greater than 60 years old (measured by the activity of tritium), except for alluvial groundwater upgradient of the Laboratory and springs discharging within Sierra de los Valles or within other recharge zones;
- a location hydrologically upgradient of the Laboratory or downgradient in areas not impacted by Laboratory-derived contaminants (including nitrate at less than 2 mg/L);
- a generally known mode of groundwater occurrence (alluvial groundwater, perched intermediate zones, and regional aquifer);
- the availability of data for the years between early 2000 and 2006, with minor exceptions;
- length of sampling record (at least three sampling events recorded during the time interval);
- quality of data (determined by inclusion in the WQDB, with the exception of Spring 9B and Pine Spring, for which additional data were added from the ER Database);
- consistency of sampling location for springs; and
- meeting of well-screen quality criteria (evaluated using Well Screen Analysis Report criteria [LANL 2005, 091121]).

Two exceptions were made with respect to data availability. Spring 9B is the only spring sampled that discharges from the Cerros del Rio basalts. For this case, data collected between 1997 and 2000 were used. Data for Pine Spring, one of two alluvial locations, were also available only for the years between 1997 and 2000.

The resulting list of locations was then screened for evidence of corrosion in the candidate wells. Levels of iron, chromium, nickel, manganese, and copper were evaluated. For example, wells LA-5 and LA-3 were eliminated because of high levels of copper (greater than three standard deviations from the mean of other well values and at least three to 10 times the concentration in other evaluated wells). The final list of locations then totaled 30.

3.1.3 Data Inputs

Data inputs for each aquifer type are provided in Table 3.1-1. Names and locations of background stations are provided in Table 3.1-2. Data for the alluvial, perched intermediate, and regional aquifer locations are presented in section 4.

The majority of the data was obtained from the WQDB. The search was limited to data from 2000 and later. Two locations selected, Pine Spring and Spring 9B, had only one or two samples within the WQDB. To augment this data set, data were obtained from the ERDB. This search was initiated using sample IDs from Revision 0 of this report. No condition was set for start date.

3.1.4 Spatial and Temporal Boundaries

The region considered in this investigation extends from the western edge of the Jemez Mountains eastward to the Rio Grande, and from Frijoles Canyon northward to Garcia Canyon. Sampling locations were selected from these pools of potential locations:

- those used in the previous report version, including Seven Springs, which is located west of the Laboratory; and
- Pajarito Plateau locations west of the river that did not exhibit anthropogenic effects.

Data used were collected between early 2000 and 2006, as discussed above, with the exceptions of Spring 9B and Pine Spring, for which recent data were not available. This more recent data set was used because many new sampling locations have been added since 1997, because up-to-date and more consistent sampling and analysis techniques were used, and because the larger data set provides a better basis for the statistical analysis of the regional aquifer beneath and around the Pajarito Plateau.

3.1.5 Data Assessment

For this study, all analytical results in the data set were used to calculate statistical results presented in section 4 and to develop box plots (Appendix C). No data were excluded from statistics as being outliers. The data were assessed using the criteria below.

If analytical results for groundwater samples collected from a single mode of groundwater occurrence met the data-assessment criteria, then these data were included in statistical analyses to establish background distributions for each analyte for that mode of groundwater occurrence.

Steps in the data assessment were as follows:

- Evaluate the sample analytical results for each analyte to determine the overall variability and to verify the hypothesized differences between water sources (alluvial, perched intermediate, and regional aquifer) (Appendix C).
- Assess variability. Variability from Laboratory analyses should be small compared with temporal/spatial variability of groundwater samples; a target value should have less than 25% relative standard deviations from Laboratory duplicates.

3.1.6 Design Optimization

Because groundwater sample locations for background must be defined (i.e., locations must be credible upgradient or in unimpacted areas) and ideally would be taken from a random grid, a statistical-design optimization is not practical for the study area. Rather, the available locations were evaluated and selected using specific criteria to encompass geographic and hydrological variation (section 3.1.2).

Classification of groundwater with respect to the aquifer unit was based on (1) well depth, (2) hydrogeologic units penetrated, (3) depth to the zone of saturation sampled and observed, or (4) the projected position of the regional water table at that location. Groundwater collected from well LAO-B was considered to be perched in the alluvium because it was the only well penetrating the alluvium upgradient of the Laboratory boundary. Water from well LAOI-1.1(a) (Guaje Pumice Bed) was assigned to the intermediate-depth perched system because the saturated zone from which it came lies above the projected position of the regional water table. Groundwater samples collected from supply wells such as PM-4 were classified as regional groundwater because those wells are only screened in the deep groundwater system.

Classification of spring waters is more difficult because of a lack of subsurface data and information. Several criteria were applied in classification: position relative to the regional water table, geologic material at the spring outlet, hydrologic conditions in the area, elevation relative to the Rio Grande, and water chemistry. Several springs are within recharge boundaries in the Sierra de los Valles (Water

Canyon Gallery, Pine Spring [alluvium], and Cañon de Valle-5.0 Spring). This hydrologic setting indicates that these groundwaters had relatively short travel or residence times within the volcanic rocks and alluvium. Several springs in White Rock Canyon discharge from the Cerros del Rio basalt (e.g., Spring 9B) and from hydromagmatic deposits and were assigned to the regional aquifer. Some spring waters discharging from elevations slightly above that of the Rio Grande were also assigned to the regional groundwater system. These springs occur in an area of known artesian conditions and had low tritium activity, suggesting that they have had a decades-long travel time (e.g., Spring 1).

Although the position of the groundwater divide west of the Laboratory is uncertain, Seven Springs clearly lies west of the divide. Nonetheless, it is included as one of the perched intermediate sampling locations because it discharges from the Bandelier Tuff and its major ion chemistry is similar to that of well LAOI-1.1(a).

The sampling design included an analysis of groundwater samples to characterize both inorganic constituents and radionuclides. A full table of analytes is presented in Table 3.2-2. Background level distributions of these anions and radionuclides were determined by sampling:

- springs that discharge east, west, north, and south of the Laboratory boundary;
- a range of characterization, monitoring, and supply wells across the Pajarito Plateau and surrounding areas;
- supply wells, characterization wells, and springs that contain concentrations of anions less than those observed in contaminated groundwater; and
- supply wells, characterization wells, and springs downgradient of Laboratory releases that contain concentrations of tritium less than 1 pCi/L and/or activities of fallout-derived radionuclides (strontium-90, cesium-137, plutonium-238, plutonium-239/240, and americium-241) with greater than 90% of analyses less than detection.

Initial statistical analyses include mean, maximum, minimum, standard deviation, Student's *t*-tests, normal quantile plots, and box plots (section 4.2 and Appendix C). A secondary, multivariate statistical analysis (sections 3.6.1 and 4.5.1, below) used the regional aquifer data in both hierarchical CA and PCA to determine appropriate groupings of similar water types. Geochemical evaluation of the background data included comparing cation-anion distributions; observing trends in metals occurrence; determining the presence or absence of tritium in relation to recharge and discharge zones; and evaluating trace-element geochemistry.

3.2 Field and Laboratory Analytical Methods

Results of field measurements taken at the sampling stations are provided in Appendix B. The following laboratories were used for analysis of groundwater samples for organic, inorganic, and radiochemical analyses:

- General Engineering Laboratories (GEL, also known as GELC) for selected trace elements, metals, and general aqueous geochemistry;
- The Laboratory's EES-6 geochemistry laboratory for general aqueous geochemistry;
- University of Miami Tritium Laboratory (UMTL) for low-level tritium analyses.

3.2.1 Field Methods

Detailed information on field methods is contained in the "Interim Facility-Wide Groundwater Monitoring Plan, Revision 1.1" (LANL 2006, 094043).

A bladder pump sampling system was used to collect groundwater from alluvial well LAO-B and intermediate well LAOI-1.1(a). Submersible pump sampling systems were used to collect groundwater from single-screen regional wells R-1, R-13, and R-21. Wells were purged to a minimum of one bore volume, and purging continued until water-quality indicator parameters stabilized. Field parameters, measured in a flow-through cell, were allowed to stabilize from these wells before samples were collected.

Groundwater samples from supply wells PM-2, PM-4, PM-5, G-1A, G-2A, G-3A, G-4A, and G-5A were collected from a spigot or from tubing connected in line with the pump. Samples were obtained after running the water for a minimum of 5 min. Field parameters were measured in an open container. These samples were not filtered.

Water samples at springs were collected by dipping a beaker or sample bottle into the surface expression or by transferring the water directly from the spring to the sample container using a peristaltic pump. Field parameters were measured by placing the individual meters directly into the pool of spring water. Samples collected for turbidity measurements were dipped from the pool of water and were placed into a sample measurement cell.

Groundwater samples for metals and general chemistry analyses were collected in precleaned plastic bottles. Filtered samples were processed on-site immediately after collection, using 0.45μm acetate filter membranes, or filtered during the sampling process with 0.45 μm in-line filters. Duplicate samples were collected in the field for every 10 primary samples. The field duplicate samples were separate aliquots collected during the same sampling event for a location. Total carbonate alkalinity was determined in the laboratory using standard titration techniques within 48 h of sample collection.

Groundwater samples were preserved as required, including the use of ice at 4°C and by using concentrated HNO_3 or concentrated H_2SO_4. The pH of acidified samples (metals, nitrate plus nitrite, and radionuclides excluding tritium) was lowered by the dropwise addition of acid to a pH of <2 or by the use of preacidified sample containers.

The field parameters recorded for each of the 29 sampling stations included pH, temperature (°C), dissolved oxygen, oxidation reduction potential, specific conductance (μS/cm), and turbidity (NTU). Appendix B provides the field-measured values for pH, specific conductance, temperature, and turbidity taken at each sampling station and the sampling dates.

An Orion temperature-compensated pH meter was used for temperature and pH. The meter was calibrated daily using three buffer solutions (pH = 4.01, 7.00, and 10.01). Specific conductance was measured with two Hanna temperature-compensated conductivity meters. The meters were calibrated at the beginning of each day of use. Turbidity was measured with a Hach turbidmeter calibrated at the beginning of the field season.

The Orion meter had a resolution of 0.01, and accuracy was reported as ±0.01 for pH. Temperature resolution and accuracy were 0.1°C and ±1.0°C, respectively. The Hanna conductivity meters had a resolution of 10 μS/cm, and accuracy was reported as ±40 μS/cm. The Hach turbidmeter had a resolution of 0.1 NTU below 100 NTU and an accuracy of ≤5% of the reading or ±0.1 NTU.

3.2.2 Analytical Methods

A list of constituents analyzed is shown in Table 3.2-2. Analytical methods and the analytical laboratories using the methods are shown in Table 4.1-1. The external analytical laboratories followed the Environmental Restoration (ER) Project statement of work (SOW) (LANL 1995, 049738 and/or subsequent revisions) for quality control (QC) of sample analyses for holding time and sample preservation, storage, preparation and chain of custody procedures.

GEL/GELC analyzed groundwater samples for metals and uranium using inductively coupled plasma mass spectroscopy (ICPMS). Detection limits for these analytes generally ranged from 0.1 to 0.5 μg/L. Samples were also analyzed for inorganics as specified in EPA SW-846 (EPA 1997, 057589 and subsequent revisions).

At **EES-6**, groundwater samples were analyzed for inorganics using additional techniques specified in EPA SW-846 (EPA 1997, 057589 and subsequent revisions). EES-6 instrumentation and instrument detection limits are presented in Appendix F, Table F-2.2-2.

UMTL performed tritium analyses using direct counting for tritium and electrolytic enrichment for low-level tritium (less than 100 pCi/L).

3.2.3 Analytes of Interest

Tables in section 4 provide field parameters, major ions, neutral species, trace elements, and radionuclides measured or analyzed as part of this investigation.

3.3 Scope of Groundwater Background Investigations in Time and Space

This subsection presents an overview of the sampling stations selected for Revision 3 of this groundwater background investigation from 2000 to 2006. More detailed information is provided in Appendix E, including the sampling station name, location, land ownership, geologic setting, and a brief description for each site. The sampled locations included 13 wells and 16 springs. Sample locations are shown in Figure 1.2-1.

Seven Springs is included as part of this investigation although it is separated from the Pajarito Plateau. This spring is located west of the recharge area for the Pajarito Plateau, but its major ion chemistry is similar to well LAOI-1.1(a). Seven Springs and well LAOI-1.1(a) discharge and are completed, respectively, within the Otowi Member of the Bandelier Tuff and the Guaje Pumice Bed. Seven Springs discharges from the west side of Calaveras Canyon, about 400 m upstream of State Highway 126 and west of the Valles Caldera on the Jemez Plateau. Several springs are in the immediate vicinity of one another; some of the springs discharge from alluvium, and others discharge from outcrops of densely welded rhyolite tuff. Samples were taken from the spring that issued the largest volume of water.

3.3.1 Springs within the Recharge Zone

Springs in the recharge area west of and upgradient of the Laboratory include Cañon de Valle-5.0 Spring, Pine Spring, Barbara Spring, Campsite Springs, and the Water Canyon Gallery. Cañon de Valle-5.0 Spring issues about 2.4 km west of State Highway 501 at an elevation of 2569 m. The spring is situated about 20 m above the bottom of upper Cañon de Valle. The spring may discharge from the Tshirege Member of the Bandelier Tuff or the Tschicoma Formation. At this location, it appears that the Tshirege Member fills pre-existing topography in the vicinity of the spring, because downstream there are major outcrops of pre-existing Tschicoma Formation dacite.

Water Canyon Gallery (elevation 2439 m) is an improved spring occurring in the north branch of uppermost Water Canyon, about 1.3 km west of State Highway 501 and just west of the Pajarito Plateau. The spring issues from a tunnel that extends into a cliff of densely welded ignimbrite of the Tshirege Member of the Bandelier Tuff.

Barbara Spring is located in Frijoles Canyon about 5.5 km west-southwest of the Laboratory boundary. It discharges from a location near the contact of the Bandelier Tuff and Tschicoma Formation (Smith et al. 1970, 009752). It has a southwest-sloping discharge at three discharge points at an elevation of 2357 m.

The Campsite Springs are located in Guaje Canyon about 8.5 km northwest of the Laboratory boundary. They discharge from the Tschicoma Formation (Smith et al. 1970, 009752). They have a southward-sloping discharge with three discharge points about 6 m above a channel at an elevation of 2622 m.

3.3.2 Sampling Stations on the Pajarito Plateau

Figure 1.2-1 shows the locations of wells completed in the regional aquifer that are positioned along regional flow paths downgradient of the recharge zone for the Pajarito Plateau.

Well LAOI-1.1(a) is an observation well that was drilled in upper Los Alamos Canyon in 1994. It is screened within a perched zone in the Guaje Pumice Bed at the base of the Otowi Member of the Bandelier Tuff. Perched intermediate groundwater at the well occurs at a depth of 94.5 m.

Well LAO-B is an observation well drilled into valley-fill alluvium in upper Los Alamos Canyon west of the Laboratory boundary. The groundwater occurs within alluvium.

Pine Spring is located in upper Garcia Canyon about 6 km north of Los Alamos. Pine Spring discharges within the alluvium on the downthrown side of a north-south-trending fault juxtaposing boulder-bearing sediments of the Puye Formation (to the west) against mafic-to-intermediate composition lavas and overlying Puye deposits (to the east) (Smith et al. 1970, 009752; Kempter and Kelley 2002, 088777).

Well R-1 is a characterization well of the regional aquifer located in upper Mortandad Canyon near TA-5. It has a total depth of 355 m below ground surface (bgs) and is screened from 314 to 322 m bgs into the lower Puye Formation (Collins et al. 2005, 092028).

Well R-13 is a characterization well of the regional aquifer located in Mortandad Canyon, in the east-central portion of the Laboratory, near the boundary with the San Ildefonso Pueblo. The well was installed as a monitoring well for potential effluents in the Mortandad Canyon watershed. It was drilled to a depth of 345 m bgs with a single screen in the regional aquifer. Water was encountered at about 254 m bgs, in the Puye Formation and the Cerros del Rio basalts. No perched water was encountered at this location (LANL 2003, 076060).

Well R-21 is a characterization well of the regional aquifer located north of TA-54 in Cañada del Buey. It has a total depth of 303 m bgs and is screened from 271 to 276 m bgs into the Puye Formation (Collins et al. 2005, 092028).

Wells G-1A, G-2A, G-3A, G-4A, and G-5A are water supply wells located in the Guaje Well Field north of the Laboratory in Guaje Canyon. All of the wells are completed in the Santa Fe Group, Tesuque Formation, basalt, and basalt breccias. Well G-1A was drilled to a total depth of 463 m bgs and screened from 83 to 461 m bgs in the regional aquifer (Purtymun 1995, 045344; McLin 2006, 093672). Well G-2A was drilled to a depth of 619 m bgs and is screened from 172 to 604 m bgs. Well G-3A was drilled to a depth of 619 m bgs and is screened from 180 to 604 m bgs. Well G-4A was drilled to a depth of 619 m bgs and is screened from 200 to 604 m bgs. Well G-5A was drilled to a depth of 619 m bgs and is screened from 233 to 604 m bgs (Collins et al. 2005, 092028; McLin 2006, 093672).

Wells PM-2, PM-4, and PM-5 are supply wells located in the Pajarito Well Field in the central part of the Laboratory north of Threemile Canyon and Pajarito Canyon (Pajarito Plateau). Well PM-2 is completed to a depth of 792 m bgs and screened from 306 to 695 m bgs. It is completed in the Puye Formation, Totavi Lentil, Chaquehui Formation, basalt, basalt breccias, and the Tesuque Formation in the regional aquifer (Santa Fe Group) (Purtymun 1995, 045344).

Well PM-4 is completed to a depth of 890 m bgs and screened from 384 to 870 m bgs in the Puye Formation, Totavi Lentil, Chaquehui Formation, basalt, basalt breccias, and the Tesuque Formation In the regional aquifer (Santa Fe Group) (Purtymun 1995, 045344).

Well PM-5 is completed to a depth of 948 m bgs and screened from 439 to 936 m bgs in the Puye Formation, Totavi Lentil, Chaquehui Formation, basalt, basalt breccias, Chamita Formation, and the Tesuque Formation in the regional aquifer (Santa Fe Group) (Purtymun 1995, 045344).

3.3.3 Sampling Stations within the Discharge Zone

Ten springs are located within the discharge zone for the regional aquifer. These include Springs 1, 5B, 6, 6A, 8A, 9, 9A, 9B, Sacred Spring, and Ancho Spring (Figure 1.2-1). Information about the springs is located in Purtymun et al. (1980, 006048) and in Appendix E.

Spring 1 issues from a small bench about 40 m above the northeast side of the Rio Grande at elevation 1702 m and about 1.5 km downstream of the Otowi Bridge. The bench occurs within a landslide complex made up of a variety of sediment types within the Santa Fe Group (Totavi Lentil) and is a calcium-bicarbonate water type, according to Purtymun et al. (1980, 006048).

Spring 5B is located approximately 800 m northwest of the mouth of Ancho Canyon above the Rio Grande at elevation 1644 m. It issues from coarse-grained sediments of the Tesuque Formation.

Spring 6 also issues from the Tesuque Formation, just southwest (200 m) of the mouth of Ancho Canyon, at elevation 1640 m. Springs 5B and 6 are in Purtymun’s Group II (sodium bicarbonate-1640 waters) and are located at the edge of the Rio Grande channel (Purtymun et al. 1980, 006048).

Spring 6A is located southwest of Spring 6, downstream, and issues from the same formation as Spring 6 and Spring 5B. It is located at elevation 1637 m, above the river.

Springs 8A, 9, and 9A are located in a cluster upstream and immediately north of Chaquehui Canyon. All issue from the Tesuque Formation about 40 to 60 m above the river. The elevation of Spring 8A is 1668 m. The elevation of Spring 9 is 1669 m, and the elevation of Spring 9A is 1695 m. Spring 8A is located east of springs 9 and 9A. Purtymun characterized these springs in his Group II sodium and bicarbonate waters (Purtymun et al. 1980, 006048).

Spring 9B issues from the bottom of a basaltic lava flow on the northwest side of White Rock Canyon, roughly 200 m downstream of the mouth of Chaquehui Canyon. It is located in hydromagmatic deposits and flows out of the Cerros del Rio volcanic field. The spring is about 25 m above the Rio Grande at elevation 1674 m (Purtymun et al. 1980, 006048).

Sacred Spring issues into a pool about 10 m in diameter located about 0.5 km north of the junction of State Highways 4 and 30 and about 100 m east of State Highway 30. Sacred Spring issues from unconsolidated sedimentary rocks of the Santa Fe Group at elevation 2029 m.

Ancho Spring is located approximately ¾ mile upcanyon from the Rio Grande in Ancho Canyon at elevation 1737 m. It issues from the Puye Formation (Totavi Lentil) (Purtymun et al. 1980, 006048; Collins et al. 2005, 092028).

3.4 Descriptive Statistics

Statistical parameters for groundwater facies were calculated for both filtered and nonfiltered datasets. Parameters calculated or identified were the number of analyses, number of nondetects, percent nondetects, median, mean, maximum, minimum, standard deviation, percentiles (5^{th}, 10^{th}, 25^{th}, 75^{th}, 90^{th}, 95^{th}), geometric mean, skew, and upper tolerance limit (UTL). With the exception of the UTL, (section 3.6.4), all parameters were calculated using Microsoft Excel basic statistics functions. In the case of fewer than eight analyses or greater than 50% nondetects, only median, mean, maximum, and minimum are presented to avoid presenting values not indicative of background. Otherwise, nondetects were incorporated as one-half of the detection limit.

The Mann-Whitney *U*-test is a nonparametric alternative to the *t*-test for independent samples. This test was used instead of a *t*-test because most of the constituents measured for each aquifer type are not normally distributed for filtered samples. The Mann-Whitney *U*-test assumes that the variable under consideration was measured on at least an ordinal (rank order) scale. The interpretation of the result of the test is essentially identical to the interpretation of the result of a *t*-test for independent samples, except that the *U*-test is computed based on rank sums rather than means. The *U*-test is the most powerful (or sensitive) nonparametric alternative to the *t*-test for independent samples; in fact, in some instances it may offer even greater power to reject the null hypothesis than the *t*-test. Results of this test are presented in Table 4.3-1 and discussed below in section 4.3.

3.5 Data Plots

Analytical suites and sampling dates for the background stations are provided in Appendix A. All data with qualifiers are presented in Appendix B.

In order to examine the data, several types of data plots were prepared using Sigma Plot and are presented in Appendix C. For each constituent, a time series is presented along with two types of box plots; one showing variation by location and the other showing variation by aquifer types and filtration. While box plots can be used to identify outliers, no outlier identification was performed for this analysis, and no data were excluded from the data set.

Box plots: There are two box lots presented for each constituent—one separated by location, and the other by aquifer and filtration. In the location box plot, only filtered values are shown with the exception of water supply wells (G-1A, G-2A, G-3A, G-4A, G-5A, PM-2, PM-4, PM-5). Because of the nature of the analyses, pH, specific conductance, total suspended solids, tritium, dissolved oxygen, oxidation reduction potential, temperature, and turbidity show nonfiltered values for the location box plots. Box plots are used to show differences between two or more sample locations or other data groupings. Box plots summarize information about the shape and spread of the distribution of concentrations for an analyte. Box plots consist of a box, a (median) line across the box, and a mean line. The *y*-axis displays the observed concentrations in the reported units. The area enclosed by the box shows the concentration range containing the middle half of the data; that is, the lower box edge is at the 25^{th} percentile, and the upper box edge is at the 75^{th} percentile. The length of the box is a measure of the spread of the range of concentrations. The black horizontal line across the box represents the median (50^{th} percentile) of the data, a measure of the center of the concentration distribution. If the median line divides the box into two approximately equal parts, the shape of the distribution of concentrations is symmetric; if not, the distribution is skewed of nonsymmetrical. The red horizontal line across the box represents the mean of the data, a measure influenced by exceptionally low or high values. The top and bottom horizontal lines represent the 5th and 95th percentiles. Concentrations outside the 25th to 75th percentiles are plotted as points outside the box.

Time series analysis: A time-versus-concentration scatter plot is provided for each constituent measured. Time is plotted along the *x*-axis, and the constituent concentration is plotted along the *y*-axis. Any long-term trends can be deduced from these plots. Nondetects are shown in open symbols and plotted as one-half the detection limit. Figures show the impact of the number of nondetects, the detection limit to the total data set, and variation between filtered and nonfiltered results.

3.6 PCA and CA Statistical Methods

3.6.1 PCA and CA Method Description

This study employed multivariate statistical analyses to determine if water quality patterns exist within the regional aquifer that could lead to development of area-specific background water quality levels. The multivariate statistical techniques were used to reduce the large amounts of geochemical data to decipher patterns within the data that might not otherwise be observed. Ultimately, this approach allows for partitioning water chemistry samples into like groups. The general procedures recommended by Güler et al. (2002, 094417) for classification of water chemistry data were followed in this study.

3.6.2 Data Set Used in the Analysis

Selected regional aquifer groundwater quality data from 2000 through 2006 were pulled from the WQDB. Data were pulled for 35 initial candidate sample locations that included White Rock Canyon Springs, municipal supply wells, and groundwater monitoring wells. Results for a minimum of three sampling rounds were available for each of the stations. From this data set, the median value was identified from the various sampling rounds as a robust description of the typical analyte concentration present in the aquifer at a given station. Use of the median reduces the possibility of the statistical analyses being overly influenced by a single out-of-the-ordinary result.

Of the 37 water-quality parameters (consisting of major ions, metals, and pH), 17 parameters occur most often and were used in the statistical analysis. The parameters used were: bicarbonate alkalinity ($HCO_{3)}$), boron (B), barium (Ba), calcium (Ca), chloride (Cl), chromium (Cr), fluoride (F), potassium (K), magnesium (Mg), sodium (Na), nitrate (NO_3+NO_2 as N), silica (Si as SiO_2), sulfate ($SO_{4)}$, strontium (Sr), uranium (U), vanadium (V), and pH. Only data from filtered samples of the White Rock Canyon springs and monitoring wells were used. Both filtered and nonfiltered sample results from the water supply wells were used because of the low turbidity and developed nature of the wells.

3.6.3 Data Editing Procedures

First, analytes with below-instrument-detection-limit concentrations values in more than half the samples (nondetects) were removed from statistical analyses. Below-detection-limit concentration values were replaced with values equal to half the instrument detection limit (Farnham et al. 2002, 094420).

The statistical analyses performed on the data included PCA, hierarchical cluster analysis (HCA), and K-means clustering. The data are not required to be normally distributed for the PCA, but the assumptions of CA techniques include equal variance and normal distribution of the variables (Güler et al. 2002, 094417). Therefore, the data were transformed to approximate a normal distribution to allow for cluster analyses. Probability plots and box plots were used to evaluate the distribution characteristics of the median values for each variable in the dataset. Based on these graphics, decisions were made concerning the need for natural logarithmic transformations to achieve a better approximation of the normal distribution. The review showed that most of the variables skewed positively, containing a small number of high values. All but five (Cr, NO_3 + NO_2 as N; Mg, Si as SiO_2, pH) of the parameters were log-transformed so that they more closely corresponded to normally distributed data.

The last step in the data editing involved standardization of the data. All 17 parameters were standardized by calculating their standard scores (z-scores), as follows:

$$z_i = \frac{x_i - \bar{x}}{s} \tag{2}$$

where z_i = standard score of the sample *I* ; x_i = value of sample *I* ; $\bar{x}$ = mean; *s* =standard deviation.

The concentrations of the analytes used in this study vary by several orders of magnitude. Some trace elements concentrations are measured in µg/L levels and others in ng/L levels. Standardization allows each analyte, regardless of concentration magnitude, to be compared equally. Standardization scales the data to a range of approximately -3 to +3 standard deviations, centered about a mean of zero. Each variable thus has equal weight in the statistical analyses. The standardized scores were input into the statistical analysis software "Statistica for Windows 7.1."

3.6.4 Upper Tolerance Limit Calculation Methods

UTL values were calculated for constituents that were detected at a rate greater than 50% and with a number of detections greater than or equal to 8 using statistical methods (described in LANL 1998, 059730). If these statistical criteria were not met, the maximum typical detection limit was used. Results are shown in Tables 4.2-1, 4.2-2, and 4.2-3.

Measured results were square-root transformed and natural logarithm transformed. Normal probability plots were produced from these data using the Statistica Software package. The plots were reviewed, and the best approximation to a normal distribution was selected. Three parameters were found not to approximate a normal distribution in the regional aquifer data set, even with transformation: strontium, silica, magnesium, alkalinity, and bicarbonate. These parameters appeared to be bimodal in form.

UTLs were calculated following EPA guidance and previous LANL background reports (LANL 1998, 059730). For log-transformed data, a formula from Gilbert (1987, 056179) was used.

$$\mu = \exp(y + \frac{S_y{}^2}{2}) \tag{3}$$

$$\sigma^2 = \mu^2(\exp(S_y{}^2) - 1) \tag{4}$$

Where:

µ = mean

y = arithmetic mean

S_y = variance of sample

σ = variance of population

For strontium, silica, magnesium, alkalinity, and bicarbonate the same nonparametric formula was used (as referenced in LANL 1998, 059730.2).

$$RANK(UTL) = 0.95 \times (n+1) + 0.427 \times n^{0.5} \tag{5}$$

The mean and the square root of the variance (standard deviation) are then used as described in LANL, 1998 (059730). For constituents that did not meet the UTL calculation criteria, maximum values were calculated. Results are discussed in section 4.3.1.

4.0 RESULTS

4.1 Results of Data Validation

Revision 0 and Revision 1 of this report contained a detailed analysis of data validation for comparisons between EES-6 and other analytical laboratories and for the validation of all data used for background studies between 1997 and 2000. The prior discussion of the EES-6 data-validation process and other contract-laboratory data-validation and quality-assurance (QA) processes is presented in Appendix F. The data-validation and QA processes have remained the same for this revision of the report, so no further discussion is necessary.

A detailed discussion of data-quality criteria, data-quality issues and their resolution, and the risk-based approach to environmental QA activities can be found in the Laboratory's Environmental Surveillance reports for each year. Environmental sampling personnel conduct QA activities in accordance with DOE Order 414.1A, which prescribes a risk-based, graded approach to QA. The WQDB (http://www.lanl.gov/community/environment/h2o/) contains all the surface water, groundwater, and sediment analytical data received from contract analytical laboratories. None of the data are censored or removed. The primary documentation of analytical issues for data for any given year is provided in these reports. This process promotes the selective application of QA and management controls based on the risk associated with each activity to maximize effective resource use. The most recent report is "Environmental Surveillance at LANL during 2005, LA-14304-ENV, September 2006"(LANL 2006, 093925), which can be found at: http://www.lanl.gov/community/environment/docs/reports/esr.shtml.

4.2 Evaluation of Analytes

4.2.1 Analyte Groups

The entire list of analytes from the contract analytical laboratories and the EES-6 analytical laboratory was reduced to those most applicable to the objectives of this report (section 1.3), particularly major ions and field parameters, metals, tritium, selected radionuclides, and radioanalytical measurements. Table 4.2-5 lists the analytes and the applicable regulatory agency (NMED, EPA, and DOE). Statistical plots for these analytes are provided in Appendix C, and a brief narrative is provided below for each analyte by type. The statistical plots provide a visual summary of the results from all analytical laboratories. Both filtered and nonfiltered data were reviewed for this section of the report. Differences between filtered and nonfiltered data sets are noted where applicable. Nondetects are plotted in Appendix C as one-half of the detection limit.

Field Measurements: Specific conductance (conductivity), *pH, temperature, dissolved oxygen, oxidation reduction potential,* and *turbidity* were measured on nonfiltered samples. Specific conductance was highest in the alluvial groundwater with comparable levels in intermediate and regional systems. The highest mean values were at PM-4, Sacred Spring, and Spring 1. The greatest variance was at PM-4 (Figure C-20).

The pH in most locations tended to be near neutral to slightly alkaline, and its greatest variation was in the perched intermediate groundwater (Figure C-19). The highest pH values were noted in Guaje wells 1-A, 2-A, 3-A, 5-A, and in R-13. A trend in well LAOI-1.1(a) was noted, with pH and specific conductance in the values from 2004 to 2006 decreasing from levels much greater than those measured in the 1997 to 2000 time frame (Appendix F). The cause of this trend is unknown and should be noted by data users. No concomitant trends were noted in the metals analyses for this well.

Temperature was observed to increase with depth and was greatest in the regional aquifer sampling locations (Figure C-22). This trend was consistent with temperature data in Revision 1 (Appendix F).

Turbidity measurements are generally low. This finding is indicative of a well that is sufficiently developed and indicates proper sampling technique in springs (Figure C-22).

Dissolved oxygen measurements indicate oxic conditions (Figure C-23).

Oxidation reduction potential is smallest in the regional aquifer (Figure C-25).

Major Cations: The major cations *calcium* (Figure C-32), *magnesium* (Figure C-39), *potassium* (Figure C-44), and *sodium* (Figure C-47) were detected in nearly all samples (98% detection of magnesium in the regional aquifer). Within the regional aquifer, more nonfiltered samples were collected than filtered samples. Median values of calcium, potassium, magnesium, and sodium were similar in nonfiltered samples. Sacred Spring and Spring 1 tend to have higher sodium or calcium levels than in other nonfiltered samples from other locations. Sacred Spring exhibits markedly higher concentrations of calcium and Spring 1 exhibited higher levels of sodium than other locations in both filtered and nonfiltered samples. The remaining locations tended to have similar ranges of both filtered and nonfiltered values for all four major cations. These results have implications for the statistical PCA and CA analysis groupings, discussed below.

All but two samples of intermediate locations were nonfiltered. Ranges of all major cations in these nonfiltered samples fell within the same ranges as for filtered samples in the regional aquifer. All alluvial major cation samples were filtered. Median values and ranges for calcium, magnesium, and potassium were slightly higher in the alluvial samples than in intermediate and regional median values, while the sodium median value was lower.

Ammonium (Figure C-3) was detected infrequently and was highest in alluvial samples.

Major Anions: Major anions were generally detected at a high frequency, with some exceptions, particularly bromide and ammonia in the regional and alluvial data sets. The regional aquifer has slightly elevated levels of *alkalinity* (Figure C-1), *bicarbonate* (Figure C-2), and elevated levels of *fluoride* (Figure C-7) when compared with the other aquifer types. Filtered and nonfiltered alkalinity results within the regional aquifer were similar, except for Sacred Spring, Spring 1, and well G-5A, which had higher bicarbonate alkalinities than other regional locations. Fluoride in the regional aquifer (filtered and nonfiltered data) tended to be higher in well G-1A and Springs 1 and 9B. Median and ranges of fluoride values were lower than the regional results in both the intermediate and alluvial groundwater samples.

Chloride (Figure C-6) in the alluvium was much higher than intermediate or regional values. Well G-1A, as well as Sacred Spring and Spring 1, had higher levels of chloride within the regional (filtered samples).

Other major anions such as *bromide* (Figure C-4), and *sulfate* (Figure C-13) do not show significant variation among groundwater types. *Nitrate* ($N0_3 + NO_2$ as N) (Figure C-9) concentrations are lowest in the alluvial groundwater and show the highest variance in the regional aquifer. This is probably a result of biogeochemical cycling in the shallow subsurface or low anthropogenic inputs (e.g., agricultural or septic). In the shallow subsurface, microsites of anoxia can develop in otherwise oxic environments, which lead to reduction of nitrate to nitrogen gas (Koba et al. 1997, 093667).

Trace Metals: The detection rate of trace metals varied greatly, with some constituents rarely detected or not detected at all, including *silver, beryllium, cadmium, cobalt, copper, mercury, nickel, lead, antimony, selenium, tin, thallium,* and *titanium.* These metals were each detected in a few samples (fewer than 25%) and showed no appreciable trends or elevated levels in either filtered or nonfiltered samples across all aquifer types.

For constituents detected at low frequency, box plots must be evaluated with care. *Aluminum, arsenic, boron, copper, iron, and lithium* were detected more frequently in the alluvial and intermediate samples (Figures C-25, -27, -30, -35, -36, and -38), possibly because EES-6 analyzed a higher proportionate number of these samples with a lower detection limit.

Pine Spring aluminum results were 10 to 100 times greater than results from other sampling locations, including the highest nonfiltered results from the regional or intermediate locations. No trends were otherwise noted for aluminum.

Arsenic (Figure C-27) results were typically consistent across all sample locations, with most detected results within the perched intermediate groundwater, which also had slightly higher concentrations than the other groundwater facies. More variance was found in the regional aquifer.

Boron (Figure C-30) was not detected in the alluvium but was detected at high frequency (96%) in intermediate groundwater. PM-2, Sacred Spring, and Spring 1 showed higher levels of boron. The most variance was found in the regional aquifer.

Copper (Figure C-35), *manganese* (Figure C-40), *molybdenum* (Figure C-42), and *strontium* (Figure C-44) results were generally consistent by sample location with no significant differences among groundwater types. Two exceptions were noted. At well R-21, Mn levels have remained elevated over time (7.29-11.2 μg/L). Other wells have had levels in this range, but these levels have decreased over time. Sacred Spring also exhibited high Mn levels from 2004 onward (32.8-124 μg/L).

Chromium (Figure C-33) was detected most frequently in the regional aquifer, not at all in the alluvial, and showed higher concentrations and variance in the regional than the intermediate locations.

Trace metal constituents most frequently detected included *barium* (Figure C-28), *iron* (Figure C-36), *strontium* (Figure C-48), *uranium* (Figure C-52), and *vanadium* (Figure C-53). The latter two were more frequently detected in the regional locations than in intermediate or alluvial locations.

Barium (Figure C-28) results showed some higher values in the regional aquifer, but median values were similar across aquifer types. Barium was detected in all regional and intermediate locations but not at all in the alluvial locations, and it was at Sacred Spring and Spring 1.

Iron (Figure C-36) was detected more frequently in intermediate and alluvial groundwaters. Results tended to be variable for both location and aquifer type. Pine Spring iron results are 10 to 100 times larger than results from other sample locations. A nonfiltered result from Spring 1 was similarly higher than other samples, while nonfiltered results from intermediate samples tended to be up to 10 times higher than regional data. Pine Spring also exhibited higher nickel and manganese concentrations than other locations.

Strontium (Figure C-48) was detected at all sampling locations, with no appreciable differences between aquifer types or filtered and nonfiltered samples. Sacred Spring and Spring 1 showed the highest concentrations.

Uranium (Figure C-52) was detected most frequently in the regional aquifer, with little difference between filtered and nonfiltered results. There was little variation from location to location and among groundwater types. Uranium in Spring 1 and Sacred Spring appears elevated (2 to 10 times concentration levels) compared with other sample locations.

Vanadium (Figure C-53) concentrations were higher in the regional aquifer than in the intermediate and were not detected at the alluvial locations.

Zinc (Figure C-54) concentrations are greatest at LAOI-1.1(a) skewing the median value and range higher for the intermediate locations. Otherwise values were consistent with the regional aquifer locations.

Radionuclides: Several radionuclides and radiologic measurements exhibited very low rates of detection. Because of the high percentage of nondetects (75% to 100% across all groundwater types), americium-241, cesium-137, plutonium-238 and strontium-90 statistical plots (Figures C-56, C-57, C-61, and C-62) represent instrument noise rather than representative values.

Gross-alpha radioactivity was detected in 17% of regional and 20% of perched intermediate samples, while gross beta radioactivity was detected in 48% of regional aquifer samples, 80% of perched-intermediate, and 100% of alluvial samples. Gross-gamma radiation was detected in 40% of the alluvial samples. Other detection percentages for radioactivity were less than 1%. Overall variability was low but mean values were skewed high by individual sample measurements.

Tritium was characterized using UMTL results. Well LAO-B contained tritium at 30 pCi/L in 2006. This was the highest concentration found, as expected for modern waters. Perched-intermediate locations such as LAOI-1.1(a) well samples contained tritium at 5.7 and 7.5 pCi/L in older samples, although a recent sample from 2006 was much lower (0.13 pCi/L). Tritium in regional groundwater was not detected in 98% of samples, and most results were low (median value of 0.05 pCi/L). These data are consistent with tritium results in the previous report versions 0 and 1, and corroborate the relative groundwater age differences noted between alluvial, perched-intermediate, and regional locations in previous data and in the conceptual geochemical model.

The statistical plots for isotopic uranium are provided as Figures C-63 and C-64. The percentage of nondetects in regional locations was 4% to 7%, 17% to 33% in the perched-intermediate groundwaters, and 71% to 57% in the alluvial waters. Median values for each isotope rose from alluvial through perched-intermediate to regional groundwaters, with low variability within each water type. This finding is consistent with conclusions of the conceptual geochemical model. These results also are consistent with previous report versions. Revision 1 of this report (Appendix F and Hakam et al. 2000, 070168) contains a brief discussion regarding isotope disequilibrium; these data also tend to corroborate that conclusion. Note that one anomalous detection-limit value of 15.6 µg/L was found for Spring 6. This value tended to skew the statistics for the regional aquifer anomalously high. The value is not a normal detection limit and therefore was deleted from the statistical calculations, even though it is still included in Appendix B.

Other Constituents: TOC (Figure C-16) was detected in low numbers of samples. The regional aquifer exhibits the lowest mean value and the least variation; little difference was found between the alluvial and intermediate groundwater. Dissolved oxygen (Figure C-23) values indicated oxic water for all locations sampled (values between or exceeding 1-9 mg/L). Oxidation reduction potential (ORP, Figure C-24) data were available on a limited basis and generally indicated positive (oxidizing) potentials with some exceptions in well R-1. Note that these values should be considered in conjunction with appropriate redox couples.

Nitrite was detected infrequently and thus exhibited no clear trends (Figure C-10).

Silica (99% detection) varies by location and was slightly higher in the regional aquifer (Figure C-12). Intermediate and regional locations showed wide variances in silica concentrations.

TDS (Figure C-14) was measured for all locations in the regional aquifer for both filtered and nonfiltered samples. Filtered data are discussed here. Sacred Spring consistently had higher filtered TDS values than other regional locations. Intermediate groundwater locations had TDS values that were closer to those measured at Sacred Spring and Spring 1 than most other regional locations, while alluvial filtered TDS data were also within the range of most regional locations.

Perchlorate: In the regional aquifer, perchlorate values varied little between filtered and nonfiltered samples (median value filtered 0.28 µg/L, median nonfiltered 0.315 µg/L), and exhibited low variance. The lowest values were noted at Sacred Spring. A similar result was noted for the intermediate samples. These values are consistent with the data discussion in Appendix F regarding atmospheric sources of perchlorate and low levels of detected perchlorate in a variety of groundwater samples sitewide. In the alluvium, Pine Spring perchlorate levels were noted to be anomalously high (up to 14.2 µg/L). This is perhaps a result of having only a pre-2000 data set for Pine Spring, for which a less sensitive analytical method was used to detect perchlorate.

4.3 Results of Descriptive Statistics

The results of all statistics calculated using the methods described in section 3.4 are presented in Tables 4.2-1, 4.2-2, and 4.2-3. Statistical values were not calculated for certain constituents because they did not meet the minimum criteria of greater than 50% detects and more than eight values per analyte. For the analytes with fewer than eight values, median, mean, maximum, and minimum are shown. For analytes with greater than 50% nondetects, the number of analyses at each detection limit is shown. When available, both filtered and nonfiltered results are shown.

The results of the Mann-Whitney *U*-test are shown in Table 4.3-1. The number of checkmarks indicates the significance level of the difference between the compared water types. Some comparisons could not be made, including those for carbonate, perchlorate, nickel, and lead, and other minor metals such as tin, cobalt, and mercury, because there were fewer than eight detections in the data set for one or more of the compared water types for that constituent. It is important to note that while these comparisons are between water types, results from similar populations do not necessarily share the same geochemical origins or evolution. However, differences and similarities noted here may assist with the interpretation of the PCA and CA analyses of constituents and locations, as discussed below in section 4.5.

Constituents that showed no significant difference between the regional and intermediate water types included copper, iron, and zinc metals; cations strontium, potassium, lithium, and magnesium; and oxidized anions nitrate, phosphate, and sulfate. Significant or very significant differences were noted for the metals arsenic, boron, uranium, and vanadium; major cations calcium and sodium; anions including silica, bromide, fluoride, and chloride; and total alkalinity and pH. These data indicate that oxidized conditions exist for both water types, as expected. Metals with lower relative abundances such as copper and iron in the Pajarito Plateau tended to have similar regional and intermediate water types, while contributors to TDS such as chloride and total alkalinity, sodium, silica, and calcium showed differences that may be related to the evolution of these groundwater facies with increasing rock contact times. These differences are consistent with previous observations of the evolution of waters as they move from intermediate to regional depths.

Between the alluvial and intermediate water types, a large number of constituents were not included in the calculation because of a lack of detections in either the alluvial or intermediate zones. Similarities were noted in aluminum, arsenic, boron, iron, sodium, and uranium; and in anions fluoride, phosphate, sulfate, and silica. Significant, or very significant, differences were noted for barium, calcium, potassium, magnesium, strontium, and zinc, and for ions chloride and nitrate, as well as for total alkalinity and pH. Differences in constituents such as nitrate may indicate the effects of the soil profile on nitrate concentration in shallow alluvial zones. Levels of nitrate were not significantly different between intermediate and regional zones because there are fewer removal or addition mechanisms in this pathway. Chloride was also significantly different between the two zones; this may also indicate that variations in input concentrations are affecting the concentrations in the alluvial zones. Once water migrates deeper, again there are fewer mechanisms that will affect the concentration of this ion. For cations, levels of sodium remained similar between the two, whereas cations in lower concentrations such as barium, calcium, potassium, and magnesium showed differences. This situation might be due to the proportional effect of variations in rock-water interaction on these lower concentration constituents as opposed to the effect on a high concentration constituent such as sodium.

The largest number of differences might be expected between the alluvial and regional water types, given the longer pathways between the two and given that more interactions are expected along those pathways. This is the case for the constituents that could be compared: silver, aluminum, barium, cadmium, chromium, iron, uranium, and zinc metals; major cations potassium, magnesium, sodium, and strontium; and anions and other parameters including fluoride, sulfate, silica, and pH. Similarities occurred only for arsenic, boron, calcium, manganese, alkalinity, bicarbonate, chloride, nitrate, and phosphate.

4.3.1 UTL Results and Recommended Background Screening Values

The proposed inorganic chemical background screening values for groundwater are summarized in Tables 4.3-2a, -2b, and -2c and Figures 4.3-1a and b. Where available, the calculated UTL (Tables 4.2-1, 4.2-2, and 4.2-3) was used as the recommended screening value. UTLs could not be calculated for certain constituents because they did not meet the minimum criteria of greater than 50% detects and more than eight values per analyte. With a few exceptions, only filtered samples were used for UTL calculations. Samples taken from municipal supply wells were treated as filtered. This decision was made because of the active use of these wells and the number of analyses added to the dataset. Also, in the case of specific conductance and pH, nonfiltered results were used due to the nature of the analyses.

If a UTL was not calculated, the maximum typical detection limit was used as the screening value. Usually, this approach was applied to constituents that are rarely detected in groundwater samples. Exceptions to using the detection limit as the alternative screening value were made for those constituents that are found in groundwater in abundant concentrations, but, because of the small number of samples, a UTL was not calculated. This approach was applied to total alkalinity, bicarbonate, TDS, and elemental strontium. For these abundant constituents, the maximum measured value for that particular groundwater zone was selected as the screening value.

For several metals, the typical analytical detection limits and recommended screening values are close to a regulatory standard, as shown in Tables 4.3-2a, -2b, and -2c. This observation is particularly true for antimony, arsenic, mercury, selenium, and thallium. It is recommended that the screening values for these metals be adjusted if lower detection methods are utilized. Simply put, if these latter metals are detected in groundwater, the results should be flagged for more detailed evaluation. The user should recognize the dependence upon detection limits. For fallout-associated radionuclides, the screening value is the typical minimum detectable activity. In practice, any detection of radionuclides in groundwater should result in further evaluation of the result.

Figures 4.3-1a and b illustrate screening values that represent uncontaminated groundwater across the Pajarito Plateau. They illustrate the summation of water quality, general chemistry, and metals analyses and parameters from a large data set. They are derived from a large geographical area beneath the Pajarito Plateau from recharge and discharge zones and across the three groundwater types including the regional aquifer, which is most strongly represented.

4.4 Results of Data Plots

4.4.1 Spatial Trends in Water Chemistry Results

Spatial trends are discussed here with respect to the conceptual hydrogeochemical model (section 2.2.2) and the various statistical values and analyses presented. Implicit in this discussion is the location of the recharge zone in the Sierra de los Valles west of the laboratory, the evolution of groundwater facies in the regional aquifer along various flow pathways as water moves through the various rock units of the Pajarito Plateau, the chemistry of these facies which are sampled by various wells on and near the Plateau, and then discharge of the regional groundwater at various springs in White Rock Canyon. This section discusses only the current data set obtained between 2000 and 2006.

Figures 2.2-1 a-d show many of the constituents of interest. Statistical data and data distributions are shown in Tables 4.2-1, 4.2-2, and 4.2-3, while Appendix B lists all raw data used in this report and Appendix C contains statistical plots.

The statistical relationships discussed in sections 4.3 and 4.5 provide input to the development of spatial trends in water chemistry. The Mann-Whitney *U*-test indicates that the intermediate-regional aquifer means comparisons were mostly from different populations. Only ammonium, bicarbonate, chloride, magnesium, nickel, potassium, TDS, and pH were from similar populations. More constituents were found to be from the same populations for the alluvial-intermediate comparisons and the alluvial-regional comparisons, although these results may be biased by the limited number and high mean values of alluvial data points.

Figures 2.2-1a and 2.2-1c show general constituent concentrations including bicarbonate, sulfate, silica, chloride, pH, and nitrate for the intermediate and regional sampling stations. Note that bicarbonate values are divided by 10 to allow all constituents to be shown clearly within the target diagram scales.

For intermediate locations, general constituents bicarbonate and silica were highest in well LAOI-1.1(a) and lowest in Cañon de Valle-5.0 spring, where sulfate and chloride were highest. Seven Springs also had low silica but high bicarbonate. All the intermediate locations had low to moderate concentrations of other general constituents (sulfate, chloride, nitrate, and fluoride) and near neutral pH values, as would be expected in a recharge zone. In the regional locations, silica and bicarbonate are higher than in intermediate locations, with the exception of Spring 9B which is notably lower in bicarbonate. Regional locations also have higher pH values. All locations showed low values for nitrate, fluoride, chloride, and sulfate, indicating that they are not impacted by anthropogenic sources of these constituents.

Figures 2.2-1b and 2.2-1d show target diagrams for metals concentrations at the intermediate and regional locations. Cañon de Valle-5.0 Spring showed the highest level of barium, while Seven Springs showed higher levels of boron than the other intermediate locations. Potassium and sodium were highest in well LAOI-1.1(a). Metals concentrations for the perched-intermediate locations tended to be low overall. In the regional locations, barium is highest at well G-1A and Sacred Spring, while boron is highest at Spring 1 and wells PM-2, PM-6 and Sacred Spring. Springs 9A, 9B, 9, 8A, and 6A showed low concentrations of all the mapped metals, as did well R-21. Ancho Spring, Spring 6, and Spring 5B showed slightly higher levels of calcium and barium. Guaje wells 3A, 4A and 5A showed very similar metals chemistry along with wells R-1 and R-18. Barium, boron, and sodium all appear to show the trend of higher mean concentrations in wells and springs northwest of the laboratory. Correlation tables in section 4.5 indicate strong correlations between boron, TDS, bicarbonate, and sodium.

Constituents of interest with respect to both potential contamination and redox conditions include chromium and nitrate, while manganese and iron are of interest with respect to redox conditions. A discussion on speciation of the latter two is given in section 2.2.2. Mean nitrate concentrations are shown in Figures 2.2-1a and 2.2-1c.

Chromium and nitrate are from significantly different populations when correlation coefficients are compared (Table 4.5-1). Nitrate values in the intermediate locations are all less than 0.5 mg/L, with Water Canyon Gallery the lowest at 0.07 mg/L. Mean nitrate in filtered regional samples is 0.33 mg/L, with the maximum value of 1.05 mg/L at Spring 5B in 2000. (Later data show a decrease.)

Chromium is rarely detected in the intermediate locations (73% non-detects) but Campsite Springs and well LAOI-1.1(a) showed detections below 1 mg/L. Chromium is detected more frequently (32% non-detect) in the regional locations, with a higher mean value of 3.44 mg/L. Highest concentrations were found in wells R-1, PM-4, G-2A, and PM-5.

Arsenic, uranium, and strontium are naturally occurring but also of interest with respect to water quality. All are higher in the regional aquifer locations than at intermediate locations. Uranium is a significant factor in factor 1 of the PCA, discussed below in section 4.5, and is known to be higher in Santa Fe Group sediments than in other aquifer materials (Appendix F).

Strontium is highest in Cañon de Valle-5.0 Spring and in well LAOI-1.1(a) in the intermediate aquifer (Appendix B). In the regional aquifer, overall filtered values of strontium are near 50 µg/L, with the exception of Sacred Spring that has values about 10 times higher, and at Springs 1 and 5B, which show values twice as high. This skews the mean for the regional aquifer high. The PCA discussion (section 4.5) mentions the difference in groupings between springs 1, 5B, and Sacred Spring and the rest of the regional locations, and higher strontium concentrations appear to contribute to these differences.

Most concentrations of arsenic lie between 2 and 6 µg/L in the regional aquifer, with one exceptional value of 12 µg/L, at Spring 6, in 2006. In the intermediate locations, arsenic is typically not detected or is detected at less than 1 µg/L.

Tritium variation is discussed in detail in section 2.2.2. Generally tritium is low in most regional and intermediate locations, less than 3 pCi/L, indicating older waters and less likelihood of mixing with younger waters along flow paths. Insufficient detail is available for the alluvial locations, however, previous work (Appendix F) discusses higher concentrations found previously in alluvial locations and the young relative ages of those waters.

4.4.2 Temporal Trends in Water Chemistry Results (2000–2006)

Some specific locations and overall regional groundwater data were examined for temporal trends in general chemistry and some constituents of interest. Data from the previous report revisions and from pre-1997 data were also examined. The data set from the current report has excluded wells and springs that showed upward trends in potential contaminants, such as nitrate, chromate, or well corrosion indicators (e.g., iron or manganese). This approach reduces the potential for finding upward temporal trends in the data set. Some locations such as the R-wells, well G-1A, PM-2, and several springs had more complete data sets over time. Alluvial locations were mostly not evaluated because limited data were available. Section 4.6 also discusses some temporal data.

TDS and bicarbonate concentrations for the alluvial, intermediate, and regional locations were plotted and compared with data from Appendix D, Figure D.1-4, which show the relationship between TDS and bicarbonate for pre-1997 baseline groundwater samples. Results fell well within the regions defined in D.1-4, although they showed more overlap of the combined alluvial and intermediate locations with the Santa Fe Group regional locations. This finding indicates that these constituents are not changing regionally over time. The current data did not show the high concentrations of TDS and bicarbonate found in well Otowi-4. Several higher concentration valley wells and discharge springs were eliminated from the current data set because the PCA and CA analysis (section 4.5) grouped those locations (along with well Otowi-4) in regional group I.

Regional locations were examined for trends over time with respect to constituents of interest including arsenic, boron, chromium, nitrate, strontium, and uranium. In many cases, only one perchlorate data point was available per sampling location, precluding a trend analysis. In addition, most locations showed variability around a median value but no clear trends. Ancho Spring showed slight increasing trends in arsenic and nitrate; however, other constituents such as strontium and uranium were stable, while chromium decreased. Only one data point for perchlorate was available. Well G-1A showed a higher concentration of strontium in August 2005, which has since decreased. Well R-13 showed an increasing trend in arsenic; however, decreasing trends in boron, nitrate, strontium, and uranium (late decrease in 2006) also were noted. Well R-21 showed decreases in nitrate. Springs 6A and 8A showed increasing boron concentrations, while 8A also showed a slight increase in arsenic, and 6A showed decreasing nitrate. Spring 9 showed an increasing trend in uranium. Spring 9A showed increasing arsenic and boron values, but decreasing uranium may be occurring as noted by a late (2006) decrease in uranium concentration. Sacred Spring showed clearly decreasing nitrate, possibly because of improved sampling at the source since 2000.

Data for general constituents—including bicarbonate, chloride, fluoride, sulfate, specific conductance, silica, and TDS—were examined for temporal trends. Many locations showed variable constituent concentrations that varied relatively consistently around a mean value with no trend evident over the time frame examined. (See statistical Tables 4.2-1, -2, and -3 for more information.) Most trends were slight—such as a decrease in bicarbonate in G-3A and a decrease in nitrate in well G-4A. PM-2 showed decreasing specific conductance and silica. One spring that exhibited higher overall constituent concentrations was Sacred Spring, where chloride, specific conductance and TDS increased and nitrate decreased. Spring 6 showed increases in TDS and specific conductance. In Ancho Spring, boron, nitrate, and chloride increased, although other constituents of interest decreased. (See above.)

While some specific trends were noted, the typical general chemistry and metals values did not tend to be significantly different than reported in Revision 1 for data from 1997 through 2000. The expanded list of locations for the perched-intermediate and regional aquifers was not found to have different typical median values.

4.5 Results of PCA and CA analysis

4.5.1 Statistical Analysis

Principal component analysis is a multivariate statistical technique for data reduction and for deciphering patterns with large sets of data (Stetzenbach et al. 2001, 090565). This method was selected to assist understanding of patterns within the regional aquifer chemistry, which can be highly variable over the large region of the Pajarito Plateau and surrounding recharge and discharge areas. In using PCA, a large data matrix can be reduced to two smaller matrices, one consisting of principal component (PC) scores and the other containing the loadings. The scores help define the chemical signatures for each sample in the data set. The loadings identify the analytes with concentrations that vary the most in the data set. In this study, the PCA reduced the 17 analytes to 3 PCs.

Two separate CAs were used to evaluate the PCA scores and group the stations according to similar chemical signatures. The HCA results are presented as a dendrogram, or “tree diagram” (Figure 4.5-1). The number of groups is based on visual inspection of the dendrogram. Clusters were determined using the Ward’s amalgamation method and Euclidean distance linkage. The second CA method, K-means clustering (KMC), is different from HCA because the number of clusters is preselected at the start of the analysis, and results are presented in a table showing members of each cluster. In this study, HCA was run to select a reasonable number of clusters, and that number then was used in KMC.

4.5.2 Key Analytes Identified through the Analysis

A correlation analysis was performed on the original data. For this analysis only, supply well metals data were included with filtered results because of their low turbidity values and to increase the number of locations in the analysis. Results are presented in Table 4.5-1. The correlation matrix shows substantial correlation between many of the analytes, providing justification for proceeding with the PCA.

PCs are calculated so that they take into account the correlations present in the original data, but they are uncorrelated (orthogonal) to one another (Farnham et al. 2003, 094423). The factor loadings determine the elements that are most correlated within each PC.

The factor loadings identified through the PCA are provided in Table 4.5-2. Factor loadings identify which analytes “trend together”—in other words, which analytes contribute the most variance within the data set. The key analytes are identified in Table 4.5-2 along with the proportional amount of variation in the data set that is explained. The 17 metals/major ions were reduced to 3 PCs (groups of analytes). The 3 components explain 78% of the variation in the data set.

Typically, with PCA, the first PC describes the overall difference in the TDS between samples (Farnham et al. 2003, 094423). This situation becomes apparent when one views the loadings, which are mostly all either negative or positive. This fact indicates that all elements tend to be higher in the high TDS samples and lower in the lower TDS samples. In this study, 9 analytes (a large number) are significant contributors to the first PC, explaining 40% of the variance. They include bicarbonate, boron, chloride, fluoride, sodium, sulfate, strontium, and uranium in the positive sense, and silica in the negative sense.

The second PC is related to the aquifer materials through which the water flowed (Farnham et al. 2003, 094423). In this study, barium, calcium, potassium, and magnesium dominate PC2 in the positive sense and pH in the negative sense. PC2 explains 23% of the variance.

The third PC often explained differences in the oxidation/reduction characteristics of the waters. PC3 is dominated by chromium and nitrate in the positive sense. It explains 15% of the variance. While a full analysis of oxidation and reduction processes would include identification of redox pairs, this PC simply indicates an effect that may be attributed to these constituents.

4.5.3 Groundwater Groups Identified

The number of groundwater groups was selected based on visual examination of the HCA tree diagram (Figure 4.5-1). The diagram was interpreted to have classified water quality samples from the 35 candidate stations into three major groups (I-III). A separate CA (not shown) using a K-means method corroborated the HCA groupings; KMC produced similar groupings of stations for three clusters. The differences among the major groups defined by HCA were determined to be statistically significant ($p<0.001$) using multivariate analysis of variance (ANOVA). Factor scores are plotted in Figure 4.5-2 by group.

Group II samples all have significantly higher TDS than group I or III samples. They also have a wider range of factor scores (Figure 4.5-2). All of the high-TDS waters are located in the Rio Grande Valley near the river, mostly in proximity to San Ildefonso Pueblo. This general location has been shown to be a regional groundwater discharge area. Groundwater within a discharge zone, at the end of groundwater flow paths, generally has the highest mineral or solute content and also represents the oldest water, provided that mixing with younger groundwater has not taken place. As a result of this analysis, this group was not chosen for background locations.

Group I waters have moderate TDS concentrations, between Groups II and III. They generally are located within Los Alamos Canyon and Sandia Canyon. Factor scores for this group range between those of Group II and Group III. This group includes some Pajarito Plateau locations from Revision 1 of this report, as well as other proposed locations. While some of these locations were screened out because of other factors, it is significant that the analysis indicates consistency within the grouping.

Group III waters show the lowest and most consistent TDS concentrations and a narrower range of factor scores (Figure 4.5-2). This group includes most of the final locations chosen. Former background locations and newly included locations fall within the group. Based on comments from NMED (2006, 094447), and on the potential for contamination of some locations in Group I from anthropogenic sources or disturbance of the well chemistry due to corrosion, many of the locations from Group I were eliminated, and the remaining locations were combined with Group III to produce the final list of regional background locations.

In summary, the analytes that contribute to the first PC are significant major cations and anions indicative of TDS trends, as well as a trace constituent of interest, uranium. The analytes that contribute to this PC are indicators of facies evolution within the groundwaters and follow the geochemical model for the site. The analytes contributing to the second PC can be indicative of the rock type within the aquifer. The constituents that contribute to the third PC are of interest because they can be naturally occurring as well as from contamination. This component is important in that it explains variance in redox-sensitive constituents in and around the Pajarito Plateau. The PCA and CA analysis validates the geochemical model by grouping the locations that indicate evolved regional groundwater facies chemistry (Group III).

The analysis also addresses the request for a more robust statistical analysis of background by utilizing a much larger data set with more locations, and it shows that the geochemistry at the newer locations is similar to the original locations. The geographical context of background is thus broader than indicated in the original report.

4.6 Chemical Effects of the Cerro Grande Fire on Laboratory Background Sampling Stations

The Cerro Grande fire significantly impacted several major watersheds that drain into and north of the Laboratory (Gallaher and Koch 2004, 088747). These included Pueblo, Sandia, Mortandad, Pajarito, Water, Guaje, Rendija, Garcia, and Los Alamos Canyons. The Laboratory has conducted sampling and analyses of surface water and groundwater to assess this impact within Pueblo, Mortandad, Water, Pajarito, and Los Alamos Canyons, and Cañon de Valle watersheds (Gallaher and Koch 2004, 088747). Analytical results collected in June 2000 and May 2002 show that concentrations of major ions and trace elements have returned to prefire values.

A summary of a geochemical conceptual model of the impact of the Cerro Grande fire on surface water and groundwater chemistry developed by Longmire et al. (2001, 071362) is presented in this section. Ash and charcoal produced from the Cerro Grande fire consisted of complex mixtures of inorganic and organic compounds. Calcium, magnesium, silica, potassium, sodium, carbonate, manganese, iron, and other trace elements were concentrated in the ash and charcoal (Longmire et al. 2001, 071362). Long-chain aliphatic, paraffin, aromatic, and polycyclic aromatic compounds were hypothesized to be concentrated in the ash and charcoal contributing to the hydrophobic nature of the residual soil. During the fire, organic carbon oxidized to form bicarbonate and carbonate, causing precipitation of $CaCO_3$ (calcite) (Longmire et al. 2001, 071362). Calcite has been observed within ash samples of ponderosa pine, aspen, and scrub oak collected on the south rim of upper Los Alamos Canyon (Longmire et al. 2001, 071362). This precipitation process resulted in higher concentrations of dissolved calcium and bicarbonate in storm runoff and base flow.

During storm events, ash and charcoal were washed into canyons, carried downstream, and redeposited. After the fire, TOC and DOC concentrations in surface water were elevated because of the redistribution of ash, charcoal, soot, and other forms of organic carbon concentrated in surface water (Longmire et al. 2001, 071362). Storm runoff, consisting of a mixture of rainwater, ash, charcoal, and sediment, was characterized by a calcium-potassium-bicarbonate solution having a TDS content greater than 100 mg/L (Longmire et al. 2001, 071362; Gallaher and Koch 2004, 088747). The TDS content of the ash-rich water was higher than prefire storm runoff and base flow. By 2002, the TDS content of base flow had returned to concentrations observed during prefire conditions in several major watersheds (Gallaher and Koch 2004, 088747).

4.6.1 Analytical Results for Selected Springs and Well LAO-B

The following discussion incorporates data from Revision 1 of this report as well as newer data added from the current data set. Historical results from Apache Spring are retained for continuity; however, Apache Spring has since been contaminated with road salt runoff and is not used elsewhere in Revisions 2 and 3.

Results of analyses of Apache Spring, Water Canyon Gallery, Pine Spring, and Cañon de Valle-5.0 Spring from June 2000 are provided in Table 4.6-1. Additional data for Water Canyon Gallery and Cañon de Valle-5.0 Spring from this report collected in 2005 also are included. The June 2000 analytical results for Apache Spring, Water Canyon Gallery, Cañon de Valle-5.0 Spring, and Pine Spring were not included in the statistical analysis for the background data set in Revision 1 because impacts from the Cerro

Grande fire were observed. No new data were available for Pine Spring for this report revision. Apache Spring was not evaluated for this report revision because of road-salt contamination.

Data from Revision 1 of this report (LANL 2006, 094637) indicated that Water Canyon Gallery and Cañon de Valle-5.0 Spring were not impacted by the Cerro Grande fire—as shown by similarities in water chemistry (major ion and trace element) before and after the fire.

Pine Spring, however, may have been impacted by ash-rich runoff, which resulted in elevated concentrations of major ions, most notably calcium, sulfate, carbonate alkalinity, and TDS (Figure 4.6-1), and some trace elements, including manganese (Figure 4.6-2). Concentrations of manganese increased at Pine Spring immediately after the fire in response to increasing DOC.

Organic carbon, when used by heterotrophic microbes, is a strong reducing agent (electron donor) that has the capacity to reduce many solutes, including manganese, iron, nitrate, sulfate, and uranium (Langmuir 1997, 056037). This change in redox chemistry resulting from the fire increased the solubility of manganese oxides and (oxy)hydroxides. Under oxidizing conditions, manganese(III, IV) is stable as MnOOH and manganese oxide, but under reducing conditions, these solids dissolve to form soluble Mn^{2+}. The aqueous chemistry observed at Pine Spring during June 2000 was expected to return to prefire conditions over time, depending on the residual amount of ash, charcoal, and other organic material derived from the Cerro Grande fire. Elevated concentrations of dissolved manganese in surface water (base flow) were observed elsewhere upstream of the Laboratory (in Los Alamos Canyon and Pajarito Canyon) after the fire (Gallaher and Koch 2004, 088747).

Sampling of Water Canyon Gallery by the Laboratory since the fire, however, showed that this sampling station had returned to pre-Cerro Grande fire conditions by 2002 with respect to major ions and trace elements. This observation is supported by the more recent data from this Revision 2 of the report, collected between 2001 and 2005. Data from the sampling in July 2005 is shown in Table 4.6-1. Although data from 2001 to 2005 for sulfate, chloride, and aluminum show variable (increasing then decreasing) trends during that time frame. Other indicators such as TDS, calcium, and other metals and anions, show decreasing trends or stable concentrations.

Cañon de Valle-5.0 Spring shows concentrations of chloride and sulfate that are slightly higher than the June 2000 data; however, decreasing trends were noted between March 3, 2005, and July 11, 2005, for both metals and anions.

Well LAO-B was not strongly affected by the Cerro Grande fire. However, upper Los Alamos Canyon west of the well was severely impacted. Ash present in runoff recharged alluvial groundwater in the canyon that resulted in iron and manganese reduction, elevated concentrations of major cations and anions, and trace elements in several watersheds (Gallaher and Koch 2004, 088747). Prefire conditions have been restored at the well, however, based on the analytical results for major ions (excluding calcium and magnesium), and trace anions (fluoride), excluding trace elements largely collected from June 2000 through May 2002 (LANL 2004, 087390). The latest data (Table 4.6-1) from this well indicate that no further changes have occurred at the well outside of normal low fluctuations in constituent concentrations.

Well LAO-B represents baseline data that are unimpacted by the Laboratory. While LAO-B has shown some postfire effects and a return to prefire conditions, it is not possible to resolve the effect of the Los Alamos reservoir beyond that of the Cerro Grande fire. Addition of background wells in the future may provide data that clarify the effect of the reservoir on the alluvial groundwater. Potential impacts may be associated with anoxia of reservoir sediments, the distance from the reservoir, and underflow of alluvial groundwater below the reservoir but cannot be clearly discerned at this time. Well LAO-B is intended to provide a baseline for the wells downcanyon and for other alluvial locations.

5.0 SUMMARY AND CONCLUSIONS

5.1 Summary

A revised hydrogeochemical background investigation of groundwaters was conducted for the Laboratory in 2006 and 2007. This data set provides the most recent set of background groundwater chemistry analyses conducted for the Laboratory. This study included a comprehensive field, chemical, radiochemical, and statistical investigation of 29 sampling stations within the Pajarito Plateau/Jemez Mountains region from 2000 to 2006. Groundwaters from alluvium, Bandelier Tuff (Otowi Member and Guaje Pumice Bed), Tschicoma Formation, Cerros del Rio basalt, hydromagmatic deposits, Totavi gravels, and Santa Fe Group sediments were sampled, analyzed, and evaluated as part of this investigation. The sampling sites for this investigation were chosen to provide background data for groundwater occurring in shallow alluvium (well LAO-B and Pine Spring), perched intermediate groundwater within volcanic rocks [Seven Springs, Water Canyon Gallery, upper Cañon de Valle Spring, Campsite Springs, Barbara Spring, and well LAOI-1.1(a)], and the regional aquifer (Spring 5B, Sacred Spring, Spring 6, PM-2, PM-4, PM-5, Spring 9, Ancho Spring, Spring 6A, Spring 8A, Guaje wells 1A, 2A, 3A, 4A, 5A, wells R-1, R-13, R-21, Spring 9B, and Spring 1).

The overall objectives of Revision 2 of this report were fulfilled and included the following:

- analyzing additional more recent groundwater samples from background stations (springs and wells) for alluvial, perched intermediate groundwater, and the regional aquifer between 2000 and 2006; and
- providing validated analytical results and statistical distributions for the different analytes occurring within alluvial, perched intermediate groundwaters, and the regional aquifer.

General tables of analytical data are presented in Appendix B. Results of statistical analyses, including minimum, mean, median, maximum, one standard deviation, 5th, 10th, 25th, 75th, 90th, and 95th percentiles, geometric mean, skew, percent nondetects, and UTLs are provided for the alluvial groundwater (Table 4.2-1), perched intermediate zones (Table 4.2-2), and the regional aquifer (Table 4.2-3). The tables containing results of statistical analyses are grouped by filtered and nonfiltered samples for each aquifer type. Other parameters, including the number of samples and number of detects and nondetects, are also provided in Table 4.2-4. Table 4.3-1 shows results of a Mann-Whitney *U*-test of means between different aquifer types for selected analytes. Table 4.5-1 provides correlation coefficients, and Table 4.5-2 provides PCA and CA results on relationships within the regional aquifer. Tables 4.3-2a, b, and c provide screening values for the analyzed constituents.

Hydrogeochemical data and hydrogeologic information collected during the background investigation satisfy the Consent Order requirement, Section IV.A.3.d, which stipulates that the respondents shall determine the background concentrations for naturally occurring metals and general chemistry parameters in alluvial, intermediate, and regional groundwater. This revised background investigation report lists the background concentration for each metal and the general chemistry parameters and states the bases for selecting each such concentration. Background distributions of solutes presented in this revised report are applicable to Laboratory site evaluation.

5.2 Geochemical Variations among Groundwater Types

Important physical, geochemical, and statistical attributes of alluvial and perched intermediate groundwater and the regional aquifer are summarized in this subsection.

- Groundwater temperature increases with depth from the alluvium to the regional aquifer in response to ambient and Jemez Mountains geothermal gradients. Temperature measurements of groundwater are very useful in differentiating perched intermediate systems from the regional aquifer (LANL 2006, 094637).
- The three aquifer types are characterized by a pH range of 6.0 to 9.2, with the greatest variation within perched intermediate groundwaters. The most basic pH measurements were associated with the perched intermediate groundwaters. Most regional results are near neutral pH.
- Concentrations of calcium, magnesium, sodium, and potassium are generally lowest within the alluvial groundwater (as represented by well LAO-B) and highest in the regional aquifer, when the short-term effects of the Cerro Grande fire are discounted. The range of major cation concentrations is generally the lowest for the alluvial system and the highest in the regional aquifer. The same compositional trend is generally observed for the major anion bicarbonate between the three aquifer types. Mean value comparisons of chloride and sulfate among the three aquifers, however, indicate significant differences between aquifer types, according to the Mann-Whitney *U*-test (Table 4.3-1).
- Concentrations of nitrate (as nitrogen) are the lowest within the alluvial system compared with the perched intermediate system and the regional aquifer. Concentrations of nitrate (as nitrogen) are typically <0.6 mg/L in groundwater beneath the Pajarito Plateau and are greater than 1 mg/L at Spring 1 in White Rock Canyon near the confluence with lower Los Alamos Canyon.
- Concentrations of fluoride are similar in the alluvial and perched intermediate waters and increase in the regional aquifer. The greatest range of results is found in the regional aquifer.
- Background concentrations of arsenic, barium, boron, bromide, strontium, and uranium were lowest within alluvial groundwater and highest within the regional aquifer. The highest concentrations of dissolved arsenic (3.7 to 4.4 µg/L) were measured at Spring 1. Mean concentrations of these trace elements within the perched intermediate groundwater tended to be similar to the alluvial groundwater mean concentrations and lower than the regional aquifer mean concentration.
- Background concentrations of uranium are remarkably uniform (<0.6 µg/L) in the regional aquifer beneath the Pajarito Plateau and substantially increase at Spring 1 east of the plateau.
- Background/fallout activities of tritium are the highest for the Sierra de los Valles springs and alluvial groundwater (well LAO-B and Pine Spring) and the lowest within the regional aquifer (less than 3 pCi/L). This finding indicates the age of groundwater is generally increasing with depth.

5.3 Uncertainties

A revised investigation of groundwater chemistry, hydrostratigraphy for background locations, and detailed statistical analyses was conducted in 2006 and 2007. A high degree of confidence lies within the background water chemistry data as a result of this investigation because of the increase from 12 to 29 sampling stations and because of additional analyses performed on the data in comparison to what was done in earlier revisions of the report. However, several uncertainties should be taken into consideration in light of the conclusions of this study.

1. The detailed lithology, the criteria for stratigraphic divisions, and the nomenclature of sedimentary units beneath the Pajarito Plateau retain many uncertainties (i.e., compare the highly contrasting stratigraphy of Purtymun [1995, 045344], with that of Goff et al. [2002, 088776]). Because units such as the Puye Formation, Totavi Lentil, and various subunits within the Santa Fe Group host

or partially host the regional aquifer, an improved geologic framework is needed to reduce uncertainty in the hydrostratigraphy of the Santa Fe Group.

2. As the geochemical and geohydrologic conceptual models continue to evolve, uncertainty is likely to decrease in groundwater flow paths, solute and groundwater residence times, age(s) of deep groundwater, and hydrogeochemical processes that control groundwater composition.
3. Uncertainties exist about the complete representative nature of groundwater chemistry within the alluvium; currently, there are only two background sampling stations.
4. The data collected from wells and springs during this investigation reflect background. However, the long-term (50 yr and more) chemical composition of background sampling sites within and downgradient of the Laboratory is likely to evolve over many decades.

5.4 Conclusions

This background investigation report is an evaluation of the applicability of background sampling locations, the quality of background data from those locations, and the distinguishing characteristics of the aquifer types sampled. Results of this investigation, including hydrostratigraphic descriptions, multiple chemical analyses, and statistical evaluations of multiyear data sets, provide a technically defensible background database for subsurface water sampling locations for the Pajarito Plateau and Sierra de los Valles. These locations are shown to be free of Laboratory anthropogenic influences and are considered to be valid background locations with respect to the Laboratory. The aquifers studied exhibit specific chemical characteristics that will be used for future data screening and comparisons.

- The addition of new intermediate and regional aquifer stations has not changed the conceptual model. Instead, it has provided data that fits well within the model.
- The short-term effects of the Cerro Grande fire on several of the background sampling sites within the Sierra de los Valles (Apache Spring, Water Canyon Gallery, upper Cañon de Valle-5.0 Spring, and Pine Spring) and upper Los Alamos Canyon (well LAO-B) have been assessed. Groundwater chemistry has returned to prefire conditions at the two most impacted background sampling stations (well LAO-B and Pine Spring).
- Natural variability exists in regional background groundwater chemistry within the Pajarito Plateau. According to the PCA, Spring 1, Spring 5B, and Sacred Spring belong to a different geochemical facies than other sampling stations within the regional aquifer on the Pajarito Plateau. This finding is verified by the other statistical comparisons.
- Statistical parameters describing distributions of trace elements, such as antimony, beryllium, cadmium, lead, and thallium, are complex because of the high percentage of nondetects. Statistical relationships among trace elements with a higher detection rate, such as iron, were less complex and indicated similarity between alluvial and perched intermediate groundwaters.
- In Revision 2 of this study, perchlorate values were consistent with previously measured data. The median values within the regional aquifer were slightly higher (0.314 µg/L) than the perched-intermediate median value of 0.159 µg/L. The previous median value in Revision 1 was 0.27 µg/L. All results had low variances.
- Statistical analyses of the groundwater samples have advanced the understanding of solute distributions within the three aquifer types. Many of the major ions are log-normally distributed, which is a direct function of mineralogy of aquifer material, groundwater chemistry, microbial populations, and solute and groundwater residence times. Statistical comparisons for significance

between means indicated that some constituents are from different populations between different aquifer types. PCA and CA comparisons showed that the regional aquifer can exhibit different chemical facies with location.

- While some specific trends were noted, the typical general chemistry and metals values reported here for data from 2000 through 2006 did not tend to be significantly different than was reported in Revision 1 of this report (data from 1997 through 2000). The expanded list of locations for the perched-intermediate and regional aquifers generally did not have different typical median values.
- When distinct regional geochemical populations are combined, as in Revision 2, higher screening values are derived for some constituents than if the populations had been separated.
- Screening values presented in this report represent uncontaminated groundwater across the Pajarito Plateau. These are conservative values in that 95% of detections are below these values (UTLs). They illustrate the summation of water quality, including general chemistry, and metals analyses and parameters from a large data set over a large geographical area and within three groundwater types.

6.0 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 number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs-Environmental Remediation and Surveillance Program (EP-ERSS) Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the EP-ERSS master reference set.

Copies of the master reference set are maintained at NMED's Hazardous Waste Bureau; the DOE–Los Alamos Site Office; EPA, Region 6; and EP-ERSS. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

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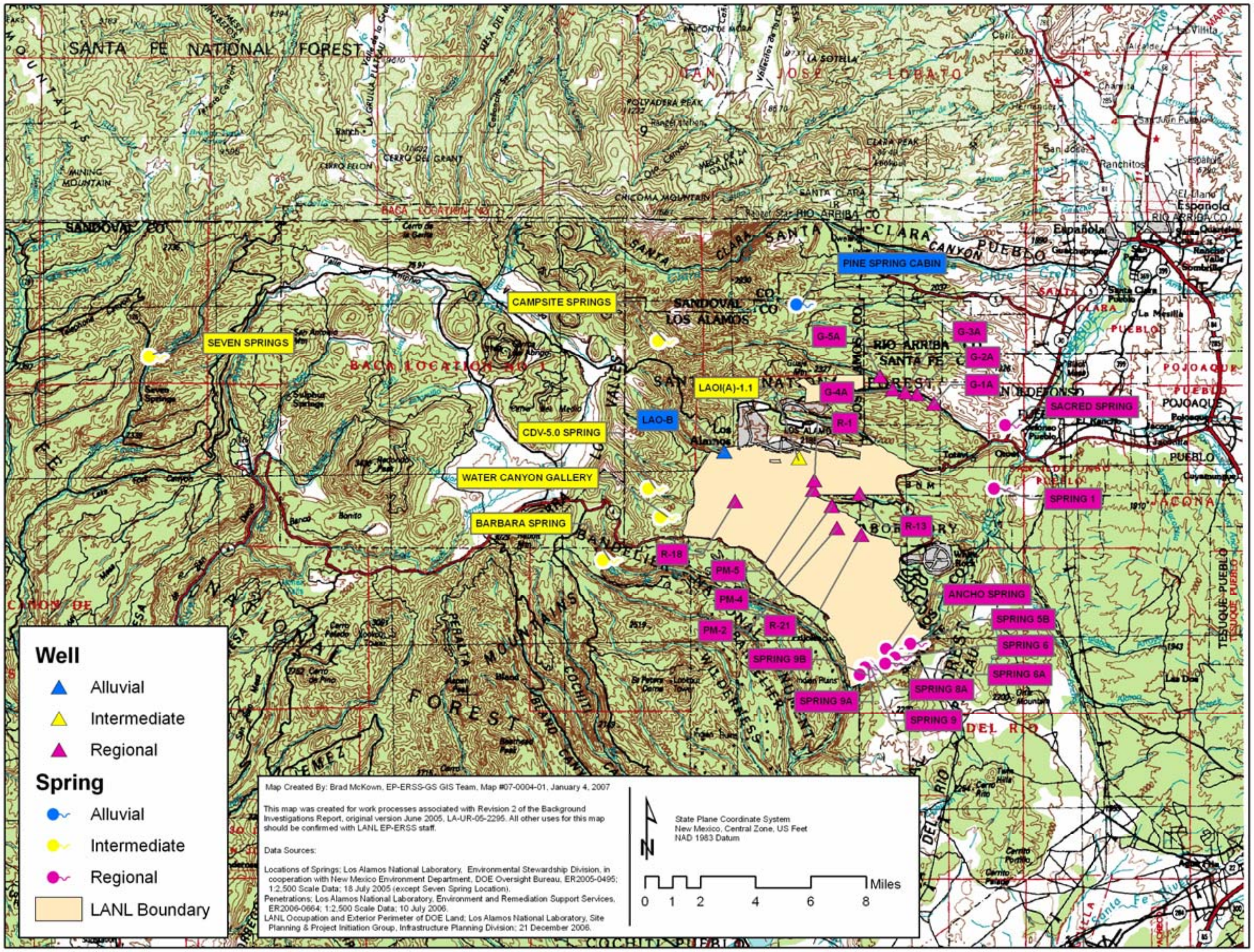


Figure 1.2-1 Location of groundwater background sites in the Jemez Mountains and near Los Alamos National Laboratory, New Mexico. Note: R-18 was removed as a background location.

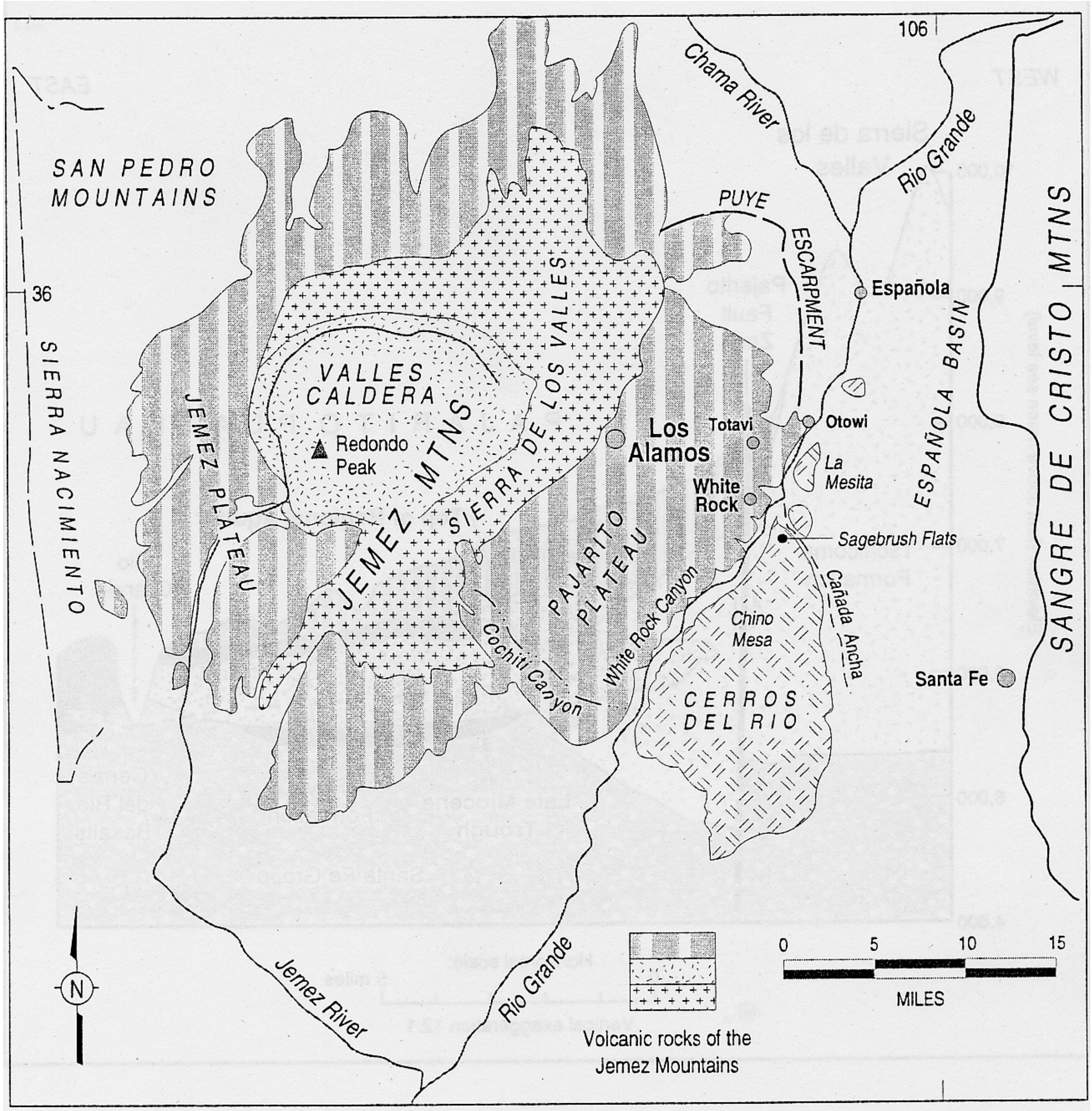
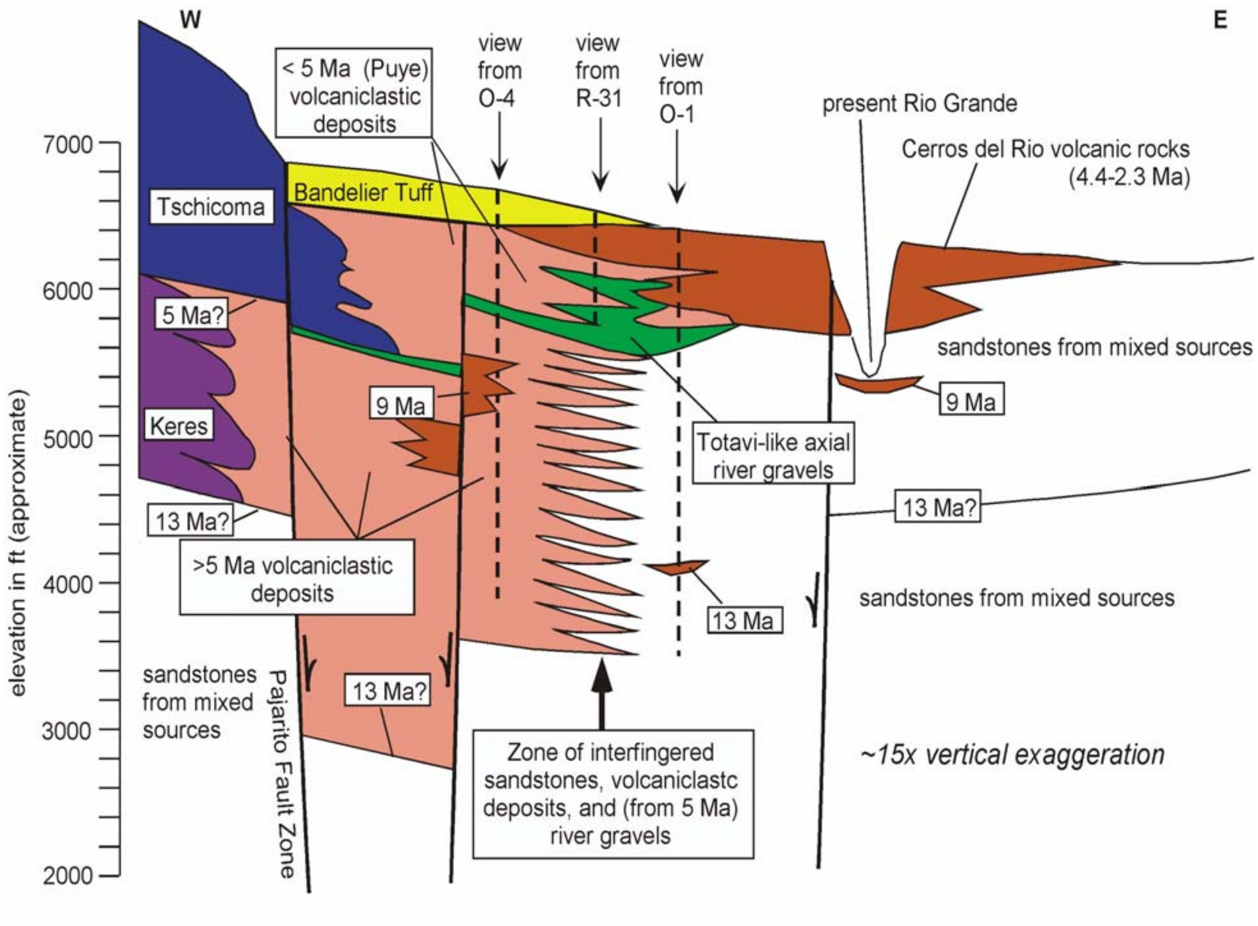
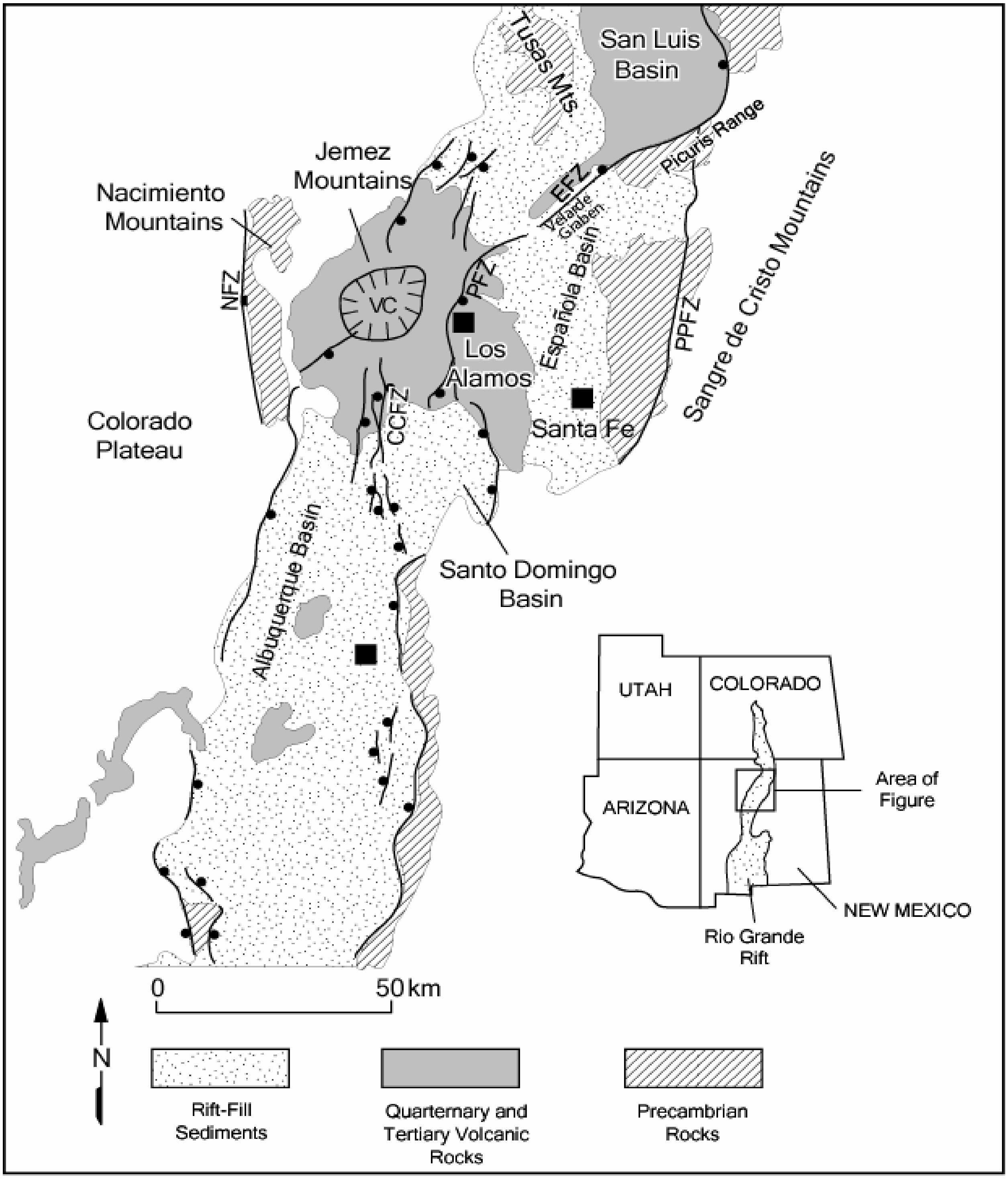


Figure 2.1-1 Regional and tectonic setting of the Jemez Mountains, Valles Caldera, and Pajarito Plateau in relation to the Rio Grande rift, Española Basin, Colorado Plateau, and the Sangre de Cristo Mountains, New Mexico (LANL 1998, 059599, Figure 2.3)



Note: O-1 is well Otowi-1, O-4 is well Otowi-4, and R-31 refers to well R-31. Ma refers to millions of years before the present.

Figure 2.1-2 Generalized geologic relations beneath the Pajarito Plateau



Note: Major fault systems are shown with ball on downthrown side. VC stands for Valles Caldera complex, EFZ is the Embudo fault zone; NFZ is the Nacimiento fault zone; CCFZ is the Cañada del Cochiti fault zone; PFZ is the Pajarito fault zone; and PPFZ is the Picuris-Pecos fault zone.

Figure 2.1-3 Regional geologic map (Broxton and Vaniman 2005, 90038)

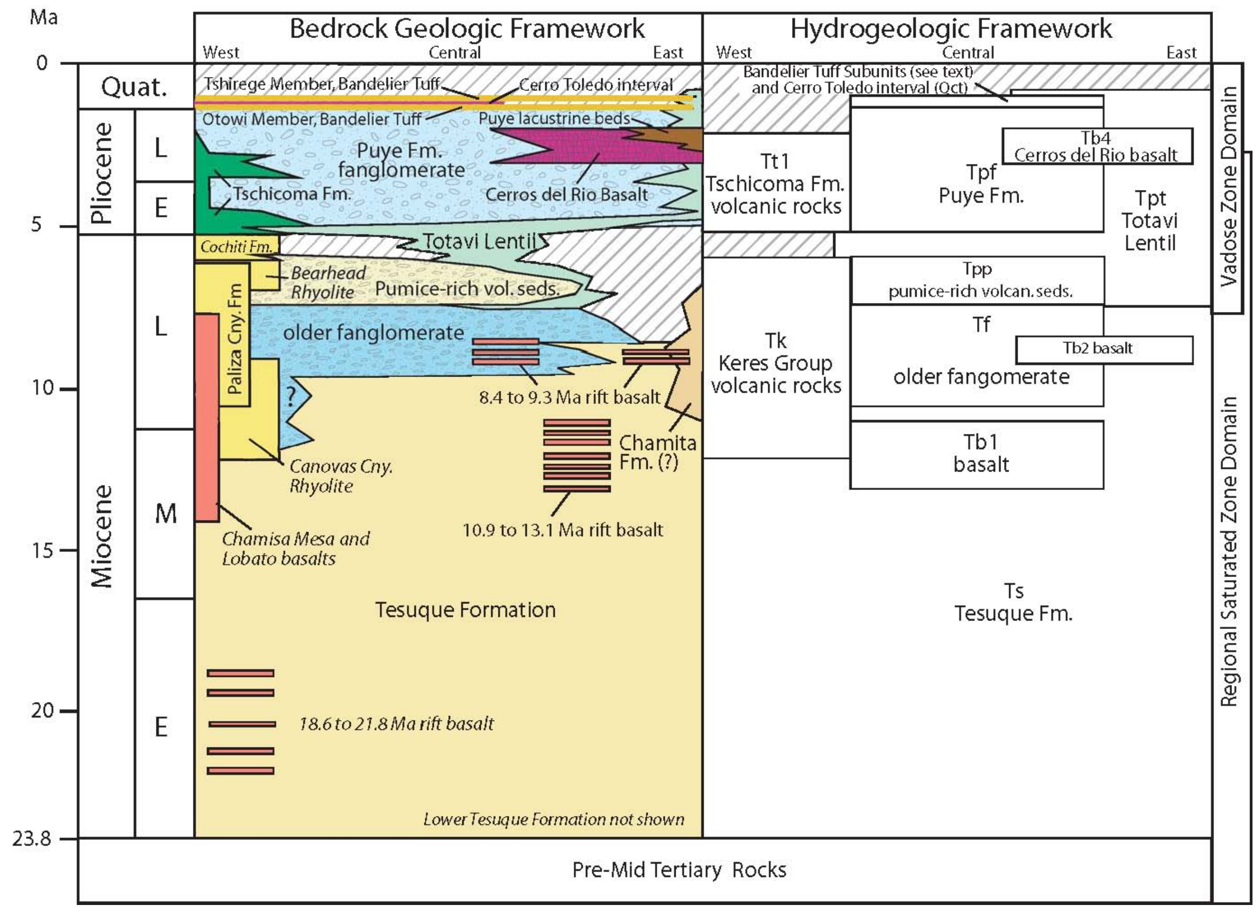
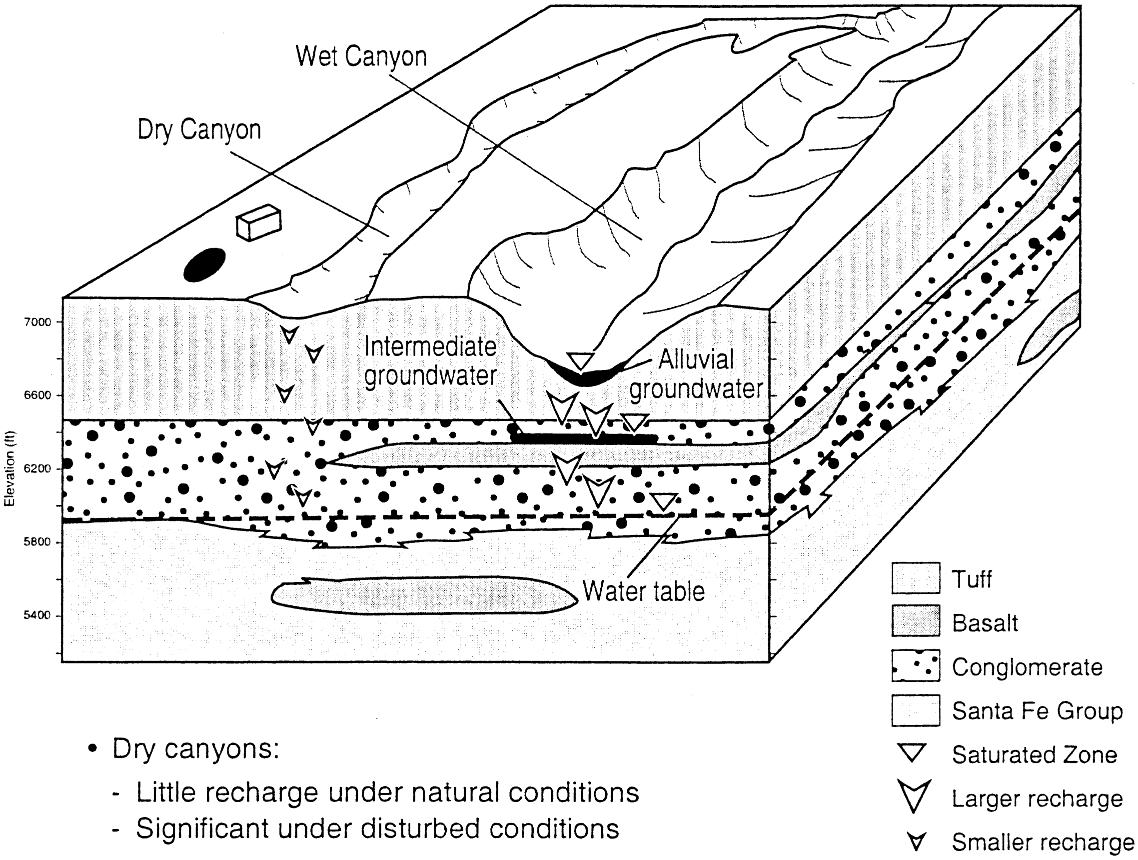
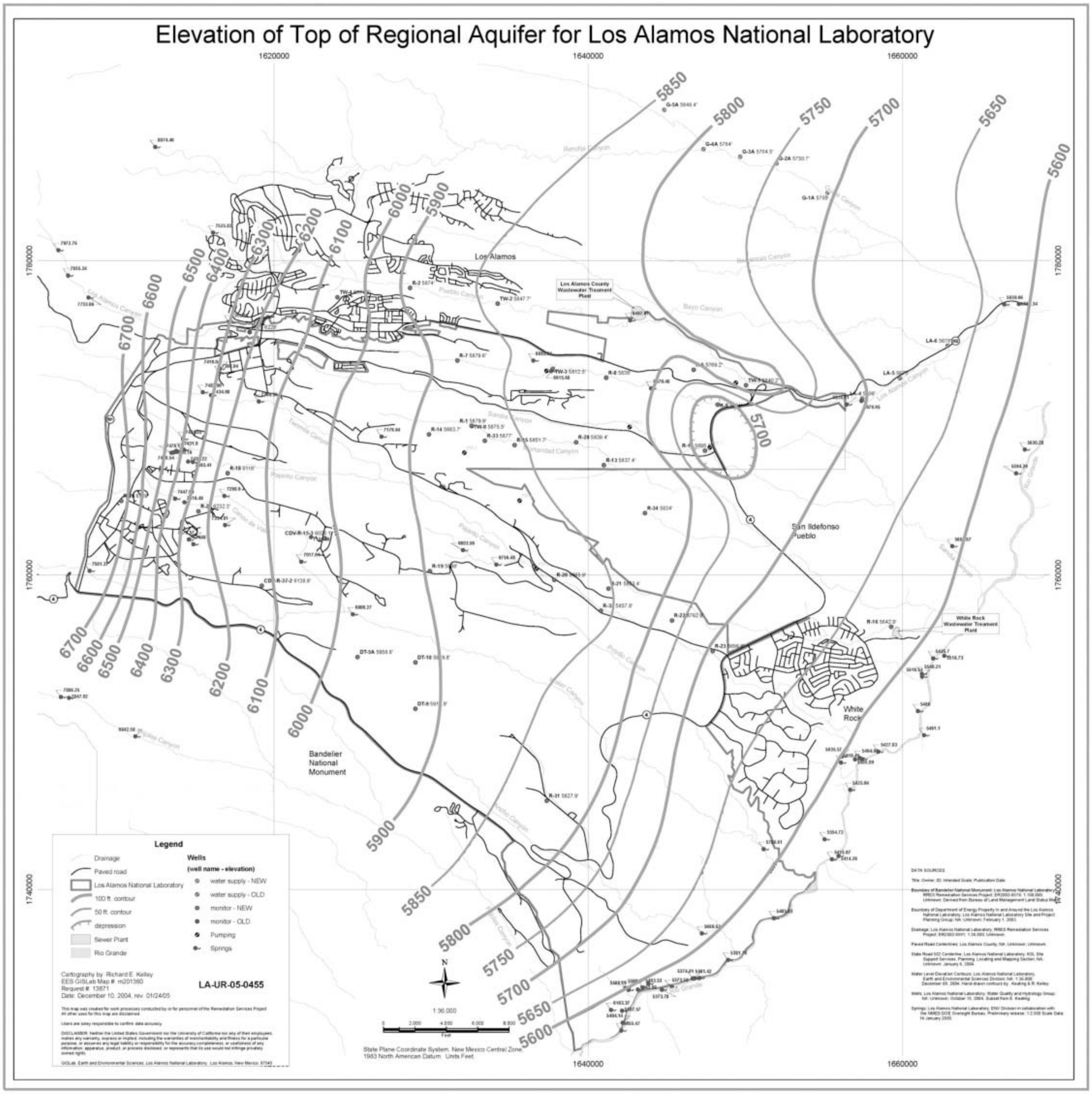


Figure 2.1-4 Revised stratigraphy of the Pajarito Plateau (Broxton and Vaniman 2005, 090038)



- Dry canyons:
  - Little recharge under natural conditions
  - Significant under disturbed conditions
- Wet canyons:
  - Source of recharge to intermediate groundwater and main aquifer
- Intermediate groundwater:
  - Significant contaminant transport path
  - Source of recharge to main aquifer
  - Occurs in larger canyon systems
  - Exists beneath canyons, not mesas?
  - Laterally extensive near Jemez Mountains?
  - Controlled by subsurface lithology

Figure 2.1-5 Hydrologic conceptual model for the canyons of the Pajarito Plateau (LANL 1998, 059599)



Note: This figure references the same data set used in Collins et al. from the "2006 General Facility Information Report, Appendix F2," (LANL 2006, 093570).

Figure 2.1-6 Regional water-level map in the vicinity of the Pajarito Plateau (Collins et al. 2005, 092028)

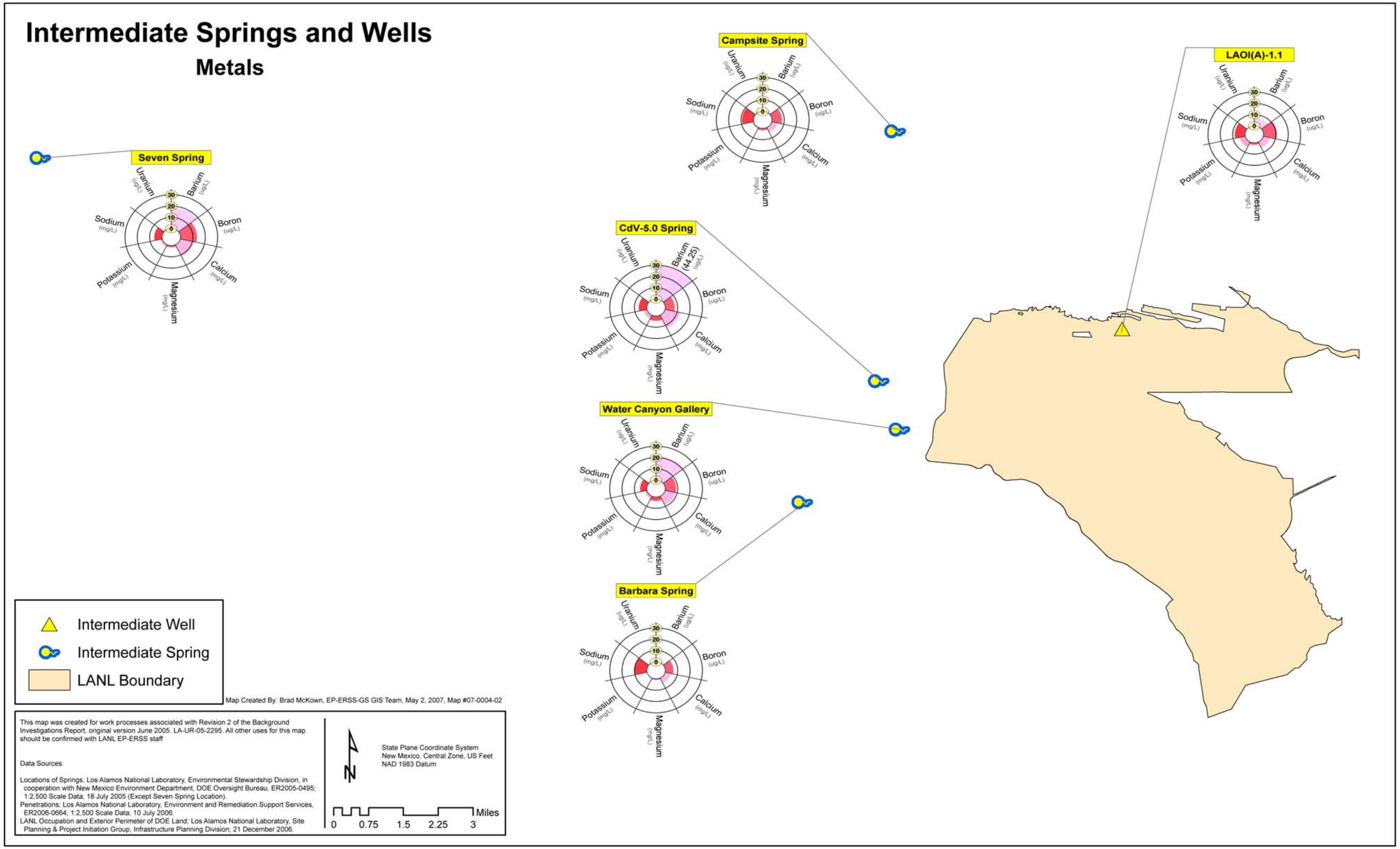


Figure 2.2-1a. Average concentrations for pH and selected major ions for intermediate background locations (Note: All values represent nonfiltered averages, except where noted with an 'F' for filtered. The exact value is listed for concentrations off-scale. Some constituent values are divided by 10 as noted to fit the target scale.) Note: R-18 was removed from the statistical data set during finalization of this report revision but is included in the data set used to make this figure.

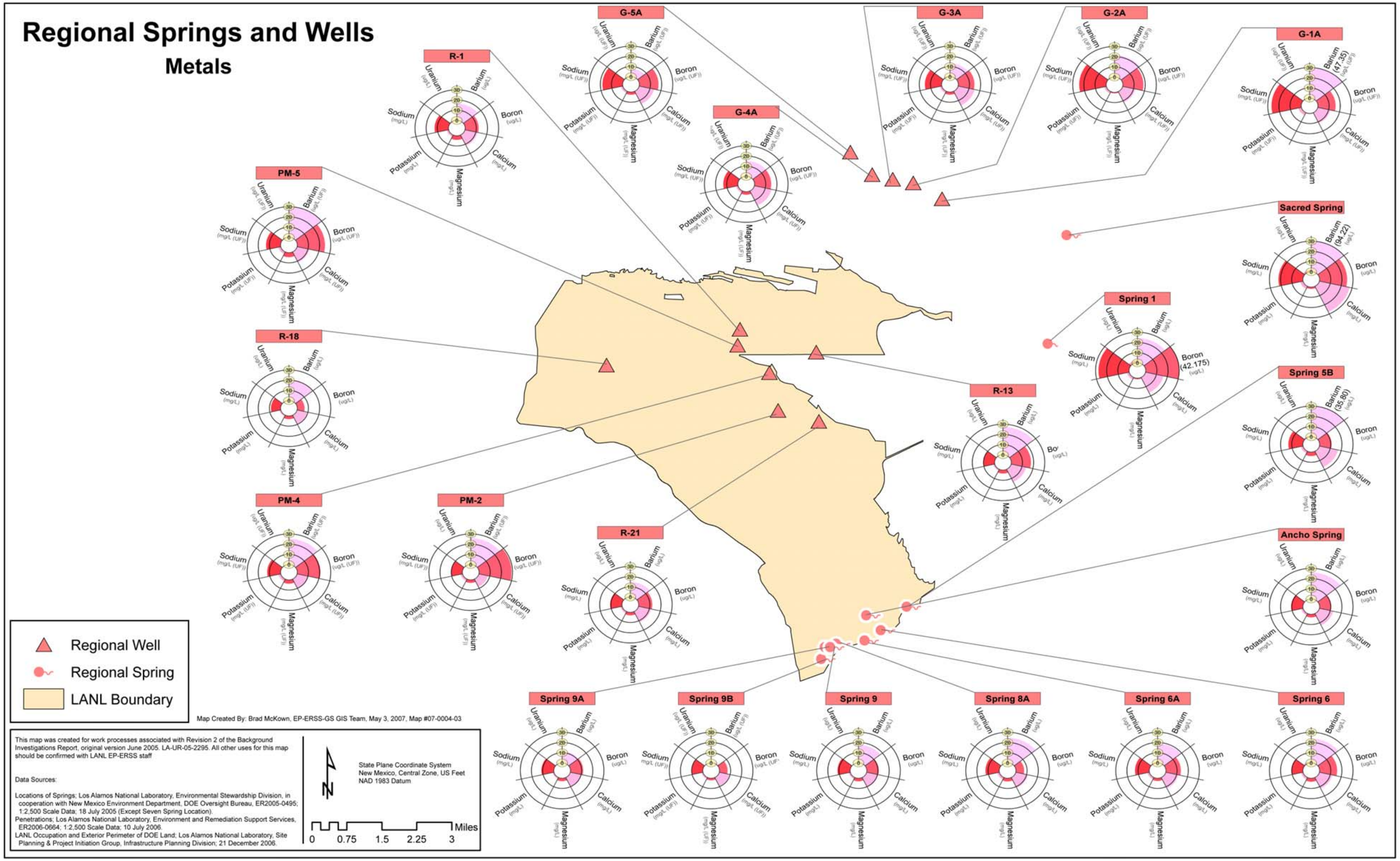


Figure 2.2-1b. **Average concentrations for selected metals for regional aquifer background locations** (Note: All values represent nonfiltered averages, except where noted with an 'F' for filtered. The exact value is listed for off-scale concentrations.) Note: R-18 was removed from the statistical data set during finalization of this report revision but is included in the data set used to make this figure. Note: R-18 was removed from the statistical data set during finalization of this report revision but is included in the data set used to make this figure.

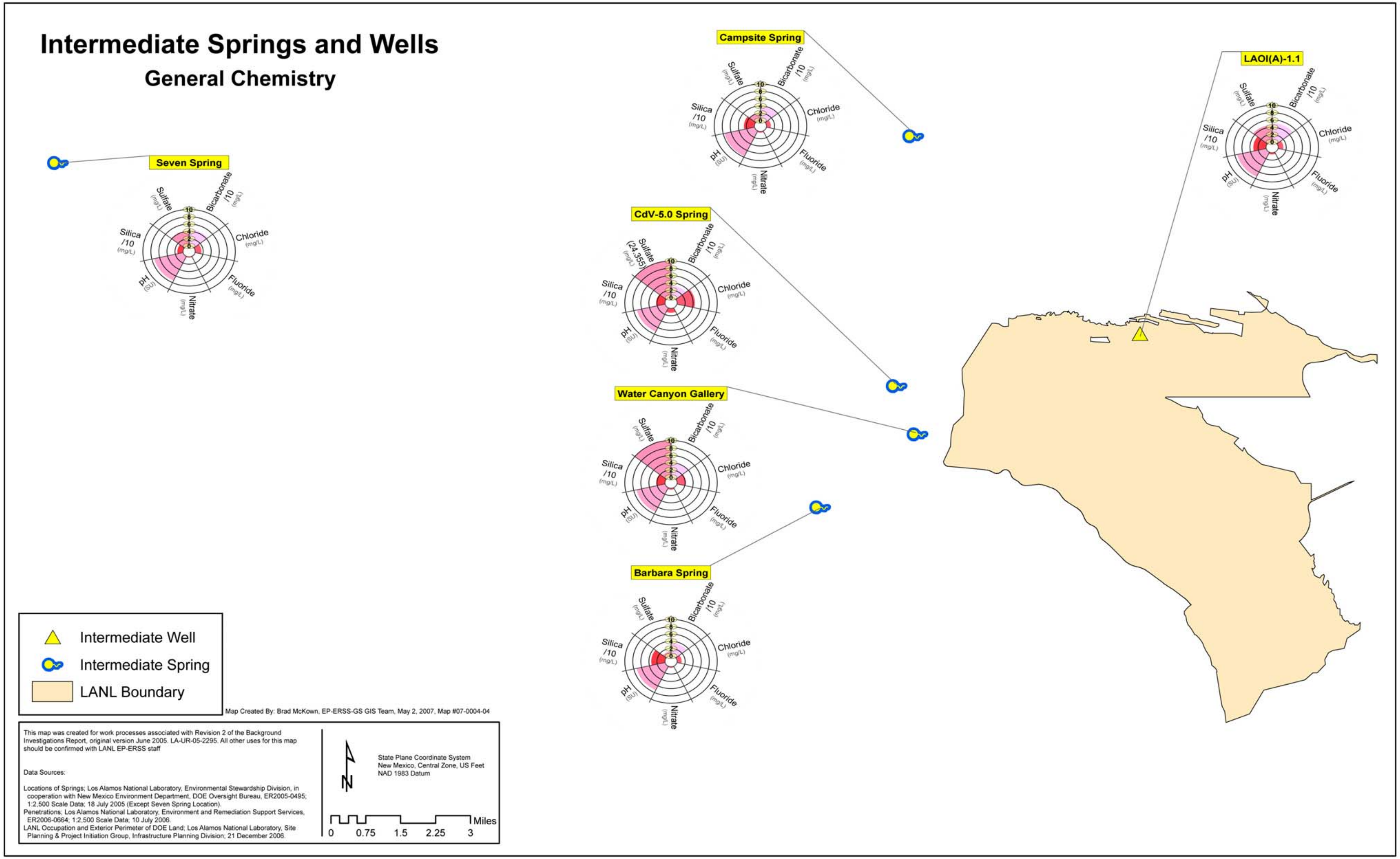


Figure 2.2-1c. **Average concentrations for major ions for intermediate background locations (Note: All values nonfiltered except where noted with an 'F' for filtered. Exact values are given for off-scale concentrations. Some constituent values are divided by 10 as noted to fit the target scale.)** Note: R-18 was removed from the statistical data set during finalization of this report revision but is included in the data set used to make this figure.

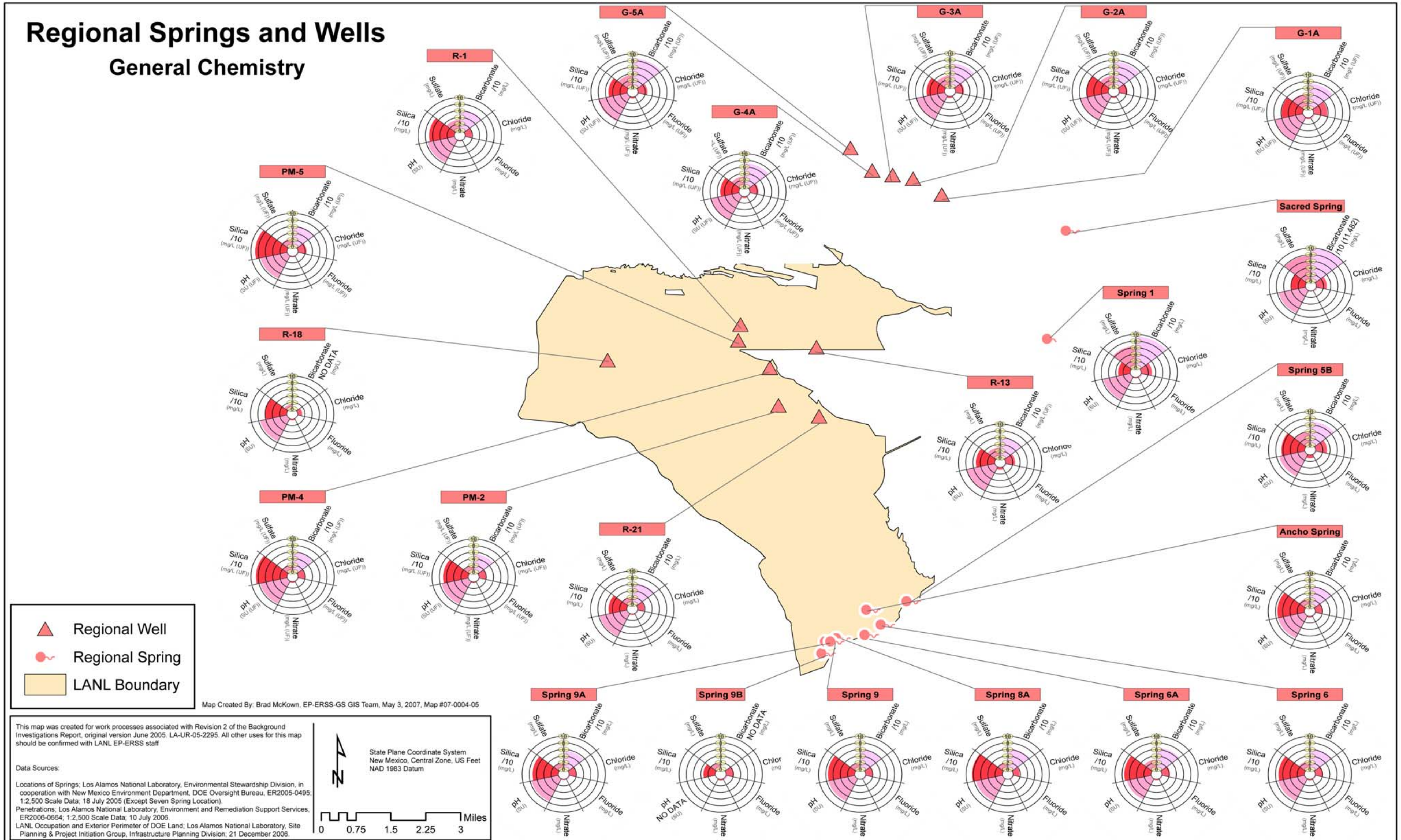
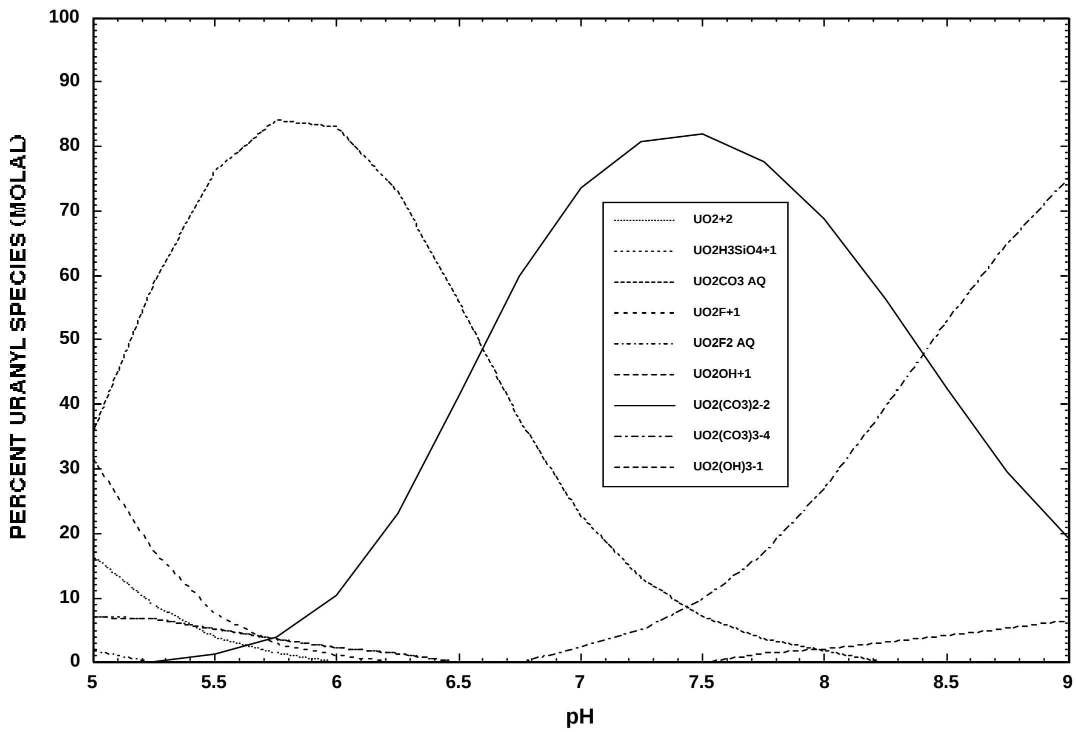


Figure 2.2-1d. **Average concentration for selected metals for regional background locations** (Note: All values represent nonfiltered averages, except where noted with an 'F' for filtered. Exact values are given for off-scale concentrations.) Note: R-18 was removed from the statistical data set during finalization of this report revision but is included in the data set used to make this figure.



Note: Log U(VI) = -9.26 molal (m), log F = -4.69 m, log H_4SiO_4 = -2.92 m, and log CO_3^{2-} = -3.07 m at 20.5°C. See Appendix F for source data.

Figure 2.2-3 Results of uranium(VI) speciation calculations for Spring 9B, White Rock Canyon using the computer program MINTEQA2

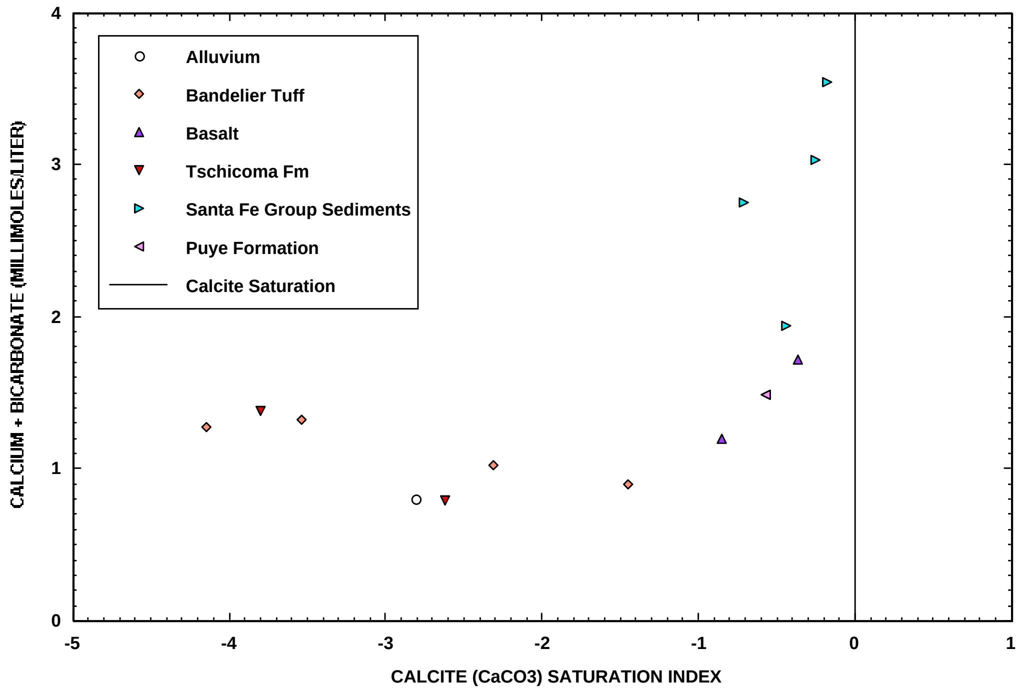


Figure 2.2-4 Saturation indices for calcite versus calcium and bicarbonate concentrations in selected Laboratory springs and wells

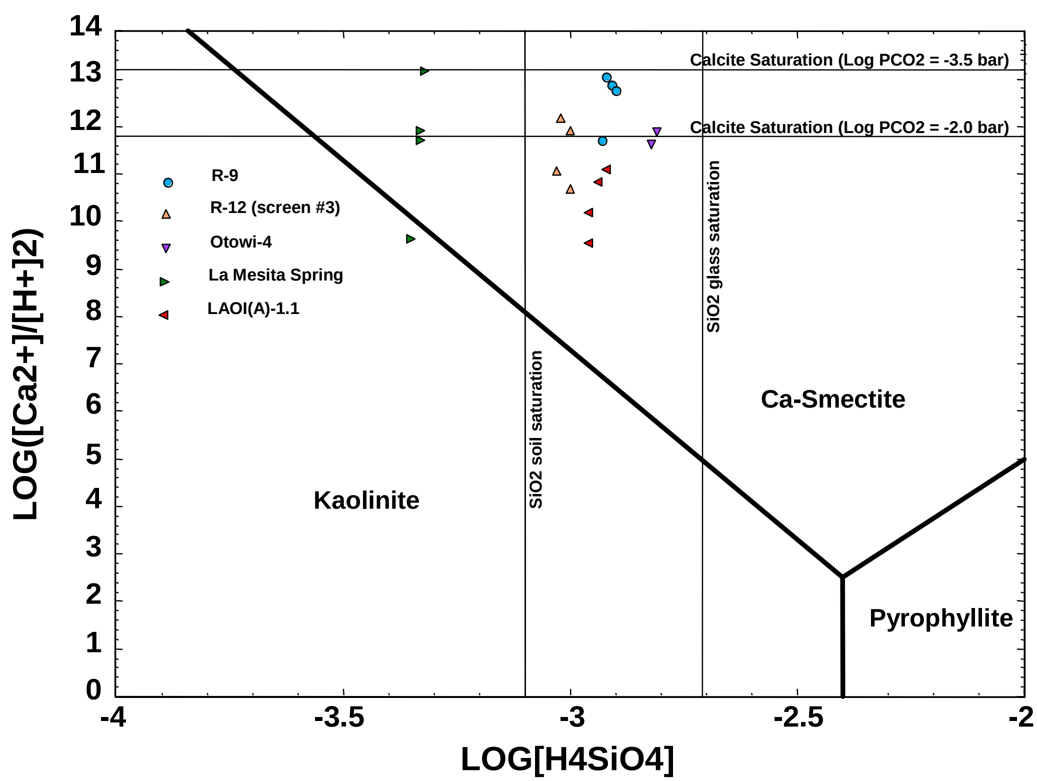


Figure 2.2-5 Activity diagram of log[H_4SiO_4] versus log activity (Ca^2+/[H+]^2) at 25°C for wells Otowi-4, R-9, R-12 (screen #3), LAOI-1.1(a), and La Mesita Spring

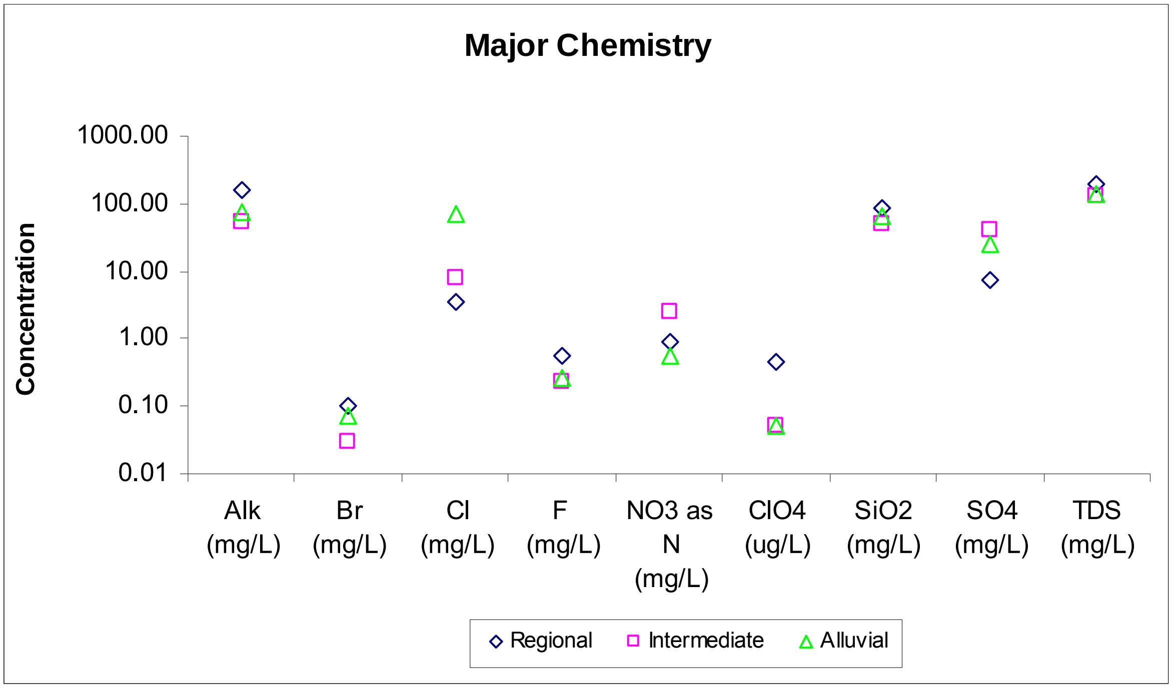


Figure 4.3-1a Screening values for selected major chemical constituents for regional, perched intermediate, and alluvial groundwaters

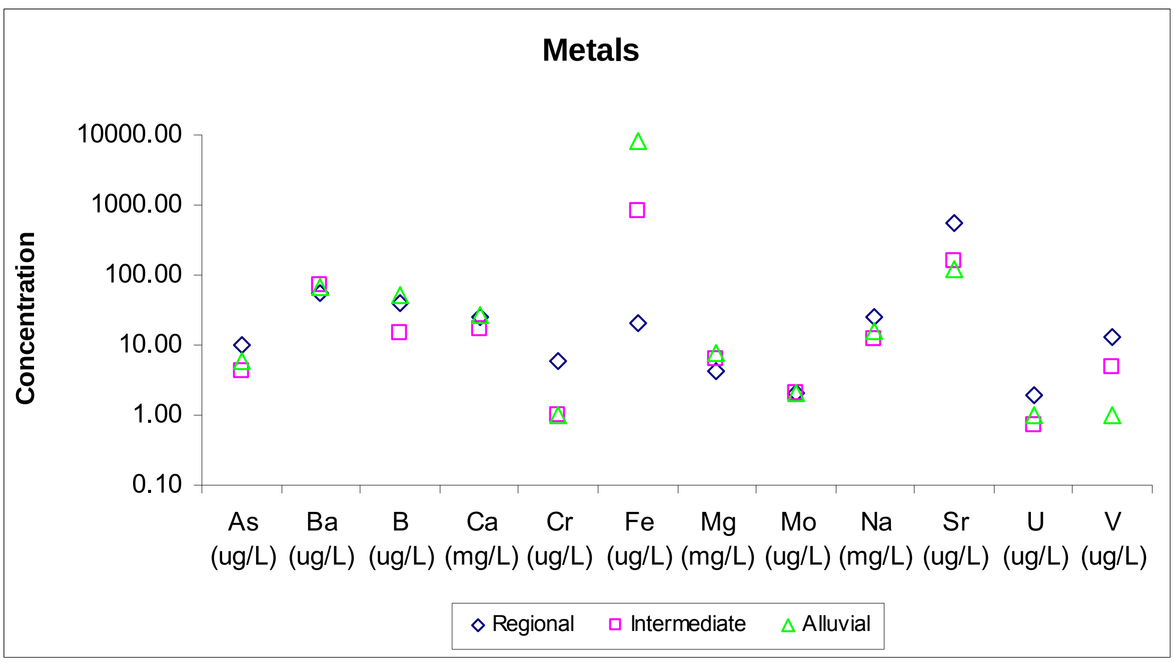


Figure 4.3-1b Screening values for selected metals for regional, perched intermediate, and alluvial groundwaters

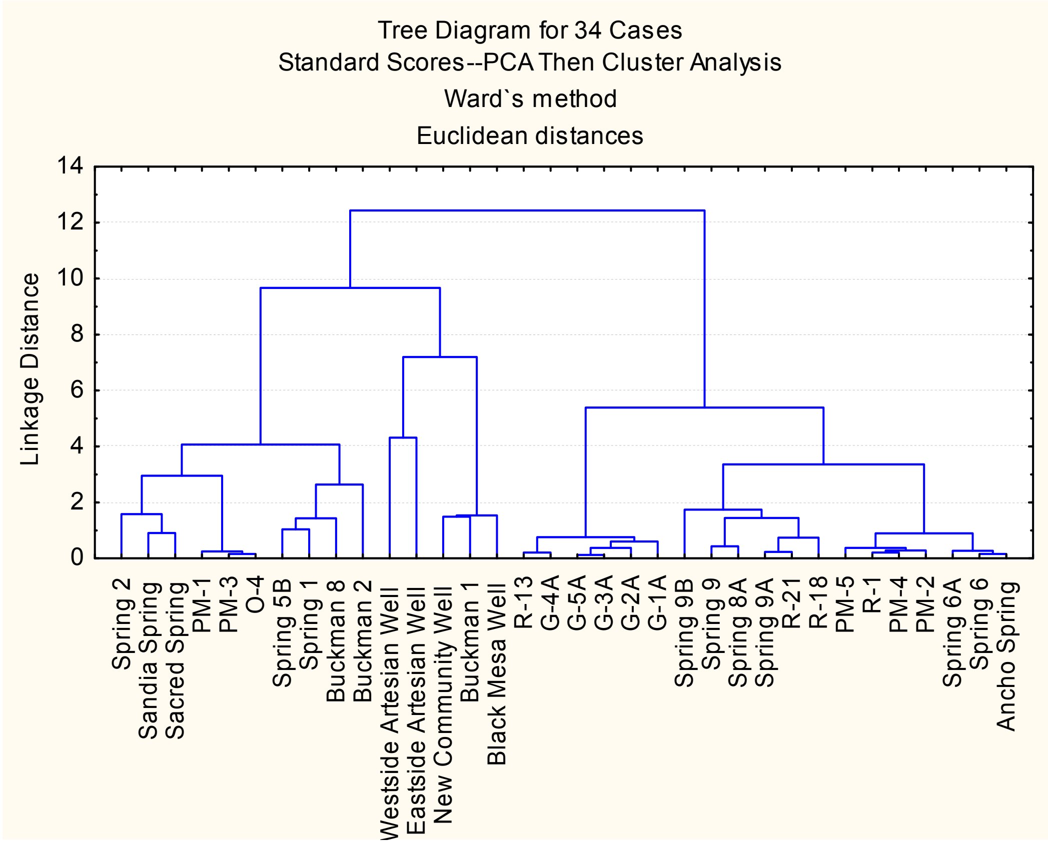


Figure 4.5-1 Groundwater groupings determined by PCA and CA

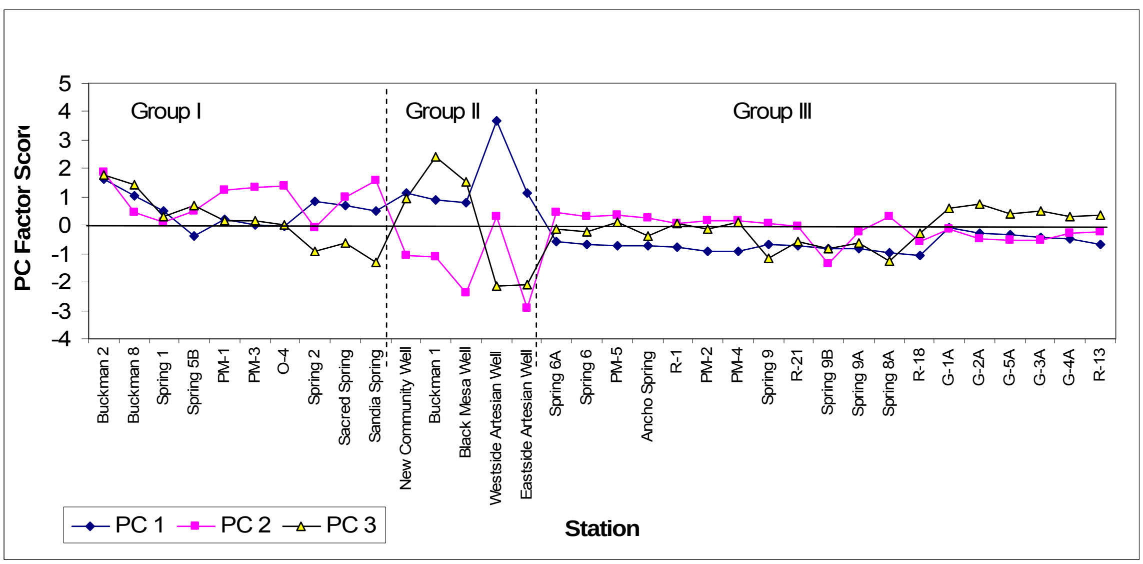


Figure 4.5-2 Principal component factor scores of groundwaters from locations on and near the Pajarito Plateau

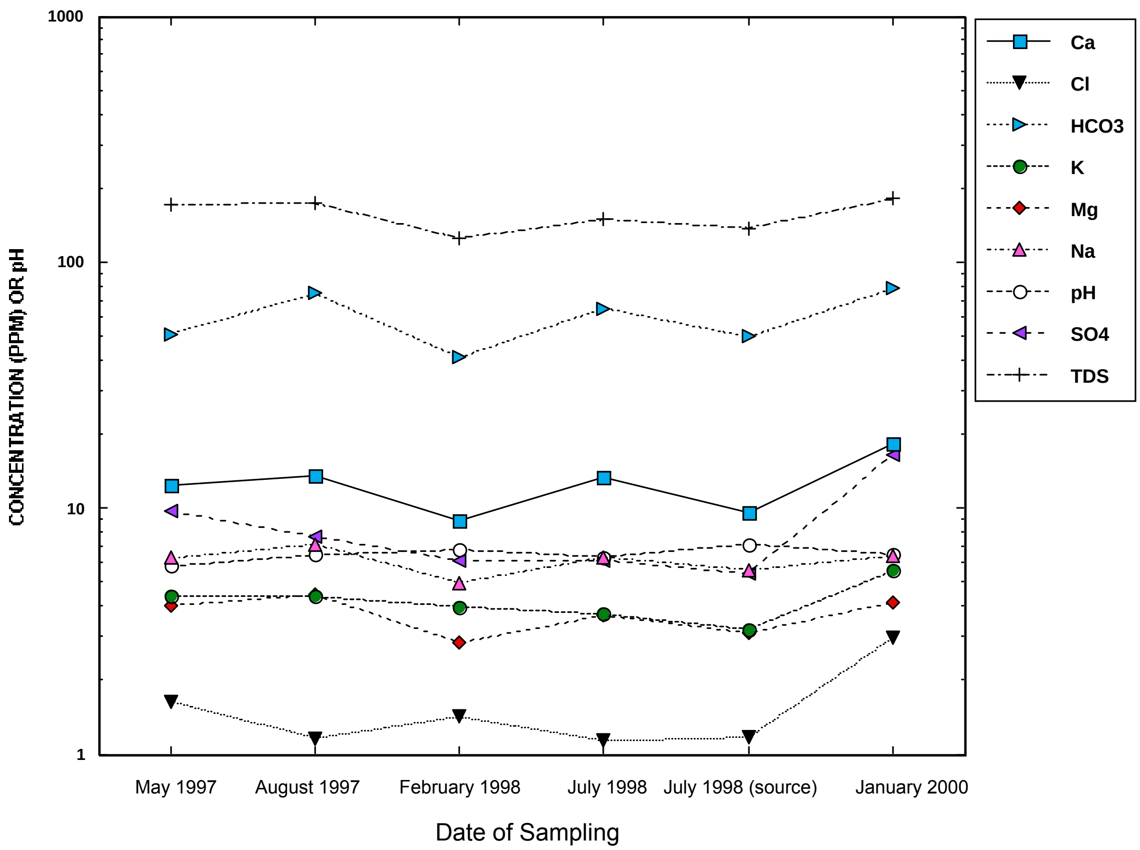


Figure 4.6-1 Concentrations of total dissolved solids and major ions at Pine Spring, Garcia Canyon (alluvium, Puye Formation, and lavas of the Polvadera Group)

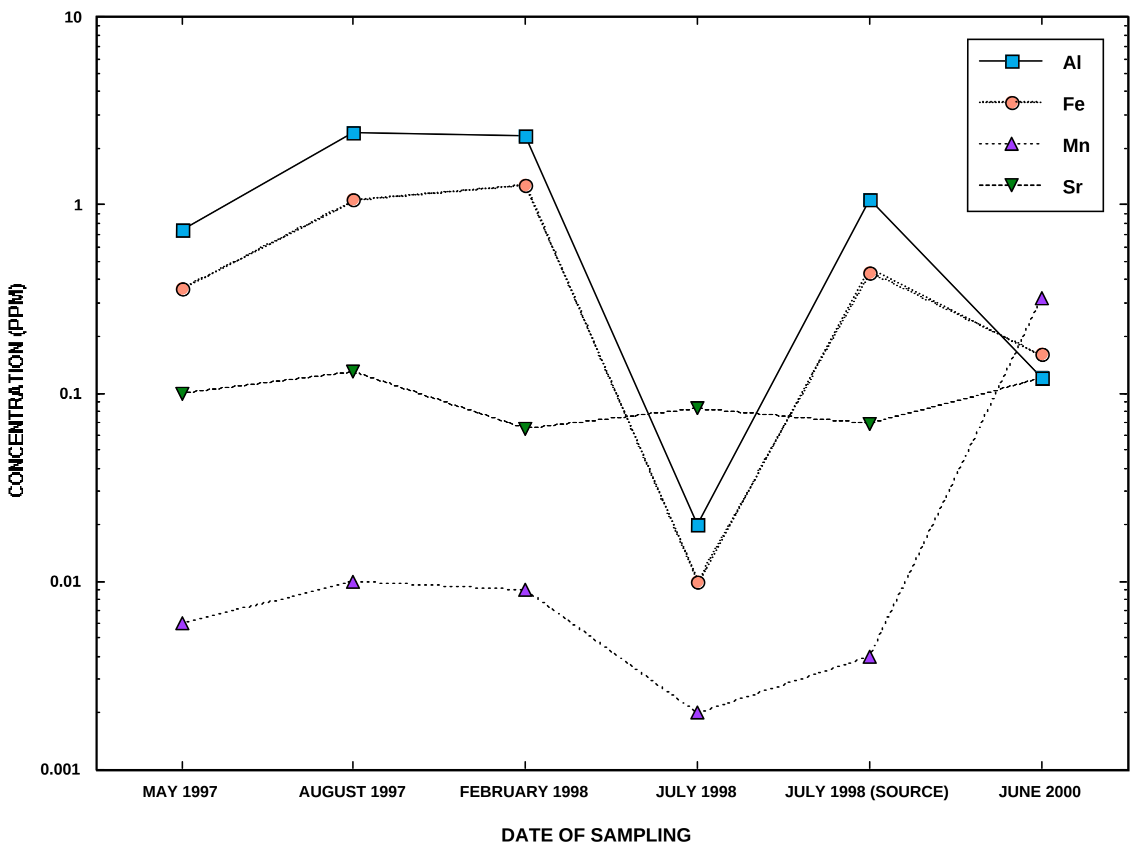


Figure 4.6-2 Concentrations of dissolved aluminum, iron, manganese, and strontium at Pine Spring, Garcia Canyon (Puye Formation and lavas of the Polvadera Group)

Table 2.1-1
Summary of Important Lithologic Units in the Pajarito Plateau Region, New Mexico

Unit	Age	Thickness (m)	Major Lithologic Types
Galisteo Formation	Eocene	200	Indurated sandstone, siltstone, mudstone, conglomerate
Santa Fe Group	Middle to Late Miocene	>2000	Nonindurated mudstone, siltstone, sandstone, gravel, conglomerate
Mafic flows in Santa Fe Group	Miocene	3 to 10	Lava flows, minor scoria, and pillow-palagonite tuff; basalt to basanite
Keres Group	Miocene	≤ 150 per unit	Flows, domes, tuffs, and volcaniclastic sediments; basalt to rhyolite
Volcaniclastic deposits, Keres Group	Miocene	≤ 450	Lahars, block and ash flows, and debris flows (Cochiti Formation)
Polvadera Group	Miocene to Pliocene	≥ 200 per unit	Flows, domes, tuffs and volcaniclastic sediments; basalt to rhyolite
Tschicoma Formation, Polvadera Group	Miocene to Pliocene	≥ 200 per unit	Mostly flows, domes, and minor tuffs; dacite to rhyodacite
Puye Formation, Polvadera Group	Late Miocene to Pliocene	≤ 660	Volcanic gravel, debris flows, sandstone, siltstone, interbedded tephra
Totavi Lentil, Puye Formation	Pliocene	≤ 100	Pebble-to-cobble gravel rich in Precambrian lithologies
Cerros del Rio volcanic field	Pliocene	≤ 70 per unit	Flows, plugs, scoria, pillows, hydromagmatic deposits; basalt to dacite
Lower Bandelier Tuff, Tewa Group	Quaternary	≤ 75	Ash-flow tuff (ignimbrite); minor surge and fall deposits; high-silica rhyolite
Cerro Toledo interval	Quaternary	≤ 30	Fall deposits (rhyolite) interbedded with volcanic sand and gravel
Upper Bandelier Tuff, Tewa Group	Quaternary	≤ 260	Ash-flow tuff (ignimbrite); minor surge and fall deposits; high-silica rhyolite
El Cajete Pumice, Valles Rhyolite, Tewa Group	Late Quaternary	≤ 10	Fall deposits of rhyolitic pumice
Other post-Bandelier deposits	Mostly Late Quaternary	≤ 50	Alluvium, colluvium, fanglomerate, landslides, and terrace deposits

Source: Goff et al. 2002, 049682.

Table 3.1-1
Conditions Used to Query Data from the Water Quality Database and the Environmental Remediation Database

Water Quality Database Conditions	
Condition	Reason
Lab Sample Type Code = 'CS'	Eliminate analytical laboratory duplicates or blanks
Lab Code NOT IN 'CST'	Eliminate results from contract laboratory CST
Start Date > '1-1-2000'	Eliminate older results
Lab Qual Code NOT IN 'R', 'X'	Eliminate results rejected by either laboratory or secondary validation
Lab Code LIKE 'UMTL' for 'H3'	Limit tritium results to lower detection limit method
Well Class NOT IN 'Borehole'	Eliminate borehole samples
Anyl Meth Code NOT IN 'EPA:901.1' for 'Cs-137'	Limit Cesium-137 results to lower detection limit method
Anyl Meth Code IN 'SW-846:8321A(M)' or 'SW846 6850 Modified' for 'ClO4'	Limits perchlorate results to lower detection limit method
Field QC Type Code IS 'NULL'	Eliminate field duplicates or blanks
Environmental Remediation Database Conditions	
Condition	Reason
Location in Pine Spring or Spring 9B	Limits locations to Pine Spring and Spring 9B
Analyte Description listed in Table 3.1-1b	Limits data to analytes pulled from WQDB
Start Date listed	Eliminates data without a start date
FLD_QC_TYPE_CODE either 'NULL' or 'NA'	Eliminates field duplicates or blanks

CS = Customer Sample
CST = Chemical Science and Technology Group, LANL
Lab Qual Code = Laboratory Qualifier Code
UMTL = University of Miami Tritium Laboratory
Anyl Meth Code = Analytical Method Code
Field QC = Field Quality Control
FLd QC TYPE CODE = Field Quality Control Type Code

Table 3.1-2
Sample Location Information

Station Name	Easting	Northing	Source	Elevation (m)	Location Notes
Alluvial					
LAO-B Well	1615149	1775170	FIMAD	2233	Volcanic-rich alluvium
Pine Spring	1630151	1803290	Blake	2234	Puye Fm., lavas of Keres Group, and alluvium
Perched Intermediate					
Barbara Spring	1593101	1754219	GIS	2357	Tschicoma Fm.
Campsite Springs	1603674	1796417	GIS	2622	Tschicoma Fm.
Cañon de Valle-5.0 Spring	1601806	1767986	GIS	2569	Bandelier Tuff/Tschicoma Fm.
LAOI-1.1(a) Well	1629427	1773925	FIMAD	2084	Bandelier Tuff
Seven Springs	1505978	1798869	Blake	2482	Bandelier Tuff
Water Canyon Gallery	1604088	1762656	GPS	2439	Upper Bandelier Tuff
Regional Aquifer					
Ancho Spring	1647208	1737200	GIS	1737	Totavi Lentil
G-1A Water Supply Well	1655241	1784353	GIS	1833	Tesuque Fm., Santa Fe Group
G-2A Water Supply Well	1651974	1786166	GIS	1869	Tesuque Fm., Santa Fe Group
G-3A Water Supply Well	1649662	1786585	GIS	1893	Tesuque Fm., Santa Fe Group
G-4A Water Supply Well	1647318	1787113	GIS	1920	Tesuque Fm., Santa Fe Group
G-5A Water Supply Well	1644877	1789636	GIS	1955	Tesuque Fm., Santa Fe Group
PM-2 Water Supply Well	1636698	1760406	GIS	2047	Totavi Lentil, Puye Fm., older Santa Fe Group with Miocene basalts
PM-4 Water Supply Well	1635717	1764674	GIS	2109	Totavi Lentil, Puye Fm., older Santa Fe Group with Miocene basalts
PM-5 Water Supply Well	1632110	1767790	GIS	2163	Older Santa Fe Group
R-1 Well	1632355	1769599	GIS	2097	Lower Puye Fanglomerate
R-13 Well	1640988	1766988	GIS	2034	Puye Formation/pumiceous unit
R-21 Well	1641286	1759143	GIS	2029	Puye Formation/pumiceous unit, Cerros del Rio basalt
Sacred Spring	1641286	1759143	GIS	2029	Totavi Lentil
Spring 1	1667883	1768364	GPS	1702	Landslide blocks in Cerros del Rio basalt, Santa Fe Group sediments
Spring 5B	1651803	1738173	GIS	1644	Tesuque Fm., coarse grained
Spring 6	1648882	1735517	GIS	1640	Tesuque Fm., coarse grained
Spring 6A	1647047	1734368	GIS	1637	Tesuque Fm., coarse grained
Spring 8A	1643802	1734005	GIS	1668	Tesuque Fm., coarse grained
Spring 9	1643135	1733631	GIS	1669	Tesuque Fm., coarse grained
Spring 9A	1642543	1733606	GIS	1695	Tesuque Fm., coarse grained
Spring 9B	1641613	1732525	GPS	1674	Cerros del Rio basalt and hydromagmatic deposits

Table 3.2-2
Chemical Constituents Included in Data Presented

Field Parameters
pH, Specific Conductance, temperature, turbidity
Major Chemistry
Alkalinity (HCO3 + CO3), Ammonia as N, Bicarbonate, Bromide, Carbonate, Chloride, Fluoride, Nitrate as N, Nitrate + Nitrite as N, Nitrite as N, Perchlorate, Silicon Dioxide, Sulfate, Total Dissolved Solids, Total Kjeldahl Nitrogen, Total Organic Carbon, Total Phosphate as P, and Total Suspended Solids
Metals
Aluminium, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc
Radionuclides
Americium-241, Cesium-137, Gross Alpha Radiation, Gross Beta Radiation, Gross Gamma Radiation, Plutonium-238, Strontium-90, Tritium, Uranium-234, Uranium-238

Table 4.1-1
Analytical Methods Used by Contract Laboratories

Analytical Method	Analyte Suite	Analytical Laboratory
ICPES (USEPA 6010B, USEPA 6020) and CVAA (USEPA 7470)	Trace metals	GEL
ICPES (USEPA 6010B, USEPA 6020) and CVAA (USEPA 7470)	Trace Metals	NMSSL
Ion chromatography (USEPA 300.0)	Anions	GEL
Titrimetric (USEPA 310.1)	Bicarbonate	GEL
ICPES (SW846:6010B)	Dissolved silica	GEL
ICPMS (SW846:6020)	Total uranium	GEL
Oxidation/Combustion (SW-415.1)	Total organic carbon	GEL
Proportional Counting (EPA:900 and 901.1)	Gross alpha, beta, gamma	GEL
Gamma Spectrometry (EPA:901.1)	^{137}Cs	GEL
Alpha spectrometry (HASL-300:ISOU and HASL-300:ISOPU)	^{241}Am, ^{238}Pu, ^{234}U, ^{235}U, ^{238}U	GEL
Electrolytic enrichment/Direct counting	Tritium (low-level)	UMTL
Gamma proportional counting (EPA:905.0)	^{90}Sr	GEL
Gamma proportional counting (EPA:905.0)	^{90}Sr	Paragon Laboratories, Inc.
LC-TS/MS (EPA 6850 Modified)	Perchlorate	GEL

GEL = General Engineering Laboratories
ICPAES = Inductively coupled plasma atomic (optical) emission spectroscopy
LC/TS-MS = Liquid chromatography, thermospray, mass TS mass spectroscopy
ICPES = Inductively coupled emission spectroscopy
CVAA = Cold vapor atomic absorption
ICPMS = Inductively coupled plasma mass spectroscopy
LSC = Liquid scintillation counting
NMSSL = New Mexico Soil Science Laboratory
UMTL = University of Miami Tritium Laboratory

Table 4.2-1
Statistical Data for Alluvial Groundwater

Group	Constituent	Units	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
Field	pH	SU	UF	3	0	0	7.23	7.30	7.48	7.20										
Field	Conductance	uS/cm	UF	3	0	0	179.60	180.30	184.20	177.10										
General	Alkalinity	mg/L	F	5	0	0	50.70	54.88	76.00	38.60										
General	Alkalinity	mg/L	UF	1	0	0	76.00	76.00	76.00	76.00										
General	Ammonia*	mg/L	F	4	4	100	0.25	0.20	0.25	0.03										
General	Ammonia*	mg/L	UF	1	1	100	0.06	0.06	0.06	0.06										
General	Bicarbonate	mg/L	F	1	0	0	38.60	38.60	38.60	38.60										
General	Bicarbonate	mg/L	UF	2	0	0	35.50	35.50	36.00	35.00										
General	Bromide	mg/L	F	8	7	88	0.02	0.03	0.10	0.01										
General	Bromide	mg/L	UF	2	2	100	0.04	0.04	0.05	0.03										
General	Carbonate	mg/L	F	3	3	100	0.50	0.50	0.50	0.50										
General	Chloride	mg/L	F	8	0	0	11.03	9.25	16.20	1.50	6.93	1.51	1.52	1.68	15.19	16.09	16.14	5.99	-0.21	69.76
General	Chloride	mg/L	UF	2	0	0	4.71	4.71	7.42	2.00										
General	Fluoride	mg/L	F	8	2	25	0.10	0.10	0.17	0.02	0.05	0.03	0.04	0.07	0.14	0.16	0.16	0.08	-0.29	0.27
General	Fluoride	mg/L	UF	2	1	50	0.08	0.08	0.14	0.03										
General	Nitrate*	mg/L	F	4	1	25	0.28	0.31	0.57	0.10										
General	Nitrate*	mg/L	UF	1	0	0	0.10	0.10	0.10	0.10										
General	Nitrate+Nitrite*	mg/L	F	5	0	0	0.10	0.17	0.45	0.08										
General	Nitrate+Nitrite*	mg/L	UF	1	1	100	0.05	0.05	0.05	0.05										
General	Nitrite*	mg/L	F	4	4	100	0.00	0.01	0.05	0.00										
General	Nitrite*	mg/L	UF	1	1	100	0.05	0.05	0.05	0.05										
General	Perchlorate	ug/L	F	4	1	25	5.65	6.38	14.20	0.03										
General	Silicon Dioxide	mg/L	F	8	0	0	24.00	25.20	44.00	12.90	11.06	13.15	13.39	16.00	32.13	37.84	40.92	23.10	0.54	64.21
General	Silicon Dioxide	mg/L	UF	3	0	0	45.60	42.30	45.90	35.40										
General	Sulfate	mg/L	F	8	0	0	8.05	9.91	15.80	5.55	4.40	5.78	6.01	6.29	14.43	15.31	15.56	9.09	0.48	24.83

Table 4.2-1 (continued)

Group	Constituent	Units	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
General	Sulfate	mg/L	UF	2	0	0	5.99	5.99	6.40	5.58										
General	TDS	mg/L	F	2	0	0	127.00	127.00	139.00	115.00										
General	TDS	mg/L	UF	3	0	0	190.00	183.33	220.00	140.00										
General	TKN	mg/L	F	5	2	40	0.14	0.19	0.46	0.05										
General	TKN	mg/L	UF	1	1	100	0.03	0.03	0.03	0.03										
General	TOC	mg/L	F	1	0	0	4.99	4.99	4.99	4.99										
General	TOC	mg/L	UF	1	0	0	2.28	2.28	2.28	2.28										
General	TP	mg/L	F	5	2	40	0.02	0.03	0.04	0.02										
General	TP	mg/L	UF	2	2	100	0.06	0.06	0.10	0.02										
General	TSS	mg/L	UF	1	1	100	0.95	0.95	0.95	0.95										
Metals	Aluminum	ug/L	F	9	2	22	100.00	1492.48	8700.00	2.30	2916.64	7.78	13.26	22.00	870.00	4460.00	6580.00	139.80	2.36	15670.00
Metals	Aluminum	ug/L	UF	6	2	33	2099.50	4649.49	14900.00	3.95										
Metals	Antimony	ug/L	F	12	12	100	0.50	1.46	10.00	0.25										
Metals	Antimony	ug/L	UF	3	3	100	0.25	0.58	1.25	0.25										
Metals	Arsenic	ug/L	F	9	7	78	1.15	1.72	5.00	0.10										
Metals	Arsenic	ug/L	UF	6	5	83	1.98	2.06	3.00	1.20										
Metals	Barium	ug/L	F	9	4	44	33.80	30.99	50.00	13.00	12.40	13.60	14.20	21.00	38.60	42.00	46.00	28.37	-0.26	68.57
Metals	Barium	ug/L	UF	6	2	33	36.40	40.91	69.00	22.60										
Metals	Beryllium	ug/L	F	12	11	92	0.48	0.49	2.50	0.01										
Metals	Beryllium	ug/L	UF	6	4	67	0.30	0.49	1.20	0.05										
Metals	Boron	ug/L	F	9	4	44	14.60	17.61	50.00	7.50	13.07	7.90	8.30	8.50	17.40	27.60	38.80	14.77	2.26	51.89
Metals	Boron	ug/L	UF	4	0	0	12.30	12.00	13.60	9.80										
Metals	Cadmium	ug/L	F	12	12	100	0.09	0.38	2.50	0.05										
Metals	Cadmium	ug/L	UF	6	5	83	0.13	0.17	0.45	0.05										
Metals	Calcium	mg/L	F	10	0	0	14.70	13.23	18.20	6.80	4.51	7.03	7.25	8.90	17.10	17.66	17.93	12.43	-0.44	26.36
Metals	Calcium	mg/L	UF	6	0	0	12.50	12.58	17.30	8.27										
Metals	Chromium	ug/L	F	9	9	100	0.50	1.27	5.00	0.19										

Table 4.2-1 (continued)

Group	Constituent	Units	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
Metals	Chromium	ug/L	UF	6	3	50	0.98	1.61	4.80	0.15										
Metals	Cobalt	ug/L	F	9	9	100	0.50	0.97	5.00	0.26										
Metals	Cobalt	ug/L	UF	6	4	67	0.50	0.70	1.70	0.25										
Metals	Copper	ug/L	F	9	8	89	1.30	1.43	5.00	0.39										
Metals	Copper	ug/L	UF	6	4	67	1.50	1.42	2.40	0.41										
Metals	Iron	ug/L	F	9	4	44	50.00	822.89	4600.00	5.00	1571.28	5.00	5.00	10.00	510.00	2600.00	3600.00	76.57	2.19	8240.00
Metals	Iron	ug/L	UF	6	2	33	829.00	2038.98	6660.00	4.40										
Metals	Lead	ug/L	F	12	11	92	0.25	0.56	1.88	0.01										
Metals	Lead	ug/L	UF	6	6	100	0.55	0.50	0.70	0.25										
Metals	Lithium	ug/L	F	4	1	25	4.30	4.30	5.00	3.60										
Metals	Magnesium	mg/L	F	10	0	0	3.88	3.95	5.50	2.20	1.18	2.38	2.56	3.00	5.01	5.25	5.37	3.77	-0.09	7.78
Metals	Magnesium	mg/L	UF	6	2	33	3.45	3.49	4.98	1.99										
Metals	Manganese	mg/L	F	9	7	78	1.00	4.53	21.00	0.50										
Metals	Manganese	mg/L	UF	6	1	17	6.50	9.65	27.10	1.00										
Metals	Mercury	ug/L	F	9	9	100	0.03	0.03	0.10	0.01										
Metals	Mercury	ug/L	UF	6	4	67	0.02	0.02	0.03	0.01										
Metals	Molybdenum	ug/L	F	6	5	83	0.64	1.38	5.00	0.50										
Metals	Molybdenum	ug/L	UF	4	3	75	1.23	1.16	1.45	0.75										
Metals	Nickel	ug/L	F	9	9	100	0.50	1.88	10.00	0.38										
Metals	Nickel	ug/L	UF	6	4	67	1.20	2.44	6.20	0.35										
Metals	Potassium	mg/L	F	10	0	0	3.10	3.24	4.00	2.33	0.65	2.41	2.48	2.75	3.93	4.00	4.00	3.18	0.04	5.21
Metals	Potassium	mg/L	UF	6	0	0	3.74	3.65	3.98	3.15										
Metals	Selenium	ug/L	F	9	9	100	1.75	1.53	3.00	0.50										
Metals	Selenium	ug/L	UF	6	6	100	1.50	1.71	3.00	1.25										
Metals	Silver	ug/L	F	9	9	100	0.50	0.91	5.00	0.10										
Metals	Sodium	mg/L	F	10	0	0	7.71	7.63	11.60	4.30	2.72	4.35	4.39	5.03	9.13	11.33	11.47	7.16	0.10	15.54
Metals	Sodium	mg/L	UF	6	0	0	5.92	7.06	11.80	4.70										

Table 4.2-1 (continued)

Group	Constituent	Units	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
Metals	Strontium	ug/L	F	6	0	0	106.50	107.00	120.00	98.00										
Metals	Strontium	ug/L	UF	4	0	0	84.25	85.45	111.00	62.30										
Metals	Thallium	ug/L	F	12	12	100	0.50	1.02	5.00	0.01										
Metals	Thallium	ug/L	UF	6	6	100	1.90	1.98	4.95	0.20										
Metals	Tin	ug/L	F	6	6	100	0.88	1.84	5.00	0.50										
Metals	Tin	ug/L	UF	4	4	100	4.68	4.41	7.05	1.25										
Metals	Titanium	ug/L	F	3	2	67	0.50	0.67	1.00	0.50										
Metals	Titanium	ug/L	UF	2	0	0	186.50	186.50	230.00	143.00										
Metals	Uranium	ug/L	F	10	4	40	0.10	0.23	0.96	0.03	0.27	0.05	0.07	0.09	0.26	0.38	0.67	0.15	2.50	1.03
Metals	Uranium	ug/L	UF	3	0	0	0.25	0.25	0.41	0.08										
Metals	Vanadium	ug/L	F	9	7	78	1.00	1.88	5.00	0.50										
Metals	Vanadium	ug/L	UF	6	3	50	1.93	4.14	12.00	0.50										
Metals	Zinc	ug/L	F	9	6	67	2.75	4.61	10.00	0.95										
Metals	Zinc	ug/L	UF	6	3	50	2.75	5.70	15.30	0.90										
RAD	Americium-241	pCi/L	F	2	2	100	0.00	0.00	0.01	0.00										
RAD	Americium-241	pCi/L	UF	9	7	78	0.01	0.59	4.50	0.00										
RAD	Cesium-137	pCi/L	F	2	2	100	0.23	0.23	0.34	0.12										
RAD	Cesium-137	pCi/L	UF	5	5	100	0.09	0.09	0.26	0.00										
RAD	Gross Alpha	pCi/L	F	2	2	100	0.26	0.26	0.39	0.12										
RAD	Gross Alpha	pCi/L	UF	5	5	100	0.61	0.53	0.90	0.10										
RAD	Gross Beta	pCi/L	F	3	0	0	4.71	4.59	4.80	4.27										
RAD	Gross Beta	pCi/L	UF	3	0	0	3.80	4.36	5.50	3.78										
RAD	Gross Gamma	pCi/L	F	2	2	100	601.40	601.40	1170.00	32.80										
RAD	Gross Gamma	pCi/L	UF	3	1	33	161.00	143.00	220.00	48.00										
RAD	Plutonium-238	pCi/L	F	1	1	100	0.00	0.00	0.00	0.00										
RAD	Plutonium-238	pCi/L	UF	5	5	100	0.00	0.00	0.00	0.00										
RAD	Strontium-90	pCi/L	F	2	2	100	0.03	0.03	0.04	0.02										

Table 4.2-1 (continued)

Group	Constituent	Units	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
RAD	Strontium-90	pCi/L	UF	5	5	100	0.00	0.02	0.06	0.00										
RAD	Tritium	pCi/L	UF	3	0	0	30.97	31.32	57.28	5.70										
RAD	Uranium-234	pCi/L	F	2	2	100	0.02	0.02	0.03	0.02										
RAD	Uranium-234	pCi/L	UF	5	3	60	0.03	0.05	0.16	0.01										
RAD	Uranium-238	pCi/L	F	2	2	100	0.02	0.02	0.03	0.01										
RAD	Uranium-238	pCi/L	UF	5	2	40	0.04	0.06	0.12	0.01										

Note: An upper Threshold Tolerance was not calculated for nonfiltered samples. Statistics were not calculated for constituents with fewer than 8 samples or greater than 50% nondetects.

* reported as Nitrogen
μg/L = micrograms per liter
mg/L = milligrams per liter
SU = standard units
uS/cm = microsiemens per centimeter
pCi/L = picocuries per liter
F = filtered
UF= nonfiltered
n = number of analyses
ND = number of nondetects
% ND = percent nondetects
max = maximum
min = minimum
std dev = standard deviation
geomean = geometric mean
UTL = upper tolerance threshold

TDS = total dissolved solids
TKN = total Kjeldahl Nitrogen
TOC = total organic carbon
TP = total phosphate as phosphorus
TSS = total suspended solids

Table 4.2-2
Statistical Data for Intermediate Groundwater

Group	Constituent	unit	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
Field	pH§	SU	UF	29	0	0	7.39	7.62	10.14	6.73	0.76	6.83	6.97	7.18	7.85	8.43	9.18	7.59	1.84	6.10 / 8.80
Field	Conductance	uS/cm	UF	27	0	0	107.80	137.85	908.00	12.82	159.83	45.04	73.14	82.40	127.00	174.76	212.12	105.28	4.61	276.03
General	Alkalinity	mg/L	F	22	0	0	38.45	38.58	51.20	25.70	5.55	33.80	33.88	34.83	34.75	38.72	40.04	38.19	0.15	52.00
General	Alkalinity	mg/L	UF	5	0	0	44.60	56.96	89.70	39.70										
General	Ammonia*	mg/L	F	1	0	0	0.07	0.07	0.07	0.07										
General	Ammonia*	mg/L	UF	1	0	0	0.06	0.06	0.06	0.06										
General	Bicarbonate	mg/L	F	1	0	0	43.20	43.20	43.20	43.20										
General	Bicarbonate	mg/L	UF	4	0	0	55.70	58.43	79.60	42.70										
General	Bromide	mg/L	F	21	2	10	0.02	0.02	0.03	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.02	0.22	0.03
General	Bromide	mg/L	UF	2	2	100	0.03	0.03	0.03	0.02										
General	Carbonate	mg/L	F	20	20	100	0.50	0.50	0.50	0.50										
General	Chloride	mg/L	F	22	0	0	1.37	2.07	6.43	0.98	1.50	0.99	1.05	1.13	2.58	3.59	5.29	1.73	1.83	7.78
General	Chloride	mg/L	UF	5	0	0	1.22	1.07	1.37	0.62										
General	Fluoride	mg/L	F	22	0	0	0.12	0.11	0.20	0.04	0.05	0.04	0.05	0.06	0.14	0.17	0.20	0.10	0.21	0.23
General	Fluoride	mg/L	UF	5	0	0	0.15	0.16	0.24	0.12										
General	Nitrate*	mg/L	F	20	0	0	0.34	0.49	1.78	0.18	0.41	0.22	0.22	0.26	0.49	0.94	1.33	0.39	2.22	2.41
General	Nitrate+Nitrite*	mg/L	F	3	0	0	0.29	0.30	0.33	0.29										
General	Nitrate+Nitrite*	mg/L	UF	4	0	0	0.19	0.22	0.43	0.07										
General	Nitrite*	mg/L	F	20	20	100	0.00	0.00	0.00	0.00										
General	Perchlorate	ug/L	F	1	0	0	0.18	0.18	0.18	0.18										
General	Perchlorate	ug/L	UF	2	0	0	0.16	0.16	0.17	0.15										
General	Silicon Dioxide	mg/L	F	22	0	0	24.35	25.66	65.70	13.60	11.76	13.63	14.21	18.03	33.10	34.87	35.95	23.64	1.92	50.72
General	Silicon Dioxide	mg/L	UF	3	0	0	70.40	71.20	73.90	69.30										
General	Sulfate	mg/L	F	22	0	0	4.08	8.30	34.80	1.07	9.82	1.14	1.16	1.74	13.05	18.23	30.29	4.50	1.65	40.03
General	Sulfate	mg/L	UF	5	0	0	3.24	2.53	3.72	1.09										

Table 4.2-2 (continued)

Group	Constituent	unit	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
General	TDS	mg/L	F	2	0	0	113.50	113.50	127.00	100.00										
General	TDS	mg/L	UF	5	0	0	138.00	127.40	160.00	97.00										
General	TKN	mg/L	F	2	0	0	0.17	0.17	0.20	0.15										
General	TKN	mg/L	UF	1	0	0	0.02	0.02	0.02	0.02										
General	TOC	mg/L	F	1	1	100	0.30	0.30	0.30	0.30										
General	TOC	mg/L	UF	1	0	0	0.45	0.45	0.45	0.45										
General	TP	mg/L	F	22	3	14	0.02	0.03	0.07	0.00	0.02	0.01	0.01	0.01	0.04	0.05	0.06	0.02	0.63	0.08
General	TP	mg/L	UF	1	1	100	0.06	0.06	0.06	0.06										
General	TSS	mg/L	UF	4	1	25	37.40	36.37	70.30	0.38										
Metals	Aluminium	ug/L	F	22	0	0	30.50	105.23	820.00	2.10	186.27	3.48	5.10	11.00	85.45	302.70	358.00	34.76	3.10	1065.84
Metals	Aluminium	ug/L	UF	3	0	0	1220.00	1210.00	1240.00	1170.00										
Metals	Antimony	ug/L	F	22	22	100	0.50	0.47	0.50	0.05										
Metals	Antimony	ug/L	UF	3	3	100	0.25	0.23	0.25	0.20										
Metals	Arsenic	ug/L	F	22	2	9	0.50	0.66	3.00	0.30	0.66	0.30	0.30	0.40	0.58	0.70	2.21	0.52	3.03	4.32
Metals	Arsenic	ug/L	UF	3	3	100	3.00	2.37	3.00	1.12										
Metals	Barium	ug/L	F	22	0	0	15.50	17.51	58.00	1.30	16.56	1.40	1.42	2.13	0.27	34.70	53.05	9.41	1.12	71.83
Metals	Barium	ug/L	UF	3	0	0	12.60	16.63	26.10	11.20										
Metals	Beryllium	ug/L	F	22	22	100	0.50	0.48	0.50	0.10										
Metals	Beryllium	ug/L	UF	3	2	67	0.20	0.27	0.50	0.12										
Metals	Boron	ug/L	F	22	0	0	8.25	8.98	18.00	5.60	2.87	6.00	6.03	7.58	10.33	12.00	12.86	8.62	1.62	15.12
Metals	Boron	ug/L	UF	3	1	33	10.70	10.47	15.70	5.00										
Metals	Cadmium	ug/L	F	22	22	100	0.50	0.46	0.50	0.03										
Metals	Cadmium	ug/L	UF	3	2	67	0.05	0.07	0.12	0.05										
Metals	Calcium	mg/L	F	22	0	0	7.56	8.37	16.50	4.39	3.68	4.60	4.66	5.01	11.18	11.95	15.42	7.65	0.73	17.31
Metals	Calcium	mg/L	UF	5	0	0	6.39	6.74	7.71	6.07										
Metals	Chromium	ug/L	F	22	17	77	0.50	0.86	2.40	0.50										

Table 4.2-2 (continued)

Group	Constituent	unit	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
Metals	Chromium	ug/L	UF	3	0	0	1.89	1.66	2.00	1.10										
Metals	Cobalt	ug/L	F	22	21	95	0.50	0.52	1.20	0.15										
Metals	Cobalt	ug/L	UF	3	3	100	0.50	0.42	0.50	0.27										
Metals	Copper	ug/L	F	22	7	32	1.37	1.77	3.80	0.50	1.15	0.50	0.50	1.00	2.70	3.50	3.69	1.41	0.66	5.32
Metals	Copper	ug/L	UF	3	2	67	1.50	2.24	3.71	1.50										
Metals	Iron	ug/L	F	22	10	45	20.00	83.83	480.00	5.00	140.69	5.00	5.00	5.00	50.00	284.10	413.45	23.50	2.01	839.99
Metals	Iron	ug/L	UF	3	0	0	467.00	451.33	471.00	416.00										
Metals	Lead	ug/L	F	22	19	86	0.10	0.12	0.30	0.04										
Metals	Lead	ug/L	UF	3	0	0	1.80	1.85	2.55	1.20										
Metals	Lithium	ug/L	F	20	0	0	7.90	15.55	40.00	2.30	13.58	2.59	3.23	6.60	26.25	37.20	39.05	10.50	0.86	61.25
Metals	Magnesium	mg/L	F	22	0	0	1.65	2.35	5.86	0.74	1.42	0.78	0.90	1.50	3.46	4.20	4.44	1.98	0.89	6.12
Metals	Magnesium	mg/L	UF	5	0	0	1.94	2.38	3.53	1.23										
Metals	Manganese	ug/L	F	22	17	77	0.50	0.91	3.63	0.50										
Metals	Manganese	ug/L	UF	3	0	0	5.10	4.46	5.47	2.80										
Metals	Mercury	ug/L	F	21	21	100	0.03	0.03	0.03	0.03										
Metals	Mercury	ug/L	UF	4	4	100	0.03	0.03	0.04	0.02										
Metals	Molybdenum	ug/L	F	22	12	55	0.50	1.09	4.30	0.50										
Metals	Molybdenum	ug/L	UF	3	0	0	2.80	2.70	3.19	2.10										
Metals	Nickel	ug/L	F	22	19	86	0.50	3.04	29.00	0.37										
Metals	Nickel	ug/L	UF	3	2	67	0.59	0.56	0.60	0.48										
Metals	Potassium	mg/L	F	22	0	0	1.82	2.21	10.00	0.19	2.09	0.21	0.29	1.30	2.57	3.61	4.67	1.49	2.66	10.03
Metals	Potassium	mg/L	UF	5	0	0	4.83	8.91	27.70	1.47										
Metals	Selenium	ug/L	F	21	21	100	0.50	0.54	1.25	0.50										
Metals	Selenium	ug/L	UF	4	3	75	1.64	3.26	8.50	1.25										
Metals	Silver	ug/L	F	22	22	100	0.50	0.46	0.50	0.10										
Metals	Silver	ug/L	UF	3	3	100	0.42	0.34	0.50	0.10										

Table 4.2-2 (continued)

Group	Constituent	unit	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
Metals	Sodium	mg/L	F	22	0	0	7.23	7.48	11.10	4.87	1.96	5.17	5.22	5.83	9.32	9.95	10.09	7.24	0.31	12.19
Metals	Sodium	mg/L	UF	5	0	0	8.31	10.63	22.60	5.59										
Metals	Strontium	ug/L	F	22	0	0	55.00	55.58	140.00	19.00	34.23	19.05	20.00	21.25	76.25	88.80	120.35	45.89	0.89	154.76
Metals	Strontium	ug/L	UF	3	0	0	51.60	71.67	126.00	37.40										
Metals	Thallium	ug/L	F	22	22	100	0.50	0.46	0.50	0.01										
Metals	Thallium	ug/L	UF	3	3	100	0.20	0.14	0.20	0.01										
Metals	Tin	ug/L	F	22	22	100	0.50	0.57	1.25	0.50										
Metals	Tin	ug/L	UF	3	3	100	1.63	1.74	2.35	1.25										
Metals	Titanium	ug/L	F	20	10	50	0.75	2.15	9.00	0.50	2.77	0.50	0.50	0.50	2.00	8.00	8.05	1.18	1.85	8.96
Metals	Uranium	ug/L	F	21	9	43	0.30	0.28	0.60	0.10	0.18	0.10	0.10	0.10	0.50	0.50	0.50	0.22	0.28	0.72
Metals	Uranium	ug/L	UF	2	0	0	0.80	0.80	0.81	0.79										
Metals	Vanadium	ug/L	F	22	5	23	2.40	2.17	4.00	0.50	1.16	0.50	0.50	1.13	3.00	3.00	3.95	1.75	-0.28	4.91
Metals	Vanadium	ug/L	UF	3	1	33	0.85	0.82	1.10	0.50										
Metals	Zinc	ug/L	F	22	13	59	0.75	3.21	19.00	0.50										
Metals	Zinc	ug/L	UF	3	1	33	8.90	35.80	91.60	6.90										
RAD	Americium-241	pCi/L	F	2	2	100	0.01	0.01	0.01	0.00										
RAD	Americium-241	pCi/L	UF	4	3	75	0.01	0.03	0.11	0.00										
RAD	Cesium-137	pCi/L	F	2	2	100	0.21	0.21	0.41	0.00										
RAD	Cesium-137	pCi/L	UF	4	4	100	0.23	0.30	0.76	0.00										
RAD	Gross Alpha	pCi/L	F	2	2	100	0.21	0.21	0.42	0.00										
RAD	Gross Alpha	pCi/L	UF	3	2	67	0.40	0.85	2.14	0.00										
RAD	Gross Beta	pCi/L	F	2	0	0	2.77	2.77	4.05	1.49										
RAD	Gross Beta	pCi/L	UF	3	1	33	3.86	10.08	23.90	2.49										
RAD	Gross Gamma	pCi/L	F	2	2	100	54.50	54.50	64.00	45.00										
RAD	Gross Gamma	pCi/L	UF	4	4	100	56.25	53.89	73.00	30.05										
RAD	Plutonium-238	pCi/L	F	2	2	100	0.00	0.00	0.00	0.00										

Table 4.2-2 (continued)

Group	Constituent	unit	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
RAD	Plutonium-238	pCi/L	UF	4	4	100	0.00	0.00	0.01	0.00										
RAD	Strontium-90	pCi/L	F	2	2	100	0.00	0.00	0.00	0.00										
RAD	Strontium-90	pCi/L	UF	4	4	100	0.05	0.04	0.05	0.00										
RAD	Tritium	pCi/L	UF	3	1	33	5.75	4.45	7.54	0.06										
RAD	Uranium-234	pCi/L	F	2	0	0	0.09	0.09	0.09	0.09										
RAD	Uranium-234	pCi/L	UF	4	1	25	0.21	0.18	0.26	0.02										
RAD	Uranium-238	pCi/L	F	2	1	50	0.03	0.03	0.04	0.03										
RAD	Uranium-238	pCi/L	UF	4	1	25	0.18	0.14	0.20	0.01										

Note: An upper Threshold Tolerance was not calculated for nonfiltered samples. Statistics were not calculated for constituents with fewer than 8 samples or greater than 50% nondetects.

§Both an upper and lower tolerance interval of pH.

* reported as Nitrogen

µg/L = micrograms per liter

mg/L = milligrams per liter

SU = standard units

uS/cm = microsiemens per centimeter

pCi/L = picocuries per liter

F = filtered

UF= nonfiltered

n = number of analyses

ND = number of nondetects

% ND = percent nondetects

max = maximum

min = minimum

std dev = standard deviation

geomean = geometric mean

UTL = upper tolerance threshold

TDS = total dissolved solids

TKN = total Kjeldahl Nitrogen

TOC = total organic carbon

TP -= total phosphate as phosphorous

TSS = total suspended solids

Table 4.2-3
Statistical Data for Regional Aquifer

Group	Constituent	unit	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
Field	pH§	SU	UF	213	0	0	7.85	7.83	8.96	6.43	0.44	6.93	7.18	7.61	8.20	8.32	8.45	7.82	-0.52	6.91 / 8.64
Field	Conductance	uS/cm	UF	168	0	0	142.80	153.98	532.00	15.04	49.49	116.32	122.65	129.03	164.78	185.25	226.65	N/A	4.14	278.21
General	Alkalinity	mg/L	F	69	0	0	62.20	73.11	152.00	51.10	22.94	53.30	55.10	57.90	81.20	110.00	122.80	70.25	1.55	156.60
General	Alkalinity	mg/L	UF	80	1	1	65.35	67.97	153.00	26.40	17.21	56.20	56.69	58.78	71.43	78.05	84.77	66.30	2.83	
General	Ammonia*	mg/L	F	31	30	97	0.01	0.02	0.25	0.01										
General	Ammonia*	mg/L	UF	30	28	93	0.01	0.01	0.05	0.01										
General	Bicarbonate	mg/L	F	36	0	0	63.75	75.16	126.00	52.40	22.98	53.20	55.30	56.90	93.88	112.50	119.50	72.17	0.99	132.30
General	Bicarbonate	mg/L	UF	39	0	0	69.50	68.31	132.00	26.20	14.53	55.09	56.24	60.60	73.50	76.46	81.15	66.80	1.56	
General	Bromide	mg/L	F	40	35	88	0.03	0.05	0.18	0.02										
General	Bromide	mg/L	UF	42	24	57	0.03	0.04	0.22	0.01										
General	Carbonate	mg/L	F	1	0	0	7.20	7.20	7.20	7.20										
General	Carbonate	mg/L	UF	18	15	83	0.50	1.55	7.10	0.50										
General	Chloride	mg/L	F	71	0	0	2.17	2.37	5.95	1.61	0.65	1.81	1.89	1.94	2.64	3.08	3.24	2.30	2.78	3.57
General	Chloride	mg/L	UF	81	1	1	2.25	2.35	7.56	1.66	0.75	1.73	1.83	1.97	2.44	2.85	3.18	2.28	4.66	
General	Fluoride	mg/L	F	71	6	8	0.35	0.37	0.57	0.19	0.11	0.19	0.22	0.29	0.46	0.52	0.54	0.35	0.03	0.57
General	Fluoride	mg/L	UF	118	14	12	0.28	0.30	0.63	0.09	0.10	0.16	0.18	0.23	0.34	0.44	0.50	0.28	0.70	
General	Nitrate*	mg/L	F	1	0	0	0.53	0.53	0.53	0.53										
General	Nitrate*	mg/L	UF	19	1	5	0.37	0.42	0.75	0.22	0.15	0.27	0.30	0.34	0.43	0.67	0.71	0.40	1.31	
General	Nitrate+Nitrite*	mg/L	F	70	6	9	0.31	0.33	1.05	0.01	0.22	0.06	0.08	0.18	0.39	0.71	0.75	0.25	1.07	0.89
General	Nitrate+Nitrite*	mg/L	UF	104	10	10	0.33	0.37	0.79	0.04	0.15	0.14	0.22	0.29	0.44	0.57	0.60	0.33	0.46	
General	Nitrite*	mg/L	F	1	1	100	0.00	0.00	0.00	0.00										
General	Nitrite*	mg/L	UF	19	19	100	0.00	0.00	0.05	0.00										
General	Perchlorate	ug/L	F	26	1	4	0.29	0.28	0.41	0.09	0.08	0.12	0.16	0.26	0.31	0.36	0.39	0.26	-0.87	0.46
General	Perchlorate	ug/L	UF	69	0	0	0.32	0.32	0.44	0.14	0.06	0.25	0.26	0.29	0.36	0.41	0.43	0.32	-0.36	

Table 4.2-3 (continued)

Group	Constituent	unit	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
General	Silicon Dioxide	mg/L	F	66	2	3	70.20	60.90	87.20	22.40	19.11	31.68	32.70	38.43	73.95	78.55	81.85	57.28	-0.65	88.50
General	Silicon Dioxide	mg/L	UF	84	3	4	56.15	56.59	94.10	6.20	21.01	31.58	33.03	34.00	73.33	84.94	87.83	52.02	-0.05	
General	Sulfate	mg/L	F	71	0	0	2.83	3.61	8.63	1.65	2.00	1.92	2.03	2.21	3.97	7.03	7.80	3.19	1.26	7.20
General	Sulfate	mg/L	UF	81	1	1	2.94	2.98	7.03	1.55	1.02	1.89	1.98	2.19	3.34	3.96	4.18	2.84	1.79	
General	TDS	mg/L	F	57	0	0	147.00	150.19	225.00	115.00	22.07	125.60	127.60	136.00	153.00	180.60	191.20	148.74	1.25	191.68
General	TDS	mg/L	UF	62	0	0	146.00	148.97	230.00	123.00	17.70	128.00	130.10	139.00	156.50	168.90	171.95	148.03	1.80	
General	TKN	mg/L	F	35	20	57	0.04	0.10	0.52	0.01										
General	TKN	mg/L	UF	35	22	63	0.03	0.07	0.45	0.01										
General	TOC	mg/L	F	3	0	0	0.26	0.31	0.46	0.21										
General	TOC	mg/L	UF	28	14	50	0.34	0.41	1.37	0.11	0.31	0.17	0.17	0.20	0.42	0.89	1.08	0.34	1.81	
General	TP	mg/L	F	71	49	69	0.02	0.04	0.34	0.01										
General	TP	mg/L	UF	86	52	60	0.02	0.02	0.30	0.01										
General	TSS	mg/L	UF	57	31	54	0.70	21.04	260.00	0.18										
Metals	Aluminium	ug/L	F	69	61	88	17.15	20.88	50.00	1.00										
Metals	Aluminium	ug/L	UF	78	58	74	34.00	49.66	1640.00	1.00										
Metals	Antimony	ug/L	F	69	67	97	0.25	0.28	1.00	0.03										
Metals	Antimony	ug/L	UF	85	85	100	0.25	0.32	2.00	0.10										
Metals	Arsenic	ug/L	F	69	57	83	2.50	2.37	12.00	0.80										
Metals	Arsenic	ug/L	UF	91	66	73	3.00	2.99	16.30	0.27										
Metals	Barium	ug/L	F	69	0	0	21.80	26.63	115.00	4.90	20.94	10.04	10.84	15.80	28.00	41.20	81.16	22.07	2.73	56.83
Metals	Barium	ug/L	UF	88	10	11	19.95	26.99	310.00	1.50	36.05	3.78	5.10	13.93	28.55	50.00	50.00	18.03	5.99	
Metals	Beryllium	ug/L	F	69	69	100	0.24	0.29	0.50	0.04										
Metals	Beryllium	ug/L	UF	90	90	100	0.50	0.32	2.00	0.01										
Metals	Boron	ug/L	F	69	19	28	13.10	15.53	51.60	2.37	9.98	4.42	5.04	8.95	18.90	29.46	36.52	12.74	1.38	38.77
Metals	Boron	ug/L	UF	77	20	26	13.90	17.56	86.10	4.00	14.49	5.00	5.00	9.00	19.40	32.28	43.24	13.95	2.66	
Metals	Cadmium	ug/L	F	69	66	96	0.05	0.16	0.50	0.02										
Metals	Cadmium	ug/L	UF	93	92	99	0.05	0.17	2.00	0.02										

Table 4.2-3 (continued)

Group	Constituent	unit	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
Metals	Calcium	mg/L	F	75	0	0	11.70	13.99	41.70	4.30	6.91	9.97	10.14	10.90	13.95	17.36	32.62	12.91	2.64	24.88
Metals	Calcium	mg/L	UF	97	1	1	11.70	12.77	42.50	0.61	4.61	9.50	9.99	10.80	13.80	15.72	16.32	12.08	4.07	
Metals	Chromium	ug/L	F	80	23	29	3.05	3.07	7.20	0.39	1.61	0.50	0.74	1.96	4.40	5.11	5.61	2.53	0.17	5.75
Metals	Chromium	ug/L	UF	96	16	17	3.90	3.85	9.80	0.50	1.79	0.91	1.55	2.65	4.93	5.95	6.38	3.31	0.28	
Metals	Cobalt	ug/L	F	69	59	86	0.50	0.91	7.00	0.15										
Metals	Cobalt	ug/L	UF	78	76	97	0.50	0.58	2.70	0.02										
Metals	Copper	ug/L	F	69	62	90	1.50	1.42	5.00	0.50										
Metals	Copper	ug/L	UF	78	60	77	1.50	2.76	62.20	0.21										
Metals	Iron	ug/L	F	69	49	71	9.50	19.32	147.00	5.00										
Metals	Iron	ug/L	UF	78	37	47	18.85	75.11	1270.00	3.65	197.92	5.00	5.91	9.00	47.95	114.80	262.35	22.23	4.57	
Metals	Lead	ug/L	F	69	62	90	0.25	0.30	2.90	0.03										
Metals	Lead	ug/L	UF	80	63	79	0.25	0.38	4.60	0.01										
Metals	Lithium	ug/L	F	8	0	0	23.50	23.13	25.00	17.00	2.64	19.10	21.20	23.00	25.00	25.00	25.00	22.97	-2.16	27.40
Metals	Lithium	ug/L	UF	11	1	9	24.00	27.00	47.00	17.00	8.22	20.00	23.00	23.50	27.00	37.00	42.00	26.06	1.71	
Metals	Magnesium	mg/L	F	75	0	0	2.96	2.79	4.40	0.48	0.94	1.03	1.16	2.54	3.39	3.86	4.06	2.56	-0.81	4.15
Metals	Magnesium	mg/L	UF	97	2	2	3.05	2.86	7.64	0.20	1.22	0.51	0.87	2.43	3.48	4.06	4.42	2.44	-0.11	
Metals	Manganese	ug/L	F	69	44	64	1.00	7.55	124.00	0.15										
Metals	Manganese	ug/L	UF	75	45	60	1.00	8.84	220.00	0.04										
Metals	Mercury	ug/L	F	48	47	98	0.03	0.04	0.26	0.02										
Metals	Mercury	ug/L	UF	107	105	98	0.03	0.04	0.24	0.01										
Metals	Molybdenum	ug/L	F	69	35	51	1.11	1.53	4.40	0.30										
Metals	Molybdenum	ug/L	UF	72	29	40	1.21	1.83	5.80	0.24	1.12	0.86	1.00	1.00	2.33	3.04	3.80	1.55	1.42	
Metals	Nickel	ug/L	F	69	54	78	0.50	2.14	50.00	0.25										
Metals	Nickel	ug/L	UF	88	66	75	0.50	0.94	5.00	0.18										
Metals	Potassium	mg/L	F	75	0	0	1.79	1.85	3.11	1.10	0.43	1.30	1.35	1.54	2.08	2.58	2.68	1.81	0.74	2.63
Metals	Potassium	mg/L	UF	97	2	2	1.79	1.86	3.43	0.15	0.48	1.26	1.33	1.66	2.09	2.56	2.70	1.78	0.18	
Metals	Selenium	ug/L	F	51	51	100	1.25	1.40	3.93	0.50										

Table 4.2-3 (continued)

Group	Constituent	unit	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
Metals	Selenium	ug/L	UF	112	107	96	1.41	1.61	4.99	0.25										
Metals	Silver	ug/L	F	69	69	100	0.26	0.41	2.50	0.10										
Metals	Silver	ug/L	UF	75	74	99	0.42	0.45	2.50	0.10										
Metals	Sodium	mg/L	F	75	0	0	11.40	14.26	32.90	4.60	6.57	9.72	9.98	10.60	13.20	24.12	30.11	13.15	1.64	24.50
Metals	Sodium	mg/L	UF	97	1	1	12.40	14.32	33.20	0.91	5.89	9.56	9.87	10.50	15.20	24.50	25.92	13.17	1.23	
Metals	Strontium	ug/L	F	66	0	0	53.50	91.82	477.00	43.90	106.87	45.45	45.90	49.13	63.80	191.00	426.25	68.30	2.92	540.00
Metals	Strontium	ug/L	UF	72	1	1	52.55	71.49	480.00	2.80	73.94	43.17	45.03	49.58	64.00	79.67	146.00	58.54	4.82	
Metals	Thallium	ug/L	F	69	57	83	0.20	0.22	0.83	0.01										
Metals	Thallium	ug/L	UF	90	83	92	0.20	0.29	2.00	0.01										
Metals	Tin	ug/L	F	58	57	98	1.25	1.29	3.60	0.50										
Metals	Tin	ug/L	UF	60	60	100	1.25	1.27	5.90	0.50										
Metals	Titanium	ug/L	F	8	8	100	0.50	0.56	1.00	0.50										
Metals	Titanium	ug/L	UF	12	12	100	0.50	0.68	2.00	0.16										
Metals	Uranium	ug/L	F	55	1	2	0.40	0.63	2.50	0.06	0.57	0.13	0.21	0.32	0.76	1.34	2.23	0.46	2.08	1.90
Metals	Uranium	ug/L	UF	68	2	3	0.47	0.60	2.90	0.10	0.47	0.22	0.25	0.36	0.70	0.90	1.60	0.49	2.89	
Metals	Vanadium	ug/L	F	69	5	7	7.30	8.18	29.70	2.27	4.56	3.65	4.77	5.90	8.96	10.94	16.08	7.38	2.97	13.41
Metals	Vanadium	ug/L	UF	78	8	10	7.00	10.50	62.70	0.50	9.74	2.76	4.42	5.30	11.00	18.82	29.44	7.98	3.04	
Metals	Zinc	ug/L	F	69	47	68	1.45	3.08	32.00	0.40										
Metals	Zinc	ug/L	UF	77	44	57	2.50	5.30	51.00	0.36										
RAD	Americium-241	pCi/L	F	55	49	89	0.00	0.01	0.03	0.00										
RAD	Americium-241	pCi/L	UF	76	70	92	0.00	0.01	0.16	0.00										
RAD	Cesium-137	pCi/L	F	55	54	98	0.14	0.47	4.45	0.00										
RAD	Cesium-137	pCi/L	UF	77	77	100	0.10	0.49	8.00	0.00										
RAD	Gross Alpha	pCi/L	F	45	33	73	0.26	0.66	2.54	0.00										
RAD	Gross Alpha	pCi/L	UF	66	58	88	0.27	0.62	14.50	0.00										
RAD	Gross Beta	pCi/L	F	50	26	52	1.25	2.01	14.10	0.05										
RAD	Gross Beta	pCi/L	UF	77	40	52	1.30	1.89	8.20	0.00										

Table 4.2-3 (continued)

Group	Constituent	unit	Prep	n	ND	% ND	median	mean	max	min	std dev	5th	10th	25th	75th	90th	95th	geomean	skew	UTL
RAD	Gross Gamma	pCi/L	F	37	36	97	43.35	48.48	123.00	7.05										
RAD	Gross Gamma	pCi/L	UF	64	64	100	43.70	52.25	219.50	23.75										
RAD	Plutonium-238	pCi/L	F	55	52	95	0.00	0.00	0.03	0.00										
RAD	Plutonium-238	pCi/L	UF	75	72	96	0.00	0.00	0.02	0.00										
RAD	Strontium-90	pCi/L	F	54	52	96	0.01	0.11	4.49	0.00										
RAD	Strontium-90	pCi/L	UF	185	178	96	0.01	0.02	0.17	0.00										
RAD	Tritium	pCi/L	UF	100	98	98	0.05	0.31	11.43	0.00										
RAD	Uranium-234	pCi/L	F	55	2	4	0.27	0.57	3.40	0.02	0.59	0.09	0.14	0.22	0.89	1.32	1.44	0.36	2.44	2.17
RAD	Uranium-234	pCi/L	UF	75	0	0	0.31	0.41	1.55	0.07	0.27	0.18	0.21	0.26	0.51	0.61	0.80	0.35	2.53	
RAD	Uranium-238	pCi/L	F	55	4	7	0.14	0.29	2.14	0.02	0.35	0.03	0.06	0.09	0.42	0.69	0.76	0.17	3.07	1.20
RAD	Uranium-238	pCi/L	UF	74	1	1	0.18	0.21	0.81	0.01	0.14	0.09	0.09	0.13	0.26	0.32	0.43	0.18	2.37	

UTL and stats only calculated for filtered results with greater than 50% detection and greater than 8 results negative values for rads replaced with zero

§Both an upper and lower tolerance interval of pH.

* reported as Nitrogen

μg/L = micrograms per liter

mg/L = milligrams per liter

SU = standard units

uS/cm = microsiemens per centimeter

pCi/L = picocuries per liter

F = filtered

UF= nonfiltered

n = number of analyses

ND = number of nondetects

% ND = percent nondetects

max = maximum

min = minimum

std dev = standard deviation

geomean = geometric mean

UTL = upper tolerance threshold

TDS = total dissolved solids

TKN = total Kjeldahl Nitrogen

TOC = total organic carbon

TP -= total phosphate as phosphorous

TSS = total suspended solids

Table 4.2-4
Summary of Detection Limits Listed by Groundwater Type

Aquifer	Group	Constituent	Unit	Prep	#	MDL	#	MDL	#	MDL	#	MDL	#	MDL	#	MDL
Alluvial	General	Bromide	mg/L	F	3	0.01	1	0.04	1	0.07						
Intermediate	General	Carbonate	mg/L	F	20	1										
Intermediate	General	Nitrite*	mg/L	F	20	0.003										
Regional	General	Ammonia*	mg/L	F	25	0.01	4	0.02	4	0.04	1	0.05				
Regional	General	Ammonia*	mg/L	UF	23	0.01	4	0.02	3	0.04	2	0.05	3	0.1		
Regional	General	Bromide	mg/L	F	1	0.01	1	0.02	18	0.04	15	0.07	4	0.09	4	0.1
Regional	General	Carbonate	mg/L	UF	19	1	1	2								
Regional	General	Nitrite*	mg/L	UF	3	0.002	17	0.003	1	0.006						
Regional	General	TKN	mg/L	F	20	0.01	1	0.02	2	0.03	12	0.04	1	0.05	1	0.1
Regional	General	TKN	mg/L	UF	23	0.01	1	0.02	3	0.03	8	0.04	5	0.1		
Regional	General	TOC	mg/L	UF	4	0.02	5	0.03	1	0.04	7	0.07	14	0.3		
Regional	General	TP	mg/L	F	1	0.003	49	0.01	15	0.02	5	0.05	4	0.2		
Alluvial	Metal	Antimony	ug/L	F	2	0.5	3	1								
Alluvial	Metal	Arsenic	ug/L	F	3	0.2	2	6								
Alluvial	Metal	Beryllium	ug/L	F	1	0.1	4	1								
Alluvial	Metal	Cadmium	ug/L	F	2	0.1	3	1								
Alluvial	Metal	Chromium	ug/L	F	5	1										
Alluvial	Metal	Cobalt	ug/L	F	5	1										
Alluvial	Metal	Copper	ug/L	F	3	1	2	3								
Alluvial	Metal	Lead	ug/L	F	3	0.2	2	0.5								
Alluvial	Metal	Manganese	mg/L	F	4	1	1	2								
Alluvial	Metal	Mercury	ug/L	F	4	0.05	1	0.06								
Alluvial	Metal	Nickel	ug/L	F	1	0.5	4	1								
Alluvial	Metal	Selenium	ug/L	F	3	1	1	3	1	6						
Alluvial	Metal	Silver	ug/L	F	4	1	1	0.2								

Table 4.2-4 (continued)

Aquifer	Group	Constituent	Unit	Prep	#	MDL	#	MDL	#	MDL	#	MDL	#	MDL	#	MDL
Alluvial	Metal	Thallium	ug/L	F	3	1	2	0.4								
Alluvial	Metal	Vanadium	ug/L	F	5	1										
Alluvial	Metal	Zinc	ug/L	F	3	1	2	2								
Intermediate	Metal	Antimony	ug/L	F	1	0.1	1	0.5	20	1						
Intermediate	Metal	Beryllium	ug/L	F	1	0.2	21	1								
Intermediate	Metal	Cadmium	ug/L	F	1	0.1	1	0.05	20	1						
Intermediate	Metal	Chromium	ug/L	F	1	0.8	21	1								
Intermediate	Metal	Cobalt	ug/L	F	1	0.3	21	1								
Intermediate	Metal	Lead	ug/L	F	1	0.1	20	0.2	1	0.5						
Intermediate	Metal	Manganese	ug/L	F	20	1	1	2	1	3						
Intermediate	Metal	Mercury	ug/L	F	20	0.05	1	0.06								
Intermediate	Metal	Molybdenum	ug/L	F	1	0.6	20	1	1	2						
Intermediate	Metal	Nickel	ug/L	F	1	0.4	1	0.6	20	1						
Intermediate	Metal	Selenium	ug/L	F	20	1	1	2.5								
Intermediate	Metal	Silver	ug/L	F	2	0.2	20	1								
Intermediate	Metal	Thallium	ug/L	F	1	0.01	1	0.4	20	1						
Intermediate	Metal	Tin	ug/L	F	20	1	1	2	1	3						
Intermediate	Metal	Zinc	ug/L	F	20	1	1	2	1	3						
Regional	Metal	Aluminium	ug/L	F	8	2	22	10	5	20	7	30	32	70		
Regional	Metal	Aluminium	ug/L	UF	4	2	3	5	18	10	1	30	46	70		
Regional	Metal	Antimony	ug/L	F	12	1	1	0.2	22	0.3	32	0.5	8	1		
Regional	Metal	Antimony	ug/L	UF	8	0.2	18	0.3	46	0.5	19	1	1	2		
Regional	Metal	Arsenic	ug/L	F	9	0.2	18	2	5	3	7	5	31	6	1	10
Regional	Metal	Arsenic	ug/L	UF	24	0.5	5	1	18	2	2	5	45	6	1	10
Regional	Metal	Beryllium	ug/L	F	1	0.03	8	0.08	4	0.1	20	0.2	5	0.5	36	1
Regional	Metal	Beryllium	ug/L	UF	8	0.07	8	0.08	11	0.1	10	0.2	54	1	1	2
Regional	Metal	Cadmium	ug/L	F	22	0.04	4	0.05	32	0.1	3	0.4		0.6	8	1

Table 4.2-4 (continued)

Aquifer	Group	Constituent	Unit	Prep	#	MDL	#	MDL	#	MDL	#	MDL	#	MDL	#	MDL
Regional	Metal	Cadmium	ug/L	UF	18	0.04	11	0.05	46	0.1	19	1	1	2		
Regional	Metal	Cobalt	ug/L	F	7	0.3	22	0.5	5	0.6	40	1				
Regional	Metal	Cobalt	ug/L	UF	4	0.3	18	0.5	59	1	1	2				
Regional	Metal	Copper	ug/L	F	30	1	5	2	39	3						
Regional	Metal	Copper	ug/L	UF	34	1	1	2	47	3						
Regional	Metal	Iron	ug/L	F	30	10	44	20								
Regional	Metal	Lead	ug/L	F	22	0.05	1	0.07	6	0.08	8	0.2	32	0.5	5	2
Regional	Metal	Lead	ug/L	UF	21	0.05	1	0.07	13	0.2	1	0.4	46	0.5		
Regional	Metal	Manganese	ug/L	F	14	0.3	1	0.7	17	1	36	2	6	3		
Regional	Metal	Manganese	ug/L	UF	10	0.3	1	0.7	24	1	44	2				
Regional	Metal	Mercury	ug/L	F	4	0.04	28	0.05	20	0.06	1	0.07				
Regional	Metal	Mercury	ug/L	UF	4	0.04	72	0.05	21	0.06	7	0.7	2	0.1		
Regional	Metal	Nickel	ug/L	F	27	0.5	29	0.7	12	1	6	3				
Regional	Metal	Nickel	ug/L	UF	41	0.5	19	0.7	24	1	1	2	7	3		
Regional	Metal	Selenium	ug/L	F	8	1	5	2	39	3	4	6				
Regional	Metal	Selenium	ug/L	UF	24	1	1	2	74	3	11	6	6	5		
Regional	Metal	Silver	ug/L	F	35	0.2	5	0.5	22	0.8	12	1				
Regional	Metal	Silver	ug/L	UF	37	0.2	18	0.8	23	1	1	2				
Regional	Metal	Thallium	ug/L	F	12	0.01	22	0.02	32	0.4	8	1				
Regional	Metal	Thallium	ug/L	UF	1	0.01	25	0.02	46	0.4	19	1	1	2		
Regional	Metal	Tin	ug/L	F	8	1	11	2	42	3						
Regional	Metal	Tin	ug/L	UF	13	1	1	2	52	3						
Regional	Metal	Titanium	ug/L	F	8	1										
Regional	Metal	Titanium	ug/L	UF	1	0.3	11	1	2	3						
Regional	Metal	Zinc	ug/L	F	22	0.9	8	1	32	2	7	3	5	4		
Regional	Metal	Zinc	ug/L	UF	18	0.9	13	1	50	2	1	3				
Alluvial	RAD	Americium-241	pCi/L	UF	1	0.03	1	0.04	2	0.005	1	0.08	4	10		

Table 4.2-4 (continued)

Aquifer	Group	Constituent	Unit	Prep	#	MDL	#	MDL	#	MDL	#	MDL	#	MDL	#	MDL
Regional	RAD	Americium-241	pCi/L	F	7	0.01	10	0.02	19	0.03	14	0.04	9	0.05		
Regional	RAD	Americium-241	pCi/L	UF	6	0.01	5	0.02	37	0.03	24	0.04	7	0.05	1	10
Regional	RAD	Cesium-137	pCi/L	F	5	2	22	3	2	6	16	4	7	5	6	8
Regional	RAD	Cesium-137	pCi/L	UF	9	2	42	3	21	4	6	5	4	8		
Regional	RAD	Gross Alpha	pCi/L	F	2	0.8	2	0.9	14	1	24	2	4	3		
Regional	RAD	Gross Alpha	pCi/L	UF	2	0.6	2	0.8	4	0.9	29	1	23	2	9	3
Regional	RAD	Gross Beta	pCi/L	F	17	1	16	2	17	3	1	4				
Regional	RAD	Gross Beta	pCi/L	UF	2	0.8	10	1	43	2	23	3	2	4		
Regional	RAD	Gross Gamma	pCi/L	F	10	200	19	300	17	400	2	500	1	600		
Regional	RAD	Gross Gamma	pCi/L	UF	14	200	33	300	18	400	3	1000				
Regional	RAD	Plutonium-238	pCi/L	F	38	< 0.03	6	0.04	7	0.05	5	0.06				
Regional	RAD	Plutonium-238	pCi/L	UF	20	< 0.03	14	0.04	13	0.05	5	0.06	3	0.07		
Regional	RAD	Strontium-90	pCi/L	F	23	< 0.2	22	0.03	7	0.04	3	0.05				
Regional	RAD	Strontium-90	pCi/L	UF	30	< 0.1	46	0.2	39	0.3	13	0.4	5	0.5		
Regional	RAD	Tritium	pCi/L	UF	1	0.06	37	0.3								

Note: Detection limits shown are for each constituent with greater than 8 analyses and fewer than 50% detected results.

* reported as Nitrogen

MDL - Method Detection Limit

MDA - Minimum Detected Activity

TKN - Total Kjeldahl Nitrogen

TOC - Total Organic Carbon

TP - Total Phosphate as Phosphorous

mg/L - milligrams per Liter

µg/L - micrograms per Liter

pCi/L - picocuries per Liter

F - Filtered

UF - Unfiltered

Table 4.2-5
Standards Applicable to Background Groundwater Analytes

Group	Analyte	Regulatory Standard		
		NMED	EPA	DOE
Field	Specific conductance (conductivity)	—	—	—
Field	pH	x	x	—
Metals	Aluminum	x	x	—
Metals	Antimony	—	x	—
Metals	Arsenic	x	x	—
Metals	Barium	x	x	—
Metals	Beryllium	—	x	—
Metals	Boron	x	—	—
Metals	Cadmium	x	x	—
Metals	Calcium	—	—	—
Metals	Chromium, total	x	x	—
Metals	Cobalt	x	x	—
Metals	Copper	x	x	—
Metals	Iron	x	x	—
Metals	Lead	x	x	—
Metals	Lithium	—	—	—
Metals	Magnesium	—	—	—
Metals	Manganese	x	x	—
Metals	Mercury	x	x	—
Metals	Molybdenum	x	x	—
Metals	Nickel	x	x	—
Metals	Potassium	—	—	—
Metals	Selenium	x	x	—
Metals	Silver	—	x	—
Metals	Sodium	—	—	—
Metals	Strontium	—	—	—
Metals	Thallium	—	x	—
Metals	Tin	—	—	—
Metals	Titanium	—	—	—
Metals	Uranium	x	x	—
Metals	Vanadium	—	—	—
Metals	Zinc	x	x	—
General	Alkalinity (HCO_3 +CO_3)	—	—	—
General	Ammonia [as N]	—	—	—
General	Bicarbonate	—	—	—
General	Bromide	—	—	—

Table 4.2-5 (continued)

Group	Analyte	Regulatory Standard		
		NMED	EPA	DOE
General	Fluoride	x	x	—
General	Nitrate [as N]	x	x	—
General	Nitrate + Nitrite [as N]	—	—	—
General	Nitrite [as N]	—	x	—
General	Low-level perchlorate	—	—	—
General	Silicon Dioxide	—	—	—
General	Sulfate	—	—	—
General	Total dissolved solids	x	x	—
General	Total Kjeldahl Nitrogen	—	—	—
General	Total Organic Carbon	—	—	—
General	Total Phosphate as Phosphorus	—	—	—
General	Total Suspended Solids	—	—	—
Rads	Gross-alpha radiation	x	x	x
Rads	Gross-beta radiation	x	x	x
Rads	Gross-gamma radiation	x	x	x
Rads	Americium-241	—	—	x
Rads	Cesium-137	—	—	x
Rads	Plutonium-238	—	—	x
Rads	Strontium-90	x	x	x
Rads	Tritium	—	—	x
Rads	Uranium-234	—	—	x
Rads	Uranium-235	—	—	x
Rads	Uranium-238	—	—	x

x = standard exists
— = no standard

Table 4.3-1
Mann-Whitney *U*-Test Comparisons of Selected Analytes between Water Types

Analyte	Regional vs. Intermediate	Regional vs. Alluvial	Intermediate vs. Alluvial
Aluminum	√	√	n.s.
Arsenic	√√√	n.s.	n.s.
Barium	√	√	√
Bicarbonate	NC	n.s.	NC
Boron	√√	n.s.	n.s.
Bromide	√√√	NC	NC
Cadmium	NC	√	NC
Calcium	√√√	n.s.	√√
Chloride	√√	n.s.	√√
Chromium	NC	√√	NC
Cobalt	NC	n.s.	NC
Copper	n.s.	NC	NC
Fluoride	√√√	√√√	n.s.
Iron	n.s.	√	n.s.
Lithium	n.s.	NC	NC
Magnesium	n.s.	√	√√
Manganese	NC	n.s.	NC
Mercury	NC	√	NC
Molybdenum	√	NC	NC
Nitrate + nitrite as N	n.s.	n.s.	√
pH	√√	√√√	√
Potassium	n.s.	√√√	√√
Silicon dioxide	√√√	√√√	n.s.
Silver	NC	√	NC
Sodium	√√√	√√√	n.s.
Strontium	n.s.	√√√	√√
Sulfate	n.s.	√√√	n.s.
Total alkalinity	√√√	n.s.	√
Total phosphate as P	n.s.	n.s.	n.s.
Uranium	√√	√√√	n.s.
Vanadium	√√√	NC	NC
Zinc	n.s.	√	√

√√√ = Statistically significant difference at < 0.001 confidence level.
√√ = Significant difference at < 0.01 confidence level.
√ = Significant difference at < 0.1 confidence level.
n.s. = Not significantly different.
NC = Not calculated. One water type exhibits fewer than eight detections for the analyte compared.

Table 4.3-2a
UTLs, Maximum Values, and Screening Values for Alluvial Groundwater

Group	Constituent	Unit	Filtration	UTL	Maximum Value	Maximum Detection Limit	Standard	Standard Type	Screening Value
Field	pH	SU	UF		7.48	n/a[a]	—	—	6.0/9.0
Field	Specific Conductance	uS/cm	UF		184.20	n/a	—	—	184.00
General	Alkalinity - HCO3+CO3	mg/L	F		76.00	1.50	—	—	76.00
General	Ammonia as N	mg/L	F		0.25	0.04	—	—	0.04
General	Bicarbonate	mg/L	F		38.60	1.50	—	—	76.00
General	Bromide	mg/L	F		0.10	0.066	—	—	0.07
General	Carbonate	mg/L	F		0.50	1.00	—	—	1.00
General	Chloride	mg/L	F	69.76	16.20	0.066	250	NM GW Std	69.76
General	Fluoride	mg/L	F	0.27	0.17	0.0553	1.6	NM GW Std	0.27
General	Nitrate+Nitrite as N	mg/L	F		0.57	0.017	10	NM GW Std	0.57
General	Nitrite as N	mg/L	F		0.05	0.002	10	NM GW Std	0.002
General	Perchlorate	µg/L	F		14.20	0.05	4	NM Consent Order Screening Value	0.05
General	Silicon Dioxide	mg/L	F	64.21	44.00	0.032	250	EPA Secondary MCL	64.21
General	Sulfate	mg/L	F	24.83	15.80	0.193	500	EPA Secondary MCL	24.83
General	Total Dissolved Solids	mg/L	F		139.00	6.29	—	—	139.00
General	Total Kjeldahl Nitrogen	mg/L	F		0.46	0.04	—	—	0.04
General	Total Organic Carbon	mg/L	F		4.99	0.46	—	—	0.46
General	Total Phosphate as P	mg/L	F		0.04	0.048	—	—	0.05
Metals	Aluminum	µg/L	F	15670	8700.00	68	500	EPA Secondary MCL	15670
Metals	Antimony	µg/L	F		10.00	0.5	6	EPA Primary MCL	0.50
Metals	Arsenic	µg/L	F		5.00	6	10	EPA Primary MCL	6.00
Metals	Barium	µg/L	F	68.57	50.00	1	1000	NM GW Std	68.57

Table 4.3-2a (continued)

Group	Constituent	Unit	Filtration	UTL	Maximum Value	Maximum Detection Limit	Standard	Standard Type	Screening Value
Metals	Beryllium	µg/L	F		2.50	1	4	EPA Primary MCL	1.00
Metals	Boron	µg/L	F	51.89	50.00	10	750	NM GW Std	51.89
Metals	Cadmium	µg/L	F		2.50	1	5	EPA Primary MCL	1.00
Metals	Calcium	mg/L	F	26.36	18.20	0.01	—	—	26.36
Metals	Chromium	µg/L	F		5.00	1	50	NM GW Std	1.00
Metals	Cobalt	µg/L	F		5.00	0.5	50	NM GW Std	0.50
Metals	Copper	µg/L	F		5.00	3	1000	NM GW Std	3.00
Metals	Iron	µg/L	F	8270	4600.00	20.6	300	EPA Secondary MCL	8240
Metals	Lead	µg/L	F		1.88	0.5	15	EPA Screening Level	0.50
Metals	Lithium	µg/L	F		5.00	1	—	—	1.00
Metals	Magnesium	mg/L	F	7.78	5.50	0.01	—	—	7.78
Metals	Manganese	mg/L	F		21.00	2	50	EPA Secondary MCL	2.00
Metals	Mercury	µg/L	F		0.10	0.06	2	EPA Primary MCL	0.06
Metals	Mercury	µg/L	UF		0.03	0.06	2	EPA Primary MCL	0.06
Metals	Molybdenum	µg/L	F		5.00	2	1000	NM GW Std	2.00
Metals	Nickel	µg/L	F		10.00	1	100	EPA Primary MCL	1.00
Metals	Potassium	mg/L	F	5.21	4.00	0.05	—	—	5.21
Metals	Selenium	µg/L	F		3.00	6	50	NM GW Std	6.00
Metals	Selenium	µg/L	UF		3.00	6	50	NM GW Std	6.00
Metals	Silver	µg/L	F		5.00	1	50	NM GW Std	1.00
Metals	Sodium	mg/L	F	15.54	11.60	0.045	—	—	15.54
Metals	Strontium	µg/L	F		120.00	1	25000	EPA Secondary MCL	120.00
Metals	Thallium	µg/L	F		5.00	1	2	EPA Primary MCL	1.00
Metals	Tin	µg/L	F		5.00	3.26	—	—	3.26
Metals	Titanium	µg/L	F		1.00	1	—	—	1.00
Metals	Uranium	µg/L	F	1.03	0.96	0.2	30	NM GW Std	1.03
Metals	Vanadium	µg/L	F		5.00	1	80	EPA Secondary MCL	1.00
Metals	Zinc	µg/L	F		10.00	2	5000	EPA Secondary MCL	2.00

Table 4.3-2a (continued)

Group	Constituent	Unit	Filtration	UTL	Maximum Value	Maximum Detection Limit	Standard	Standard Type	Screening Value
RAD	Americium-241	pCi/L	F		0.75	0.044	1.2	DOE 4 mrem DCG	0.04
RAD	Cesium-137	pCi/L	F		0.34	5.8	120	DOE 4 mrem DCG	5.80
RAD	Plutonium-238	pCi/L	F		0.00	0.06	1.6	DOE 4 mrem DCG	0.06
RAD	Strontium-90	pCi/L	F		0.06	0.48	8	EPA Primary MCL	0.48
RAD	Tritium	pCi/L	UF		57.28	0.861	20000	EPA Primary MCL	57
RAD	Uranium-234	pCi/L	F		0.16	0.178	20	DOE 4 mrem DCG	0.18
RAD	Uranium-238	pCi/L	F		0.12	0.19	24	DOE 4 mrem DCG	0.19

Note: Spaces left blank in UTL column intentionally. No UTL was calculated for constituents with fewer than 8 results or fewer than 50% detection.

[a] n/a = not applicable

NM GW Std = New Mexico Water Quality Control Commission Standards for Ground Water, 20.6.2.3103 NMAC

EPA Primary MCL = National Primary Drinking Water Regulations, 40CFR120, Part 141

EPA Secondary MCL = National Secondary Drinking Water Regulations, 40CFR120, Part 143

DOE 4 mrem DCG = Department of Energy Derived Concentration Guides for Drinking Water (1990), DOE Order 5400.5

— = No standard available

Table 4.3-2b
UTLs, Maximum Values, and Screening Values for Perched-Intermediate Groundwater

Group	Constituent	Unit	Filtration	UTL	Maximum Value	Maximum Detection Limit	Standard	Standard Type	Screening Value
Field	pH	SU	UF	6.10 / 8.80	10.14	n/a[a]	—	—	6.10 / 8.80
Field	Specific Conductance	µS/cm	UF	276.03	908.00	n/a	—	—	276.03
General	Alkalinity-HCO_3+CO_3	mg/L	F	52.00	51.20	1.50	—	—	52.00
General	Ammonia as N	mg/L	F		0.07	1.50	—	—	1.50
General	Bicarbonate	mg/L	F		43.20	0.066	—	—	52.00
General	Bromide	mg/L	F	0.03	0.03	0.07	—	—	0.03
General	Carbonate	mg/L	F		0.50	1	—	—	1.00
General	Chloride	mg/L	F	7.78	6.43	0.066	250	NM GW Std	7.78
General	Fluoride	mg/L	F	0.23	0.20	0.017	1.6	NM GW Std	0.23
General	Nitrate as N	mg/L	F	2.41	1.78	0.017	10	NM GW Std	2.41
General	Nitrite as N	mg/L	F		0.00	0.002	10	NM GW Std	0.00
General	Perchlorate	µg/L	F		0.18	0.05	10	NM GW Std	0.05
General	Perchlorate	µg/L	UF		0.17	0.05	4	NM Consent Order Screening Value	0.05
General	Silicon Dioxide	mg/L	F	50.72	65.70	0.032	—	—	50.72
General	Sulfate	mg/L	F	40.03	34.80	0.193	250	EPA Secondary MCL	40.03
General	Total Dissolved Solids	mg/L	F		127.00	6.29	500	EPA Secondary MCL	127.00
General	Total Kjeldahl Nitrogen	mg/L	F		0.20	0.04	—	—	0.04
General	Total Organic Carbon	mg/L	F		0.30	0.46	—	—	0.46
General	Total Phosphate as P	mg/L	F	0.08	0.07	0.048	—	—	0.08
Metals	Aluminium	µg/L	F	1065.84	820.00	68	500	EPA Secondary MCL	1065.84
Metals	Antimony	µg/L	F		0.50	0.5	6	EPA Primary MCL	0.50
Metals	Arsenic	µg/L	F	4.32	3.00	6	10	EPA Primary MCL	4.32

Table 4.3-2b (continued)

Group	Constituent	Unit	Filtration	UTL	Maximum Value	Maximum Detection Limit	Standard	Standard Type	Screening Value
Metals	Barium	µg/L	F	71.83	58.00	1	1000	NM GW Std	71.83
Metals	Beryllium	µg/L	F		0.50	1	4	EPA Primary MCL	1.00
Group	Constituent	Unit	Filtration	UTL	Maximum Value	Maximum Detection Limit	Standard	Standard Type	Screening Value
Metals	Boron	µg/L	F	15.12	18.00	10	750	NM GW Std	15.12
Metals	Cadmium	µg/L	F		0.50	1	5	EPA Primary MCL	1.00
Metals	Calcium	mg/L	F	17.31	16.50	0.01	—	—	17.31
Metals	Chromium	µg/L	F		2.40	1	50	NM GW Std	1.00
Metals	Cobalt	µg/L	F		1.20	0.5	50	NM GW Std	0.50
Metals	Copper	µg/L	F	5.32	3.80	3	1000	NM GW Std	5.32
Metals	Iron	µg/L	F	839.99	480.00	20.6	300	EPA Secondary MCL	839.99
Metals	Lead	µg/L	F		0.30	0.5	15	EPA Screening Level	0.50
Metals	Lithium	µg/L	F	61.25	40.00	1	—	—	61.25
Metals	Magnesium	mg/L	F	6.12	5.86	0.01	—	—	6.12
Metals	Manganese	µg/L	F		3.63	2	50	EPA Secondary MCL	2.00
Metals	Mercury	µg/L	F		0.03	0.06	2	EPA Primary MCL	0.06
Metals	Mercury	µg/L	UF		0.04	0.06	2	EPA Primary MCL	0.06
Metals	Molybdenum	µg/L	F		4.30	2	1000	NM GW Std	2.00
Metals	Nickel	µg/L	F		29.00	1	100	EPA Primary MCL	1.00
Metals	Potassium	mg/L	F	10.03	10.00	0.05	—	—	10.03
Metals	Selenium	µg/L	F		1.25	6	50	NM GW Std	6.00
Metals	Selenium	µg/L	UF		8.50	6	50	NM GW Std	6.00
Metals	Silver	µg/L	F		0.50	1	50	NM GW Std	1.00
Metals	Silver	µg/L	UF		0.50	1	—	—	1.00
Metals	Sodium	mg/L	F	12.19	11.10	0.045	—	—	12.19

Table 4.3-2b (continued)

Metals	Strontium	µg/L	F	154.76	140.00	1	25000	EPA Secondary MCL	154.76
Metals	Thallium	µg/L	F		0.50	1	2	EPA Primary MCL	1.00
Metals	Tin	µg/L	F		1.25	3.26	—	—	3.26
Metals	Titanium	µg/L	F	8.96	9.00	1	—	—	8.96
Metals	Uranium	µg/L	F	0.72	0.60	0.2	30	NM GW Std	0.72
Metals	Vanadium	µg/L	F	4.91	4.00	1	80	EPA Secondary MCL	4.91
Metals	Zinc	µg/L	F		19.00	2	5000	EPA Secondary MCL	2.00
RAD	Americium-241	pCi/L	UF/F		0.11	0.044	1.2	DOE 4 mrem DCG	0.04
RAD	Cesium-137	pCi/L	UF/F		0.76	5.8	120	DOE 4 mrem DCG	5.80
RAD	Plutonium-238	pCi/L	UF/F		0.01	0.06	1.6	DOE 4 mrem DCG	0.06
RAD	Strontium-90	pCi/L	UF/F		0.05	0.287	8	EPA Primary MCL	0.29
RAD	Tritium	pCi/L	UF		7.54	0.861	20000	EPA Primary MCL	7.54
RAD	Uranium-234	pCi/L	UF/F		0.26	0.178	20	DOE 4 mrem DCG	0.18
RAD	Uranium-238	pCi/L	UF/F		0.20	0.19	24	DOE 4 mrem DCG	0.19

Note: Spaces left blank in UTL column intentionally. No UTL was calculated for constituents with fewer than 8 results or fewer than 50% detection.

[a] n/a = not applicable

NM GW Std = New Mexico Water Quality Control Commission Standards for Ground Water, 20.6.2.3103 NMAC

EPA Primary MCL = National Primary Drinking Water Regulations, 40CFR120, Part 141

EPA Secondary MCL = National Secondary Drinking Water Regulations, 40CFR120, Part 143

DOE 4 mrem DCG = Department of Energy Derived Concentration Guides for Drinking Water (1990), DOE Order 5400.5

— = No standard available

Table 4.3-2c
UTLs, Maximum Values, and Screening Values for Regional Groundwater

Group	Constituent	Unit	Filtration	UTL	Maximum Value	Maximum Detection Limit	Standard	Standard Type	Screening Value
Field	pH	SU	UF	6.91 / 8.64	8.96	n/a[a]	—	—	6.91 / 8.64
Field	Specific Conductance	uS/cm	UF	278.21	532.00	n/a	—	—	287.21
General	Alkalinity-HCO3+CO3	mg/L	F	156.60	152.00	2.90	—	—	156.60
General	Ammonia as N	mg/L	F		0.25	0.05	—	—	0.05
General	Bicarbonate	mg/L	F	132.30	126.00	1.45	—	—	132.30
General	Bromide	mg/L	F		0.18	0.098	—	—	0.10
General	Carbonate	mg/L	F		7.20	1.00	—	—	1.00
General	Chloride	mg/L	F	3.57	5.95	0.066	250	NM GW Std	3.57
General	Fluoride	mg/L	F	0.57	0.57	0.0553	1.6	NM GW Std	0.57
General	Nitrate as N	mg/L	F		0.53	0.003	10	NM GW Std	0.02
General	Nitrate+Nitrite as N	mg/L	F	0.89	1.05	0.017	10	NM GW Std	0.89
General	Nitrite as N	mg/L	F		0.00	0.002	10	NM GW Std	0.00
General	Perchlorate	µg/L	F	0.46	0.41	0.05	4	NM Consent Order Screening Value	0.46
General	Perchlorate	µg/L	UF		0.44	0.05	4	NM Consent Order Screening Value	0.05
General	Silicon Dioxide	mg/L	F	88.50	87.20	10	—	—	88.50
General	Sulfate	mg/L	F	7.20	8.63	0.193	250	EPA Secondary MCL	7.20
General	Total Dissolved Solids	mg/L	F	191.68	225.00	6.29	500	EPA Secondary MCL	191.68
General	Total Kjeldahl Nitrogen	mg/L	F		1.00	0.1	—	—	0.1
General	Total Organic Carbon	mg/L	F		0.46	0.46	—	—	0.46
General	Total Organic Carbon	mg/L	UF		1.37	0.33	—	—	0.33
General	Total Phosphate as P	mg/L	F		0.34	0.16	—	—	0.16

Table 4.3-2c (continued)

Group	Constituent	Unit	Filtration	UTL	Maximum Value	Maximum Detection Limit	Standard	Standard Type	Screening Value
Metals	Aluminium	µg/L	F		73.50	68	500	EPA Secondary MCL	68.00
Metals	Antimony	µg/L	F		1.00	1.00	6	EPA Primary MCL	1.00
Metals	Arsenic	µg/L	F		12	12	10	EPA Primary MCL	10.00
Metals	Barium	µg/L	F	56.83	115.00	1	1000	NM GW Std	56.83
Metals	Beryllium	µg/L	F		0.50	1	4	EPA Primary MCL	1.00
Metals	Boron	µg/L	F	38.77	51.60	10	750	NM GW Std	38.77
Metals	Cadmium	µg/L	F		0.50	1	5	EPA Primary MCL	1.00
Metals	Calcium	mg/L	F	24.88	41.70	0.04	—	—	24.88
Metals	Chromium	µg/L	F	5.75	7.20	5	50	NM GW Std	5.75
Metals	Cobalt	µg/L	F		7.00	1	50	NM GW Std	0.50
Metals	Copper	µg/L	F		5.00	3	1000	NM GW Std	3.00
Metals	Iron	µg/L	F		147.00	21.00	300	EPA Secondary MCL	21.00
Metals	Lead	µg/L	F		2.90	1.83	15	EPA Screening Level	1.83
Metals	Lithium	µg/L	F	27.40	25.00	1	—	—	27.40
Metals	Magnesium	mg/L	F	4.15	4.40	0.09			4.15
Metals	Manganese	µg/L	F		124.00	2.94	50	EPA Secondary MCL	2.94
Metals	Mercury	µg/L	F		0.26	0.07	2	EPA Primary MCL	0.07
Metals	Mercury	µg/L	UF		0.24	0.2	2	EPA Primary MCL	0.2
Metals	Molybdenum	µg/L	F		4.40	2	1000	NM GW Std	2.0
Metals	Nickel	µg/L	F		50.00	3.09	100	EPA Primary MCL	3.09
Metals	Potassium	mg/L	F	2.63	3.11	0.05	—	—	2.63
Metals	Selenium	µg/L	F		3.93	6	50	NM GW Std	6.00

Table 4.3-2c (continued)

Group	Constituent	Unit	Filtration	UTL	Maximum Value	Maximum Detection Limit	Standard	Standard Type	Screening Value
Metals	Selenium	µg/L	UF		4.99	6	50	NM GW Std	6.00
Metals	Silver	µg/L	F		2.50	1	50	NM GW Std	1.00
Metals	Silver	µg/L	UF		2.50	2	—	—	2.00
Metals	Sodium	mg/L	F	24.50	32.90	0.045	—	—	24.50
Metals	Strontium	µg/L	F	540.00	477.00	1	25000	EPA Secondary MCL	540.00
Metals	Thallium	µg/L	F		0.83	1	2	EPA Primary MCL	1.00
Metals	Tin	µg/L	F		3.60	3.26	—	—	3.26
Metals	Titanium	µg/L	F		1.00	1	—	—	1.00
Metals	Uranium	µg/L	F	1.90	2.50	0.2	30	NM GW Std	1.90
Metals	Vanadium	µg/L	F	13.41	29.70	1.1	80	EPA Secondary MCL	13.41
Metals	Zinc	µg/L	F		32.00	3.89	5000	EPA Secondary MCL	3.89
RAD	Americium-241	pCi/L	F		0.032	0.056	1.2	DOE 4 mrem DCG	0.056
RAD	Cesium-137	pCi/L	F		4.45	9.78	120	DOE 4 mrem DCG	9.78
RAD	Gross-Alpha Radiation	pCi/L	F		2.54	2.98	15	EPA Screening Level	2.98
RAD	Gross-Beta Radiation	pCi/L	F		14.10	4.0	50	EPA Screening Level	4.0
RAD	Gross-Gamma Radiation	pCi/L	F		123.00	648	—	—	648.00
RAD	Plutonium-238	pCi/L	F		0.025	0.06	1.6	DOE 4 mrem DCG	0.06
RAD	Strontium-90	pCi/L	F		4.49	0.48	8	EPA Primary MCL	0.48
RAD	Tritium	pCi/L	UF		11.43	0.32	20000	EPA Primary MCL	0.32

Table 4.3-2c (continued)

Group	Constituent	Unit	Filtration	UTL	Maximum Value	Maximum Detection Limit	Standard	Standard Type	Screening Value
RAD	Uranium-234	pCi/L	F	2.17	3.40	0.178	20	DOE 4 mrem DCG	2.17
RAD	Uranium-238	pCi/L	F	1.20	2.14	0.19	24	DOE 4 mrem DCG	1.20

Note: Spaces left blank in UTL column intentionally. No UTL was calculated for constituents with fewer than 8 results or fewer than 50% detection.

[a] n/a = not applicable

NM GW Std = New Mexico Water Quality Control Commission Standards for Ground Water, 20.6.2.3103 NMAC

EPA Primary MCL = National Primary Drinking Water Regulations, 40CFR120, Part 141

EPA Secondary MCL = National Secondary Drinking Water Regulations, 40CFR120, Part 143

DOE 4 mrem DCG = Department of Energy Derived Concentration Guides for Drinking Water (1990), DOE Order 5400.5

— = No standard available

Table 4.5-1
Correlation Coefficients for Major Anions, Major Cations, and Trace Elements

Variable	HCO_3	B	Ba	Ca	Cl	Cr	F	K	Mg	Na	NO_3	pH	Si	SO_4	Sr	U	V	TDS
HCO_3	1.00	***0.88***	0.32	0.29	***0.65***	0.10	***0.58***	0.21	-0.30	***0.94***	0.27	0.20	***-0.66***	***0.91***	***0.81***	***0.72***	0.15	***0.91***
B	***0.88***	1.00	0.25	0.14	***0.81***	0.07	***0.66***	0.11	***-0.38***	***0.91***	0.16	0.33	***-0.60***	***0.88***	***0.63***	***0.65***	0.04	***0.88***
Ba	0.32	0.25	1.00	***0.58***	0.23	0.22	0.16	***0.70***	***0.46***	0.16	0.05	***-0.41***	0.31	0.17	***0.57***	0.33	***0.40***	0.33
Ca	0.29	0.14	***0.58***	1.00	0.23	0.07	-0.03	***0.59***	***0.57***	0.06	0.15	***-0.47***	0.14	0.23	***0.72***	***0.46***	***0.48***	0.25
Cl	***0.65***	***0.81***	0.23	0.23	1.00	-0.17	***0.69***	0.04	-0.16	***0.71***	-0.01	0.18	-0.33	***0.77***	***0.49***	***0.54***	-0.08	***0.84***
Cr	0.10	0.07	0.22	0.07	-0.17	1.00	-0.15	0.30	0.12	0.07	***0.64***	-0.08	0.16	0.04	0.06	***0.41***	***0.62***	0.02
F	***0.58***	***0.66***	0.16	-0.03	***0.69***	-0.15	1.00	0.03	***-0.44***	***0.66***	-0.25	0.14	***-0.46***	***0.58***	***0.41***	0.31	-0.03	***0.67***
K	0.21	0.11	***0.70***	***0.59***	0.04	0.30	0.03	1.00	***0.56***	-0.01	-0.07	***-0.50***	***0.40***	-0.07	***0.47***	0.10	***0.54***	0.20
Mg	-0.30	***-0.38***	***0.46***	***0.57***	-0.16	0.12	***-0.44***	***0.56***	1.00	***-0.50***	-0.01	***-0.67***	***0.75***	***-0.42***	0.03	-0.09	0.23	-0.20
Na	***0.94***	***0.91***	0.16	0.06	***0.71***	0.07	***0.66***	-0.01	***-0.50***	1.00	0.25	***0.38***	***-0.73***	***0.93***	***0.65***	***0.69***	0.08	***0.90***
NO_3+NO_2-N	0.27	0.16	0.05	0.15	-0.01	***0.64***	-0.25	-0.07	-0.01	0.25	1.00	0.11	-0.20	***0.34***	0.18	***0.60***	***0.39***	0.16
pH	0.20	0.33	***-0.41***	***-0.47***	0.18	-0.08	0.14	***-0.50***	***-0.67***	***0.38***	0.11	1.00	***-0.51***	0.34	-0.18	0.03	-0.15	0.10
Si as SiO_2	***-0.66***	***-0.60***	0.31	0.14	-0.33	0.16	***-0.46***	***0.40***	***0.75***	***-0.73***	-0.20	***-0.51***	1.00	***-0.72***	***-0.43***	-0.44	0.19	***-0.49***
SO_4	***0.91***	***0.88***	0.17	0.23	***0.77***	0.04	***0.58***	-0.07	***-0.42***	***0.93***	***0.34***	0.34	***-0.72***	1.00	***0.71***	***0.77***	0.02	***0.88***
Sr	***0.81***	***0.63***	***0.57***	***0.72***	***0.49***	0.06	***0.41***	***0.47***	0.03	***0.65***	0.18	-0.18	***-0.43***	***0.71***	1.00	***0.71***	0.33	***0.71***
U	***0.72***	***0.65***	0.33	***0.46***	***0.54***	***0.41***	0.31	0.10	-0.09	***0.69***	***0.60***	0.03	***-0.44***	***0.77***	***0.71***	1.00	***0.46***	***0.68***
V	0.15	***0.04***	***0.40***	***0.48***	-0.08	***0.62***	-0.03	***0.54***	0.23	0.08	***0.39***	-0.15	0.19	0.02	0.33	***0.46***	1.00	0.05
TDS	***0.91***	***0.88***	0.33	0.25	***0.84***	0.02	***0.67***	0.20	-0.20	***0.90***	0.16	0.10	***-0.49***	***0.88***	***0.71***	***0.68***	0.05	1.00

Note: Correlations in bold and italicized are significant at $p < .05000$; N=34

Table 4.5-2
Principal Component Loadings (Unrotated/Rotated)

	PC1 unrotated	PC1 rotated	PC2 unrotated	PC2 rotated	PC3 unrotated	PC3 rotated
Bicarbonate (HCO_3-)	***-0.95***	***0.93***	0.06	0.08	0.03	0.19
Boron (B)	***-0.93***	***0.93***	-0.09	-0.03	0.11	0.06
Barium (Ba)	-0.29	0.25	***0.75***	***0.80***	0.24	0.11
Calcium (Ca)	-0.29	0.24	***0.78***	***0.80***	0.17	0.20
Chloride (Cl)	***-0.76***	***0.82***	-0.05	0.10	0.36	-0.19
Chromium (Cr)	-0.11	-0.07	0.43	0.13	***-0.74***	***0.85***
Fluoride (F)	-0.67	***0.75***	-0.20	-0.02	0.41	-0.31
Potassium (K)	-0.10	0.06	***0.83***	***0.85***	0.22	0.11
Magnesium (Mg)	0.38	-0.42	***0.78***	***0.78***	0.17	0.04
Sodium (Na)	***-0.95***	***0.95***	-0.17	-0.15	-0.02	0.16
Nitrate (NO_3+NO_2-N)	-0.30	0.13	0.20	-0.11	***-0.82***	***0.88***
pH	-0.27	0.27	-0.68	***-0.73***	-0.29	0.07
Silica (Si as SiO_2)	0.69	***-0.71***	0.54	0.54	0.12	-0.06
Sulfate (SO_4)	***-0.96***	***0.95***	-0.12	-0.10	-0.03	0.18
Strontium (Sr)	***-0.79***	***0.76***	0.45	0.50	0.17	0.16
Uranium (U)	***-0.81***	***0.70***	0.30	0.17	-0.34	0.58
Vanadium (V)	-0.18	0.04	0.65	0.45	-0.44	0.67
Eigenvalues	6.91	6.7	4.27	3.98	2.15	2.62
Percentage of Total Variance Explained by PC	0.41	0.39	0.25	0.23	0.13	0.15

Notes: Shaded cells indicate a change in loadings from unrotated to rotated >0.70. Numbers italicized and in bold are loadings that are >0.70.

Table 4.6-1
Analytical Results (ppm) for Selected Springs and Wells within the Sierra de los Valles

Date	Spring or Well	Al	Alkalinity (mg $CaCO_3$/L)	Ba	Ca	Cl	F	Fe	K	Mg	Mn	Na	NH_4	NO_3 (N)	PO_4 (P)	SO_4	Sr	TDS
June 2000	Water Canyon Gallery	0.012	41.1	0.009	7.04	0.91	0.07	0.03	1.58	3.13	[0.001]	5.6	[0.02]	0.36	[0.02]	1.14	0.049	113[a]
	Cañon de Valle-5.0	0.042	51.6	0.028	12.2	1.24	0.06	0.07	2.86	3.31	0.015	4.9	0.03	0.35	0.14	3.36	0.088	134[a]
	Pine Spring	0.12	64.2	0.059	18.3	2.98	0.10	0.16	5.55	4.15	0.32	6.4	0.12	0.27	0.33	16.5	0.12	181[a]
	Apache Spring	0.045	55.0	0.072	13.2	16.9	0.05	0.08	4.56	5.02	0.009	10.4	[0.02]	0.26	0.03	5.26	0.11	178[a]
7/11/05 (UF)	Water Canyon Gallery	0.0034	40.7	0.0016	7.08	0.99	0.04	0.001	1.65	3.47	[0.001]	5.82	N/A	0.26	0.019	2.96	0.055	97[b]
7/11/05 (UF)	Cañon de Valle-5.0	0.021	34.7	0.035	9.86	3.2	0.05	0.001	3.62	3.79	[0.001]	5.93	N/A	0.76	0.055	14.2	0.089	N/A
8/03/06 (F)	LAO-B	0.068	76	0.0386	17.3	7.36	0.143	0.026	3.82	4.96	[0.002]	11.6	0.067	0.102	0.04	5.55	0.111	139

Note: [0.001] means less than detection with the method detection limit given in brackets. UF= unfiltered. F=Filtered

[a] Concentrations of TDS were calculated from the summation of solutes.

[b] Data from 8/26/03.

Appendix A

Samples Suites Taken after 2000 and
UTL Data Transformations

Tables

Table A-1 Post-2000 Samples and Types of Analyses A-1
Table A-2 Data Transformations Selected for UTL Calculations.. A-12

Table A-1
Post-2000 Samples and Types of Analyses

Location	Prep	Lab Code	Date MM/DD/YY	General Inorganics	Metals	Radioactives	Tritium	Field Parameters	Comments
Ancho Spring	F	GELC	09/26/00	x	x	x			
Ancho Spring	UF	GELC	09/26/00					x	
Ancho Spring	F	GELC	10/24/01	x	x	x			
Ancho Spring	UF	GELC	10/24/01					x	
Ancho Spring	F	GELC	02/02/05	x	x	x			
Ancho Spring	UF	GELC	02/02/05				x	x	
Ancho Spring	F	GELC	09/19/06	x	x	x			
Ancho Spring	UF	GELC	09/19/06	x	x	x		x	
Barbara Spring	F	EES 6	03/29/05	x	x	x		x	rads are uranium (U) only
Barbara Spring	F	EES 6	05/12/05	x	x	x		x	field parameters are pH, alkalinity, specific conductance, total sulfide, iron
Barbara Spring	F	EES 6	06/15/05	x	x	x		x	
Barbara Spring	F	EES 6	07/13/05	x	x	x		x	
Campsite Spring	F	EES 6	05/17/05	x	x	x		x	rads are U only
Campsite Spring	F	EES 6	06/08/05	x	x	x		x	field parameters are pH, alkalinity, specific conductance, total sulfide, iron
Campsite Spring	F	EES 6	07/14/05	x	x	x		x	
CDV-5.0 Spring	F	EES 6	03/03/05	x	x	x		x	rads are U only
CDV-5.0 Spring	F	EES 6	04/18/05	x	x	x		x	field parameters are pH, alkalinity, specific conductance, total sulfide, iron
CDV-5.0 Spring	F	EES 6	05/27/05	x	x	x		x	
CDV-5.0 Spring	F	EES 6	07/11/05	x	x	x		x	
Guaje-1A	SW	GELC/PARA/UMTL	03/07/00			x	x	x	pH is the only field parameter
Guaje-1A	SW	GELC/PARA	08/14/00			x			
Guaje-1A	SW	NMSSL	09/27/00	x	x				
Guaje-1A	SW	GELC	11/15/00			x		x	pH is the only field parameter
Guaje-1A	SW	GELC	11/15/00			x		x	
Guaje-1A	SW	GELC/UMTL	02/14/01			x	x		
Guaje-1A	SW	GELC	05/09/01	x		x		x	
Guaje-1A	SW	GELC	08/08/01			x			
Guaje-1A	SW	GELC	11/28/01			x			
Guaje-1A	SW	GELC/UMTL	02/23/02			x	x		
Guaje-1A	SW	GELC	05/18/02			x		x	
Guaje-1A	SW	GELC/UMTL	08/24/02	x		x	x		
Guaje-1A	SW	GELC	11/16/02			x		x	pH is the only field parameter
Guaje-1A	SW	GELC	02/08/03			x			
Guaje-1A	SW	GELC/UMTL	05/14/03			x	x		
Guaje-1A	SW	GELC	08/21/03	x		x		x	
Guaje-1A	SW	GELC	08/21/03			x			

Table A-1 (continued)

Location	Prep	Lab Code	Date MM/DD/YY	General Inorganics	Metals	Radioactives	Tritium	Field Parameters	Comments
Guaje-1A	SW	GELC	11/24/03	x	x	x			
Guaje-1A	SW	GELC	02/09/04	x		x		x	perchlorate only general
Guaje-1A	SW	GELC	05/19/04	x	x	x	x		
Guaje-1A	SW	GELC	05/18/05	x	x	x	x	x	pH only field parameter
Guaje-1A	SW	GELC	02/22/06	x	x	x			
Guaje-1A	SW	n.a.	02/22/06	x	x	x		x	pH only field parameter
Guaje-2A	SW	PARA/UMTL	03/07/00			x	x	x	
Guaje-2A	SW	PARA/UMTL	06/20/00			x		x	
Guaje-2A	SW	GELC/EES6	08/14/00			x		x	
Guaje-2A	SW	NMSSL	09/27/00	x	x				
Guaje-2A	SW	GELC/EES6/UMTL	11/15/00			x		x	
Guaje-2A	SW	GELC/EES6/UMTL	05/09/01	x		x	x	x	
Guaje-2A	SW	GELC/EES6	08/08/01			x			
Guaje-2A	SW	GELC/EES6	11/28/01			x			
Guaje-2A	SW	GELC/EES6/UMTL	02/23/02			x	x		
Guaje-2A	SW	GELC/EES6	05/18/02			x		x	
Guaje-2A	SW	GELC/EES6/UMTL	08/24/02	x		x	x	x	
Guaje-2A	SW	GELC/EES6	11/16/02			x		x	
Guaje-2A	SW	GELC/EES6	02/08/03			x			
Guaje-2A	SW	GELC/EES6	08/21/03	x		x		x	
Guaje-2A	SW	GELC/EES6	11/24/03	x	x	x			
Guaje-2A	SW	GELC/EES6	02/09/04	x		x		x	perchlorate only general
Guaje-2A	SW	GELC/EES6	05/19/04	x	x	x		x	
Guaje-2A	SW	GELC/EES6/UMTL	05/18/05	x	x	x	x	x	
Guaje-2A	SW	GELC/EES6	05/17/06		x				
Guaje-2A	SW	GELC/EES6/UMTL	05/17/06	x	x	x	x	x	
Guaje-3A	SW	PARA/UMTL	03/06/00			x	x	x	pH only general
Guaje-3A	SW	PARA	06/20/00			x		x	pH only general
Guaje-3A	SW	GELC	08/03/00			x		x	pH only general
Guaje-3A	SW	PARA/GELC	08/14/00			x		x	pH only general
Guaje-3A	SW	NMSSL	09/27/00	x	x				
Guaje-3A	SW	GELC	11/15/00			x		x	pH only general
Guaje-3A	SW	GELC/UMTL	02/14/01			x	x		
Guaje-3A	SW	GELC	05/09/01	x		x		x	
Guaje-3A	SW	GELC	08/08/01			x			
Guaje-3A	SW	GELC	11/28/01			x			
Guaje-3A	SW	GELC/UMTL	02/23/02			x	x		
Guaje-3A	SW	GELC	05/18/02			x		x	

Table A-1 (continued)

Location	Prep	Lab Code	Date MM/DD/YY	General Inorganics	Metals	Radioactives	Tritium	Field Parameters	Comments
Guaje-3A	SW	GELC/UMTL	08/24/02	x		x	x	x	
Guaje-3A	SW	GELC	12/18/02			x		x	
Guaje-3A	SW	GELC	02/08/03			x			
Guaje-3A	SW	GELC/UMTL	05/20/03			x	x		
Guaje-3A	SW	GELC	08/21/03	x				x	
Guaje-3A	SW	GELC	11/24/03	x	x	x			
Guaje-3A	SW	GELC	02/09/04	x		x		x	perchlorate only
Guaje-3A	SW	GELC	05/19/04		x	x		x	
Guaje-3A	SW	GELC/UMTL	05/18/05	x	x	x	x	x	
Guaje-3A	SW	GELC	05/17/06	x	x				chromium (Cr) only
Guaje-3A	SW	GELC/UMTL	05/17/06	x	x	x	x	x	
Guaje-4A	SW	PARA/UMTL	3/6/00			x	x		
Guaje-4A	SW	PARA	06/20/00			x		x	
Guaje-4A	SW	GELC	08/14/00			x		x	
Guaje-4A	SW	PARA	08/15/00			x		x	
Guaje-4A	SW	NMSSL	09/27/00	x	x	x			
Guaje-4A	SW	GELC	11/15/00			x		x	
Guaje-4A	SW	GELC	11/15/00			x		x	
Guaje-4A	SW	GELC/UMTL	02/14/01			x	x		
Guaje-4A	SW	GELC	05/09/01	x		x		x	
Guaje-4A	SW	GELC	08/08/01			x			
Guaje-4A	SW	GELC	11/28/01			x			
Guaje-4A	SW	GELC/UMTL	02/23/02			x	x		
Guaje-4A	SW	GELC	08/24/02	x				x	
Guaje-4A	SW	GELC	11/16/02			x		x	
Guaje-4A	SW	GELC	02/08/03			x			
Guaje-4A	SW	GELC/UMTL	05/20/03			x	x		
Guaje-4A	SW	GELC	08/21/03	x		x		x	
Guaje-4A	SW	GELC	11/24/03	x	x	x			
Guaje-4A	SW	GELC	02/09/04	x		x		x	perchlorate only general
Guaje-4A	SW	GELC/UMTL	05/19/04	x	x	x	x	x	
Guaje-4A	SW	GELC/UMTL	05/18/05	x	x	x	x	x	
Guaje-4A	SW	GELC	05/17/06		x				Cr only
Guaje-4A	SW	GELC/UMTL	05/17/06	x	x	x	x	x	
Guaje-5A	SW	GELC/UMTL	08/08/01			x	x		
Guaje-5A	SW	GELC	11/28/01			x			
Guaje-5A	SW	GELC/UMTL	02/23/02			x	x		
Guaje-5A	SW	GELC/UMTL	08/24/02	x		x	x	x	

Table A-1 (continued)

Location	Prep	Lab Code	Date MM/DD/YY	General Inorganics	Metals	Radioactives	Tritium	Field Parameters	Comments
Guaje-5A	SW	GELC	11/16/02			x			
Guaje-5A	SW	GELC	02/08/03			x			
Guaje-5A	SW	GELC/UMTL	05/20/03			x	x		
Guaje-5A	SW	GELC	08/21/03	x		x		x	
Guaje-5A	SW	GELC	08/21/03					x	
Guaje-5A	SW	GELC	11/24/03	x	x	x			
Guaje-5A	SW	GELC	02/09/04	x		x		x	perchlorate only general
Guaje-5A	SW	GELC/UMTL	05/19/04	x	x	x	x	x	
Guaje-5A	SW	GELC/UMTL	05/18/05	x	x	x	x	x	
Guaje-5A	SW	GELC	05/17/06		x				Cr only metals
Guaje-5A	SW	GELC/UMTL	05/17/06	x	x	x	x	x	
LAO-B	SW	EES 6	03/03/05	x		x		x	
LAO-B	SW	EES 6/GELC	05/10/05	x	x	x		x	
LAO-B	SW	EES 6/GE:C	05/10/05	x	x			x	
LAO-B	SW	EES6	08/17/05	x	x	x		x	
LAO-B	SW	GELC	08/03/06	x	x	x		x	
LAO-B	SW	GELC/UMTL	08/03/06	x	x	x	x	x	
LAOI-1.1(a)	SW	GELC/UMTL	06/03/04	x	x	x	x	x	
LAOI-1.1(a)	SW	EES6	03/04/05	x	x	x		x	U only rad
LAOI-1.1(a)	SW	n.a.	03/07/05					x	
LAOI-1.1(a)	SW	GELC	05/07/05	x					nitrate only general
LAOI-1.1(a)	SW	GELC/UMTL	05/07/05	x	x	x	x	x	
LAOI-1.1(a)	SW	GELC	08/04/06	x	x	x			
LAOI-1.1(a)	SW	GELC/UMTL	08/04/06	x	x	x	x	x	
PM-2	SW	PARA/UMTL	02/14/00			x	x	x	strontium (Sr) only rad
PM-2	SW	n.a.	02/15/00					x	
PM-2	SW	PARA	06/20/00			x		x	Sr only rad
PM-2	SW	GELC/PARA	08/14/00			x		x	Sr only rad
PM-2	SW	NMSSL	09/27/00	x	x				
PM-2	SW	GELC	11/15/00	x		x		x	Sr only rad
PM-2	SW	GELC/UMTL	02/14/01			x	x		Sr only rad
PM-2	SW	GELC	05/09/01	x		x		x	
PM-2	SW	GELC	08/08/01			x			Sr only rad
PM-2	SW	n.a.	09/05/01	x					
PM-2	SW	GELC	11/28/01	x		x			Sr only rad
PM-2	SW	GELC/UMTL	02/23/02	x		x	x		Sr only rad
PM-2	SW	GELC/UMTL	05/18/02	x		x	x	x	
PM-2	SW	GELC	08/24/02	x		x		x	Sr only rad

Table A-1 (continued)

Location	Prep	Lab Code	Date MM/DD/YY	General Inorganics	Metals	Radioactives	Tritium	Field Parameters	Comments
PM-2	SW	GELC	10/09/02	x	x			x	
PM-2	SW	GELC	11/16/02	x		x			Sr only rad
PM-2	SW	GELC	02/08/03	x		x			Sr only rad
PM-2	SW	GELC/UMTL	05/20/03	x		x	x		Sr only rad
PM-2	SW	GELC	08/04/03	x		x		x	Sr only rad
PM-2	SW	GELC	08/21/03	x		x		x	
PM-2	SW	n.a.	09/24/03					x	
PM-2	SW	n.a.	10/29/03					x	
PM-2	SW	GELC	11/24/03	x	x	x			
PM-2	SW	GELC	12/17/03	x		x		x	Sr only rad
PM-2	SW	GELC	02/09/04	x		x		x	Sr only rad
PM-2	SW	n.a.	03/24/04	x					perchlorate only general
PM-2	SW	GELC/UMTL	05/20/04	x	x	x	x	x	
PM-2	SW	GELC	08/31/04	x				x	perchlorate only general
PM-2	SW	GELC	11/16/04	x				x	perchlorate only general
PM-2	SW	n.a.	03/23/05	x				x	perchlorate only general
PM-2	SW	GELC/UMTL	05/18/05	x	x	x	x	x	
PM-2	SW	GELC	08/17/05	x				x	perchlorate only general
PM-2	SW	UMTL	11/16/05	x			x	x	perchlorate only general
PM-2	SW	GELC	01/19/06	x				x	perchlorate only general
PM-2	SW	GELC	05/24/06		x				Cr only metal
PM-2	SW	GELC/UMTL	05/24/06	x		x	x	x	
PM-2	SW	GELC	08/24/06		x				Cr only metal
PM-2	SW	GELC	08/24/06	x	x			x	perchlorate only general, chromium only metal
PM-4	SW	PARA	06/21/00			x			Sr only rad
PM-4	SW	UMTL	07/07/00				x		
PM-4	SW	PARA/GELC	08/03/00			x		x	Sr only rad
PM-4	SW	PARA/GELC	08/14/00			x		x	Sr only rad
PM-4	SW	GELC	11/15/00			x		x	Sr only rad
PM-4	SW	GELC/UMTL	02/14/01			x	x		Sr only rad
PM-4	SW	GELC	05/09/01	x		x		x	
PM-4	SW	GELC	08/08/01			x			Sr only rad
PM-4	SW	GELC	09/05/01	x					
PM-4	SW	GELC	11/28/01	x		x			Sr only rad
PM-4	SW	GELC/UMTL	02/23/02	x		x	x		Sr only rad
PM-4	SW	GELC	10/09/02		x				
PM-4	SW	GELC/UMTL	06/18/03	x			x		
PM-4	SW	GELC	08/21/03	x		x			

Table A-1 (continued)

Location	Prep	Lab Code	Date MM/DD/YY	General Inorganics	Metals	Radioactives	Tritium	Field Parameters	Comments
PM-4	SW	n.a.	06/07/04					x	
PM-4	SW	GELC/UMTL	02/15/05	x	x	x	x	x	
PM-4	SW	GELC/UMTL	02/22/06	x	x	x	x	x	
PM-4	SW	GELC	05/09/06	x	x				perchlorate only general, chromium only metal
PM-5	SW	PARA/UMTL	02/14/00			x	x	x	Sr only rad
PM-5	SW	n.a.	02/15/00					x	
PM-5	SW	PARA	06/20/00			x		x	Sr only rad
PM-5	SW	GELC/PARA	08/14/00			x		x	Sr only rad
PM-5	SW	NMSSL	09/27/00	x	x				
PM-5	SW	GELC	11/15/00			x		x	Sr only rad
PM-5	SW	GELC	02/14/01			x			Sr only rad
PM-5	SW	UMTL	02/14/01				x		
PM-5	SW	GELC	05/09/01	x		x		x	
PM-5	SW	n.a.	07/11/01					x	
PM-5	SW	GELC	08/08/01			x			Sr only rad
PM-5	SW	GELC	09/05/01	x					
PM-5	SW	GELC	11/28/01	x		x			Sr only rad
PM-5	SW	GELC/UMTL	02/23/02	x		x	x		Sr only rad
PM-5	SW	GELC	05/18/02	x		x		x	Sr only rad
PM-5	SW	n.a.	06/26/02					x	
PM-5	SW	GELC	08/24/02	x		x		x	Sr only rad
PM-5	SW	n.a.	09/25/02					x	
PM-5	SW	GELC	10/09/02		x			x	
PM-5	SW	GELC	11/16/02	x		x		x	Sr only rad
PM-5	SW	GELC/UMTL	05/14/03	x		x	x		Sr only rad
PM-5	SW	GELC	08/21/03	x		x		x	
PM-5	SW	n.a.	09/24/03					x	
PM-5	SW	GELC/UMTL	10/29/03	x		x	x	x	Sr only rad
PM-5	SW	GELC	11/24/03	x	x	x			
PM-5	SW	n.a.	12/17/03					x	
PM-5	SW	GELC	01/28/04	x				x	perchlorate only general
PM-5	SW	GELC	02/09/04	x		x		x	Sr only rad
PM-5	SW	GELC	03/24/04	x				x	perchlorate only general
PM-5	SW	GELC/UMTL	05/20/04	x	x	x	x	x	
PM-5	SW	GELC	08/31/04	x				x	perchlorate only general
PM-5	SW	GELC/UMTL	11/16/04	x		x		x	perchlorate only general
PM-5	SW	GELC	03/23/05	x				x	perchlorate only general
PM-5	SW	GELC/UMTL	05/18/05	x	x	x	x	x	

Table A-1 (continued)

Location	Prep	Lab Code	Date MM/DD/YY	General Inorganics	Metals	Radioactives	Tritium	Field Parameters	Comments
PM-5	SW	GELC	08/17/05	x				x	perchlorate only general
PM-5	SW	GELCU	11/16/05	x		x		x	perchlorate only general
PM-5	SW	GELC	01/19/06	x	x				
PM-5	SW	GELC	01/19/06	x	x	x		x	U only rad
PM-5	SW	GELC	05/24/06		x				Cr only metal
PM-5	SW	GELC	05/24/06	x	x	x	x	x	
PM-5	SW	GELC	08/24/06	x	x			x	perchlorate only general, chromium only metal
PM-5	SW	GELC	08/24/06		x				Cr only metal
R-1	F	GELC	05/19/05	x	x			x	
R-1	UF	GELC/EES6/UMTL	05/19/05	x	x	x	x		
R-1	F	GELC	09/12/05	x	x	x			U only rad
R-1	UF	GELC/EES6/UMTL	09/12/05	x	x	x	x	x	
R-1	F	GELC	11/28/05	x	x	x			U only rad
R-1	UF	GELC/EES/UMTL	11/28/05	x	x	x	x	x	
R-1	F	GELC	01/25/06	x	x	x			U only rad
R-1	UF	GELC/EES/UMTL	01/25/06	x	x	x	x	x	
R-1	F	EES6	04/19/06		x			x	Cr only metal
R-1	UF	GELC/EES6	04/19/06		x				Cr only metal
R-1	F	GELC	07/06/06	x	x	x			
R-1	UF	GELC/UMTL	07/06/06	x	x	x	x		
R-1	UF	n.a.	10/26/06					x	
R-13	F	GEL	04/18/02	x	x	x			
R-13	UF	GEL/UMTL	04/18/02	x	x	x	x		
R-13	UF	GEL/UMTL	07/03/02	x	x	x	x		
R-13	F	GEL	07/03/02	x	x	x			
R-13	F	GEL	10/28/02	x	x	x			
R-13	UF	GEL/UMTL	10/28/02	x	x	x	x		
R-13	F	GEL	01/27/03	x	x	x			
R-13	UF	GEL/UMTL	01/27/03	x	x	x	x		
R-13	F	GEL	05/22/03	x	x	x			
R-13	UF	GEL/UMTL	05/22/03	x	x	x	x		
R-13	UF	GELC/UMTL	12/09/03	x	x	x	x		
R-13	UF	GELC/UMTL	06/11/04	x	x	x		x	
R-13	UF	EES6	03/10/05	x	x	x		x	U only rad
R-13	F	GELC	05/26/05	x					
R-13	UF	GELC/UMTL	05/26/05	x			x	x	
R-13	F	GELC	09/01/05	x					
R-13	UF	GELC/EES6	09/01/05	x	x	x	x	x	U only rad

Table A-1 (continued)

Location	Prep	Lab Code	Date MM/DD/YY	General Inorganics	Metals	Radioactives	Tritium	Field Parameters	Comments
R-13	F	GELC	02/02/06	x	x	x			U only rad
R-13	UF	GELC	02/02/06	x	x	x	x	x	U only rad
R-13	F	GELC	07/03/06	x	x	x			
R-13	UF	GELC/UMTL	07/03/06	x	x	x	x	x	
R-13	UF	n.a.	10/25/06					x	
R-21	F	GELC	03/31/04	x	x	x			U only rad
R-21	UF	GELC/EES6/UMTL	03/31/04	x	x	x	x	x	
R-21	F	GELC	06/30/04	x	x	x			U only rad
R-21	UF	GELC/EES6/UMTL	06/30/04	x	x	x	x		
R-21	F	GELC	09/23/04	x	x	x			U only rad
R-21	UF	GELC/EES6/UMTL	09/23/04	x	x	x	x	x	
R-21	F	GELC	12/14/04	x	x	x			U only rad
R-21	UF	GELC/EES6/UMTL	12/14/04	x	x	x	x		
R-21	F	GELC	06/06/05	x	x	x			
R-21	UF	GELC	06/06/05	x	x	x		x	
R-21	F	GELC	07/07/06						
R-21	UF	GELC	07/07/06	x	x	x	x	x	
R-21	UF	n.a.	11/06/06					x	
Sacred Spring	F	GELC	10/19/00	x		x			
Sacred Spring	UF	n.a.	10/19/00					x	
Sacred Spring	F	GELC	10/23/01	x	x	x			
Sacred Spring	UF	GELC	10/23/01		x			x	mercury (Hg) and selenium (Se) only metals
Sacred Spring	F	GELC	10/23/01	x	x	x			
Sacred Spring	UF	GELC	10/23/01		x			x	Hg and Se only metals
Sacred Spring	F	GELC	06/25/02	x		x			
Sacred Spring	UF	UMTL	06/25/02				x	x	
Sacred Spring	F	GELC	07/23/03	x		x			
Sacred Spring	UF	n.a.	07/23/03					x	
Sacred Spring	F	GELC	08/24/04	x	x	x			
Sacred Spring	UF	GELC	08/24/04	x	x			x	perchlorate only general, Hg and Se only metals
Sacred Spring	F	GELC	07/13/05	x	x	x			
Sacred Spring	UF	GELC	07/13/05	x	x	x		x	
Sacred Spring	F	GELC	09/14/06	x	x	x			
Sacred Spring	UF	GELC/UMTL	09/14/06	x	x	x	x	x	
Seven Springs	F	EES6	03/10/05	x	x	x		x	U only rad
Seven Springs	F	EES6	05/09/05	x	x	x		x	U only rad
Seven Springs	F	EES6	06/23/05	x	x	x		x	U only rad
Seven Springs	F	EES6	07/15/05	x	x	x		x	U only rad

Table A-1 (continued)

Location	Prep	Lab Code	Date MM/DD/YY	General Inorganics	Metals	Radioactives	Tritium	Field Parameters	Comments
Spring 1	F	GELC	09/25/00	x		x			
Spring 1	UF	n.a.	09/25/00					x	
Spring 1	UF	GELC	09/24/01		x			x	Hg and Se only metals
Spring 1	F	GELC	09/24/01	x	x	x			
Spring 1	F	GELC	11/06/02	x		x			
Spring 1	UF	UMTL	11/06/02				x	x	
Spring 1	F	GELC	10/06/03	x		x			
Spring 1	UF	n.a.	10/06/03					x	
Spring 1	F	GELC	09/13/04	x	x	x			
Spring 1	UF	GELC/UMTL	09/13/04	x	x		x	x	perchlorate only general, Hg and Se only metals
Spring 1	F	GELC	09/26/05	x	x	x			
Spring 1	UF	GELC	09/26/05	x	x	x		x	
Spring 1	F	GELC	09/18/06	x	x	x			
Spring 1	UF	GELC/UMTL	09/18/06	x	x	x	x	x	
Spring 5B	F	GELC	07/26/00	x	x	x			
Spring 5B	UF	n.a.	07/26/00					x	
Spring 5B	F	GELC	10/07/03	x	x	x			
Spring 5B	UF	GELC/UMTL	10/07/03		x		x	x	Hg and Se only metals
Spring 6	F	GELC	09/26/00	x	x	x			
Spring 6	UF	n.a.	09/26/00					x	
Spring 6	F	GELC	09/24/02	x	x	x			
Spring 6	UF	GELC/UMTL	09/24/02		x		x	x	Hg and Se only metals
Spring 6	UF	GELC	03/12/04	x				x	perchlorate only general
Spring 6	F	GELC	09/14/04	x	x	x			
Spring 6	UF	GELC/UMTL	09/14/04	x	x		x	x	perchlorate only general, Hg and Se only metals
Spring 6	F	EES6	03/24/05	x	x	x		x	U only rad
Spring 6	F	EES6	04/29/05	x	x	x		x	U only rad
Spring 6	F	EES6	07/25/05	x	x	x		x	U only rad
Spring 6	F	GELC	09/27/05	x	x	x			
Spring 6	UF	GELC	09/27/05	x	x	x		x	
Spring 6	F	GELC	09/19/06	x	x	x			
Spring 6	UF	GELC	09/19/06	x	x			x	
Spring 6A	UF	GELC	09/25/01		x			x	Hg and Se only metals
Spring 6A	F	GELC	09/25/01	x	x	x			
Spring 6A	F	GELC	10/07/03	x	x	x			
Spring 6A	UF	GELC/UMTL	10/07/03		x		x	x	Hg and Se only metals
Spring 6A	UF	GELC	03/12/04	x				x	perchlorate only general
Spring 6A	F	GELC	09/14/04	x	x	x			

Table A-1 (continued)

Location	Prep	Lab Code	Date MM/DD/YY	General Inorganics	Metals	Radioactives	Tritium	Field Parameters	Comments
Spring 6A	UF	GELC/UMTL	09/14/04	x	x		x	x	perchlorate only general, Hg and Se only metals
Spring 6A	F	GELC	09/27/05	x	x	x			
Spring 6A	UF	GELC	09/27/05	x	x	x		x	
Spring 6A	F	GELC	09/19/06	x	x	x			
Spring 6A	UF	GELC	09/19/06	x	x	x		x	
Spring 8A	F	GELC	09/26/00	x	x	x			
Spring 8A	UF	GELC	09/26/00	x					total suspended solids (TSS) only general
Spring 8A	F	GELC	10/07/03	x	x	x			
Spring 8A	UF	GELC/UMTL	10/07/03		x		x	x	Hg and Se only metals
Spring 8A	UF	GELC	03/18/04	x				x	perchlorate only general
Spring 8A	F	GELC	01/26/05	x	x	x			
Spring 8A	UF	GELC/UMTL	01/26/05	x	x		x	x	perchlorate only general, Hg and Se only metals
Spring 8A	F	GELC	09/19/06	x	x	x			
Spring 8A	UF	GELC	09/19/06	x	x	x		x	
Spring 9	UF	GELC	09/25/01		x			x	Hg and Se only metals
Spring 9	F	GELC	09/26/01	x	x	x			
Spring 9	F	GELC	10/08/03	x	x	x			
Spring 9	UF	GELC/UMTL	10/08/03		x		x	x	Hg and Se only metals
Spring 9	UF	GELC	03/18/04	x				x	perchlorate only general
Spring 9	F	GELC	09/14/04	x	x	x			
Spring 9	UF	GELC/UMTL	09/14/04	x	x		x	x	perchlorate only general, Hg and Se only metals
Spring 9	F	GELC	09/28/05	x	x	x			
Spring 9	UF	GELC	09/28/05	x	x	x		x	
Spring 9	F	GELC	09/19/06	x	x				
Spring 9	UF	GELC	09/19/06	x	x			x	
Spring 9A	F	GELC	09/27/00	x	x	x			
Spring 9A	UF	n.a.	09/27/00					x	
Spring 9A	F	GELC	10/08/03	x	x	x			
Spring 9A	UF	GELC/UMTL	10/08/03		x		x	x	Hg and Se only metals
Spring 9A	UF	GELC	03/18/04	x				x	perchlorate only general
Spring 9A	F	GELC	09/14/04	x	x	x			
Spring 9A	UF	GELC/UMTL	09/14/04	x	x		x	x	perchlorate only general, Hg and Se only metals
Spring 9A	F	EES6	03/08/05	x	x	x		x	U only rad
Spring 9A	F	EES6	04/29/05	x	x	x		x	U only rad
Spring 9A	F	EES6	05/18/05	x	x	x		x	U only rad
Spring 9A	F	EES6	07/20/05	x	x	x		x	U only rad
Spring 9A	F	GELC	09/28/05	x	x	x			
Spring 9A	UF	GELC	09/28/05	x	x	x		x	

Table A-1 (continued)

Location	Prep	Lab Code	Date MM/DD/YY	General Inorganics	Metals	Radioactives	Tritium	Field Parameters	Comments
Spring 9A	F	GELC	09/20/06	x	x	x			
Spring 9A	UF	GELC	09/20/06	x	x	x		x	
Pine Spring	UF	PARA/HUFF/GELC	02/10/98	x	x	x		x	
Pine Spring	UF	PARA/HUFF/GELC	02/10/98	x	x	x		x	
Pine Spring	UF	PARA/HUFF/GELC/UMTL	07/14/98	x	x	x	x		
Pine Spring	F	PARA/HUFF/GELC	01/06/00	x	x	x			
Pine Spring	F	PARA/HUFF/GELC	03/30/00	x	x	x			
Spring 9B	UF	PARA/HUFF/GELC	09/23/98	x	x	x			
Spring 9B	F	PARA/HUFF/GELC	01/07/00	x	x				
Spring 9B	F	PARA/HUFF/GELC	04/06/2000	x	x				
Water Canyon Gallery	UF	n.a.	08/15/00					x	pH only field param
Water Canyon Gallery	F	GELC	11/29/01	x	x			x	
Water Canyon Gallery	UF	GELC	11/29/01	x		x		x	TSS only general
Water Canyon Gallery	UF	GELC	09/09/02	x				x	
Water Canyon Gallery	UF	GELC	08/26/03	x		x		x	
Water Canyon Gallery	F	EES-6	03/04/05	x	x	x		x	U only rad
Water Canyon Gallery	F	EES-6	04/18/05	x	x	x		x	U only rad
Water Canyon Gallery	F	EES-6	05/27/05	x	x	x		x	U only rad
Water Canyon Gallery	F	EES-6	07/11/05	x	x	x		x	U only rad

x = analyzed
GEL or GELC = General Engineering Laboratories
PARA = Paragon Laboratory
UMTL = University of Miami Tritium Laboratory
HUFF = Huffman Laboratories
EES6 = Los Alamos National Laboratory, Earth and Environmental Science Group 6 Laboratory
CDV-5.0 Spring = Cañon de Valle Spring
n.a. = not available
UF = unfiltered
F = filtered
SW = supply well. Unfiltered data from supply wells were used as filtered data when notation says “SW.”
Blank fields indicate no applicable information or no analysis performed

Table A-2
Data Transformations Selected for UTL Calculations

Analyte	Regional Aquifer	Intermediate GW Zone	Alluvial GW Zone
Al	n.c.	Natural Log	Nonparametric
As	n.c.	Nonparametric	n.c.
B	Natural Log	Natural Log	Natural Log
Ba	Natural Log	Square Root	None
Br	n.c.	Nonparametric	n.c.
Ca	Natural Log	Natural Log	None
Cl	Square Root	Nonparametric	Natural Log
ClO4	None	n.c.	Square Root
Cr	None	n.c.	n.c.
Cu	n.c.	Natural Log	n.c.
F	None	None	None
Fe	n.c.	Natural Log	Nonparametric
Field Conductivity	Natural Log	Natural Log	n.c.
Field pH	None	None	n.c.
HCO3	Natural Log	n.c.	n.c.
K	Natural Log	Natural Log	Natural Log
Lab Conductivity	Natural Log	n.c.	n.c.
Lab pH	None	Square Root	None
Li	None	Natural Log	None
Mg	None	Natural Log	Natural Log
Mo	Natural Log	n.c.	n.c.
Na	Natural Log	Natural Log	None
NO3+NO2-N	Square Root	Nonparametric	Nonparametric
PO4-N	n.c.	Square Root	n.c.
SiO2	None	Natural Log	Natural Log
SO4	Natural Log	Natural Log	Natural Log
Sr	Natural Log	Square Root	None
TDS	Natural Log	n.c.	n.c.
Ti	n.c.	Natural Log	n.c.
Total Alkalinity	Natural Log	Natural Log	Natural Log
U	Natural Log	None	Natural Log
U234	Natural Log	n.c.	n.c.
U238	Natural Log	n.c.	n.c.
V	Natural Log	None	n.c.

n.c. = Not calculated because either number of results was less than 8 or the frequency of nondetections was greater than 50%.

Alluvial and intermediate groundwater zone UTLs were calculated using analytical results from filtered samples.

Regional aquifer groundwater UTLs were calculated using filtered sample results plus nonfiltered results from municipal water supply wells.

Appendix B

Comprehensive Data Tables
(Background Locations, Years 2000 to 2006)

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Tablenotes

CdV-5.0 = Cañon de Valle Spring

GEL or GELC = General Engineering Laboratories

PARA = Paragon Laboratory

UMTL = University of Miami Tritium Laboratory

HUFF = Huffman Laboratories

EES6 = LANL, Earth and Environmental Science Group 6 Laboratory

NMSSL = New Mexico Soil Science Laboratory

CST = LANL Chemical Sciences and Technology Group

ATICO = Analytical Technologies, Inc.

UF = unfiltered

F = filtered

MDL = Method Detection Limit

MDA = Minimum Detected Activity (applicable to radioactive constituents only)

Note: Italicized and underlined values are MDA

Sym = "<" indicates result is less than the method detection limit

C = Celsius

NTU = nephelometric turbidity unit

Mg/L = millgrams per liter

μg/L = micrograms per liter

FLD = measurement taken in field

SU = standard units

pCi/L = picoCuries per liter

mV = millivolts

Blank fields indicate no applicable information or no analysis performed

pH and conductivity parameters are measured in the field on unfiltered samples for all locations

Table B-1.1
LAO-B

Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
			Start Date Time	03/03/05				05/10/05				05/10/05				08/17/05				08/03/06				08/03/06			
			Fld Prep Code	F				F				F				F				F				UF			
GENINORG	Alkalinity-CO3	GELC	mg/L					<	1.45	1.45										<	0.725	0.725		<	0.725	0.725	
	Alkalinity-CO3+HCO3	EES6	mg/L		50.7	1							41.2	1			67.9	1									
	Alkalinity-CO3+HCO3	GELC	mg/L						38.6	1.45											76	0.725			76	0.725	
	Alkalinity-HCO3	GELC	mg/L						38.6	1.45																	
	Ammonia as Nitrogen	GELC	mg/L																	<	0.067	0.01		<	0.119	0.01	
	Bromide	EES6	mg/L	<	0.01	0.01						<	0.01	0.01			0.02	0.01									
	Bromide	GELC	mg/L					<	0.041	0.041										<	0.066	0.066		<	0.066	0.066	
	Calcium	EES6	mg/L		17.6	0.01	0.1						15.4	0.01	0.1		18.2	0.01	0.1								
	Calcium	GELC	mg/L						16.5	0.036			16.3	0.036							17.3	0.036			17.3	0.036	
	Chloride	EES6	mg/L		14.9	0.01							16.2	0.01			16.04	0.01									
	Chloride	GELC	mg/L						14.7	0.053											7.36	0.066			7.42	0.066	
	Fluoride	EES6	mg/L		0.09	0.01							0.15	0.01			0.08	0.01									
	Fluoride	GELC	mg/L					<	0.03	0.03											0.143	0.033			0.135	0.033	
	Magnesium	EES6	mg/L		5.22	0.01	0.03						3.75	0.01	0.02		5.5	0.01	0.06								
	Magnesium	GELC	mg/L						5.02	0.085			4.94	0.085							4.96	0.085			4.98	0.085	
	Nitrate as Nitrogen	EES6	mg/L		0.45	0.003							0.57	0.003			0.1	0.003									
	Nitrate-Nitrite as N	GELC	mg/L						0.451	0.003											0.102	0.014		<	0.0907	0.014	
	Nitrite as Nitrogen	EES6	mg/L	<	0.003	0.003						<	0.003	0.003		<	0.003	0.003									
	Perchlorate	GELC	µg/L						0.39	0.05										<	0.05	0.05					
	Potassium	EES6	mg/L		3.02	0.01	0.03						2.33	0.01	0.04		3.96	0.01	0.01								
	Potassium	GELC	mg/L						3.17	0.05			3.15	0.05							3.82	0.05			3.82	0.05	
	Silicon Dioxide	EES6	mg/L		12.9	10	0						13.6	10	0.1		16.8	10	0.1								
	Silicon Dioxide	GELC	mg/L						31.1	0.032											35.2	0.032			35.4	0.032	
	Sodium	EES6	mg/L		8.65	0.01	0.08						8.41	0.01	0.05		11.3	0.01	0.1								
	Sodium	GELC	mg/L						9.29	0.045			9.26	0.045							11.6	0.045			11.8	0.045	
	Specific Conductance	FLD	uS/cm		184.2								179.6												177.1		
	Sulfate	EES6	mg/L		15.1	0.01							15.8	0.01			9.22	0.01									
	Sulfate	GELC	mg/L						14.2	0.057											5.55	0.1			5.58	0.1	
	Total Dissolved Solids	GELC	mg/L						115	2.38											139	2.38			140	2.38	
	Total Kjeldahl Nitrogen	GELC	mg/L						0.141	0.01										<	0.191	0.01		<	0.064	0.01	
	Total Organic Carbon	GELC	mg/L						4.99	0.074															2.28	0.33	
	Total Phosphate as Phosphorus	EES6	mg/L		0.02282	0.003							0.0326	0.003			0.03586	0.003									
	Total Phosphate as Phosphorus	GELC	mg/L					<	0.044	0.01										<	0.04	0.01		<	0.035	0.01	
	Total Suspended Solids	GELC	mg/L																					<	1.9	1.9	
	pH	FLD	SU		7.48								7.2												7.23		
METALS	Aluminum	EES6	µg/L		22	2	1						16	2			2.3	2									
	Aluminum	GELC	µg/L						288	68			359	68						<	68	68		<	68	68	
	Antimony	EES6	µg/L	<	1	1						<	1	1		<	1	1									
	Antimony	GELC	µg/L					<	0.5	0.5		<	0.5	0.5						<	0.5	0.5		<	0.5	0.5	
	Arsenic	EES6	µg/L	<	0.2	0.2							0.2	0.2			0.4	0.2									
	Arsenic	GELC	µg/L					<	6	6		<	6	6						<	6	6		<	6	6	
	Barium	EES6	µg/L		36	1							13	1			40	1									
	Barium	GELC	µg/L						33.8	1			34.1	1							38.6	1			38.7	1	
	Beryllium	EES6	µg/L	<	1	1						<	1	1		<	1	1									
	Beryllium	GELC	µg/L					<	0.1	0.1		<	0.1	0.1						<	1	1		<	1	1	
	Boron	EES6	µg/L		13	1							22	1	1		17	1									
	Boron	GELC	µg/L						17.4	10			13	10							14.6	10			13.6	10	
	Cadmium	EES6	µg/L	<	1	1						<	1	1		<	1	1									
	Cadmium	GELC	µg/L					<	0.1	0.1			0.45	0.1						<	0.1	0.1		<	0.1	0.1	
	Chromium	EES6	µg/L	<	1	1						<	1	1		<	1	1									
	Chromium	GELC	µg/L					<	1	1			1.3	1						<	1.7	1		<	1.3	1	
	Cobalt	EES6	µg/L	<	1	1						<	1	1		<	1	1									
	Cobalt	GELC	µg/L					<	1	1		<	1	1						<	1	1		<	1	1	

Table B-1.1 (continued)

			Start Date Time	03/03/05				05/10/05				05/10/05				08/17/05				08/03/06				08/03/06			
			Fld Prep Code	F				F				F				F				F				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
METALS (continued)	Copper	EES6	µg/L	<	1	1						<	1	1		<	1	1									
	Copper	GELC	µg/L					<	3	3		<	3	3						<	3	3		<	3	3	
	Iron	EES6	µg/L		10	10						<	10	10		<	10	10									
	Iron	GELC	µg/L						113	18			148	18						<	26	18		<	22.9	18	
	Lead	EES6	µg/L	<	0.2	0.2						<	0.2	0.2		<	0.2	0.2									
	Lead	GELC	µg/L					<	0.5	0.5		<	0.5	0.5						<	0.5	0.5		<	0.5	0.5	
	Manganese	EES6	µg/L	<	1	1						<	1	1		<	1	1									
	Manganese	GELC	µg/L					<	1	1			1.4	1						<	2	2		<	2	2	
	Mercury	EES6	µg/L	<	0.05	0.05						<	0.05	0.05		<	0.05	0.05									
	Mercury	GELC	µg/L					<	0.05	0.05		<	0.05	0.05						<	0.06	0.06		<	0.06	0.06	
	Nickel	EES6	µg/L	<	1	1						<	1	1		<	1	1									
	Nickel	GELC	µg/L					<	1	1		<	1	1						<	0.75	0.5		<	0.69	0.5	
	Selenium	EES6	µg/L	<	1	1						<	1	1		<	1	1									
	Selenium	GELC	µg/L					<	6	6		<	6	6						<	2.5	2.5		<	2.5	2.5	
	Silver	EES6	µg/L	<	1	1						<	1	1		<	1	1									
	Silver	GELC	µg/L					<	1	1		<	1	1						<	0.2	0.2		<	0.2	0.2	
	Thallium	EES6	µg/L	<	1	1						<	1	1		<	1	1									
	Thallium	GELC	µg/L					<	0.4	0.4		<	0.4	0.4						<	0.4	0.4		<	0.4	0.4	
	Tin	EES6	µg/L	<	1	1						<	1	1		<	1	1									
	Tin	GELC	µg/L					<	6.6	2.5		<	4.6	2.5						<	2.5	2.5		<	2.5	2.5	
	Vanadium	EES6	µg/L	<	1	1							1	1		<	1	1									
	Vanadium	GELC	µg/L						1	1			1.2	1						<	1	1		<	1	1	
	Zinc	EES6	µg/L		7	1							2	1			8	1									
	Zinc	GELC	µg/L					<	2	2			2.9	2						<	5.5	2		<	5.2	2	
RAD	Americium-241	GELC	pCi/L						0.00194	*0.034*	0.00204										0.0106	*0.0254*	0.00805		0.026	0.0269	0.011
	Cesium-137	GELC	pCi/L						0.238	*2.36*	0.662										0.688	*3.98*	1.04		0.176	4.75	1.29
	Gross alpha	GELC	pCi/L						0.246	*1.23*	0.298										0.781	*1.14*	0.37		0.209	1.26	0.338
	Gross beta	GELC	pCi/L						4.27	*2.33*	0.701										4.71	*2.26*	0.774		3.78	2.38	0.786
	Gross gamma	GELC	pCi/L						2340	*1400*	2600										65.6	*207*	203		96	353	94
	Plutonium-238	GELC	pCi/L						0.0515	*0.043*	0.0148										-0.00318	*0.0306*	0.00842		0.00876	0.0281	0.00507
	Strontium-90	GELC	pCi/L						0.0381	*0.234*	0.058										0.0842	*0.457*	0.135		-0.104	0.391	0.112
	Tritium	UMTL	pCi/L																						30.9721	0.28737	0.9579
	Uranium	EES6	µg/L	<	0.2	0.2						<	0.2	0.2		<	0.2	0.2									
	Uranium	GELC	µg/L																		0.076	0.05			0.078	0.05	
	Uranium-234	GELC	pCi/L						0.0501	*0.08*	0.0134										0.0345	*0.126*	0.0235		0.0464	0.0567	0.014
	Uranium-238	GELC	pCi/L						0.0132	*0.057*	0.00794										0.0682	*0.134*	0.0249		0.0322	0.0603	0.0104

Table B-1.2
Pine Spring

			Start Date Time	2/10/1998				2/10/1998				7/14/1998				1/6/2000				3/30/2000			
			Fld Prep Code	UF				UF				UF				F				F			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
	Alkalinity-HCO3	PARA	mg/L		36				35														
	Ammonia as Nitrogen	PARA	mg/L													<	0.5			<	0.5		
	Bromide	PARA	mg/L	<	0.1			<	0.1							<	0.2						
	Calcium	PARA	mg/L		8.58				8.27				12.5				8.2				7.3		
	Chloride	PARA	mg/L		2				2								1.5						
	Chloride	GELC	mg/L																		1.53		
	Dissolved Organic Carbon	HUFFMAN	mg/L		5.4								4.7										
	Fluoride	PARA	mg/L	<	0.05			<	0.05							<	0.1						
	Fluoride	GELC	mg/L																		0.101		
	Nitrate as N	PARA	mg/L		0.1				0.1							<	0.2						
	Nitrite as N	PARA	mg/L	<	0.1			<	0.1							<	0.1						
	Nitrate-Nitrite as N	PARA	mg/L													<	0.1				0.095		
	Potassium	PARA	mg/L		3.92				3.4				3.98				2.9				2.7		
	Silicon Dioxide	PARA	mg/L		45.9				45.6								44				26		
	Sodium	PARA	mg/L		4.7				4.79				6.03				4.4				4.3		
	Specific Conductance	HUFFMAN	uS/cm										115										
	Sulfate	PARA	mg/L		6.4				6.4								6.2						
	Sulfate	GELC	mg/L																		6.32		
	Total Dissolved Solids	PARA	mg/L		220				190														
	Total Kjeldahl Nitrogen	RECRAP	mg/L														0.46						
	Total Kjeldahl Nitrogen	CST	mg/L																	<	0.1		
	Total Phosphate as Phosphorus	PARA	mg/L														8.7				0.12		
	pH	HUFFMAN	SU										6.4										
METALS	Aluminum	PARA	µg/L		14900				8760				3840				8700				3400		
	Antimony	GELC	µg/L													<	0.683			<	0.683		
	Antimony	PARA	µg/L	<	3.4			<	3.4			<	2.5			<	2.8			<	2.8		
	Arsenic	PARA	µg/L		2.7			<	2.5			<	2.4			<	2.3			<	2.3		
	Barium	PARA	µg/L		69				51.6			<	58.9			<	64			<	42		
	Beryllium	PARA	µg/L		1.2				0.98			<	0.2			<	1.3			<	0.18		
	Beryllium	GELC	µg/L													<	0.01				0.466		
	Boron	PARA	µg/L		9.8				11.6							<	17			<	17		
	Cadmium	PARA	µg/L	<	0.3			<	0.3			<	0.2			<	0.17			<	0.17		
	Cadmium	GELC	µg/L													<	0.13			<	0.13		
	Chromium	PARA	µg/L		4.8				2.4			<	0.75			<	5			<	1.8		
	Cobalt	PARA	µg/L		1.7				1			<	0.5			<	1.4			<	0.51		
	Copper	PARA	µg/L		2.4				1.6			<	2.2			<	2.6				1.7		
	Iron	PARA	µg/L		6.66				3.9				1510				4600				2100		
	Lead	PARA	µg/L	<	1.4			<	1.4			<	1.1			<	2			<	2		
	Lead	GELC	µg/L													<	0.01				1.88		
	Magnesium	PARA	mg/L		3.71				3.19			<	4.3				2.9				2.6		
	Manganese	PARA	µg/L		27.1				15.4				9.9				21				10		
	Mercury	PARA	µg/L		0.02				0.03			<	0.02			<	0.013			<	0.011		
	Molybdenum	PARA	µg/L	<	2.9			<	2.9														
	Nickel	PARA	µg/L		6.2				5.2			<	3.4			<	5.6			<	1.8		
	Selenium	PARA	µg/L	<	3.1			<	3.1			<	2.9			<	3.8			<	3.8		
	Silver	PARA	µg/L	<	0.9			<	0.9							<	0.64			<	0.64		
	Strontium	PARA	µg/L		66.5				62.3														
	Thallium	PARA	µg/L	<	3.8			<	3.8			<	9.9			<	3.2			<	3.2		
	Thallium	GELC	µg/L													<	0.026			<	0.335		
	Tin	PARA	µg/L	<	14.1			<	14.1														
	Titanium	PARA	µg/L		230				143														
	Uranium	PARA	µg/L		0.41				0.25								0.32				0.26		
	Uranium	GELC	µg/L														0.957				0.251		
	Vanadium	PARA	µg/L		12				7.3			<	5.3			<	9.4			<	5		
	Zinc	PARA	µg/L		15.3				10			<	5			<	14			<	5.5		

Table B-1.2 (continued)

			Start Date Time	2/10/1998				2/10/1998				7/14/1998				1/6/2000				3/30/2000			
			Fld Prep Code	UF				UF				UF				F				F			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
RAD	Americium-241	PARA	pCi/L	<	-0.003	0.077		<	0.02	0.052		<	0.031	0.036									
	Americium-241	ATICO	pCi/L									<	1.5	10									
	Cesium-137	PARA	pCi/L	<	0.225	2.11		<	0.529	2.03													
	Cesium-137	ATICO	pCi/L									<	-0.9	1.7									
	Gross alpha	PARA	pCi/L	<	1.8	1.2		<	1.22	0.79		<	1.28	1.4									
	Gross beta	PARA	pCi/L										5.5	2.33									
	Gross gamma	PARA	pCi/L										161	12									
	Plutonium-238	PARA	pCi/L	<	-0.004	0.094		<	-0	0.081		<	0	0.047									
	Plutonium-239	PARA	pCi/L	<	0.014	0.065						<	0.0079	0.029									
	Strontium-90	PARA	pCi/L	<	0.12	0.39		<	0.08	0.42		<	-0.28	1.12									
	Tritium	UMTL	pCi/L										5.7	3			57.28	0					
	Uranium-235	PARA	pCi/L	<	0.0061	0.041		<	0.013	0.037		<	0.0025	0.025									
	Uranium-235	ATICO	pCi/L									<	-3.7	3.7									
	Uranium-234	PARA	pCi/L		0.16	0.045		<	0.069	0.079			0.048	0.03									
	Uranium-238	PARA	pCi/L		0.102	0.037			0.124	0.042		<	0.037	0.034									

Table B-1.3
Barbara Spring

			Start Date Time	03/29/05				05/12/05				06/15/05				07/13/05			
			Fld Prep Code	F				F				F				F			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3+HCO3	FLD	mg/L														33		
	Alkalinity-CO3+HCO3	EES6	mg/L		35.7	1			34.8	1			35.2	1			34.6	1	
	Bromide	EES6	mg/L		0.01	0.01			0.02	0.01			0.02	0.01			0.01	0.01	
	Calcium	EES6	mg/L		4.86	0.01	0.04		4.6	0.01	0.01		4.64	0.01	0.05		4.81	0.01	0.06
	Chloride	EES6	mg/L		1.21	0.01			1.15	0.01			1.15	0.01			1.11	0.01	
	Fluoride	EES6	mg/L		0.12	0.01			0.12	0.01			0.12	0.01			0.12	0.01	
	Magnesium	EES6	mg/L		0.74	0.01			0.77	0.01			0.9	0.01	0.01		0.91	0.01	0.01
	Nitrate as Nitrogen	EES6	mg/L		0.27	0.003			0.28	0.003			0.25	0.003			0.28	0.003	
	Nitrite as Nitrogen	EES6	mg/L	<	0.003	0.003		<	0.003	0.003		<	0.003	0.003		<	0.003	0.003	
	Potassium	EES6	mg/L		0.19	0.01			0.21	0.01			0.29	0.01			0.32	0.01	0.01
	Silicon Dioxide	EES6	mg/L		34.2	10	0.4		33.6	10	0.1		34.9	10	0.2		34.6	10	0.6
	Sodium	EES6	mg/L		9.75	0.01	0.16		9.43	0.01	0.06		9.97	0.01	0.09		10.1	0.01	0.1
	Specific Conductance	FLD	uS/cm		73.3				73.4				74.9				72.9		
	Sulfate	EES6	mg/L		1.22	0.01			1.14	0.01			1.15	0.01			1.07	0.01	
	Sulfide, Total	FLD	mg/L																
	Total Phosphate as Phosphorus	EES6	mg/L		0.05216	0.003			0.03912	0.003			0.02608	0.003			0.03912	0.003	
	pH	FLD	SU		7.76				7.39				7.06				7.22		
METALS	Aluminum	EES6	µg/L		15	2			11	2			5	2			6	2	
	Antimony	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Arsenic	EES6	µg/L		0.5	0.2			0.6	0.2			0.7	0.2			0.5	0.2	
	Barium	EES6	µg/L		1.4	1			1.4	1			1.3	1			1.6	1	
	Beryllium	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Boron	EES6	µg/L		7.5	1			6.6	1	1		6.3	1			6	1	
	Cadmium	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Chromium	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Cobalt	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Copper	EES6	µg/L	<	1	1			1.8	1		<	1	1			1.3	1	
	Iron	FLD	µg/L																
	Iron	EES6	µg/L		20	10		<	10	10		<	10	10		<	10	10	
	Lead	EES6	µg/L	<	0.2	0.2		<	0.2	0.2		<	0.2	0.2		<	0.2	0.2	
	Manganese	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Mercury	EES6	µg/L	<	0.05	0.05		<	0.05	0.05		<	0.05	0.05		<	0.05	0.05	
	Nickel	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Selenium	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Silver	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Thallium	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Tin	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Vanadium	EES6	µg/L		2	1			2	1			2	1			1	1	
	Zinc	EES6	µg/L	<	1	1		<	1	1			2	1		<	1	1	
RAD	Uranium	EES6	µg/L		0.3	0.2			0.3	0.2			0.3	0.2		<	0.2	0.2	

Table B-1.4
Campsite Spring

			Start Date Time	05/17/05				06/08/05				07/14/05			
			Fld Prep Code	F				F				F			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3+HCO3	FLD	mg/L												
	Alkalinity-CO3+HCO3	EES6	mg/L		38.5	1			38.6	1			38.8	1	
	Bromide	EES6	mg/L		0.02	0.01			0.02	0.01			0.01	0.01	
	Calcium	EES6	mg/L		5.35	0.01	0.03		4.39	0.01	0.01		4.9	0.01	0.02
	Chloride	EES6	mg/L		1.12	0.01			1.08	0.01			1.05	0.01	
	Fluoride	EES6	mg/L		0.13	0.01			0.14	0.01			0.14	0.01	
	Magnesium	EES6	mg/L		1.63	0.01			1.6	0.01	0.01		1.74	0.01	0.01
	Nitrate as Nitrogen	EES6	mg/L		0.33	0.003			0.35	0.003			0.34	0.003	
	Nitrite as Nitrogen	EES6	mg/L	<	0.003	0.003		<	0.003	0.003		<	0.003	0.003	
	Potassium	EES6	mg/L		1.21	0.01			1.27	0.01	0.01		1.45	0.01	0.01
	Silicon Dioxide	EES6	mg/L		26.2	10	0		25.1	10	0.1		26.7	10	0.1
	Sodium	EES6	mg/L		8.95	0.01	0.07		8.97	0.01	0.02		9.6	0.01	0.03
	Specific Conductance	FLD	uS/cm		75								33.1		
	Sulfate	EES6	mg/L		2.46	0.01			1.93	0.01			1.54	0.01	
	Sulfide, Total	FLD	mg/L												
	Total Phosphate as Phosphorus	EES6	mg/L		0.02608	0.003			0.02608	0.003			0.02282	0.003	
	pH	FLD	SU		7.86				7.73				7.85		
METALS	Aluminum	EES6	µg/L		36	2			11	2			2.1	2	
	Antimony	EES6	µg/L	<	1	1		<	1	1		<	1	1	
	Arsenic	EES6	µg/L		0.5	0.2			0.6	0.2			0.5	0.2	
	Barium	EES6	µg/L		2.2	1			1.9	1			2.1	1	
	Beryllium	EES6	µg/L	<	1	1		<	1	1		<	1	1	
	Boron	EES6	µg/L		8.8	1			7.9	1			7.8	1	
	Cadmium	EES6	µg/L	<	1	1		<	1	1		<	1	1	
	Chromium	EES6	µg/L		2.2	1	0.1		2.4	1			2.4	1	
	Cobalt	EES6	µg/L	<	1	1		<	1	1		<	1	1	
	Copper	EES6	µg/L		3.5	1	0.1		2.9	1		<	1	1	
	Iron	FLD	µg/L												
	Iron	EES6	µg/L		20	10		<	10	10		<	10	10	
	Lead	EES6	µg/L	<	0.2	0.2		<	0.2	0.2		<	0.2	0.2	
	Manganese	EES6	µg/L	<	1	1		<	1	1		<	1	1	
	Mercury	EES6	µg/L	<	0.05	0.05		<	0.05	0.05		<	0.05	0.05	
	Nickel	EES6	µg/L	<	1	1		<	1	1		<	1	1	
	Selenium	EES6	µg/L	<	1	1		<	1	1		<	1	1	
	Silver	EES6	µg/L	<	1	1		<	1	1		<	1	1	
	Thallium	EES6	µg/L	<	1	1		<	1	1		<	1	1	
	Tin	EES6	µg/L	<	1	1		<	1	1		<	1	1	
	Vanadium	EES6	µg/L		3	1			3	1			3	1	
	Zinc	EES6	µg/L	<	1	1			5	1		<	1	1	
RAD	Uranium	EES6	µg/L		0.5	0.2			0.4	0.2			0.4	0.2	

Table B-1.5
Cañon de Valle Spring (CdV-5.0 Spring)

			Start Date Time	03/03/05				04/18/05				05/27/05				07/11/05			
			Fld Prep Code	F				F				F				F			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3+HCO3	FLD	mg/L																
	Alkalinity-CO3+HCO3	EES6	mg/L		33.8	1			33.8	1			25.7	1			34.7	1	
	Bromide	EES6	mg/L		0.02	0.01			0.03	0.01			0.02	0.01			0.02	0.01	
	Calcium	EES6	mg/L		16.5	0.01			15.6	0.01	0.1		8.2	0.01	0.05		9.86	0.01	0.06
	Chloride	EES6	mg/L		6.43	0.01			5.38	0.01			2.79	0.01			3.2	0.01	
	Fluoride	EES6	mg/L		0.07	0.01			0.09	0.01			0.06	0.01			0.05	0.01	
	Magnesium	EES6	mg/L		5.86	0.01	0.05		4.45	0.01	0.01		3.14	0.01	0.01		3.79	0.01	0.03
	Nitrate as Nitrogen	EES6	mg/L		1.31	0.003			1.78	0.003			0.9	0.003			0.76	0.003	
	Nitrite as Nitrogen	EES6	mg/L	<	0.003	0.003		<	0.003	0.003		<	0.003	0.003		<	0.003	0.003	
	Potassium	EES6	mg/L		3.54	0.01	0.01		2.62	0.01	0.01		2.41	0.01	0.03		3.62	0.01	0.02
	Silicon Dioxide	EES6	mg/L		24.5	10	0		24.2	10	0		19	10	0.1		19.9	10	0.1
	Sodium	EES6	mg/L		7.49	0.01	0.03		7.52	0.01	0.08		5.2	0.01	0.02		5.93	0.01	0.05
	Specific Conductance	FLD	uS/cm		173				177.4				114.6				119.6		
	Sulfate	EES6	mg/L		34.8	0.01			30.92	0.01			17.5	0.01			14.2	0.01	
	Sulfide, Total	FLD	mg/L																
	Total Phosphate as Phosphorus	EES6	mg/L		0.0489	0.003			0.0652	0.003			0.0489	0.003			0.05542	0.003	
	pH	FLD	SU		7.86				7.02				7.35				6.97		
METALS	Aluminum	EES6	µg/L		820	2	70		75	2			85	2	1		21	2	
	Antimony	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Arsenic	EES6	µg/L		0.5	0.2	0.1		0.5	0.2			0.4	0.2	0.1		0.3	0.2	
	Barium	EES6	µg/L		58	1			54	1	1		30	1			35	1	
	Beryllium	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Boron	EES6	µg/L		7.9	1			8.6	1			6	1			7.9	1	
	Cadmium	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Chromium	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Cobalt	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Copper	EES6	µg/L		2.1	1	0.1		3.3	1			3.8	1	0.1		1.4	1	
	Iron	FLD	µg/L																
	Iron	EES6	µg/L		480	10			40	10			30	10		<	10	10	
	Lead	EES6	µg/L		0.3	0.2		<	0.2	0.2		<	0.2	0.2		<	0.2	0.2	
	Manganese	EES6	µg/L		1.6	1	0.1	<	1	1		<	1	1		<	1	1	
	Mercury	EES6	µg/L	<	0.05	0.05		<	0.05	0.05		<	0.05	0.05		<	0.05	0.05	
	Nickel	EES6	µg/L	<	1	1			29	1		<	1	1		<	1	1	
	Selenium	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Silver	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Thallium	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Tin	EES6	µg/L	<	1	1		<	1	1		<	1	1		<	1	1	
	Vanadium	EES6	µg/L		4	1			4	1			3	1			3	1	
	Zinc	EES6	µg/L	<	1	1			19	1			2	1		<	1	1	
RAD	Uranium	EES6	µg/L	<	0.2	0.2		<	0.2	0.2		<	0.2	0.2		<	0.2	0.2	

Table B-1.6
LAOI-1.1(a)

			Start Date Time	06/03/04				03/04/05				03/07/05				05/07/05				05/07/05				08/04/06				08/04/06			
			Fld Prep Code	UF				F				UF				F				UF				F				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L		9.43	1.45														<	1.45	1.45		<	0.725	0.725		<	0.725	0.725	
	Alkalinity-CO3+HCO3	EES6	mg/L						51.2	1																					
	Alkalinity-CO3+HCO3	GELC	mg/L		89.7	1.45															68	1.45			41.9	0.725			39.7	0.725	
	Alkalinity-HCO3	GELC	mg/L		79.6	1.45															66.9	1.45									
	Ammonia as Nitrogen	GELC	mg/L																						0.074	0.01			0.063	0.01	
	Bromide	EES6	mg/L						0.01	0.01																					
	Bromide	GELC	mg/L																	<	0.041	0.041		<	0.066	0.066		<	0.066	0.066	
	Calcium	EES6	mg/L						5.78	0.01	0.05																				
	Calcium	GELC	mg/L		6.1	0.00554															6.39	0.036			5.64	0.036			6.07	0.036	
	Chloride	EES6	mg/L						1.29	0.01																					
	Chloride	GELC	mg/L		1.37	0.0322															1.22	0.053			1.28	0.066			1.27	0.066	
	Fluoride	EES6	mg/L						0.1	0.01																					
	Fluoride	GELC	mg/L		0.24	0.0553															0.145	0.03			0.171	0.033			0.168	0.033	
	Magnesium	EES6	mg/L						1.57	0.01	0.02																				
	Magnesium	GELC	mg/L		1.23	0.00518															1.94	0.085			1.66	0.085			1.87	0.085	
	Nitrate as Nitrogen	EES6	mg/L						0.47	0.003																					
	Nitrate-Nitrite as N	GELC	mg/L		0.43	0.01											0.291	0.003							0.289	0.014			0.232	0.014	
	Nitrite as Nitrogen	EES6	mg/L					<	0.003	0.003																					
	Perchlorate	GELC	µg/L		0.151	0.05															0.168	0.05			0.175	0.05					
	Potassium	EES6	mg/L						10	0.01	0.1																				
	Potassium	GELC	mg/L		27.7	0.0165															8.83	0.05			4.73	0.05			4.83	0.05	
	Silicon Dioxide	EES6	mg/L						31.6	10	0.3																				
	Silicon Dioxide	GELC	mg/L		73.9	0.0212															70.4	0.032			65.7	0.032			69.3	0.032	
	Sodium	EES6	mg/L						11.1	0.01	0.1																				
	Sodium	GELC	mg/L		22.6	0.0144															10.4	0.045			8.27	0.045			8.31	0.045	
	Specific Conductance	FLD	uS/cm		227				147.9				128.5								119.9								91.7		
	Sulfate	EES6	mg/L						4.58	0.01																					
	Sulfate	GELC	mg/L		3.72	0.193															3.39	0.057			3.28	0.1			3.24	0.1	
	Total Dissolved Solids	GELC	mg/L		160	3.07															142	2.38			127	2.38			138	2.38	
	Total Kjeldahl Nitrogen	GELC	mg/L														0.196	0.01							0.145	0.01			0.015	0.01	
	Total Organic Carbon	GELC	mg/L													<	0.599	0.074											0.446	0.33	
	Total Phosphate as Phosphorus	EES6	mg/L						0.01304	0.003																					
	Total Phosphate as Phosphorus	GELC	mg/L													<	0.031	0.01						<	0.02	0.01		<	0.12	0.01	
	Total Suspended Solids	GELC	mg/L		70.3	2.06																							58.8	2.28	
	pH	FLD	SU		10.14				9.26				8.27								7.46								9.06		

Table B-1.6 (continued)

			Start Date Time	06/03/04				03/04/05				03/07/05				05/07/05				05/07/05				08/04/06				08/04/06			
			Fld Prep Code	UF				F				UF				F				UF				F				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
METALS	Aluminum	EES6	µg/L						70	2	21																				
	Aluminum	GELC	µg/L		1220	14.7															1240	68			85.6	68			1170	68	
	Antimony	EES6	µg/L					<	1	1																					
	Antimony	GELC	µg/L	<	0.409	0.28														<	0.5	0.5		<	0.5	0.5		<	0.5	0.5	
	Arsenic	EES6	µg/L						0.4	0.2																					
	Arsenic	GELC	µg/L	<	2.24	2.24														<	6	6		<	6	6		<	6	6	
	Barium	EES6	µg/L						9.3	1																					
	Barium	GELC	µg/L		26.1	0.222															11.2	1			7.1	1			12.6	1	
	Beryllium	EES6	µg/L					<	1	1																					
	Beryllium	GELC	µg/L	<	0.233	0.158															0.2	0.1		<	1	1		<	1	1	
	Boron	EES6	µg/L						8.6	1																					
	Boron	GELC	µg/L		15.7	4.88														<	10	10			10.8	10			10.7	10	
	Cadmium	EES6	µg/L					<	1	1																					
	Cadmium	GELC	µg/L		0.123	0.04														<	0.1	0.1		<	0.1	0.1		<	0.1	0.1	
	Chromium	EES6	µg/L					<	1	1																					
	Chromium	GELC	µg/L		1.89	0.503															1.1	1			2.1	1			2	1	
	Cobalt	EES6	µg/L					<	1	1																					
	Cobalt	GELC	µg/L	<	0.541	0.541														<	1	1			1.2	1		<	1	1	
	Copper	EES6	µg/L						1.3	1																					
	Copper	GELC	µg/L		3.71	1.39														<	3	3		<	3	3		<	3	3	
	Iron	EES6	µg/L						110	10																					
	Iron	GELC	µg/L		471	12.6															416	18		<	80.6	18			467	18	
	Lead	EES6	µg/L						0.2	0.2																					
	Lead	GELC	µg/L		2.55	0.05															1.2	0.5		<	0.5	0.5			1.8	0.5	
	Manganese	EES6	µg/L					<	1	1																					
	Manganese	GELC	µg/L		5.47	0.296															2.8	1			3.4	2			5.1	2	
	Mercury	EES6	µg/L					<	0.05	0.05																					
	Mercury	GELC	µg/L	<	0.0472	0.0472														<	0.05	0.05		<	0.06	0.06		<	0.06	0.06	
	Nickel	EES6	µg/L					<	1	1																					
	Nickel	GELC	µg/L	<	0.953	0.69														<	1.2	1			0.55	0.5			0.59	0.5	
	Selenium	EES6	µg/L					<	1	1																					
	Selenium	GELC	µg/L	<	3.48	2.81															8.5	6		<	2.5	2.5		<	2.5	2.5	
	Silver	EES6	µg/L					<	1	1																					
	Silver	GELC	µg/L	<	0.835	0.835														<	1	1		<	0.2	0.2		<	0.2	0.2	
	Thallium	EES6	µg/L					<	1	1																					
	Thallium	GELC	µg/L	<	0.02	0.02														<	0.4	0.4		<	0.4	0.4		<	0.4	0.4	
	Tin	EES6	µg/L					<	1	1																					
	Tin	GELC	µg/L	<	3.26	3.26														<	4.7	2.5		<	2.5	2.5		<	2.5	2.5	
	Vanadium	EES6	µg/L					<	1	1																					
	Vanadium	GELC	µg/L		0.852	0.606														<	1	1			1.5	1			1.1	1	
	Zinc	EES6	µg/L						3	1																					
	Zinc	GELC	µg/L		91.6	0.883															8.9	2		<	7.9	2		<	13.8	2	
RAD	Americium-241	GELC	pCi/L		0.00193	0.034	0.0135														0.0217	0.034	0.0127		0.00106	0.0319	0.0184		0.107	0.0315	0.0208
	Cesium-137	GELC	pCi/L		-0.711	6.43	1.82														-0.288	2.83	0.8		0.824	4.79	1.3		0.912	4.26	1.36
	Gross alpha	GELC	pCi/L		0.803	1.55	0.541														1.04	1.01	0.378		-0.34	0.712	0.183		2.14	0.855	0.415
	Gross beta	GELC	pCi/L		23.9	1.5	0.972														9.67	2.38	0.856		4.05	1.33	0.508		3.86	1.06	0.446
	Gross gamma	GELC	pCi/L		146	508	199														124	355	129		90	293	73		60.1	232	41.1
	Plutonium-238	GELC	pCi/L		0.0125	0.032	0.00725														0.0206	0.048	0.0083		0	0.0376	0.00391		-0.00347	0.0334	0.00602
	Strontium-90	GELC	pCi/L		0.091	0.121	0.0396														0.0945	0.286	0.0679		-0.321	0.512	0.146		-0.0258	0.41	0.12
	Tritium	UMTL	pCi/L		7.53548	0.28737	0.28737														5.7474	0.28737	0.28737						0.12772	0.28737	0.28737
	Uranium	EES6	µg/L						0.5	0.2																					
	Uranium	GELC	µg/L		0.785	0.02																			0.25	0.05			0.81	0.05	
	Uranium-234	GELC	pCi/L		0.261	0.054	0.0243														0.191	0.076	0.0254		0.0932	0.0611	0.0196		0.236	0.0772	0.0356
	Uranium-238	GELC	pCi/L		0.186	0.038	0.0204														0.176	0.054	0.0229		0.0523	0.0649	0.0149		0.195	0.0821	0.0315

Table B-1.7
Seven Springs

						Start Date Time	03/10/05	03/10/05	03/10/05	03/10/05	03/10/05	05/09/05	05/09/05	05/09/05	05/09/05	05/09/05	06/23/05	06/23/05	06/23/05	06/23/05	06/23/05	07/15/05	07/15/05	07/15/05	07/15/05	07/15/05
						Fld Prep Code	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																				
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom		Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L			43.9	1				43	1				45.1	1				46.4	1		
	Bromide	Br(-1)		EES6	mg/L			0.01	0.01				0.02	0.01				0.02	0.01				0.02	0.01		
	Calcium	Ca		EES6	mg/L			11.2	0.01		0.1		10.9	0.01		0.1		11.5	0.01		0.1		12	0.01		0.1
	Chloride	Cl(-1)		EES6	mg/L			1.88	0.01				1.52	0.01				1.45	0.01				1.47	0.01		
	Fluoride	F(-1)		EES6	mg/L			0.2	0.01				0.2	0.01				0.17	0.01				0.17	0.01		
	Magnesium	Mg		EES6	mg/L			1.5	0.01		0.02		1.25	0.01				1.51	0.01				1.56	0.01		0.01
	Nitrate as Nitrogen	NO3-N		EES6	mg/L			0.25	0.003				0.22	0.003				0.18	0.003				0.22	0.003		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L		<	0.003	0.003			<	0.003	0.003			<	0.003	0.003			<	0.003	0.003		
	Potassium	K		EES6	mg/L			1.9	0.01		0.02		1.47	0.01				1.82	0.01		0.01		1.83	0.01		
	Silicon Dioxide	SiO2		EES6	mg/L			15.2	10		0.1		13.6	10		0		14.1	10		0.1		13.6	10		0
	Sodium	Na		EES6	mg/L			6.97	0.01		0.07		5.84	0.01		0.02		6.16	0.01		0.02		6.24	0.01		0.01
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			100.2					102.8					106.9					107.8			
	Sulfate	SO4(-2)		EES6	mg/L			4.04	0.01				4.22	0.01				4.28	0.01				4.12	0.01		
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L			0.00978	0.003				0.00978	0.003			<	0.00326	0.003				0.00978	0.003		
	pH	pH	Field	FLD	SU			7.3					7.37					6.73					7.3			
METALS	Aluminum	Al		EES6	µg/L			360	2		90		69	2				24	2				11	2		
	Antimony	Sb		EES6	µg/L		<	1	1			<	1	1			<	1	1			<	1	1		
	Arsenic	As		EES6	µg/L			0.7	0.2		0.3		0.4	0.2				0.5	0.2				0.4	0.2		
	Barium	Ba		EES6	µg/L			24	1				15	1				17	1				18	1		
	Beryllium	Be		EES6	µg/L		<	1	1			<	1	1			<	1	1			<	1	1		
	Boron	B		EES6	µg/L			18	1		4		12	1				12	1				11	1		
	Cadmium	Cd		EES6	µg/L		<	1	1			<	1	1			<	1	1			<	1	1		
	Chromium	Cr		EES6	µg/L		<	1	1			<	1	1			<	1	1			<	1	1		
	Cobalt	Co		EES6	µg/L		<	1	1			<	1	1			<	1	1			<	1	1		
	Copper	Cu		EES6	µg/L		<	1	1				3.7	1			<	1	1				1	1		
	Iron	Fe		EES6	µg/L			240	10				50	10				10	10			<	10	10		
	Lead	Pb		EES6	µg/L		<	0.2	0.2			<	0.2	0.2			<	0.2	0.2			<	0.2	0.2		
	Manganese	Mn		EES6	µg/L			1.8	1		0.7	<	1	1			<	1	1			<	1	1		
	Mercury	Hg		EES6	µg/L		<	0.05	0.05			<	0.05	0.05			<	0.05	0.05			<	0.05	0.05		
	Nickel	Ni		EES6	µg/L		<	1	1			<	1	1			<	1	1			<	1	1		
	Selenium	Se		EES6	µg/L		<	1	1			<	1	1			<	1	1			<	1	1		
	Silver	Ag		EES6	µg/L		<	1	1			<	1	1			<	1	1			<	1	1		
	Thallium	Tl		EES6	µg/L		<	1	1			<	1	1			<	1	1			<	1	1		
	Tin	Sn		EES6	µg/L		<	1	1			<	1	1			<	1	1			<	1	1		
	Vanadium	V		EES6	µg/L		<	1	1			<	1	1			<	1	1			<	1	1		
	Zinc	Zn		EES6	µg/L		<	1	1			<	1	1				5	1			<	1	1		
RAD	Uranium	U		EES6	µg/L			0.5	0.2				0.5	0.2				0.5	0.2				0.6	0.2		

Table B-1.8
Water Canyon Gallery

						Start Date Time	08/15/00	08/15/00	08/15/00	08/15/00	08/15/00	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																	
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																		
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L							<	0.725	0.725									
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L								43.4	0.725									
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L								43.2	0.725									
	Bromide	Br(-1)		EES6	mg/L																		
	Calcium	Ca		EES6	mg/L																		
	Calcium	Ca		GELC	mg/L								6	0.0375									
	Chloride	Cl(-1)		EES6	mg/L																		
	Chloride	Cl(-1)		GELC	mg/L								0.977	0.025									
	Fluoride	F(-1)		EES6	mg/L																		
	Fluoride	F(-1)		GELC	mg/L								0.0797	0.006									
	Magnesium	Mg		EES6	mg/L																		
	Magnesium	Mg		GELC	mg/L								2.4	0.00449									
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L								0.33	0.0069									
	Nitrite as Nitrogen	NO2-N		EES6	mg/L																		
	Potassium	K		EES6	mg/L																		
	Potassium	K		GELC	mg/L								1.39	0.00707									
	Silicon Dioxide	SiO2		EES6	mg/L																		
	Silicon Dioxide	SiO2		GELC	mg/L								36	0.0284									
	Sodium	Na		EES6	mg/L																		
	Sodium	Na		GELC	mg/L								4.87	0.00813									
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm													127					127
	Sulfate	SO4(-2)		EES6	mg/L																		
	Sulfate	SO4(-2)		GELC	mg/L								1.68	0.062									
	Total Dissolved Solids	TDS		GELC	mg/L								100	5.09									
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																		
	Total Suspended Solids	TSS		GELC	mg/L																		16
	pH	pH	Field	FLD	SU			6.96										7.69					7.69
METALS	Aluminum	Al		EES6	µg/L																		
	Aluminum	Al		GELC	µg/L								147	34.3									
	Antimony	Sb		EES6	µg/L																		
	Antimony	Sb		GELC	µg/L							<	0.09	0.111									
	Arsenic	As		EES6	µg/L																		
	Arsenic	As		GELC	µg/L							<	4.57	4.57									
	Barium	Ba		EES6	µg/L																		
	Barium	Ba		GELC	µg/L								12	0.206									
	Beryllium	Be		EES6	µg/L																		
	Beryllium	Be		GELC	µg/L							<	0.203	0.203									
	Boron	B		EES6	µg/L																		
	Boron	B		GELC	µg/L								12.9	2.95									
	Cadmium	Cd		EES6	µg/L																		
	Cadmium	Cd		GELC	µg/L							<	0.05	0.05									
	Chromium	Cr		EES6	µg/L																		
	Chromium	Cr		GELC	µg/L								1.28	0.781									
	Cobalt	Co		EES6	µg/L																		
	Cobalt	Co		GELC	µg/L							<	0.295	0.295									
	Copper	Cu		EES6	µg/L																		
	Copper	Cu		GELC	µg/L							<	2.67	2.67									
	Iron	Fe		EES6	µg/L																		
	Iron	Fe		GELC	µg/L								289	20.6									
	Lead	Pb		EES6	µg/L																		
	Lead	Pb		GELC	µg/L							<	0.077	0.077									
	Manganese	Mn		EES6	µg/L																		
	Manganese	Mn		GELC	µg/L								3.63	2.94									

Table B-1.8 (continued)

						Start Date Time	08/15/00	08/15/00	08/15/00	08/15/00	08/15/00	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01	11/29/01
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																	
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																		
METALS (cont.)	Mercury	Hg		EES6	µg/L																		
	Mercury	Hg		GELC	µg/L																	<	0.073
	Nickel	Ni		EES6	µg/L																		
	Nickel	Ni		GELC	µg/L							<	0.743	0.743									
	Selenium	Se		EES6	µg/L																		
	Selenium	Se		GELC	µg/L																	<	3.09
	Silver	Ag		EES6	µg/L																		
	Silver	Ag		GELC	µg/L							<	0.197	0.197									
	Thallium	Tl		EES6	µg/L																		
	Thallium	Tl		GELC	µg/L							<	0.014	0.014									
	Tin	Sn		EES6	µg/L																		
	Tin	Sn		GELC	µg/L							<	2.4	2.4									
	Vanadium	V		EES6	µg/L																		
	Vanadium	V		GELC	µg/L								2.79	1.09									
	Zinc	Zn		EES6	µg/L																		
	Zinc	Zn		GELC	µg/L							<	2.49	2.81									
RAD	Americium-241	Am-241		GELC	pCi/L								0.0192		0.0301	0.00984							
	Cesium-137	Cs-137		GELC	pCi/L								-0.881		2.76	0.806							
	Gross alpha	GROSSA		GELC	pCi/L								0.849		1.4	0.403							
	Gross beta	GROSSB		GELC	pCi/L								1.49		1.41	0.39							
	Gross gamma	GROSSG		GELC	pCi/L								128		363	137							
	Plutonium-238	Pu-238		GELC	pCi/L								0.00689		0.0169	0.00515							
	Strontium-90	Sr-90		GELC	pCi/L								-0.0043		0.171	0.0628							
	Uranium	U		EES6	µg/L																		
	Uranium-234	U-234		GELC	pCi/L								0.0876		0.0224	0.0157							
	Uranium-238	U-238		GELC	pCi/L								0.0417		0.00565	0.00976							

Table B-1.8 (continued)

						Start Date Time	11/29/01	11/29/01	11/29/01	09/09/02	09/09/02	09/09/02	09/09/02	09/09/02	08/26/03	08/26/03	08/26/03	08/26/03	08/26/03	03/04/05	03/04/05	03/04/05	03/04/05
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																	
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																		
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L					<	1.45	1.45			<	1.45	1.45						
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																34.9	1	
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L						44.6	1.45				42.8	1.45						
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L						44.5	1.45				42.7	1.45						
	Bromide	Br(-1)		EES6	mg/L															<	0.01	0.01	
	Calcium	Ca		EES6	mg/L																11.1	0.01	
	Calcium	Ca		GELC	mg/L						7.71	0.00554				7.43	0.00554						
	Chloride	Cl(-1)		EES6	mg/L																3.6	0.01	
	Chloride	Cl(-1)		GELC	mg/L						0.622	0.0322				0.843	0.0322						
	Fluoride	F(-1)		EES6	mg/L																0.05	0.01	
	Fluoride	F(-1)		GELC	mg/L						0.119	0.0553				0.121	0.0553						
	Magnesium	Mg		EES6	mg/L																4.25	0.01	
	Magnesium	Mg		GELC	mg/L						3.33	0.00518				3.53	0.00518						
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																0.35	0.003	
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L						0.07	0.01				0.15	0.01						
	Nitrite as Nitrogen	NO2-N		EES6	mg/L															<	0.003	0.003	
	Potassium	K		EES6	mg/L																2.89	0.01	
	Potassium	K		GELC	mg/L						1.74	0.0165				1.47	0.0165						
	Silicon Dioxide	SiO2		EES6	mg/L																18.4	10	
	Silicon Dioxide	SiO2		GELC	mg/L																		
	Sodium	Na		EES6	mg/L																5.7	0.01	
	Sodium	Na		GELC	mg/L						6.27	0.0144				5.59	0.0144						
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm						90.6					908					121.7		
	Sulfate	SO4(-2)		EES6	mg/L																18.3	0.01	
	Sulfate	SO4(-2)		GELC	mg/L						1.2	0.193				1.09	0.193						
	Total Dissolved Solids	TDS		GELC	mg/L						100	3.07				97	3.07						
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																0.01956	0.003	
	Total Suspended Solids	TSS		GELC	mg/L		1.4								<	0.764	0.764						
	pH	pH	Field	FLD	SU						7.18					7.43					7.95		
METALS	Aluminum	Al		EES6	µg/L																320	2	
	Aluminum	Al		GELC	µg/L																		
	Antimony	Sb		EES6	µg/L															<	1	1	
	Antimony	Sb		GELC	µg/L																		
	Arsenic	As		EES6	µg/L																0.3	0.2	
	Arsenic	As		GELC	µg/L																		
	Barium	Ba		EES6	µg/L																32	1	
	Barium	Ba		GELC	µg/L																		
	Beryllium	Be		EES6	µg/L															<	1	1	
	Beryllium	Be		GELC	µg/L																		
	Boron	B		EES6	µg/L																8.1	1	
	Boron	B		GELC	µg/L																		
	Cadmium	Cd		EES6	µg/L															<	1	1	
	Cadmium	Cd		GELC	µg/L																		
	Chromium	Cr		EES6	µg/L															<	1	1	
	Chromium	Cr		GELC	µg/L																		
	Cobalt	Co		EES6	µg/L															<	1	1	
	Cobalt	Co		GELC	µg/L																		
	Copper	Cu		EES6	µg/L																1	1	
	Copper	Cu		GELC	µg/L																		
	Iron	Fe		EES6	µg/L																420	10	
	Iron	Fe		GELC	µg/L																		
	Lead	Pb		EES6	µg/L																0.2	0.2	
	Lead	Pb		GELC	µg/L																		
	Manganese	Mn		EES6	µg/L																1.1	1	
	Manganese	Mn		GELC	µg/L																		
	Mercury	Hg		EES6	µg/L															<	0.05	0.05	
	Mercury	Hg		GELC	µg/L		0.073																

Table B-1.8 (continued)

						Start Date Time	11/29/01	11/29/01	11/29/01	09/09/02	09/09/02	09/09/02	09/09/02	09/09/02	08/26/03	08/26/03	08/26/03	08/26/03	08/26/03	03/04/05	03/04/05	03/04/05	03/04/05
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																	
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																		
METALS (cont.)	Nickel	Ni		EES6	µg/L															<	1	1	
	Nickel	Ni		GELC	µg/L																		
	Selenium	Se		EES6	µg/L															<	1	1	
	Selenium	Se		GELC	µg/L		3.09																
	Silver	Ag		EES6	µg/L															<	1	1	
	Silver	Ag		GELC	µg/L																		
	Thallium	Tl		EES6	µg/L															<	1	1	
	Thallium	Tl		GELC	µg/L																		
	Tin	Sn		EES6	µg/L															<	1	1	
	Tin	Sn		GELC	µg/L																		
	Vanadium	V		EES6	µg/L																3	1	
	Vanadium	V		GELC	µg/L																		
	Zinc	Zn		EES6	µg/L															<	1	1	
	Zinc	Zn		GELC	µg/L																		
RAD	Americium-241	Am-241		GELC	pCi/L											0.0203		0.029	0.00765				
	Cesium-137	Cs-137		GELC	pCi/L											1.51		6.64	1.81				
	Gross alpha	GROSSA		GELC	pCi/L											-0.233		1.25	0.274				
	Gross beta	GROSSB		GELC	pCi/L											2.49		2.43	0.674				
	Gross gamma	GROSSG		GELC	pCi/L											101		451	100				
	Plutonium-238	Pu-238		GELC	pCi/L											-1E-09		0.03	0.0068				
	Strontium-90	Sr-90		GELC	pCi/L											0.109		0.321	0.0767				
	Uranium	U		EES6	µg/L															<	0.2	0.2	
	Uranium-234	U-234		GELC	pCi/L											0.0498		0.058	0.014				
	Uranium-238	U-238		GELC	pCi/L											0.0224		0.037	0.00976				

Table B-1.8 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
						Start Date Time	03/04/05	04/18/05	04/18/05	04/18/05	04/18/05	04/18/05	05/27/05	05/27/05	05/27/05	05/27/05	05/27/05	07/11/05	07/11/05	07/11/05	07/11/05	07/11/05
						Fld Prep Code	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																	
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L				35.7	1				38.4	1				40.7	1		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																	
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																	
	Bromide	Br(-1)		EES6	mg/L				0.02	0.01				0.02	0.01				0.01	0.01		
	Calcium	Ca		EES6	mg/L				11.2	0.01				8.04	0.01		0.07		7.08	0.01		0.06
	Calcium	Ca		GELC	mg/L																	
	Chloride	Cl(-1)		EES6	mg/L				3.49	0.01				1.96	0.01				0.99	0.01		
	Chloride	Cl(-1)		GELC	mg/L																	
	Fluoride	F(-1)		EES6	mg/L				0.05	0.01				0.04	0.01				0.04	0.01		
	Fluoride	F(-1)		GELC	mg/L																	
	Magnesium	Mg		EES6	mg/L		0.01		3.43	0.01		0.02		3.61	0.01		0.01		3.47	0.01		0.01
	Magnesium	Mg		GELC	mg/L																	
	Nitrate as Nitrogen	NO3-N		EES6	mg/L				0.45	0.003				0.54	0.003				0.26	0.003		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																	
	Nitrite as Nitrogen	NO2-N		EES6	mg/L			<	0.003	0.003			<	0.003	0.003			<	0.003	0.003		
	Potassium	K		EES6	mg/L		0.03		1.96	0.01		0.01		1.82	0.01		0.02		1.65	0.01		
	Potassium	K		GELC	mg/L																	
	Silicon Dioxide	SiO2		EES6	mg/L		0.1		17.9	10		0.1		16.3	10		0.1		19.2	10		0
	Silicon Dioxide	SiO2		GELC	mg/L																	
	Sodium	Na		EES6	mg/L		0.04		5.44	0.01		0.01		5.17	0.01		0.03		5.82	0.01		0.03
	Sodium	Na		GELC	mg/L																	
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm				125.1					12.82					89.8			
	Sulfate	SO4(-2)		EES6	mg/L				17.63	0.01				9.58	0.01				2.96	0.01		
	Sulfate	SO4(-2)		GELC	mg/L																	
	Total Dissolved Solids	TDS		GELC	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L				0.01956	0.003				0.02934	0.003				0.01956	0.003		
	Total Suspended Solids	TSS		GELC	mg/L																	
	pH	pH	Field	FLD	SU				6.75					7.21					7.15			
METALS	Aluminum	Al		EES6	µg/L		20		113	2		7		25	2		3		3.4	2		
	Aluminum	Al		GELC	µg/L																	
	Antimony	Sb		EES6	µg/L			<	1	1			<	1	1			<	1	1		
	Antimony	Sb		GELC	µg/L																	
	Arsenic	As		EES6	µg/L				0.3	0.2				0.3	0.2				0.3	0.2		
	Arsenic	As		GELC	µg/L																	
	Barium	Ba		EES6	µg/L				28	1				18	1				16	1		
	Barium	Ba		GELC	µg/L																	
	Beryllium	Be		EES6	µg/L			<	1	1			<	1	1			<	1	1		
	Beryllium	Be		GELC	µg/L																	
	Boron	B		EES6	µg/L				8.4	1				8.9	1		1		5.6	1		
	Boron	B		GELC	µg/L																	
	Cadmium	Cd		EES6	µg/L			<	1	1			<	1	1			<	1	1		
	Cadmium	Cd		GELC	µg/L																	
	Chromium	Cr		EES6	µg/L			<	1	1			<	1	1			<	1	1		
	Chromium	Cr		GELC	µg/L																	
	Cobalt	Co		EES6	µg/L			<	1	1			<	1	1			<	1	1		
	Cobalt	Co		GELC	µg/L																	
	Copper	Cu		EES6	µg/L				1.7	1				3.5	1				1.3	1		
	Copper	Cu		GELC	µg/L																	
	Iron	Fe		EES6	µg/L				50	10			<	10	10			<	10	10		
	Iron	Fe		GELC	µg/L																	
	Lead	Pb		EES6	µg/L			<	0.2	0.2			<	0.2	0.2			<	0.2	0.2		
	Lead	Pb		GELC	µg/L																	
	Manganese	Mn		EES6	µg/L		0.1	<	1	1			<	1	1			<	1	1		
	Manganese	Mn		GELC	µg/L																	
	Mercury	Hg		EES6	µg/L			<	0.05	0.05			<	0.05	0.05			<	0.05	0.05		
	Mercury	Hg		GELC	µg/L																	

Table B-1.8 (continued)

						Start Date Time	03/04/05	04/18/05	04/18/05	04/18/05	04/18/05	04/18/05	05/27/05	05/27/05	05/27/05	05/27/05	05/27/05	07/11/05	07/11/05	07/11/05	07/11/05	07/11/05
						Fld Prep Code	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
METALS (cont.)	Nickel	Ni		EES6	µg/L				28	1			<	1	1			<	1	1		
	Nickel	Ni		GELC	µg/L																	
	Selenium	Se		EES6	µg/L			<	1	1			<	1	1			<	1	1		
	Selenium	Se		GELC	µg/L																	
	Silver	Ag		EES6	µg/L			<	1	1			<	1	1			<	1	1		
	Silver	Ag		GELC	µg/L																	
	Thallium	Tl		EES6	µg/L			<	1	1			<	1	1			<	1	1		
	Thallium	Tl		GELC	µg/L																	
	Tin	Sn		EES6	µg/L			<	1	1			<	1	1			<	1	1		
	Tin	Sn		GELC	µg/L																	
	Vanadium	V		EES6	µg/L				2	1				3	1				3	1		
	Vanadium	V		GELC	µg/L																	
	Zinc	Zn		EES6	µg/L				19	1				1	1				4	1		
	Zinc	Zn		GELC	µg/L																	
RAD	Americium-241	Am-241		GELC	pCi/L																	
	Cesium-137	Cs-137		GELC	pCi/L																	
	Gross alpha	GROSSA		GELC	pCi/L																	
	Gross beta	GROSSB		GELC	pCi/L																	
	Gross gamma	GROSSG		GELC	pCi/L																	
	Plutonium-238	Pu-238		GELC	pCi/L																	
	Strontium-90	Sr-90		GELC	pCi/L																	
	Uranium	U		EES6	µg/L			<	0.2	0.2			<	0.2	0.2			<	0.2	0.2		
	Uranium-234	U-234		GELC	pCi/L																	
	Uranium-238	U-238		GELC	pCi/L																	

Table B-1.9
Ancho Spring

			Start Date Time	09/26/00				09/26/00				10/24/01				10/24/01				02/02/05				02/02/05				09/19/06				09/19/06			
			Fld Prep Code	F				UF				F				UF				F				UF				F				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L	<	1	1						<	0.725	0.725						<	1.45	1.45						<	0.725	0.725		<	0.725	0.725	
	Alkalinity-CO3+HCO3	GELC	mg/L		57.1	1							71.4	0.725							57.1	1.45							53.9	0.725			60.6	0.725	
	Alkalinity-HCO3	GELC	mg/L		56.9	1							71.2	0.725							56.9	1.45													
	Ammonia as Nitrogen	GELC	mg/L																									<	0.01	0.01		<	0.01	0.01	
	Bromide	GELC	mg/L																									<	0.066	0.066		<	0.066	0.066	
	Calcium	GELC	mg/L		13	0.0355							12.1	0.0375							13.1	0.00554							12.7	0.036			12.7	0.036	
	Chloride	GELC	mg/L		1.92	0.026							1.89	0.025							2.16	0.0322							2.24	0.066			2.21	0.066	
	Fluoride	GELC	mg/L		0.355	0.007							0.315	0.006							0.307	0.0553						<	0.384	0.033		<	0.411	0.033	
	Magnesium	GELC	mg/L		3.02	0.00354							2.96	0.00449							3.11	0.00518							2.98	0.085			3	0.085	
	Nitrate-Nitrite as N	GELC	mg/L		0.37	0.009							0.34	0.0069							0.491	0.003							0.424	0.014			0.371	0.014	
	Perchlorate	GELC	µg/L																						0.439	0.05			0.3	0.05					
	Potassium	GELC	mg/L		1.86	0.0164							1.84	0.00707							1.72	0.0165							1.75	0.05			1.73	0.05	
	Silicon Dioxide	GELC	mg/L		81.1	0.0186							74.6	0.0568							71.2	0.0212							72	0.032			73.1	0.032	
	Sodium	GELC	mg/L		11.1	0.013							10.4	0.00813							10.4	0.0144							10.1	0.045			10.2	0.045	
	Specific Conductance	FLD	uS/cm																						134.9								135.2		
	Sulfate	GELC	mg/L		2.22	0.079							2.21	0.062							2.61	0.193							2.59	0.1			2.56	0.1	
	Total Dissolved Solids	GELC	mg/L		148	6.29							144	5.09							131	3.07							151	2.38			155	2.38	
	Total Kjeldahl Nitrogen	GELC	mg/L																										0.036	0.01			0.064	0.01	
	Total Organic Carbon	GELC	mg/L																													<	0.737	0.33	
	Total Phosphate as Phosphorus	GELC	mg/L	<	0.02	0.02																						<	0.01	0.01		<	0.01	0.01	
	Total Suspended Solids	GELC	mg/L						10	1.4							8.2	0.699																	
	pH	FLD	SU						7.16																8.01								7.87		
METALS	Aluminum	GELC	µg/L	<	9.73	23.4						<	34.3	34.3						<	14.7	14.7						<	68	68		<	68	68	
	Antimony	GELC	µg/L	<	0.111	0.111						<	0.35	0.111						<	0.28	0.28						<	0.5	0.5		<	0.5	0.5	
	Arsenic	GELC	µg/L	<	2.57	2.57						<	3.05	4.57							2.6	2.24						<	6	6		<	6	6	
	Barium	GELC	µg/L		28.1	0.748							25.7	0.206							24.7	0.222							25.6	1			25.7	1	
	Beryllium	GELC	µg/L	<	0.474	0.474						<	0.203	0.203						<	0.158	0.158						<	1	1		<	1	1	
	Boron	GELC	µg/L	<	4.74	4.74						<	22.8	2.95							14.1	4.88							13.9	10			13.9	10	
	Cadmium	GELC	µg/L	<	0.631	0.631						<	0.19	0.05						<	0.04	0.04						<	0.1	0.1		<	0.1	0.1	
	Chromium	GELC	µg/L		3.41	1.06							3.47	0.781						<	3.8	0.503							2.8	1			3.4	1	
	Cobalt	GELC	µg/L		1.23	0.627						<	0.295	0.295						<	0.541	0.541						<	1	1		<	1	1	
	Copper	GELC	µg/L	<	1.84	1.84						<	2.67	2.67						<	1.39	1.39						<	3	3		<	3	3	
	Iron	GELC	µg/L	<	19.9	19.9						<	20.6	20.6						<	12.6	12.6						<	18	18		<	18	18	
	Lead	GELC	µg/L	<	1.83	1.83						<	0.18	0.077						<	0.05	0.05						<	0.5	0.5		<	0.5	0.5	
	Manganese	GELC	µg/L	<	2.69	1.15							3.46	2.94						<	0.296	0.296						<	2	2		<	2	2	
	Mercury	GELC	µg/L	<	0.06	0.06										<	0.073	0.073						<	0.0472	0.0472		<	0.06	0.06		<	0.06	0.06	
	Nickel	GELC	µg/L	<	1.62	3.09						<	0.743	0.743						<	0.69	0.69						<	0.5	0.5		<	0.5	0.5	
	Selenium	GELC	µg/L	<	2.36	2.36										<	3.09	3.09						<	6.1	2.81		<	2.5	2.5		<	2.5	2.5	
	Silver	GELC	µg/L	<	0.529	0.529						<	0.197	0.197						<	0.835	0.835						<	0.2	0.2		<	0.2	0.2	
	Thallium	GELC	µg/L	<	0.019	0.014						<	0.05	0.014						<	0.41	0.02						<	0.4	0.4		<	0.4	0.4	
	Tin	GELC	µg/L	<	1.98	1.98						<	2.19	2.4						<	3.26	3.26						<	2.5	2.5		<	2.5	2.5	
	Vanadium	GELC	µg/L		6.77	0.89							6.72	1.09						<	7.6	0.606							6.2	1			6.2	1	
	Zinc	GELC	µg/L	<	2.26	3.89						<	1.51	2.81						<	1.2	0.883						<	3.2	2		<	3.5	2	
RAD	Americium-241	GELC	pCi/L		0.0298	*0.0313*	0.0129						0.00586	*0.0216*	0.00587						0.00972	*0.031*	0.00803						0.00712	*0.041*	0.0051		0.00992	*0.0443*	0.0114
	Cesium-137	GELC	pCi/L		3.24	*3.08*	1.64						0.314	*4.75*	1.21						-1.37	*3.29*	1.15						-1.34	*3.84*	1.14		-0.335	*4.3*	1.22
	Gross alpha	GELC	pCi/L		-0.0922	*1.39*	0.302						0.9	*1.45*	0.4						0.577	*2.98*	0.736						0.363	*2.17*	0.552		0.585	*2.5*	0.668
	Gross beta	GELC	pCi/L		3.95	*2.22*	0.775						2.87	*2.8*	0.711						1.83	*2.09*	0.516						0.974	*2.74*	0.809		3.52	*3*	0.99
	Gross gamma	GELC	pCi/L																		246	*447*	127						64.5	*230*	122		56.3	*291*	74.7
	Plutonium-238	GELC	pCi/L		0.00821	*0.0302*	0.00829						0.0114	*0.0307*	0.00905						-0.011	*0.028*	0.00519						0	*0.0184*	0.00383		0.00257	*0.0247*	0.0152
	Strontium-90	GELC	pCi/L		0.0342	*0.328*	0.0948						0.3	*0.221*	0.0865						0.0201	*0.339*	0.0823						0.047	*0.258*	0.0705		-0.0495	*0.277*	0.0657
	Tritium	UMTL	pCi/L																						-0.15965	0.28737	0.28737								
	Uranium	GELC	µg/L																										0.24	0.05			0.25	0.05	
	Uranium-234	GELC	pCi/L		0.218	*0.134*	0.0514						0.191	*0.016*	0.0245						0.253	*0.071*	0.0272						0.215	*0.0478*	0.0273		0.214	*0.0442*	0.0253
	Uranium-238	GELC	pCi/L		0.0623	*0.0827*	0.0264						0.0802	*0.0201*	0.015						0.132	*0.05*	0.0183						0.0962	*0.0508*	0.0186		0.0889	*0.047*	0.0149

Table B-1.10
G-1A

			Start Date Time	03/07/00				08/14/00				09/27/00				11/15/00				11/15/00			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L																				
	Alkalinity-CO3+HCO3	EES6	mg/L																				
	Alkalinity-CO3+HCO3	GELC	mg/L																				
	Alkalinity-HCO3	GELC	mg/L																				
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	EES6	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	EES6	mg/L																				
	Calcium	GELC	mg/L																				
	Chloride	EES6	mg/L																				
	Chloride	GELC	mg/L																				
	Fluoride	EES6	mg/L																				
	Fluoride	GELC	mg/L																				
	Fluoride	NMSSL	mg/L										0.541	0.1									
	Magnesium	EES6	mg/L																				
	Magnesium	GELC	mg/L																				
	Nitrate as Nitrogen	EES6	mg/L																				
	Nitrate-Nitrite as N	GELC	mg/L																				
	Nitrate-Nitrite as N	NMSSL	mg/L										0.441	0.1									
	Nitrite as Nitrogen	EES6	mg/L																				
	Perchlorate	GELC	µg/L																				
	Potassium	EES6	mg/L																				
	Potassium	GELC	mg/L																				
	Silicon Dioxide	EES6	mg/L																				
	Silicon Dioxide	GELC	mg/L																				
	Sodium	EES6	mg/L																				
	Sodium	GELC	mg/L																				
	Specific Conductance	FLD	uS/cm																				
	Sulfate	EES6	mg/L																				
	Sulfate	GELC	mg/L																				
	Total Dissolved Solids	GELC	mg/L																				
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	EES6	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L																				
	pH	FLD	SU		7.69				7.16								7.61				7.61		
METALS	Aluminum	EES6	µg/L																				
	Aluminum	GELC	µg/L																				
	Antimony	EES6	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L									<	1	1									
	Arsenic	EES6	µg/L																				
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L										10	5									
	Barium	EES6	µg/L																				
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L									<	100	100									
	Beryllium	EES6	µg/L																				
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L									<	1	1									
	Boron	EES6	µg/L																				
	Boron	GELC	µg/L																				
	Cadmium	EES6	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L									<	1	1									
	Chromium	EES6	µg/L																				
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L										6	1									
	Cobalt	EES6	µg/L																				
	Cobalt	GELC	µg/L																				
	Copper	EES6	µg/L																				
	Copper	GELC	µg/L																				

Table B-1.10 (continued)

			Start Date Time	03/07/00				08/14/00				09/27/00				11/15/00				11/15/00			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
METALS (cont.)	Iron	EES6	µg/L																				
	Iron	GELC	µg/L																				
	Lead	EES6	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	EES6	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	EES6	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L									<	0.2	0.2									
	Nickel	EES6	µg/L																				
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L									<	10	10									
	Selenium	EES6	µg/L																				
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L									<	5	5									
	Silver	EES6	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	EES6	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L									<	1	1									
	Tin	EES6	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	EES6	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	EES6	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L																				
	Cesium-137	GELC	pCi/L																				
	Gross alpha	GELC	pCi/L																				
	Gross beta	GELC	pCi/L																				
	Gross gamma	GELC	pCi/L																				
	Plutonium-238	GELC	pCi/L																				
	Strontium-90	GELC	pCi/L						-0.0189	*0.258*	0.151										0.14	*0.234*	0.0705
	Strontium-90	PARA	pCi/L		0.019	*0.13*	0.0375		0.025		0.044												
	Tritium	UMTL	pCi/L		0.12772	0.28737	0.41509																
	Uranium	EES6	µg/L																				
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L																				
	Uranium-238	GELC	pCi/L																				

Table B-1.10 (continued)

			Start Date Time	02/14/01				05/09/01				08/08/01				11/28/01				02/23/02			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L						1.71	0.725													
	Alkalinity-CO3+HCO3	EES6	mg/L																				
	Alkalinity-CO3+HCO3	GELC	mg/L						82.9	0.725													
	Alkalinity-HCO3	GELC	mg/L						81.1	0.725													
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	EES6	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	EES6	mg/L																				
	Calcium	GELC	mg/L						10	0.0375													
	Chloride	EES6	mg/L																				
	Chloride	GELC	mg/L						2.9	0.025													
	Fluoride	EES6	mg/L																				
	Fluoride	GELC	mg/L						0.629	0.006													
	Fluoride	NMSSL	mg/L																				
	Magnesium	EES6	mg/L																				
	Magnesium	GELC	mg/L						0.467	0.00449													
	Nitrate as Nitrogen	EES6	mg/L																				
	Nitrate-Nitrite as N	GELC	mg/L						0.42	0.0069													
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Nitrite as Nitrogen	EES6	mg/L																				
	Perchlorate	GELC	µg/L																				
	Potassium	EES6	mg/L																				
	Potassium	GELC	mg/L						2.63	0.00707													
	Silicon Dioxide	EES6	mg/L																				
	Silicon Dioxide	GELC	mg/L						74.1														
	Sodium	EES6	mg/L																				
	Sodium	GELC	mg/L						33.2	0.0163													
	Specific Conductance	FLD	uS/cm						188.4														
	Sulfate	EES6	mg/L																				
	Sulfate	GELC	mg/L						3.86	0.062													
	Total Dissolved Solids	GELC	mg/L						177	5.09													
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	EES6	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L					<	0.699	0.699													
	pH	FLD	SU						8.3														
METALS	Aluminum	EES6	µg/L																				
	Aluminum	GELC	µg/L																				
	Antimony	EES6	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L																				
	Arsenic	EES6	µg/L																				
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L																				
	Barium	EES6	µg/L																				
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L																				
	Beryllium	EES6	µg/L																				
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L																				
	Boron	EES6	µg/L																				
	Boron	GELC	µg/L																				
	Cadmium	EES6	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L																				
	Chromium	EES6	µg/L																				
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L																				
	Cobalt	EES6	µg/L																				
	Cobalt	GELC	µg/L																				
	Copper	EES6	µg/L																				
	Copper	GELC	µg/L																				
	Iron	EES6	µg/L																				
	Iron	GELC	µg/L																				

Table B-1.10 (continued)

			Start Date Time	02/14/01				05/09/01				08/08/01				11/28/01				02/23/02			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
METALS (cont.)	Lead	EES6	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	EES6	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	EES6	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L																				
	Nickel	EES6	µg/L																				
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L																				
	Selenium	EES6	µg/L																				
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L																				
	Silver	EES6	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	EES6	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L																				
	Tin	EES6	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	EES6	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	EES6	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L						0.0152	*0.0103*	0.00767												
	Cesium-137	GELC	pCi/L						-0.0712	*2.58*	0.724												
	Gross alpha	GELC	pCi/L						0.667	*2.53*	0.706												
	Gross beta	GELC	pCi/L						6.25	*2.16*	0.819												
	Gross gamma	GELC	pCi/L																				
	Plutonium-238	GELC	pCi/L						0.008	*0.0181*	0.00527												
	Strontium-90	GELC	pCi/L		-0.0156	*0.325*	0.0939		0.0665	*0.201*	0.0614		0.0326	*0.136*	0.0502		-0.0059	*0.0793*	0.029		-0.011	*0.128*	0.0468
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L		1.56457	0.28737	0.25544														-0.15965	0.28737	0.15965
	Uranium	EES6	µg/L																				
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L						0.27	*0.0196*	0.0308												
	Uranium-238	GELC	pCi/L						0.135	*0.00572*	0.0194												

Table B-1.10 (continued)

			Start Date Time	02/14/01	05/18/02				08/24/02				11/16/02				02/08/03				05/14/03			
			Fld Prep Code	UF	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L						<	1.45	1.45													
	Alkalinity-CO3+HCO3	EES6	mg/L																					
	Alkalinity-CO3+HCO3	GELC	mg/L							77.3	1.45													
	Alkalinity-HCO3	GELC	mg/L							76.3	1.45													
	Ammonia as Nitrogen	GELC	mg/L																					
	Bromide	EES6	mg/L																					
	Bromide	GELC	mg/L																					
	Calcium	EES6	mg/L																					
	Calcium	GELC	mg/L							10.7	0.00554													
	Chloride	EES6	mg/L																					
	Chloride	GELC	mg/L							2.61	0.0322													
	Fluoride	EES6	mg/L																					
	Fluoride	GELC	mg/L							0.5	0.0553													
	Fluoride	NMSSL	mg/L																					
	Magnesium	EES6	mg/L																					
	Magnesium	GELC	mg/L							0.503	0.00518													
	Nitrate as Nitrogen	EES6	mg/L																					
	Nitrate-Nitrite as N	GELC	mg/L							0.34	0.01													
	Nitrate-Nitrite as N	NMSSL	mg/L																					
	Nitrite as Nitrogen	EES6	mg/L																					
	Perchlorate	GELC	µg/L																					
	Potassium	EES6	mg/L																					
	Potassium	GELC	mg/L							2.67	0.0165													
	Silicon Dioxide	EES6	mg/L																					
	Silicon Dioxide	GELC	mg/L																					
	Sodium	EES6	mg/L																					
	Sodium	GELC	mg/L							25.3	0.0144													
	Specific Conductance	FLD	uS/cm			190.2				179.5				183.9										
	Sulfate	EES6	mg/L																					
	Sulfate	GELC	mg/L							4.12	0.193													
	Total Dissolved Solids	GELC	mg/L							163	3.07													
	Total Kjeldahl Nitrogen	GELC	mg/L																					
	Total Phosphate as Phosphorus	EES6	mg/L																					
	Total Phosphate as Phosphorus	GELC	mg/L																					
	Total Suspended Solids	GELC	mg/L																					
	pH	FLD	SU			8.21				8.33				8.5										
METALS	Aluminum	EES6	µg/L																					
	Aluminum	GELC	µg/L																					
	Antimony	EES6	µg/L																					
	Antimony	GELC	µg/L																					
	Antimony	NMSSL	µg/L																					
	Arsenic	EES6	µg/L																					
	Arsenic	GELC	µg/L																					
	Arsenic	NMSSL	µg/L																					
	Barium	EES6	µg/L																					
	Barium	GELC	µg/L																					
	Barium	NMSSL	µg/L																					
	Beryllium	EES6	µg/L																					
	Beryllium	GELC	µg/L																					
	Beryllium	NMSSL	µg/L																					
	Boron	EES6	µg/L																					
	Boron	GELC	µg/L																					
	Cadmium	EES6	µg/L																					
	Cadmium	GELC	µg/L																					
	Cadmium	NMSSL	µg/L																					
	Chromium	EES6	µg/L																					
	Chromium	GELC	µg/L																					
	Chromium	NMSSL	µg/L																					
	Cobalt	EES6	µg/L																					
	Cobalt	GELC	µg/L																					
	Copper	EES6	µg/L																					
	Copper	GELC	µg/L																					
	Iron	EES6	µg/L																					
	Iron	GELC	µg/L																					

Table B-1.10 (continued)

			Start Date Time	02/14/01	05/18/02				08/24/02				11/16/02				02/08/03				05/14/03			
			Fld Prep Code	UF	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
METALS (cont.)	Lead	EES6	µg/L																					
	Lead	GELC	µg/L																					
	Manganese	EES6	µg/L																					
	Manganese	GELC	µg/L																					
	Mercury	EES6	µg/L																					
	Mercury	GELC	µg/L																					
	Mercury	NMSSL	µg/L																					
	Nickel	EES6	µg/L																					
	Nickel	GELC	µg/L																					
	Nickel	NMSSL	µg/L																					
	Selenium	EES6	µg/L																					
	Selenium	GELC	µg/L																					
	Selenium	NMSSL	µg/L																					
	Silver	EES6	µg/L																					
	Silver	GELC	µg/L																					
	Thallium	EES6	µg/L																					
	Thallium	GELC	µg/L																					
	Thallium	NMSSL	µg/L																					
	Tin	EES6	µg/L																					
	Tin	GELC	µg/L																					
	Vanadium	EES6	µg/L																					
	Vanadium	GELC	µg/L																					
	Zinc	EES6	µg/L																					
	Zinc	GELC	µg/L																					
RAD	Americium-241	GELC	pCi/L							0.0048	*0.029*	0.00588												
	Cesium-137	GELC	pCi/L							0.259	*3.47*	0.93												
	Gross alpha	GELC	pCi/L							1.48	*0.624*	0.269												
	Gross beta	GELC	pCi/L							5.14	*2.02*	0.655												
	Gross gamma	GELC	pCi/L							61.2	*201*	55.5												
	Plutonium-238	GELC	pCi/L							-0.00263	*0.034*	0.00372												
	Strontium-90	GELC	pCi/L			-0.0131	*0.156*	0.0409		-0.0265	*0.101*	0.0289		-0.0094	*0.125*	0.0305		0.0114	*0.0878*	0.0225		-0.005	*0.126*	0.0367
	Strontium-90	PARA	pCi/L																					
	Tritium	UMTL	pCi/L							-0.38316	0.28737	0.28737										0	0.28737	0.28737
	Uranium	EES6	µg/L																					
	Uranium	GELC	µg/L																					
	Uranium-234	GELC	pCi/L							0.314	*0.028*	0.043												
	Uranium-238	GELC	pCi/L							0.22	*0.029*	0.0344												

Table B-1.10 (continued)

			Start Date Time	02/14/01	05/18/02	08/21/03				08/21/03				11/24/03				02/09/04				05/19/04			
			Fld Prep Code	UF	UF	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Sym	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L			<	1.45	1.45														<	1.45	1.45	
	Alkalinity-CO3+HCO3	EES6	mg/L																						
	Alkalinity-CO3+HCO3	GELC	mg/L				72.3	1.45															65.4	1.45	
	Alkalinity-HCO3	GELC	mg/L				71.5	1.45															64.8	1.45	
	Ammonia as Nitrogen	GELC	mg/L																						
	Bromide	EES6	mg/L																						
	Bromide	GELC	mg/L																						
	Calcium	EES6	mg/L																						
	Calcium	GELC	mg/L				10.6	0.00554															10.4	0.00554	
	Chloride	EES6	mg/L																						
	Chloride	GELC	mg/L				2.55	0.0322															3.18	0.0322	
	Fluoride	EES6	mg/L																						
	Fluoride	GELC	mg/L				0.523	0.0553							0.333	0.0553							0.416	0.0553	
	Fluoride	NMSSL	mg/L																						
	Magnesium	EES6	mg/L																						
	Magnesium	GELC	mg/L				0.521	0.00518															0.495	0.00518	
	Nitrate as Nitrogen	EES6	mg/L																						
	Nitrate-Nitrite as N	GELC	mg/L				0.45	0.01							0.44	0.01							0.51	0.01	
	Nitrate-Nitrite as N	NMSSL	mg/L																						
	Nitrite as Nitrogen	EES6	mg/L																						
	Perchlorate	GELC	µg/L																0.271				0.285	0.05	
	Potassium	EES6	mg/L																						
	Potassium	GELC	mg/L				2.66	0.0165															2.76	0.0165	
	Silicon Dioxide	EES6	mg/L																						
	Silicon Dioxide	GELC	mg/L																				69.7	0.0212	
	Sodium	EES6	mg/L																						
	Sodium	GELC	mg/L				24.5	0.0144															27.9	0.0144	
	Specific Conductance	FLD	uS/cm				170.4				170.4								155				102		
	Sulfate	EES6	mg/L																						
	Sulfate	GELC	mg/L				4.01	0.193															4.18	0.193	
	Total Dissolved Solids	GELC	mg/L				171	3.07															169	3.07	
	Total Kjeldahl Nitrogen	GELC	mg/L																						
	Total Phosphate as Phosphorus	EES6	mg/L																						
	Total Phosphate as Phosphorus	GELC	mg/L																						
	Total Suspended Solids	GELC	mg/L			<	0.796	0.796														<	0.764	0.764	
	pH	FLD	SU				8.8				8.8								8.22				8.43		
METALS	Aluminum	EES6	µg/L																						
	Aluminum	GELC	µg/L																				21.7	14.7	
	Antimony	EES6	µg/L																						
	Antimony	GELC	µg/L											<	0.264	0.2						<	0.28	0.28	
	Antimony	NMSSL	µg/L																						
	Arsenic	EES6	µg/L																						
	Arsenic	GELC	µg/L												6.84	0.53						<	9.39	2.24	
	Arsenic	NMSSL	µg/L																						
	Barium	EES6	µg/L																						
	Barium	GELC	µg/L												38.2	0.25							36.8	0.222	
	Barium	NMSSL	µg/L																						
	Beryllium	EES6	µg/L																						
	Beryllium	GELC	µg/L											<	0.07	0.07						<	0.158	0.158	
	Beryllium	NMSSL	µg/L																						
	Boron	EES6	µg/L																						
	Boron	GELC	µg/L																				32.7	4.88	
	Cadmium	EES6	µg/L																						
	Cadmium	GELC	µg/L											<	0.07	0.07						<	0.04	0.04	
	Cadmium	NMSSL	µg/L																						
	Chromium	EES6	µg/L																						
	Chromium	GELC	µg/L												5.59	0.3							7.31	0.503	
	Chromium	NMSSL	µg/L																						
	Cobalt	EES6	µg/L																						
	Cobalt	GELC	µg/L																			<	0.541	0.541	
	Copper	EES6	µg/L																						
	Copper	GELC	µg/L																				2.4	1.39	
	Iron	EES6	µg/L																						
	Iron	GELC	µg/L																			<	12.6	12.6	

Table B-1.10 (continued)

			Start Date Time	02/14/01	05/18/02	08/21/03				08/21/03				11/24/03				02/09/04				05/19/04			
			Fld Prep Code	UF	UF	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Sym	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
METALS (cont.)	Lead	EES6	µg/L																						
	Lead	GELC	µg/L																			<	0.246	0.05	
	Manganese	EES6	µg/L																						
	Manganese	GELC	µg/L																				0.382	0.296	
	Mercury	EES6	µg/L																						
	Mercury	GELC	µg/L											<	0.0472	0.0472						<	0.0472	0.0472	
	Mercury	NMSSL	µg/L																						
	Nickel	EES6	µg/L																						
	Nickel	GELC	µg/L												0.229	0.07						<	0.69	0.69	
	Nickel	NMSSL	µg/L																						
	Selenium	EES6	µg/L																						
	Selenium	GELC	µg/L											<	1	1						<	2.81	2.81	
	Selenium	NMSSL	µg/L																						
	Silver	EES6	µg/L																						
	Silver	GELC	µg/L																			<	0.835	0.835	
	Thallium	EES6	µg/L																						
	Thallium	GELC	µg/L												0.544	0.02						<	0.073	0.02	
	Thallium	NMSSL	µg/L																						
	Tin	EES6	µg/L																						
	Tin	GELC	µg/L																			<	3.26	3.26	
	Vanadium	EES6	µg/L																						
	Vanadium	GELC	µg/L																				37.6	0.606	
	Zinc	EES6	µg/L																						
	Zinc	GELC	µg/L																				7.27	0.883	
RAD	Americium-241	GELC	pCi/L				-1E-09	*0.03*	0.00516														2.64E-10	*0.039*	0.00443
	Cesium-137	GELC	pCi/L				-1.05	*3.28*	0.998														-0.841	*3.47*	1.03
	Gross alpha	GELC	pCi/L				0.159	*1.63*	0.402						0.336	*1.24*	0.315						-0.305	*2.5*	0.56
	Gross beta	GELC	pCi/L				1.93	*2.24*	0.574						2.4	*2.05*	0.595						2.67	*2.49*	0.686
	Gross gamma	GELC	pCi/L				86.2	*359*	101														101	*412*	84.4
	Plutonium-238	GELC	pCi/L				4.56E-09	*0.033*	0.0143														0	*0.031*	0.00562
	Strontium-90	GELC	pCi/L				0.071	*0.0755*	0.0255		0.0451	*0.0657*	0.0211		0.004	*0.134*	0.0396		0.0063	*0.0937*	0.0276		-0.444	*0.418*	0.102
	Strontium-90	PARA	pCi/L																						
	Tritium	UMTL	pCi/L																				0.09579	0.28737	0.28737
	Uranium	EES6	µg/L																						
	Uranium	GELC	µg/L																				0.478	0.02	
	Uranium-234	GELC	pCi/L				0.258	*0.055*	0.0299														0.274	*0.063*	0.0313
	Uranium-238	GELC	pCi/L				0.146	*0.035*	0.0211														0.167	*0.044*	0.0221

Table B-1.10 (continued)

Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
			Start Date Time	05/18/05				02/22/06				02/22/06			
			Fld Prep Code	UF				F				UF			
GENINORG	Alkalinity-CO3	GELC	mg/L	<	1.45	1.45			1.2	0.725					
	Alkalinity-CO3+HCO3	EES6	mg/L						85.3				84.2		
	Alkalinity-CO3+HCO3	GELC	mg/L		70.8	1.45			76.3	0.725					
	Alkalinity-HCO3	GELC	mg/L		70.7	1.45									
	Ammonia as Nitrogen	GELC	mg/L					<	0.01	0.01					
	Bromide	EES6	mg/L						0.04	0.01			0.04	0.01	
	Bromide	GELC	mg/L					<	0.041	0.041					
	Calcium	EES6	mg/L						10.6	0.01	0.1		11.3	0.01	
	Calcium	GELC	mg/L		16.4	0.036			11.2	0.036			11.3	0.036	
	Chloride	EES6	mg/L						3.9	0.01			3.88	0.01	
	Chloride	GELC	mg/L		7.56	0.053			2.79	0.053					
	Fluoride	EES6	mg/L						0.57	0.01			0.55	0.01	
	Fluoride	GELC	mg/L		0.433	0.03			0.539	0.03					
	Fluoride	NMSSL	mg/L												
	Magnesium	EES6	mg/L						0.48	0.01	0.01		0.51	0.01	0.01
	Magnesium	GELC	mg/L		0.592	0.085			0.538	0.085			0.543	0.085	
	Nitrate as Nitrogen	EES6	mg/L						0.53	0.003			0.54	0.003	
	Nitrate-Nitrite as N	GELC	mg/L		0.216	0.003			0.375	0.017					
	Nitrate-Nitrite as N	NMSSL	mg/L												
	Nitrite as Nitrogen	EES6	mg/L					<	0.002	0.002		<	0.002	0.002	
	Perchlorate	GELC	µg/L		0.25	0.05			0.314	0.05					
	Potassium	EES6	mg/L						2.71	0.01	0.05		2.87	0.01	0.04
	Potassium	GELC	mg/L		2.83	0.05			2.81	0.05			2.82	0.05	
	Silicon Dioxide	EES6	mg/L						31.9	10	0.4		33.8	10	0.1
	Silicon Dioxide	GELC	mg/L		55.7	0.032			74.6	0.032					
	Sodium	EES6	mg/L						23.7	0.01	0.6		25.5	0.01	0.5
	Sodium	GELC	mg/L		23.2	0.045			26.8	0.045			26.8	0.045	
	Specific Conductance	FLD	uS/cm		192.6								173.4		
	Sulfate	EES6	mg/L						5.54	0.01			5.47	0.01	
	Sulfate	GELC	mg/L		3.93	0.057			3.95	0.057					
	Total Dissolved Solids	GELC	mg/L		136	2.38			179	2.38					
	Total Kjeldahl Nitrogen	GELC	mg/L					<	0.025	0.01					
	Total Phosphate as Phosphorus	EES6	mg/L						0.044	0.003			0.047	0.003	
	Total Phosphate as Phosphorus	GELC	mg/L		0.299	0.01			0.052	0.01					
	Total Suspended Solids	GELC	mg/L									<	1.27	1.27	
	pH	FLD	SU		7.3								8.01		
METALS	Aluminum	EES6	µg/L					<	2	2			3.2	2	0.1
	Aluminum	GELC	µg/L	<	68	68		<	68	68		<	68	68	
	Antimony	EES6	µg/L					<	1	1		<	1	1	
	Antimony	GELC	µg/L	<	0.5	0.5		<	0.5	0.5		<	0.5	0.5	
	Antimony	NMSSL	µg/L												
	Arsenic	EES6	µg/L						6.2	0.2	0.1		6.2	0.2	0.2
	Arsenic	GELC	µg/L		6.1	6		<	6	6			8.3	6	
	Arsenic	NMSSL	µg/L												
	Barium	EES6	µg/L						41	1	1		44	1	
	Barium	GELC	µg/L		73	1			44.9	1			42.1	1	
	Barium	NMSSL	µg/L												
	Beryllium	EES6	µg/L					<	1	1		<	1	1	
	Beryllium	GELC	µg/L	<	0.1	0.1		<	1	1		<	1	1	
	Beryllium	NMSSL	µg/L												
	Boron	EES6	µg/L						29	1	1		30	1	1
	Boron	GELC	µg/L		22.2	10			30.3	10			30.5	10	
	Cadmium	EES6	µg/L					<	1	1		<	1	1	
	Cadmium	GELC	µg/L	<	0.1	0.1		<	0.1	0.1		<	0.1	0.1	
	Cadmium	NMSSL	µg/L												
	Chromium	EES6	µg/L						5	1			6.2	1	
	Chromium	GELC	µg/L		3.5	1			5.5	1			6.1	1	
	Chromium	NMSSL	µg/L												
	Cobalt	EES6	µg/L					<	1	1		<	1	1	
	Cobalt	GELC	µg/L	<	1	1		<	1	1		<	1	1	
	Copper	EES6	µg/L						3.5	1	0.2		17	1	
	Copper	GELC	µg/L	<	3	3			5	3			62.2	3	
	Iron	EES6	µg/L						20	10			40	10	
	Iron	GELC	µg/L		915	18		<	21.5	18		<	77.1	18	

Table B-1.10 (continued)

			Start Date Time	05/18/05				02/22/06				02/22/06			
			Fld Prep Code	UF				F				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
METALS (cont.)	Lead	EES6	µg/L						2	0.2			2.8	0.2	0.1
	Lead	GELC	µg/L		0.75	0.5			2.9	0.5			4.6	0.5	
	Manganese	EES6	µg/L						13	1			14	1	
	Manganese	GELC	µg/L		220	1			13.7	2			16	2	
	Mercury	EES6	µg/L						0.26	0.05			0.24	0.05	
	Mercury	GELC	µg/L	<	0.05	0.05		<	0.05	0.05		<	0.05	0.05	
	Mercury	NMSSL	µg/L												
	Nickel	EES6	µg/L					<	1	1		<	1	1	
	Nickel	GELC	µg/L	<	1	1		<	0.5	0.5			0.77	0.5	
	Nickel	NMSSL	µg/L												
	Selenium	EES6	µg/L					<	1	1		<	1	1	
	Selenium	GELC	µg/L	<	6	6		<	2.5	2.5		<	2.5	2.5	
	Selenium	NMSSL	µg/L												
	Silver	EES6	µg/L					<	1	1		<	1	1	
	Silver	GELC	µg/L	<	1	1		<	0.2	0.2		<	0.2	0.2	
	Thallium	EES6	µg/L					<	1	1		<	1	1	
	Thallium	GELC	µg/L	<	0.4	0.4		<	0.4	0.4		<	0.4	0.4	
	Thallium	NMSSL	µg/L												
	Tin	EES6	µg/L					<	1	1		<	1	1	
	Tin	GELC	µg/L	<	2.5	2.5		<	2.5	2.5		<	2.5	2.5	
	Vanadium	EES6	µg/L						28	1	1		28	1	
	Vanadium	GELC	µg/L		14.6	1			29.7	1			30.6	1	
	Zinc	EES6	µg/L						2	1			3	1	
	Zinc	GELC	µg/L	<	5.8	2			5	2			6.1	2	
RAD	Americium-241	GELC	pCi/L		-0.00465	*0.031*	0.00964								
	Cesium-137	GELC	pCi/L		0.234	*2.35*	0.677								
	Gross alpha	GELC	pCi/L		1.09	*1.41*	0.439								
	Gross beta	GELC	pCi/L		1.6	*1.38*	0.404								
	Gross gamma	GELC	pCi/L		70.7	*255*	145								
	Plutonium-238	GELC	pCi/L		0.0134	*0.056*	0.00968								
	Strontium-90	GELC	pCi/L		0.17	*0.438*	0.111								
	Strontium-90	PARA	pCi/L												
	Tritium	UMTL	pCi/L		0.09579	*0.28737*	0.28737								
	Uranium	EES6	µg/L						0.4	0.2			0.4	0.2	
	Uranium	GELC	µg/L						0.46	0.05			0.42	0.05	
	Uranium-234	GELC	pCi/L		0.464	*0.091*	0.0419								
	Uranium-238	GELC	pCi/L		0.244	*0.064*	0.0291								

Table B-1.11
G-2A

			Start Date Time	03/07/00				06/20/00				08/14/00				09/27/00				11/15/00			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L																				
	Alkalinity-CO3+HCO3	GELC	mg/L																				
	Alkalinity-HCO3	GELC	mg/L																				
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L																				
	Chloride	GELC	mg/L																				
	Fluoride	GELC	mg/L																				
	Fluoride	NMSSL	mg/L														0.354	0.1					
	Magnesium	GELC	mg/L																				
	Nitrate-Nitrite as N	GELC	mg/L																				
	Nitrate-Nitrite as N	NMSSL	mg/L														0.425	0.1					
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L																				
	Silicon Dioxide	GELC	mg/L																				
	Sodium	GELC	mg/L																				
	Specific Conductance	FLD	uS/cm																				
	Sulfate	GELC	mg/L																				
	Total Dissolved Solids	GELC	mg/L																				
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L																				
	pH	FLD	SU		8.29				7.17				6.8								8.21		
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L													<	1	1					
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L														9	1					
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L													<	100	100					
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L													<	1	1					
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L													<	1	1					
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L														4	1					
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L													<	0.2	0.2					
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L													<	10	10					
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L													<	5	5					
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L													<	1	1					
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L																				
	Cesium-137	GELC	pCi/L																				
	Gross alpha	GELC	pCi/L																				
	Gross beta	GELC	pCi/L																				
	Gross gamma	GELC	pCi/L																				
	Plutonium-238	GELC	pCi/L																				
	Strontium-90	GELC	pCi/L										0.0537	*0.28*	0.165						-0.0001	*0.235*	0.0686
	Strontium-90	PARA	pCi/L		0.028	*0.13*	0.0375		0.046	*0.13*	0.0385		-0.044		0.0435								
	Tritium	UMTL	pCi/L		0.44702	0.28737	0.44702																
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L																				
	Uranium-238	GELC	pCi/L																				

Table B-1.11 (continued)

			Start Date Time	05/09/01				08/08/01				11/28/01				02/23/02				05/18/02			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L		0.776	0.725																	
	Alkalinity-CO3+HCO3	GELC	mg/L		77.9	0.725																	
	Alkalinity-HCO3	GELC	mg/L		77.1	0.725																	
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L		11	0.0375																	
	Chloride	GELC	mg/L		2.01	0.025																	
	Fluoride	GELC	mg/L		0.433	0.006																	
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L		0.912	0.00449																	
	Nitrate-Nitrite as N	GELC	mg/L		0.41	0.0069																	
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L		2.09	0.00707																	
	Silicon Dioxide	GELC	mg/L		59.6																		
	Sodium	GELC	mg/L		25.7	0.0163																	
	Specific Conductance	FLD	uS/cm		169.9																193.1		
	Sulfate	GELC	mg/L		3.19	0.062																	
	Total Dissolved Solids	GELC	mg/L		148	5.09																	
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L	<	0.699	0.699																	
	pH	FLD	SU		8.28																8.62		
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L		0.00609	*0.00825*	0.00432																
	Cesium-137	GELC	pCi/L		0.931	*3.03*	0.842																
	Gross alpha	GELC	pCi/L		0.116	*1.57*	0.406																
	Gross beta	GELC	pCi/L		1.32	*2.62*	0.785																
	Gross gamma	GELC	pCi/L																				
	Plutonium-238	GELC	pCi/L		0.00401	*0.00544*	0.00284																
	Strontium-90	GELC	pCi/L		0.0065	*0.178*	0.0527		0.0909	*0.124*	0.0478		-0.011	*0.087*	0.0318		-0.0007	*0.175*	0.0461		0.0402	*0.14*	0.0383
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L		0.06386	0.28737	0.25544										0	0.28737	0.12772				
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L		0.286	*0.0325*	0.0364																
	Uranium-238	GELC	pCi/L		0.161	*0.028*	0.0254																

Table B-1.11 (continued)

			Start Date Time	08/24/02				11/16/02				02/08/03				08/21/03				11/24/03			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L	<	1.45	1.45										<	1.45	1.45					
	Alkalinity-CO3+HCO3	GELC	mg/L		82.3	1.45											74.4	1.45					
	Alkalinity-HCO3	GELC	mg/L		81.6	1.45											73.5	1.45					
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L		12.4	0.00554											12.2	0.00554					
	Chloride	GELC	mg/L		2.39	0.0322											2.39	0.0322					
	Fluoride	GELC	mg/L		0.385	0.0553											0.37	0.0553			0.284	0.0553	
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L		1.06	0.00518											1.05	0.00518					
	Nitrate-Nitrite as N	GELC	mg/L		0.35	0.01											0.45	0.01			0.44	0.01	
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L		2.02	0.0165											1.92	0.0165					
	Silicon Dioxide	GELC	mg/L																				
	Sodium	GELC	mg/L		23.4	0.0144											21	0.0144					
	Specific Conductance	FLD	uS/cm		174.3				175.5								165.3						
	Sulfate	GELC	mg/L		3.42	0.193											3.51	0.193					
	Total Dissolved Solids	GELC	mg/L		169	3.07											164	3.07					
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L													<	0.796	0.796					
	pH	FLD	SU		8.29				8.3								8.4						
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																	<	0.2	0.2	
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L																		9.27	0.53	
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L																		13.4	0.25	
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L																	<	0.07	0.07	
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																	<	0.07	0.07	
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L																		5.19	0.3	
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																	<	0.0472	0.0472	
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L																		0.223	0.07	
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L																	<	1	1	
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																	<	0.027	0.02	
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L		0.00408	*0.025*	0.00815										0.0103	*0.029*	0.00464				
	Cesium-137	GELC	pCi/L		-1.05	*3.14*	0.948										0.556	*3.68*	1.06				
	Gross alpha	GELC	pCi/L		1.04	*1.38*	0.429										0.439	*1.09*	0.297		0.446	*1.07*	0.289
	Gross beta	GELC	pCi/L		2.92	*2.46*	0.669										1.46	*2.26*	0.569		1.99	*2.37*	0.651
	Gross gamma	GELC	pCi/L		62	*246*	53.3										60.7	*308*	71.7				
	Plutonium-238	GELC	pCi/L		-2.57E-10	*0.028*	0.00305										0.0187	*0.043*	0.0197				
	Strontium-90	GELC	pCi/L		0.0369	*0.147*	0.054		0.0721	*0.11*	0.0312		0.0369	*0.0888*	0.024		0.0201	*0.0878*	0.0262		0.0201	*0.153*	0.0457
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L		-0.09579	0.28737	0.28737																
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L		0.294	*0.032*	0.043										0.299	*0.051*	0.0327				
	Uranium-238	GELC	pCi/L		0.239	*0.033*	0.0383										0.165	*0.032*	0.0221				

Table B-1.11 (continued)

			Start Date Time	02/09/04				05/19/04				05/18/05				05/17/06				05/17/06			
			Fld Prep Code	UF				UF				UF				F				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L					<	1.45	1.45		<	1.45	1.45							2.39	0.725	
	Alkalinity-CO3+HCO3	GELC	mg/L						69.5	1.45			75	1.45							79.4	0.725	
	Alkalinity-HCO3	GELC	mg/L						68.8	1.45			74.6	1.45									
	Ammonia as Nitrogen	GELC	mg/L																	<	0.1	0.1	
	Bromide	GELC	mg/L																	<	0.066	0.066	
	Calcium	GELC	mg/L						11.6	0.00554			12.2	0.036							10	0.036	
	Chloride	GELC	mg/L						2.25	0.0322			2.09	0.053							2.3	0.066	
	Fluoride	GELC	mg/L						0.283	0.0553			0.315	0.03							0.498	0.033	
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L						1.01	0.00518			0.997	0.085							0.801	0.085	
	Nitrate-Nitrite as N	GELC	mg/L						0.42	0.01			0.36	0.003							0.397	0.014	
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L		0.315				0.337	0.05			0.37	0.05							0.323	0.05	
	Potassium	GELC	mg/L						2	0.0165			2.08	0.05							1.73	0.05	
	Silicon Dioxide	GELC	mg/L						60.2	0.0212			60.9	0.032							56.6	0.032	
	Sodium	GELC	mg/L						22.8	0.0144			24.1	0.045							27.9	0.045	
	Specific Conductance	FLD	uS/cm		152.6				171.9				167.2								178.6		
	Sulfate	GELC	mg/L						3.27	0.193			2.96	0.057							3.51	0.1	
	Total Dissolved Solids	GELC	mg/L						128	4.44			134	2.38							161	2.38	
	Total Kjeldahl Nitrogen	GELC	mg/L																	<	0.1	0.1	
	Total Phosphate as Phosphorus	GELC	mg/L									<	0.04	0.01						<	0.024	0.01	
	Total Suspended Solids	GELC	mg/L					<	1.27	1.27													
	pH	FLD	SU		8.2				8.33				8.1								8.47		
METALS	Aluminum	GELC	µg/L						16	14.7		<	68	68						<	68	68	
	Antimony	GELC	µg/L					<	0.28	0.28		<	0.5	0.5						<	0.5	0.5	
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L					<	9.97	2.24			6.4	6							16.3	6	
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L						13.7	0.222			14.7	1							15	1	
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L					<	0.158	0.158		<	0.1	0.1						<	1	1	
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L					<	15.9	4.88			22.9	10							24.3	10	
	Cadmium	GELC	µg/L					<	0.04	0.04		<	0.1	0.1						<	0.1	0.1	
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L						4.65	0.503			4.7	1			6	1			5.9	1	
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L					<	0.541	0.541		<	1	1						<	1	1	
	Copper	GELC	µg/L					<	1.39	1.39		<	3	3						<	3	3	
	Iron	GELC	µg/L					<	12.6	12.6			216	18						<	18	18	
	Lead	GELC	µg/L					<	0.088	0.05		<	0.5	0.5						<	0.5	0.5	
	Manganese	GELC	µg/L					<	0.296	0.296		<	1	1						<	2	2	
	Mercury	GELC	µg/L					<	0.0472	0.0472		<	0.05	0.05						<	0.06	0.06	
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L					<	0.69	0.69		<	1	1						<	0.5	0.5	
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L					<	3.99	2.81		<	6	6						<	2.5	2.5	
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L					<	0.835	0.835		<	1	1						<	0.2	0.2	
	Thallium	GELC	µg/L						0.323	0.02		<	0.4	0.4							0.6	0.4	
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L					<	3.26	3.26		<	2.5	2.5						<	2.5	2.5	
	Vanadium	GELC	µg/L						39.7	0.606			38.5	1							62.7	1	
	Zinc	GELC	µg/L						7.17	0.883		<	2	2						<	2	2	
RAD	Americium-241	GELC	pCi/L						-0.0038	*0.034*	0.00466		-0.00463	*0.032*	0.00842						0.0302	*0.0368*	0.0124
	Cesium-137	GELC	pCi/L						-2.2	*3.11*	1.01		-0.0175	*2.76*	0.779						0.519	*2.85*	1.09
	Gross alpha	GELC	pCi/L						0.428	*1.1*	0.292		-0.294	*1.25*	0.211						0.292	*1.82*	0.386
	Gross beta	GELC	pCi/L						2.27	*1.85*	0.582		1.52	*1.58*	0.446						2.48	*2.69*	0.713
	Gross gamma	GELC	pCi/L						109	*288*	105		116	*387*	126						57.6	*255*	110
	Plutonium-238	GELC	pCi/L						0.0103	*0.032*	0.00848		0.00204	*0.042*	0.00354						-0.00252	*0.0302*	0.0126
	Strontium-90	GELC	pCi/L		0.0098	*0.0781*	0.023		0.0918	*0.268*	0.0685		0.177	*0.332*	0.085						0.0246	*0.184*	0.0472
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L										0.38316	*0.28737*	0.28737						0.12772	*0.28737*	0.28737
	Uranium	GELC	µg/L						0.598	0.02											0.53	0.05	
	Uranium-234	GELC	pCi/L						0.263	*0.068*	0.0312		0.338	*0.07*	0.0313						0.334	*0.116*	0.0414
	Uranium-238	GELC	pCi/L						0.211	*0.048*	0.0263		0.225	*0.05*	0.0246						0.192	*0.0648*	0.0307

Table B-1.12
G-3A

			Start Date Time	03/06/00				06/20/00				08/03/00				08/14/00				09/27/00			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L																				
	Alkalinity-CO3+HCO3	GELC	mg/L																				
	Alkalinity-HCO3	GELC	mg/L																				
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L																				
	Chloride	GELC	mg/L																				
	Fluoride	GELC	mg/L																				
	Fluoride	NMSSL	mg/L																		0.326	0.1	
	Magnesium	GELC	mg/L																				
	Nitrate-Nitrite as N	GELC	mg/L																				
	Nitrate-Nitrite as N	NMSSL	mg/L																		0.55	0.1	
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L																				
	Silicon Dioxide	GELC	mg/L																				
	Sodium	GELC	mg/L																				
	Specific Conductance	FLD	uS/cm																				
	Sulfate	GELC	mg/L																				
	Total Dissolved Solids	GELC	mg/L																				
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L																				
	pH	FLD	SU		8.28				7.31				8.2				6.94						
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L																	<	1	1	
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L																		4	1	
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L																	<	100	100	
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L																	<	1	1	
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L																	<	1	1	
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L																		3	1	
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L																	<	0.2	0.2	
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L																	<	10	10	
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L																	<	5	5	
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L																	<	1	1	
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L																				
	Cesium-137	GELC	pCi/L																				
	Gross alpha	GELC	pCi/L																				
	Gross beta	GELC	pCi/L																				
	Gross gamma	GELC	pCi/L																				
	Plutonium-238	GELC	pCi/L																				
	Strontium-90	GELC	pCi/L										0.0683	*0.558*	0.326		-0.0415	*0.259*	0.151				
	Strontium-90	PARA	pCi/L		0.014	*0.12*	0.0365		0.171	*0.13*	0.0445		0.012	*0.14*	0.0405		0.017		0.043				
	Tritium	UMTL	pCi/L		-0.6386	0.28737	0.38316																
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L																				
	Uranium-238	GELC	pCi/L																				

Table B-1.12 (continued)

			Start Date Time	11/15/00				02/14/01				05/09/01				08/08/01				11/28/01			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L										0.907	0.725									
	Alkalinity-CO3+HCO3	GELC	mg/L										75.9	0.725									
	Alkalinity-HCO3	GELC	mg/L										74.9	0.725									
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L										16.3	0.0375									
	Chloride	GELC	mg/L										2.29	0.025									
	Fluoride	GELC	mg/L										0.344	0.006									
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L										3.02	0.00449									
	Nitrate-Nitrite as N	GELC	mg/L										0.58	0.0069									
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L										1.88	0.00707									
	Silicon Dioxide	GELC	mg/L										52.6										
	Sodium	GELC	mg/L										14.9	0.00813									
	Specific Conductance	FLD	uS/cm										164										
	Sulfate	GELC	mg/L										3.13	0.062									
	Total Dissolved Solids	GELC	mg/L										136	5.09									
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L									<	0.699	0.699									
	pH	FLD	SU		8.1								8.21										
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L										0.0317	*0.0123*	0.0122								
	Cesium-137	GELC	pCi/L										0.403	*2.64*	0.83								
	Gross alpha	GELC	pCi/L										0.639	*1.27*	0.406								
	Gross beta	GELC	pCi/L										-1.33	*2.86*	0.781								
	Gross gamma	GELC	pCi/L																				
	Plutonium-238	GELC	pCi/L										0.00868	*0.00784*	0.00503								
	Strontium-90	GELC	pCi/L		-0.0909	*0.187*	0.0533		0.0625	*0.229*	0.0671		-0.002	*0.201*	0.0595		0.0026	*0.12*	0.0438		0.0113	*0.0544*	0.0201
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L						0.3193	0.28737	0.19158												
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L										0.535	*0.0181*	0.0497								
	Uranium-238	GELC	pCi/L										0.268	*0.0181*	0.0298								

Table B-1.12 (continued)

			Start Date Time	02/23/02				05/18/02				08/24/02				12/18/02				02/08/03			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L									<	1.45	1.45									
	Alkalinity-CO3+HCO3	GELC	mg/L										74.4	1.45									
	Alkalinity-HCO3	GELC	mg/L										73.5	1.45									
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L										15.4	0.00554									
	Chloride	GELC	mg/L										2.61	0.0322									
	Fluoride	GELC	mg/L										0.345	0.0553									
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L										2.54	0.00518									
	Nitrate-Nitrite as N	GELC	mg/L										0.46	0.01									
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L										1.82	0.0165									
	Silicon Dioxide	GELC	mg/L																				
	Sodium	GELC	mg/L										15.4	0.0144									
	Specific Conductance	FLD	uS/cm						167.3				168.9				167.7						
	Sulfate	GELC	mg/L										3.37	0.193									
	Total Dissolved Solids	GELC	mg/L										136	3.07									
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L																				
	pH	FLD	SU						8.35				8.17				8.6						
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L										1.36E-09	*0.028*	0.00456								
	Cesium-137	GELC	pCi/L										0.956	*3.71*	0.976								
	Gross alpha	GELC	pCi/L										1.38	*1.31*	0.455								
	Gross beta	GELC	pCi/L										3.64	*1.95*	0.643								
	Gross gamma	GELC	pCi/L										77.7	*210*	87.8								
	Plutonium-238	GELC	pCi/L										-0.00239	*0.031*	0.00633								
	Strontium-90	GELC	pCi/L		-0.0307	*0.175*	0.0455		-0.0241	*0.154*	0.04		0.0131	*0.0794*	0.0235		-0.0031	*0.107*	0.0272		-0.0244	*0.0804*	0.0197
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L		0.03193	0.28737	0.09579						-0.15965	0.28737	0.28737								
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L										0.446	*0.032*	0.0567								
	Uranium-238	GELC	pCi/L										0.263	*0.033*	0.0394								

Table B-1.12 (continued)

			Start Date Time	05/20/03				08/21/03				11/24/03				02/09/04				05/19/04			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L					<	1.45	1.45										<	1.45	1.45	
	Alkalinity-CO3+HCO3	GELC	mg/L						71.3	1.45											66.4	1.45	
	Alkalinity-HCO3	GELC	mg/L						70.5	1.45											65.9	1.45	
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L						15.6	0.00554											14.4	0.00554	
	Chloride	GELC	mg/L						2.58	0.0322											2.39	0.0322	
	Fluoride	GELC	mg/L						0.338	0.0553			0.251	0.0553							0.225	0.0553	
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L						2.63	0.00518											2.43	0.00518	
	Nitrate-Nitrite as N	GELC	mg/L						0.57	0.01			0.6	0.01							0.58	0.01	
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L														0.377				0.434	0.05	
	Potassium	GELC	mg/L						1.69	0.0165											1.8	0.0165	
	Silicon Dioxide	GELC	mg/L																		48.8	0.0212	
	Sodium	GELC	mg/L						13.8	0.0144											15.6	0.0144	
	Specific Conductance	FLD	uS/cm						163.1								125.9				171.9		
	Sulfate	GELC	mg/L						3.34	0.193											3.13	0.193	
	Total Dissolved Solids	GELC	mg/L						145	3.07											125	3.07	
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L					<	0.779	0.779										<	0.764	0.764	
	pH	FLD	SU						8.2								8.14				8.24		
METALS	Aluminum	GELC	µg/L																	<	14.7	14.7	
	Antimony	GELC	µg/L									<	0.2	0.2						<	0.28	0.28	
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L									<	4.8	0.53						<	3.8	2.24	
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L										3.81	0.25							3.77	0.222	
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L									<	0.07	0.07						<	0.158	0.158	
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L																	<	16.2	4.88	
	Cadmium	GELC	µg/L									<	0.07	0.07						<	0.04	0.04	
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L										3.47	0.3							3.41	0.503	
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L																	<	0.541	0.541	
	Copper	GELC	µg/L																	<	1.39	1.39	
	Iron	GELC	µg/L																	<	12.6	12.6	
	Lead	GELC	µg/L																	<	0.05	0.05	
	Manganese	GELC	µg/L																	<	0.296	0.296	
	Mercury	GELC	µg/L									<	0.0472	0.0472						<	0.0472	0.0472	
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L										0.238	0.07						<	0.69	0.69	
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L									<	1	1						<	2.81	2.81	
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L																	<	0.835	0.835	
	Thallium	GELC	µg/L									<	0.021	0.02						<	0.028	0.02	
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L																	<	3.26	3.26	
	Vanadium	GELC	µg/L																		17.6	0.606	
	Zinc	GELC	µg/L																		7.15	0.883	
RAD	Americium-241	GELC	pCi/L						0.00567	*0.027*	0.00329										0.00213	*0.038*	0.00476
	Cesium-137	GELC	pCi/L						-0.932	*7.19*	2										0.406	*4.03*	1.1
	Gross alpha	GELC	pCi/L						0.707	*1.62*	0.437		0.639	*1.28*	0.356						0.651	*0.898*	0.282
	Gross beta	GELC	pCi/L						2.94	*2.2*	0.593		3.32	*2.58*	0.734						1.37	*2.54*	0.654
	Gross gamma	GELC	pCi/L						185	*760*	169										123	*429*	249
	Plutonium-238	GELC	pCi/L						-0.0287	*0.033*	0.0173										0.00626	*0.032*	0.00626
	Strontium-90	GELC	pCi/L		0.0172	*0.121*	0.0313		0.0838	*0.0848*	0.0286		-0.0133	*0.133*	0.0392		0.0643	*0.0772*	0.0257		0.272	*0.288*	0.0868
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L		-0.28737	0.28737	0.28737														0.03193	0.28737	0.28737
	Uranium	GELC	µg/L																		0.858	0.02	
	Uranium-234	GELC	pCi/L						0.532	*0.051*	0.0483										0.49	*0.063*	0.0444
	Uranium-238	GELC	pCi/L						0.302	*0.032*	0.0326										0.258	*0.045*	0.0285

Table B-1.12 (continued)

Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Std Uncert	Sym	Result	MDL/MDA	Uncert
			Start Date Time	05/18/05				05/17/06				05/17/06			
			Fld Prep Code	UF				F				UF			
GENINORG	Alkalinity-CO3	GELC	mg/L	<	1.45	1.45							1.55	0.725	
	Alkalinity-CO3+HCO3	GELC	mg/L		67.5	1.45							70.4	0.725	
	Alkalinity-HCO3	GELC	mg/L		67.2	1.45									
	Ammonia as Nitrogen	GELC	mg/L									<	0.1	0.1	
	Bromide	GELC	mg/L									<	0.066	0.066	
	Calcium	GELC	mg/L		15.5	0.036							14.1	0.036	
	Chloride	GELC	mg/L		2.21	0.053							2.32	0.066	
	Fluoride	GELC	mg/L		0.181	0.03							0.366	0.033	
	Fluoride	NMSSL	mg/L												
	Magnesium	GELC	mg/L		2.54	0.085							2.31	0.085	
	Nitrate-Nitrite as N	GELC	mg/L		0.437	0.003							0.477	0.014	
	Nitrate-Nitrite as N	NMSSL	mg/L												
	Perchlorate	GELC	µg/L		0.438	0.05							0.414	0.05	
	Potassium	GELC	mg/L		1.91	0.05							1.7	0.05	
	Silicon Dioxide	GELC	mg/L		49.8	0.032							47.5	0.032	
	Sodium	GELC	mg/L		15.2	0.045							15	0.045	
	Specific Conductance	FLD	uS/cm		162.3								163.5		
	Sulfate	GELC	mg/L		2.86	0.057							3.35	0.1	
	Total Dissolved Solids	GELC	mg/L		123	2.38							140	2.38	
	Total Kjeldahl Nitrogen	GELC	mg/L										0.057	0.01	
	Total Phosphate as Phosphorus	GELC	mg/L	<	0.016	0.01						<	0.011	0.01	
	Total Suspended Solids	GELC	mg/L												
	pH	FLD	SU		8.1								8.14		
METALS	Aluminum	GELC	µg/L	<	68	68						<	68	68	
	Antimony	GELC	µg/L	<	0.5	0.5						<	0.5	0.5	
	Antimony	NMSSL	µg/L												
	Arsenic	GELC	µg/L	<	6	6						<	6	6	
	Arsenic	NMSSL	µg/L												
	Barium	GELC	µg/L		4.2	1							4	1	
	Barium	NMSSL	µg/L												
	Beryllium	GELC	µg/L	<	0.1	0.1						<	1	1	
	Beryllium	NMSSL	µg/L												
	Boron	GELC	µg/L		16.4	10							18.8	10	
	Cadmium	GELC	µg/L	<	0.1	0.1						<	0.1	0.1	
	Cadmium	NMSSL	µg/L												
	Chromium	GELC	µg/L		3.2	1			4.4	1			4.3	1	
	Chromium	NMSSL	µg/L												
	Cobalt	GELC	µg/L	<	1	1						<	1	1	
	Copper	GELC	µg/L	<	3	3						<	3	3	
	Iron	GELC	µg/L	<	18	18						<	18	18	
	Lead	GELC	µg/L	<	0.5	0.5						<	0.5	0.5	
	Manganese	GELC	µg/L	<	1	1						<	2	2	
	Mercury	GELC	µg/L	<	0.05	0.05						<	0.06	0.06	
	Mercury	NMSSL	µg/L												
	Nickel	GELC	µg/L	<	1	1						<	0.5	0.5	
	Nickel	NMSSL	µg/L												
	Selenium	GELC	µg/L	<	6	6						<	2.5	2.5	
	Selenium	NMSSL	µg/L												
	Silver	GELC	µg/L	<	1	1						<	0.2	0.2	
	Thallium	GELC	µg/L	<	0.4	0.4						<	0.4	0.4	
	Thallium	NMSSL	µg/L												
	Tin	GELC	µg/L	<	2.5	2.5						<	2.5	2.5	
	Vanadium	GELC	µg/L		15.8	1							20.2	1	
	Zinc	GELC	µg/L	<	5.8	2						<	2	2	
RAD	Americium-241	GELC	pCi/L		-0.00458	*0.032*	0.00758						-0.00574	*0.0281*	0.00946
	Cesium-137	GELC	pCi/L		1.07	*3.06*	0.826						-0.324	*4.08*	1.17
	Gross alpha	GELC	pCi/L		1.84	*2.26*	0.648						0.393	*1.64*	0.376
	Gross beta	GELC	pCi/L		1.39	*1.57*	0.439						0.997	*2.82*	0.67
	Gross gamma	GELC	pCi/L		118	*331*	108						68.7	*312*	89.6
	Plutonium-238	GELC	pCi/L		0.00418	*0.043*	0.00591						0.02	*0.0399*	0.0156
	Strontium-90	GELC	pCi/L		-0.0798	*0.324*	0.0698						0.0261	*0.194*	0.0497
	Strontium-90	PARA	pCi/L												
	Tritium	UMTL	pCi/L		-0.09579	*0.28737*	0.28737						0.22351	*0.28737*	0.28737
	Uranium	GELC	µg/L										0.79	0.05	
	Uranium-234	GELC	pCi/L		0.528	*0.074*	0.0449						0.469	*0.0686*	0.0428
	Uranium-238	GELC	pCi/L		0.288	*0.052*	0.0303						0.26	*0.0385*	0.03

Table B-1.13
G-4A

			Start Date Time	03/06/00				06/20/00				08/14/00				08/15/00				09/27/00			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L																				
	Alkalinity-CO3+HCO3	GELC	mg/L																				
	Alkalinity-HCO3	GELC	mg/L																				
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L																				
	Chloride	GELC	mg/L																				
	Fluoride	GELC	mg/L																				
	Fluoride	NMSSL	mg/L																		0.263	0.1	
	Magnesium	GELC	mg/L																				
	Nitrate-Nitrite as N	GELC	mg/L																				
	Nitrate-Nitrite as N	NMSSL	mg/L																		0.513	0.1	
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L																				
	Silicon Dioxide	GELC	mg/L																				
	Sodium	GELC	mg/L																				
	Specific Conductance	FLD	uS/cm																				
	Sulfate	GELC	mg/L																				
	Total Dissolved Solids	GELC	mg/L																				
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L																				
	pH	FLD	SU		7.99				7.02				6.83				6.83						
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L																	<	1	1	
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L																		2	1	
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L																	<	100	100	
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L																	<	1	1	
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L																	<	1	1	
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L																		2	1	
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L																	<	0.2	0.2	
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L																	<	10	10	
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L																	<	5	5	
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L																	<	1	1	
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L																				
	Cesium-137	GELC	pCi/L																				
	Gross alpha	GELC	pCi/L																				
	Gross beta	GELC	pCi/L																				
	Gross gamma	GELC	pCi/L																				
	Plutonium-238	GELC	pCi/L																				
	Strontium-90	GELC	pCi/L										0.0289	*0.208*	0.122								
	Strontium-90	PARA	pCi/L		0.009	*0.13*	0.0375		0.004	*0.13*	0.0405						-0.047		0.044				
	Tritium	UMTL	pCi/L		-0.35123	0.28737	0.41509																
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L																				
	Uranium-238	GELC	pCi/L																				

Table B-1.13 (continued)

			Start Date Time	11/15/00				11/15/00				02/14/01				05/09/01				08/08/01			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L														0.77	0.725					
	Alkalinity-CO3+HCO3	GELC	mg/L														73.9	0.725					
	Alkalinity-HCO3	GELC	mg/L														73	0.725					
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L														16	0.0375					
	Chloride	GELC	mg/L														2.16	0.025					
	Fluoride	GELC	mg/L														0.303	0.006					
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L														3.11	0.00449					
	Nitrate-Nitrite as N	GELC	mg/L														0.51	0.0069					
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L														1.96	0.00707					
	Silicon Dioxide	GELC	mg/L														53.8						
	Sodium	GELC	mg/L														13.2	0.00813					
	Specific Conductance	FLD	uS/cm														161.6						
	Sulfate	GELC	mg/L														2.88	0.062					
	Total Dissolved Solids	GELC	mg/L														138	5.09					
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L													<	0.699	0.699					
	pH	FLD	SU		8.17				8.17								8.26						
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L														0.0103	*0.0269*	0.00715				
	Cesium-137	GELC	pCi/L														-0.597	*2.85*	0.836				
	Gross alpha	GELC	pCi/L														0.681	*1.06*	0.356				
	Gross beta	GELC	pCi/L														1.47	*2.13*	0.652				
	Gross gamma	GELC	pCi/L																				
	Plutonium-238	GELC	pCi/L														0.00922	*0.00416*	0.00379				
	Strontium-90	GELC	pCi/L		-0.0114	*0.186*	0.054		-0.0721	*0.235*	0.0678		-0.128	*0.293*	0.0829		0.0446	*0.189*	0.0572		-0.0241	*0.138*	0.0504
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L										0	0.28737	0.12772								
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L														0.536	*0.0489*	0.058				
	Uranium-238	GELC	pCi/L														0.268	*0.0427*	0.0364				

Table B-1.13 (continued)

			Start Date Time	11/28/01				02/23/02				08/24/02				11/16/02				02/08/03			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L									<	1.45	1.45									
	Alkalinity-CO3+HCO3	GELC	mg/L										76.3	1.45									
	Alkalinity-HCO3	GELC	mg/L										75.5	1.45									
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L										16.1	0.00554									
	Chloride	GELC	mg/L										2.65	0.0322									
	Fluoride	GELC	mg/L										0.25	0.0553									
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L										3.11	0.00518									
	Nitrate-Nitrite as N	GELC	mg/L										0.41	0.01									
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L										1.87	0.0165									
	Silicon Dioxide	GELC	mg/L																				
	Sodium	GELC	mg/L										12.9	0.0144									
	Specific Conductance	FLD	uS/cm										166.3				164.6						
	Sulfate	GELC	mg/L										3.22	0.193									
	Total Dissolved Solids	GELC	mg/L										149	3.07									
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L																				
	pH	FLD	SU										8.2				8.2						
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L										0.00965	*0.023*	0.00514								
	Cesium-137	GELC	pCi/L										-2.23	*2.87*	0.941								
	Gross alpha	GELC	pCi/L										1.31	*1.65*	0.509								
	Gross beta	GELC	pCi/L										3.45	*2.24*	0.666								
	Gross gamma	GELC	pCi/L										119	*312*	87.3								
	Plutonium-238	GELC	pCi/L										-2.82E-10	*0.031*	0.00335								
	Strontium-90	GELC	pCi/L		-0.0088	*0.0712*	0.026		-0.0227	*0.171*	0.0444		0.0139	*0.0852*	0.0252		-0.0024	*0.0972*	0.0237		-0.003	*0.092*	0.0231
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L						0.19158	0.28737	0.19158		0.67053	0.28737	0.28737								
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L										0.463	*0.028*	0.0549								
	Uranium-238	GELC	pCi/L										0.181	*0.029*	0.0307								

Table B-1.13 (continued)

			Start Date Time	05/20/03				08/21/03				11/24/03				02/09/04				05/19/04			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L					<	1.45	1.45										<	1.45	1.45	
	Alkalinity-CO3+HCO3	GELC	mg/L						71.3	1.45											66.4	1.45	
	Alkalinity-HCO3	GELC	mg/L						70.6	1.45											65.9	1.45	
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L						16.3	0.00554											15.3	0.00554	
	Chloride	GELC	mg/L						2.55	0.0322											2.37	0.0322	
	Fluoride	GELC	mg/L						0.307	0.0553			0.196	0.0553							0.193	0.0553	
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L						3.16	0.00518											2.88	0.00518	
	Nitrate-Nitrite as N	GELC	mg/L						0.48	0.01			0.51	0.01							0.46	0.01	
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L														0.364				0.417	0.05	
	Potassium	GELC	mg/L						1.78	0.0165											1.93	0.0165	
	Silicon Dioxide	GELC	mg/L																		51.8	0.0212	
	Sodium	GELC	mg/L						12.4	0.0144											13.3	0.0144	
	Specific Conductance	FLD	uS/cm						162								153.1				164.6		
	Sulfate	GELC	mg/L						3.27	0.193											3.05	0.193	
	Total Dissolved Solids	GELC	mg/L						148	3.07											131	3.07	
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L					<	0.779	0.779										<	0.764	0.764	
	pH	FLD	SU						8.1								8.1				8.23		
METALS	Aluminum	GELC	µg/L																	<	14.7	14.7	
	Antimony	GELC	µg/L									<	0.2	0.2						<	0.28	0.28	
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L									<	3.14	0.53						<	3.87	2.24	
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L										7.85	0.25							6.17	0.222	
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L									<	0.07	0.07						<	0.158	0.158	
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L																	<	18.5	4.88	
	Cadmium	GELC	µg/L									<	0.07	0.07						<	0.04	0.04	
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L										3.1	0.3							3.77	0.503	
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L																	<	0.541	0.541	
	Copper	GELC	µg/L																	<	1.39	1.39	
	Iron	GELC	µg/L																		152	12.6	
	Lead	GELC	µg/L																	<	0.05	0.05	
	Manganese	GELC	µg/L																		1.87	0.296	
	Mercury	GELC	µg/L									<	0.0472	0.0472						<	0.0472	0.0472	
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L										0.254	0.07						<	0.69	0.69	
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L										1.27	1						<	2.81	2.81	
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L																	<	0.835	0.835	
	Thallium	GELC	µg/L									<	0.02	0.02						<	0.02	0.02	
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L																	<	3.26	3.26	
	Vanadium	GELC	µg/L																		14.9	0.606	
	Zinc	GELC	µg/L																		8.99	0.883	
RAD	Americium-241	GELC	pCi/L						0.0075	0.027	0.0046										0.00618	0.037	0.00546
	Cesium-137	GELC	pCi/L						-2.8	8.4	2.48										-0.272	3.09	0.88
	Gross alpha	GELC	pCi/L						0.0779	1.04	0.287		0.0449	1.49	0.351						0.578	1.66	0.426
	Gross beta	GELC	pCi/L						2.32	2.35	0.609		2.42	2.65	0.73						2.05	2.37	0.637
	Gross gamma	GELC	pCi/L						237	1170	287										102	292	44.5
	Plutonium-238	GELC	pCi/L						0.0046	0.032	0.0046										-0.00756	0.039	0.011
	Strontium-90	GELC	pCi/L		-0.0126	0.149	0.0378		0.0665	0.0784	0.026		0.0869	0.132	0.0422		0.0367	0.086	0.0264		0.249	0.262	0.0805
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L		0.60667	0.28737	0.28737														0.25544	0.28737	0.28737
	Uranium	GELC	µg/L																		0.72	0.02	
	Uranium-234	GELC	pCi/L						0.459	0.053	0.0438										0.456	0.059	0.0417
	Uranium-238	GELC	pCi/L						0.231	0.034	0.0274										0.219	0.041	0.0251

Table B-1.13 (continued)

			Start Date Time	05/18/05				05/17/06				05/17/06			
			Fld Prep Code	UF				F				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L	<	1.45	1.45							1.39	0.725	
	Alkalinity-CO3+HCO3	GELC	mg/L		68.6	1.45							67.4	0.725	
	Alkalinity-HCO3	GELC	mg/L		68.2	1.45									
	Ammonia as Nitrogen	GELC	mg/L									<	0.01	0.01	
	Bromide	GELC	mg/L									<	0.066	0.066	
	Calcium	GELC	mg/L		15.9	0.036							14.8	0.036	
	Chloride	GELC	mg/L		2.2	0.053							2.29	0.066	
	Fluoride	GELC	mg/L		0.17	0.03							0.326	0.033	
	Fluoride	NMSSL	mg/L												
	Magnesium	GELC	mg/L		2.82	0.085							2.42	0.085	
	Nitrate-Nitrite as N	GELC	mg/L		0.404	0.003							0.431	0.014	
	Nitrate-Nitrite as N	NMSSL	mg/L												
	Perchlorate	GELC	µg/L		0.422	0.05							0.404	0.05	
	Potassium	GELC	mg/L		1.98	0.05							1.77	0.05	
	Silicon Dioxide	GELC	mg/L		52	0.032							48.9	0.032	
	Sodium	GELC	mg/L		13.8	0.045							12.9	0.045	
	Specific Conductance	FLD	uS/cm		161.2								159		
	Sulfate	GELC	mg/L		2.76	0.057							3.1	0.1	
	Total Dissolved Solids	GELC	mg/L		130	2.38							133	2.38	
	Total Kjeldahl Nitrogen	GELC	mg/L										0.041	0.01	
	Total Phosphate as Phosphorus	GELC	mg/L	<	0.023	0.01						<	0.01	0.01	
	Total Suspended Solids	GELC	mg/L												
	pH	FLD	SU		8.2								8.23		
METALS	Aluminum	GELC	µg/L	<	68	68						<	68	68	
	Antimony	GELC	µg/L	<	0.5	0.5						<	0.5	0.5	
	Antimony	NMSSL	µg/L												
	Arsenic	GELC	µg/L	<	6	6						<	6	6	
	Arsenic	NMSSL	µg/L												
	Barium	GELC	µg/L		6.2	1							5.4	1	
	Barium	NMSSL	µg/L												
	Beryllium	GELC	µg/L	<	0.1	0.1						<	1	1	
	Beryllium	NMSSL	µg/L												
	Boron	GELC	µg/L		18	10							17.4	10	
	Cadmium	GELC	µg/L	<	0.1	0.1						<	0.1	0.1	
	Cadmium	NMSSL	µg/L												
	Chromium	GELC	µg/L		2.7	1			3.2	1			3	1	
	Chromium	NMSSL	µg/L												
	Cobalt	GELC	µg/L	<	1	1						<	1	1	
	Copper	GELC	µg/L	<	3	3						<	3	3	
	Iron	GELC	µg/L	<	18	18						<	18	18	
	Lead	GELC	µg/L	<	0.5	0.5						<	0.5	0.5	
	Manganese	GELC	µg/L	<	1	1						<	2	2	
	Mercury	GELC	µg/L		0.16	0.05						<	0.06	0.06	
	Mercury	NMSSL	µg/L												
	Nickel	GELC	µg/L		1.1	1						<	0.5	0.5	
	Nickel	NMSSL	µg/L												
	Selenium	GELC	µg/L	<	6	6						<	2.5	2.5	
	Selenium	NMSSL	µg/L												
	Silver	GELC	µg/L	<	1	1						<	0.2	0.2	
	Thallium	GELC	µg/L	<	0.4	0.4						<	0.4	0.4	
	Thallium	NMSSL	µg/L												
	Tin	GELC	µg/L	<	2.5	2.5						<	2.5	2.5	
	Vanadium	GELC	µg/L		16	1							14.7	1	
	Zinc	GELC	µg/L	<	2.4	2						<	2	2	
RAD	Americium-241	GELC	pCi/L		-0.00855	*0.03*	0.0105						-0.0106	*0.0252*	0.00435
	Cesium-137	GELC	pCi/L		-0.259	*3.33*	0.927						0.944	*3.38*	2.15
	Gross alpha	GELC	pCi/L		0.149	*1.46*	0.353						1.13	*1.38*	0.407
	Gross beta	GELC	pCi/L		3.06	*1.81*	0.545						2.33	*3.29*	0.827
	Gross gamma	GELC	pCi/L		64.2	*274*	88.3						99.1	*321*	75.5
	Plutonium-238	GELC	pCi/L		0.00221	*0.046*	0.00383						-0.00684	*0.0274*	0.00685
	Strontium-90	GELC	pCi/L		0.0755	*0.3*	0.0724						0.0253	*0.254*	0.065
	Strontium-90	PARA	pCi/L												
	Tritium	UMTL	pCi/L		0.79825	*0.28737*	0.28737						0.12772	*0.28737*	0.28737
	Uranium	GELC	µg/L										0.68	0.05	
	Uranium-234	GELC	pCi/L		0.494	*0.074*	0.0431						0.478	*0.074*	0.0448
	Uranium-238	GELC	pCi/L		0.265	*0.053*	0.0289						0.2	*0.0415*	0.0255

Table B-1.14
G-5A

			Start Date Time	08/08/01				11/28/01				02/23/02				08/24/02				11/16/02			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L														2.78	1.45					
	Alkalinity-CO3+HCO3	GELC	mg/L														135	1.45					
	Alkalinity-HCO3	GELC	mg/L														132	1.45					
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L														13.2	0.00554					
	Chloride	GELC	mg/L														2.98	0.0322					
	Fluoride	GELC	mg/L														0.347	0.0553					
	Magnesium	GELC	mg/L														2.71	0.00518					
	Nitrate-Nitrite as N	GELC	mg/L														0.4	0.01					
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L														1.66	0.0165					
	Silicon Dioxide	GELC	mg/L																				
	Sodium	GELC	mg/L														19.4	0.0144					
	Specific Conductance	FLD	uS/cm														177.6				174.7		
	Sulfate	GELC	mg/L														4.08	0.193					
	Total Dissolved Solids	GELC	mg/L														143	3.07					
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L																				
	pH	FLD	SU														8.61				8.5		
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																				
	Arsenic	GELC	µg/L																				
	Barium	GELC	µg/L																				
	Beryllium	GELC	µg/L																				
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																				
	Chromium	GELC	µg/L																				
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Nickel	GELC	µg/L																				
	Selenium	GELC	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L														0.0209	*0.025*	0.00842				
	Cesium-137	GELC	pCi/L														1.26	*3.6*	0.975				
	Gross alpha	GELC	pCi/L														1.13	*2.14*	0.573				
	Gross beta	GELC	pCi/L														3.4	*2.22*	0.64				
	Gross gamma	GELC	pCi/L														110	*456*	95.9				
	Plutonium-238	GELC	pCi/L														-0.0173	*0.028*	0.00814				
	Strontium-90	GELC	pCi/L		0.0484	*0.113*	0.0423		-0.0134	*0.0841*	0.0307		0.0397	*0.181*	0.0523		-0.0177	*0.0948*	0.0272		0.0649	*0.111*	0.0309
	Tritium	UMTL	pCi/L		-0.28737	0.57474	0.44702						-0.3193	0.28737	0.12772		-0.03193	0.28737	0.28737				
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L														0.594	*0.031*	0.0684				
	Uranium-238	GELC	pCi/L														0.346	*0.032*	0.0469				

Table B-1.14 (continued)

			Start Date Time	02/08/03				05/20/03				08/21/03				08/21/03				11/24/03			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L									<	1.45	1.45									
	Alkalinity-CO3+HCO3	GELC	mg/L										73.3	1.45									
	Alkalinity-HCO3	GELC	mg/L										72.6	1.45									
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L										15.1	0.00554									
	Chloride	GELC	mg/L										2.89	0.0322									
	Fluoride	GELC	mg/L										0.331	0.0553							0.227	0.0553	
	Magnesium	GELC	mg/L										3.15	0.00518									
	Nitrate-Nitrite as N	GELC	mg/L										0.55	0.01							0.57	0.01	
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L										1.7	0.0165									
	Silicon Dioxide	GELC	mg/L																				
	Sodium	GELC	mg/L										14.9	0.0144									
	Specific Conductance	FLD	uS/cm										172.6				172.6						
	Sulfate	GELC	mg/L										3.93	0.193									
	Total Dissolved Solids	GELC	mg/L										159	3.07									
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L									<	0.813	0.813									
	pH	FLD	SU										8.2				8.2						
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																	<	0.2	0.2	
	Arsenic	GELC	µg/L																	<	2.97	0.53	
	Barium	GELC	µg/L																		10.1	0.25	
	Beryllium	GELC	µg/L																	<	0.07	0.07	
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																	<	0.07	0.07	
	Chromium	GELC	µg/L																		2.83	0.3	
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																	<	0.0472	0.0472	
	Nickel	GELC	µg/L																		0.305	0.07	
	Selenium	GELC	µg/L																	<	1	1	
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																	<	0.02	0.02	
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L										0.0143	*0.029*	0.00618								
	Cesium-137	GELC	pCi/L										3.18	*7.98*	2.11								
	Gross alpha	GELC	pCi/L										0.372	*1.11*	0.308						0.743	*1.55*	0.415
	Gross beta	GELC	pCi/L										2.85	*2.29*	0.61						0.826	*2.3*	0.606
	Gross gamma	GELC	pCi/L										88.6	*395*	117								
	Plutonium-238	GELC	pCi/L										0	*0.036*	0.0026								
	Strontium-90	GELC	pCi/L		0.0475	*0.0876*	0.0241		0.0457	*0.123*	0.0331		0.001	*0.0848*	0.0247		-0.003	*0.0718*	0.0209		0.0712	*0.168*	0.0518
	Tritium	UMTL	pCi/L						0.06386	0.28737	0.28737												
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L										0.533	*0.048*	0.0499								
	Uranium-238	GELC	pCi/L										0.346	*0.03*	0.036								

Table B-1.14 (continued)

			Start Date Time	02/09/04				05/19/04				05/18/05				05/17/06				05/17/06			
			Fld Prep Code	UF				UF				UF				F				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L					<	1.45	1.45		<	1.45	1.45							2.28	0.725	
	Alkalinity-CO3+HCO3	GELC	mg/L						70.5	1.45			71.8	1.45							70.9	0.725	
	Alkalinity-HCO3	GELC	mg/L						69.5	1.45			71	1.45									
	Ammonia as Nitrogen	GELC	mg/L																	<	0.01	0.01	
	Bromide	GELC	mg/L																	<	0.066	0.066	
	Calcium	GELC	mg/L						12.4	0.00554			15.1	0.036							12.9	0.036	
	Chloride	GELC	mg/L						2.3	0.0322			2.43	0.053							2.32	0.066	
	Fluoride	GELC	mg/L						0.226	0.0553			0.214	0.03							0.36	0.033	
	Magnesium	GELC	mg/L						2.21	0.00518			2.96	0.085							2.24	0.085	
	Nitrate-Nitrite as N	GELC	mg/L						0.41	0.01			0.49	0.003							0.418	0.014	
	Perchlorate	GELC	µg/L		0.355				0.346	0.05			0.438	0.05							0.38	0.05	
	Potassium	GELC	mg/L						1.73	0.0165			1.97	0.05							1.76	0.05	
	Silicon Dioxide	GELC	mg/L						50.8	0.0212			52.5	0.032							51.1	0.032	
	Sodium	GELC	mg/L						18.9	0.0144			18.9	0.045							18.4	0.045	
	Specific Conductance	FLD	uS/cm		159.4				170.6				170.6								163.9		
	Sulfate	GELC	mg/L						3.27	0.193			3.16	0.057							3.3	0.1	
	Total Dissolved Solids	GELC	mg/L						129	3.07			134	2.38							141	2.38	
	Total Kjeldahl Nitrogen	GELC	mg/L																		0.035	0.01	
	Total Phosphate as Phosphorus	GELC	mg/L									<	0.035	0.01						<	0.01	0.01	
	Total Suspended Solids	GELC	mg/L					<	0.764	0.764													
	pH	FLD	SU		8.26				8.51				8.4								8.45		
METALS	Aluminum	GELC	µg/L						21.1	14.7		<	68	68						<	68	68	
	Antimony	GELC	µg/L					<	0.28	0.28		<	0.5	0.5						<	0.5	0.5	
	Arsenic	GELC	µg/L					<	3.5	2.24		<	6	6						<	6	6	
	Barium	GELC	µg/L						5.94	0.222			7.9	1							7.2	1	
	Beryllium	GELC	µg/L					<	0.158	0.158		<	0.1	0.1						<	1	1	
	Boron	GELC	µg/L					<	16.5	4.88			22.4	10							20.8	10	
	Cadmium	GELC	µg/L					<	0.04	0.04		<	0.1	0.1						<	0.1	0.1	
	Chromium	GELC	µg/L						3.57	0.503			1.7	1			3.2	1			3.4	1	
	Cobalt	GELC	µg/L					<	0.541	0.541		<	1	1						<	1	1	
	Copper	GELC	µg/L					<	1.39	1.39		<	3	3							5.1	3	
	Iron	GELC	µg/L					<	12.6	12.6		<	32.5	18						<	18	18	
	Lead	GELC	µg/L					<	0.485	0.05			1.3	0.5							2.3	0.5	
	Manganese	GELC	µg/L						0.859	0.296			2.3	1						<	2	2	
	Mercury	GELC	µg/L					<	0.0472	0.0472		<	0.05	0.05						<	0.06	0.06	
	Nickel	GELC	µg/L					<	0.69	0.69		<	1	1						<	0.5	0.5	
	Selenium	GELC	µg/L					<	2.81	2.81		<	6	6						<	2.5	2.5	
	Silver	GELC	µg/L					<	0.835	0.835		<	1	1						<	0.2	0.2	
	Thallium	GELC	µg/L					<	0.02	0.02		<	0.4	0.4						<	0.4	0.4	
	Tin	GELC	µg/L					<	3.26	3.26		<	2.5	2.5						<	2.5	2.5	
	Vanadium	GELC	µg/L						18.7	0.606			17.7	1							19.1	1	
	Zinc	GELC	µg/L						7.83	0.883			15.1	2							12.7	2	
RAD	Americium-241	GELC	pCi/L						0.0126	*0.037*	0.00596		-0.0148	*0.032*	0.0113						-0.00574	*0.0256*	0.00487
	Cesium-137	GELC	pCi/L						3.97	*3.34*	1.69		2.83	*2.92*	0.757						0.18	*3.4*	1.04
	Gross alpha	GELC	pCi/L						0.528	*1.02*	0.285		0.35	*1.65*	0.397						0.545	*0.865*	0.28
	Gross beta	GELC	pCi/L						2.09	*1.54*	0.49		0.369	*1.91*	0.485						1.66	*1.42*	0.446
	Gross gamma	GELC	pCi/L						167	*398*	109		89.8	*191*	66.3						3.99E+11	*3.12E+11*	2.54E+11
	Plutonium-238	GELC	pCi/L						0.0172	*0.046*	0.0107		-0.0045	*0.047*	0.00637						0.00235	*0.0282*	0.0118
	Strontium-90	GELC	pCi/L		0.0353	*0.0807*	0.0248		0.108	*0.292*	0.0751		0.0382	*0.294*	0.0691						0.107	*0.231*	0.0562
	Tritium	UMTL	pCi/L						0	0.28737	0.28737		-0.12772	*0.28737*	0.28737						0.03193	*0.28737*	0.28737
	Uranium	GELC	µg/L						0.832	0.02											0.81	0.05	
	Uranium-234	GELC	pCi/L						0.525	*0.067*	0.0504		0.627	*0.081*	0.0529						0.456	*0.0821*	0.0449
	Uranium-238	GELC	pCi/L						0.274	*0.047*	0.0314		0.347	*0.058*	0.0363						0.255	*0.046*	0.0318

Table B-1.15
PM-2

			Start Date Time	02/14/00				02/15/00				06/20/00				08/14/00				09/27/00			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L																				
	Alkalinity-CO3+HCO3	GELC	mg/L																				
	Alkalinity-HCO3	GELC	mg/L																				
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L																				
	Chloride	GELC	mg/L																				
	Fluoride	GELC	mg/L																				
	Fluoride	NMSSL	mg/L																		0.265	0.1	
	Magnesium	GELC	mg/L																				
	Nitrate-Nitrite as N	GELC	mg/L																				
	Nitrate-Nitrite as N	NMSSL	mg/L																		0.322	0.1	
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L																				
	Silicon Dioxide	GELC	mg/L																				
	Sodium	GELC	mg/L																				
	Specific Conductance	FLD	uS/cm																				
	Sulfate	GELC	mg/L																				
	Total Dissolved Solids	GELC	mg/L																				
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L																				
	pH	FLD	SU		7.58				7.38				7.43				6.91						
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L																	<	1	1	
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L																		1	1	
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L																	<	100	100	
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L																	<	1	1	
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L																	<	1	1	
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L																		4	1	
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L																	<	0.2	0.2	
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L																	<	10	10	
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L																	<	5	5	
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L																	<	1	1	
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L																				
	Cesium-137	GELC	pCi/L																				
	Gross alpha	GELC	pCi/L																				
	Gross beta	GELC	pCi/L																				
	Gross gamma	GELC	pCi/L																				
	Plutonium-238	GELC	pCi/L																				
	Strontium-90	GELC	pCi/L														0.109	*0.243*	0.145				
	Strontium-90	PARA	pCi/L		0	0.109999999	0.035						0.13	*0.16*	0.05		0.027		0.046				
	Tritium	UMTL	pCi/L		-0.12772	0.28737	0.41509																
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L																				
	Uranium-238	GELC	pCi/L																				

Table B-1.15 (continued)

			Start Date Time	11/15/00				02/14/01				05/09/01				08/08/01				09/05/01			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L									<	0.725	0.725									
	Alkalinity-CO3+HCO3	GELC	mg/L										58.8	0.725									
	Alkalinity-HCO3	GELC	mg/L										58.3	0.725									
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L										10.7	0.0375									
	Chloride	GELC	mg/L										1.95	0.025									
	Fluoride	GELC	mg/L										0.326	0.006							0.246	0.006	
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L										3.88	0.00449									
	Nitrate-Nitrite as N	GELC	mg/L										0.29	0.0069						<	0.33	0.0069	
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L										2.25	0.0707									
	Silicon Dioxide	GELC	mg/L										93.5										
	Sodium	GELC	mg/L										12.1	0.00813									
	Specific Conductance	FLD	uS/cm										130.6										
	Sulfate	GELC	mg/L										1.96	0.062									
	Total Dissolved Solids	GELC	mg/L										143	5.09									
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L										1.6	0.699									
	pH	FLD	SU		7.95								7.93										
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L										0.0256	*0.0116*	0.0106								
	Cesium-137	GELC	pCi/L										0.164	*2.5*	0.688								
	Gross alpha	GELC	pCi/L										1.03	*2.7*	0.851								
	Gross beta	GELC	pCi/L										3.55	*2.22*	0.746								
	Gross gamma	GELC	pCi/L																				
	Plutonium-238	GELC	pCi/L										0.00978	*0.0259*	0.00692								
	Strontium-90	GELC	pCi/L		-0.0511	*0.198*	0.057		-0.0317	*0.368*	0.104		-0.0019	*0.235*	0.0694		-0.031	*0.125*	0.0455				
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L						-0.12772	0.28737	0.09579												
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L										0.257	*0.029*	0.0307								
	Uranium-238	GELC	pCi/L										0.106	*0.0163*	0.0173								

Table B-1.15 (continued)

			Start Date Time	11/28/01				02/23/02				05/18/02				08/24/02				10/09/02			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L									<	0.725	0.725									
	Alkalinity-CO3+HCO3	GELC	mg/L										26.4	0.725									
	Alkalinity-HCO3	GELC	mg/L										26.2	0.725									
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L										9.98	0.00554									
	Chloride	GELC	mg/L										2.27	0.0322									
	Fluoride	GELC	mg/L		0.274	0.006			0.193	0.014			0.219	0.0553			0.289	0.0553					
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L										3.53	0.00518									
	Nitrate-Nitrite as N	GELC	mg/L		0.32	0.0069			0.28	0.0069			0.31	0.01			0.32	0.01					
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L										2.22	0.0165									
	Silicon Dioxide	GELC	mg/L																				
	Sodium	GELC	mg/L										12.1	0.0144									
	Specific Conductance	FLD	uS/cm										126.9				135.5						
	Sulfate	GELC	mg/L										2.27	0.193									
	Total Dissolved Solids	GELC	mg/L										153	5.09									
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L									<	0.35	0.35									
	pH	FLD	SU										7.87										
METALS	Aluminum	GELC	µg/L																		73.5	5.31	
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L																	<	0.53	0.53	
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L																		86.1	0.19	
	Cadmium	GELC	µg/L																	<	0.07	0.07	
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L																		3.08	0.3	
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L																		0.23	0.04	
	Copper	GELC	µg/L																		3.41	0.25	
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																		0.679	0.05	
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L																	<	1	1	
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																		6.46	0.81	
	Zinc	GELC	µg/L																		3.99	1.54	
RAD	Americium-241	GELC	pCi/L																				
	Cesium-137	GELC	pCi/L										1.53	*2.41*	1.13								
	Gross alpha	GELC	pCi/L																				
	Gross beta	GELC	pCi/L																				
	Gross gamma	GELC	pCi/L																				
	Plutonium-238	GELC	pCi/L																				
	Strontium-90	GELC	pCi/L		0.0301	*0.0725*	0.0273		-0.0268	*0.133*	0.0485		0.0049	*0.0751*	0.0218		0.0221	*0.112*	0.0334				
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L						0.09579	0.28737	0.12772		-0.03193	0.28737	0.12772								
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L																				
	Uranium-238	GELC	pCi/L																				

Table B-1.15 (continued)

			Start Date Time	11/16/02				02/08/03				05/20/03				08/04/03				08/21/03			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L																	<	1.45	1.45	
	Alkalinity-CO3+HCO3	GELC	mg/L																		57	1.45	
	Alkalinity-HCO3	GELC	mg/L																		56.8	1.45	
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L																		9.73	0.00554	
	Chloride	GELC	mg/L																		2.09	0.0322	
	Fluoride	GELC	mg/L		0.302	0.0553			0.304	0.0553			0.269	0.0553			0.186	0.0553			0.17	0.0553	
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L																		3.43	0.00518	
	Nitrate-Nitrite as N	GELC	mg/L		0.33	0.01			0.33	0.01			0.31	0.01			0.28	0.01			0.3	0.01	
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L																				
	Potassium	GELC	mg/L																		2.21	0.0165	
	Silicon Dioxide	GELC	mg/L																				
	Sodium	GELC	mg/L																		12	0.0144	
	Specific Conductance	FLD	uS/cm		120.6												128.2				128.2		
	Sulfate	GELC	mg/L																		1.89	0.193	
	Total Dissolved Solids	GELC	mg/L																		128	3.07	
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L																	<	0.813	0.813	
	pH	FLD	SU		7.9												7.8				7.8		
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L																				
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L																				
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L																				
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L																				
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L																				
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L																				
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L																				
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L																				
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L																				
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L																				
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L																		0.0588	*0.031*	0.0124
	Cesium-137	GELC	pCi/L																		-0.347	*3.55*	1.02
	Gross alpha	GELC	pCi/L																		-0.227	*1.17*	0.25
	Gross beta	GELC	pCi/L																		1.06	*2.68*	0.648
	Gross gamma	GELC	pCi/L																		84.7	*275*	83.3
	Plutonium-238	GELC	pCi/L																		0.00948	*0.033*	0.0146
	Strontium-90	GELC	pCi/L		0.0467	*0.117*	0.0314		0.0897	*0.107*	0.0318		0.0366	*0.126*	0.0336		0.11	*0.166*	0.047		0.0031	*0.166*	0.0368
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L										0.35123	0.28737	0.28737								
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L																		0.222	*0.06*	0.0285
	Uranium-238	GELC	pCi/L																		0.0992	*0.038*	0.0173

Table B-1.15 (continued)

			Start Date Time	09/24/03				10/29/03				11/24/03				12/17/03				02/09/04			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L																				
	Alkalinity-CO3+HCO3	GELC	mg/L																				
	Alkalinity-HCO3	GELC	mg/L																				
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L																				
	Chloride	GELC	mg/L																				
	Fluoride	GELC	mg/L									<	0.193	0.0553			0.26	0.0553			0.294	0.0553	
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L																				
	Nitrate-Nitrite as N	GELC	mg/L										0.3	0.01			0.35	0.01			0.29	0.01	
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L																		0.293		
	Potassium	GELC	mg/L																				
	Silicon Dioxide	GELC	mg/L																				
	Sodium	GELC	mg/L																				
	Specific Conductance	FLD	uS/cm		133.2				126.4								126				120.9		
	Sulfate	GELC	mg/L																				
	Total Dissolved Solids	GELC	mg/L																				
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L																				
	pH	FLD	SU		7.87				7.79								7.76				7.72		
METALS	Aluminum	GELC	µg/L																				
	Antimony	GELC	µg/L									<	0.2	0.2									
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L										0.622	0.53									
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L										26.4	0.25									
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L									<	0.07	0.07									
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L																				
	Cadmium	GELC	µg/L									<	0.07	0.07									
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L										4.93	0.3									
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L																				
	Copper	GELC	µg/L																				
	Iron	GELC	µg/L																				
	Lead	GELC	µg/L																				
	Manganese	GELC	µg/L																				
	Mercury	GELC	µg/L									<	0.0472	0.0472									
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L										0.182	0.07									
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L									<	1	1									
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L																				
	Thallium	GELC	µg/L									<	0.021	0.02									
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L																				
	Vanadium	GELC	µg/L																				
	Zinc	GELC	µg/L																				
RAD	Americium-241	GELC	pCi/L																				
	Cesium-137	GELC	pCi/L																				
	Gross alpha	GELC	pCi/L										0.277	*0.957*	0.245								
	Gross beta	GELC	pCi/L										2.44	*2.15*	0.61								
	Gross gamma	GELC	pCi/L																				
	Plutonium-238	GELC	pCi/L																				
	Strontium-90	GELC	pCi/L														0.0729	*0.152*	0.0472		0.105	*0.203*	0.0545
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L																				
	Uranium	GELC	µg/L																				
	Uranium-234	GELC	pCi/L																				
	Uranium-238	GELC	pCi/L																				

Table B-1.15 (continued)

			Start Date Time	03/24/04				05/20/04				08/31/04				11/16/04				03/23/05			
			Fld Prep Code	UF				UF				UF				UF				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L					<	1.45	1.45													
	Alkalinity-CO3+HCO3	GELC	mg/L						56.2	1.45													
	Alkalinity-HCO3	GELC	mg/L						56	1.45													
	Ammonia as Nitrogen	GELC	mg/L																				
	Bromide	GELC	mg/L																				
	Calcium	GELC	mg/L						8.62	0.00554													
	Chloride	GELC	mg/L						1.66	0.0322													
	Fluoride	GELC	mg/L						0.211	0.0553													
	Fluoride	NMSSL	mg/L																				
	Magnesium	GELC	mg/L						3	0.00518													
	Nitrate-Nitrite as N	GELC	mg/L						0.29	0.01													
	Nitrate-Nitrite as N	NMSSL	mg/L																				
	Perchlorate	GELC	µg/L		0.296				0.258	0.05			0.332	0.05			0.296	0.05			0.296	0.05	
	Potassium	GELC	mg/L						1.88	0.0165													
	Silicon Dioxide	GELC	mg/L						85.3	0.0212													
	Sodium	GELC	mg/L						10.9	0.0144													
	Specific Conductance	FLD	uS/cm		137.4				106.1				130.3				124.7				106.5		
	Sulfate	GELC	mg/L						1.55	0.193													
	Total Dissolved Solids	GELC	mg/L						141	3.07													
	Total Kjeldahl Nitrogen	GELC	mg/L																				
	Total Phosphate as Phosphorus	GELC	mg/L																				
	Total Suspended Solids	GELC	mg/L					<	0.764	0.764													
	pH	FLD	SU		7.85				7.77				7.88				7.67				7.46		
METALS	Aluminum	GELC	µg/L					<	14.7	14.7													
	Antimony	GELC	µg/L					<	0.28	0.28													
	Antimony	NMSSL	µg/L																				
	Arsenic	GELC	µg/L					<	2.24	2.24													
	Arsenic	NMSSL	µg/L																				
	Barium	GELC	µg/L						24	0.222													
	Barium	NMSSL	µg/L																				
	Beryllium	GELC	µg/L					<	0.158	0.158													
	Beryllium	NMSSL	µg/L																				
	Boron	GELC	µg/L					<	12.3	4.88													
	Cadmium	GELC	µg/L					<	0.04	0.04													
	Cadmium	NMSSL	µg/L																				
	Chromium	GELC	µg/L						4.61	0.503													
	Chromium	NMSSL	µg/L																				
	Cobalt	GELC	µg/L					<	0.541	0.541													
	Copper	GELC	µg/L					<	1.39	1.39													
	Iron	GELC	µg/L					<	12.6	12.6													
	Lead	GELC	µg/L						0.364	0.05													
	Manganese	GELC	µg/L					<	0.296	0.296													
	Mercury	GELC	µg/L					<	0.0472	0.0472													
	Mercury	NMSSL	µg/L																				
	Nickel	GELC	µg/L					<	0.69	0.69													
	Nickel	NMSSL	µg/L																				
	Selenium	GELC	µg/L					<	2.81	2.81													
	Selenium	NMSSL	µg/L																				
	Silver	GELC	µg/L					<	0.835	0.835													
	Thallium	GELC	µg/L					<	0.02	0.02													
	Thallium	NMSSL	µg/L																				
	Tin	GELC	µg/L					<	3.26	3.26													
	Vanadium	GELC	µg/L						9.7	0.606													
	Zinc	GELC	µg/L						7.61	0.883													
RAD	Americium-241	GELC	pCi/L						-0.00194	*0.034*	0.00644												
	Cesium-137	GELC	pCi/L						1.88	*3.38*	1.88												
	Gross alpha	GELC	pCi/L						-0.218	*2.18*	0.323												
	Gross beta	GELC	pCi/L						1.47	*2.41*	0.637												
	Gross gamma	GELC	pCi/L						281	*427*	99.8												
	Plutonium-238	GELC	pCi/L						0.00721	*0.037*	0.00722												
	Strontium-90	GELC	pCi/L						0.0575	*0.287*	0.0706												
	Strontium-90	PARA	pCi/L																				
	Tritium	UMTL	pCi/L						-0.28737	0.28737	0.28737						0.25544	0.28737	0.28737				
	Uranium	GELC	µg/L						0.236	0.02													
	Uranium-234	GELC	pCi/L						0.13	*0.067*	0.0265												
	Uranium-238	GELC	pCi/L						0.0882	*0.048*	0.0165												

Table B-1.15 (continued)

			Start Date Time	03/24/04	05/18/05				08/17/05				11/16/05				01/19/06				05/24/06			
			Fld Prep Code	UF	UF				UF				UF				UF				F			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L		<	1.45	1.45																	
	Alkalinity-CO3+HCO3	GELC	mg/L			70.8	1.45																	
	Alkalinity-HCO3	GELC	mg/L			70.6	1.45																	
	Ammonia as Nitrogen	GELC	mg/L																					
	Bromide	GELC	mg/L																					
	Calcium	GELC	mg/L			10.2	0.036																	
	Chloride	GELC	mg/L			1.9	0.053																	
	Fluoride	GELC	mg/L			0.166	0.03																	
	Fluoride	NMSSL	mg/L																					
	Magnesium	GELC	mg/L			3.48	0.085																	
	Nitrate-Nitrite as N	GELC	mg/L			0.283	0.003																	
	Nitrate-Nitrite as N	NMSSL	mg/L																					
	Perchlorate	GELC	µg/L			0.308	0.05			0.311	0.05			0.31	0.05			0.312	0.05					
	Potassium	GELC	mg/L			2.2	0.05																	
	Silicon Dioxide	GELC	mg/L			91.4	0.032																	
	Sodium	GELC	mg/L			12.7	0.045																	
	Specific Conductance	FLD	uS/cm			133.3				131.8				132.3				126.1						
	Sulfate	GELC	mg/L			1.71	0.057																	
	Total Dissolved Solids	GELC	mg/L			141	2.38																	
	Total Kjeldahl Nitrogen	GELC	mg/L																					
	Total Phosphate as Phosphorus	GELC	mg/L		<	0.038	0.01																	
	Total Suspended Solids	GELC	mg/L																					
	pH	FLD	SU			7.8				7.82				7.75				7.75						
METALS	Aluminum	GELC	µg/L		<	68	68																	
	Antimony	GELC	µg/L		<	0.5	0.5																	
	Antimony	NMSSL	µg/L																					
	Arsenic	GELC	µg/L		<	6	6																	
	Arsenic	NMSSL	µg/L																					
	Barium	GELC	µg/L			26.9	1																	
	Barium	NMSSL	µg/L																					
	Beryllium	GELC	µg/L		<	0.1	0.1																	
	Beryllium	NMSSL	µg/L																					
	Boron	GELC	µg/L			19.4	10																	
	Cadmium	GELC	µg/L		<	0.1	0.1																	
	Cadmium	NMSSL	µg/L																					
	Chromium	GELC	µg/L			4.3	1																4.2	1	
	Chromium	NMSSL	µg/L																					
	Cobalt	GELC	µg/L		<	1	1																	
	Copper	GELC	µg/L		<	3	3																	
	Iron	GELC	µg/L		<	18	18																	
	Lead	GELC	µg/L		<	0.5	0.5																	
	Manganese	GELC	µg/L		<	1	1																	
	Mercury	GELC	µg/L		<	0.05	0.05																	
	Mercury	NMSSL	µg/L																					
	Nickel	GELC	µg/L		<	1	1																	
	Nickel	NMSSL	µg/L																					
	Selenium	GELC	µg/L		<	6	6																	
	Selenium	NMSSL	µg/L																					
	Silver	GELC	µg/L		<	1	1																	
	Thallium	GELC	µg/L		<	0.4	0.4																	
	Thallium	NMSSL	µg/L																					
	Tin	GELC	µg/L		<	2.5	2.5																	
	Vanadium	GELC	µg/L			11.7	1																	
	Zinc	GELC	µg/L		<	3.9	2																	
RAD	Americium-241	GELC	pCi/L			0.000715	0.039	0.0105																
	Cesium-137	GELC	pCi/L			0.145	3.59	1.04																
	Gross alpha	GELC	pCi/L			0.386	1.31	0.342																
	Gross beta	GELC	pCi/L			0.872	1.39	0.375																
	Gross gamma	GELC	pCi/L			142	368	94.3																
	Plutonium-238	GELC	pCi/L			-0.00422	0.044	0.00731																
	Strontium-90	GELC	pCi/L			0.0694	0.251	0.0626																
	Strontium-90	PARA	pCi/L																					
	Tritium	UMTL	pCi/L			0.09579	0.28737	0.28737						0.03193	0.28737	0.28737								
	Uranium	GELC	µg/L																					
	Uranium-234	GELC	pCi/L			0.194	0.07	0.0225																
	Uranium-238	GELC	pCi/L			0.0994	0.05	0.0156																

Table B-1.15 (continued)

			Start Date Time	05/24/06				08/24/06				08/24/06			
			Fld Prep Code	UF				F				UF			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
GENINORG	Alkalinity-CO3	GELC	mg/L	<	0.725	0.725									
	Alkalinity-CO3+HCO3	GELC	mg/L		52.7	0.725									
	Alkalinity-HCO3	GELC	mg/L												
	Ammonia as Nitrogen	GELC	mg/L	<	0.01	0.01									
	Bromide	GELC	mg/L	<	0.066	0.066									
	Calcium	GELC	mg/L		0.61	0.036									
	Chloride	GELC	mg/L		1.72	0.066									
	Fluoride	GELC	mg/L		0.28	0.033									
	Fluoride	NMSSL	mg/L												
	Magnesium	GELC	mg/L		0.196	0.085									
	Nitrate-Nitrite as N	GELC	mg/L		0.305	0.014									
	Nitrate-Nitrite as N	NMSSL	mg/L												
	Perchlorate	GELC	µg/L		0.294	0.05							0.311	0.05	
	Potassium	GELC	mg/L		0.148	0.05									
	Silicon Dioxide	GELC	mg/L		6.2	0.032									
	Sodium	GELC	mg/L		0.911	0.045									
	Specific Conductance	FLD	uS/cm		113.2								115.3		
	Sulfate	GELC	mg/L		1.84	0.1									
	Total Dissolved Solids	GELC	mg/L		151	2.38									
	Total Kjeldahl Nitrogen	GELC	mg/L	<	0.1	0.1									
	Total Phosphate as Phosphorus	GELC	mg/L	<	0.044	0.01									
	Total Suspended Solids	GELC	mg/L												
	pH	FLD	SU		7.59								8.2		
METALS	Aluminum	GELC	µg/L	<	68	68									
	Antimony	GELC	µg/L	<	0.5	0.5									
	Antimony	NMSSL	µg/L												
	Arsenic	GELC	µg/L	<	6	6									
	Arsenic	NMSSL	µg/L												
	Barium	GELC	µg/L		1.5	1									
	Barium	NMSSL	µg/L												
	Beryllium	GELC	µg/L	<	1	1									
	Beryllium	NMSSL	µg/L												
	Boron	GELC	µg/L	<	10	10									
	Cadmium	GELC	µg/L	<	0.1	0.1									
	Cadmium	NMSSL	µg/L												
	Chromium	GELC	µg/L	<	1	1			4.4	1			5.3	1	
	Chromium	NMSSL	µg/L												
	Cobalt	GELC	µg/L	<	1	1									
	Copper	GELC	µg/L	<	3	3									
	Iron	GELC	µg/L	<	18	18									
	Lead	GELC	µg/L	<	0.5	0.5									
	Manganese	GELC	µg/L	<	2	2									
	Mercury	GELC	µg/L	<	0.06	0.06									
	Mercury	NMSSL	µg/L												
	Nickel	GELC	µg/L	<	0.5	0.5									
	Nickel	NMSSL	µg/L												
	Selenium	GELC	µg/L	<	2.5	2.5									
	Selenium	NMSSL	µg/L												
	Silver	GELC	µg/L	<	0.2	0.2									
	Thallium	GELC	µg/L	<	0.4	0.4									
	Thallium	NMSSL	µg/L												
	Tin	GELC	µg/L	<	2.5	2.5									
	Vanadium	GELC	µg/L	<	1	1									
	Zinc	GELC	µg/L	<	2	2									
RAD	Americium-241	GELC	pCi/L		-0.0199	0.0436	0.0229								
	Cesium-137	GELC	pCi/L		2.53	5.26	1.38								
	Gross alpha	GELC	pCi/L		0.426	1.31	0.327								
	Gross beta	GELC	pCi/L		3.09	2.81	0.77								
	Gross gamma	GELC	pCi/L		57.4	245	696								
	Plutonium-238	GELC	pCi/L		-0.0045	0.054	0.0045								
	Strontium-90	GELC	pCi/L		0.0386	0.319	0.0734								
	Strontium-90	PARA	pCi/L												
	Tritium	UMTL	pCi/L		0.06386	0.28737	0.28737								
	Uranium	GELC	µg/L		0.25	0.05									
	Uranium-234	GELC	pCi/L		0.214	0.122	0.0324								
	Uranium-238	GELC	pCi/L		0.0877	0.0681	0.0225								

Table B-1.16
PM-4

						Start Date Time	06/21/00	06/21/00	06/21/00	06/21/00	06/21/00	07/07/00	07/07/00	07/07/00	07/07/00	07/07/00	08/03/00	08/03/00	08/03/00	08/03/00	08/03/00
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		GELC	mg/L																
	Magnesium	Mg		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU													7.6			
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Arsenic	As		GELC	µg/L																
	Barium	Ba		GELC	µg/L																
	Beryllium	Be		GELC	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Chromium	Cr		GELC	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Nickel	Ni		GELC	µg/L																
	Selenium	Se		GELC	µg/L																
	Selenium	Se		SwRI	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L																
	Strontium-90	Sr-90		PARA	pCi/L			0.091		0.13	0.0405							-0.107		0.16	0.0485
	Tritium	H-3		UMTL	pCi/L								-0.22351			0.28737					
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.16 (continued)

						Start Date Time	08/03/00	08/03/00	08/03/00	08/03/00	08/03/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		GELC	mg/L																
	Magnesium	Mg		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			7.6					6.86					6.86			
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Arsenic	As		GELC	µg/L																
	Barium	Ba		GELC	µg/L																
	Beryllium	Be		GELC	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Chromium	Cr		GELC	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Nickel	Ni		GELC	µg/L																
	Selenium	Se		GELC	µg/L																
	Selenium	Se		SwRI	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L			0.224		0.68	0.402							-0.165		0.284	0.164
	Strontium-90	Sr-90		PARA	pCi/L													-0.02			0.044
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.16 (continued)

						Start Date Time	11/15/00	11/15/00	11/15/00	11/15/00	11/15/00	02/14/01	02/14/01	02/14/01	02/14/01	02/14/01	05/09/01	05/09/01	05/09/01	05/09/01	05/09/01
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L												<	0.725	0.725		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L													56.3	0.725		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L													55.8	0.725		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L													10.3	0.0375		
	Chloride	Cl(-1)		GELC	mg/L													1.73	0.025		
	Fluoride	F(-1)		GELC	mg/L													0.312	0.006		
	Magnesium	Mg		GELC	mg/L													3.76	0.00449		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L													0.28	0.0069		
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L													2.1	0.0707		
	Silicon Dioxide	SiO2		GELC	mg/L													91.9			
	Sodium	Na		GELC	mg/L													11.4	0.00813		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm													126.8			
	Sulfate	SO4(-2)		GELC	mg/L													2	0.062		
	Total Dissolved Solids	TDS		GELC	mg/L													141	5.09		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L												<	0.699	0.699		
	pH	pH	Field	FLD	SU			7.76										7.84			
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Arsenic	As		GELC	µg/L																
	Barium	Ba		GELC	µg/L																
	Beryllium	Be		GELC	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Chromium	Cr		GELC	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Nickel	Ni		GELC	µg/L																
	Selenium	Se		GELC	µg/L																
	Selenium	Se		SwRI	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L													0.00534		0.0318	0.00688
	Cesium-137	Cs-137		GELC	pCi/L													0.0205		2.28	1.41
	Gross alpha	GROSSA		GELC	pCi/L													0.721		2.33	0.691
	Gross beta	GROSSB		GELC	pCi/L													6.03		2.27	0.836
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L													0.0168		0.0076	0.00693
	Strontium-90	Sr-90		GELC	pCi/L			-0.0306		0.208	0.0601		0.0159		0.415	0.119		0.224		0.28	0.0938
	Strontium-90	Sr-90		PARA	pCi/L																
	Tritium	H-3		UMTL	pCi/L								0	0.28737		0.09579					
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L													0.275		0.0143	0.0302
	Uranium-238	U-238		GELC	pCi/L													0.136		0.00525	0.0188

Table B-1.16 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	08/08/01	08/08/01	08/08/01	08/08/01	08/08/01	09/05/01	09/05/01	09/05/01	09/05/01	09/05/01	11/28/01	11/28/01	11/28/01	11/28/01	11/28/01
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		GELC	mg/L								0.266	0.006				0.251	0.006		
	Magnesium	Mg		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L							<	0.3	0.0069				0.33	0.0069		
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU																
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Arsenic	As		GELC	µg/L																
	Barium	Ba		GELC	µg/L																
	Beryllium	Be		GELC	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Chromium	Cr		GELC	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Nickel	Ni		GELC	µg/L																
	Selenium	Se		GELC	µg/L																
	Selenium	Se		SwRI	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L			0.081		0.118	0.0455							0.134		0.0741	0.0373
	Strontium-90	Sr-90		PARA	pCi/L																
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.16 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
						Start Date Time	08/08/01	02/23/02	02/23/02	02/23/02	02/23/02	02/23/02	10/09/02	10/09/02	10/09/02	10/09/02	10/09/02	06/18/03	06/18/03	06/18/03	06/18/03	06/18/03
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																	
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																	
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																	
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																	
	Bromide	Br(-1)		GELC	mg/L																	
	Calcium	Ca		GELC	mg/L																	
	Chloride	Cl(-1)		GELC	mg/L																	
	Fluoride	F(-1)		GELC	mg/L				0.395	0.028												
	Magnesium	Mg		GELC	mg/L																	
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L				0.57	0.0138												
	Perchlorate	ClO4		GELC	µg/L																	
	Potassium	K		GELC	mg/L																	
	Silicon Dioxide	SiO2		GELC	mg/L																	
	Sodium	Na		GELC	mg/L																	
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																	
	Sulfate	SO4(-2)		GELC	mg/L																	
	Total Dissolved Solids	TDS		GELC	mg/L																	
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																	
	Total Suspended Solids	TSS		GELC	mg/L																	
	pH	pH	Field	FLD	SU																	
METALS	Aluminum	Al		GELC	µg/L									7.91	5.31							
	Antimony	Sb		GELC	µg/L																	
	Arsenic	As		GELC	µg/L								<	0.53	0.53							
	Barium	Ba		GELC	µg/L																	
	Beryllium	Be		GELC	µg/L																	
	Boron	B		GELC	µg/L									34.4	0.19							
	Cadmium	Cd		GELC	µg/L								<	0.07	0.07							
	Chromium	Cr		GELC	µg/L									4.71	0.3							
	Cobalt	Co		GELC	µg/L								<	0.04	0.04							
	Copper	Cu		GELC	µg/L								<	1.5	0.25							
	Iron	Fe		GELC	µg/L																	
	Lead	Pb		GELC	µg/L									0.083	0.05							
	Manganese	Mn		GELC	µg/L																	
	Mercury	Hg		GELC	µg/L																	
	Nickel	Ni		GELC	µg/L																	
	Selenium	Se		GELC	µg/L								<	1	1							
	Selenium	Se		SwRI	µg/L																	
	Silver	Ag		GELC	µg/L																	
	Thallium	Tl		GELC	µg/L																	
	Tin	Sn		GELC	µg/L																	
	Vanadium	V		GELC	µg/L									9.54	0.81							
	Zinc	Zn		GELC	µg/L									2.77	1.54							
RAD	Americium-241	Am-241		GELC	pCi/L																	
	Cesium-137	Cs-137		GELC	pCi/L																	
	Gross alpha	GROSSA		GELC	pCi/L																	
	Gross beta	GROSSB		GELC	pCi/L																	
	Gross gamma	GROSSG		GELC	pCi/L																	
	Plutonium-238	Pu-238		GELC	pCi/L																	
	Strontium-90	Sr-90		GELC	pCi/L				0.047		0.291	0.0917										
	Strontium-90	Sr-90		PARA	pCi/L																	
	Tritium	H-3		UMTL	pCi/L				-0.35123	0.28737		0.12772							-0.19158	0.28737		0.28737
	Uranium	U		GELC	µg/L																	
	Uranium-234	U-234		GELC	pCi/L																	
	Uranium-238	U-238		GELC	pCi/L																	

Table B-1.16 (continued)

						Start Date Time	08/08/01	06/18/03	06/18/03	06/18/03	06/18/03	06/18/03	08/21/03	08/21/03	08/21/03	08/21/03	08/21/03	06/07/04	06/07/04	06/07/04	06/07/04	06/07/04
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
	Alkalinity-CO3	ALK-CO3		GELC	mg/L								<	1.45	1.45							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L									66.2	1.45							
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L									65.8	1.45							
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																	
	Bromide	Br(-1)		GELC	mg/L																	
	Calcium	Ca		GELC	mg/L									11.2	0.00554							
	Chloride	Cl(-1)		GELC	mg/L									2.44	0.0322							
	Fluoride	F(-1)		GELC	mg/L				0.316	0.0553				0.387	0.1106							
	Magnesium	Mg		GELC	mg/L									4.17	0.00518							
GENINORG	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L				0.31	0.01				0.62	0.02							
	Perchlorate	ClO4		GELC	µg/L																	
	Potassium	K		GELC	mg/L									2.56	0.0165							
	Silicon Dioxide	SiO2		GELC	mg/L																	
	Sodium	Na		GELC	mg/L									13.1	0.0144							
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm									149.6					532			
	Sulfate	SO4(-2)		GELC	mg/L									2.29	0.193							
	Total Dissolved Solids	TDS		GELC	mg/L									172	3.07							
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																	
	Total Suspended Solids	TSS		GELC	mg/L								<	0.796	0.796							
	pH	pH	Field	FLD	SU									8					7.13			
	Aluminum	Al		GELC	µg/L																	
	Antimony	Sb		GELC	µg/L																	
	Arsenic	As		GELC	µg/L																	
	Barium	Ba		GELC	µg/L																	
	Beryllium	Be		GELC	µg/L																	
	Boron	B		GELC	µg/L																	
	Cadmium	Cd		GELC	µg/L																	
	Chromium	Cr		GELC	µg/L																	
	Cobalt	Co		GELC	µg/L																	
	Copper	Cu		GELC	µg/L																	
METALS	Iron	Fe		GELC	µg/L																	
	Lead	Pb		GELC	µg/L																	
	Manganese	Mn		GELC	µg/L																	
	Mercury	Hg		GELC	µg/L																	
	Nickel	Ni		GELC	µg/L																	
	Selenium	Se		GELC	µg/L																	
	Selenium	Se		SwRI	µg/L																	
	Silver	Ag		GELC	µg/L																	
	Thallium	Tl		GELC	µg/L																	
	Tin	Sn		GELC	µg/L																	
	Vanadium	V		GELC	µg/L																	
	Zinc	Zn		GELC	µg/L																	
	Americium-241	Am-241		GELC	pCi/L									0.00836		0.04	0.00837					
	Cesium-137	Cs-137		GELC	pCi/L									2.05		3.28	1.56					
	Gross alpha	GROSSA		GELC	pCi/L									0.36		0.962	0.272					
	Gross beta	GROSSB		GELC	pCi/L									2.83		2	0.553					
	Gross gamma	GROSSG		GELC	pCi/L									90.5		214	141					
	Plutonium-238	Pu-238		GELC	pCi/L									0.0143		0.04	0.0125					
RAD	Strontium-90	Sr-90		GELC	pCi/L									0.0881		0.297	0.0734					
	Strontium-90	Sr-90		PARA	pCi/L																	
	Tritium	H-3		UMTL	pCi/L																	
	Uranium	U		GELC	µg/L																	
	Uranium-234	U-234		GELC	pCi/L									0.213		0.057	0.0278					
	Uranium-238	U-238		GELC	pCi/L									0.119		0.036	0.0197					

Table B-1.16 (continued)

						Start Date Time	02/15/05	02/15/05	02/15/05	02/15/05	02/15/05	02/22/06	02/22/06	02/22/06	02/22/06	02/22/06	05/09/06	05/09/06	05/09/06	05/09/06	05/09/06	05/09/06	05/09/06	05/09/06	05/09/06	05/09/06
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260
						Fld Qc Type Code																				
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																					
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	1.45	1.45			<	0.725	0.725												
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			56.5	1.45				57.1	0.725												
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L			56.3	1.45																	
	Ammonia as Nitrogen	NH3-N		GELC	mg/L								0.01	0.01												
	Bromide	Br(-1)		GELC	mg/L							<	0.041	0.041												
	Calcium	Ca		GELC	mg/L			10.5	0.00554				9.78	0.036												
	Chloride	Cl(-1)		GELC	mg/L			1.71	0.0322				1.75	0.053												
	Fluoride	F(-1)		GELC	mg/L			0.174	0.0553				0.343	0.03												
	Magnesium	Mg		GELC	mg/L			3.57	0.00518				3.47	0.085												
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.289	0.003				0.287	0.017												
	Perchlorate	ClO4		GELC	µg/L			0.338	0.05				0.337	0.05									0.344	0.05		
	Potassium	K		GELC	mg/L			2.13	0.0165				1.95	0.05												
	Silicon Dioxide	SiO2		GELC	mg/L			84.1	0.0212				82.5	0.032												
	Sodium	Na		GELC	mg/L			12	0.0144				11.5	0.045												
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			123.8					134.2													
	Sulfate	SO4(-2)		GELC	mg/L			1.79	0.193				1.92	0.057												
	Total Dissolved Solids	TDS		GELC	mg/L			149	3.07				162	2.38												
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L							<	0.01	0.01												
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L								0.039	0.01												
	Total Suspended Solids	TSS		GELC	mg/L		<	1.53	1.53			<	1.27	1.27												
	pH	pH	Field	FLD	SU			8.35					7.76													
METALS	Aluminum	Al		GELC	µg/L		<	14.7	14.7			<	68	68												
	Antimony	Sb		GELC	µg/L		<	0.28	0.28			<	0.5	0.5												
	Arsenic	As		GELC	µg/L		<	2.24	2.24			<	6	6												
	Barium	Ba		GELC	µg/L			25.2	0.222				25.2	1												
	Beryllium	Be		GELC	µg/L		<	0.158	0.158			<	1	1												
	Boron	B		GELC	µg/L			14.4	4.88				13.4	10												
	Cadmium	Cd		GELC	µg/L		<	0.04	0.04			<	0.1	0.1												
	Chromium	Cr		GELC	µg/L			5.4	0.503				5.5	1				6.1	1				6	1		
	Cobalt	Co		GELC	µg/L		<	0.541	0.541			<	1	1												
	Copper	Cu		GELC	µg/L			1.7	1.39			<	3	3												
	Iron	Fe		GELC	µg/L			15	12.6				22.6	18												
	Lead	Pb		GELC	µg/L			0.1	0.05			<	0.5	0.5												
	Manganese	Mn		GELC	µg/L		<	0.36	0.296			<	2	2												
	Mercury	Hg		GELC	µg/L		<	0.0472	0.0472			<	0.05	0.05												
	Nickel	Ni		GELC	µg/L		<	0.69	0.69			<	0.5	0.5												
	Selenium	Se		GELC	µg/L		<	9.2	2.81			<	2.5	2.5												
	Selenium	Se		SwRI	µg/L		<	0.5	0.138																	
	Silver	Ag		GELC	µg/L		<	0.835	0.835			<	0.2	0.2												
	Thallium	Tl		GELC	µg/L			0.29	0.02			<	0.4	0.4												
	Tin	Sn		GELC	µg/L		<	3.26	3.26			<	2.5	2.5												
	Vanadium	V		GELC	µg/L			8	0.606				7.5	1												
	Zinc	Zn		GELC	µg/L			41.1	0.883			<	2	2												
RAD	Americium-241	Am-241		GELC	pCi/L			0.00886		0.047	0.0142		0.0112		0.0327	0.00832										
	Cesium-137	Cs-137		GELC	pCi/L			0.548		2.07	0.568		-0.0591		3.96	1.1										
	Gross alpha	GROSSA		GELC	pCi/L			1.94		1.86	0.62		0.199		1.33	0.319										
	Gross beta	GROSSB		GELC	pCi/L			1.14		1.28	0.354		3.24		2.79	0.775										
	Gross gamma	GROSSG		GELC	pCi/L			54.1		196	90.2		105		420	185										
	Plutonium-238	Pu-238		GELC	pCi/L			0.00219		0.034	0.01		0.0268		0.0321	0.0152										
	Strontium-90	Sr-90		GELC	pCi/L			0.0492		0.341	0.0759		-0.00626		0.184	0.0379										
	Strontium-90	Sr-90		PARA	pCi/L																					
	Tritium	H-3		UMTL	pCi/L			-0.3193	0.28737		0.28737		0.09579		0.28737	0.28737										
	Uranium	U		GELC	µg/L								0.38	0.05												
	Uranium-234	U-234		GELC	pCi/L			0.253		0.065	0.0267		0.238		0.0774	0.0334										
	Uranium-238	U-238		GELC	pCi/L			0.144		0.046	0.0188		0.109		0.0434	0.0279										

Table B-1.17
PM-5

						Start Date Time	02/14/00	02/14/00	02/14/00	02/14/00	02/14/00	02/15/00	02/15/00	02/15/00	02/15/00	02/15/00	06/20/00	06/20/00	06/20/00	06/20/00	06/20/00
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		GELC	mg/L																
	Fluoride	F(-1)		NMSSL	mg/L																
	Magnesium	Mg		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			7.58					7.58					7.47			
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Antimony	Sb		NMSSL	µg/L																
	Arsenic	As		GELC	µg/L																
	Arsenic	As		NMSSL	µg/L																
	Barium	Ba		GELC	µg/L																
	Barium	Ba		NMSSL	µg/L																
	Beryllium	Be		GELC	µg/L																
	Beryllium	Be		NMSSL	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Cadmium	Cd		NMSSL	µg/L																
	Chromium	Cr		GELC	µg/L																
	Chromium	Cr		NMSSL	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Mercury	Hg		NMSSL	µg/L																
	Nickel	Ni		GELC	µg/L																
	Nickel	Ni		NMSSL	µg/L																
	Selenium	Se		GELC	µg/L																
	Selenium	Se		NMSSL	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Thallium	Tl		NMSSL	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L																
	Strontium-90	Sr-90		PARA	pCi/L			0.03	0.12		0.035										
	Tritium	H-3		UMTL	pCi/L			-0.38316	0.28737		0.38316										
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.17 (continued)

						Start Date Time	06/20/00	06/20/00	06/20/00	06/20/00	06/20/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		GELC	mg/L																
	Fluoride	F(-1)		NMSSL	mg/L																
	Magnesium	Mg		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			7.47					7.2					6.83			
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Antimony	Sb		NMSSL	µg/L																
	Arsenic	As		GELC	µg/L																
	Arsenic	As		NMSSL	µg/L																
	Barium	Ba		GELC	µg/L																
	Barium	Ba		NMSSL	µg/L																
	Beryllium	Be		GELC	µg/L																
	Beryllium	Be		NMSSL	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Cadmium	Cd		NMSSL	µg/L																
	Chromium	Cr		GELC	µg/L																
	Chromium	Cr		NMSSL	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Mercury	Hg		NMSSL	µg/L																
	Nickel	Ni		GELC	µg/L																
	Nickel	Ni		NMSSL	µg/L																
	Selenium	Se		GELC	µg/L																
	Selenium	Se		NMSSL	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Thallium	Tl		NMSSL	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L													-1.22		0.213	0.141
	Strontium-90	Sr-90		PARA	pCi/L			0.062		0.13	0.041							-0.016			0.046
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.17 (continued)

						Start Date Time	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	11/15/00	11/15/00	11/15/00	11/15/00	11/15/00	02/14/01	02/14/01	02/14/01	02/14/01	02/14/01
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		GELC	mg/L																
	Fluoride	F(-1)		NMSSL	mg/L			0.281	0.1												
	Magnesium	Mg		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L			0.3	0.1												
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU								7.73								
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Antimony	Sb		NMSSL	µg/L		<	1	1												
	Arsenic	As		GELC	µg/L																
	Arsenic	As		NMSSL	µg/L			1	1												
	Barium	Ba		GELC	µg/L																
	Barium	Ba		NMSSL	µg/L		<	100	100												
	Beryllium	Be		GELC	µg/L																
	Beryllium	Be		NMSSL	µg/L		<	1	1												
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Cadmium	Cd		NMSSL	µg/L		<	1	1												
	Chromium	Cr		GELC	µg/L																
	Chromium	Cr		NMSSL	µg/L			4	1												
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Mercury	Hg		NMSSL	µg/L		<	0.2	0.2												
	Nickel	Ni		GELC	µg/L																
	Nickel	Ni		NMSSL	µg/L		<	10	10												
	Selenium	Se		GELC	µg/L																
	Selenium	Se		NMSSL	µg/L		<	5	5												
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Thallium	Tl		NMSSL	µg/L		<	1	1												
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L								0.04		0.201	0.059		0.0441		0.386	0.111
	Strontium-90	Sr-90		PARA	pCi/L																
	Tritium	H-3		UMTL	pCi/L													0	0.28737		0.12772
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.17 (continued)

						Start Date Time	05/09/01	05/09/01	05/09/01	05/09/01	05/09/01	07/11/01	07/11/01	07/11/01	07/11/01	07/11/01	08/08/01	08/08/01	08/08/01	08/08/01	08/08/01
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	0.725	0.725												
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			65.3	0.725												
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L			64.8	0.725												
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L			10.8	0.0375												
	Chloride	Cl(-1)		GELC	mg/L			1.97	0.025												
	Fluoride	F(-1)		GELC	mg/L		<	0.303	0.006												
	Fluoride	F(-1)		NMSSL	mg/L																
	Magnesium	Mg		GELC	mg/L			4.25	0.00449												
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L		<	0.27	0.0069												
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L			2.09	0.0707												
	Silicon Dioxide	SiO2		GELC	mg/L			94.1													
	Sodium	Na		GELC	mg/L			12.5	0.00813												
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			137.8					135.4								
	Sulfate	SO4(-2)		GELC	mg/L			2.21	0.062												
	Total Dissolved Solids	TDS		GELC	mg/L			147	5.09												
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L		<	0.699	0.699												
	pH	pH	Field	FLD	SU			7.92					7.9								
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Antimony	Sb		NMSSL	µg/L																
	Arsenic	As		GELC	µg/L																
	Arsenic	As		NMSSL	µg/L																
	Barium	Ba		GELC	µg/L																
	Barium	Ba		NMSSL	µg/L																
	Beryllium	Be		GELC	µg/L																
	Beryllium	Be		NMSSL	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Cadmium	Cd		NMSSL	µg/L																
	Chromium	Cr		GELC	µg/L																
	Chromium	Cr		NMSSL	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Mercury	Hg		NMSSL	µg/L																
	Nickel	Ni		GELC	µg/L																
	Nickel	Ni		NMSSL	µg/L																
	Selenium	Se		GELC	µg/L																
	Selenium	Se		NMSSL	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Thallium	Tl		NMSSL	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L			0.012		0.0081	0.00602										
	Cesium-137	Cs-137		GELC	pCi/L			0.482		3.25	0.913										
	Gross alpha	GROSSA		GELC	pCi/L			0.553		2.08	0.597										
	Gross beta	GROSSB		GELC	pCi/L			4.01		2.3	0.777										
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L			0.000766		0.0223	0.00378										
	Strontium-90	Sr-90		GELC	pCi/L			0.0387		0.238	0.0714							-0.0765		0.25	0.0562
	Strontium-90	Sr-90		PARA	pCi/L																
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L			0.323		0.0254	0.0335										
	Uranium-238	U-238		GELC	pCi/L			0.144		0.0167	0.0193										

Table B-1.17 (continued)

						Start Date Time	05/09/01	09/05/01	09/05/01	09/05/01	09/05/01	09/05/01	11/28/01	11/28/01	11/28/01	11/28/01	11/28/01	02/23/02	02/23/02	02/23/02	02/23/02	02/23/02
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<															
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																	
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																	
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																	
	Bromide	Br(-1)		GELC	mg/L																	
	Calcium	Ca		GELC	mg/L																	
	Chloride	Cl(-1)		GELC	mg/L																	
	Fluoride	F(-1)		GELC	mg/L		<		0.252	0.006				0.258	0.006				0.224	0.014		
	Fluoride	F(-1)		NMSSL	mg/L																	
	Magnesium	Mg		GELC	mg/L																	
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L		<	<	0.31	0.0069				0.3	0.0069				0.27	0.0069		
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																	
	Perchlorate	ClO4		GELC	µg/L																	
	Potassium	K		GELC	mg/L																	
	Silicon Dioxide	SiO2		GELC	mg/L																	
	Sodium	Na		GELC	mg/L																	
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																	
	Sulfate	SO4(-2)		GELC	mg/L																	
	Total Dissolved Solids	TDS		GELC	mg/L																	
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																	
	Total Suspended Solids	TSS		GELC	mg/L		<															
	pH	pH	Field	FLD	SU																	
METALS	Aluminum	Al		GELC	µg/L																	
	Antimony	Sb		GELC	µg/L																	
	Antimony	Sb		NMSSL	µg/L																	
	Arsenic	As		GELC	µg/L																	
	Arsenic	As		NMSSL	µg/L																	
	Barium	Ba		GELC	µg/L																	
	Barium	Ba		NMSSL	µg/L																	
	Beryllium	Be		GELC	µg/L																	
	Beryllium	Be		NMSSL	µg/L																	
	Boron	B		GELC	µg/L																	
	Cadmium	Cd		GELC	µg/L																	
	Cadmium	Cd		NMSSL	µg/L																	
	Chromium	Cr		GELC	µg/L																	
	Chromium	Cr		NMSSL	µg/L																	
	Cobalt	Co		GELC	µg/L																	
	Copper	Cu		GELC	µg/L																	
	Iron	Fe		GELC	µg/L																	
	Lead	Pb		GELC	µg/L																	
	Manganese	Mn		GELC	µg/L																	
	Mercury	Hg		GELC	µg/L																	
	Mercury	Hg		NMSSL	µg/L																	
	Nickel	Ni		GELC	µg/L																	
	Nickel	Ni		NMSSL	µg/L																	
	Selenium	Se		GELC	µg/L																	
	Selenium	Se		NMSSL	µg/L																	
	Silver	Ag		GELC	µg/L																	
	Thallium	Tl		GELC	µg/L																	
	Thallium	Tl		NMSSL	µg/L																	
	Tin	Sn		GELC	µg/L																	
	Vanadium	V		GELC	µg/L																	
	Zinc	Zn		GELC	µg/L																	
RAD	Americium-241	Am-241		GELC	pCi/L																	
	Cesium-137	Cs-137		GELC	pCi/L																	
	Gross alpha	GROSSA		GELC	pCi/L																	
	Gross beta	GROSSB		GELC	pCi/L																	
	Gross gamma	GROSSG		GELC	pCi/L																	
	Plutonium-238	Pu-238		GELC	pCi/L																	
	Strontium-90	Sr-90		GELC	pCi/L									0.0141		0.089	0.0328		0.011		0.166	0.0471
	Strontium-90	Sr-90		PARA	pCi/L																	
	Tritium	H-3		UMTL	pCi/L														0.25544	0.28737		0.15965
	Uranium	U		GELC	µg/L																	
	Uranium-234	U-234		GELC	pCi/L																	
	Uranium-238	U-238		GELC	pCi/L																	

Table B-1.17 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	05/18/02	05/18/02	05/18/02	05/18/02	05/18/02	05/18/02	05/18/02	05/18/02	05/18/02	05/18/02	06/26/02	06/26/02	06/26/02	06/26/02	06/26/02
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L							<	0.725	0.725							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L								49	0.725							
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L								48.7	0.725							
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L								12.3	0.00554							
	Chloride	Cl(-1)		GELC	mg/L								2.85	0.0322							
	Fluoride	F(-1)		GELC	mg/L			0.339	0.006				0.244	0.0553							
	Fluoride	F(-1)		NMSSL	mg/L																
	Magnesium	Mg		GELC	mg/L								4.87	0.00518							
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.3	0.01				0.29	0.01							
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L								2.3	0.0165							
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		GELC	mg/L								13.4	0.0144							
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			150					150.1					159.4			
	Sulfate	SO4(-2)		GELC	mg/L								2.76	0.193							
	Total Dissolved Solids	TDS		GELC	mg/L								166	5.09							
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L							<	0.35	0.35							
	pH	pH	Field	FLD	SU			8.02					8.02					7.62			
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Antimony	Sb		NMSSL	µg/L																
	Arsenic	As		GELC	µg/L																
	Arsenic	As		NMSSL	µg/L																
	Barium	Ba		GELC	µg/L																
	Barium	Ba		NMSSL	µg/L																
	Beryllium	Be		GELC	µg/L																
	Beryllium	Be		NMSSL	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Cadmium	Cd		NMSSL	µg/L																
	Chromium	Cr		GELC	µg/L																
	Chromium	Cr		NMSSL	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Mercury	Hg		NMSSL	µg/L																
	Nickel	Ni		GELC	µg/L																
	Nickel	Ni		NMSSL	µg/L																
	Selenium	Se		GELC	µg/L																
	Selenium	Se		NMSSL	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Thallium	Tl		NMSSL	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L								-0.451		2.46	0.833					
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L			0.0085		0.0821	0.0241										
	Strontium-90	Sr-90		PARA	pCi/L																
	Tritium	H-3		UMTL	pCi/L								-0.06386	0.28737		0.12772					
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.17 (continued)

						Start Date Time	08/24/02	08/24/02	08/24/02	08/24/02	08/24/02	09/25/02	09/25/02	09/25/02	09/25/02	09/25/02	10/09/02	10/09/02	10/09/02	10/09/02	10/09/02
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom		Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		GELC	mg/L			0.273	0.0553												
	Fluoride	F(-1)		NMSSL	mg/L																
	Magnesium	Mg		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.31	0.01												
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			163.1					153.4					137.5			
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			7.65					7.79					7.98			
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Antimony	Sb		NMSSL	µg/L																
	Arsenic	As		GELC	µg/L																
	Arsenic	As		NMSSL	µg/L																
	Barium	Ba		GELC	µg/L																
	Barium	Ba		NMSSL	µg/L																
	Beryllium	Be		GELC	µg/L																
	Beryllium	Be		NMSSL	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Cadmium	Cd		NMSSL	µg/L																
	Chromium	Cr		GELC	µg/L																
	Chromium	Cr		NMSSL	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Mercury	Hg		NMSSL	µg/L																
	Nickel	Ni		GELC	µg/L																
	Nickel	Ni		NMSSL	µg/L																
	Selenium	Se		GELC	µg/L																
	Selenium	Se		NMSSL	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Thallium	Tl		NMSSL	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L			-0.0054		0.104	0.03										
	Strontium-90	Sr-90		PARA	pCi/L																
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.17 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom	Start Date Time	10/09/02	10/09/02	10/09/02	10/09/02	10/09/02	11/16/02	11/16/02	11/16/02	11/16/02	11/16/02	05/14/03	05/14/03	05/14/03	05/14/03	05/14/03
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		GELC	mg/L								0.291	0.0553				0.26	0.0553		
	Fluoride	F(-1)		NMSSL	mg/L																
	Magnesium	Mg		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L								0.33	0.01				0.3	0.01		
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm								154.6								
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU								7.9								
METALS	Aluminum	Al		GELC	µg/L			44.7	5.31												
	Antimony	Sb		GELC	µg/L																
	Antimony	Sb		NMSSL	µg/L																
	Arsenic	As		GELC	µg/L		<	0.53	0.53												
	Arsenic	As		NMSSL	µg/L																
	Barium	Ba		GELC	µg/L																
	Barium	Ba		NMSSL	µg/L																
	Beryllium	Be		GELC	µg/L																
	Beryllium	Be		NMSSL	µg/L																
	Boron	B		GELC	µg/L			67	0.19												
	Cadmium	Cd		GELC	µg/L		<	0.07	0.07												
	Cadmium	Cd		NMSSL	µg/L																
	Chromium	Cr		GELC	µg/L			4.76	0.3												
	Chromium	Cr		NMSSL	µg/L																
	Cobalt	Co		GELC	µg/L		<	0.04	0.04												
	Copper	Cu		GELC	µg/L		<	1.11	0.25												
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L			0.355	0.05												
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Mercury	Hg		NMSSL	µg/L																
	Nickel	Ni		GELC	µg/L																
	Nickel	Ni		NMSSL	µg/L																
	Selenium	Se		GELC	µg/L		<	1	1												
	Selenium	Se		NMSSL	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Thallium	Tl		NMSSL	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L			7.74	0.81												
	Zinc	Zn		GELC	µg/L			4.57	1.54												
RAD	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L								-0.017		0.137	0.0331		-0.0337		0.121	0.0346
	Strontium-90	Sr-90		PARA	pCi/L																
	Tritium	H-3		UMTL	pCi/L													-0.09579	0.28737		0.28737
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.17 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
						Start Date Time	10/09/02	08/21/03	08/21/03	08/21/03	08/21/03	08/21/03	09/24/03	09/24/03	09/24/03	09/24/03	09/24/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L			<	1.45	1.45												
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L				61.1	1.45												
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L				60.9	1.45												
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																	
	Bromide	Br(-1)		GELC	mg/L																	
	Calcium	Ca		GELC	mg/L				9.47	0.00554												
	Chloride	Cl(-1)		GELC	mg/L				1.9	0.0322												
	Fluoride	F(-1)		GELC	mg/L				0.356	0.1106								<	0.179	0.0553		
	Fluoride	F(-1)		NMSSL	mg/L																	
	Magnesium	Mg		GELC	mg/L				3.57	0.00518												
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L				0.58	0.02									0.28	0.01		
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																	
	Perchlorate	ClO4		GELC	µg/L																	
	Potassium	K		GELC	mg/L				2.22	0.0165												
	Silicon Dioxide	SiO2		GELC	mg/L																	
	Sodium	Na		GELC	mg/L				13.5	0.0144												
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm				133.9					154.3					149.9			
	Sulfate	SO4(-2)		GELC	mg/L				1.95	0.193												
	Total Dissolved Solids	TDS		GELC	mg/L				168	3.07												
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																	
	Total Suspended Solids	TSS		GELC	mg/L			<	0.796	0.796												
	pH	pH	Field	FLD	SU				7.9					7.75					7.76			
METALS	Aluminum	Al		GELC	µg/L																	
	Antimony	Sb		GELC	µg/L																	
	Antimony	Sb		NMSSL	µg/L																	
	Arsenic	As		GELC	µg/L		<															
	Arsenic	As		NMSSL	µg/L																	
	Barium	Ba		GELC	µg/L																	
	Barium	Ba		NMSSL	µg/L																	
	Beryllium	Be		GELC	µg/L																	
	Beryllium	Be		NMSSL	µg/L																	
	Boron	B		GELC	µg/L																	
	Cadmium	Cd		GELC	µg/L		<															
	Cadmium	Cd		NMSSL	µg/L																	
	Chromium	Cr		GELC	µg/L																	
	Chromium	Cr		NMSSL	µg/L																	
	Cobalt	Co		GELC	µg/L		<															
	Copper	Cu		GELC	µg/L		<															
	Iron	Fe		GELC	µg/L																	
	Lead	Pb		GELC	µg/L																	
	Manganese	Mn		GELC	µg/L																	
	Mercury	Hg		GELC	µg/L																	
	Mercury	Hg		NMSSL	µg/L																	
	Nickel	Ni		GELC	µg/L																	
	Nickel	Ni		NMSSL	µg/L																	
	Selenium	Se		GELC	µg/L		<															
	Selenium	Se		NMSSL	µg/L																	
	Silver	Ag		GELC	µg/L																	
	Thallium	Tl		GELC	µg/L																	
	Thallium	Tl		NMSSL	µg/L																	
	Tin	Sn		GELC	µg/L																	
	Vanadium	V		GELC	µg/L																	
	Zinc	Zn		GELC	µg/L																	
RAD	Americium-241	Am-241		GELC	pCi/L				0.157		0.039	0.0225										
	Cesium-137	Cs-137		GELC	pCi/L				-0.281		3.33	0.931										
	Gross alpha	GROSSA		GELC	pCi/L				0.118		1.12	0.276										
	Gross beta	GROSSB		GELC	pCi/L				1.9		2.09	0.554										
	Gross gamma	GROSSG		GELC	pCi/L				95.5		325	99.3										
	Plutonium-238	Pu-238		GELC	pCi/L				-0.027		0.054	0.0229										
	Strontium-90	Sr-90		GELC	pCi/L				0.0049		0.342	0.0766							0.0185		0.128	0.0309
	Strontium-90	Sr-90		PARA	pCi/L																	
	Tritium	H-3		UMTL	pCi/L														1.2772	0.57474		0.6386
	Uranium	U		GELC	µg/L																	
	Uranium-234	U-234		GELC	pCi/L				0.228		0.063	0.0307										
	Uranium-238	U-238		GELC	pCi/L				0.165		0.04	0.0247										

Table B-1.17 (continued)

						Start Date Time	11/24/03	11/24/03	11/24/03	11/24/03	11/24/03	12/17/03	12/17/03	12/17/03	12/17/03	12/17/03	01/28/04	01/28/04	01/28/04	01/28/04	01/28/04
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		GELC	mg/L		<	0.18	0.0553												
	Fluoride	F(-1)		NMSSL	mg/L																
	Magnesium	Mg		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.27	0.01												
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																
	Perchlorate	ClO4		GELC	µg/L													0.347			
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm								147.1					147.2			
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU								7.73					7.73			
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L		<	0.2	0.2												
	Antimony	Sb		NMSSL	µg/L																
	Arsenic	As		GELC	µg/L			0.625	0.53												
	Arsenic	As		NMSSL	µg/L																
	Barium	Ba		GELC	µg/L			29.9	0.25												
	Barium	Ba		NMSSL	µg/L																
	Beryllium	Be		GELC	µg/L		<	0.07	0.07												
	Beryllium	Be		NMSSL	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L		<	0.07	0.07												
	Cadmium	Cd		NMSSL	µg/L																
	Chromium	Cr		GELC	µg/L			4.94	0.3												
	Chromium	Cr		NMSSL	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L		<	0.0472	0.0472												
	Mercury	Hg		NMSSL	µg/L																
	Nickel	Ni		GELC	µg/L			0.237	0.07												
	Nickel	Ni		NMSSL	µg/L																
	Selenium	Se		GELC	µg/L		<	1	1												
	Selenium	Se		NMSSL	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L		<	0.02	0.02												
	Thallium	Tl		NMSSL	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L			0.665		0.812	0.26										
	Gross beta	GROSSB		GELC	pCi/L			2.95		2.16	0.643										
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L																
	Strontium-90	Sr-90		PARA	pCi/L																
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.17 (continued)

						Start Date Time	02/09/04	02/09/04	02/09/04	02/09/04	02/09/04	03/24/04	03/24/04	03/24/04	03/24/04	03/24/04	05/20/04	05/20/04	05/20/04	05/20/04	05/20/04
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom		Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L												<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L													60.3	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L													60	1.45		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L													11.9	0.00554		
	Chloride	Cl(-1)		GELC	mg/L													2.56	0.0322		
	Fluoride	F(-1)		GELC	mg/L			0.289	0.0553									0.205	0.0553		
	Fluoride	F(-1)		NMSSL	mg/L																
	Magnesium	Mg		GELC	mg/L													4.77	0.00518		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.26	0.01									0.25	0.01		
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																
	Perchlorate	ClO4		GELC	µg/L			0.301					0.356					0.314	0.05		
	Potassium	K		GELC	mg/L													2.31	0.0165		
	Silicon Dioxide	SiO2		GELC	mg/L													87.9	0.0212		
	Sodium	Na		GELC	mg/L													13.2	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			147.2					161.3					142.9			
	Sulfate	SO4(-2)		GELC	mg/L													2.38	0.193		
	Total Dissolved Solids	TDS		GELC	mg/L													149	3.07		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L												<	0.764	0.764		
	pH	pH	Field	FLD	SU			7.64					7.75					7.73			
METALS	Aluminum	Al		GELC	µg/L												<	14.7	14.7		
	Antimony	Sb		GELC	µg/L												<	0.28	0.28		
	Antimony	Sb		NMSSL	µg/L																
	Arsenic	As		GELC	µg/L												<	2.24	2.24		
	Arsenic	As		NMSSL	µg/L																
	Barium	Ba		GELC	µg/L													32.5	0.222		
	Barium	Ba		NMSSL	µg/L																
	Beryllium	Be		GELC	µg/L												<	0.158	0.158		
	Beryllium	Be		NMSSL	µg/L																
	Boron	B		GELC	µg/L												<	15.8	4.88		
	Cadmium	Cd		GELC	µg/L												<	0.04	0.04		
	Cadmium	Cd		NMSSL	µg/L																
	Chromium	Cr		GELC	µg/L													5.9	0.503		
	Chromium	Cr		NMSSL	µg/L																
	Cobalt	Co		GELC	µg/L												<	0.541	0.541		
	Copper	Cu		GELC	µg/L												<	1.39	1.39		
	Iron	Fe		GELC	µg/L												<	12.6	12.6		
	Lead	Pb		GELC	µg/L													0.283	0.05		
	Manganese	Mn		GELC	µg/L													1.81	0.296		
	Mercury	Hg		GELC	µg/L												<	0.0472	0.0472		
	Mercury	Hg		NMSSL	µg/L																
	Nickel	Ni		GELC	µg/L												<	0.69	0.69		
	Nickel	Ni		NMSSL	µg/L																
	Selenium	Se		GELC	µg/L												<	3.55	2.81		
	Selenium	Se		NMSSL	µg/L																
	Silver	Ag		GELC	µg/L												<	0.835	0.835		
	Thallium	Tl		GELC	µg/L												<	0.02	0.02		
	Thallium	Tl		NMSSL	µg/L																
	Tin	Sn		GELC	µg/L												<	3.26	3.26		
	Vanadium	V		GELC	µg/L													10.5	0.606		
	Zinc	Zn		GELC	µg/L													12.2	0.883		
RAD	Americium-241	Am-241		GELC	pCi/L													0.0089		0.032	0.0069
	Cesium-137	Cs-137		GELC	pCi/L													15.2		5.37	1.55
	Gross alpha	GROSSA		GELC	pCi/L													0.463		1.65	0.414
	Gross beta	GROSSB		GELC	pCi/L													2.6		2.95	0.794
	Gross gamma	GROSSG		GELC	pCi/L													150		347	92.1
	Plutonium-238	Pu-238		GELC	pCi/L													-0.00225		0.035	0.00595
	Strontium-90	Sr-90		GELC	pCi/L			0.115		0.234	0.0605							0.194		0.28	0.0791
	Strontium-90	Sr-90		PARA	pCi/L																
	Tritium	H-3		UMTL	pCi/L													2.36282	0.28737		0.3193
	Uranium	U		GELC	µg/L													0.553	0.02		
	Uranium-234	U-234		GELC	pCi/L													0.387		0.078	0.0433
	Uranium-238	U-238		GELC	pCi/L													0.169		0.055	0.0269

Table B-1.17 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom	Start Date Time	08/31/04	08/31/04	08/31/04	08/31/04	08/31/04	11/16/04	11/16/04	11/16/04	11/16/04	11/16/04	03/23/05	03/23/05	03/23/05	03/23/05	03/23/05
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		GELC	mg/L																
	Fluoride	F(-1)		NMSSL	mg/L																
	Magnesium	Mg		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																
	Perchlorate	ClO4		GELC	µg/L			0.376	0.05				0.361	0.05				0.36	0.05		
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			140					124.2					123.8			
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			7.81					7.64					7.37			
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Antimony	Sb		NMSSL	µg/L																
	Arsenic	As		GELC	µg/L																
	Arsenic	As		NMSSL	µg/L																
	Barium	Ba		GELC	µg/L																
	Barium	Ba		NMSSL	µg/L																
	Beryllium	Be		GELC	µg/L																
	Beryllium	Be		NMSSL	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Cadmium	Cd		NMSSL	µg/L																
	Chromium	Cr		GELC	µg/L																
	Chromium	Cr		NMSSL	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Mercury	Hg		NMSSL	µg/L																
	Nickel	Ni		GELC	µg/L																
	Nickel	Ni		NMSSL	µg/L																
	Selenium	Se		GELC	µg/L																
	Selenium	Se		NMSSL	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Thallium	Tl		NMSSL	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L																
	Strontium-90	Sr-90		PARA	pCi/L																
	Tritium	H-3		UMTL	pCi/L								-0.9579	0.28737		0.28737					
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.17 (continued)

						Start Date Time	05/18/05	05/18/05	05/18/05	05/18/05	05/18/05	08/17/05	08/17/05	08/17/05	08/17/05	08/17/05	11/16/05	11/16/05	11/16/05	11/16/05	11/16/05
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	1.45	1.45												
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			75	1.45												
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L			74.9	1.45												
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L			11.8	0.036												
	Chloride	Cl(-1)		GELC	mg/L			2.27	0.053												
	Fluoride	F(-1)		GELC	mg/L			0.26	0.03												
	Fluoride	F(-1)		NMSSL	mg/L																
	Magnesium	Mg		GELC	mg/L			4.5	0.085												
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.278	0.003												
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																
	Perchlorate	ClO4		GELC	µg/L			0.326	0.05				0.323	0.05				0.344	0.05		
	Potassium	K		GELC	mg/L			2.23	0.05												
	Silicon Dioxide	SiO2		GELC	mg/L			85.7	0.032												
	Sodium	Na		GELC	mg/L			13.3	0.045												
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			153.5					149.1					144.7			
	Sulfate	SO4(-2)		GELC	mg/L			2.07	0.057												
	Total Dissolved Solids	TDS		GELC	mg/L			152	2.38												
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<	0.046	0.01												
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			7.8					7.86					7.41			
METALS	Aluminum	Al		GELC	µg/L		<	68	68												
	Antimony	Sb		GELC	µg/L		<	0.5	0.5												
	Antimony	Sb		NMSSL	µg/L																
	Arsenic	As		GELC	µg/L		<	6	6												
	Arsenic	As		NMSSL	µg/L																
	Barium	Ba		GELC	µg/L			30.4	1												
	Barium	Ba		NMSSL	µg/L																
	Beryllium	Be		GELC	µg/L		<	0.1	0.1												
	Beryllium	Be		NMSSL	µg/L																
	Boron	B		GELC	µg/L			15.5	10												
	Cadmium	Cd		GELC	µg/L		<	0.1	0.1												
	Cadmium	Cd		NMSSL	µg/L																
	Chromium	Cr		GELC	µg/L			4.8	1												
	Chromium	Cr		NMSSL	µg/L																
	Cobalt	Co		GELC	µg/L		<	1	1												
	Copper	Cu		GELC	µg/L		<	3	3												
	Iron	Fe		GELC	µg/L		<	18	18												
	Lead	Pb		GELC	µg/L		<	0.5	0.5												
	Manganese	Mn		GELC	µg/L		<	1	1												
	Mercury	Hg		GELC	µg/L		<	0.05	0.05												
	Mercury	Hg		NMSSL	µg/L																
	Nickel	Ni		GELC	µg/L		<	1	1												
	Nickel	Ni		NMSSL	µg/L																
	Selenium	Se		GELC	µg/L		<	6	6												
	Selenium	Se		NMSSL	µg/L																
	Silver	Ag		GELC	µg/L		<	1	1												
	Thallium	Tl		GELC	µg/L		<	0.4	0.4												
	Thallium	Tl		NMSSL	µg/L																
	Tin	Sn		GELC	µg/L		<	2.5	2.5												
	Vanadium	V		GELC	µg/L			11	1												
	Zinc	Zn		GELC	µg/L		<	3.8	2												
RAD	Americium-241	Am-241		GELC	pCi/L			-0.0178		0.044	0.0147										
	Cesium-137	Cs-137		GELC	pCi/L			-0.711		2.71	0.8										
	Gross alpha	GROSSA		GELC	pCi/L			-0.17		1.81	0.413										
	Gross beta	GROSSB		GELC	pCi/L			1.71		1.26	0.385										
	Gross gamma	GROSSG		GELC	pCi/L			159		427	108										
	Plutonium-238	Pu-238		GELC	pCi/L			5.77E-10		0.05	0.00685										
	Strontium-90	Sr-90		GELC	pCi/L			0.0416		0.268	0.0654										
	Strontium-90	Sr-90		PARA	pCi/L																
	Tritium	H-3		UMTL	pCi/L			1.18141	0.28737		0.28737							-0.06386		0.28737	0.28737
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L			0.391		0.091	0.0388										
	Uranium-238	U-238		GELC	pCi/L			0.218		0.064	0.0277										

Table B-1.17 (continued)

						Start Date Time	05/18/05	01/19/06	01/19/06	01/19/06	01/19/06	01/19/06	01/19/06	01/19/06	01/19/06	01/19/06	01/19/06	05/24/06	05/24/06	05/24/06	05/24/06	05/24/06
						Fld Prep Code	UF	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<															
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																	
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																	
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																	
	Bromide	Br(-1)		GELC	mg/L																	
	Calcium	Ca		GELC	mg/L				11.2	0.036				11.4	0.036							
	Chloride	Cl(-1)		GELC	mg/L																	
	Fluoride	F(-1)		GELC	mg/L																	
	Fluoride	F(-1)		NMSSL	mg/L																	
	Magnesium	Mg		GELC	mg/L				4.4	0.085				4.46	0.085							
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																	
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																	
	Perchlorate	ClO4		GELC	µg/L									0.305	0.05							
	Potassium	K		GELC	mg/L				2.12	0.05				2.18	0.05							
	Silicon Dioxide	SiO2		GELC	mg/L				86.4	0.032				87.4	0.032							
	Sodium	Na		GELC	mg/L				12.6	0.045				12.5	0.045							
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm									145.6								
	Sulfate	SO4(-2)		GELC	mg/L																	
	Total Dissolved Solids	TDS		GELC	mg/L																	
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<															
	Total Suspended Solids	TSS		GELC	mg/L																	
	pH	pH	Field	FLD	SU									7.93								
METALS	Aluminum	Al		GELC	µg/L		<	<	68	68			<	68	68							
	Antimony	Sb		GELC	µg/L		<	<	0.5	0.5			<	0.5	0.5							
	Antimony	Sb		NMSSL	µg/L																	
	Arsenic	As		GELC	µg/L		<	<	6	6			<	6	6							
	Arsenic	As		NMSSL	µg/L																	
	Barium	Ba		GELC	µg/L				31.1	1				31.6	1							
	Barium	Ba		NMSSL	µg/L																	
	Beryllium	Be		GELC	µg/L		<	<	1	1			<	1	1							
	Beryllium	Be		NMSSL	µg/L																	
	Boron	B		GELC	µg/L				18.2	10				17.8	10							
	Cadmium	Cd		GELC	µg/L		<	<	0.1	0.1			<	0.1	0.1							
	Cadmium	Cd		NMSSL	µg/L																	
	Chromium	Cr		GELC	µg/L				5.5	1				5.7	1				4.8	1		
	Chromium	Cr		NMSSL	µg/L																	
	Cobalt	Co		GELC	µg/L		<	<	1	1			<	1	1							
	Copper	Cu		GELC	µg/L		<	<	3	3			<	3	3							
	Iron	Fe		GELC	µg/L		<	<	18	18				31.1	18							
	Lead	Pb		GELC	µg/L		<	<	0.5	0.5			<	0.5	0.5							
	Manganese	Mn		GELC	µg/L		<	<	2	2			<	2	2							
	Mercury	Hg		GELC	µg/L		<															
	Mercury	Hg		NMSSL	µg/L																	
	Nickel	Ni		GELC	µg/L		<	<	0.5	0.5			<	0.5	0.5							
	Nickel	Ni		NMSSL	µg/L																	
	Selenium	Se		GELC	µg/L		<	<	2.5	2.5			<	2.5	2.5							
	Selenium	Se		NMSSL	µg/L																	
	Silver	Ag		GELC	µg/L		<	<	0.2	0.2			<	0.2	0.2							
	Thallium	Tl		GELC	µg/L		<	<	0.4	0.4			<	0.4	0.4							
	Thallium	Tl		NMSSL	µg/L																	
	Tin	Sn		GELC	µg/L		<	<	2.5	2.5			<	2.5	2.5							
	Vanadium	V		GELC	µg/L				9.8	1				9.8	1							
	Zinc	Zn		GELC	µg/L		<		4.6	2				6.4	2							
RAD	Americium-241	Am-241		GELC	pCi/L																	
	Cesium-137	Cs-137		GELC	pCi/L																	
	Gross alpha	GROSSA		GELC	pCi/L																	
	Gross beta	GROSSB		GELC	pCi/L																	
	Gross gamma	GROSSG		GELC	pCi/L																	
	Plutonium-238	Pu-238		GELC	pCi/L																	
	Strontium-90	Sr-90		GELC	pCi/L																	
	Strontium-90	Sr-90		PARA	pCi/L																	
	Tritium	H-3		UMTL	pCi/L																	
	Uranium	U		GELC	µg/L				0.5	0.05				0.5	0.05							
	Uranium-234	U-234		GELC	pCi/L																	
	Uranium-238	U-238		GELC	pCi/L																	

Table B-1.17 (continued)

						Start Date Time	05/24/06	05/24/06	05/24/06	05/24/06	05/24/06	08/24/06	08/24/06	08/24/06	08/24/06	08/24/06	08/24/06	08/24/06	08/24/06	08/24/06	08/24/06
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	0.725	0.725												
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			70.1	0.725												
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L		<	0.01	0.01												
	Bromide	Br(-1)		GELC	mg/L		<	0.066	0.066												
	Calcium	Ca		GELC	mg/L			11.5	0.036												
	Chloride	Cl(-1)		GELC	mg/L			2.62	0.066												
	Fluoride	F(-1)		GELC	mg/L			0.315	0.033												
	Fluoride	F(-1)		NMSSL	mg/L																
	Magnesium	Mg		GELC	mg/L			4.41	0.085												
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.304	0.014												
	Nitrate-Nitrite as N	NO3+NO2-N		NMSSL	mg/L																
	Perchlorate	ClO4		GELC	µg/L			0.336	0.05									0.34	0.05		
	Potassium	K		GELC	mg/L			2.14	0.05												
	Silicon Dioxide	SiO2		GELC	mg/L			85.5	0.032												
	Sodium	Na		GELC	mg/L			12.7	0.045												
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			151.7										149.9			
	Sulfate	SO4(-2)		GELC	mg/L			2.63	0.1												
	Total Dissolved Solids	TDS		GELC	mg/L			167	2.38												
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L		<	0.01	0.01												
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<	0.038	0.01												
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			7.68										8			
METALS	Aluminum	Al		GELC	µg/L		<	68	68												
	Antimony	Sb		GELC	µg/L		<	0.5	0.5												
	Antimony	Sb		NMSSL	µg/L																
	Arsenic	As		GELC	µg/L		<	6	6												
	Arsenic	As		NMSSL	µg/L																
	Barium	Ba		GELC	µg/L			29.8	1												
	Barium	Ba		NMSSL	µg/L																
	Beryllium	Be		GELC	µg/L		<	1	1												
	Beryllium	Be		NMSSL	µg/L																
	Boron	B		GELC	µg/L			15.6	10												
	Cadmium	Cd		GELC	µg/L		<	0.1	0.1												
	Cadmium	Cd		NMSSL	µg/L																
	Chromium	Cr		GELC	µg/L			4.8	1				5.8	1				6	1		
	Chromium	Cr		NMSSL	µg/L																
	Cobalt	Co		GELC	µg/L		<	1	1												
	Copper	Cu		GELC	µg/L		<	3	3												
	Iron	Fe		GELC	µg/L		<	18	18												
	Lead	Pb		GELC	µg/L		<	0.5	0.5												
	Manganese	Mn		GELC	µg/L		<	2	2												
	Mercury	Hg		GELC	µg/L		<	0.06	0.06												
	Mercury	Hg		NMSSL	µg/L																
	Nickel	Ni		GELC	µg/L		<	0.5	0.5												
	Nickel	Ni		NMSSL	µg/L																
	Selenium	Se		GELC	µg/L		<	2.5	2.5												
	Selenium	Se		NMSSL	µg/L																
	Silver	Ag		GELC	µg/L		<	0.2	0.2												
	Thallium	Tl		GELC	µg/L		<	0.4	0.4												
	Thallium	Tl		NMSSL	µg/L																
	Tin	Sn		GELC	µg/L		<	2.5	2.5												
	Vanadium	V		GELC	µg/L			9.9	1												
	Zinc	Zn		GELC	µg/L		<	5.9	2												
RAD	Americium-241	Am-241		GELC	pCi/L			-0.0123		0.0338	0.0174										
	Cesium-137	Cs-137		GELC	pCi/L			1.86		3.99	1.01										
	Gross alpha	GROSSA		GELC	pCi/L			0.787		2.32	0.574										
	Gross beta	GROSSB		GELC	pCi/L			1.36		2.94	0.736										
	Gross gamma	GROSSG		GELC	pCi/L			74.7		281	75										
	Plutonium-238	Pu-238		GELC	pCi/L			-0.0103		0.0619	0.00731										
	Strontium-90	Sr-90		GELC	pCi/L			-0.0116		0.458	0.101										
	Strontium-90	Sr-90		PARA	pCi/L																
	Tritium	H-3		UMTL	pCi/L			-0.03193		0.28737	0.28737										
	Uranium	U		GELC	µg/L			0.57	0.05												
	Uranium-234	U-234		GELC	pCi/L			0.405		0.129	0.0481										
	Uranium-238	U-238		GELC	pCi/L			0.187		0.0725	0.0311										

Table B-1.18
R-13

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom	Start Date Time	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	07/03/02	07/03/02	07/03/02	07/03/02	07/03/02
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3	Field	FLD	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GEL	mg/L			65.3	1.5												
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia	NH3		GEL	mg/L		<	0.05	0.02												
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		EES6	mg/L																
	Bromide	Br(-1)		GEL	mg/L		<	0.2	0.02												
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		EES6	mg/L																
	Calcium	Ca		GEL	mg/L			13.9	0.038				13.9	0.038				13.6	0.0055		
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		EES6	mg/L																
	Chloride	Cl(-1)		GEL	mg/L			5.95	0.02												
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		EES6	mg/L																
	Fluoride	F(-1)		GEL	mg/L			0.48	0.01												
	Fluoride	F(-1)		GELC	mg/L																
	Magnesium	Mg		EES6	mg/L																
	Magnesium	Mg		GEL	mg/L			3.45	0.0045				3.44	0.0045				3.27	0.0052		
	Magnesium	Mg		GELC	mg/L																
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GEL	mg/L			0.81	0.0069												
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																
	Nitrite as Nitrogen	NO2-N		EES6	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		EES6	mg/L																
	Potassium	K		GEL	mg/L			1.37	0.0071				1.39	0.0071				1.29	0.017		
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		EES6	mg/L																
	Silicon Dioxide	SiO2		GEL	mg/L													33.5	0.0098		
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		EES6	mg/L																
	Sodium	Na		GEL	mg/L			9.95	0.0081				9.94	0.0081				9.42	0.014		
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		EES6	mg/L																
	Sulfate	SO4(-2)		GEL	mg/L			3.13	0.06												
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GEL	mg/L			0.12	0.05									0.1	0.03		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GEL	mg/L								0.3	0.04				0.35	0.02		
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Organic Carbon	TOC		HUFFMAN	mg/L																
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU																

Table B-1.18 (continued)

						Start Date Time	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	07/03/02	07/03/02	07/03/02	07/03/02	07/03/02
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS	Aluminum	Al		EES6	µg/L																
	Aluminum	Al		GEL	µg/L		<	50	34			<	50	34			<	19	15		
	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		EES6	µg/L																
	Antimony	Sb		GEL	µg/L		<	0.12	0.11			<	0.25	0.11			<	2	0.28		
	Antimony	Sb		GELC	µg/L																
	Arsenic	As		EES6	µg/L																
	Arsenic	As		GEL	µg/L		<	5	4.6			<	5	4.6			<	5	2.2		
	Arsenic	As		GELC	µg/L																
	Barium	Ba		EES6	µg/L																
	Barium	Ba		GEL	µg/L			29.3	0.21				29.3	0.21				28.3	0.22		
	Barium	Ba		GELC	µg/L																
	Beryllium	Be		EES6	µg/L																
	Beryllium	Be		GEL	µg/L		<	0.2	0.03			<	0.2	0.03			<	0.2	0.08		
	Beryllium	Be		GELC	µg/L																
	Boron	B		EES6	µg/L																
	Boron	B		GEL	µg/L		<	50	3			<	50	3			<	50	4.9		
	Boron	B		GELC	µg/L																
	Cadmium	Cd		EES6	µg/L																
	Cadmium	Cd		GEL	µg/L		<	1	0.05			<	1	0.05			<	1	0.04		
	Cadmium	Cd		GELC	µg/L																
	Chromium	Cr		EES6	µg/L																
	Chromium	Cr		GEL	µg/L		<	2.47	0.78			<	2.73	0.78			<	4.28	0.5		
	Chromium	Cr		GELC	µg/L																
	Cobalt	Co		EES6	µg/L																
	Cobalt	Co		GEL	µg/L		<	5	0.3			<	5	0.3			<	0.62	0.54		
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		EES6	µg/L																
	Copper	Cu		GEL	µg/L		<	5	2.7			<	3.59	2.7			<	5	1.4		
	Copper	Cu		GELC	µg/L																
	Iron	Fe		EES6	µg/L																
	Iron	Fe		GEL	µg/L			72.8	21				77.2	21				86.8	13		
	Iron	Fe		GELC	µg/L																
	Lead	Pb		EES6	µg/L																
	Lead	Pb		GEL	µg/L		<	0.11	0.07			<	0.25	0.07			<	0.09	0.05		
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		EES6	µg/L																
	Manganese	Mn		GEL	µg/L			7.55	0.66				7.66	0.66				6.59	1.6		
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		EES6	µg/L																
	Mercury	Hg		GEL	µg/L		<	0.2	0.07			<	0.2	0.07			<	0.2	0.04		
	Mercury	Hg		GELC	µg/L																
	Nickel	Ni		EES6	µg/L																
	Nickel	Ni		GEL	µg/L		<	5	0.74			<	5	0.74			<	5	0.69		
	Nickel	Ni		GELC	µg/L																
	Selenium	Se		EES6	µg/L																
	Selenium	Se		GEL	µg/L		<	5	3.1			<	5	3.1			<	5	2.8		
	Selenium	Se		GELC	µg/L																
	Silver	Ag		EES6	µg/L																
	Silver	Ag		GEL	µg/L		<	5	0.2			<	5	0.2			<	2.43	0.84		
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		EES6	µg/L																
	Thallium	Tl		GEL	µg/L		<	0.09	0.01			<	0.25	0.01			<	0.34	0.02		
	Thallium	Tl		GELC	µg/L																
	Tin	Sn		EES6	µg/L																
	Tin	Sn		GELC	µg/L																
	Uranium	U		GEL	µg/L			0.5	0.01				0.49	0.01				0.46	0.02		

Table B-1.18 (continued)

						Start Date Time	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	04/18/02	07/03/02	07/03/02	07/03/02	07/03/02	07/03/02
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Vanadium	V		EES6	µg/L																
	Vanadium	V		GEL	µg/L		<	4.54	1.1			<	4.43	1.1			<	6.38	0.61		
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		EES6	µg/L																
	Zinc	Zn		GEL	µg/L			5.53	2.8				6.69	2.8			<	3.17	0.88		
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GEL	pCi/L		<	0.01		0.01	0.0063						<	0.00876		0.01	0.0053
	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GEL	pCi/L		<	-0.64		1.5	0.47						<	-1.14		3.6	1.1
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GEL	pCi/L							<	2.34		3.5	0.88	<	2.32		3.3	0.86
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GEL	pCi/L							<	47.5		160	0.96	<	84.1		250	82
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GEL	pCi/L		<	-0.00733		0.02	0.0043						<	-0.01		0.03	0.0079
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GEL	pCi/L		<	-0.02		0.14	0.03						<	0.03		0.12	0.03
	Strontium-90	Sr-90		GELC	pCi/L																
	Tritium	H-3		UMTL	pCi/L								-0.06	0	0.32	0.32		0.06	0	0.06	0.32
	Uranium	U		EES6	µg/L																
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GEL	pCi/L			0.25		0.02	0.03							0.3		0.0057	0.03
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GEL	pCi/L			0.14		0.01	0.02							0.15		0.0057	0.02

Table B-1.18 (continued)

						Start Date Time	07/03/02	07/03/02	07/03/02	07/03/02	07/03/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02
						Fld Prep Code	F	F	F	F	F	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3	Field	FLD	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GEL	mg/L			69	1.5				72.3	1.5							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia	NH3		GEL	mg/L		<	0.05	0.02				0.04	0.02							
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		EES6	mg/L																
	Bromide	Br(-1)		GEL	mg/L		<	0.2	0.09			<	0.2	0.09							
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		EES6	mg/L																
	Calcium	Ca		GEL	mg/L			13.6	0.0055				14	0.0055				14.1	0.0055		
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		EES6	mg/L																
	Chloride	Cl(-1)		GEL	mg/L			2.22	0.03				2.35	0.03							
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		EES6	mg/L																
	Fluoride	F(-1)		GEL	mg/L			0.32	0.05				0.34	0.05							
	Fluoride	F(-1)		GELC	mg/L																
	Magnesium	Mg		EES6	mg/L																
	Magnesium	Mg		GEL	mg/L			3.26	0.0052				3.41	0.0052				3.43	0.0052		
	Magnesium	Mg		GELC	mg/L																
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GEL	mg/L			0.74	0.01				0.76	0.01							
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																
	Nitrite as Nitrogen	NO2-N		EES6	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		EES6	mg/L																
	Potassium	K		GEL	mg/L			1.29	0.017				1.32	0.017				1.31	0.017		
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		EES6	mg/L																
	Silicon Dioxide	SiO2		GEL	mg/L			33.5	0.0098				34.6	0.0098				34.1	0.0098		
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		EES6	mg/L																
	Sodium	Na		GEL	mg/L			9.38	0.014				10.6	0.014				10.6	0.014		
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		EES6	mg/L																
	Sulfate	SO4(-2)		GEL	mg/L			2.79	0.19				2.99	0.19							
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GEL	mg/L			0.03	0.03									0.14	0.03		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GEL	mg/L													0.24	0.02		
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Organic Carbon	TOC		HUFFMAN	mg/L								0.26	0.26							
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU																
METALS	Aluminum	Al		EES6	µg/L																
	Aluminum	Al		GEL	µg/L		<	21.1	15				16.3	15			<	100	15		
	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		EES6	µg/L																

Table B-1.18 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
						Start Date Time	07/03/02	07/03/02	07/03/02	07/03/02	07/03/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02
						Fld Prep Code	F	F	F	F	F	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
METALS (cont.)	Antimony	Sb		GEL	µg/L		<	2	0.28			<	2	0.28			<	2	0.28		
	Antimony	Sb		GELC	µg/L																
	Arsenic	As		EES6	µg/L																
	Arsenic	As		GEL	µg/L		<	5	2.2			<	5	2.2			<	5	2.2		
	Arsenic	As		GELC	µg/L																
	Barium	Ba		EES6	µg/L																
	Barium	Ba		GEL	µg/L			28.4	0.22				27.4	0.22				27.5	0.22		
	Barium	Ba		GELC	µg/L																
	Beryllium	Be		EES6	µg/L																
	Beryllium	Be		GEL	µg/L		<	0.2	0.08			<	0.2	0.08			<	0.2	0.08		
	Beryllium	Be		GELC	µg/L																
	Boron	B		EES6	µg/L																
	Boron	B		GEL	µg/L		<	50	4.9			<	50	4.9			<	50	4.9		
	Boron	B		GELC	µg/L																
	Cadmium	Cd		EES6	µg/L																
	Cadmium	Cd		GEL	µg/L		<	1	0.04			<	1	0.04			<	1	0.04		
	Cadmium	Cd		GELC	µg/L																
	Chromium	Cr		EES6	µg/L																
	Chromium	Cr		GEL	µg/L		<	4.18	0.5				2.72	0.5				2.99	0.5		
	Chromium	Cr		GELC	µg/L																
	Cobalt	Co		EES6	µg/L																
	Cobalt	Co		GEL	µg/L		<	5	0.54			<	5	0.54			<	5	0.54		
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		EES6	µg/L																
	Copper	Cu		GEL	µg/L		<	1.76	1.4			<	5	1.4			<	5	1.4		
	Copper	Cu		GELC	µg/L																
	Iron	Fe		EES6	µg/L																
	Iron	Fe		GEL	µg/L			91.2	13				147	13				140	13		
	Iron	Fe		GELC	µg/L																
	Lead	Pb		EES6	µg/L																
	Lead	Pb		GEL	µg/L		<	0.06	0.05			<	0.05	0.05			<	0.05	0.05		
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		EES6	µg/L																
	Manganese	Mn		GEL	µg/L			6.5	1.6				3.86	1.6				3.71	1.6		
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		EES6	µg/L																
	Mercury	Hg		GEL	µg/L		<	0.2	0.04			<	0.06	0.04			<	0.05	0.04		
	Mercury	Hg		GELC	µg/L																
	Nickel	Ni		EES6	µg/L																
	Nickel	Ni		GEL	µg/L		<	5	0.69			<	5	0.69			<	5	0.69		
	Nickel	Ni		GELC	µg/L																
	Selenium	Se		EES6	µg/L																
	Selenium	Se		GEL	µg/L		<	5	2.8			<	5	2.8			<	5	2.8		
	Selenium	Se		GELC	µg/L																
	Silver	Ag		EES6	µg/L																
	Silver	Ag		GEL	µg/L		<	2.12	0.84			<	5	0.84			<	5	0.84		
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		EES6	µg/L																
	Thallium	Tl		GEL	µg/L		<	0.05	0.02				0.03	0.02				0.27	0.02		
	Thallium	Tl		GELC	µg/L																
	Tin	Sn		EES6	µg/L																
	Tin	Sn		GELC	µg/L																
	Uranium	U		GEL	µg/L			0.46	0.02				0.45	0.02				0.44	0.02		
	Vanadium	V		EES6	µg/L																
	Vanadium	V		GEL	µg/L		<	6.57	0.61				4.81	0.61				4.85	0.61		
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		EES6	µg/L																

Table B-1.18 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	07/03/02	07/03/02	07/03/02	07/03/02	07/03/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02	10/28/02
						Fld Prep Code	F	F	F	F	F	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
METALS (cont.)	Zinc	Zn		GEL	µg/L			5.78	0.88			<	3.49	0.88			<	2.98	0.88		
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GEL	pCi/L			0.01		0.0054	0.006		0.01		0.05	0.0058		0.00766		0.05	0.0044
	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GEL	pCi/L		<	0.6		3.8	1		-0.47		2.9	0.88		-0.55		3	0.88
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GEL	pCi/L													1.92		1.3	0.43
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GEL	pCi/L													68.5		260	2
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GEL	pCi/L		<	-0.00425		0.02	0.0043		0.00238		0.06	0.0041		-3E-10		0.06	0.0036
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GEL	pCi/L		<	-0.04		0.14	0.03		0.0068		0.13	0.04		0.01		0.14	0.04
	Strontium-90	Sr-90		GELC	pCi/L																
	Tritium	H-3		UMTL	pCi/L													-0.06	0	-0.06386	0.32
	Uranium	U		EES6	µg/L																
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GEL	pCi/L			0.33		0.03	0.03		0.31		0.03	0.03		0.3		0.03	0.03
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GEL	pCi/L			0.14		0.04	0.02		0.14		0.04	0.02		0.15		0.04	0.02
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.18 (continued)

						Start Date Time	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	05/22/03	05/22/03	05/22/03	05/22/03	05/22/03
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3	Field	FLD	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GEL	mg/L			60.6	1.5									61.2	1.5		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia	NH3		GEL	mg/L		<	0.05	0.02								<	0.05	0.02		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		EES6	mg/L																
	Bromide	Br(-1)		GEL	mg/L		<	0.2	0.09								<	0.2	0.09		
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		EES6	mg/L																
	Calcium	Ca		GEL	mg/L			14.1	0.0055				13.9	0.0055				14.7	0.0055		
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		EES6	mg/L																
	Chloride	Cl(-1)		GEL	mg/L			2.47	0.03									2.3	0.03		
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		EES6	mg/L																
	Fluoride	F(-1)		GEL	mg/L			0.29	0.05									0.35	0.05		
	Fluoride	F(-1)		GELC	mg/L																
	Magnesium	Mg		EES6	mg/L																
	Magnesium	Mg		GEL	mg/L			3.5	0.0052				3.44	0.0052				3.71	0.0052		
	Magnesium	Mg		GELC	mg/L																
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GEL	mg/L			0.73	0.01									0.71	0.01		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																
	Nitrite as Nitrogen	NO2-N		EES6	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		EES6	mg/L																
	Potassium	K		GEL	mg/L			1.44	0.017				1.38	0.017				1.44	0.017		
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		EES6	mg/L																
	Silicon Dioxide	SiO2		GEL	mg/L			33.2	0.0098				33.3	0.0098				35.3	0.0098		
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		EES6	mg/L																
	Sodium	Na		GEL	mg/L			10.3	0.014				10.2	0.014				11.1	0.014		
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		EES6	mg/L																
	Sulfate	SO4(-2)		GEL	mg/L			3.07	0.19									3.06	0.19		
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GEL	mg/L			0.12	0.03				0.17	0.03				0.14	0.04		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GEL	mg/L								0.34	0.02							
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Organic Carbon	TOC		HUFFMAN	mg/L			0.21	0.21									0.46	0.46		
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU																
METALS	Aluminum	Al		EES6	µg/L																
	Aluminum	Al		GEL	µg/L		<	100	15			<	100	15				40.5	15		
	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		EES6	µg/L																

Table B-1.18 (continued)

						Start Date Time	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	05/22/03	05/22/03	05/22/03	05/22/03	05/22/03
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Antimony	Sb		GEL	µg/L		<	2	0.28			<	2	0.28			<	2	0.28		
	Antimony	Sb		GELC	µg/L																
	Arsenic	As		EES6	µg/L																
	Arsenic	As		GEL	µg/L		<	5	2.2			<	5	2.2			<	5	2.2		
	Arsenic	As		GELC	µg/L																
	Barium	Ba		EES6	µg/L																
	Barium	Ba		GEL	µg/L			28	0.22				27	0.22				28.5	0.22		
	Barium	Ba		GELC	µg/L																
	Beryllium	Be		EES6	µg/L																
	Beryllium	Be		GEL	µg/L		<	0.2	0.08			<	0.2	0.08			<	0.2	0.08		
	Beryllium	Be		GELC	µg/L																
	Boron	B		EES6	µg/L																
	Boron	B		GEL	µg/L			10.7	4.9				10.6	4.9				21.5	4.9		
	Boron	B		GELC	µg/L																
	Cadmium	Cd		EES6	µg/L																
	Cadmium	Cd		GEL	µg/L		<	1	0.04			<	1	0.04			<	1	0.04		
	Cadmium	Cd		GELC	µg/L																
	Chromium	Cr		EES6	µg/L																
	Chromium	Cr		GEL	µg/L			3.76	0.5				4.02	0.5				3.73	0.5		
	Chromium	Cr		GELC	µg/L																
	Cobalt	Co		EES6	µg/L																
	Cobalt	Co		GEL	µg/L		<	5	0.54			<	5	0.54				1.6	0.54		
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		EES6	µg/L																
	Copper	Cu		GEL	µg/L		<	5	1.4			<	5	1.4			<	5	1.4		
	Copper	Cu		GELC	µg/L																
	Iron	Fe		EES6	µg/L																
	Iron	Fe		GEL	µg/L			74.3	13				75.7	13				15.9	13		
	Iron	Fe		GELC	µg/L																
	Lead	Pb		EES6	µg/L																
	Lead	Pb		GEL	µg/L		<	2	0.05			<	2	0.05			<	2	0.05		
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		EES6	µg/L																
	Manganese	Mn		GEL	µg/L			3.26	1.6				3.35	1.6			<	5	1.6		
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		EES6	µg/L																
	Mercury	Hg		GEL	µg/L		<	0.2	0.04			<	0.2	0.04			<	0.2	0.04		
	Mercury	Hg		GELC	µg/L																
	Nickel	Ni		EES6	µg/L																
	Nickel	Ni		GEL	µg/L		<	5	0.69			<	1.38	0.69			<	5	0.69		
	Nickel	Ni		GELC	µg/L																
	Selenium	Se		EES6	µg/L																
	Selenium	Se		GEL	µg/L		<	5	2.8			<	5	2.8			<	5	2.8		
	Selenium	Se		GELC	µg/L																
	Silver	Ag		EES6	µg/L																
	Silver	Ag		GEL	µg/L		<	5	0.84			<	5	0.84			<	5	0.84		
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		EES6	µg/L																
	Thallium	Tl		GEL	µg/L		<	0.5	0.02			<	0.5	0.02				0.03	0.02		
	Thallium	Tl		GELC	µg/L																
	Tin	Sn		EES6	µg/L																
	Tin	Sn		GELC	µg/L																
	Uranium	U		GEL	µg/L			0.45	0.02				0.47	0.02				0.47	0.02		
	Vanadium	V		EES6	µg/L																
	Vanadium	V		GEL	µg/L			4.62	0.61				5.05	0.61			<	7.11	0.61		
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		EES6	µg/L																

Table B-1.18 (continued)

						Start Date Time	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	01/27/03	05/22/03	05/22/03	05/22/03	05/22/03	05/22/03
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Zinc	Zn		GEL	µg/L		<	5	0.88			<	5	0.88			<	5	0.88		
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GEL	pCi/L			0.01		0.04	0.006		0.00895		0.04	0.0064		0.00803		0.02	0.0049
	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GEL	pCi/L			0.34		2	0.55		0.17		2.2	0.64		-0.78		1.8	0.57
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GEL	pCi/L								1.61		3	0.75					
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GEL	pCi/L								54.8		210	93					
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GEL	pCi/L			-0.00224		0.05	0.0039		0.00254		0.06	0.0044		0.00477		0.04	0.01
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GEL	pCi/L			0.0099		0.21	0.06		-0.01		0.3	0.08		0.06		0.11	0.02
	Strontium-90	Sr-90		GELC	pCi/L																
	Tritium	H-3		UMTL	pCi/L								3.2	0	0	9.6					
	Uranium	U		EES6	µg/L																
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GEL	pCi/L			0.25		0.03	0.02		0.31		0.03	0.03		0.26		0.07	0.03
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GEL	pCi/L			0.13		0.04	0.01		0.15		0.04	0.02		0.1		0.03	0.01
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.18 (continued)

						Start Date Time	01/27/03	05/22/03	05/22/03	05/22/03	05/22/03	05/22/03	12/09/03	12/09/03	12/09/03	12/09/03	12/09/03	06/11/04	06/11/04	06/11/04	06/11/04	06/11/04
						Fld Prep Code	F	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L								<	1.45	1.45			<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3	Field	FLD	mg/L																	
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																	
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GEL	mg/L																	
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L									60.8	1.45				58.5	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L									60.3	1.45				58.2	1.45		
	Ammonia	NH3		GEL	mg/L		<															
	Ammonia as Nitrogen	NH3-N		GELC	mg/L								<	0.024	0.024							
	Bromide	Br(-1)		EES6	mg/L																	
	Bromide	Br(-1)		GEL	mg/L		<															
	Bromide	Br(-1)		GELC	mg/L																	
	Calcium	Ca		EES6	mg/L																	
	Calcium	Ca		GEL	mg/L				13.8	0.0055												
	Calcium	Ca		GELC	mg/L									14.2	0.00554				13.4	0.00554		
	Chloride	Cl(-1)		EES6	mg/L																	
	Chloride	Cl(-1)		GEL	mg/L																	
	Chloride	Cl(-1)		GELC	mg/L									2.22	0.0322				2.52	0.0322		
	Fluoride	F(-1)		EES6	mg/L																	
	Fluoride	F(-1)		GEL	mg/L																	
	Fluoride	F(-1)		GELC	mg/L									0.297	0.0553				0.451	0.0553		
	Magnesium	Mg		EES6	mg/L																	
	Magnesium	Mg		GEL	mg/L				3.49	0.0052												
	Magnesium	Mg		GELC	mg/L									3.52	0.00518				3.23	0.00518		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																	
	Nitrate-Nitrite as N	NO3+NO2-N		GEL	mg/L																	
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L									0.79	0.01				0.76	0.01		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L																	
	Perchlorate	ClO4		GELC	µg/L														0.404	0.05		
	Potassium	K		EES6	mg/L																	
	Potassium	K		GEL	mg/L				1.35	0.017												
	Potassium	K		GELC	mg/L									1.4	0.0165				1.26	0.0165		
	Silicon Dioxide	SiO2		EES6	mg/L																	
	Silicon Dioxide	SiO2		GEL	mg/L				33.1	0.0098												
	Silicon Dioxide	SiO2		GELC	mg/L									73.3	0.0212				66.6	0.0212		
	Sodium	Na		EES6	mg/L																	
	Sodium	Na		GEL	mg/L				10.5	0.014												
	Sodium	Na		GELC	mg/L									10.6	0.0144				10	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm									142.3								
	Sulfate	SO4(-2)		EES6	mg/L																	
	Sulfate	SO4(-2)		GEL	mg/L																	
	Sulfate	SO4(-2)		GELC	mg/L									2.81	0.193				3.36	0.193		
	Total Dissolved Solids	TDS		GELC	mg/L									141	3.07				143	3.07		
	Total Kjeldahl Nitrogen	TKN		GEL	mg/L				0.14	0.04												
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																	
	Total Organic Carbon	TOC		GEL	mg/L				0.33	0.02												
	Total Organic Carbon	TOC		GELC	mg/L									0.202	0.025							
	Total Organic Carbon	TOC		HUFFMAN	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																	
	Total Suspended Solids	TSS		GELC	mg/L								<	0.764	0.764			<	1.27	1.27		
	pH	pH	Field	FLD	SU									8.2								
METALS	Aluminum	Al		EES6	µg/L																	
	Aluminum	Al		GEL	µg/L		<	<	100	15												
	Aluminum	Al		GELC	µg/L								<	14.7	14.7			<	14.7	14.7		
	Antimony	Sb		EES6	µg/L																	

Table B-1.18 (continued)

						Start Date Time	01/27/03	05/22/03	05/22/03	05/22/03	05/22/03	05/22/03	12/09/03	12/09/03	12/09/03	12/09/03	12/09/03	06/11/04	06/11/04	06/11/04	06/11/04	06/11/04
						Fld Prep Code	F	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
METALS (cont.)	Antimony	Sb		GEL	µg/L		<	<	2	0.28												
	Antimony	Sb		GELC	µg/L								<	0.28	0.28			<	0.28	0.28		
	Arsenic	As		EES6	µg/L																	
	Arsenic	As		GEL	µg/L		<	<	5	2.2												
	Arsenic	As		GELC	µg/L								<	2.24	2.24				3.56	2.24		
	Barium	Ba		EES6	µg/L																	
	Barium	Ba		GEL	µg/L				26.7	0.22												
	Barium	Ba		GELC	µg/L									26.9	0.222				27.1	0.222		
	Beryllium	Be		EES6	µg/L																	
	Beryllium	Be		GEL	µg/L		<	<	0.2	0.08												
	Beryllium	Be		GELC	µg/L								<	0.158	0.158			<	0.158	0.158		
	Boron	B		EES6	µg/L																	
	Boron	B		GEL	µg/L				21.5	4.9												
	Boron	B		GELC	µg/L									7.94	4.88				15	4.88		
	Cadmium	Cd		EES6	µg/L																	
	Cadmium	Cd		GEL	µg/L		<	<	1	0.04												
	Cadmium	Cd		GELC	µg/L								<	0.04	0.04			<	0.04	0.04		
	Chromium	Cr		EES6	µg/L																	
	Chromium	Cr		GEL	µg/L				3.08	0.5												
	Chromium	Cr		GELC	µg/L									4.58	0.503				3.49	0.503		
	Cobalt	Co		EES6	µg/L																	
	Cobalt	Co		GEL	µg/L		<	<	5	0.54												
	Cobalt	Co		GELC	µg/L								<	0.541	0.541			<	0.541	0.541		
	Copper	Cu		EES6	µg/L																	
	Copper	Cu		GEL	µg/L		<	<	5	1.4												
	Copper	Cu		GELC	µg/L								<	1.39	1.39				2.34	1.39		
	Iron	Fe		EES6	µg/L																	
	Iron	Fe		GEL	µg/L				14.5	13												
	Iron	Fe		GELC	µg/L								<	12.6	12.6				31.6	12.6		
	Lead	Pb		EES6	µg/L																	
	Lead	Pb		GEL	µg/L		<	<	2	0.05												
	Lead	Pb		GELC	µg/L									0.073	0.05				0.105	0.05		
	Manganese	Mn		EES6	µg/L																	
	Manganese	Mn		GEL	µg/L			<	5	1.6												
	Manganese	Mn		GELC	µg/L								<	1.75	0.296			<	1.25	0.296		
	Mercury	Hg		EES6	µg/L																	
	Mercury	Hg		GEL	µg/L		<	<	0.2	0.04												
	Mercury	Hg		GELC	µg/L								<	0.0472	0.0472			<	0.0472	0.0472		
	Nickel	Ni		EES6	µg/L																	
	Nickel	Ni		GEL	µg/L		<	<	5	0.69												
	Nickel	Ni		GELC	µg/L								<	1.29	0.69			<	2.42	0.69		
	Selenium	Se		EES6	µg/L																	
	Selenium	Se		GEL	µg/L		<		2.98	2.8												
	Selenium	Se		GELC	µg/L								<	2.81	2.81			<	2.81	2.81		
	Silver	Ag		EES6	µg/L																	
	Silver	Ag		GEL	µg/L		<	<	5	0.84												
	Silver	Ag		GELC	µg/L								<	0.835	0.835			<	0.835	0.835		
	Thallium	Tl		EES6	µg/L																	
	Thallium	Tl		GEL	µg/L		<		0.04	0.02												
	Thallium	Tl		GELC	µg/L								<	0.067	0.02			<	0.053	0.02		
	Tin	Sn		EES6	µg/L																	
	Tin	Sn		GELC	µg/L								<	11.8	3.26			<	3.26	3.26		
	Uranium	U		GEL	µg/L				0.47	0.02												
	Vanadium	V		EES6	µg/L																	
	Vanadium	V		GEL	µg/L			<	6.58	0.61												
	Vanadium	V		GELC	µg/L									5.9	0.606				4.98	0.606		
	Zinc	Zn		EES6	µg/L																	

Table B-1.18 (continued)

						Start Date Time	01/27/03	05/22/03	05/22/03	05/22/03	05/22/03	05/22/03	12/09/03	12/09/03	12/09/03	12/09/03	12/09/03	06/11/04	06/11/04	06/11/04	06/11/04	06/11/04
						Fld Prep Code	F	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
METALS (cont.)	Zinc	Zn		GEL	µg/L		<	<	5	0.88												
	Zinc	Zn		GELC	µg/L								<	1.46	0.883				7.69	0.883		
RAD	Americium-241	Am-241		GEL	pCi/L				0.00787		0.02	0.0048										
	Americium-241	Am-241		GELC	pCi/L									0.00325		0.03	0.00716		-0.00238		0.042	0.00629
	Cesium-137	Cs-137		GEL	pCi/L				0.31		1.8	0.51										
	Cesium-137	Cs-137		GELC	pCi/L									-3		6.03	1.8		-0.00249		3.44	0.958
	Gross alpha	GROSSA		GELC	pCi/L									0.647		0.587	0.203		0.241		1.38	0.322
	Gross beta	GROSSB		GEL	pCi/L				2.58		2.2	0.65										
	Gross beta	GROSSB		GELC	pCi/L									0.504		0.815	0.222		0.579		1.48	0.377
	Gross gamma	GROSSG		GEL	pCi/L				55.4		190	51										
	Gross gamma	GROSSG		GELC	pCi/L									203		437	109		122		287	98.1
	Plutonium-238	Pu-238		GEL	pCi/L				2.07E-09		0.03	0.0097										
	Plutonium-238	Pu-238		GELC	pCi/L									-0.0218		0.027	0.0107		0.00218		0.034	0.00218
	Strontium-90	Sr-90		GEL	pCi/L				0.01		0.14	0.03										
	Strontium-90	Sr-90		GELC	pCi/L									0.115		0.515	0.12		0.163		0.3	0.0752
	Tritium	H-3		UMTL	pCi/L				0	0	0	9.6		-0.28737			0.28737					
	Uranium	U		EES6	µg/L																	
	Uranium	U		GELC	µg/L									0.463	0.02				0.44	0.02		
	Uranium-234	U-234		GEL	pCi/L				0.31		0.07	0.03										
	Uranium-234	U-234		GELC	pCi/L									0.299		0.047	0.032		0.243		0.069	0.0274
	Uranium-238	U-238		GEL	pCi/L				0.11		0.03	0.01										
	Uranium-238	U-238		GELC	pCi/L									0.135		0.03	0.0194		0.145		0.049	0.0201

Table B-1.18 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	06/11/04	06/11/04	06/11/04	06/11/04	06/11/04	03/10/05	03/10/05	03/10/05	03/10/05	03/10/05	05/26/05	05/26/05	05/26/05	05/26/05	05/26/05
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3	Field	FLD	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L								61.6	1							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GEL	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L													57.9	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia	NH3		GEL	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		EES6	mg/L								0.02	0.01							
	Bromide	Br(-1)		GEL	mg/L																
	Bromide	Br(-1)		GELC	mg/L												<	0.041	0.041		
	Calcium	Ca		EES6	mg/L								13.2	0.01		0.1					
	Calcium	Ca		GEL	mg/L																
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		EES6	mg/L								2.41	0.01							
	Chloride	Cl(-1)		GEL	mg/L																
	Chloride	Cl(-1)		GELC	mg/L													2.14	0.053		
	Fluoride	F(-1)		EES6	mg/L								0.29	0.01							
	Fluoride	F(-1)		GEL	mg/L																
	Fluoride	F(-1)		GELC	mg/L													0.343	0.03		
	Magnesium	Mg		EES6	mg/L								3.36	0.01		0.02					
	Magnesium	Mg		GEL	mg/L																
	Magnesium	Mg		GELC	mg/L																
	Nitrate as Nitrogen	NO3-N		EES6	mg/L								0.75	0.003							
	Nitrate-Nitrite as N	NO3+NO2-N		GEL	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L													0.61	0.003		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L							<	0.003	0.003							
	Perchlorate	ClO4		GELC	µg/L													0.414	0.05		
	Potassium	K		EES6	mg/L								1.37	0.01							
	Potassium	K		GEL	mg/L																
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		EES6	mg/L								32	10		0.2					
	Silicon Dioxide	SiO2		GEL	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L													69.4	0.032		
	Sodium	Na		EES6	mg/L								9.83	0.01		0.04					
	Sodium	Na		GEL	mg/L																
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			141.4					136.6								
	Sulfate	SO4(-2)		EES6	mg/L								3.19	0.01							
	Sulfate	SO4(-2)		GEL	mg/L																
	Sulfate	SO4(-2)		GELC	mg/L													3.14	0.057		
	Total Dissolved Solids	TDS		GELC	mg/L													147	2.38		
	Total Kjeldahl Nitrogen	TKN		GEL	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GEL	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Organic Carbon	TOC		HUFFMAN	mg/L																
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L								0.0163	0.003							
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L												<	0.031	0.01		
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			8.2					8.32								
METALS	Aluminum	Al		EES6	µg/L							<	2	2							
	Aluminum	Al		GEL	µg/L																
	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		EES6	µg/L							<	1	1							

Table B-1.18 (continued)

						Start Date Time	06/11/04	06/11/04	06/11/04	06/11/04	06/11/04	03/10/05	03/10/05	03/10/05	03/10/05	03/10/05	05/26/05	05/26/05	05/26/05	05/26/05	05/26/05
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Antimony	Sb		GEL	µg/L																
	Antimony	Sb		GELC	µg/L																
	Arsenic	As		EES6	µg/L								0.7	0.2							
	Arsenic	As		GEL	µg/L																
	Arsenic	As		GELC	µg/L																
	Barium	Ba		EES6	µg/L								32	1							
	Barium	Ba		GEL	µg/L																
	Barium	Ba		GELC	µg/L																
	Beryllium	Be		EES6	µg/L							<	1	1							
	Beryllium	Be		GEL	µg/L																
	Beryllium	Be		GELC	µg/L																
	Boron	B		EES6	µg/L								14	1							
	Boron	B		GEL	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		EES6	µg/L							<	1	1							
	Cadmium	Cd		GEL	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Chromium	Cr		EES6	µg/L								4.4	1		0.3					
	Chromium	Cr		GEL	µg/L																
	Chromium	Cr		GELC	µg/L																
	Cobalt	Co		EES6	µg/L							<	1	1							
	Cobalt	Co		GEL	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		EES6	µg/L								1.2	1							
	Copper	Cu		GEL	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		EES6	µg/L							<	10	10							
	Iron	Fe		GEL	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		EES6	µg/L							<	0.2	0.2							
	Lead	Pb		GEL	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		EES6	µg/L							<	1	1							
	Manganese	Mn		GEL	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		EES6	µg/L							<	0.05	0.05							
	Mercury	Hg		GEL	µg/L																
	Mercury	Hg		GELC	µg/L																
	Nickel	Ni		EES6	µg/L							<	1	1							
	Nickel	Ni		GEL	µg/L																
	Nickel	Ni		GELC	µg/L																
	Selenium	Se		EES6	µg/L							<	1	1							
	Selenium	Se		GEL	µg/L																
	Selenium	Se		GELC	µg/L																
	Silver	Ag		EES6	µg/L							<	1	1							
	Silver	Ag		GEL	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		EES6	µg/L							<	1	1							
	Thallium	Tl		GEL	µg/L																
	Thallium	Tl		GELC	µg/L																
	Tin	Sn		EES6	µg/L							<	1	1							
	Tin	Sn		GELC	µg/L																
	Uranium	U		GEL	µg/L																
	Vanadium	V		EES6	µg/L								5	1							
	Vanadium	V		GEL	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		EES6	µg/L								4	1							

Table B-1.18 (continued)

						Start Date Time	06/11/04	06/11/04	06/11/04	06/11/04	06/11/04	03/10/05	03/10/05	03/10/05	03/10/05	03/10/05	05/26/05	05/26/05	05/26/05	05/26/05	05/26/05
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Zinc	Zn		GEL	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GEL	pCi/L																
	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GEL	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GEL	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GEL	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GEL	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GEL	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L																
	Tritium	H-3		UMTL	pCi/L			0.03193	0.28737		0.28737										
	Uranium	U		EES6	µg/L								0.3	0.2							
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GEL	pCi/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GEL	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.18 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	05/26/05	05/26/05	05/26/05	05/26/05	05/26/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L							<	1.45	1.45			<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3	Field	FLD	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L													61.6	1		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GEL	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			57.9	1.45				55.1	1.45				56.1	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia	NH3		GEL	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		EES6	mg/L													0.02	0.01		
	Bromide	Br(-1)		GEL	mg/L																
	Bromide	Br(-1)		GELC	mg/L		<	0.041	0.041			<	0.041	0.041			<	0.041	0.041		
	Calcium	Ca		EES6	mg/L													12.9	0.01		0.2
	Calcium	Ca		GEL	mg/L																
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		EES6	mg/L													2.34	0.01		
	Chloride	Cl(-1)		GEL	mg/L																
	Chloride	Cl(-1)		GELC	mg/L			2.15	0.053				2.27	0.053				2.31	0.053		
	Fluoride	F(-1)		EES6	mg/L													0.28	0.01		
	Fluoride	F(-1)		GEL	mg/L																
	Fluoride	F(-1)		GELC	mg/L			0.332	0.03				0.327	0.03				0.329	0.03		
	Magnesium	Mg		EES6	mg/L													3.31	0.01		0.04
	Magnesium	Mg		GEL	mg/L																
	Magnesium	Mg		GELC	mg/L																
	Nitrate as Nitrogen	NO3-N		EES6	mg/L													0.71	0.003		
	Nitrate-Nitrite as N	NO3+NO2-N		GEL	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.604	0.003				0.624	0.017							
	Nitrite as Nitrogen	NO2-N		EES6	mg/L												<	0.003	0.003		
	Perchlorate	ClO4		GELC	µg/L							<	0.408	0.05							
	Potassium	K		EES6	mg/L													1.21	0.01		0.01
	Potassium	K		GEL	mg/L																
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		EES6	mg/L													33.6	10		0.3
	Silicon Dioxide	SiO2		GEL	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L			69.9	0.032												
	Sodium	Na		EES6	mg/L													11.7	0.01		0.2
	Sodium	Na		GEL	mg/L																
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			151.4										137.3			
	Sulfate	SO4(-2)		EES6	mg/L													3.04	0.01		
	Sulfate	SO4(-2)		GEL	mg/L																
	Sulfate	SO4(-2)		GELC	mg/L			3.12	0.057				3.07	0.057				3.1	0.057		
	Total Dissolved Solids	TDS		GELC	mg/L			192	2.38				137	2.38				143	2.38		
	Total Kjeldahl Nitrogen	TKN		GEL	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L		<	0.01	0.01								<	0.058	0.01		
	Total Organic Carbon	TOC		GEL	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L			0.243	0.074								<	0.835	0.074		
	Total Organic Carbon	TOC		HUFFMAN	mg/L																
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L													0.01304	0.003		
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<	0.039	0.01				0.095	0.01							
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			8.96										8.06			
METALS	Aluminum	Al		EES6	µg/L													7	2		
	Aluminum	Al		GEL	µg/L																
	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		EES6	µg/L												<	1	1		

Table B-1.18 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	05/26/05	05/26/05	05/26/05	05/26/05	05/26/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
METALS (cont.)	Antimony	Sb		GEL	µg/L																
	Antimony	Sb		GELC	µg/L																
	Arsenic	As		EES6	µg/L													0.6	0.2		
	Arsenic	As		GEL	µg/L																
	Arsenic	As		GELC	µg/L																
	Barium	Ba		EES6	µg/L													310	1		
	Barium	Ba		GEL	µg/L																
	Barium	Ba		GELC	µg/L																
	Beryllium	Be		EES6	µg/L												<	1	1		
	Beryllium	Be		GEL	µg/L																
	Beryllium	Be		GELC	µg/L																
	Boron	B		EES6	µg/L													63	1		1
	Boron	B		GEL	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		EES6	µg/L												<	1	1		
	Cadmium	Cd		GEL	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Chromium	Cr		EES6	µg/L													5.9	1		
	Chromium	Cr		GEL	µg/L																
	Chromium	Cr		GELC	µg/L																
	Cobalt	Co		EES6	µg/L												<	1	1		
	Cobalt	Co		GEL	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		EES6	µg/L													1.1	1		
	Copper	Cu		GEL	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		EES6	µg/L												<	10	10		
	Iron	Fe		GEL	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		EES6	µg/L												<	0.2	0.2		
	Lead	Pb		GEL	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		EES6	µg/L												<	1	1		
	Manganese	Mn		GEL	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		EES6	µg/L												<	0.05	0.05		
	Mercury	Hg		GEL	µg/L																
	Mercury	Hg		GELC	µg/L																
	Nickel	Ni		EES6	µg/L												<	1	1		
	Nickel	Ni		GEL	µg/L																
	Nickel	Ni		GELC	µg/L																
	Selenium	Se		EES6	µg/L												<	1	1		
	Selenium	Se		GEL	µg/L																
	Selenium	Se		GELC	µg/L																
	Silver	Ag		EES6	µg/L												<	1	1		
	Silver	Ag		GEL	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		EES6	µg/L												<	1	1		
	Thallium	Tl		GEL	µg/L																
	Thallium	Tl		GELC	µg/L																
	Tin	Sn		EES6	µg/L												<	1	1		
	Tin	Sn		GELC	µg/L																
	Uranium	U		GEL	µg/L																
	Vanadium	V		EES6	µg/L													6	1		
	Vanadium	V		GEL	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		EES6	µg/L													38	1		

Table B-1.18 (continued)

						Start Date Time	05/26/05	05/26/05	05/26/05	05/26/05	05/26/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05	09/01/05
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Zinc	Zn		GEL	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GEL	pCi/L																
	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GEL	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GEL	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GEL	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GEL	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GEL	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L																
	Tritium	H-3		UMTL	pCi/L			0.60667	0.28737		0.28737							0.19158		0.28737	0.28737
	Uranium	U		EES6	µg/L													0.4	0.2		
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GEL	pCi/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GEL	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.18 (continued)

						Start Date Time	05/26/05	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	07/03/06	07/03/06	07/03/06	07/03/06	07/03/06
						Fld Prep Code	UF	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L			<	1.45	1.45								<	0.725	0.725		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3	Field	FLD	mg/L									63.4								
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																	
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GEL	mg/L																	
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L				59.2	1.45									60.6	0.725		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																	
	Ammonia	NH3		GEL	mg/L																	
	Ammonia as Nitrogen	NH3-N		GELC	mg/L								<	0.05	0.05				0.028	0.01		
	Bromide	Br(-1)		EES6	mg/L																	
	Bromide	Br(-1)		GEL	mg/L																	
	Bromide	Br(-1)		GELC	mg/L		<	<	0.041	0.041								<	0.066	0.066		
	Calcium	Ca		EES6	mg/L																	
	Calcium	Ca		GEL	mg/L																	
	Calcium	Ca		GELC	mg/L				13.3	0.036				13.1	0.036				13.5	0.036		
	Chloride	Cl(-1)		EES6	mg/L																	
	Chloride	Cl(-1)		GEL	mg/L																	
	Chloride	Cl(-1)		GELC	mg/L				2.22	0.053									2.24	0.066		
	Fluoride	F(-1)		EES6	mg/L																	
	Fluoride	F(-1)		GEL	mg/L																	
	Fluoride	F(-1)		GELC	mg/L				0.332	0.03									0.354	0.033		
	Magnesium	Mg		EES6	mg/L																	
	Magnesium	Mg		GEL	mg/L																	
	Magnesium	Mg		GELC	mg/L				3.36	0.085				3.29	0.085				3.31	0.085		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																	
	Nitrate-Nitrite as N	NO3+NO2-N		GEL	mg/L																	
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L				0.594	0.017									0.724	0.014		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L																	
	Perchlorate	ClO4		GELC	µg/L				0.341	0.05									0.394	0.05		
	Potassium	K		EES6	mg/L																	
	Potassium	K		GEL	mg/L																	
	Potassium	K		GELC	mg/L				1.29	0.05				1.25	0.05				1.34	0.05		
	Silicon Dioxide	SiO2		EES6	mg/L																	
	Silicon Dioxide	SiO2		GEL	mg/L																	
	Silicon Dioxide	SiO2		GELC	mg/L				69.9	0.032				69.2	0.032				70.4	0.032		
	Sodium	Na		EES6	mg/L																	
	Sodium	Na		GEL	mg/L																	
	Sodium	Na		GELC	mg/L				9.78	0.045				9.66	0.045				10.1	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm									133								
	Sulfate	SO4(-2)		EES6	mg/L																	
	Sulfate	SO4(-2)		GEL	mg/L																	
	Sulfate	SO4(-2)		GELC	mg/L				3	0.057									2.93	0.1		
	Total Dissolved Solids	TDS		GELC	mg/L				153	2.38									137	2.38		
	Total Kjeldahl Nitrogen	TKN		GEL	mg/L																	
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L		<						<	0.01	0.01				0.066	0.01		
	Total Organic Carbon	TOC		GEL	mg/L																	
	Total Organic Carbon	TOC		GELC	mg/L																	
	Total Organic Carbon	TOC		HUFFMAN	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<	<	0.1	0.01								<	0.039	0.01		
	Total Suspended Solids	TSS		GELC	mg/L																	
	pH	pH	Field	FLD	SU									8.3								
METALS	Aluminum	Al		EES6	µg/L																	
	Aluminum	Al		GEL	µg/L																	
	Aluminum	Al		GELC	µg/L			<	68	68			<	68	68			<	68	68		
	Antimony	Sb		EES6	µg/L																	

Table B-1.18 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
						Start Date Time	05/26/05	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	07/03/06	07/03/06	07/03/06	07/03/06	07/03/06
						Fld Prep Code	UF	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
METALS (cont.)	Antimony	Sb		GEL	µg/L																	
	Antimony	Sb		GELC	µg/L			<	0.5	0.5			<	0.5	0.5			<	0.5	0.5		
	Arsenic	As		EES6	µg/L																	
	Arsenic	As		GEL	µg/L																	
	Arsenic	As		GELC	µg/L			<	6	6			<	6	6			<	6	6		
	Barium	Ba		EES6	µg/L																	
	Barium	Ba		GEL	µg/L																	
	Barium	Ba		GELC	µg/L				25.7	1				25.1	1				25.9	1		
	Beryllium	Be		EES6	µg/L																	
	Beryllium	Be		GEL	µg/L																	
	Beryllium	Be		GELC	µg/L			<	1	1			<	1	1			<	1	1		
	Boron	B		EES6	µg/L																	
	Boron	B		GEL	µg/L																	
	Boron	B		GELC	µg/L				14.6	10				12.8	10				14.3	10		
	Cadmium	Cd		EES6	µg/L																	
	Cadmium	Cd		GEL	µg/L																	
	Cadmium	Cd		GELC	µg/L			<	0.1	0.1			<	0.1	0.1			<	0.1	0.1		
	Chromium	Cr		EES6	µg/L																	
	Chromium	Cr		GEL	µg/L																	
	Chromium	Cr		GELC	µg/L			<	4.6	1			<	4.2	1				5.1	1		
	Cobalt	Co		EES6	µg/L																	
	Cobalt	Co		GEL	µg/L																	
	Cobalt	Co		GELC	µg/L			<	1	1			<	1	1			<	1	1		
	Copper	Cu		EES6	µg/L																	
	Copper	Cu		GEL	µg/L																	
	Copper	Cu		GELC	µg/L			<	3	3			<	3	3			<	3	3		
	Iron	Fe		EES6	µg/L																	
	Iron	Fe		GEL	µg/L																	
	Iron	Fe		GELC	µg/L			<	18	18			<	18	18			<	18	18		
	Lead	Pb		EES6	µg/L																	
	Lead	Pb		GEL	µg/L																	
	Lead	Pb		GELC	µg/L			<	0.5	0.5			<	0.5	0.5			<	0.5	0.5		
	Manganese	Mn		EES6	µg/L																	
	Manganese	Mn		GEL	µg/L																	
	Manganese	Mn		GELC	µg/L			<	2	2			<	2	2			<	2	2		
	Mercury	Hg		EES6	µg/L																	
	Mercury	Hg		GEL	µg/L																	
	Mercury	Hg		GELC	µg/L			<	0.05	0.05			<	0.05	0.05			<	0.06	0.06		
	Nickel	Ni		EES6	µg/L																	
	Nickel	Ni		GEL	µg/L																	
	Nickel	Ni		GELC	µg/L				0.56	0.5				0.51	0.5			<	0.5	0.5		
	Selenium	Se		EES6	µg/L																	
	Selenium	Se		GEL	µg/L																	
	Selenium	Se		GELC	µg/L			<	2.5	2.5			<	2.5	2.5			<	2.5	2.5		
	Silver	Ag		EES6	µg/L																	
	Silver	Ag		GEL	µg/L																	
	Silver	Ag		GELC	µg/L			<	0.2	0.2			<	0.2	0.2			<	0.2	0.2		
	Thallium	Tl		EES6	µg/L																	
	Thallium	Tl		GEL	µg/L																	
	Thallium	Tl		GELC	µg/L				0.54	0.4			<	0.4	0.4			<	0.4	0.4		
	Tin	Sn		EES6	µg/L																	
	Tin	Sn		GELC	µg/L			<	2.5	2.5			<	2.5	2.5			<	2.5	2.5		
	Uranium	U		GEL	µg/L																	
	Vanadium	V		EES6	µg/L																	
	Vanadium	V		GEL	µg/L																	
	Vanadium	V		GELC	µg/L			<	5.3	1			<	5	1				5.8	1		
	Zinc	Zn		EES6	µg/L																	

Table B-1.18 (continued)

						Start Date Time	05/26/05	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	02/02/06	07/03/06	07/03/06	07/03/06	07/03/06	07/03/06
						Fld Prep Code	UF	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
METALS (cont.)	Zinc	Zn		GEL	µg/L																	
	Zinc	Zn		GELC	µg/L			<	2	2			<	2	2			<	3	2		
RAD	Americium-241	Am-241		GEL	pCi/L																	
	Americium-241	Am-241		GELC	pCi/L														-0.0164		0.0504	0.0202
	Cesium-137	Cs-137		GEL	pCi/L																	
	Cesium-137	Cs-137		GELC	pCi/L														1.84		3.79	0.968
	Gross alpha	GROSSA		GELC	pCi/L														-0.0336		2.17	0.417
	Gross beta	GROSSB		GEL	pCi/L																	
	Gross beta	GROSSB		GELC	pCi/L														0.109		2.05	0.461
	Gross gamma	GROSSG		GEL	pCi/L																	
	Gross gamma	GROSSG		GELC	pCi/L														93		263	78.4
	Plutonium-238	Pu-238		GEL	pCi/L																	
	Plutonium-238	Pu-238		GELC	pCi/L														0.0024		0.023	0.0024
	Strontium-90	Sr-90		GEL	pCi/L																	
	Strontium-90	Sr-90		GELC	pCi/L														-0.0411		0.311	0.0664
	Tritium	H-3		UMTL	pCi/L									-0.03193		0.28737	0.28737					
	Uranium	U		EES6	µg/L																	
	Uranium	U		GELC	µg/L				0.53	0.05				0.48	0.05				0.39	0.05		
	Uranium-234	U-234		GEL	pCi/L																	
	Uranium-234	U-234		GELC	pCi/L														0.255		0.0437	0.0279
	Uranium-238	U-238		GEL	pCi/L																	
	Uranium-238	U-238		GELC	pCi/L														0.134		0.0464	0.0187

Table B-1.18 (continued)

						Start Date Time	07/03/06	07/03/06	07/03/06	07/03/06	07/03/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code										
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom											
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	0.725	0.725							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3	Field	FLD	mg/L											
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L											
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GEL	mg/L											
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			60.6	0.725							
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L											
	Ammonia	NH3		GEL	mg/L											
	Ammonia as Nitrogen	NH3-N		GELC	mg/L			0.011	0.01							
	Bromide	Br(-1)		EES6	mg/L											
	Bromide	Br(-1)		GEL	mg/L											
	Bromide	Br(-1)		GELC	mg/L		<	0.066	0.066							
	Calcium	Ca		EES6	mg/L											
	Calcium	Ca		GEL	mg/L											
	Calcium	Ca		GELC	mg/L			13.4	0.036							
	Chloride	Cl(-1)		EES6	mg/L											
	Chloride	Cl(-1)		GEL	mg/L											
	Chloride	Cl(-1)		GELC	mg/L			2.24	0.066							
	Fluoride	F(-1)		EES6	mg/L											
	Fluoride	F(-1)		GEL	mg/L											
	Fluoride	F(-1)		GELC	mg/L			0.358	0.033							
	Magnesium	Mg		EES6	mg/L											
	Magnesium	Mg		GEL	mg/L											
	Magnesium	Mg		GELC	mg/L			3.28	0.085							
	Nitrate as Nitrogen	NO3-N		EES6	mg/L											
	Nitrate-Nitrite as N	NO3+NO2-N		GEL	mg/L											
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.716	0.014							
	Nitrite as Nitrogen	NO2-N		EES6	mg/L											
	Perchlorate	ClO4		GELC	µg/L											
	Potassium	K		EES6	mg/L											
	Potassium	K		GEL	mg/L											
	Potassium	K		GELC	mg/L			1.3	0.05							
	Silicon Dioxide	SiO2		EES6	mg/L											
	Silicon Dioxide	SiO2		GEL	mg/L											
	Silicon Dioxide	SiO2		GELC	mg/L			69.5	0.032							
	Sodium	Na		EES6	mg/L											
	Sodium	Na		GEL	mg/L											
	Sodium	Na		GELC	mg/L			10	0.045							
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			134.8					129.3			
	Sulfate	SO4(-2)		EES6	mg/L											
	Sulfate	SO4(-2)		GEL	mg/L											
	Sulfate	SO4(-2)		GELC	mg/L			2.95	0.1							
	Total Dissolved Solids	TDS		GELC	mg/L			139	2.38							
	Total Kjeldahl Nitrogen	TKN		GEL	mg/L											
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L			0.018	0.01							
	Total Organic Carbon	TOC		GEL	mg/L											
	Total Organic Carbon	TOC		GELC	mg/L		<	0.33	0.33							
	Total Organic Carbon	TOC		HUFFMAN	mg/L											
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L											
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<	0.036	0.01							
	Total Suspended Solids	TSS		GELC	mg/L											
	pH	pH	Field	FLD	SU			8.17					8.2			
METALS	Aluminum	Al		EES6	µg/L											
	Aluminum	Al		GEL	µg/L											
	Aluminum	Al		GELC	µg/L		<	68	68							
	Antimony	Sb		EES6	µg/L											

Table B-1.18 (continued)

						Start Date Time	07/03/06	07/03/06	07/03/06	07/03/06	07/03/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code										
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom											
METALS (cont.)	Antimony	Sb		GEL	µg/L											
	Antimony	Sb		GELC	µg/L		<	0.5	0.5							
	Arsenic	As		EES6	µg/L											
	Arsenic	As		GEL	µg/L											
	Arsenic	As		GELC	µg/L		<	6	6							
	Barium	Ba		EES6	µg/L											
	Barium	Ba		GEL	µg/L											
	Barium	Ba		GELC	µg/L			26.1	1							
	Beryllium	Be		EES6	µg/L											
	Beryllium	Be		GEL	µg/L											
	Beryllium	Be		GELC	µg/L		<	1	1							
	Boron	B		EES6	µg/L											
	Boron	B		GEL	µg/L											
	Boron	B		GELC	µg/L			13.1	10							
	Cadmium	Cd		EES6	µg/L											
	Cadmium	Cd		GEL	µg/L											
	Cadmium	Cd		GELC	µg/L		<	0.1	0.1							
	Chromium	Cr		EES6	µg/L											
	Chromium	Cr		GEL	µg/L											
	Chromium	Cr		GELC	µg/L			4.6	1							
	Cobalt	Co		EES6	µg/L											
	Cobalt	Co		GEL	µg/L											
	Cobalt	Co		GELC	µg/L		<	1	1							
	Copper	Cu		EES6	µg/L											
	Copper	Cu		GEL	µg/L											
	Copper	Cu		GELC	µg/L		<	3	3							
	Iron	Fe		EES6	µg/L											
	Iron	Fe		GEL	µg/L											
	Iron	Fe		GELC	µg/L		<	18	18							
	Lead	Pb		EES6	µg/L											
	Lead	Pb		GEL	µg/L											
	Lead	Pb		GELC	µg/L		<	0.5	0.5							
	Manganese	Mn		EES6	µg/L											
	Manganese	Mn		GEL	µg/L											
	Manganese	Mn		GELC	µg/L		<	2	2							
	Mercury	Hg		EES6	µg/L											
	Mercury	Hg		GEL	µg/L											
	Mercury	Hg		GELC	µg/L		<	0.06	0.06							
	Nickel	Ni		EES6	µg/L											
	Nickel	Ni		GEL	µg/L											
	Nickel	Ni		GELC	µg/L		<	0.5	0.5							
	Selenium	Se		EES6	µg/L											
	Selenium	Se		GEL	µg/L											
	Selenium	Se		GELC	µg/L		<	2.5	2.5							
	Silver	Ag		EES6	µg/L											
	Silver	Ag		GEL	µg/L											
	Silver	Ag		GELC	µg/L		<	0.2	0.2							
	Thallium	Tl		EES6	µg/L											
	Thallium	Tl		GEL	µg/L											
	Thallium	Tl		GELC	µg/L		<	0.4	0.4							
	Tin	Sn		EES6	µg/L											
	Tin	Sn		GELC	µg/L		<	2.5	2.5							
	Uranium	U		GEL	µg/L											
	Vanadium	V		EES6	µg/L											
	Vanadium	V		GEL	µg/L											
	Vanadium	V		GELC	µg/L			5.3	1							
	Zinc	Zn		EES6	µg/L											

Table B-1.18 (continued)

						Start Date Time	07/03/06	07/03/06	07/03/06	07/03/06	07/03/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3	958.3
						Fld Qc Type Code										
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom											
METALS (cont.)	Zinc	Zn		GEL	µg/L											
	Zinc	Zn		GELC	µg/L		<	2.4	2							
RAD	Americium-241	Am-241		GEL	pCi/L											
	Americium-241	Am-241		GELC	pCi/L			0.0111		0.0522	0.0134					
	Cesium-137	Cs-137		GEL	pCi/L											
	Cesium-137	Cs-137		GELC	pCi/L			0.347		3.39	0.926					
	Gross alpha	GROSSA		GELC	pCi/L			0.0249		2.72	0.532					
	Gross beta	GROSSB		GEL	pCi/L											
	Gross beta	GROSSB		GELC	pCi/L			-0.177		2.1	0.456					
	Gross gamma	GROSSG		GEL	pCi/L											
	Gross gamma	GROSSG		GELC	pCi/L			72		258	72.2					
	Plutonium-238	Pu-238		GEL	pCi/L											
	Plutonium-238	Pu-238		GELC	pCi/L			-0.0082		0.016	0.00369					
	Strontium-90	Sr-90		GEL	pCi/L											
	Strontium-90	Sr-90		GELC	pCi/L			-0.184		0.299	0.055					
	Tritium	H-3		UMTL	pCi/L			0.22351		0.28737	0.28737					
	Uranium	U		EES6	µg/L											
	Uranium	U		GELC	µg/L			0.37	0.05							
	Uranium-234	U-234		GEL	pCi/L											
	Uranium-234	U-234		GELC	pCi/L			0.259		0.0557	0.0311					
	Uranium-238	U-238		GEL	pCi/L											
	Uranium-238	U-238		GELC	pCi/L			0.131		0.0592	0.0232					

Table B-1.19
R-21

						Start Date Time	03/31/04	03/31/04	03/31/04	03/31/04	03/31/04	03/31/04	03/31/04	03/31/04	03/31/04	03/31/04	06/30/04	06/30/04	06/30/04	06/30/04	06/30/04
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	1.45	1.45								<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L								58.2	1							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			57	1.45									85.8	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L			56.5	1.45									85.3	1.45		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L		<	0.0159	0.0159			<	0.0318	0.0318			<	0.0159	0.0159		
	Bromide	Br(-1)		EES6	mg/L								0.02	0.01							
	Bromide	Br(-1)		GELC	mg/L		<	0.0978	0.0978								<	0.0978	0.0978		
	Calcium	Ca		EES6	mg/L								11.2	0.01		0.1					
	Calcium	Ca		GELC	mg/L			11.4	0.00554				10.9	0.00554				11.7	0.00554		
	Chloride	Cl(-1)		EES6	mg/L								1.76	0.01							
	Chloride	Cl(-1)		GELC	mg/L			1.98	0.0322									1.92	0.0322		
	Fluoride	F(-1)		EES6	mg/L								0.24	0.01							
	Fluoride	F(-1)		GELC	mg/L			0.348	0.0553									0.347	0.0553		
	Magnesium	Mg		EES6	mg/L								2.83	0.01		0.05					
	Magnesium	Mg		GELC	mg/L			2.95	0.00518				2.81	0.00518				3.12	0.00518		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L								0.35	0.003							
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.32	0.01				0.32	0.01				0.31	0.01		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L							<	0.003	0.003							
	Perchlorate	ClO4		GELC	µg/L								0.299								
	Potassium	K		EES6	mg/L								1.7	0.01		0.03					
	Potassium	K		GELC	mg/L			1.74	0.0165				1.69	0.0165				1.7	0.0165		
	Silicon Dioxide	SiO2		EES6	mg/L								34.9	10		0.2					
	Silicon Dioxide	SiO2		GELC	mg/L			71.7	0.0212				68.3	0.0212				32.2	0.00983		
	Sodium	Na		EES6	mg/L								10.3	0.01		0.2					
	Sodium	Na		GELC	mg/L			10.6	0.0144				10.1	0.0144				10.6	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm								127.1								
	Sulfate	SO4(-2)		EES6	mg/L								2.19	0.01							
	Sulfate	SO4(-2)		GELC	mg/L			2.32	0.193									2.26	0.193		
	Sulfide, Total	S(-2)	Field	FLD	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L			0.344	0.044				0.425	0.044				0.054	0.044		
	Total Organic Carbon	TOC		GELC	mg/L								0.366	0.025							
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L								0.02282	0.003							
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<	0.151	0.151								<	0.19	0.151		
	pH	pH	Field	FLD	SU								8.3								
METALS	Aluminum	Al		EES6	µg/L								5	2							
	Aluminum	Al		GELC	µg/L		<	14.7	14.7			<	14.7	14.7			<	14.7	14.7		
	Antimony	Sb		EES6	µg/L							<	1	1							
	Antimony	Sb		GELC	µg/L		<	0.28	0.28			<	0.28	0.28			<	0.28	0.28		
	Arsenic	As		EES6	µg/L								1.2	0.2							
	Arsenic	As		GELC	µg/L			2.26	2.24			<	2.24	2.24			<	2.24	2.24		
	Barium	Ba		EES6	µg/L								16	1							
	Barium	Ba		GELC	µg/L			15.6	0.222				14.8	0.222				15	0.222		
	Beryllium	Be		EES6	µg/L							<	1	1							
	Beryllium	Be		GELC	µg/L		<	0.08	0.08			<	0.08	0.08			<	0.08	0.08		
	Boron	B		EES6	µg/L								14	1							
	Boron	B		GELC	µg/L			10.1	4.88				7.77	4.88			<	17.9	4.9		
	Cadmium	Cd		EES6	µg/L							<	1	1							
	Cadmium	Cd		GELC	µg/L		<	0.04	0.04			<	0.04	0.04			<	0.04	0.04		
	Chromium	Cr		EES6	µg/L								2.5	1		0.1					
	Chromium	Cr		GELC	µg/L			1.78	0.503				1.05	0.503				2.36	0.503		
	Cobalt	Co		EES6	µg/L							<	1	1							
	Cobalt	Co		GELC	µg/L		<	0.791	0.541			<	0.541	0.541			<	0.541	0.541		
	Copper	Cu		EES6	µg/L								1.9	1							
	Copper	Cu		GELC	µg/L		<	1.39	1.39			<	1.39	1.39			<	1.39	1.39		

Table B-1.19 (continued)

						Start Date Time	03/31/04	03/31/04	03/31/04	03/31/04	03/31/04	03/31/04	03/31/04	03/31/04	03/31/04	03/31/04	06/30/04	06/30/04	06/30/04	06/30/04	06/30/04
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Iron	Fe		EES6	µg/L								10	10							
	Iron	Fe		GELC	µg/L			23.1	12.6				20.5	12.6				14.9	12.6		
	Lead	Pb		EES6	µg/L							<	0.2	0.2							
	Lead	Pb		GELC	µg/L			0.123	0.05				0.137	0.05				0.09	0.05		
	Manganese	Mn		EES6	µg/L								8.3	1		0.2					
	Manganese	Mn		GELC	µg/L			8.73	1.61				8.47	1.61				7.29	1.61		
	Mercury	Hg		EES6	µg/L							<	0.05	0.05							
	Mercury	Hg		GELC	µg/L		<	0.0472	0.0472			<	0.0472	0.0472			<	0.0472	0.0472		
	Nickel	Ni		EES6	µg/L							<	1	1							
	Nickel	Ni		GELC	µg/L		<	0.69	0.69			<	0.69	0.69			<	0.69	0.69		
	Selenium	Se		EES6	µg/L							<	1	1							
	Selenium	Se		GELC	µg/L		<	7.86	2.81			<	2.81	2.81			<	2.81	2.81		
	Silver	Ag		EES6	µg/L							<	0.2	0.2							
	Silver	Ag		GELC	µg/L		<	0.835	0.835			<	0.835	0.835			<	0.835	0.835		
	Thallium	Tl		EES6	µg/L							<	1	1							
	Thallium	Tl		GELC	µg/L			0.297	0.02			<	0.078	0.02			<	0.084	0.02		
	Tin	Sn		EES6	µg/L							<	1	1							
	Tin	Sn		GELC	µg/L																
	Vanadium	V		EES6	µg/L								6	1							
	Vanadium	V		GELC	µg/L			5.28	0.606				5.52	0.606				5.03	0.606		
	Zinc	Zn		EES6	µg/L								4	1							
	Zinc	Zn		GELC	µg/L			7.58	0.883				5.81	0.883				7.81	0.883		
RAD	Americium-241	Am-241		GELC	pCi/L								0.00652		0.039	0.00897					
	Cesium-137	Cs-137		GELC	pCi/L								0.146		3.49	0.978					
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L								79		249	165					
	Plutonium-238	Pu-238		GELC	pCi/L								0.0139		0.032	0.00659					
	Strontium-90	Sr-90		GELC	pCi/L								-0.0166		0.217	0.053					
	Tritium	H-3		UMTL	pCi/L								0.06386	0.28737		0.28737					
	Uranium	U		EES6	µg/L								0.4	0.2							
	Uranium	U		GELC	µg/L			0.401	0.02				0.415	0.02				0.398	0.02		
	Uranium-234	U-234		GELC	pCi/L								0.253		0.055	0.0303					
	Uranium-238	U-238		GELC	pCi/L								0.102		0.035	0.0171					

Table B-1.19 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	06/30/04	06/30/04	06/30/04	06/30/04	06/30/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L							<	1.45	1.45							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L			57.4	1									56.7	1		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L								53.6	1.45							
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L								53.3	1.45							
	Ammonia as Nitrogen	NH3-N		GELC	mg/L		<	0.0159	0.0159			<	0.0159	0.0159			<	0.0159	0.0159		
	Bromide	Br(-1)		EES6	mg/L			0.01	0.01									0.02	0.01		
	Bromide	Br(-1)		GELC	mg/L							<	0.0978	0.0978							
	Calcium	Ca		EES6	mg/L			12	0.01									11.5	0.01		0.2
	Calcium	Ca		GELC	mg/L			11.5	0.00554				12.1	0.00554				11.9	0.00554		
	Chloride	Cl(-1)		EES6	mg/L			1.66	0.01									1.83	0.01		
	Chloride	Cl(-1)		GELC	mg/L								1.75	0.0322							
	Fluoride	F(-1)		EES6	mg/L			0.23	0.01									0.24	0.01		
	Fluoride	F(-1)		GELC	mg/L								0.338	0.0553							
	Magnesium	Mg		EES6	mg/L			2.93	0.01		0.02							2.77	0.01		0.02
	Magnesium	Mg		GELC	mg/L			3.06	0.00518				3.07	0.00518				3.03	0.00518		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L			0.35	0.003									0.35	0.003		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.31	0.01				0.359	0.003				0.39	0.003		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L		<	0.003	0.003								<	0.003	0.003		
	Perchlorate	ClO4		GELC	µg/L			0.246	0.05									0.27	0.05		
	Potassium	K		EES6	mg/L			1.72	0.01		0.02							1.7	0.01		0.02
	Potassium	K		GELC	mg/L			1.67	0.0165				1.81	0.0165				1.82	0.0165		
	Silicon Dioxide	SiO2		EES6	mg/L			33.9	10		0.2							31.5	10		0.2
	Silicon Dioxide	SiO2		GELC	mg/L			31.4	0.0491				27	0.0491				26.8	0.0491		
	Sodium	Na		EES6	mg/L			10.5	0.01		0.1							9.77	0.01		0.07
	Sodium	Na		GELC	mg/L			10.4	0.0144				11	0.0144				10.7	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm													120.1			
	Sulfate	SO4(-2)		EES6	mg/L			2.11	0.01									2.19	0.01		
	Sulfate	SO4(-2)		GELC	mg/L								2.04	0.193							
	Sulfide, Total	S(-2)	Field	FLD	mg/L													0.003			
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L		<	0.044	0.044				0.05	0.044			<	0.044	0.044		
	Total Organic Carbon	TOC		GELC	mg/L		<	0.386	0.025								<	0.362	0.025		
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L			0.02934	0.003									0.02282	0.003		
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L								0.16	0.151							
	pH	pH	Field	FLD	SU													8.12			
METALS	Aluminum	Al		EES6	µg/L			3	2									7	2		
	Aluminum	Al		GELC	µg/L		<	14.7	14.7			<	24.6	14.7			<	24.6	14.7		
	Antimony	Sb		EES6	µg/L		<	1	1								<	1	1		
	Antimony	Sb		GELC	µg/L		<	0.28	0.28			<	0.28	0.28			<	0.28	0.28		
	Arsenic	As		EES6	µg/L			0.9	0.2									0.8	0.2		
	Arsenic	As		GELC	µg/L		<	2.24	2.24			<	3.5	2.24			<	4.9	2.24		
	Barium	Ba		EES6	µg/L			15	1									14	1		
	Barium	Ba		GELC	µg/L			15.2	0.222				14.9	0.222				14.9	0.222		
	Beryllium	Be		EES6	µg/L		<	1	1								<	1	1		
	Beryllium	Be		GELC	µg/L		<	0.08	0.08			<	0.08	0.08			<	0.08	0.08		
	Boron	B		EES6	µg/L			12	1									13	1		
	Boron	B		GELC	µg/L		<	17.7	4.9				12.4	4.88				13.2	4.88		
	Cadmium	Cd		EES6	µg/L		<	1	1								<	1	1		
	Cadmium	Cd		GELC	µg/L		<	0.04	0.04			<	0.04	0.04			<	0.04	0.04		
	Chromium	Cr		EES6	µg/L			1.9	1									2.3	1		0.2
	Chromium	Cr		GELC	µg/L			2.42	0.503			<	3.9	0.503			<	2.8	0.503		
	Cobalt	Co		EES6	µg/L		<	1	1								<	1	1		
	Cobalt	Co		GELC	µg/L		<	0.541	0.541			<	1.4	0.541			<	0.541	0.541		
	Copper	Cu		EES6	µg/L			1.3	1									2.3	1		
	Copper	Cu		GELC	µg/L			13.1	1.39			<	1.39	1.39			<	1.39	1.39		
	Iron	Fe		EES6	µg/L		<	10	10									30	10		
	Iron	Fe		GELC	µg/L			48.9	12.6			<	21.7	12.6			<	14.2	12.6		

Table B-1.19 (continued)

						Start Date Time	06/30/04	06/30/04	06/30/04	06/30/04	06/30/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8
						Fld Qc Type Code															
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Lead	Pb		EES6	µg/L		<	0.2	0.2								<	0.2	0.2		
	Lead	Pb		GELC	µg/L			0.097	0.05			<	0.05	0.05			<	0.05	0.05		
	Manganese	Mn		EES6	µg/L			7.6	1		0.1							8.3	1		0.1
	Manganese	Mn		GELC	µg/L			7.22	1.61				8.3	1.61				6.9	1.61		
	Mercury	Hg		EES6	µg/L		<	0.05	0.05								<	0.05	0.05		
	Mercury	Hg		GELC	µg/L		<	0.0472	0.0472			<	0.0472	0.0472			<	0.0472	0.0472		
	Nickel	Ni		EES6	µg/L			1.3	1								<	1	1		
	Nickel	Ni		GELC	µg/L		<	0.69	0.69			<	1.8	0.69			<	2.1	0.69		
	Selenium	Se		EES6	µg/L		<	1	1								<	1	1		
	Selenium	Se		GELC	µg/L		<	4.3	2.81			<	2.81	2.81			<	2.81	2.81		
	Silver	Ag		EES6	µg/L			1.1	1								<	1	1		
	Silver	Ag		GELC	µg/L		<	0.835	0.835			<	0.835	0.835			<	0.835	0.835		
	Thallium	Tl		EES6	µg/L		<	1	1								<	1	1		
	Thallium	Tl		GELC	µg/L		<	0.033	0.02				0.11	0.02				0.095	0.02		
	Tin	Sn		EES6	µg/L		<	1	1								<	1	1		
	Tin	Sn		GELC	µg/L																
	Vanadium	V		EES6	µg/L			5	1									5	1		
	Vanadium	V		GELC	µg/L			5.1	0.606				4.5	0.606				4.7	0.606		
	Zinc	Zn		EES6	µg/L			4	1								<	1	1		
	Zinc	Zn		GELC	µg/L			16	0.883			<	2.8	0.883			<	3.5	0.883		
RAD	Americium-241	Am-241		GELC	pCi/L			0.0103		0.037	0.00623							0.00991		0.039	0.0111
	Cesium-137	Cs-137		GELC	pCi/L			1.93		4.23	1.11							16		4.54	1.41
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L			121		298	122										
	Plutonium-238	Pu-238		GELC	pCi/L			0.00462		0.036	0.00328							1.05E-09		0.034	0.00695
	Strontium-90	Sr-90		GELC	pCi/L			0.0445		0.343	0.0835							0.117		0.199	0.0525
	Tritium	H-3		UMTL	pCi/L			0.41509	0.28737		0.28737							0.15965	0.28737		0.28737
	Uranium	U		EES6	µg/L			0.4	0.2									0.6	0.2		
	Uranium	U		GELC	µg/L			0.386	0.02				0.36	0.02				0.36	0.02		
	Uranium-234	U-234		GELC	pCi/L			0.294		0.058	0.0319							0.277		0.062	0.0271
	Uranium-238	U-238		GELC	pCi/L			0.122		0.051	0.0227							0.141		0.044	0.0181

Table B-1.19 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
						Start Date Time	06/30/04	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	06/06/05	06/06/05	06/06/05	06/06/05	06/06/05
						Fld Prep Code	UF	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L			<	1.45	1.45												
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L									58.7	1							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L				58.3	1.45									57.9	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L				57.6	1.45												
	Ammonia as Nitrogen	NH3-N		GELC	mg/L		<	<	0.0159	0.0159			<	0.0159	0.0159			<	0.01	0.01		
	Bromide	Br(-1)		EES6	mg/L									0.03	0.01							
	Bromide	Br(-1)		GELC	mg/L			<	0.0978	0.0978								<	0.041	0.041		
	Calcium	Ca		EES6	mg/L									11.9	0.01		0.1					
	Calcium	Ca		GELC	mg/L				11.4	0.00554				11.4	0.00554				11.5	0.036		
	Chloride	Cl(-1)		EES6	mg/L									1.83	0.01							
	Chloride	Cl(-1)		GELC	mg/L				1.88	0.0322									1.76	0.053		
	Fluoride	F(-1)		EES6	mg/L									0.23	0.01							
	Fluoride	F(-1)		GELC	mg/L				0.279	0.0553									0.193	0.03		
	Magnesium	Mg		EES6	mg/L									2.95	0.01		0.06					
	Magnesium	Mg		GELC	mg/L				3.06	0.00518				3.05	0.00518				2.85	0.085		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L									0.38	0.003							
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L				0.305	0.003				0.3	0.003				0.25	0.003		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L		<						<	0.003	0.003							
	Perchlorate	ClO4		GELC	µg/L									0.26	0.05				0.288	0.05		
	Potassium	K		EES6	mg/L									1.73	0.01		0.01					
	Potassium	K		GELC	mg/L				1.67	0.0165				1.65	0.0165				1.71	0.05		
	Silicon Dioxide	SiO2		EES6	mg/L									34.1	10		0.4					
	Silicon Dioxide	SiO2		GELC	mg/L				32.6	0.00983				32.3	0.00983				70.4	0.032		
	Sodium	Na		EES6	mg/L									10.7	0.01		0.3					
	Sodium	Na		GELC	mg/L				10.2	0.0144				10.2	0.0144				10.8	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																	
	Sulfate	SO4(-2)		EES6	mg/L									2.2	0.01							
	Sulfate	SO4(-2)		GELC	mg/L				2.29	0.193									1.96	0.057		
	Sulfide, Total	S(-2)	Field	FLD	mg/L																	
	Total Dissolved Solids	TDS		GELC	mg/L														127	2.38		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L		<	<	0.044	0.044			<	0.044	0.044			<	0.01	0.01		
	Total Organic Carbon	TOC		GELC	mg/L		<						<	0.384	0.025							
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L									0.02282	0.003							
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L				0.21	0.151								<	0.046	0.01		
	pH	pH	Field	FLD	SU																	
METALS	Aluminum	Al		EES6	µg/L									2	2							
	Aluminum	Al		GELC	µg/L		<	<	14.7	14.7			<	14.7	14.7			<	68	68		
	Antimony	Sb		EES6	µg/L		<						<	1	1							
	Antimony	Sb		GELC	µg/L		<	<	0.28	0.28			<	0.28	0.28			<	0.5	0.5		
	Arsenic	As		EES6	µg/L									0.9	0.2							
	Arsenic	As		GELC	µg/L		<	<	2.24	2.24			<	2.24	2.24			<	6	6		
	Barium	Ba		EES6	µg/L									15	1							
	Barium	Ba		GELC	µg/L				14.1	0.222				14.2	0.222				14.7	1		
	Beryllium	Be		EES6	µg/L		<						<	1	1							
	Beryllium	Be		GELC	µg/L		<	<	0.08	0.08			<	0.08	0.08			<	1	1		
	Boron	B		EES6	µg/L									11	1							
	Boron	B		GELC	µg/L		<	<	20.8	4.88			<	18	4.88				15.9	10		
	Cadmium	Cd		EES6	µg/L		<						<	1	1							
	Cadmium	Cd		GELC	µg/L		<	<	0.04	0.04			<	0.04	0.04			<	0.1	0.1		
	Chromium	Cr		EES6	µg/L									2.2	1							
	Chromium	Cr		GELC	µg/L				3	0.503				2.8	0.503				2.4	1		
	Cobalt	Co		EES6	µg/L		<						<	1	1							
	Cobalt	Co		GELC	µg/L		<	<	0.541	0.541			<	0.541	0.541			<	1	1		
	Copper	Cu		EES6	µg/L								<	1	1							
	Copper	Cu		GELC	µg/L			<	1.39	1.39			<	1.39	1.39			<	3	3		
	Iron	Fe		EES6	µg/L		<							20	10							
	Iron	Fe		GELC	µg/L			<	12.6	12.6			<	12.6	12.6				24.8	18		

Table B-1.19 (continued)

						Start Date Time	06/30/04	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	06/06/05	06/06/05	06/06/05	06/06/05	06/06/05
						Fld Prep Code	UF	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8
						Fld Qc Type Code																
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
METALS (cont.)	Lead	Pb		EES6	µg/L		<						<	0.2	0.2							
	Lead	Pb		GELC	µg/L			<	0.05	0.05			<	0.05	0.05			<	0.5	0.5		
	Manganese	Mn		EES6	µg/L									6.7	1		0.1					
	Manganese	Mn		GELC	µg/L				8	1.61				7.5	1.61				10.6	2		
	Mercury	Hg		EES6	µg/L		<						<	0.05	0.05							
	Mercury	Hg		GELC	µg/L		<	<	0.0472	0.0472			<	0.0472	0.0472			<	0.05	0.05		
	Nickel	Ni		EES6	µg/L								<	1	1							
	Nickel	Ni		GELC	µg/L		<	<	0.69	0.69			<	0.69	0.69				0.57	0.5		
	Selenium	Se		EES6	µg/L		<						<	1	1							
	Selenium	Se		GELC	µg/L		<	<	2.81	2.81			<	2.81	2.81			<	2.5	2.5		
	Silver	Ag		EES6	µg/L								<	1	1							
	Silver	Ag		GELC	µg/L		<	<	0.835	0.835			<	0.835	0.835			<	0.2	0.2		
	Thallium	Tl		EES6	µg/L		<						<	1	1							
	Thallium	Tl		GELC	µg/L		<		0.83	0.02			<	0.29	0.02			<	0.4	0.4		
	Tin	Sn		EES6	µg/L		<						<	1	1							
	Tin	Sn		GELC	µg/L													<	2.5	2.5		
	Vanadium	V		EES6	µg/L									4	1							
	Vanadium	V		GELC	µg/L				5	0.606				5.1	0.606				5.3	1		
	Zinc	Zn		EES6	µg/L								<	1	1							
	Zinc	Zn		GELC	µg/L				7.4	0.883				7.8	0.883			<	2.9	2		
RAD	Americium-241	Am-241		GELC	pCi/L									0.0117		0.046	0.0117		0.00764		0.032	0.00951
	Cesium-137	Cs-137		GELC	pCi/L									-0.578		3.26	0.977		1.02		2.54	0.688
	Gross alpha	GROSSA		GELC	pCi/L														-0.221		1.9	0.384
	Gross beta	GROSSB		GELC	pCi/L														0.714		1.88	0.478
	Gross gamma	GROSSG		GELC	pCi/L														64		227	80.6
	Plutonium-238	Pu-238		GELC	pCi/L									-0.00478		0.037	0.00956		-0.0234		0.049	0.0137
	Strontium-90	Sr-90		GELC	pCi/L									0.0729		0.266	0.0628		0.0874		0.285	0.0742
	Tritium	H-3		UMTL	pCi/L									0.19158	0.28737		0.28737					
	Uranium	U		EES6	µg/L									0.3	0.2							
	Uranium	U		GELC	µg/L				0.36	0.02				0.36	0.02				0.34	0.05		
	Uranium-234	U-234		GELC	pCi/L									0.241		0.084	0.0297		0.239		0.061	0.0244
	Uranium-238	U-238		GELC	pCi/L									0.0997		0.06	0.0191		0.129		0.043	0.0172

Table B-1.19 (continued)

						Start Date Time	06/06/05	06/06/05	06/06/05	06/06/05	06/06/05	07/07/06	07/07/06	07/07/06	07/07/06	07/07/06	07/07/06	07/07/06	07/07/06	07/07/06	07/07/06	11/06/06	11/06/06	11/06/06	11/06/06	11/06/06
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8
						Fld Qc Type Code																				
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																					
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L							<	0.725	0.725			<	0.725	0.725							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																					
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L								58.5	0.725				58.5	0.725							
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																					
	Ammonia as Nitrogen	NH3-N		GELC	mg/L							<	0.047	0.01			<	0.051	0.01							
	Bromide	Br(-1)		EES6	mg/L																					
	Bromide	Br(-1)		GELC	mg/L							<	0.066	0.066			<	0.066	0.066							
	Calcium	Ca		EES6	mg/L																					
	Calcium	Ca		GELC	mg/L			11.4	0.036				11.2	0.036				11.4	0.036							
	Chloride	Cl(-1)		EES6	mg/L																					
	Chloride	Cl(-1)		GELC	mg/L								1.86	0.066				1.88	0.066							
	Fluoride	F(-1)		EES6	mg/L																					
	Fluoride	F(-1)		GELC	mg/L								0.284	0.033				0.264	0.033							
	Magnesium	Mg		EES6	mg/L																					
	Magnesium	Mg		GELC	mg/L			2.83	0.085				2.79	0.085				2.81	0.085							
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																					
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L								0.284	0.014				0.277	0.014							
	Nitrite as Nitrogen	NO2-N		EES6	mg/L																					
	Perchlorate	ClO4		GELC	µg/L								0.269	0.05												
	Potassium	K		EES6	mg/L																					
	Potassium	K		GELC	mg/L			1.58	0.05				1.67	0.05				1.69	0.05							
	Silicon Dioxide	SiO2		EES6	mg/L																					
	Silicon Dioxide	SiO2		GELC	mg/L			68.2	0.032				67.7	0.032				68	0.032							
	Sodium	Na		EES6	mg/L																					
	Sodium	Na		GELC	mg/L			9.59	0.045				10.4	0.045				10.5	0.045							
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			126.1										126.6					15.04			
	Sulfate	SO4(-2)		EES6	mg/L																					
	Sulfate	SO4(-2)		GELC	mg/L								2.1	0.1				2.18	0.1							
	Sulfide, Total	S(-2)	Field	FLD	mg/L																					
	Total Dissolved Solids	TDS		GELC	mg/L								144	2.38				147	2.38							
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L							<	0.01	0.01			<	0.01	0.01							
	Total Organic Carbon	TOC		GELC	mg/L													0.63	0.33							
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																					
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L							<	0.012	0.01			<	0.01	0.01							
	pH	pH	Field	FLD	SU			8.06										8.03					7.8			
METALS	Aluminum	Al		EES6	µg/L																					
	Aluminum	Al		GELC	µg/L		<	68	68			<	68	68			<	68	68							
	Antimony	Sb		EES6	µg/L																					
	Antimony	Sb		GELC	µg/L		<	0.5	0.5			<	0.5	0.5			<	0.5	0.5							
	Arsenic	As		EES6	µg/L																					
	Arsenic	As		GELC	µg/L		<	6	6			<	6	6			<	6	6							
	Barium	Ba		EES6	µg/L																					
	Barium	Ba		GELC	µg/L			13.6	1				14.1	1				14.1	1							
	Beryllium	Be		EES6	µg/L																					
	Beryllium	Be		GELC	µg/L		<	1	1			<	1	1			<	1	1							
	Boron	B		EES6	µg/L																					
	Boron	B		GELC	µg/L			13.1	10				15.3	10				14.2	10							
	Cadmium	Cd		EES6	µg/L																					
	Cadmium	Cd		GELC	µg/L		<	0.1	0.1			<	0.1	0.1			<	0.1	0.1							
	Chromium	Cr		EES6	µg/L																					
	Chromium	Cr		GELC	µg/L		<	3.2	1				3.1	1				3	1							
	Cobalt	Co		EES6	µg/L																					
	Cobalt	Co		GELC	µg/L		<	1	1			<	1	1			<	1	1							
	Copper	Cu		EES6	µg/L																					
	Copper	Cu		GELC	µg/L		<	3	3			<	3	3			<	3	3							

Table B-1.19 (continued)

						Start Date Time	06/06/05	06/06/05	06/06/05	06/06/05	06/06/05	07/07/06	07/07/06	07/07/06	07/07/06	07/07/06	07/07/06	07/07/06	07/07/06	07/07/06	07/07/06	11/06/06	11/06/06	11/06/06	11/06/06	11/06/06
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8	888.8
						Fld Qc Type Code																				
						Well Class	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE	SINGLE
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																					
METALS (cont.)	Iron	Fe		EES6	µg/L																					
	Iron	Fe		GELC	µg/L			19.5	18				29.6	18				33.4	18							
	Lead	Pb		EES6	µg/L																					
	Lead	Pb		GELC	µg/L		<	0.5	0.5			<	0.5	0.5			<	0.5	0.5							
	Manganese	Mn		EES6	µg/L																					
	Manganese	Mn		GELC	µg/L			8.5	2				11.2	2				11.7	2							
	Mercury	Hg		EES6	µg/L																					
	Mercury	Hg		GELC	µg/L		<	0.05	0.05			<	0.06	0.06			<	0.06	0.06							
	Nickel	Ni		EES6	µg/L																					
	Nickel	Ni		GELC	µg/L			0.59	0.5				0.59	0.5				0.57	0.5							
	Selenium	Se		EES6	µg/L																					
	Selenium	Se		GELC	µg/L		<	2.5	2.5			<	2.5	2.5			<	2.5	2.5							
	Silver	Ag		EES6	µg/L																					
	Silver	Ag		GELC	µg/L		<	0.2	0.2			<	0.2	0.2			<	0.2	0.2							
	Thallium	Tl		EES6	µg/L																					
	Thallium	Tl		GELC	µg/L		<	0.4	0.4				0.77	0.4			<	0.4	0.4							
	Tin	Sn		EES6	µg/L																					
	Tin	Sn		GELC	µg/L		<	2.5	2.5			<	2.5	2.5			<	2.5	2.5							
	Vanadium	V		EES6	µg/L																					
	Vanadium	V		GELC	µg/L		<	4.1	1				5.3	1				5.3	1							
	Zinc	Zn		EES6	µg/L																					
	Zinc	Zn		GELC	µg/L		<	3	2			<	3	2			<	3.6	2							
RAD	Americium-241	Am-241		GELC	pCi/L			-0.0118		0.041	0.0071		-0.00334		0.0231	0.00315		0.0109		0.0258	0.00501					
	Cesium-137	Cs-137		GELC	pCi/L			0.727		3.08	0.874		-1.91		2.99	0.951		-0.719		3.49	1.03					
	Gross alpha	GROSSA		GELC	pCi/L			0.19		1.96	0.47		0.229		2.16	0.529		1.2		2.84	0.75					
	Gross beta	GROSSB		GELC	pCi/L			-0.836		1.98	0.437		1.26		1.84	0.485		1.15		1.82	0.475					
	Gross gamma	GROSSG		GELC	pCi/L			147		405	124		94.9		285	77.8		76.6		236	64.2					
	Plutonium-238	Pu-238		GELC	pCi/L			0.0376		0.078	0.025		0.00871		0.0209	0.00689		0		0.0206	0.00214					
	Strontium-90	Sr-90		GELC	pCi/L			0.124		0.271	0.0644		-0.0465		0.272	0.0564		-0.0237		0.353	0.0776					
	Tritium	H-3		UMTL	pCi/L													0.15965		0.28737	0.28737					
	Uranium	U		EES6	µg/L																					
	Uranium	U		GELC	µg/L			0.34	0.05				0.4	0.05				0.39	0.05							
	Uranium-234	U-234		GELC	pCi/L			0.244		0.066	0.0257		0.224		0.0531	0.0278		0.216		0.0495	0.0263					
	Uranium-238	U-238		GELC	pCi/L			0.147		0.047	0.0197		0.102		0.0565	0.0179		0.0925		0.0526	0.0184					

Table B-1.20
Sacred Spring

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	10/19/00	10/19/00	10/19/00	10/19/00	10/19/00	10/19/00	10/19/00	10/19/00	10/19/00	10/19/00	10/23/01	10/23/01	10/23/01	10/23/01	10/23/01
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L			1.68	1									0.775	0.725		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			126	1									117	0.725		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L			124	1									116	0.725		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L			37.7	0.0355									31.3	0.0375		
	Chloride	Cl(-1)		GELC	mg/L			2.92	0.026									2.6	0.025		
	Fluoride	F(-1)		GELC	mg/L			0.468	0.007									0.436	0.006		
	Magnesium	Mg		GELC	mg/L			1.64	0.00354									1.39	0.00449		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.16	0.009									0.2	0.0069		
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L			2.58	0.0164									2.76	0.00707		
	Silicon Dioxide	SiO2		GELC	mg/L			44.1	0.0186									45	0.0284		
	Sodium	Na		GELC	mg/L			22.2	0.013									21.7	0.00813		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		GELC	mg/L			7.83	0.079									7.32	0.062		
	Total Dissolved Solids	TDS		GELC	mg/L			196	6.29									177	5.09		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<	0.03	0.02												
	Total Suspended Solids	TSS		GELC	mg/L								39	0.874							
	pH	pH	Field	FLD	SU								7.63								
METALS	Aluminum	Al		GELC	µg/L												<	34.3	34.3		
	Antimony	Sb		GELC	µg/L												<	0.05	0.111		
	Arsenic	As		GELC	µg/L												<	3.68	4.57		
	Barium	Ba		GELC	µg/L													81.1	0.206		
	Beryllium	Be		GELC	µg/L												<	0.203	0.203		
	Boron	B		GELC	µg/L													27.4	2.95		
	Cadmium	Cd		GELC	µg/L												<	0.28	0.05		
	Chromium	Cr		GELC	µg/L													1.96	0.781		
	Cobalt	Co		GELC	µg/L												<	0.295	0.295		
	Copper	Cu		GELC	µg/L												<	2.67	2.67		
	Iron	Fe		GELC	µg/L												<	20.6	20.6		
	Lead	Pb		GELC	µg/L												<	0.16	0.077		
	Manganese	Mn		GELC	µg/L												<	2.29	2.94		
	Mercury	Hg		GELC	µg/L																
	Nickel	Ni		GELC	µg/L												<	0.743	0.743		
	Selenium	Se		GELC	µg/L																
	Silver	Ag		GELC	µg/L												<	0.197	0.197		
	Thallium	Tl		GELC	µg/L												<	0.12	0.014		
	Tin	Sn		GELC	µg/L												<	2.4	2.4		
	Vanadium	V		GELC	µg/L													8.87	1.09		
	Zinc	Zn		GELC	µg/L												<	1.43	2.81		
RAD	Americium-241	Am-241		GELC	pCi/L			0.00461		0.0125	0.00462							-0.00342		0.0513	0.0123
	Cesium-137	Cs-137		GELC	pCi/L			-0.554		3.13	0.887							0		3.48	1.63
	Gross alpha	GROSSA		GELC	pCi/L			0.927		0.941	0.377							2.24		1.65	0.604
	Gross beta	GROSSB		GELC	pCi/L			2.55		1.52	0.507							4.3		2.34	0.691
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L			0.00685		0.00928	0.00494							0.00771		0.0337	0.00928
	Strontium-90	Sr-90		GELC	pCi/L			0.0937		0.118	0.0358							0.144		0.363	0.0982
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L			3.4		0.0574	0.284							0.927		0.0435	0.0811
	Uranium-238	U-238		GELC	pCi/L			2.14		0.12	0.193							0.528		0.0339	0.0521

Table B-1.20 (continued)

						Start Date Time	10/23/01	10/23/01	10/23/01	10/23/01	10/23/01	10/23/01	10/23/01	10/23/01	10/23/01	10/23/01	10/23/01	10/23/01	10/23/01	10/23/01	10/23/01
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L								0.741	0.725							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L								110	0.725							
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L								109	0.725							
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L								30.8	0.0375							
	Chloride	Cl(-1)		GELC	mg/L								2.51	0.025							
	Fluoride	F(-1)		GELC	mg/L								0.446	0.006							
	Magnesium	Mg		GELC	mg/L								1.37	0.00449							
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L								0.19	0.0069							
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L								2.65	0.00707							
	Silicon Dioxide	SiO2		GELC	mg/L								44.2	0.0284							
	Sodium	Na		GELC	mg/L								21.3	0.00813							
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			247										247			
	Sulfate	SO4(-2)		GELC	mg/L								7.17	0.062							
	Total Dissolved Solids	TDS		GELC	mg/L								177	5.09							
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L			260	2.33									3.2	0.699		
	pH	pH	Field	FLD	SU			7.66										7.66			
METALS	Aluminum	Al		GELC	µg/L							<	34.3	34.3							
	Antimony	Sb		GELC	µg/L							<	0.111	0.111							
	Arsenic	As		GELC	µg/L							<	4.57	4.57							
	Barium	Ba		GELC	µg/L								81.2	0.206							
	Beryllium	Be		GELC	µg/L							<	0.203	0.203							
	Boron	B		GELC	µg/L								28.7	2.95							
	Cadmium	Cd		GELC	µg/L							<	0.24	0.05							
	Chromium	Cr		GELC	µg/L								1.61	0.781							
	Cobalt	Co		GELC	µg/L								0.81	0.295							
	Copper	Cu		GELC	µg/L							<	2.67	2.67							
	Iron	Fe		GELC	µg/L							<	20.6	20.6							
	Lead	Pb		GELC	µg/L							<	0.14	0.077							
	Manganese	Mn		GELC	µg/L							<	2.29	2.94							
	Mercury	Hg		GELC	µg/L		<	0.073	0.073								<	0.073	0.073		
	Nickel	Ni		GELC	µg/L							<	0.743	0.743							
	Selenium	Se		GELC	µg/L		<	3.09	3.09								<	3.09	3.09		
	Silver	Ag		GELC	µg/L							<	0.197	0.197							
	Thallium	Tl		GELC	µg/L							<	0.17	0.014							
	Tin	Sn		GELC	µg/L							<	2.4	2.4							
	Vanadium	V		GELC	µg/L								9.15	1.09							
	Zinc	Zn		GELC	µg/L							<	1.46	2.81							
RAD	Americium-241	Am-241		GELC	pCi/L								-0.00272		0.0453	0.0112					
	Cesium-137	Cs-137		GELC	pCi/L								-2.31		4.67	1.47					
	Gross alpha	GROSSA		GELC	pCi/L								2.17		1.7	0.577					
	Gross beta	GROSSB		GELC	pCi/L								4.97		2.84	0.786					
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L								0.00715		0.0312	0.0086					
	Strontium-90	Sr-90		GELC	pCi/L								0.0657		0.25	0.0656					
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L								0.984		0.0181	0.0848					
	Uranium-238	U-238		GELC	pCi/L								0.419		0.0264	0.044					

Table B-1.20 (continued)

						Start Date Time	06/25/02	06/25/02	06/25/02	06/25/02	06/25/02	06/25/02	06/25/02	06/25/02	06/25/02	06/25/02	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	1.45	1.45								<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			96.5	1.45									118	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L			95.9	1.45									118	1.45		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L			30.3	0.00554									31	0.00554		
	Chloride	Cl(-1)		GELC	mg/L			2.65	0.0322									3.03	0.0322		
	Fluoride	F(-1)		GELC	mg/L			0.447	0.0553									0.489	0.0553		
	Magnesium	Mg		GELC	mg/L			1.39	0.00518									1.38	0.00518		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.17	0.01									0.14	0.01		
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L			2.57	0.0165									2.48	0.0165		
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		GELC	mg/L			22.3	0.0144									21.5	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm								235								
	Sulfate	SO4(-2)		GELC	mg/L			8.57	0.193									8.63	0.193		
	Total Dissolved Solids	TDS		GELC	mg/L			174	3.07									183	3.07		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L								1.6	1.53							
	pH	pH	Field	FLD	SU								8.07								
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Arsenic	As		GELC	µg/L																
	Barium	Ba		GELC	µg/L																
	Beryllium	Be		GELC	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Chromium	Cr		GELC	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L																
	Nickel	Ni		GELC	µg/L																
	Selenium	Se		GELC	µg/L																
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L			0.0184		0.0359	0.00865							0.00795		0.028	0.00488
	Cesium-137	Cs-137		GELC	pCi/L			-1.26		2.95	1.04							0.964		6.92	1.93
	Gross alpha	GROSSA		GELC	pCi/L			1.27		2.22	0.63							1.47		1.15	0.398
	Gross beta	GROSSB		GELC	pCi/L			14.1		4	1.46							2.4		2.41	0.624
	Gross gamma	GROSSG		GELC	pCi/L			67.5		236	65.5							183		648	4.67
	Plutonium-238	Pu-238		GELC	pCi/L			0.000777		0.033	0.00342							-0.00389		0.035	0.00615
	Strontium-90	Sr-90		GELC	pCi/L													0.0056		0.142	0.0329
	Tritium	H-3		UMTL	pCi/L								0.86211	0.28737		0.12772					
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L			0.854		0.051	0.0837							1.07		0.092	0.0941
	Uranium-238	U-238		GELC	pCi/L			0.422		0.0286	0.0504							0.488		0.059	0.0545

Table B-1.20 (continued)

						Start Date Time	06/25/02	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	08/24/04	08/24/04	08/24/04	08/24/04	08/24/04	08/24/04	08/24/04	08/24/04	08/24/04	08/24/04
						Fld Prep Code	F	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<						<	1.45	1.45							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L									126	1.45							
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L									126	1.45							
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																	
	Bromide	Br(-1)		GELC	mg/L																	
	Calcium	Ca		GELC	mg/L									35.7	0.00554							
	Chloride	Cl(-1)		GELC	mg/L									3.08	0.0322							
	Fluoride	F(-1)		GELC	mg/L									0.468	0.0553							
	Magnesium	Mg		GELC	mg/L									2.45	0.00518							
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L									0.125	0.003							
	Perchlorate	ClO4		GELC	µg/L														0.154	0.05		
	Potassium	K		GELC	mg/L									3.11	0.0165							
	Silicon Dioxide	SiO2		GELC	mg/L									42.7	0.0212							
	Sodium	Na		GELC	mg/L									19.6	0.0144							
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm				250										289			
	Sulfate	SO4(-2)		GELC	mg/L									8	0.193							
	Total Dissolved Solids	TDS		GELC	mg/L									190	3.07							
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																	
	Total Organic Carbon	TOC		GELC	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																	
	Total Suspended Solids	TSS		GELC	mg/L				17.8	0.764									103	1.53		
	pH	pH	Field	FLD	SU				7.75										8.07			
METALS	Aluminum	Al		GELC	µg/L								<	14.7	14.7							
	Antimony	Sb		GELC	µg/L								<	0.28	0.28							
	Arsenic	As		GELC	µg/L									3.2	2.24							
	Barium	Ba		GELC	µg/L									94.6	0.222							
	Beryllium	Be		GELC	µg/L								<	0.158	0.158							
	Boron	B		GELC	µg/L									31.3	4.88							
	Cadmium	Cd		GELC	µg/L								<	0.04	0.04							
	Chromium	Cr		GELC	µg/L								<	1.5	0.503							
	Cobalt	Co		GELC	µg/L								<	0.541	0.541							
	Copper	Cu		GELC	µg/L								<	1.39	1.39							
	Iron	Fe		GELC	µg/L									36.3	12.6							
	Lead	Pb		GELC	µg/L								<	0.05	0.05							
	Manganese	Mn		GELC	µg/L									32.8	0.296							
	Mercury	Hg		GELC	µg/L													<	0.0472	0.0472		
	Nickel	Ni		GELC	µg/L								<	0.8	0.69							
	Selenium	Se		GELC	µg/L													<	5	2.81		
	Silver	Ag		GELC	µg/L								<	0.835	0.835							
	Thallium	Tl		GELC	µg/L								<	0.046	0.02							
	Tin	Sn		GELC	µg/L								<	3.26	3.26							
	Vanadium	V		GELC	µg/L									7.1	0.606							
	Zinc	Zn		GELC	µg/L								<	1.8	0.883							
RAD	Americium-241	Am-241		GELC	pCi/L									0.00797		0.032	0.00566					
	Cesium-137	Cs-137		GELC	pCi/L									-0.752		3.39	0.974					
	Gross alpha	GROSSA		GELC	pCi/L									1.8		1.32	0.463					
	Gross beta	GROSSB		GELC	pCi/L									5.17		2.23	0.748					
	Gross gamma	GROSSG		GELC	pCi/L									73.2		254	10.8					
	Plutonium-238	Pu-238		GELC	pCi/L									-0.0127		0.033	0.0131					
	Strontium-90	Sr-90		GELC	pCi/L									0.145		0.261	0.0836					
	Tritium	H-3		UMTL	pCi/L																	
	Uranium	U		GELC	µg/L									2.3	0.02							
	Uranium-234	U-234		GELC	pCi/L									1.37		0.061	0.0732					
	Uranium-238	U-238		GELC	pCi/L									0.709		0.043	0.0461					

Table B-1.20 (continued)

						Start Date Time	07/13/05	07/13/05	07/13/05	07/13/05	07/13/05	07/13/05	07/13/05	07/13/05	07/13/05	07/13/05	09/14/06	09/14/06	09/14/06	09/14/06	09/14/06
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	1.45	1.45									1.36	0.725		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			110	1.45									152	0.725		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L		<	0.01	0.01								<	0.01	0.01		
	Bromide	Br(-1)		GELC	mg/L		<	0.041	0.041								<	0.066	0.066		
	Calcium	Ca		GELC	mg/L			35.9	0.036				36	0.036				41.7	0.036		
	Chloride	Cl(-1)		GELC	mg/L			3	0.053									3.6	0.066		
	Fluoride	F(-1)		GELC	mg/L			0.321	0.03									0.463	0.033		
	Magnesium	Mg		GELC	mg/L			1.76	0.085				1.78	0.085				2.23	0.085		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.0513	0.017									0.0964	0.014		
	Perchlorate	ClO4		GELC	µg/L			0.122	0.05									0.0909	0.05		
	Potassium	K		GELC	mg/L			2.66	0.05				2.56	0.05				2.64	0.05		
	Silicon Dioxide	SiO2		GELC	mg/L		<	44.8	0.032			<	43.9	0.032				46.6	0.032		
	Sodium	Na		GELC	mg/L			22.2	0.045				21	0.045				24.4	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm								226								
	Sulfate	SO4(-2)		GELC	mg/L			7.77	0.057									7.03	0.1		
	Total Dissolved Solids	TDS		GELC	mg/L			204	2.38									225	2.38		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L			0.011	0.01								<	0.01	0.01		
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<	0.03	0.01								<	0.063	0.01		
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU								8.2								
METALS	Aluminum	Al		GELC	µg/L		<	68	68			<	68	68			<	68	68		
	Antimony	Sb		GELC	µg/L		<	0.5	0.5			<	0.5	0.5			<	0.5	0.5		
	Arsenic	As		GELC	µg/L		<	6	6			<	6	6			<	6	6		
	Barium	Ba		GELC	µg/L			99.2	1				99.8	1				115	1		
	Beryllium	Be		GELC	µg/L		<	1	1			<	1	1			<	1	1		
	Boron	B		GELC	µg/L			30.6	10				30	10				31.4	10		
	Cadmium	Cd		GELC	µg/L		<	0.1	0.1			<	0.1	0.1			<	0.1	0.1		
	Chromium	Cr		GELC	µg/L			2	1				2.2	1			<	1	1		
	Cobalt	Co		GELC	µg/L		<	1	1			<	1	1			<	1	1		
	Copper	Cu		GELC	µg/L		<	3	3			<	3	3			<	3	3		
	Iron	Fe		GELC	µg/L			37.8	18				58.7	18				71.3	18		
	Lead	Pb		GELC	µg/L		<	0.5	0.5			<	0.5	0.5			<	0.5	0.5		
	Manganese	Mn		GELC	µg/L			64.6	2				70.3	2				124	2		
	Mercury	Hg		GELC	µg/L		<	0.05	0.05			<	0.05	0.05			<	0.14	0.06		
	Nickel	Ni		GELC	µg/L			1	0.5				1.2	0.5				0.78	0.5		
	Selenium	Se		GELC	µg/L		<	2.5	2.5			<	2.5	2.5			<	2.5	2.5		
	Silver	Ag		GELC	µg/L		<	0.2	0.2			<	0.2	0.2			<	0.2	0.2		
	Thallium	Tl		GELC	µg/L		<	0.4	0.4			<	0.4	0.4			<	0.4	0.4		
	Tin	Sn		GELC	µg/L		<	2.5	2.5			<	2.5	2.5			<	2.5	2.5		
	Vanadium	V		GELC	µg/L			6.4	1				6.1	1				5.5	1		
	Zinc	Zn		GELC	µg/L		<	8	2			<	6.4	2			<	4	2		
RAD	Americium-241	Am-241		GELC	pCi/L			-0.00325		0.044	0.00395		0.00699		0.05	0.00472		-0.00095		0.0243	0.00216
	Cesium-137	Cs-137		GELC	pCi/L			0.471		4.17	1.12		0.814		4.86	1.3		0.433		2.9	0.772
	Gross alpha	GROSSA		GELC	pCi/L			2.1		1.17	0.473		2.43		1.61	0.563		2.23		0.77	0.377
	Gross beta	GROSSB		GELC	pCi/L			7.04		2.52	0.813		8.2		2.78	0.893		4.17		2.84	0.989
	Gross gamma	GROSSG		GELC	pCi/L			102		348	67.5		79		291	67.5		94.2		292	69.2
	Plutonium-238	Pu-238		GELC	pCi/L			7.12E-10		0.062	0.00731		-0.00742		0.077	0.0272		-0.00659		0.0211	0.0175
	Strontium-90	Sr-90		GELC	pCi/L			-0.0434		0.162	0.0396		-0.0299		0.2	0.0501		0.133		0.276	0.0832
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		GELC	µg/L			1.7	0.05				1.7	0.05				1.6	0.05		
	Uranium-234	U-234		GELC	pCi/L			1.15		0.103	0.0844		1.17		0.107	0.0866		0.95		0.0486	0.0728
	Uranium-238	U-238		GELC	pCi/L			0.641		0.073	0.0569		0.571		0.076	0.0528		0.561		0.0517	0.0488

Table B-1.20 (continued)

						Start Date Time	07/13/05	09/14/06	09/14/06	09/14/06	09/14/06	09/14/06
						Fld Prep Code	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0
						Fld Qc Type Code						
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom							
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<		2.14	0.725		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L				153	0.725		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L							
	Ammonia as Nitrogen	NH3-N		GELC	mg/L		<	<	0.01	0.01		
	Bromide	Br(-1)		GELC	mg/L		<	<	0.066	0.066		
	Calcium	Ca		GELC	mg/L				42.5	0.036		
	Chloride	Cl(-1)		GELC	mg/L				3.57	0.066		
	Fluoride	F(-1)		GELC	mg/L				0.465	0.033		
	Magnesium	Mg		GELC	mg/L				2.28	0.085		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L				0.0638	0.014		
	Perchlorate	ClO4		GELC	µg/L							
	Potassium	K		GELC	mg/L				2.69	0.05		
	Silicon Dioxide	SiO2		GELC	mg/L		<		47.9	0.032		
	Sodium	Na		GELC	mg/L				24.5	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm				273			
	Sulfate	SO4(-2)		GELC	mg/L				7.03	0.1		
	Total Dissolved Solids	TDS		GELC	mg/L				230	2.38		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L			<	0.1	0.1		
	Total Organic Carbon	TOC		GELC	mg/L			<	1.64	0.33		
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<	<	0.047	0.01		
	Total Suspended Solids	TSS		GELC	mg/L							
	pH	pH	Field	FLD	SU				7.62			
METALS	Aluminum	Al		GELC	µg/L		<		118	68		
	Antimony	Sb		GELC	µg/L		<	<	0.5	0.5		
	Arsenic	As		GELC	µg/L		<	<	6	6		
	Barium	Ba		GELC	µg/L				121	1		
	Beryllium	Be		GELC	µg/L		<	<	1	1		
	Boron	B		GELC	µg/L				32	10		
	Cadmium	Cd		GELC	µg/L		<	<	0.1	0.1		
	Chromium	Cr		GELC	µg/L			<	1	1		
	Cobalt	Co		GELC	µg/L		<	<	1	1		
	Copper	Cu		GELC	µg/L		<	<	3	3		
	Iron	Fe		GELC	µg/L				156	18		
	Lead	Pb		GELC	µg/L		<	<	0.5	0.5		
	Manganese	Mn		GELC	µg/L				132	2		
	Mercury	Hg		GELC	µg/L		<	<	0.06	0.06		
	Nickel	Ni		GELC	µg/L				0.91	0.5		
	Selenium	Se		GELC	µg/L		<	<	2.5	2.5		
	Silver	Ag		GELC	µg/L		<	<	0.2	0.2		
	Thallium	Tl		GELC	µg/L		<	<	0.4	0.4		
	Tin	Sn		GELC	µg/L		<	<	2.5	2.5		
	Vanadium	V		GELC	µg/L				6	1		
	Zinc	Zn		GELC	µg/L		<	<	2.1	2		
RAD	Americium-241	Am-241		GELC	pCi/L				-0.0237		0.0366	0.0162
	Cesium-137	Cs-137		GELC	pCi/L				1.41		4	0.999
	Gross alpha	GROSSA		GELC	pCi/L				1.5		2.38	0.806
	Gross beta	GROSSB		GELC	pCi/L				1.39		1.13	0.36
	Gross gamma	GROSSG		GELC	pCi/L				79.9		223	56.4
	Plutonium-238	Pu-238		GELC	pCi/L				-0.0165		0.0226	0.0139
	Strontium-90	Sr-90		GELC	pCi/L				-0.0223		0.233	0.0582
	Tritium	H-3		UMTL	pCi/L				11.43094		0.28737	0.38316
	Uranium	U		GELC	µg/L				1.7	0.05		
	Uranium-234	U-234		GELC	pCi/L				1.09		0.119	0.11
	Uranium-238	U-238		GELC	pCi/L				0.67		0.126	0.077

Table B-1.21
Spring 1

						Start Date Time	09/25/00	09/25/00	09/25/00	09/25/00	09/25/00	09/25/00	09/25/00	09/25/00	09/25/00	09/25/00	09/24/01	09/24/01	09/24/01	09/24/01	09/24/01
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	1	1												
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			96.9	1												
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L			96	1												
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L			16.8	0.0355												
	Chloride	Cl(-1)		GELC	mg/L			2.97	0.026												
	Fluoride	F(-1)		GELC	mg/L			0.516	0.007												
	Magnesium	Mg		GELC	mg/L			1.03	0.00354												
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.37	0.009												
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L			2.14	0.0164												
	Silicon Dioxide	SiO2		GELC	mg/L			35.1	0.0186												
	Sodium	Na		GELC	mg/L			28.5	0.013												
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm													227			
	Sulfate	SO4(-2)		GELC	mg/L			6.45	0.079												
	Total Dissolved Solids	TDS		GELC	mg/L			152	6.29												
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L			0.08	0.02												
	Total Suspended Solids	TSS		GELC	mg/L								8.75	1.46				60.9	1.09		
	pH	pH	Field	FLD	SU								7.92					7.17			
METALS	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		GELC	µg/L																
	Arsenic	As		GELC	µg/L																
	Barium	Ba		GELC	µg/L																
	Beryllium	Be		GELC	µg/L																
	Boron	B		GELC	µg/L																
	Cadmium	Cd		GELC	µg/L																
	Chromium	Cr		GELC	µg/L																
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		GELC	µg/L																
	Iron	Fe		GELC	µg/L																
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		GELC	µg/L												<	0.073	0.073		
	Nickel	Ni		GELC	µg/L																
	Selenium	Se		GELC	µg/L													4.99	3.09		
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		GELC	µg/L																
	Tin	Sn		GELC	µg/L																
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L			0.0169		0.00914	0.0076										
	Cesium-137	Cs-137		GELC	pCi/L			-1.15		4.78	1.43										
	Gross alpha	GROSSA		GELC	pCi/L			2.08		1.85	0.713										
	Gross beta	GROSSB		GELC	pCi/L			3.12		3.11	0.993										
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L			0.012		0.0108	0.0071										
	Strontium-90	Sr-90		GELC	pCi/L			0.0348		0.423	0.122										
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L			1.25		0.147	0.144										
	Uranium-238	U-238		GELC	pCi/L			0.617		0.106	0.0889										

Table B-1.21 (continued)

						Start Date Time	09/24/01	09/24/01	09/24/01	09/24/01	09/24/01	11/06/02	11/06/02	11/06/02	11/06/02	11/06/02	11/06/02	11/06/02	11/06/02	11/06/02	11/06/02
						Fld Prep Code	F	F	F	F	F	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L			0.835	0.725			<	1.45	1.45							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			110	0.725				72.3	1.45							
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L			109	0.725				72.2	1.45							
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L			18.8	0.0375				16	0.00554							
	Chloride	Cl(-1)		GELC	mg/L			2.7	0.025				3.04	0.0322							
	Fluoride	F(-1)		GELC	mg/L			0.565	0.006				0.515	0.0553							
	Magnesium	Mg		GELC	mg/L			1.21	0.00449				1.03	0.00518							
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.23	0.0069				0.35	0.01							
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L			2.29	0.00707				2.11	0.0165							
	Silicon Dioxide	SiO2		GELC	mg/L			36.1	0.284												
	Sodium	Na		GELC	mg/L			32	0.00813				31.3	0.0144							
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm													215			
	Sulfate	SO4(-2)		GELC	mg/L			6.18	0.062				6.52	0.193							
	Total Dissolved Solids	TDS		GELC	mg/L			167	5.09				163	3.07							
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU													8.14			
METALS	Aluminum	Al		GELC	µg/L		<	21.7	34.3												
	Antimony	Sb		GELC	µg/L		<	0.111	0.111												
	Arsenic	As		GELC	µg/L		<	4.29	4.57												
	Barium	Ba		GELC	µg/L			42	0.206												
	Beryllium	Be		GELC	µg/L		<	0.203	0.203												
	Boron	B		GELC	µg/L			51.6	2.95												
	Cadmium	Cd		GELC	µg/L			0.301	0.301												
	Chromium	Cr		GELC	µg/L		<	4.19	0.781												
	Cobalt	Co		GELC	µg/L		<	0.295	0.295												
	Copper	Cu		GELC	µg/L		<	2.67	2.67												
	Iron	Fe		GELC	µg/L		<	16.1	20.6												
	Lead	Pb		GELC	µg/L		<	0.077	0.077												
	Manganese	Mn		GELC	µg/L		<	1.79	2.94												
	Mercury	Hg		GELC	µg/L																
	Nickel	Ni		GELC	µg/L		<	0.743	0.743												
	Selenium	Se		GELC	µg/L																
	Silver	Ag		GELC	µg/L		<	0.197	0.197												
	Thallium	Tl		GELC	µg/L		<	0.014	0.014												
	Tin	Sn		GELC	µg/L		<	2.4	2.4												
	Vanadium	V		GELC	µg/L			16.4	1.09												
	Zinc	Zn		GELC	µg/L		<	1.53	2.81												
RAD	Americium-241	Am-241		GELC	pCi/L			0.00881		0.0284	0.00727		0.00783		0.042	0.00621					
	Cesium-137	Cs-137		GELC	pCi/L			0.0445		2.18	0.609		1.44		4.42	1.22					
	Gross alpha	GROSSA		GELC	pCi/L			1.59		2.16	0.626		1.53		1.21	0.43					
	Gross beta	GROSSB		GELC	pCi/L			2.3		1.44	0.432		3.09		2.27	0.65					
	Gross gamma	GROSSG		GELC	pCi/L								117		481	1.92					
	Plutonium-238	Pu-238		GELC	pCi/L			0.0053		0.00718	0.00376		-0.00207		0.052	0.0115					
	Strontium-90	Sr-90		GELC	pCi/L			-0.0624		0.285	0.0721		-0.0172		0.272	0.0792					
	Tritium	H-3		UMTL	pCi/L													0.28737	0.28737		0.19158
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L			1.28		0.0984	0.128		1.47		0.088	0.135					
	Uranium-238	U-238		GELC	pCi/L			0.584		0.0936	0.0738		0.901		0.098	0.0915					

Table B-1.21 (continued)

						Start Date Time	09/24/01	10/06/03	10/06/03	10/06/03	10/06/03	10/06/03	10/06/03	10/06/03	10/06/03	10/06/03	10/06/03	09/13/04	09/13/04	09/13/04	09/13/04	09/13/04
						Fld Prep Code	F	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L			<	1.45	1.45								<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L				96.5	1.45									94.1	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L				95.6	1.45									93.3	1.45		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																	
	Bromide	Br(-1)		GELC	mg/L																	
	Calcium	Ca		GELC	mg/L				15.8	0.00554									17	0.00554		
	Chloride	Cl(-1)		GELC	mg/L				3.13	0.0322									2.97	0.0322		
	Fluoride	F(-1)		GELC	mg/L				0.438	0.0553									0.529	0.0553		
	Magnesium	Mg		GELC	mg/L				1.05	0.00518									1.12	0.00518		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L				0.4	0.01									0.256	0.003		
	Perchlorate	ClO4		GELC	µg/L																	
	Potassium	K		GELC	mg/L				2.28	0.0165									2.15	0.0165		
	Silicon Dioxide	SiO2		GELC	mg/L														32.8	0.0212		
	Sodium	Na		GELC	mg/L				32.9	0.0144									32.9	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm									444								
	Sulfate	SO4(-2)		GELC	mg/L				6.84	0.193									6.32	0.193		
	Total Dissolved Solids	TDS		GELC	mg/L				140	3.07									132	3.07		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																	
	Total Organic Carbon	TOC		GELC	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																	
	Total Suspended Solids	TSS		GELC	mg/L									10.2	0.764							
	pH	pH	Field	FLD	SU									8.42								
METALS	Aluminum	Al		GELC	µg/L		<												47.9	14.7		
	Antimony	Sb		GELC	µg/L		<											<	0.28	0.28		
	Arsenic	As		GELC	µg/L		<											<	3.6	2.24		
	Barium	Ba		GELC	µg/L														30.9	0.222		
	Beryllium	Be		GELC	µg/L		<											<	0.158	0.158		
	Boron	B		GELC	µg/L														39.6	4.88		
	Cadmium	Cd		GELC	µg/L													<	0.04	0.04		
	Chromium	Cr		GELC	µg/L		<												4.9	0.503		
	Cobalt	Co		GELC	µg/L		<											<	1.4	0.541		
	Copper	Cu		GELC	µg/L		<											<	1.39	1.39		
	Iron	Fe		GELC	µg/L		<												40.8	12.6		
	Lead	Pb		GELC	µg/L		<											<	0.05	0.05		
	Manganese	Mn		GELC	µg/L		<												1.9	0.296		
	Mercury	Hg		GELC	µg/L																	
	Nickel	Ni		GELC	µg/L		<											<	2.5	0.69		
	Selenium	Se		GELC	µg/L																	
	Silver	Ag		GELC	µg/L		<											<	0.835	0.835		
	Thallium	Tl		GELC	µg/L		<											<	0.02	0.02		
	Tin	Sn		GELC	µg/L		<											<	3.26	3.26		
	Vanadium	V		GELC	µg/L														16.7	0.606		
	Zinc	Zn		GELC	µg/L		<											<	2.2	0.883		
RAD	Americium-241	Am-241		GELC	pCi/L				0.0058		0.028	0.00433							0.00534		0.028	0.00472
	Cesium-137	Cs-137		GELC	pCi/L				1.91		5.8	1.41							0.278		3.45	0.924
	Gross alpha	GROSSA		GELC	pCi/L				1.92		1.22	0.48							1.84		1.55	0.483
	Gross beta	GROSSB		GELC	pCi/L				1.58		1.2	0.364							2.28		2.43	0.675
	Gross gamma	GROSSG		GELC	pCi/L				78.6		225	74.8							67.9		201	67.5
	Plutonium-238	Pu-238		GELC	pCi/L				0.00247		0.034	0.00247							0.00414		0.032	0.00508
	Strontium-90	Sr-90		GELC	pCi/L				0.0562		0.141	0.0431							0.169		0.242	0.0662
	Tritium	H-3		UMTL	pCi/L																	
	Uranium	U		GELC	µg/L														2.2	0.02		
	Uranium-234	U-234		GELC	pCi/L				1.34		0.048	0.108							1.29		0.072	0.0827
	Uranium-238	U-238		GELC	pCi/L				0.732		0.03	0.0643							0.662		0.051	0.0509

Table B-1.21 (continued)

						Start Date Time	09/13/04	09/13/04	09/13/04	09/13/04	09/13/04	09/26/05	09/26/05	09/26/05	09/26/05	09/26/05	09/26/05	09/26/05	09/26/05	09/26/05	09/26/05
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L							<	1.45	1.45							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L								94.2	1.45							
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L							<	0.04	0.04							
	Bromide	Br(-1)		GELC	mg/L							<	0.041	0.041							
	Calcium	Ca		GELC	mg/L								16.6	0.036				17.4	0.036		
	Chloride	Cl(-1)		GELC	mg/L								3.23	0.053							
	Fluoride	F(-1)		GELC	mg/L								0.552	0.03							
	Magnesium	Mg		GELC	mg/L								1.06	0.085				1.55	0.085		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L								0.195	0.017							
	Perchlorate	ClO4		GELC	µg/L			0.288	0.05				0.275	0.05							
	Potassium	K		GELC	mg/L								2.14	0.05				2.44	0.05		
	Silicon Dioxide	SiO2		GELC	mg/L								31.6	0.032				41.3	0.032		
	Sodium	Na		GELC	mg/L								30.6	0.045				31.1	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			183.5										219			
	Sulfate	SO4(-2)		GELC	mg/L								6.8	0.057							
	Total Dissolved Solids	TDS		GELC	mg/L								166	2.38							
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L								0.372	0.04							
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L								0.1	0.01							
	Total Suspended Solids	TSS		GELC	mg/L			110	1.53												
	pH	pH	Field	FLD	SU			7.74										8.18			
METALS	Aluminum	Al		GELC	µg/L							<	68	68				1640	68		
	Antimony	Sb		GELC	µg/L							<	0.5	0.5			<	0.5	0.5		
	Arsenic	As		GELC	µg/L							<	6	6			<	6	6		
	Barium	Ba		GELC	µg/L								29	1				43	1		
	Beryllium	Be		GELC	µg/L							<	1	1			<	1	1		
	Boron	B		GELC	µg/L								39.3	10				39.8	10		
	Cadmium	Cd		GELC	µg/L							<	0.1	0.1			<	0.1	0.1		
	Chromium	Cr		GELC	µg/L								4.6	1				7.5	1		
	Cobalt	Co		GELC	µg/L							<	1	1			<	1	1		
	Copper	Cu		GELC	µg/L							<	3	3			<	3	3		
	Iron	Fe		GELC	µg/L							<	18	18				1270	18		
	Lead	Pb		GELC	µg/L							<	0.5	0.5				0.63	0.5		
	Manganese	Mn		GELC	µg/L							<	2	2				23.2	2		
	Mercury	Hg		GELC	µg/L		<	0.087	0.0472			<	0.05	0.05			<	0.05	0.05		
	Nickel	Ni		GELC	µg/L							<	0.5	0.5				1.4	0.5		
	Selenium	Se		GELC	µg/L		<	2.81	2.81			<	2.5	2.5			<	2.5	2.5		
	Silver	Ag		GELC	µg/L							<	0.2	0.2			<	0.2	0.2		
	Thallium	Tl		GELC	µg/L								0.71	0.4			<	0.4	0.4		
	Tin	Sn		GELC	µg/L							<	2.5	2.5			<	2.5	2.5		
	Vanadium	V		GELC	µg/L								15	1				20.3	1		
	Zinc	Zn		GELC	µg/L							<	2	2				4.7	2		
RAD	Americium-241	Am-241		GELC	pCi/L								-0.011		0.0344	0.00487		0.00325		0.0312	0.0073
	Cesium-137	Cs-137		GELC	pCi/L								2.75		2.92	0.797		0.00835		2.49	0.697
	Gross alpha	GROSSA		GELC	pCi/L								2		1.56	0.539		2		0.974	0.441
	Gross beta	GROSSB		GELC	pCi/L								3.41		3.06	0.861		3.53		2.33	0.683
	Gross gamma	GROSSG		GELC	pCi/L								79		172			84		308	
	Plutonium-238	Pu-238		GELC	pCi/L								0.0183		0.0543	0.0114		0.0209		0.0543	0.0111
	Strontium-90	Sr-90		GELC	pCi/L								-0.146		0.293	0.0744		-0.0285		0.2	0.0526
	Tritium	H-3		UMTL	pCi/L			0	0.28737		0.28737										
	Uranium	U		GELC	µg/L								2.5	0.05				2.9	0.05		
	Uranium-234	U-234		GELC	pCi/L								1.42		0.0641	0.0869		1.55		0.065	0.0935
	Uranium-238	U-238		GELC	pCi/L								0.727		0.0454	0.0542		0.812		0.046	0.0569

Table B-1.21 (continued)

						Start Date Time	09/13/04	09/18/06	09/18/06	09/18/06	09/18/06	09/18/06	09/18/06	09/18/06	09/18/06	09/18/06	09/18/06
						Fld Prep Code	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code											
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom												
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L				1.51	0.725				0.974	0.725		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L				96.1	0.725				95.6	0.725		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L												
	Ammonia as Nitrogen	NH3-N		GELC	mg/L			<	0.01	0.01			<	0.01	0.01		
	Bromide	Br(-1)		GELC	mg/L			<	0.066	0.066			<	0.066	0.066		
	Calcium	Ca		GELC	mg/L				14.5	0.036				14.9	0.036		
	Chloride	Cl(-1)		GELC	mg/L				2.91	0.066				2.83	0.066		
	Fluoride	F(-1)		GELC	mg/L				0.521	0.033				0.497	0.033		
	Magnesium	Mg		GELC	mg/L				0.912	0.085				1.04	0.085		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L				0.292	0.014				0.29	0.014		
	Perchlorate	ClO4		GELC	µg/L				0.309	0.05							
	Potassium	K		GELC	mg/L				1.98	0.05				2.09	0.05		
	Silicon Dioxide	SiO2		GELC	mg/L				31.2	0.032				33.4	0.032		
	Sodium	Na		GELC	mg/L				29.6	0.045				30.2	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm									198			
	Sulfate	SO4(-2)		GELC	mg/L				6.22	0.1				6.06	0.1		
	Total Dissolved Solids	TDS		GELC	mg/L				148	2.38				149	2.38		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L			<	0.01	0.01			<	0.01	0.01		
	Total Organic Carbon	TOC		GELC	mg/L									0.586	0.33		
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L			<	0.042	0.01			<	0.043	0.01		
	Total Suspended Solids	TSS		GELC	mg/L												
	pH	pH	Field	FLD	SU									7.94			
METALS	Aluminum	Al		GELC	µg/L			<	68	68				307	68		
	Antimony	Sb		GELC	µg/L			<	0.5	0.5			<	0.5	0.5		
	Arsenic	As		GELC	µg/L			<	6	6			<	6	6		
	Barium	Ba		GELC	µg/L				20.9	1				24.7	1		
	Beryllium	Be		GELC	µg/L			<	1	1			<	1	1		
	Boron	B		GELC	µg/L				38.2	10				38.4	10		
	Cadmium	Cd		GELC	µg/L			<	0.1	0.1			<	0.1	0.1		
	Chromium	Cr		GELC	µg/L			<	6.3	1			<	6.7	1		
	Cobalt	Co		GELC	µg/L			<	1	1			<	1	1		
	Copper	Cu		GELC	µg/L				3.2	3				8.4	3		
	Iron	Fe		GELC	µg/L				25.3	18				728	18		
	Lead	Pb		GELC	µg/L			<	0.5	0.5			<	0.5	0.5		
	Manganese	Mn		GELC	µg/L			<	2	2				6.1	2		
	Mercury	Hg		GELC	µg/L		<	<	0.06	0.06			<	0.06	0.06		
	Nickel	Ni		GELC	µg/L				1.6	0.5				2.5	0.5		
	Selenium	Se		GELC	µg/L		<	<	2.5	2.5			<	2.5	2.5		
	Silver	Ag		GELC	µg/L			<	0.2	0.2			<	0.2	0.2		
	Thallium	Tl		GELC	µg/L			<	1.4	0.4			<	0.51	0.4		
	Tin	Sn		GELC	µg/L			<	2.5	2.5			<	2.5	2.5		
	Vanadium	V		GELC	µg/L				15.6	1				16.8	1		
	Zinc	Zn		GELC	µg/L			<	3.3	2			<	4.2	2		
RAD	Americium-241	Am-241		GELC	pCi/L				-0.00498		0.0275	0.00597		0.00164		0.0204	0.00402
	Cesium-137	Cs-137		GELC	pCi/L				-0.564		4.03	1.15		-0.484		3.68	1.04
	Gross alpha	GROSSA		GELC	pCi/L				2.54		2.2	0.937		2.5		1.44	0.75
	Gross beta	GROSSB		GELC	pCi/L				0.921		3.3	0.979		1.53		0.843	0.285
	Gross gamma	GROSSG		GELC	pCi/L				85		219	84		64		252	66.6
	Plutonium-238	Pu-238		GELC	pCi/L				0.00446		0.0214	0.00316		-2.7E-10		0.0219	0.00323
	Strontium-90	Sr-90		GELC	pCi/L				-0.0487		0.471	0.124		0.134		0.295	0.0884
	Tritium	H-3		UMTL	pCi/L									0.12772		0.28737	0.28737
	Uranium	U		GELC	µg/L				2.3	0.05				2.3	0.05		
	Uranium-234	U-234		GELC	pCi/L				1.5		0.0544	0.109		1.53		0.0481	0.107
	Uranium-238	U-238		GELC	pCi/L				0.826		0.0578	0.068		0.732		0.0512	0.0596

Table B-1.22
Spring 5B

						Start Date Time	07/26/00	07/26/00	07/26/00	07/26/00	07/26/00	07/26/00	07/26/00	07/26/00	07/26/00	07/26/00	10/07/03	10/07/03	10/07/03	10/07/03	10/07/03	10/07/03	10/07/03	10/07/03	10/07/03	10/07/03
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																				
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																					
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	1	1								<	1.45	1.45							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			71.4	1									69.1	1.45							
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L			70.5	1									68.5	1.45							
	Calcium	Ca		GELC	mg/L			17.6	0.0355									16.7	0.00554							
	Chloride	Cl(-1)		GELC	mg/L			3.08	0.026									3.25	0.0322							
	Fluoride	F(-1)		GELC	mg/L			0.485	0.007									0.367	0.0553							
	Magnesium	Mg		GELC	mg/L			4.01	0.00354									3.87	0.00518							
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			1.05	0.009									0.91	0.01							
	Potassium	K		GELC	mg/L			2.05	0.0164									2.11	0.0165							
	Silicon Dioxide	SiO2		GELC	mg/L			66	0.0186									63.2	0.0212							
	Sodium	Na		GELC	mg/L			13.2	0.013									12.8	0.0144							
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																		154.4			
	Sulfate	SO4(-2)		GELC	mg/L			3.8	0.079									3.98	0.193							
	Total Dissolved Solids	TDS		GELC	mg/L			151	6.29									115	3.07							
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<	0.02	0.02																	
	Total Suspended Solids	TSS		GELC	mg/L								11.6	1.4									168	0.688		
	pH	pH	Field	FLD	SU								8.26										8.22			
METALS	Aluminum	Al		GELC	µg/L		<	9.11	23.4								<	14.7	14.7							
	Antimony	Sb		GELC	µg/L		<	0.111	0.111								<	0.28	0.28							
	Arsenic	As		GELC	µg/L		<	2.57	2.57								<	2.24	2.24							
	Barium	Ba		GELC	µg/L			33.2	0.748									38.4	0.222							
	Beryllium	Be		GELC	µg/L		<	0.474	0.474								<	0.158	0.158							
	Boron	B		GELC	µg/L			14.3	4.74								<	14.5	4.88							
	Cadmium	Cd		GELC	µg/L		<	0.631	0.631									0.084	0.04							
	Chromium	Cr		GELC	µg/L			4.8	1.06								<	4.69	0.503							
	Cobalt	Co		GELC	µg/L			3.03	0.627								<	1.17	0.541							
	Copper	Cu		GELC	µg/L		<	1.84	1.84								<	2.75	1.39							
	Iron	Fe		GELC	µg/L		<	19.9	19.9								<	24.8	12.6							
	Lead	Pb		GELC	µg/L		<	1.83	1.83									0.066	0.05							
	Manganese	Mn		GELC	µg/L		<	0.503	1.15									66.1	0.296							
	Mercury	Hg		GELC	µg/L		<	0.06	0.06													<	0.0472	0.0472		
	Nickel	Ni		GELC	µg/L		<	3.09	3.09								<	0.69	0.69							
	Selenium	Se		GELC	µg/L		<	2.36	2.36													<	3.13	2.81		
	Silver	Ag		GELC	µg/L		<	0.529	0.529								<	0.835	0.835							
	Thallium	Tl		GELC	µg/L			0.525	0.014								<	0.02	0.02							
	Tin	Sn		GELC	µg/L		<	1.98	1.98								<	3.26	3.26							
	Vanadium	V		GELC	µg/L			8.96	0.89									9.01	0.606							
	Zinc	Zn		GELC	µg/L		<	1.95	3.89								<	0.883	0.883							
RAD	Americium-241	Am-241		GELC	pCi/L			0.0236		0.0249	0.0102							-3E-10		0.035	0.00351					
	Cesium-137	Cs-137		GELC	pCi/L			0.256		4.18	1.69							3.88		5.18	3.12					
	Gross alpha	GROSSA		GELC	pCi/L			0.106		1.63	0.412							0.969		0.858	0.312					
	Gross beta	GROSSB		GELC	pCi/L			1.15		2.79	0.827							1.18		1.18	0.344					
	Gross gamma	GROSSG		GELC	pCi/L													122		346	152					
	Plutonium-238	Pu-238		GELC	pCi/L			4.37E-10		0.0341	0.00734							0.0023		0.032	0.0023					
	Strontium-90	Sr-90		GELC	pCi/L			0.0817		0.372	0.108							0.0811		0.124	0.0394					
	Tritium	H-3		UMTL	pCi/L																		2.17124	0.28737		0.28737
	Uranium	U		GELC	µg/L													0.811	0.02							
	Uranium-234	U-234		GELC	pCi/L			0.474		0.0989	0.0767							0.529		0.049	0.0475					
	Uranium-238	U-238		GELC	pCi/L			0.231		0.13	0.0529							0.261		0.031	0.0285					

Table B-1.23
Spring 6

						Start Date Time	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/24/02	09/24/02	09/24/02	09/24/02	09/24/02
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	1	1								<	0.725	0.725		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			60.2	1									61	0.725		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L			59.9	1									60.6	0.725		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		EES6	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		EES6	mg/L																
	Calcium	Ca		GELC	mg/L			12.5	0.0355									12.5	0.00554		
	Chloride	Cl(-1)		EES6	mg/L																
	Chloride	Cl(-1)		GELC	mg/L			2.07	0.026									2.17	0.0322		
	Fluoride	F(-1)		EES6	mg/L																
	Fluoride	F(-1)		GELC	mg/L			0.361	0.007									0.326	0.0553		
	Magnesium	Mg		EES6	mg/L																
	Magnesium	Mg		GELC	mg/L			3.53	0.00354									3.72	0.00518		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.39	0.009									0.34	0.01		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		EES6	mg/L																
	Potassium	K		GELC	mg/L			1.92	0.0164									1.99	0.0165		
	Silicon Dioxide	SiO2		EES6	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L			78.1	0.0186									63.5	0.0212		
	Sodium	Na		EES6	mg/L																
	Sodium	Na		GELC	mg/L			11.2	0.013									11.1	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		EES6	mg/L																
	Sulfate	SO4(-2)		GELC	mg/L			2.27	0.079									2.46	0.193		
	Total Dissolved Solids	TDS		GELC	mg/L			126	6.29									136	3.07		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<	0.02	0.02												
	Total Suspended Solids	TSS		GELC	mg/L								2.8	1.4							
	pH	pH	Field	FLD	SU								7.54								
METALS	Aluminum	Al		EES6	µg/L																
	Aluminum	Al		GELC	µg/L		<	15.4	23.4									33.6	14.7		
	Antimony	Sb		EES6	µg/L																
	Antimony	Sb		GELC	µg/L		<	0.111	0.111								<	0.28	0.28		
	Arsenic	As		EES6	µg/L																
	Arsenic	As		GELC	µg/L		<	2.57	2.57								<	2.24	2.24		
	Barium	Ba		EES6	µg/L																
	Barium	Ba		GELC	µg/L			25.3	0.748									25.4	0.222		
	Beryllium	Be		EES6	µg/L																
	Beryllium	Be		GELC	µg/L		<	0.474	0.474								<	0.158	0.158		
	Boron	B		EES6	µg/L																
	Boron	B		GELC	µg/L			6.28	4.74									19.1	4.88		
	Cadmium	Cd		EES6	µg/L																
	Cadmium	Cd		GELC	µg/L		<	0.631	0.631								<	0.04	0.04		
	Chromium	Cr		EES6	µg/L																
	Chromium	Cr		GELC	µg/L			3.35	1.06									3.58	0.503		
	Cobalt	Co		EES6	µg/L																
	Cobalt	Co		GELC	µg/L			7	0.627								<	0.541	0.541		
	Copper	Cu		EES6	µg/L																
	Copper	Cu		GELC	µg/L		<	1.84	1.84								<	1.39	1.39		

Table B-1.23 (continued)

						Start Date Time	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/24/02	09/24/02	09/24/02	09/24/02	09/24/02
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Iron	Fe		EES6	µg/L																
	Iron	Fe		GELC	µg/L		<	19.9	19.9								<	12.6	12.6		
	Lead	Pb		EES6	µg/L																
	Lead	Pb		GELC	µg/L		<	1.83	1.83								<	0.05	0.05		
	Manganese	Mn		EES6	µg/L																
	Manganese	Mn		GELC	µg/L		<	1.15	1.15								<	0.296	0.296		
	Mercury	Hg		EES6	µg/L																
	Mercury	Hg		GELC	µg/L		<	0.06	0.06												
	Nickel	Ni		EES6	µg/L																
	Nickel	Ni		GELC	µg/L		<	1.49	3.09								<	0.69	0.69		
	Selenium	Se		EES6	µg/L																
	Selenium	Se		GELC	µg/L		<	3.65	2.36												
	Silver	Ag		EES6	µg/L																
	Silver	Ag		GELC	µg/L		<	0.529	0.529								<	0.835	0.835		
	Thallium	Tl		EES6	µg/L																
	Thallium	Tl		GELC	µg/L		<	0.019	0.014									0.246	0.02		
	Tin	Sn		EES6	µg/L																
	Tin	Sn		GELC	µg/L		<	1.98	1.98								<	3.26	3.26		
	Vanadium	V		EES6	µg/L																
	Vanadium	V		GELC	µg/L			7.17	0.89									7.47	0.606		
	Zinc	Zn		EES6	µg/L																
	Zinc	Zn		GELC	µg/L		<	1.86	3.89								<	0.883	0.883		
RAD	Americium-241	Am-241		GELC	pCi/L			0.0197		0.00892	0.00814							0.0165		0.045	0.00719
	Cesium-137	Cs-137		GELC	pCi/L			0.346		3.47	1							1.63		4.21	1.12
	Gross alpha	GROSSA		GELC	pCi/L			0.289		1.07	0.293							0.125		2.97	0.695
	Gross beta	GROSSB		GELC	pCi/L			1.47		2.54	0.769							3.84		2.13	0.695
	Gross gamma	GROSSG		GELC	pCi/L													88.4		297	80.2
	Plutonium-238	Pu-238		GELC	pCi/L			0.00382		0.0103	0.00386							0.00234		0.06	0.00406
	Strontium-90	Sr-90		GELC	pCi/L			0.261		0.32	0.0986							-0.0611		0.309	0.0716
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		EES6	µg/L																
	Uranium	U		GELC	µg/L												<	15.6	15.6		
	Uranium-234	U-234		GELC	pCi/L			0.267		0.134	0.0579							0.261		0.042	0.033
	Uranium-238	U-238		GELC	pCi/L			0.0998		0.0699	0.0327							0.0976		0.047	0.0179

Table B-1.23 (continued)

						Start Date Time	09/24/02	09/24/02	09/24/02	09/24/02	09/24/02	03/12/04	03/12/04	03/12/04	03/12/04	03/12/04	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L												<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L													65	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L													64.7	1.45		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		EES6	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		EES6	mg/L																
	Calcium	Ca		GELC	mg/L													11.3	0.00554		
	Chloride	Cl(-1)		EES6	mg/L																
	Chloride	Cl(-1)		GELC	mg/L													2.17	0.0322		
	Fluoride	F(-1)		EES6	mg/L																
	Fluoride	F(-1)		GELC	mg/L													0.371	0.0553		
	Magnesium	Mg		EES6	mg/L																
	Magnesium	Mg		GELC	mg/L													3.58	0.00518		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L													0.385	0.003		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L																
	Perchlorate	ClO4		GELC	µg/L								0.352								
	Potassium	K		EES6	mg/L																
	Potassium	K		GELC	mg/L													1.86	0.0165		
	Silicon Dioxide	SiO2		EES6	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L													69.9	0.0212		
	Sodium	Na		EES6	mg/L																
	Sodium	Na		GELC	mg/L													9.98	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			125.8					133.8								
	Sulfate	SO4(-2)		EES6	mg/L																
	Sulfate	SO4(-2)		GELC	mg/L													2.61	0.193		
	Total Dissolved Solids	TDS		GELC	mg/L													133	3.07		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			7.58					8.1								
METALS	Aluminum	Al		EES6	µg/L																
	Aluminum	Al		GELC	µg/L												<	14.7	14.7		
	Antimony	Sb		EES6	µg/L																
	Antimony	Sb		GELC	µg/L												<	0.28	0.28		
	Arsenic	As		EES6	µg/L																
	Arsenic	As		GELC	µg/L												<	2.24	2.24		
	Barium	Ba		EES6	µg/L																
	Barium	Ba		GELC	µg/L													23.9	0.222		
	Beryllium	Be		EES6	µg/L																
	Beryllium	Be		GELC	µg/L												<	0.158	0.158		
	Boron	B		EES6	µg/L																
	Boron	B		GELC	µg/L												<	18.1	4.88		
	Cadmium	Cd		EES6	µg/L																
	Cadmium	Cd		GELC	µg/L												<	0.04	0.04		
	Chromium	Cr		EES6	µg/L																
	Chromium	Cr		GELC	µg/L													4.4	0.503		
	Cobalt	Co		EES6	µg/L																
	Cobalt	Co		GELC	µg/L												<	0.541	0.541		
	Copper	Cu		EES6	µg/L																
	Copper	Cu		GELC	µg/L												<	1.39	1.39		
	Iron	Fe		EES6	µg/L																
	Iron	Fe		GELC	µg/L												<	12.6	12.6		

Table B-1.23 (continued)

						Start Date Time	09/24/02	09/24/02	09/24/02	09/24/02	09/24/02	03/12/04	03/12/04	03/12/04	03/12/04	03/12/04	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Lead	Pb		EES6	µg/L																
	Lead	Pb		GELC	µg/L												<	0.05	0.05		
	Manganese	Mn		EES6	µg/L																
	Manganese	Mn		GELC	µg/L												<	0.296	0.296		
	Mercury	Hg		EES6	µg/L																
	Mercury	Hg		GELC	µg/L		<	0.0472	0.0472												
	Nickel	Ni		EES6	µg/L																
	Nickel	Ni		GELC	µg/L												<	0.69	0.69		
	Selenium	Se		EES6	µg/L																
	Selenium	Se		GELC	µg/L			2.87	2.81												
	Silver	Ag		EES6	µg/L																
	Silver	Ag		GELC	µg/L												<	0.835	0.835		
	Thallium	Tl		EES6	µg/L																
	Thallium	Tl		GELC	µg/L												<	0.026	0.02		
	Tin	Sn		EES6	µg/L																
	Tin	Sn		GELC	µg/L												<	3.26	3.26		
	Vanadium	V		EES6	µg/L																
	Vanadium	V		GELC	µg/L													7.3	0.606		
	Zinc	Zn		EES6	µg/L																
	Zinc	Zn		GELC	µg/L													5.5	0.883		
RAD	Americium-241	Am-241		GELC	pCi/L													0.00364		0.029	0.00364
	Cesium-137	Cs-137		GELC	pCi/L													-0.699		2.38	0.704
	Gross alpha	GROSSA		GELC	pCi/L													1.37		2.59	0.694
	Gross beta	GROSSB		GELC	pCi/L													0.423		1.23	0.323
	Gross gamma	GROSSG		GELC	pCi/L													85.9		232	89.7
	Plutonium-238	Pu-238		GELC	pCi/L													0.0048		0.037	0.00589
	Strontium-90	Sr-90		GELC	pCi/L													0.0344		0.232	0.0518
	Tritium	H-3		UMTL	pCi/L			1.02176	0.28737		0.28737										
	Uranium	U		EES6	µg/L																
	Uranium	U		GELC	µg/L													0.36	0.02		
	Uranium-234	U-234		GELC	pCi/L													0.256		0.082	0.0361
	Uranium-238	U-238		GELC	pCi/L													0.151		0.058	0.0267

Table B-1.23 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
						Start Date Time	09/24/02	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04	03/24/05	03/24/05	03/24/05	03/24/05	03/24/05	04/29/05	04/29/05	04/29/05	04/29/05	04/29/05
						Fld Prep Code	UF	UF	UF	UF	UF	UF	F	F	F	F	F	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																	
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L									60.5	1				61	1		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																	
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																	
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																	
	Bromide	Br(-1)		EES6	mg/L									0.02	0.01				0.03	0.01		
	Bromide	Br(-1)		GELC	mg/L																	
	Calcium	Ca		EES6	mg/L									11.9	0.01		0.1		12	0.01		0.1
	Calcium	Ca		GELC	mg/L																	
	Chloride	Cl(-1)		EES6	mg/L									2.23	0.01				2.29	0.01		
	Chloride	Cl(-1)		GELC	mg/L																	
	Fluoride	F(-1)		EES6	mg/L									0.32	0.01				0.31	0.01		
	Fluoride	F(-1)		GELC	mg/L																	
	Magnesium	Mg		EES6	mg/L									2.79	0.01				2.9	0.01		0.01
	Magnesium	Mg		GELC	mg/L																	
	Nitrate as Nitrogen	NO3-N		EES6	mg/L									0.39	0.003				0.43	0.003		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																	
	Nitrite as Nitrogen	NO2-N		EES6	mg/L								<	0.003	0.003			<	0.003	0.003		
	Perchlorate	ClO4		GELC	µg/L				0.349	0.05												
	Potassium	K		EES6	mg/L									1.53	0.01				1.54	0.01		0.01
	Potassium	K		GELC	mg/L																	
	Silicon Dioxide	SiO2		EES6	mg/L									33	10		0.1		34	10		0.1
	Silicon Dioxide	SiO2		GELC	mg/L																	
	Sodium	Na		EES6	mg/L									9.37	0.01		0.09		9.98	0.01		0.02
	Sodium	Na		GELC	mg/L																	
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm				133					128.8					133.7			
	Sulfate	SO4(-2)		EES6	mg/L									2.53	0.01				2.47	0.01		
	Sulfate	SO4(-2)		GELC	mg/L																	
	Total Dissolved Solids	TDS		GELC	mg/L																	
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																	
	Total Organic Carbon	TOC		GELC	mg/L																	
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L									0.03912	0.003				0.01956	0.003		
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																	
	Total Suspended Solids	TSS		GELC	mg/L			<	1.53	1.53												
	pH	pH	Field	FLD	SU				7.68					6.43					7.74			
METALS	Aluminum	Al		EES6	µg/L								<	2	2				7	2		
	Aluminum	Al		GELC	µg/L																	
	Antimony	Sb		EES6	µg/L								<	1	1			<	1	1		
	Antimony	Sb		GELC	µg/L																	
	Arsenic	As		EES6	µg/L									0.8	0.2				0.8	0.2		
	Arsenic	As		GELC	µg/L																	
	Barium	Ba		EES6	µg/L									24	1				18	1		1
	Barium	Ba		GELC	µg/L																	
	Beryllium	Be		EES6	µg/L								<	1	1			<	1	1		
	Beryllium	Be		GELC	µg/L																	
	Boron	B		EES6	µg/L									15	1		1		34	1		1
	Boron	B		GELC	µg/L																	
	Cadmium	Cd		EES6	µg/L								<	1	1			<	1	1		
	Cadmium	Cd		GELC	µg/L																	
	Chromium	Cr		EES6	µg/L									4.7	1		0.2		4	1		0.1
	Chromium	Cr		GELC	µg/L																	
	Cobalt	Co		EES6	µg/L								<	1	1			<	1	1		
	Cobalt	Co		GELC	µg/L																	
	Copper	Cu		EES6	µg/L									1.1	1				2.1	1		
	Copper	Cu		GELC	µg/L																	
	Iron	Fe		EES6	µg/L								<	10	10			<	10	10		
	Iron	Fe		GELC	µg/L																	

Table B-1.23 (continued)

						Start Date Time	09/24/02	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04	03/24/05	03/24/05	03/24/05	03/24/05	03/24/05	04/29/05	04/29/05	04/29/05	04/29/05	04/29/05
						Fld Prep Code	UF	UF	UF	UF	UF	UF	F	F	F	F	F	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																	
METALS (cont.)	Lead	Pb		EES6	µg/L								<	0.2	0.2			<	0.2	0.2		
	Lead	Pb		GELC	µg/L																	
	Manganese	Mn		EES6	µg/L								<	1	1			<	1	1		
	Manganese	Mn		GELC	µg/L																	
	Mercury	Hg		EES6	µg/L								<	0.05	0.05			<	0.05	0.05		
	Mercury	Hg		GELC	µg/L		<	<	0.0472	0.0472												
	Nickel	Ni		EES6	µg/L								<	1	1				50	1		1
	Nickel	Ni		GELC	µg/L																	
	Selenium	Se		EES6	µg/L								<	1	1			<	1	1		
	Selenium	Se		GELC	µg/L			<	2.81	2.81												
	Silver	Ag		EES6	µg/L								<	1	1			<	1	1		
	Silver	Ag		GELC	µg/L																	
	Thallium	Tl		EES6	µg/L								<	1	1			<	1	1		
	Thallium	Tl		GELC	µg/L																	
	Tin	Sn		EES6	µg/L								<	1	1			<	1	1		
	Tin	Sn		GELC	µg/L																	
	Vanadium	V		EES6	µg/L									9	1				8	1		
	Vanadium	V		GELC	µg/L																	
	Zinc	Zn		EES6	µg/L								<	1	1				32	1		1
	Zinc	Zn		GELC	µg/L																	
RAD	Americium-241	Am-241		GELC	pCi/L																	
	Cesium-137	Cs-137		GELC	pCi/L																	
	Gross alpha	GROSSA		GELC	pCi/L																	
	Gross beta	GROSSB		GELC	pCi/L																	
	Gross gamma	GROSSG		GELC	pCi/L																	
	Plutonium-238	Pu-238		GELC	pCi/L																	
	Strontium-90	Sr-90		GELC	pCi/L																	
	Tritium	H-3		UMTL	pCi/L				0.86211	0.28737		0.28737										
	Uranium	U		EES6	µg/L									0.4	0.2				0.4	0.2		
	Uranium	U		GELC	µg/L																	
	Uranium-234	U-234		GELC	pCi/L																	
	Uranium-238	U-238		GELC	pCi/L																	

Table B-1.23 (continued)

						Start Date Time	07/25/05	07/25/05	07/25/05	07/25/05	07/25/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05
						Fld Prep Code	F	F	F	F	F	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L							<	1.45	1.45							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L			62.2	1												
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L								55.1	1.45							
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L							<	0.04	0.04							
	Bromide	Br(-1)		EES6	mg/L			0.03	0.01												
	Bromide	Br(-1)		GELC	mg/L							<	0.041	0.041							
	Calcium	Ca		EES6	mg/L			11.4	0.01		0.2										
	Calcium	Ca		GELC	mg/L								11.8	0.036				11.5	0.036		
	Chloride	Cl(-1)		EES6	mg/L			2.14	0.01												
	Chloride	Cl(-1)		GELC	mg/L								2.14	0.053							
	Fluoride	F(-1)		EES6	mg/L			0.3	0.01												
	Fluoride	F(-1)		GELC	mg/L								0.343	0.03							
	Magnesium	Mg		EES6	mg/L			3.48	0.01		0.04										
	Magnesium	Mg		GELC	mg/L								3.55	0.085				3.43	0.085		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L			0.42	0.003												
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L								0.34	0.017							
	Nitrite as Nitrogen	NO2-N		EES6	mg/L		<	0.003	0.003												
	Perchlorate	ClO4		GELC	µg/L								0.311	0.05							
	Potassium	K		EES6	mg/L			2.01	0.01		0.01										
	Potassium	K		GELC	mg/L								1.88	0.05				1.79	0.05		
	Silicon Dioxide	SiO2		EES6	mg/L			33.7	10		0.3										
	Silicon Dioxide	SiO2		GELC	mg/L								73.8	0.032				72.4	0.032		
	Sodium	Na		EES6	mg/L			10.2	0.01		0.2										
	Sodium	Na		GELC	mg/L								10.7	0.045				10.4	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm													131.3			
	Sulfate	SO4(-2)		EES6	mg/L			2.49	0.01												
	Sulfate	SO4(-2)		GELC	mg/L								2.56	0.057							
	Total Dissolved Solids	TDS		GELC	mg/L								141	2.38							
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L							<	0.244	0.04							
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L			0.01956	0.003												
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L							<	0.183	0.01							
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU													7.41			
METALS	Aluminum	Al		EES6	µg/L		<	2	2												
	Aluminum	Al		GELC	µg/L							<	68	68			<	68	68		
	Antimony	Sb		EES6	µg/L		<	1	1												
	Antimony	Sb		GELC	µg/L							<	0.5	0.5			<	0.5	0.5		
	Arsenic	As		EES6	µg/L			0.9	0.2												
	Arsenic	As		GELC	µg/L							<	6	6			<	6	6		
	Barium	Ba		EES6	µg/L			23	1												
	Barium	Ba		GELC	µg/L								24.6	1				23.9	1		
	Beryllium	Be		EES6	µg/L		<	1	1												
	Beryllium	Be		GELC	µg/L							<	1	1			<	1	1		
	Boron	B		EES6	µg/L			13	1												
	Boron	B		GELC	µg/L								14.2	10				12.9	10		
	Cadmium	Cd		EES6	µg/L		<	1	1												
	Cadmium	Cd		GELC	µg/L							<	0.1	0.1			<	0.1	0.1		
	Chromium	Cr		EES6	µg/L			3.5	1												
	Chromium	Cr		GELC	µg/L								4.1	1				4.1	1		
	Cobalt	Co		EES6	µg/L		<	1	1												
	Cobalt	Co		GELC	µg/L							<	1	1			<	1	1		
	Copper	Cu		EES6	µg/L		<	1	1												
	Copper	Cu		GELC	µg/L							<	3	3			<	3	3		
	Iron	Fe		EES6	µg/L		<	10	10												
	Iron	Fe		GELC	µg/L							<	18	18			<	18	18		

Table B-1.23 (continued)

						Start Date Time	07/25/05	07/25/05	07/25/05	07/25/05	07/25/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05
						Fld Prep Code	F	F	F	F	F	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Lead	Pb		EES6	µg/L		<	0.2	0.2												
	Lead	Pb		GELC	µg/L							<	0.5	0.5			<	0.5	0.5		
	Manganese	Mn		EES6	µg/L		<	1	1												
	Manganese	Mn		GELC	µg/L							<	2	2			<	2	2		
	Mercury	Hg		EES6	µg/L		<	0.05	0.05												
	Mercury	Hg		GELC	µg/L							<	0.05	0.05			<	0.05	0.05		
	Nickel	Ni		EES6	µg/L		<	1	1												
	Nickel	Ni		GELC	µg/L							<	0.5	0.5			<	0.5	0.5		
	Selenium	Se		EES6	µg/L		<	1	1												
	Selenium	Se		GELC	µg/L							<	2.5	2.5			<	2.5	2.5		
	Silver	Ag		EES6	µg/L		<	1	1												
	Silver	Ag		GELC	µg/L							<	0.2	0.2			<	0.2	0.2		
	Thallium	Tl		EES6	µg/L		<	1	1												
	Thallium	Tl		GELC	µg/L							<	0.4	0.4			<	0.4	0.4		
	Tin	Sn		EES6	µg/L		<	1	1												
	Tin	Sn		GELC	µg/L							<	2.5	2.5			<	2.5	2.5		
	Vanadium	V		EES6	µg/L			7	1												
	Vanadium	V		GELC	µg/L								7.3	1				6.9	1		
	Zinc	Zn		EES6	µg/L			1	1												
	Zinc	Zn		GELC	µg/L							<	2	2			<	2	2		
RAD	Americium-241	Am-241		GELC	pCi/L								0.00814		0.0467	0.0158		-0.0174		0.0427	0.012
	Cesium-137	Cs-137		GELC	pCi/L								-0.602		3.45	0.988		1.05		4.41	1.2
	Gross alpha	GROSSA		GELC	pCi/L								0.337		1.31	0.317		0.576		3	0.661
	Gross beta	GROSSB		GELC	pCi/L								1.6		1.38	0.451		1.76		1.74	0.542
	Gross gamma	GROSSG		GELC	pCi/L								76.2		285	286		92.8		378	90.2
	Plutonium-238	Pu-238		GELC	pCi/L								-0.0025		0.0519	0.0135		-0.00771		0.0534	0.00681
	Strontium-90	Sr-90		GELC	pCi/L								-0.0222		0.387	0.077		0.0435		0.375	0.0801
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		EES6	µg/L			0.4	0.2												
	Uranium	U		GELC	µg/L								0.33	0.05				0.33	0.05		
	Uranium-234	U-234		GELC	pCi/L								0.237		0.0744	0.0275		0.261		0.0885	0.0307
	Uranium-238	U-238		GELC	pCi/L								0.0903		0.0527	0.0166		0.11		0.0627	0.0204

Table B-1.23 (continued)

						Start Date Time	07/25/05	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06
						Fld Prep Code	F	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code											
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom												
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L			<	0.725	0.725			<	0.725	0.725		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L												
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L				61.1	0.725				61.1	0.725		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L												
	Ammonia as Nitrogen	NH3-N		GELC	mg/L			<	0.01	0.01			<	0.01	0.01		
	Bromide	Br(-1)		EES6	mg/L												
	Bromide	Br(-1)		GELC	mg/L			<	0.066	0.066			<	0.066	0.066		
	Calcium	Ca		EES6	mg/L												
	Calcium	Ca		GELC	mg/L				11.7	0.036				11.9	0.036		
	Chloride	Cl(-1)		EES6	mg/L												
	Chloride	Cl(-1)		GELC	mg/L				2.12	0.066				2.07	0.066		
	Fluoride	F(-1)		EES6	mg/L												
	Fluoride	F(-1)		GELC	mg/L			<	0.376	0.033			<	0.418	0.033		
	Magnesium	Mg		EES6	mg/L												
	Magnesium	Mg		GELC	mg/L				3.43	0.085				3.5	0.085		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L												
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L				0.367	0.014				0.359	0.014		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L		<										
	Perchlorate	ClO4		GELC	µg/L				0.277	0.05							
	Potassium	K		EES6	mg/L												
	Potassium	K		GELC	mg/L				1.96	0.05				1.96	0.05		
	Silicon Dioxide	SiO2		EES6	mg/L												
	Silicon Dioxide	SiO2		GELC	mg/L				71.9	0.032				74.5	0.032		
	Sodium	Na		EES6	mg/L												
	Sodium	Na		GELC	mg/L				10.1	0.045				10.2	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm									130.9			
	Sulfate	SO4(-2)		EES6	mg/L												
	Sulfate	SO4(-2)		GELC	mg/L				2.39	0.1				2.34	0.1		
	Total Dissolved Solids	TDS		GELC	mg/L				146	2.38				152	2.38		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L			<	0.01	0.01			<	0.01	0.01		
	Total Organic Carbon	TOC		GELC	mg/L								<	0.609	0.33		
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L												
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L			<	0.01	0.01			<	0.01	0.01		
	Total Suspended Solids	TSS		GELC	mg/L												
	pH	pH	Field	FLD	SU									7.68			
METALS	Aluminum	Al		EES6	µg/L		<										
	Aluminum	Al		GELC	µg/L			<	68	68			<	68	68		
	Antimony	Sb		EES6	µg/L		<										
	Antimony	Sb		GELC	µg/L			<	0.5	0.5			<	0.5	0.5		
	Arsenic	As		EES6	µg/L												
	Arsenic	As		GELC	µg/L			<	6	6			<	6	6		
	Barium	Ba		EES6	µg/L												
	Barium	Ba		GELC	µg/L				24.9	1				25.7	1		
	Beryllium	Be		EES6	µg/L		<										
	Beryllium	Be		GELC	µg/L			<	1	1			<	1	1		
	Boron	B		EES6	µg/L												
	Boron	B		GELC	µg/L				15.2	10				14.2	10		
	Cadmium	Cd		EES6	µg/L		<										
	Cadmium	Cd		GELC	µg/L			<	0.1	0.1			<	0.1	0.1		
	Chromium	Cr		EES6	µg/L												
	Chromium	Cr		GELC	µg/L				3.1	1				3.8	1		
	Cobalt	Co		EES6	µg/L		<										
	Cobalt	Co		GELC	µg/L			<	1	1			<	1	1		
	Copper	Cu		EES6	µg/L		<										
	Copper	Cu		GELC	µg/L			<	3	3			<	3	3		
	Iron	Fe		EES6	µg/L		<										
	Iron	Fe		GELC	µg/L			<	18	18			<	18	18		
	Lead	Pb		EES6	µg/L		<										

Table B-1.23 (continued)

						Start Date Time	07/25/05	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06
						Fld Prep Code	F	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code											
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom												
METALS (cont.)	Lead	Pb		GELC	µg/L			<	0.5	0.5			<	0.5	0.5		
	Manganese	Mn		EES6	µg/L		<										
	Manganese	Mn		GELC	µg/L			<	2	2			<	2	2		
	Mercury	Hg		EES6	µg/L		<										
	Mercury	Hg		GELC	µg/L			<	0.06	0.06			<	0.06	0.06		
	Nickel	Ni		EES6	µg/L		<										
	Nickel	Ni		GELC	µg/L			<	0.5	0.5			<	0.5	0.5		
	Selenium	Se		EES6	µg/L		<										
	Selenium	Se		GELC	µg/L			<	2.5	2.5			<	2.5	2.5		
	Silver	Ag		EES6	µg/L		<										
	Silver	Ag		GELC	µg/L			<	0.2	0.2			<	0.2	0.2		
	Thallium	Tl		EES6	µg/L		<										
	Thallium	Tl		GELC	µg/L			<	0.4	0.4			<	0.4	0.4		
	Tin	Sn		EES6	µg/L		<										
	Tin	Sn		GELC	µg/L			<	2.5	2.5			<	2.5	2.5		
	Vanadium	V		EES6	µg/L												
	Vanadium	V		GELC	µg/L				6.7	1				6.5	1		
	Zinc	Zn		EES6	µg/L												
	Zinc	Zn		GELC	µg/L			<	3.7	2			<	8.1	2		
RAD	Americium-241	Am-241		GELC	pCi/L				0.0075		0.0433	0.00679		-0.00785		0.0472	0.0161
	Cesium-137	Cs-137		GELC	pCi/L				-0.558		4.12	1.15		1.7		4.74	1.23
	Gross alpha	GROSSA		GELC	pCi/L				0.403		2.53	0.687		-0.527		1.85	0.337
	Gross beta	GROSSB		GELC	pCi/L				0.601		3.14	0.906		2.13		2.5	0.79
	Gross gamma	GROSSG		GELC	pCi/L				90.3		377	89.6		101		378	78.3
	Plutonium-238	Pu-238		GELC	pCi/L				-0.00265		0.0255	0.0046		0.00533		0.0256	0.0119
	Strontium-90	Sr-90		GELC	pCi/L				0.00494		0.377	0.0987		-0.0485		0.307	0.0731
	Tritium	H-3		UMTL	pCi/L												
	Uranium	U		EES6	µg/L												
	Uranium	U		GELC	µg/L				0.27	0.05				0.28	0.05		
	Uranium-234	U-234		GELC	pCi/L				0.22		0.0478	0.0284		0.246		0.0504	0.0291
	Uranium-238	U-238		GELC	pCi/L				0.0871		0.0508	0.0173		0.106		0.0536	0.0188

Table B-1.24
Spring 6A

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	09/25/01	09/25/01	09/25/01	09/25/01	09/25/01	09/25/01	09/25/01	09/25/01	09/25/01	09/25/01	10/07/03	10/07/03	10/07/03	10/07/03	10/07/03
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L							<	0.725	0.725			<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L								81.2	0.725				53.1	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L								81	0.725				52.9	1.45		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L								11.7	0.0375				11.6	0.00554		
	Chloride	Cl(-1)		GELC	mg/L								2.15	0.025				2.1	0.0322		
	Fluoride	F(-1)		GELC	mg/L								0.39	0.006				0.259	0.0553		
	Magnesium	Mg		GELC	mg/L								2.58	0.00449				2.68	0.00518		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L								0.38	0.0069				0.37	0.01		
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L								1.89	0.00707				1.93	0.0165		
	Silicon Dioxide	SiO2		GELC	mg/L								78.9	0.284				76.9	0.0212		
	Sodium	Na		GELC	mg/L								11.4	0.00813				11.8	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			132.7													
	Sulfate	SO4(-2)		GELC	mg/L								2.72	0.062				2.47	0.193		
	Total Dissolved Solids	TDS		GELC	mg/L								149	5.09				123	3.07		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L			117	0.659												
	pH	pH	Field	FLD	SU			6.89													
METALS	Aluminum	Al		GELC	µg/L							<	34.3	34.3			<	14.7	14.7		
	Antimony	Sb		GELC	µg/L							<	0.06	0.111			<	0.28	0.28		
	Arsenic	As		GELC	µg/L							<	4.57	4.57			<	2.24	2.24		
	Barium	Ba		GELC	µg/L								20.3	0.206				17.4	0.222		
	Beryllium	Be		GELC	µg/L							<	0.203	0.203			<	0.158	0.158		
	Boron	B		GELC	µg/L								13	2.95			<	14.4	4.88		
	Cadmium	Cd		GELC	µg/L								0.281	0.301			<	0.04	0.04		
	Chromium	Cr		GELC	µg/L							<	3.73	0.781			<	2.68	0.503		
	Cobalt	Co		GELC	µg/L							<	0.295	0.295			<	1.03	0.541		
	Copper	Cu		GELC	µg/L							<	2.67	2.67			<	2.79	1.39		
	Iron	Fe		GELC	µg/L							<	20.6	20.6			<	12.6	12.6		
	Lead	Pb		GELC	µg/L							<	0.077	0.077			<	0.05	0.05		
	Manganese	Mn		GELC	µg/L							<	2.94	2.94				2.73	0.296		
	Mercury	Hg		GELC	µg/L		<	0.073	0.073												
	Nickel	Ni		GELC	µg/L							<	0.743	0.743			<	1.04	0.69		
	Selenium	Se		GELC	µg/L		<	3.09	3.09												
	Silver	Ag		GELC	µg/L							<	0.197	0.197			<	0.835	0.835		
	Thallium	Tl		GELC	µg/L							<	0.014	0.014			<	0.02	0.02		
	Tin	Sn		GELC	µg/L							<	4.5	2.4			<	3.26	3.26		
	Vanadium	V		GELC	µg/L								10.3	1.09				11.1	0.606		
	Zinc	Zn		GELC	µg/L							<	0.798	2.81			<	0.883	0.883		
RAD	Americium-241	Am-241		GELC	pCi/L								0.0216		0.00838	0.00827		0.00616		0.029	0.00544
	Cesium-137	Cs-137		GELC	pCi/L								1.14		3.23	0.885		4.13		9.29	2.38
	Gross alpha	GROSSA		GELC	pCi/L								0.491		1.68	0.44		0.738		1.09	0.326
	Gross beta	GROSSB		GELC	pCi/L								2.86		1.21	0.423		2.25		1.23	0.395
	Gross gamma	GROSSG		GELC	pCi/L													112		444	410
	Plutonium-238	Pu-238		GELC	pCi/L								0.00803		0.0197	0.006		-0.00798		0.037	0.00462
	Strontium-90	Sr-90		GELC	pCi/L								0.0883		0.297	0.0789		0.0011		0.271	0.0585
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		GELC	µg/L													0.855	0.02		
	Uranium-234	U-234		GELC	pCi/L								0.592		0.0733	0.0747		0.413		0.05	0.0403
	Uranium-238	U-238		GELC	pCi/L								0.284		0.0449	0.0467		0.241		0.032	0.0277

Table B-1.24 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	10/07/03	10/07/03	10/07/03	10/07/03	10/07/03	03/12/04	03/12/04	03/12/04	03/12/04	03/12/04	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L												<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L													62.9	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L													62.8	1.45		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L													10	0.00554		
	Chloride	Cl(-1)		GELC	mg/L													2.1	0.0322		
	Fluoride	F(-1)		GELC	mg/L													0.364	0.0553		
	Magnesium	Mg		GELC	mg/L													2.61	0.00518		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L													0.407	0.003		
	Perchlorate	ClO4		GELC	µg/L								0.293								
	Potassium	K		GELC	mg/L													1.68	0.0165		
	Silicon Dioxide	SiO2		GELC	mg/L													69.7	0.0212		
	Sodium	Na		GELC	mg/L													9.57	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			129.3					136.8								
	Sulfate	SO4(-2)		GELC	mg/L													2.54	0.193		
	Total Dissolved Solids	TDS		GELC	mg/L													134	3.07		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L			80.2	0.688												
	pH	pH	Field	FLD	SU			7.35					7.6								
METALS	Aluminum	Al		GELC	µg/L												<	14.7	14.7		
	Antimony	Sb		GELC	µg/L												<	0.28	0.28		
	Arsenic	As		GELC	µg/L												<	2.24	2.24		
	Barium	Ba		GELC	µg/L													15.6	0.222		
	Beryllium	Be		GELC	µg/L												<	0.158	0.158		
	Boron	B		GELC	µg/L												<	16.1	4.88		
	Cadmium	Cd		GELC	µg/L												<	0.04	0.04		
	Chromium	Cr		GELC	µg/L													3.8	0.503		
	Cobalt	Co		GELC	µg/L												<	0.541	0.541		
	Copper	Cu		GELC	µg/L												<	1.39	1.39		
	Iron	Fe		GELC	µg/L												<	12.6	12.6		
	Lead	Pb		GELC	µg/L												<	0.05	0.05		
	Manganese	Mn		GELC	µg/L													0.77	0.296		
	Mercury	Hg		GELC	µg/L		<	0.0472	0.0472												
	Nickel	Ni		GELC	µg/L												<	0.69	0.69		
	Selenium	Se		GELC	µg/L		<	2.81	2.81												
	Silver	Ag		GELC	µg/L												<	0.835	0.835		
	Thallium	Tl		GELC	µg/L												<	0.02	0.02		
	Tin	Sn		GELC	µg/L												<	3.26	3.26		
	Vanadium	V		GELC	µg/L													8.2	0.606		
	Zinc	Zn		GELC	µg/L													4.3	0.883		
RAD	Americium-241	Am-241		GELC	pCi/L													0.00356		0.056	0.0128
	Cesium-137	Cs-137		GELC	pCi/L													-0.768		2.85	0.827
	Gross alpha	GROSSA		GELC	pCi/L													0.78		1.92	0.514
	Gross beta	GROSSB		GELC	pCi/L													1.08		1.32	0.372
	Gross gamma	GROSSG		GELC	pCi/L													67.4		219	39.5
	Plutonium-238	Pu-238		GELC	pCi/L													-0.0091		0.035	0.00509
	Strontium-90	Sr-90		GELC	pCi/L													-0.0047		0.16	0.0404
	Tritium	H-3		UMTL	pCi/L			-0.12772	0.28737		0.28737										
	Uranium	U		GELC	µg/L													0.71	0.02		
	Uranium-234	U-234		GELC	pCi/L													0.484		0.069	0.0434
	Uranium-238	U-238		GELC	pCi/L													0.228		0.049	0.0264

Table B-1.24 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom															
						Start Date Time	10/07/03	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05	09/27/05
						Fld Prep Code	UF	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code														
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L								<	1.45	1.45					
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L									68.2	1.45					
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L															
	Ammonia as Nitrogen	NH3-N		GELC	mg/L								<	0.01	0.01					
	Bromide	Br(-1)		GELC	mg/L								<	0.041	0.041					
	Calcium	Ca		GELC	mg/L									13	0.036				13.1	0.036
	Chloride	Cl(-1)		GELC	mg/L									2.62	0.053					
	Fluoride	F(-1)		GELC	mg/L									0.416	0.03					
	Magnesium	Mg		GELC	mg/L									2.8	0.085				2.8	0.085
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L									0.307	0.017					
	Perchlorate	ClO4		GELC	µg/L				0.323	0.05				0.306	0.05					
	Potassium	K		GELC	mg/L									1.98	0.05				2.02	0.05
	Silicon Dioxide	SiO2		GELC	mg/L									71	0.032				70.7	0.032
	Sodium	Na		GELC	mg/L									17.8	0.045				17.9	0.045
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm				118.2										155	
	Sulfate	SO4(-2)		GELC	mg/L									4.02	0.057					
	Total Dissolved Solids	TDS		GELC	mg/L									173	2.38					
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L								<	0.288	0.04					
	Total Organic Carbon	TOC		GELC	mg/L															
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L								<	0.126	0.01					
	Total Suspended Solids	TSS		GELC	mg/L				6	1.53										
	pH	pH	Field	FLD	SU				7.49										6.58	
METALS	Aluminum	Al		GELC	µg/L								<	68	68			<	68	68
	Antimony	Sb		GELC	µg/L								<	0.5	0.5			<	0.5	0.5
	Arsenic	As		GELC	µg/L								<	6	6			<	6	6
	Barium	Ba		GELC	µg/L									21.9	1				22.4	1
	Beryllium	Be		GELC	µg/L								<	1	1			<	1	1
	Boron	B		GELC	µg/L									19.8	10				19.4	10
	Cadmium	Cd		GELC	µg/L								<	0.1	0.1			<	0.1	0.1
	Chromium	Cr		GELC	µg/L									3.6	1				4	1
	Cobalt	Co		GELC	µg/L								<	1	1			<	1	1
	Copper	Cu		GELC	µg/L								<	3	3			<	3	3
	Iron	Fe		GELC	µg/L								<	18	18				23.2	18
	Lead	Pb		GELC	µg/L								<	0.5	0.5			<	0.5	0.5
	Manganese	Mn		GELC	µg/L								<	2	2			<	2	2
	Mercury	Hg		GELC	µg/L		<	<	0.0472	0.0472			<	0.05	0.05			<	0.05	0.05
	Nickel	Ni		GELC	µg/L								<	0.5	0.5			<	0.5	0.5
	Selenium	Se		GELC	µg/L		<	<	2.81	2.81			<	2.5	2.5			<	2.5	2.5
	Silver	Ag		GELC	µg/L								<	0.2	0.2			<	0.2	0.2
	Thallium	Tl		GELC	µg/L								<	0.4	0.4			<	0.4	0.4
	Tin	Sn		GELC	µg/L								<	2.5	2.5			<	2.5	2.5
	Vanadium	V		GELC	µg/L									10.3	1				10.3	1
	Zinc	Zn		GELC	µg/L								<	2	2			<	2	2
RAD	Americium-241	Am-241		GELC	pCi/L									0.00893		0.041	0.0126		0.00534	
	Cesium-137	Cs-137		GELC	pCi/L									-0.0787		3.93	1.25		-0.0447	
	Gross alpha	GROSSA		GELC	pCi/L									0.267		2.28	0.494		-0.148	
	Gross beta	GROSSB		GELC	pCi/L									1.79		1.5	0.474		1.35	
	Gross gamma	GROSSG		GELC	pCi/L									103		443	97		81.9	
	Plutonium-238	Pu-238		GELC	pCi/L									-0.00798		0.0552	0.0122		0.0145	
	Strontium-90	Sr-90		GELC	pCi/L									0.0322		0.372	0.0786		0.177	
	Tritium	H-3		UMTL	pCi/L				-0.09579	0.28737		0.28737								
	Uranium	U		GELC	µg/L									0.93	0.05				0.98	0.05
	Uranium-234	U-234		GELC	pCi/L									0.669		0.0861	0.0555		0.581	
	Uranium-238	U-238		GELC	pCi/L									0.33		0.0609	0.0358		0.321	

Table B-1.24 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom													
						Start Date Time	09/27/05	09/27/05	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06
						Fld Prep Code	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code												
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L				<	0.725	0.725			<	0.725	0.725		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L					64.2	0.725				63.2	0.725		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L													
	Ammonia as Nitrogen	NH3-N		GELC	mg/L				<	0.01	0.01			<	0.01	0.01		
	Bromide	Br(-1)		GELC	mg/L				<	0.066	0.066			<	0.066	0.066		
	Calcium	Ca		GELC	mg/L					11.9	0.036				11.8	0.036		
	Chloride	Cl(-1)		GELC	mg/L					2.2	0.066				2.16	0.066		
	Fluoride	F(-1)		GELC	mg/L				<	0.436	0.033			<	0.457	0.033		
	Magnesium	Mg		GELC	mg/L					2.41	0.085				2.37	0.085		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L				<	0.151	0.014			<	0.144	0.014		
	Perchlorate	ClO4		GELC	µg/L					0.283	0.05							
	Potassium	K		GELC	mg/L					1.93	0.05				1.85	0.05		
	Silicon Dioxide	SiO2		GELC	mg/L					73.5	0.032				73.3	0.032		
	Sodium	Na		GELC	mg/L					13.2	0.045				13.3	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm										133.8			
	Sulfate	SO4(-2)		GELC	mg/L					2.83	0.1				2.75	0.1		
	Total Dissolved Solids	TDS		GELC	mg/L					147	2.38				157	2.38		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L				<	0.01	0.01			<	0.01	0.01		
	Total Organic Carbon	TOC		GELC	mg/L									<	0.478	0.33		
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L				<	0.01	0.01			<	0.01	0.01		
	Total Suspended Solids	TSS		GELC	mg/L													
	pH	pH	Field	FLD	SU										7.1			
METALS	Aluminum	Al		GELC	µg/L				<	68	68			<	68	68		
	Antimony	Sb		GELC	µg/L				<	0.5	0.5			<	0.5	0.5		
	Arsenic	As		GELC	µg/L				<	6	6			<	6	6		
	Barium	Ba		GELC	µg/L					19.5	1				20.4	1		
	Beryllium	Be		GELC	µg/L				<	1	1			<	1	1		
	Boron	B		GELC	µg/L					18.9	10				16.6	10		
	Cadmium	Cd		GELC	µg/L				<	0.1	0.1			<	0.1	0.1		
	Chromium	Cr		GELC	µg/L					2	1				3.2	1		
	Cobalt	Co		GELC	µg/L				<	1	1			<	1	1		
	Copper	Cu		GELC	µg/L				<	3	3			<	3	3		
	Iron	Fe		GELC	µg/L				<	18	18				29.6	18		
	Lead	Pb		GELC	µg/L				<	0.5	0.5			<	0.5	0.5		
	Manganese	Mn		GELC	µg/L				<	2	2			<	2	2		
	Mercury	Hg		GELC	µg/L				<	0.06	0.06			<	0.06	0.06		
	Nickel	Ni		GELC	µg/L				<	0.5	0.5			<	0.5	0.5		
	Selenium	Se		GELC	µg/L				<	2.5	2.5			<	2.5	2.5		
	Silver	Ag		GELC	µg/L				<	0.2	0.2			<	0.2	0.2		
	Thallium	Tl		GELC	µg/L				<	0.55	0.4			<	0.4	0.4		
	Tin	Sn		GELC	µg/L				<	2.5	2.5			<	2.5	2.5		
	Vanadium	V		GELC	µg/L					10.9	1				10.9	1		
	Zinc	Zn		GELC	µg/L				<	7.3	2			<	4.2	2		
RAD	Americium-241	Am-241		GELC	pCi/L		0.0378	0.0173		-0.00743		0.0539	0.00676		-0.0182		0.0524	0.0165
	Cesium-137	Cs-137		GELC	pCi/L		3.54	0.986		-0.911		3.86	1.12		-2.76		3.32	1.1
	Gross alpha	GROSSA		GELC	pCi/L		3.08	0.638		0.984		2.44	0.719		1.62		2.6	0.82
	Gross beta	GROSSB		GELC	pCi/L		1.63	0.503		1.76		2.51	0.788		3.1		2.81	0.942
	Gross gamma	GROSSG		GELC	pCi/L		321	72.9		99.9		336	96.6		95.3		318	66.5
	Plutonium-238	Pu-238		GELC	pCi/L		0.0501	0.0118		-0.00677		0.0325	0.0239		0.00498		0.0239	0.0137
	Strontium-90	Sr-90		GELC	pCi/L		0.38	0.0925		-0.105		0.286	0.0618		0.101		0.302	0.087
	Tritium	H-3		UMTL	pCi/L													
	Uranium	U		GELC	µg/L					0.58	0.05				0.65	0.05		
	Uranium-234	U-234		GELC	pCi/L		0.0741	0.0482		0.395		0.0502	0.042		0.467		0.0516	0.044
	Uranium-238	U-238		GELC	pCi/L		0.0525	0.0321		0.197		0.0534	0.0273		0.203		0.0549	0.0265

Table B-1.25
Spring 8A

						Start Date Time	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	09/26/00	10/07/03	10/07/03	10/07/03	10/07/03	10/07/03
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom		Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	1	1								<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			74.5	1									60.1	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L			74.3	1									59.6	1.45		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		GELC	mg/L			14.8	0.0355									10.3	0.00554		
	Chloride	Cl(-1)		GELC	mg/L			2.05	0.026									1.89	0.0322		
	Fluoride	F(-1)		GELC	mg/L			0.448	0.007									0.274	0.0553		
	Magnesium	Mg		GELC	mg/L			3.31	0.00354									3.23	0.00518		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L		<	0.14	0.009								<	0.01	0.01		
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		GELC	mg/L			1.94	0.0164									2.2	0.0165		
	Silicon Dioxide	SiO2		GELC	mg/L			87.2	0.0186									82.1	0.0212		
	Sodium	Na		GELC	mg/L			13.2	0.013									13.3	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		GELC	mg/L			2.27	0.079									1.72	0.193		
	Total Dissolved Solids	TDS		GELC	mg/L			187	6.29									128	3.07		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L		<	0.02	0.02												
	Total Suspended Solids	TSS		GELC	mg/L							<	1.4	1.4							
	pH	pH	Field	FLD	SU																
METALS	Aluminum	Al		GELC	µg/L		<	8.67	23.4								<	14.7	14.7		
	Antimony	Sb		GELC	µg/L			0.784	0.111								<	0.28	0.28		
	Arsenic	As		GELC	µg/L		<	2.57	2.57								<	2.26	2.24		
	Barium	Ba		GELC	µg/L			33.7	0.748									21.8	0.222		
	Beryllium	Be		GELC	µg/L		<	0.474	0.474								<	0.158	0.158		
	Boron	B		GELC	µg/L		<	4.74	4.74								<	10.1	4.88		
	Cadmium	Cd		GELC	µg/L		<	0.631	0.631								<	0.04	0.04		
	Chromium	Cr		GELC	µg/L		<	1.06	1.06								<	1.76	0.503		
	Cobalt	Co		GELC	µg/L			1.16	0.627								<	1.02	0.541		
	Copper	Cu		GELC	µg/L		<	1.84	1.84								<	3.28	1.39		
	Iron	Fe		GELC	µg/L		<	34.1	19.9								<	12.6	12.6		
	Lead	Pb		GELC	µg/L		<	1.83	1.83								<	0.05	0.05		
	Manganese	Mn		GELC	µg/L			62.2	1.15								<	0.622	0.296		
	Mercury	Hg		GELC	µg/L		<	0.06	0.06												
	Nickel	Ni		GELC	µg/L		<	3.09	3.09								<	1.74	0.69		
	Selenium	Se		GELC	µg/L		<	2.36	2.36												
	Silver	Ag		GELC	µg/L		<	0.529	0.529								<	0.835	0.835		
	Thallium	Tl		GELC	µg/L		<	0.019	0.014								<	0.02	0.02		
	Tin	Sn		GELC	µg/L		<	1.98	1.98								<	3.26	3.26		
	Vanadium	V		GELC	µg/L			9.24	0.89									7.38	0.606		
	Zinc	Zn		GELC	µg/L		<	2.07	3.89								<	0.883	0.883		
RAD	Americium-241	Am-241		GELC	pCi/L			0.0128		0.0116	0.00744							0.0131		0.027	0.00936
	Cesium-137	Cs-137		GELC	pCi/L			1.43		4.06	1.04							-1.25		5.57	1.64
	Gross alpha	GROSSA		GELC	pCi/L			-0.255		1.94	0.449							0.206		1.05	0.263
	Gross beta	GROSSB		GELC	pCi/L			1.43		3.3	0.981							0.649		1.33	0.355
	Gross gamma	GROSSG		GELC	pCi/L													91		355	122
	Plutonium-238	Pu-238		GELC	pCi/L			0.025		0.00966	0.0101							-0.00776		0.027	0.00476
	Strontium-90	Sr-90		GELC	pCi/L			-0.0291		0.365	0.105							0.1		0.294	0.0716
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		GELC	µg/L													0.058	0.02		
	Uranium-234	U-234		GELC	pCi/L			0.0578		0.117	0.0285							0.0441		0.049	0.0127
	Uranium-238	U-238		GELC	pCi/L			0.0455		0.061	0.021							0.0399		0.031	0.0104

Table B-1.25 (continued)

						Start Date Time	10/07/03	10/07/03	10/07/03	10/07/03	10/07/03	03/18/04	03/18/04	03/18/04	03/18/04	03/18/04	01/26/05	01/26/05	01/26/05	01/26/05
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code														
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom															
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L												<	1.45	1.45	
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L													52.5	1.45	
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L													52.4	1.45	
	Ammonia as Nitrogen	NH3-N		GELC	mg/L															
	Bromide	Br(-1)		GELC	mg/L															
	Calcium	Ca		GELC	mg/L													8.95	0.00554	
	Chloride	Cl(-1)		GELC	mg/L													1.61	0.0322	
	Fluoride	F(-1)		GELC	mg/L													0.327	0.0553	
	Magnesium	Mg		GELC	mg/L													2.76	0.00518	
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L													0.19	0.003	
	Perchlorate	ClO4		GELC	µg/L								0.26							
	Potassium	K		GELC	mg/L													1.94	0.0165	
	Silicon Dioxide	SiO2		GELC	mg/L													84.9	0.0212	
	Sodium	Na		GELC	mg/L													11.6	0.0144	
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			130.3					115							
	Sulfate	SO4(-2)		GELC	mg/L													1.65	0.193	
	Total Dissolved Solids	TDS		GELC	mg/L													128	3.07	
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L															
	Total Organic Carbon	TOC		GELC	mg/L															
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L															
	Total Suspended Solids	TSS		GELC	mg/L			13.9	0.727											
	pH	pH	Field	FLD	SU			8					7.9							
METALS	Aluminum	Al		GELC	µg/L												<	14.7	14.7	
	Antimony	Sb		GELC	µg/L												<	0.28	0.28	
	Arsenic	As		GELC	µg/L												<	5	2.24	
	Barium	Ba		GELC	µg/L													17.4	0.222	
	Beryllium	Be		GELC	µg/L												<	0.158	0.158	
	Boron	B		GELC	µg/L												<	17.6	4.88	
	Cadmium	Cd		GELC	µg/L													0.051	0.04	
	Chromium	Cr		GELC	µg/L													1.8	0.503	
	Cobalt	Co		GELC	µg/L												<	0.541	0.541	
	Copper	Cu		GELC	µg/L												<	1.39	1.39	
	Iron	Fe		GELC	µg/L												<	12.6	12.6	
	Lead	Pb		GELC	µg/L												<	0.05	0.05	
	Manganese	Mn		GELC	µg/L												<	0.296	0.296	
	Mercury	Hg		GELC	µg/L		<	0.0472	0.0472											
	Nickel	Ni		GELC	µg/L												<	2.1	0.69	
	Selenium	Se		GELC	µg/L		<	2.85	2.81											
	Silver	Ag		GELC	µg/L												<	0.835	0.835	
	Thallium	Tl		GELC	µg/L												<	0.28	0.02	
	Tin	Sn		GELC	µg/L												<	3.26	3.26	
	Vanadium	V		GELC	µg/L													8.1	0.606	
	Zinc	Zn		GELC	µg/L												<	1.3	0.883	
RAD	Americium-241	Am-241		GELC	pCi/L													-0.00205		0.032
	Cesium-137	Cs-137		GELC	pCi/L													-1.78		3.72
	Gross alpha	GROSSA		GELC	pCi/L													0.261		1.72
	Gross beta	GROSSB		GELC	pCi/L													0.934		1.98
	Gross gamma	GROSSG		GELC	pCi/L													148		336
	Plutonium-238	Pu-238		GELC	pCi/L													-0.00641		0.033
	Strontium-90	Sr-90		GELC	pCi/L													0.0066		0.296
	Tritium	H-3		UMTL	pCi/L			1.14948	0.28737		0.3193									
	Uranium	U		GELC	µg/L															
	Uranium-234	U-234		GELC	pCi/L													0.142		0.076
	Uranium-238	U-238		GELC	pCi/L													0.0795		0.054

Table B-1.25 (continued)

					Start Date Time	01/26/05	01/26/05	01/26/05	01/26/05	01/26/05	01/26/05	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06
					Fld Prep Code	F	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
					Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
					Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
					Fld Qc Type Code																
					Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
						Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L							<	0.725	0.725			<	0.725	0.725		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L								62.2	0.725				61.6	0.725		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L							<	0.01	0.01			<	0.01	0.01		
	Bromide	Br(-1)		GELC	mg/L							<	0.066	0.066			<	0.066	0.066		
	Calcium	Ca		GELC	mg/L								10.8	0.036				10.7	0.036		
	Chloride	Cl(-1)		GELC	mg/L								1.78	0.066				1.78	0.066		
	Fluoride	F(-1)		GELC	mg/L							<	0.409	0.033			<	0.413	0.033		
	Magnesium	Mg		GELC	mg/L								3.19	0.085				3.17	0.085		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L							<	0.0782	0.014			<	0.0737	0.014		
	Perchlorate	ClO4		GELC	µg/L			0.237	0.05				0.123	0.05							
	Potassium	K		GELC	mg/L								1.91	0.05				1.96	0.05		
	Silicon Dioxide	SiO2		GELC	mg/L								79.4	0.032				79.2	0.032		
	Sodium	Na		GELC	mg/L								11.1	0.045				11.6	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			112.6										132.7			
	Sulfate	SO4(-2)		GELC	mg/L								2.14	0.1				2.15	0.1		
	Total Dissolved Solids	TDS		GELC	mg/L								152	2.38				153	2.38		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L							<	0.01	0.01			<	0.1	0.1		
	Total Organic Carbon	TOC		GELC	mg/L													1.37	0.33		
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L							<	0.01	0.01			<	0.01	0.01		
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			7.44										7.25			
METALS	Aluminum	Al		GELC	µg/L							<	68	68			<	68	68		
	Antimony	Sb		GELC	µg/L							<	0.5	0.5			<	0.5	0.5		
	Arsenic	As		GELC	µg/L							<	6	6			<	6	6		
	Barium	Ba		GELC	µg/L								25.5	1				26.1	1		
	Beryllium	Be		GELC	µg/L							<	1	1			<	1	1		
	Boron	B		GELC	µg/L								13.1	10				13.6	10		
	Cadmium	Cd		GELC	µg/L							<	0.1	0.1			<	0.1	0.1		
	Chromium	Cr		GELC	µg/L							<	1	1			<	1	1		
	Cobalt	Co		GELC	µg/L							<	1	1			<	1	1		
	Copper	Cu		GELC	µg/L							<	3	3			<	3	3		
	Iron	Fe		GELC	µg/L								43.2	18				104	18		
	Lead	Pb		GELC	µg/L							<	0.5	0.5			<	0.5	0.5		
	Manganese	Mn		GELC	µg/L								19.1	2				28.8	2		
	Mercury	Hg		GELC	µg/L		<	0.0472	0.0472			<	0.06	0.06			<	0.06	0.06		
	Nickel	Ni		GELC	µg/L								0.64	0.5				0.74	0.5		
	Selenium	Se		GELC	µg/L			3.9	2.81			<	2.5	2.5			<	2.5	2.5		
	Silver	Ag		GELC	µg/L							<	0.2	0.2			<	0.2	0.2		
	Thallium	Tl		GELC	µg/L							<	0.4	0.4			<	0.4	0.4		
	Tin	Sn		GELC	µg/L							<	2.5	2.5			<	2.5	2.5		
	Vanadium	V		GELC	µg/L								5.9	1				5.8	1		
	Zinc	Zn		GELC	µg/L							<	3.4	2			<	3.5	2		
RAD	Americium-241	Am-241		GELC	pCi/L	0.00982							-0.00166		0.0217	0.00641		-0.0108		0.0384	0.0101
	Cesium-137	Cs-137		GELC	pCi/L	1.11							2.25		4.97	1.72		0.439		5.08	1.38
	Gross alpha	GROSSA		GELC	pCi/L	0.384							0.309		1.08	0.325		0.101		1.15	0.312
	Gross beta	GROSSB		GELC	pCi/L	0.48							2.59		3.28	1.05		5.17		3.93	1.35
	Gross gamma	GROSSG		GELC	pCi/L	68.9							74.2		255	80.4		439		1040	433
	Plutonium-238	Pu-238		GELC	pCi/L	0.0077							-0.00432		0.0208	0.00433		0		0.0209	0.00218
	Strontium-90	Sr-90		GELC	pCi/L	0.0735							0.00826		0.178	0.0528		0.0505		0.288	0.0825
	Tritium	H-3		UMTL	pCi/L			0.12772	0.28737		0.28737										
	Uranium	U		GELC	µg/L								0.085	0.05				0.1	0.05		
	Uranium-234	U-234		GELC	pCi/L	0.0231							0.0963		0.0394	0.0174		0.0747		0.052	0.0166
	Uranium-238	U-238		GELC	pCi/L	0.015							0.0623		0.0419	0.0123		0.0224		0.0553	0.00972

Table B-1.26
Spring 9

						Start Date Time	09/25/01	09/25/01	09/25/01	09/25/01	09/25/01	09/26/01	09/26/01	09/26/01	09/26/01	09/26/01	10/08/03	10/08/03	10/08/03	10/08/03	10/08/03	10/08/03	10/08/03	10/08/03	10/08/03	10/08/03
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																				
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																					
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L							<	0.725	0.725			<	1.45	1.45							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L								59.2	0.725				56.1	1.45							
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L								58.7	0.725				55.7	1.45							
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																					
	Bromide	Br(-1)		GELC	mg/L																					
	Calcium	Ca		GELC	mg/L								11	0.0375				10.3	0.00554							
	Chloride	Cl(-1)		GELC	mg/L								1.91	0.025				1.93	0.0322							
	Fluoride	F(-1)		GELC	mg/L								0.425	0.006				0.295	0.0553							
	Magnesium	Mg		GELC	mg/L								3.09	0.00449				2.94	0.00518							
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L							<	0.15	0.0069				0.11	0.01							
	Perchlorate	ClO4		GELC	µg/L																					
	Potassium	K		GELC	mg/L								1.6	0.00707				1.75	0.0165							
	Silicon Dioxide	SiO2		GELC	mg/L								77.9	0.284				72.5	0.0212							
	Sodium	Na		GELC	mg/L								11.4	0.00813				11.9	0.0144							
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			125.4															114.1			
	Sulfate	SO4(-2)		GELC	mg/L								2.14	0.062				1.9	0.193							
	Total Dissolved Solids	TDS		GELC	mg/L								147	5.09				139	3.07							
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																					
	Total Organic Carbon	TOC		GELC	mg/L																					
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																					
	Total Suspended Solids	TSS		GELC	mg/L			11.7	0.659														26.6	0.682		
	pH	pH	Field	FLD	SU			7.5															7.81			
METALS	Aluminum	Al		GELC	µg/L							<	34.3	34.3			<	14.7	14.7							
	Antimony	Sb		GELC	µg/L							<	0.111	0.111			<	0.28	0.28							
	Arsenic	As		GELC	µg/L							<	4.57	4.57				3.02	2.24							
	Barium	Ba		GELC	µg/L								18.6	0.206				17.1	0.222							
	Beryllium	Be		GELC	µg/L							<	0.203	0.203			<	0.158	0.158							
	Boron	B		GELC	µg/L								12.7	2.95				7.6	4.88							
	Cadmium	Cd		GELC	µg/L								0.291	0.301			<	0.04	0.04							
	Chromium	Cr		GELC	µg/L							<	1.74	0.781			<	1	0.503							
	Cobalt	Co		GELC	µg/L								5.36	0.295			<	0.541	0.541							
	Copper	Cu		GELC	µg/L							<	2.67	2.67			<	1.39	1.39							
	Iron	Fe		GELC	µg/L							<	20.6	20.6			<	12.6	12.6							
	Lead	Pb		GELC	µg/L							<	0.077	0.077			<	0.05	0.05							
	Manganese	Mn		GELC	µg/L							<	2.94	2.94			<	0.296	0.296							
	Mercury	Hg		GELC	µg/L		<	0.073	0.073													<	0.0472	0.0472		
	Nickel	Ni		GELC	µg/L							<	0.743	0.743			<	1.28	0.69							
	Selenium	Se		GELC	µg/L		<	3.09	3.09								<	2.81	2.81			<	2.81	2.81		
	Silver	Ag		GELC	µg/L							<	0.197	0.197			<	0.835	0.835							
	Thallium	Tl		GELC	µg/L							<	0.014	0.014			<	0.02	0.02							
	Tin	Sn		GELC	µg/L							<	4.57	2.4			<	3.26	3.26							
	Vanadium	V		GELC	µg/L								8.35	1.09				5.88	0.606							
	Zinc	Zn		GELC	µg/L							<	1.54	2.81			<	0.883	0.883							
RAD	Americium-241	Am-241		GELC	pCi/L								0.0316		0.0226	0.0102		-0.0158		0.028	0.00742					
	Cesium-137	Cs-137		GELC	pCi/L								0.47		2.77	0.744		-2.58		9.78	2.82					
	Gross alpha	GROSSA		GELC	pCi/L								0.0913		1.64	0.347		0.411		1.74	0.448					
	Gross beta	GROSSB		GELC	pCi/L								0.445		1.06	0.26		1.49		1.2	0.36					
	Gross gamma	GROSSG		GELC	pCi/L													120		428	133					
	Plutonium-238	Pu-238		GELC	pCi/L								0.00226		0.0167	0.00392		-0.00467		0.032	0.00661					
	Strontium-90	Sr-90		GELC	pCi/L								-0.0454		0.22	0.0558		0.201		0.247	0.0713					
	Tritium	H-3		UMTL	pCi/L																		0.35123	0.28737		0.28737
	Uranium	U		GELC	µg/L													0.303	0.02							
	Uranium-234	U-234		GELC	pCi/L								0.135		0.0502	0.0295		0.158		0.052	0.0224					
	Uranium-238	U-238		GELC	pCi/L								0.0867		0.0502	0.0234		0.0992		0.033	0.0168					

Table B-1.26 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																				
						Start Date Time	09/25/01	03/18/04	03/18/04	03/18/04	03/18/04	03/18/04	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04	09/28/05	09/28/05	09/28/05
						Fld Prep Code	UF	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																			
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L								<	1.45	1.45								<	1.45	1.45
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L									62.9	1.45									53.1	1.45
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L									62.7	1.45										
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																		<	0.01	0.01
	Bromide	Br(-1)		GELC	mg/L																		<	0.041	0.041
	Calcium	Ca		GELC	mg/L									10.3	0.00554									10.2	0.036
	Chloride	Cl(-1)		GELC	mg/L									1.91	0.0322									1.91	0.053
	Fluoride	F(-1)		GELC	mg/L									0.477	0.0553									0.425	0.03
	Magnesium	Mg		GELC	mg/L									2.99	0.00518									2.87	0.085
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L									0.0148	0.003									0.183	0.017
	Perchlorate	ClO4		GELC	µg/L				0.281										0.143	0.05				0.263	0.05
	Potassium	K		GELC	mg/L									1.56	0.0165									1.43	0.05
	Silicon Dioxide	SiO2		GELC	mg/L									73.8	0.0212									72.8	0.032
	Sodium	Na		GELC	mg/L									11	0.0144									11	0.045
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm				129.1										123.3						
	Sulfate	SO4(-2)		GELC	mg/L									1.87	0.193									2.07	0.057
	Total Dissolved Solids	TDS		GELC	mg/L									142	3.07									149	2.38
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																		<	0.284	0.04
	Total Organic Carbon	TOC		GELC	mg/L																				
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																		<	0.096	0.01
	Total Suspended Solids	TSS		GELC	mg/L														101	1.53					
	pH	pH	Field	FLD	SU				7.8										7.74						
METALS	Aluminum	Al		GELC	µg/L									16.4	14.7								<	68	68
	Antimony	Sb		GELC	µg/L								<	0.28	0.28								<	0.5	0.5
	Arsenic	As		GELC	µg/L								<	2.24	2.24								<	6	6
	Barium	Ba		GELC	µg/L									15.8	0.222									17.5	1
	Beryllium	Be		GELC	µg/L								<	0.158	0.158								<	1	1
	Boron	B		GELC	µg/L								<	16.5	4.88									10.2	10
	Cadmium	Cd		GELC	µg/L								<	0.04	0.04								<	0.1	0.1
	Chromium	Cr		GELC	µg/L								<	1.3	0.503									2.2	1
	Cobalt	Co		GELC	µg/L								<	0.541	0.541								<	1	1
	Copper	Cu		GELC	µg/L								<	1.39	1.39								<	3	3
	Iron	Fe		GELC	µg/L									32.5	12.6								<	18	18
	Lead	Pb		GELC	µg/L								<	0.05	0.05								<	0.5	0.5
	Manganese	Mn		GELC	µg/L									0.76	0.296								<	2	2
	Mercury	Hg		GELC	µg/L		<											<	0.0472	0.0472			<	0.05	0.05
	Nickel	Ni		GELC	µg/L								<	0.69	0.69								<	0.5	0.5
	Selenium	Se		GELC	µg/L		<											<	2.81	2.81			<	2.5	2.5
	Silver	Ag		GELC	µg/L								<	0.835	0.835								<	0.2	0.2
	Thallium	Tl		GELC	µg/L								<	0.02	0.02								<	0.4	0.4
	Tin	Sn		GELC	µg/L								<	3.26	3.26								<	3.3	2.5
	Vanadium	V		GELC	µg/L									6.8	0.606									7.3	1
	Zinc	Zn		GELC	µg/L									4.5	0.883								<	2	2
RAD	Americium-241	Am-241		GELC	pCi/L									-0.00665		0.053	0.0163							-0.00945	
	Cesium-137	Cs-137		GELC	pCi/L									0.128		2.9	0.802							2.3	
	Gross alpha	GROSSA		GELC	pCi/L									-0.207		2.09	0.435							0.206	
	Gross beta	GROSSB		GELC	pCi/L									0.205		1.65	0.419							1.1	
	Gross gamma	GROSSG		GELC	pCi/L									86.7		252	76.4							85.6	
	Plutonium-238	Pu-238		GELC	pCi/L									-0.00185		0.029	0.00488							-0.00549	
	Strontium-90	Sr-90		GELC	pCi/L									0.0638		0.156	0.0422							-0.0665	
	Tritium	H-3		UMTL	pCi/L														0.35123	0.28737		0.28737			
	Uranium	U		GELC	µg/L									0.25	0.02									0.2	0.05
	Uranium-234	U-234		GELC	pCi/L									0.356		0.062	0.0361							0.144	
	Uranium-238	U-238		GELC	pCi/L									0.287		0.044	0.0287							0.0708	

Table B-1.26 (continued)

						Start Date Time	09/28/05	09/28/05	09/28/05	09/28/05	09/28/05	09/28/05	09/28/05	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06	09/19/06
						Fld Prep Code	F	F	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code																	
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																		
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L									<	0.725	0.725			<	0.725	0.725		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L										59.6	0.725				59.6	0.725		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L									<	0.01	0.01			<	0.01	0.01		
	Bromide	Br(-1)		GELC	mg/L									<	0.066	0.066			<	0.066	0.066		
	Calcium	Ca		GELC	mg/L					10.4	0.036				10.9	0.036				10.9	0.036		
	Chloride	Cl(-1)		GELC	mg/L										1.94	0.066				1.93	0.066		
	Fluoride	F(-1)		GELC	mg/L									<	0.438	0.033			<	0.437	0.033		
	Magnesium	Mg		GELC	mg/L					2.92	0.085				3.05	0.085				3.06	0.085		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L									<	0.136	0.014			<	0.128	0.014		
	Perchlorate	ClO4		GELC	μg/L										0.241	0.05							
	Potassium	K		GELC	mg/L					1.46	0.05				1.49	0.05				1.54	0.05		
	Silicon Dioxide	SiO2		GELC	mg/L					73.9	0.032				74	0.032				73.4	0.032		
	Sodium	Na		GELC	mg/L					11.1	0.045				11.4	0.045				11.3	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm					124.1										121.3			
	Sulfate	SO4(-2)		GELC	mg/L										2.03	0.1				2.01	0.1		
	Total Dissolved Solids	TDS		GELC	mg/L										138	2.38				123	2.38		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L									<	0.01	0.01			<	0.01	0.01		
	Total Organic Carbon	TOC		GELC	mg/L															1.05	0.33		
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L										0.068	0.01			<	0.01	0.01		
	Total Suspended Solids	TSS		GELC	mg/L																		
	pH	pH	Field	FLD	SU					8.46										7.26			
METALS	Aluminum	Al		GELC	μg/L					140	68			<	68	68			<	68	68		
	Antimony	Sb		GELC	μg/L				<	0.5	0.5			<	0.5	0.5			<	0.5	0.5		
	Arsenic	As		GELC	μg/L				<	6	6			<	6	6			<	6	6		
	Barium	Ba		GELC	μg/L					19.2	1				19.3	1				20.1	1		
	Beryllium	Be		GELC	μg/L				<	1	1			<	1	1			<	1	1		
	Boron	B		GELC	μg/L				<	10	10				14.5	10				13.7	10		
	Cadmium	Cd		GELC	μg/L				<	0.1	0.1			<	0.1	0.1			<	0.1	0.1		
	Chromium	Cr		GELC	μg/L					3	1			<	1	1			<	1	1		
	Cobalt	Co		GELC	μg/L				<	1	1			<	1	1			<	1	1		
	Copper	Cu		GELC	μg/L				<	3	3			<	3	3			<	3	3		
	Iron	Fe		GELC	μg/L					104	18			<	18	18				44.1	18		
	Lead	Pb		GELC	μg/L				<	0.5	0.5			<	0.5	0.5			<	0.5	0.5		
	Manganese	Mn		GELC	μg/L					3.6	2			<	2	2				2.8	2		
	Mercury	Hg		GELC	μg/L				<	0.05	0.05			<	0.06	0.06			<	0.06	0.06		
	Nickel	Ni		GELC	μg/L				<	0.5	0.5			<	0.5	0.5			<	0.5	0.5		
	Selenium	Se		GELC	μg/L				<	2.5	2.5			<	2.5	2.5			<	2.5	2.5		
	Silver	Ag		GELC	μg/L				<	0.2	0.2			<	0.2	0.2			<	0.2	0.2		
	Thallium	Tl		GELC	μg/L				<	0.4	0.4			<	0.54	0.4			<	0.4	0.4		
	Tin	Sn		GELC	μg/L				<	2.5	2.5			<	2.5	2.5			<	2.5	2.5		
	Vanadium	V		GELC	μg/L					7.2	1				7.5	1				7.2	1		
	Zinc	Zn		GELC	μg/L				<	2	2			<	5.3	2			<	4.6	2		
RAD	Americium-241	Am-241		GELC	pCi/L		0.0447	0.0122		0.00982		0.0371	0.0149		-0.00743		0.0232	0.00782		-0.00743		0.0271	0.011
	Cesium-137	Cs-137		GELC	pCi/L		2.63	1.2		0.607		3.32	0.91		0.69		4.83	1.29		1.1		3.78	1.16
	Gross alpha	GROSSA		GELC	pCi/L		1.62	0.346		0.598		2.38	0.573		0.145		0.81	0.237		0.852		0.887	0.317
	Gross beta	GROSSB		GELC	pCi/L		1.41	0.437		1.24		1.59	0.49		1.66		2.89	0.885		2.02		3.34	1.03
	Gross gamma	GROSSG		GELC	pCi/L		305	97		75.9		253	75.3		78.7		293	131		69.4		327	68.1
	Plutonium-238	Pu-238		GELC	pCi/L		0.057	0.0055		0.0111		0.0576	0.0111		-0.002		0.0192	0.00346		0		0.0244	0.00254
	Strontium-90	Sr-90		GELC	pCi/L		0.348	0.0623		-0.0252		0.353	0.0684		0.057		0.141	0.0424		-0.0166		0.15	0.0439
	Tritium	H-3		UMTL	pCi/L																		
	Uranium	U		GELC	μg/L					0.47	0.05				0.14	0.05				0.32	0.05		
	Uranium-234	U-234		GELC	pCi/L		0.0771	0.0224		0.558		0.0859	0.049		0.0796		0.0573	0.023		0.218		0.0478	0.028
	Uranium-238	U-238		GELC	pCi/L		0.0546	0.0164		0.27		0.0608	0.0314		0.0357		0.0609	0.0189		0.0664		0.0508	0.0152

Table B-1.27
Spring 9A

						Start Date Time	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	10/08/03	10/08/03	10/08/03	10/08/03	10/08/03
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L		<	1	1								<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L			55.1	1									56.1	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L			54.9	1									55.7	1.45		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		EES6	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		EES6	mg/L																
	Calcium	Ca		GELC	mg/L			11.6	0.0355									10.1	0.00554		
	Chloride	Cl(-1)		EES6	mg/L																
	Chloride	Cl(-1)		GELC	mg/L			1.96	0.026									2.24	0.0322		
	Fluoride	F(-1)		EES6	mg/L																
	Fluoride	F(-1)		GELC	mg/L			0.479	0.007									0.383	0.0553		
	Magnesium	Mg		EES6	mg/L																
	Magnesium	Mg		GELC	mg/L			3.18	0.00354									2.96	0.00518		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L			0.32	0.009									0.15	0.01		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L																
	Perchlorate	ClO4		GELC	µg/L																
	Potassium	K		EES6	mg/L																
	Potassium	K		GELC	mg/L			1.44	0.0164									1.65	0.0165		
	Silicon Dioxide	SiO2		EES6	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L			72.5	0.0186									69.9	0.0212		
	Sodium	Na		EES6	mg/L																
	Sodium	Na		GELC	mg/L			11.4	0.013									11.7	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm																
	Sulfate	SO4(-2)		EES6	mg/L																
	Sulfate	SO4(-2)		GELC	mg/L			1.94	0.079									2.06	0.193		
	Total Dissolved Solids	TDS		GELC	mg/L			127	6.29									141	3.07		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L			0.02	0.02												
	Total Suspended Solids	TSS		GELC	mg/L								8	1.4							
	pH	pH	Field	FLD	SU								7.24								
METALS	Aluminum	Al		EES6	µg/L																
	Aluminum	Al		GELC	µg/L		<	23.4	23.4								<	14.7	14.7		
	Antimony	Sb		EES6	µg/L																
	Antimony	Sb		GELC	µg/L		<	0.683	0.111								<	0.28	0.28		
	Arsenic	As		EES6	µg/L																
	Arsenic	As		GELC	µg/L		<	2.57	2.57								<	2.24	2.24		
	Barium	Ba		EES6	µg/L																
	Barium	Ba		GELC	µg/L			10.1	0.748									10.2	0.222		
	Beryllium	Be		EES6	µg/L																
	Beryllium	Be		GELC	µg/L		<	0.474	0.474								<	0.158	0.158		
	Boron	B		EES6	µg/L																
	Boron	B		GELC	µg/L		<	4.74	4.74									6.06	4.88		
	Cadmium	Cd		EES6	µg/L																
	Cadmium	Cd		GELC	µg/L		<	0.631	0.631								<	0.04	0.04		
	Chromium	Cr		EES6	µg/L																
	Chromium	Cr		GELC	µg/L			2.74	1.06								<	0.771	0.503		
	Cobalt	Co		EES6	µg/L																
	Cobalt	Co		GELC	µg/L			4.23	0.627								<	0.541	0.541		
	Copper	Cu		EES6	µg/L																
	Copper	Cu		GELC	µg/L		<	1.84	1.84								<	1.39	1.39		

Table B-1.27 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom	Start Date Time	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	09/27/00	10/08/03	10/08/03	10/08/03	10/08/03	10/08/03
						Fld Prep Code	F	F	F	F	F	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
METALS (cont.)	Iron	Fe		EES6	µg/L																
	Iron	Fe		GELC	µg/L		<	19.9	19.9								<	12.6	12.6		
	Lead	Pb		EES6	µg/L																
	Lead	Pb		GELC	µg/L		<	1.83	1.83									0.058	0.05		
	Manganese	Mn		EES6	µg/L																
	Manganese	Mn		GELC	µg/L		<	1.15	1.15								<	0.296	0.296		
	Mercury	Hg		EES6	µg/L																
	Mercury	Hg		GELC	µg/L		<	0.06	0.06												
	Nickel	Ni		EES6	µg/L																
	Nickel	Ni		GELC	µg/L		<	1.34	3.09								<	1.53	0.69		
	Selenium	Se		EES6	µg/L																
	Selenium	Se		GELC	µg/L		<	2.36	2.36								<	2.81	2.81		
	Silver	Ag		EES6	µg/L																
	Silver	Ag		GELC	µg/L		<	0.529	0.529								<	0.835	0.835		
	Thallium	Tl		EES6	µg/L																
	Thallium	Tl		GELC	µg/L			0.349	0.014								<	0.02	0.02		
	Tin	Sn		EES6	µg/L																
	Tin	Sn		GELC	µg/L		<	1.98	1.98								<	3.26	3.26		
	Vanadium	V		EES6	µg/L																
	Vanadium	V		GELC	µg/L			8.05	0.89									7	0.606		
	Zinc	Zn		EES6	µg/L																
	Zinc	Zn		GELC	µg/L		<	3.89	3.89								<	0.883	0.883		
RAD	Americium-241	Am-241		GELC	pCi/L			0.0249		0.0305	0.0118							0.0023		0.033	0.00399
	Cesium-137	Cs-137		GELC	pCi/L			-0.199		2.59	0.734							2.48		7.75	1.98
	Gross alpha	GROSSA		GELC	pCi/L			0.417		1.31	0.379							0.339		1.23	0.319
	Gross beta	GROSSB		GELC	pCi/L			1.97		2.46	0.769							1.33		1.15	0.342
	Gross gamma	GROSSG		GELC	pCi/L													120		479	127
	Plutonium-238	Pu-238		GELC	pCi/L			0.0061		0.0449	0.0106							-0.0125		0.029	0.00592
	Strontium-90	Sr-90		GELC	pCi/L			4.49		0.476	0.311							0.121		0.242	0.0619
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		EES6	µg/L																
	Uranium	U		GELC	µg/L													0.223	0.02		
	Uranium-234	U-234		GELC	pCi/L			0.229		0.0836	0.0471							0.144		0.051	0.0208
	Uranium-238	U-238		GELC	pCi/L			0.0349		0.0572	0.018							0.0622		0.033	0.0129

Table B-1.27 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	10/08/03	10/08/03	10/08/03	10/08/03	10/08/03	03/18/04	03/18/04	03/18/04	03/18/04	03/18/04	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L												<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L													56.6	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L													56.3	1.45		
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		EES6	mg/L																
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		EES6	mg/L																
	Calcium	Ca		GELC	mg/L													10	0.00554		
	Chloride	Cl(-1)		EES6	mg/L																
	Chloride	Cl(-1)		GELC	mg/L													1.98	0.0322		
	Fluoride	F(-1)		EES6	mg/L																
	Fluoride	F(-1)		GELC	mg/L													0.483	0.0553		
	Magnesium	Mg		EES6	mg/L																
	Magnesium	Mg		GELC	mg/L													3.03	0.00518		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L													0.183	0.003		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L																
	Perchlorate	ClO4		GELC	µg/L								0.293								
	Potassium	K		EES6	mg/L																
	Potassium	K		GELC	mg/L													1.37	0.0165		
	Silicon Dioxide	SiO2		EES6	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L													70	0.0212		
	Sodium	Na		EES6	mg/L																
	Sodium	Na		GELC	mg/L													10.7	0.0144		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			146.1					137.4								
	Sulfate	SO4(-2)		EES6	mg/L																
	Sulfate	SO4(-2)		GELC	mg/L													2.09	0.193		
	Total Dissolved Solids	TDS		GELC	mg/L													124	3.07		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L			2.73	0.694												
	pH	pH	Field	FLD	SU			7.34					8								
METALS	Aluminum	Al		EES6	µg/L																
	Aluminum	Al		GELC	µg/L												<	14.7	14.7		
	Antimony	Sb		EES6	µg/L																
	Antimony	Sb		GELC	µg/L												<	0.28	0.28		
	Arsenic	As		EES6	µg/L																
	Arsenic	As		GELC	µg/L												<	2.24	2.24		
	Barium	Ba		EES6	µg/L																
	Barium	Ba		GELC	µg/L													9.9	0.222		
	Beryllium	Be		EES6	µg/L																
	Beryllium	Be		GELC	µg/L												<	0.158	0.158		
	Boron	B		EES6	µg/L																
	Boron	B		GELC	µg/L												<	15.2	4.88		
	Cadmium	Cd		EES6	µg/L																
	Cadmium	Cd		GELC	µg/L												<	0.04	0.04		
	Chromium	Cr		EES6	µg/L																
	Chromium	Cr		GELC	µg/L												<	2.6	0.503		
	Cobalt	Co		EES6	µg/L																
	Cobalt	Co		GELC	µg/L												<	0.541	0.541		
	Copper	Cu		EES6	µg/L																
	Copper	Cu		GELC	µg/L												<	1.39	1.39		
	Iron	Fe		EES6	µg/L																
	Iron	Fe		GELC	µg/L													16	12.6		

Table B-1.27 (continued)

						Start Date Time	10/08/03	10/08/03	10/08/03	10/08/03	10/08/03	03/18/04	03/18/04	03/18/04	03/18/04	03/18/04	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04
						Fld Prep Code	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Lead	Pb		EES6	µg/L																
	Lead	Pb		GELC	µg/L												<	0.073	0.05		
	Manganese	Mn		EES6	µg/L																
	Manganese	Mn		GELC	µg/L													0.86	0.296		
	Mercury	Hg		EES6	µg/L																
	Mercury	Hg		GELC	µg/L		<	0.0472	0.0472												
	Nickel	Ni		EES6	µg/L																
	Nickel	Ni		GELC	µg/L												<	0.69	0.69		
	Selenium	Se		EES6	µg/L																
	Selenium	Se		GELC	µg/L		<	2.81	2.81												
	Silver	Ag		EES6	µg/L																
	Silver	Ag		GELC	µg/L												<	0.835	0.835		
	Thallium	Tl		EES6	µg/L																
	Thallium	Tl		GELC	µg/L												<	0.02	0.02		
	Tin	Sn		EES6	µg/L																
	Tin	Sn		GELC	µg/L												<	3.26	3.26		
	Vanadium	V		EES6	µg/L																
	Vanadium	V		GELC	µg/L													7.5	0.606		
	Zinc	Zn		EES6	µg/L																
	Zinc	Zn		GELC	µg/L													5.7	0.883		
RAD	Americium-241	Am-241		GELC	pCi/L													0.0076		0.03	0.00602
	Cesium-137	Cs-137		GELC	pCi/L													0.0416		2.62	0.742
	Gross alpha	GROSSA		GELC	pCi/L													-0.816		2.35	0.427
	Gross beta	GROSSB		GELC	pCi/L													1.19		1.28	0.367
	Gross gamma	GROSSG		GELC	pCi/L													76.9		197	169
	Plutonium-238	Pu-238		GELC	pCi/L													0.00427		0.033	0.00604
	Strontium-90	Sr-90		GELC	pCi/L													-0.0932		0.194	0.0484
	Tritium	H-3		UMTL	pCi/L			0.89404	0.28737		0.28737										
	Uranium	U		EES6	µg/L																
	Uranium	U		GELC	µg/L													0.73	0.02		
	Uranium-234	U-234		GELC	pCi/L													0.174		0.071	0.0219
	Uranium-238	U-238		GELC	pCi/L													0.0673		0.05	0.0129

Table B-1.27 (continued)

						Start Date Time	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04	03/08/05	03/08/05	03/08/05	03/08/05	03/08/05	04/29/05	04/29/05	04/29/05	04/29/05	04/29/05
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L								57	1				57.7	1		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L																
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L																
	Bromide	Br(-1)		EES6	mg/L								0.01	0.01				0.03	0.01		
	Bromide	Br(-1)		GELC	mg/L																
	Calcium	Ca		EES6	mg/L								10.2	0.01		0.1		10.1	0.01		
	Calcium	Ca		GELC	mg/L																
	Chloride	Cl(-1)		EES6	mg/L								2.05	0.01				1.95	0.01		
	Chloride	Cl(-1)		GELC	mg/L																
	Fluoride	F(-1)		EES6	mg/L								0.44	0.01				0.46	0.01		
	Fluoride	F(-1)		GELC	mg/L																
	Magnesium	Mg		EES6	mg/L								2.94	0.01		0.04		2.59	0.01		0.01
	Magnesium	Mg		GELC	mg/L																
	Nitrate as Nitrogen	NO3-N		EES6	mg/L								0.37	0.003				0.31	0.003		
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L																
	Nitrite as Nitrogen	NO2-N		EES6	mg/L							<	0.003	0.003			<	0.003	0.003		
	Perchlorate	ClO4		GELC	µg/L			0.26	0.05												
	Potassium	K		EES6	mg/L								1.48	0.01		0.02		1.1	0.01		0.01
	Potassium	K		GELC	mg/L																
	Silicon Dioxide	SiO2		EES6	mg/L								32.6	10		0		33.2	10		0
	Silicon Dioxide	SiO2		GELC	mg/L																
	Sodium	Na		EES6	mg/L								10.6	0.01				10.6	0.01		
	Sodium	Na		GELC	mg/L																
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			122.1					122.3					124.6			
	Sulfate	SO4(-2)		EES6	mg/L								2.13	0.01				2.08	0.01		
	Sulfate	SO4(-2)		GELC	mg/L																
	Total Dissolved Solids	TDS		GELC	mg/L																
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L																
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L								0.02282	0.003				0.01304	0.003		
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L																
	Total Suspended Solids	TSS		GELC	mg/L			2	1.53												
	pH	pH	Field	FLD	SU			8					7.74					7.47			
METALS	Aluminum	Al		EES6	µg/L							<	2	2			<	2	2		
	Aluminum	Al		GELC	µg/L																
	Antimony	Sb		EES6	µg/L							<	1	1			<	1	1		
	Antimony	Sb		GELC	µg/L																
	Arsenic	As		EES6	µg/L								1	0.2				0.9	0.2		
	Arsenic	As		GELC	µg/L																
	Barium	Ba		EES6	µg/L								14	1				9	1		
	Barium	Ba		GELC	µg/L																
	Beryllium	Be		EES6	µg/L							<	1	1			<	1	1		
	Beryllium	Be		GELC	µg/L																
	Boron	B		EES6	µg/L								13	1				12	1		
	Boron	B		GELC	µg/L																
	Cadmium	Cd		EES6	µg/L							<	1	1			<	1	1		
	Cadmium	Cd		GELC	µg/L																
	Chromium	Cr		EES6	µg/L								2.9	1				2.5	1		0.1
	Chromium	Cr		GELC	µg/L																
	Cobalt	Co		EES6	µg/L							<	1	1			<	1	1		
	Cobalt	Co		GELC	µg/L																
	Copper	Cu		EES6	µg/L							<	1	1				4.7	1		0.1
	Copper	Cu		GELC	µg/L																
	Iron	Fe		EES6	µg/L							<	10	10			<	10	10		
	Iron	Fe		GELC	µg/L																

Table B-1.27 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom	Start Date Time	09/14/04	09/14/04	09/14/04	09/14/04	09/14/04	03/08/05	03/08/05	03/08/05	03/08/05	03/08/05	04/29/05	04/29/05	04/29/05	04/29/05	04/29/05
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
METALS (cont.)	Lead	Pb		EES6	µg/L							<	0.2	0.2			<	0.2	0.2		
	Lead	Pb		GELC	µg/L																
	Manganese	Mn		EES6	µg/L							<	1	1			<	1	1		
	Manganese	Mn		GELC	µg/L																
	Mercury	Hg		EES6	µg/L							<	0.05	0.05			<	0.05	0.05		
	Mercury	Hg		GELC	µg/L		<	0.0472	0.0472												
	Nickel	Ni		EES6	µg/L							<	1	1				1	1		
	Nickel	Ni		GELC	µg/L																
	Selenium	Se		EES6	µg/L							<	1	1			<	1	1		
	Selenium	Se		GELC	µg/L		<	2.81	2.81												
	Silver	Ag		EES6	µg/L							<	1	1			<	1	1		
	Silver	Ag		GELC	µg/L																
	Thallium	Tl		EES6	µg/L							<	1	1			<	1	1		
	Thallium	Tl		GELC	µg/L																
	Tin	Sn		EES6	µg/L							<	1	1			<	1	1		
	Tin	Sn		GELC	µg/L																
	Vanadium	V		EES6	µg/L								9	1				8	1		
	Vanadium	V		GELC	µg/L																
	Zinc	Zn		EES6	µg/L							<	1	1				4	1		
	Zinc	Zn		GELC	µg/L																
RAD	Americium-241	Am-241		GELC	pCi/L																
	Cesium-137	Cs-137		GELC	pCi/L																
	Gross alpha	GROSSA		GELC	pCi/L																
	Gross beta	GROSSB		GELC	pCi/L																
	Gross gamma	GROSSG		GELC	pCi/L																
	Plutonium-238	Pu-238		GELC	pCi/L																
	Strontium-90	Sr-90		GELC	pCi/L																
	Tritium	H-3		UMTL	pCi/L			0.09579	0.28737		0.28737										
	Uranium	U		EES6	µg/L								0.3	0.2				0.3	0.2		
	Uranium	U		GELC	µg/L																
	Uranium-234	U-234		GELC	pCi/L																
	Uranium-238	U-238		GELC	pCi/L																

Table B-1.27(continued)

						Start Date Time	05/18/05	05/18/05	05/18/05	05/18/05	05/18/05	07/20/05	07/20/05	07/20/05	07/20/05	07/20/05	09/28/05	09/28/05	09/28/05	09/28/05	09/28/05
						Fld Prep Code	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L												<	1.45	1.45		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L			56.6	1				56.9	1							
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L													51.1	1.45		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L												<	0.01	0.01		
	Bromide	Br(-1)		EES6	mg/L			0.02	0.01				0.02	0.01							
	Bromide	Br(-1)		GELC	mg/L													0.053	0.041		
	Calcium	Ca		EES6	mg/L			10.8	0.01		0.1		9.89	0.01		0.28					
	Calcium	Ca		GELC	mg/L													10.2	0.036		
	Chloride	Cl(-1)		EES6	mg/L			2.08	0.01				2	0.01							
	Chloride	Cl(-1)		GELC	mg/L													1.95	0.053		
	Fluoride	F(-1)		EES6	mg/L			0.48	0.01				0.46	0.01							
	Fluoride	F(-1)		GELC	mg/L													0.464	0.03		
	Magnesium	Mg		EES6	mg/L			2.49	0.01				2.93	0.01		0.06					
	Magnesium	Mg		GELC	mg/L													2.91	0.085		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L			0.39	0.003				0.22	0.003							
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L													0.296	0.017		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L		<	0.003	0.003			<	0.003	0.003							
	Perchlorate	ClO4		GELC	µg/L													0.27	0.05		
	Potassium	K		EES6	mg/L			1.18	0.01		0.01		1.38	0.01		0.03					
	Potassium	K		GELC	mg/L													1.37	0.05		
	Silicon Dioxide	SiO2		EES6	mg/L			33.9	10		0.1		35.6	10		1					
	Silicon Dioxide	SiO2		GELC	mg/L													72.5	0.032		
	Sodium	Na		EES6	mg/L			10.8	0.01				11.7	0.01		0.2					
	Sodium	Na		GELC	mg/L													11.1	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			123.5					122.8								
	Sulfate	SO4(-2)		EES6	mg/L			2.04	0.01				2.09	0.01							
	Sulfate	SO4(-2)		GELC	mg/L													2.09	0.057		
	Total Dissolved Solids	TDS		GELC	mg/L													147	2.38		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L												<	0.208	0.04		
	Total Organic Carbon	TOC		GELC	mg/L																
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L			0.0163	0.003				0.00978	0.003							
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L												<	0.211	0.01		
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			7.85					7.79								
METALS	Aluminum	Al		EES6	µg/L			22	2				3.7	2							
	Aluminum	Al		GELC	µg/L												<	68	68		
	Antimony	Sb		EES6	µg/L		<	1	1			<	1	1							
	Antimony	Sb		GELC	µg/L												<	0.5	0.5		
	Arsenic	As		EES6	µg/L			0.9	0.2				1	0.2							
	Arsenic	As		GELC	µg/L												<	6	6		
	Barium	Ba		EES6	µg/L			17	1				11	1							
	Barium	Ba		GELC	µg/L													10	1		
	Beryllium	Be		EES6	µg/L		<	1	1			<	1	1							
	Beryllium	Be		GELC	µg/L												<	1	1		
	Boron	B		EES6	µg/L			25	1				12	1							
	Boron	B		GELC	µg/L													11.4	10		
	Cadmium	Cd		EES6	µg/L		<	1	1			<	1	1							
	Cadmium	Cd		GELC	µg/L												<	0.1	0.1		
	Chromium	Cr		EES6	µg/L			2.9	1		0.1		2.4	1							
	Chromium	Cr		GELC	µg/L													2.5	1		
	Cobalt	Co		EES6	µg/L		<	1	1			<	1	1							
	Cobalt	Co		GELC	µg/L												<	1	1		
	Copper	Cu		EES6	µg/L		<	1	1				1	1							
	Copper	Cu		GELC	µg/L												<	3	3		
	Iron	Fe		EES6	µg/L			20	10			<	10	10							
	Iron	Fe		GELC	µg/L												<	18	18		

Table B-1.27 (continued)

						Start Date Time	05/18/05	05/18/05	05/18/05	05/18/05	05/18/05	07/20/05	07/20/05	07/20/05	07/20/05	07/20/05	09/28/05	09/28/05	09/28/05	09/28/05	09/28/05
						Fld Prep Code	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
METALS (cont.)	Lead	Pb		EES6	µg/L		<	0.2	0.2			<	0.2	0.2							
	Lead	Pb		GELC	µg/L													0.82	0.5		
	Manganese	Mn		EES6	µg/L		<	1	1			<	1	1							
	Manganese	Mn		GELC	µg/L												<	2	2		
	Mercury	Hg		EES6	µg/L		<	0.05	0.05			<	0.05	0.05							
	Mercury	Hg		GELC	µg/L												<	0.05	0.05		
	Nickel	Ni		EES6	µg/L			49	1		1	<	1	1							
	Nickel	Ni		GELC	µg/L												<	0.5	0.5		
	Selenium	Se		EES6	µg/L		<	1	1			<	1	1							
	Selenium	Se		GELC	µg/L												<	2.5	2.5		
	Silver	Ag		EES6	µg/L		<	1	1			<	1	1							
	Silver	Ag		GELC	µg/L												<	0.2	0.2		
	Thallium	Tl		EES6	µg/L		<	1	1			<	1	1							
	Thallium	Tl		GELC	µg/L												<	0.4	0.4		
	Tin	Sn		EES6	µg/L		<	1	1			<	1	1							
	Tin	Sn		GELC	µg/L												<	2.5	2.5		
	Vanadium	V		EES6	µg/L			8	1				8	1							
	Vanadium	V		GELC	µg/L													7.8	1		
	Zinc	Zn		EES6	µg/L			31	1				1	1							
	Zinc	Zn		GELC	µg/L												<	2	2		
RAD	Americium-241	Am-241		GELC	pCi/L													0.0143		0.0413	0.0121
	Cesium-137	Cs-137		GELC	pCi/L													0.577		3.55	0.969
	Gross alpha	GROSSA		GELC	pCi/L													-0.608		3.16	0.647
	Gross beta	GROSSB		GELC	pCi/L													1.45		1.47	0.46
	Gross gamma	GROSSG		GELC	pCi/L													66.1		267	64.1
	Plutonium-238	Pu-238		GELC	pCi/L													-0.00925		0.048	0.0173
	Strontium-90	Sr-90		GELC	pCi/L													-0.101		0.343	0.0551
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		EES6	µg/L			0.3	0.2			<	0.2	0.2							
	Uranium	U		GELC	µg/L													0.27	0.05		
	Uranium-234	U-234		GELC	pCi/L													0.245		0.0749	0.0275
	Uranium-238	U-238		GELC	pCi/L													0.0933		0.053	0.0169

Table B-1.27 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	09/28/05	09/28/05	09/28/05	09/28/05	09/28/05	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
GENINORG	Alkalinity-CO3	ALK-CO3		GELC	mg/L							<	0.725	0.725				0.927	0.725		
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		EES6	mg/L																
	Alkalinity-CO3+HCO3	ALK-CO3+HCO3		GELC	mg/L								57.5	0.725				59.1	0.725		
	Alkalinity-HCO3	ALK-HCO3		GELC	mg/L																
	Ammonia as Nitrogen	NH3-N		GELC	mg/L							<	0.01	0.01			<	0.01	0.01		
	Bromide	Br(-1)		EES6	mg/L																
	Bromide	Br(-1)		GELC	mg/L							<	0.066	0.066			<	0.066	0.066		
	Calcium	Ca		EES6	mg/L																
	Calcium	Ca		GELC	mg/L			10.2	0.036				10.3	0.036				10.8	0.036		
	Chloride	Cl(-1)		EES6	mg/L																
	Chloride	Cl(-1)		GELC	mg/L								1.91	0.066				1.9	0.066		
	Fluoride	F(-1)		EES6	mg/L																
	Fluoride	F(-1)		GELC	mg/L							<	0.477	0.033			<	0.478	0.033		
	Magnesium	Mg		EES6	mg/L																
	Magnesium	Mg		GELC	mg/L			2.9	0.085				2.93	0.085				3.05	0.085		
	Nitrate as Nitrogen	NO3-N		EES6	mg/L																
	Nitrate-Nitrite as N	NO3+NO2-N		GELC	mg/L								0.0977	0.014				0.102	0.014		
	Nitrite as Nitrogen	NO2-N		EES6	mg/L																
	Perchlorate	ClO4		GELC	µg/L								0.226	0.05							
	Potassium	K		EES6	mg/L																
	Potassium	K		GELC	mg/L			1.38	0.05				1.31	0.05				1.42	0.05		
	Silicon Dioxide	SiO2		EES6	mg/L																
	Silicon Dioxide	SiO2		GELC	mg/L			72.5	0.032				70.6	0.032				72.8	0.032		
	Sodium	Na		EES6	mg/L																
	Sodium	Na		GELC	mg/L			11.1	0.045				11.2	0.045				11.6	0.045		
	Specific Conductance	SPEC_CONDC	Field	FLD	uS/cm			124.1										119.8			
	Sulfate	SO4(-2)		EES6	mg/L																
	Sulfate	SO4(-2)		GELC	mg/L								1.99	0.1				1.98	0.1		
	Total Dissolved Solids	TDS		GELC	mg/L								135	2.38				142	2.38		
	Total Kjeldahl Nitrogen	TKN		GELC	mg/L							<	0.042	0.01			<	0.052	0.01		
	Total Organic Carbon	TOC		GELC	mg/L													1.09	0.33		
	Total Phosphate as Phosphorus	PO4-P		EES6	mg/L																
	Total Phosphate as Phosphorus	PO4-P		GELC	mg/L							<	0.014	0.01			<	0.016	0.01		
	Total Suspended Solids	TSS		GELC	mg/L																
	pH	pH	Field	FLD	SU			7.16										7.77			
METALS	Aluminum	Al		EES6	µg/L																
	Aluminum	Al		GELC	µg/L			107	68			<	68	68			<	68	68		
	Antimony	Sb		EES6	µg/L																
	Antimony	Sb		GELC	µg/L		<	0.5	0.5			<	0.5	0.5			<	0.5	0.5		
	Arsenic	As		EES6	µg/L																
	Arsenic	As		GELC	µg/L		<	6	6			<	6	6			<	6	6		
	Barium	Ba		EES6	µg/L																
	Barium	Ba		GELC	µg/L			11	1				10.1	1				10.6	1		
	Beryllium	Be		EES6	µg/L																
	Beryllium	Be		GELC	µg/L		<	1	1			<	1	1			<	1	1		
	Boron	B		EES6	µg/L																
	Boron	B		GELC	µg/L			10.5	10				13.3	10				12.6	10		
	Cadmium	Cd		EES6	µg/L																
	Cadmium	Cd		GELC	µg/L		<	0.1	0.1			<	0.1	0.1			<	0.1	0.1		
	Chromium	Cr		EES6	µg/L																
	Chromium	Cr		GELC	µg/L			3.4	1			<	1	1			<	1	1		
	Cobalt	Co		EES6	µg/L																
	Cobalt	Co		GELC	µg/L		<	1	1			<	1	1			<	1	1		
	Copper	Cu		EES6	µg/L																
	Copper	Cu		GELC	µg/L		<	3	3			<	3	3			<	3	3		
	Iron	Fe		EES6	µg/L																
	Iron	Fe		GELC	µg/L			59.4	18			<	18	18				25.6	18		

Table B-1.27 (continued)

Anyl Suite Code	Analyte Desc	Analyte	Lab Code (Decoded)	Lab Code	Std Uom																
						Start Date Time	09/28/05	09/28/05	09/28/05	09/28/05	09/28/05	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06
						Fld Prep Code	UF	UF	UF	UF	UF	F	F	F	F	F	UF	UF	UF	UF	UF
						Lab Sample Type Code	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
						Port Depth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Fld Qc Type Code															
						Well Class	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING	SPRING
							Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert	Sym	Result	Std Mdl	Std Mda	Std Uncert
METALS (cont.)	Lead	Pb		EES6	µg/L																
	Lead	Pb		GELC	µg/L		<	0.5	0.5			<	0.5	0.5			<	0.5	0.5		
	Manganese	Mn		EES6	µg/L																
	Manganese	Mn		GELC	µg/L		<	2	2			<	2	2			<	2	2		
	Mercury	Hg		EES6	µg/L																
	Mercury	Hg		GELC	µg/L		<	0.05	0.05			<	0.06	0.06			<	0.06	0.06		
	Nickel	Ni		EES6	µg/L																
	Nickel	Ni		GELC	µg/L		<	0.5	0.5			<	0.5	0.5			<	0.5	0.5		
	Selenium	Se		EES6	µg/L																
	Selenium	Se		GELC	µg/L		<	2.5	2.5			<	2.5	2.5			<	2.5	2.5		
	Silver	Ag		EES6	µg/L																
	Silver	Ag		GELC	µg/L		<	0.2	0.2			<	0.2	0.2			<	0.2	0.2		
	Thallium	Tl		EES6	µg/L																
	Thallium	Tl		GELC	µg/L		<	0.4	0.4			<	0.4	0.4			<	0.4	0.4		
	Tin	Sn		EES6	µg/L																
	Tin	Sn		GELC	µg/L		<	2.5	2.5			<	2.5	2.5			<	2.5	2.5		
	Vanadium	V		EES6	µg/L																
	Vanadium	V		GELC	µg/L			7.6	1				6.7	1				7	1		
	Zinc	Zn		EES6	µg/L																
	Zinc	Zn		GELC	µg/L		<	2	2			<	2.2	2			<	4.2	2		
RAD	Americium-241	Am-241		GELC	pCi/L			-0.00202		0.0364	0.00767		-0.0114		0.0224	0.0109		0.00341		0.0305	0.0049
	Cesium-137	Cs-137		GELC	pCi/L			1.66		3.3	1.94		0.607		3.95	1.07		0.362		3.06	0.791
	Gross alpha	GROSSA		GELC	pCi/L			0.322		2.22	0.479		0.515		1.16	0.357		0.415		1.06	0.321
	Gross beta	GROSSB		GELC	pCi/L			0.896		1.59	0.487		0.0902		3.29	0.896		0.716		2.52	0.731
	Gross gamma	GROSSG		GELC	pCi/L			71.5		253	79.5		78.6		334	125		106		323	84.4
	Plutonium-238	Pu-238		GELC	pCi/L			-0.0282		0.0651	0.0181		0.00667		0.0213	0.00386		-0.00672		0.0323	0.00673
	Strontium-90	Sr-90		GELC	pCi/L			-0.15		0.407	0.0691		-0.00789		0.128	0.0374		-0.0268		0.304	0.0832
	Tritium	H-3		UMTL	pCi/L																
	Uranium	U		EES6	µg/L																
	Uranium	U		GELC	µg/L			0.39	0.05				0.17	0.05				0.19	0.05		
	Uranium-234	U-234		GELC	pCi/L			0.295		0.0726	0.0307		0.169		0.0431	0.0217		0.157		0.0474	0.022
	Uranium-238	U-238		GELC	pCi/L			0.181		0.0514	0.0228		0.0557		0.0458	0.0119		0.0887		0.0504	0.0155

Table B-1.28
Spring 9B

			Start Date Time	9/23/1998				1/7/2000				4/6/2000			
			Fld Prep Code	UF				F				F			
Anyl Suite Code	Analyte Desc	Lab Code	Std Uom	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert	Sym	Result	MDL/MDA	Uncert
	Ammonia as Nitrogen	PARA	mg/L					<	0.5			<	0.5		
	Bromide	PARA	mg/L	<	0.2			<	0.2						
	Calcium	PARA	mg/L		9.74				9.5				9.1		
	Chloride	PARA	mg/L		2.3				2.2						
	Chloride	GELC	mg/L										2.06		
	Fluoride	PARA	mg/L		0.41										
	Fluoride	GELC	mg/L						0.51				0.454		
	Nitrate as N	PARA	mg/L		0.36										
	Nitrite as N	PARA	mg/L	<	0.1										
	Nitrate-Nitrite as N	PARA	mg/L						0.34				0.4		
	Potassium	PARA	mg/L	<	1.64				1.7				1.7		
	Silicon Dioxide	PARA	mg/L						33				33		
	Sodium	PARA	mg/L		9.4				9.7				10		
	Sulfate	PARA	mg/L		2.1				2.2						
	Sulfate	GELC	mg/L										2.03		
	Total Kjeldahl Nitrogen	RECRAP	mg/L						0.34				0.19		
	Total Phosphate as Phosphorus		mg/L					<	50			<	0.05		
METALS	Aluminum	PARA	µg/L	<	16.8			<	61			<	3.2		
	Antimony	PARA	µg/L	<	2.5			<	2.8			<	3.5		
	Antimony	GELC	µg/L					<	0.683			<	0.683		
	Arsenic	PARA	µg/L	<	2.4			<	2.3			<	3		
	Barium	PARA	µg/L	<	3.8			<	4.3			<	3.5		
	Beryllium	PARA	µg/L	<	0.2			<	0.8			<	0.18		
	Beryllium	GELC	µg/L					<	0.01			<	0.01		
	Boron	PARA	µg/L					<	17			<	12		
	Cadmium	GELC	µg/L					<	0.13			<	0.13		
	Cadmium	PARA	µg/L					<	0.17			<	0.18		
	Chromium	PARA	µg/L	<	3			<	3.9			<	3.4		
	Cobalt	PARA	µg/L	<	0.5			<	0.39			<	0.58		
	Copper	PARA	µg/L	<	0.86			<	0.42			<	0.56		
	Iron	PARA	µg/L	<	44.7			<	7.3			<	50		
	Lead	PARA	µg/L	<	1.1			<	2			<	0.95		
	Lead	GELC	µg/L					<	0.01			<	0.01		
	Magnesium	PARA	mg/L	<	3.04				3				2.8		
	Manganese	PARA	µg/L	<	0.44			<	0.07			<	0.1		
	Mercury	PARA	µg/L	<	0.02			<	0.013			<	0.011		
	Nickel	PARA	µg/L	<	1.7			<	1.2			<	0.52		
	Selenium	PARA	µg/L	<	2.9			<	3.8			<	3.5		
	Silver	PARA	µg/L	<	0.6			<	0.64			<	0.87		
	Thallium	PARA	µg/L	<	2.6			<	3.2			<	3.4		
	Thallium	GELC	µg/L					<	0.026			<	0.183		
	Uranium	GELC	µg/L						0.222			<	0.195		
	Uranium	PARA	µg/L						0.28				0.23		
	Vanadium	PARA	µg/L	<	10.8				11				11		
	Zinc	PARA	µg/L	<	0.72			<	1			<	1.5		
RAD	Americium-241	PARA	pCi/L	<	-1	9.9	5.5								
	Cesium-137	PARA	pCi/L	<	0.2	1.7									
	Gross alpha	PARA	pCi/L	<	0.17	0.85									
	Gross beta	PARA	pCi/L	<	0.7	1.3									
	Plutonium-238	PARA	pCi/L	<	-0.0011	0.043									
	plutonium-239	PARA	pCi/L	<	0.0084	0.031									
	Uranium-234	PARA	pCi/L		0.1	0.027									
	Uranium-235	PARA	pCi/L	<	0.0129	0.037									
	Uranium-238	PARA	pCi/L		0.055	0.037									

Table B-1.29
Turbidity and Temperature Data for Nonfiltered Alluvial Groundwater Samples

Location Name	Start Date Time	Temperature (C)	Turbidity (NTU)
LAO-B	3/3/2005	5	
LAO-B	5/10/2005	6.8	2.48
LAO-B	8/3/2006	12.6	1.08

Table B-1.30
Turbidity and Temperature Data for Nonfiltered Intermediate Groundwater Samples

Location Name	Start Date Time	Temperature (C)	Turbidity (NTU)
Barbara Spring	3/29/2005	13.8	
Barbara Spring	5/12/2005	15.2	
Barbara Spring	6/15/2005	15.4	
Barbara Spring	7/13/2005	15.5	2.08
CDV-5.0 SPRING	3/3/2005	8.7	
CDV-5.0 SPRING	4/18/2005	9	
CDV-5.0 SPRING	5/27/2005	8.6	
CDV-5.0 SPRING	7/11/2005	8.9	4.9
Campsite Spring	5/17/2005	14.4	
Campsite Spring	6/8/2005	14.9	
Campsite Spring	7/14/2005	15	0.53
LAOI-1.1(a)	6/3/2004	12.3	19.8
LAOI-1.1(a)	3/4/2005	9.5	
LAOI-1.1(a)	3/7/2005	9.5	
LAOI-1.1(a)	5/7/2005	9.3	15.6
LAOI-1.1(a)	8/4/2006	11.1	18.8
Seven Springs	3/10/2005	10.7	
Seven Springs	5/9/2005	11.8	
Seven Springs	6/23/2005	12.2	
Seven Springs	7/15/2005	11.1	3.21
Water Canyon Gallery	11/29/2001	12.1	1.46
Water Canyon Gallery	11/29/2001	12.1	1.46
Water Canyon Gallery	9/9/2002	14.1	1.07
Water Canyon Gallery	8/26/2003	13.2	3.37
Water Canyon Gallery	3/4/2005	9.9	
Water Canyon Gallery	4/18/2005	10.7	
Water Canyon Gallery	5/27/2005	11.3	
Water Canyon Gallery	7/11/2005	12.1	3.1

Table B-1.31
Turbidity and Temperature Data for Nonfiltered Regional Groundwater

Location Name	Start Date Time	Temperature (C)	Turbidity (NTU)
Ancho Spring	2/2/2005	19.1	4.79
Ancho Spring	9/19/2006	20.7	0.38
G-1A	5/9/2001	27.7	0.19
G-1A	5/18/2002	28.3	0.25
G-1A	8/24/2002	27	0.94
G-1A	11/16/2002	27.1	0.12
G-1A	8/21/2003	28.4	0.33
G-1A	8/21/2003	28.4	0.33
G-1A	2/9/2004	24.7	1.03
G-1A	5/19/2004	21.8	0.28
G-1A	5/18/2005	26.6	0.32
G-1A	2/22/2006	25.6	1.33
G-2A	5/9/2001	28.8	0.23
G-2A	5/18/2002	29.9	0.23
G-2A	8/24/2002	28.8	0.22
G-2A	11/16/2002	27.8	0.1
G-2A	8/21/2003	27.8	0.1
G-2A	8/21/2003	27.8	0.1
G-2A	2/9/2004	27.1	0.29
G-2A	5/19/2004	28.5	0.13
G-2A	5/18/2005	29.3	0.13
G-2A	5/17/2006	29.1	0.17
G-3A	5/9/2001	26.9	0.32
G-3A	5/18/2002	26.3	0.31
G-3A	8/24/2002	27.2	0.26
G-3A	12/18/2002	26.6	0.08
G-3A	8/21/2003	27.3	0.35
G-3A	8/21/2003	27.3	0.35
G-3A	2/9/2004	26.1	0.25
G-3A	5/19/2004	26.9	0.17
G-3A	5/18/2005	27.3	0.34
G-3A	5/17/2006	26.2	0.14
G-4A	5/9/2001	25.9	0.25
G-4A	8/24/2002	25.5	0.11
G-4A	11/16/2002	24.7	0.12
G-4A	8/21/2003	26.3	0.13
G-4A	8/21/2003	26.3	0.13
G-4A	2/9/2004	25.7	0.16
G-4A	5/19/2004	26.7	0.11
G-4A	5/18/2005	26.5	0.07
G-4A	5/17/2006	25.5	0.11
G-5A	8/24/2002	29.1	0.62
G-5A	11/16/2002	26.6	1.38
G-5A	8/21/2003	28.2	0.58
G-5A	8/21/2003	28.2	0.58
G-5A	2/9/2004	27.8	1.33
G-5A	5/19/2004	29.9	0.54
G-5A	5/18/2005	29.5	0.6
G-5A	5/17/2006	28.4	1.47

Table B-1.31 (continued)

Location Name	Start Date Time	Temperature (C)	Turbidity (NTU)
PM-2	5/9/2001	25.2	0.62
PM-2	5/18/2002	25.4	0.3
PM-2	5/18/2002	25.4	0.3
PM-2	8/24/2002	24.9	0.19
PM-2	11/16/2002	22.1	0.09
PM-2	8/4/2003	22.8	0.15
PM-2	8/21/2003	22.8	0.15
PM-2	9/24/2003	24.8	0.22
PM-2	10/29/2003	24.1	0.19
PM-2	12/17/2003	24.9	0.1
PM-2	2/9/2004	24.8	0.19
PM-2	3/24/2004	24.5	0.2
PM-2	5/20/2004	24.4	0.2
PM-2	8/31/2004	25.3	0.13
PM-2	11/16/2004	24.5	0.15
PM-2	3/23/2005	22	0.25
PM-2	5/18/2005	24.8	0.15
PM-2	8/17/2005	24.6	0.12
PM-2	11/16/2005	25.4	0.13
PM-2	1/19/2006	24.2	0.15
PM-2	5/24/2006	24.1	0.11
PM-2	8/24/2006	23.7	0.21
PM-2	12/7/2006	23.3	0.27
PM-4	5/9/2001	25.4	0.3
PM-4	8/21/2003	25.2	0.1
PM-4	6/7/2004	10.3	7.91
PM-4	2/15/2005	25.8	0.24
PM-4	2/22/2006	22	0.79
PM-5	5/9/2001	24.5	0.31
PM-5	7/11/2001	252	0.4
PM-5	5/18/2002	25	0.14
PM-5	5/18/2002	25	0.14
PM-5	6/26/2002	25.8	0.07
PM-5	8/24/2002	26.2	0.17
PM-5	9/25/2002	27.6	0.22
PM-5	10/9/2002	23.3	0.14
PM-5	11/16/2002	23.5	23.5
PM-5	8/21/2003	23.1	0.14
PM-5	9/24/2003	24.2	0.13
PM-5	10/29/2003	24.4	0.11
PM-5	12/17/2003	19.6	0.17
PM-5	1/28/2004	23.6	0.19
PM-5	2/9/2004	24.4	0.23
PM-5	3/24/2004	24.4	0.15
PM-5	5/20/2004	25.4	0.15
PM-5	8/31/2004	24.3	0.11
PM-5	11/16/2004	22.1	0.13
PM-5	3/23/2005	23.2	0.24
PM-5	5/18/2005	24.8	0.12
PM-5	8/17/2005	23.8	0.17
PM-5	11/16/2005	24	0.3

Table B-1.31 (continued)

Location Name	Start Date Time	Temperature (C)	Turbidity (NTU)
PM-5	1/19/2006	24	0.09
PM-5	5/24/2006	25.2	0.06
PM-5	8/24/2006	24.1	0.17
PM-5	12/7/2006	24	0.15
R-1	5/19/2005	22.42	0.41
R-1	9/12/2005	21.7	0.57
R-1	11/28/2005	21.3	0.37
R-1	1/25/2006	21.3	0.65
R-1	4/19/2006	19.9	0.58
R-1	7/6/2006	21.3	0.7
R-1	10/26/2006	20.8	0.74
R-13	12/9/2003	21	0.16
R-13	6/11/2004	21.6	0.34
R-13	6/11/2004	21.6	0.44
R-13	3/10/2005	21.1	
R-13	5/26/2005	21.7	0.16
R-13	9/1/2005	21.6	0.28
R-13	2/2/2006	21.1	0.36
R-13	7/3/2006	21.9	0.9
R-13	10/25/2006	20.9	4.24
R-21	3/31/2004	21.5	0.27
R-21	9/23/2004	21.7	0.63
R-21	6/6/2005	21.5	0.21
R-21	7/7/2006	21.9	0.43
R-21	11/6/2006	21.5	0.44
Sacred Spring	10/23/2001	15.3	2.7
Sacred Spring	10/23/2001	15.3	
Sacred Spring	6/25/2002	11.7	2.2
Sacred Spring	7/23/2003	17.4	2.35
Sacred Spring	8/24/2004	17.7	42.3
Sacred Spring	7/13/2005	18.4	-35.6
Sacred Spring	9/14/2006	25	0.53
Spring 1	9/24/2001	18.6	21.2
Spring 1	11/6/2002	16.3	1.56
Spring 1	10/6/2003	12	3.61
Spring 1	9/13/2004	16.9	36.8
Spring 1	9/26/2005	14.7	8.18
Spring 1	9/18/2006	17.9	0.86
Spring 5B	10/7/2003	16.5	6.67
Spring 6	9/24/2002	20.8	0.13
Spring 6	3/12/2004	20.6	0.12
Spring 6	9/14/2004	21	0.28
Spring 6	3/24/2005	20.5	
Spring 6	4/29/2005	21	
Spring 6	9/27/2005	21	0.2
Spring 6	9/19/2006	21	6.73
Spring 6A	9/25/2001	22.2	13.1
Spring 6A	10/7/2003	20.3	3.18
Spring 6A	3/12/2004	20.4	0.27
Spring 6A	9/14/2004	23.5	1.85
Spring 6A	9/27/2005	21.2	1.56

Table B-1.31 (continued)

Location Name	Start Date Time	Temperature (C)	Turbidity (NTU)
Spring 6A	9/19/2006	20.9	3.01
Spring 8A	10/7/2003	12.8	0.34
Spring 8A	3/18/2004	21.1	0.26
Spring 8A	1/26/2005	19.3	1.31
Spring 8A	9/19/2006	19.1	2.18
Spring 9	9/25/2001	21.5	9.95
Spring 9	10/8/2003	19.1	9.86
Spring 9	3/18/2004	20.9	2.19
Spring 9	9/14/2004	22.3	22.4
Spring 9	9/28/2005	20.5	2.41
Spring 9	9/19/2006	20.4	0.25
Spring 9A	10/8/2003	16.8	0.66
Spring 9A	3/18/2004	19.2	2.05
Spring 9A	9/14/2004	20	0.6
Spring 9A	3/8/2005	20.1	
Spring 9A	4/29/2005	19.3	
Spring 9A	5/18/2005	20.5	
Spring 9A	7/20/2005	20.6	2.4
Spring 9A	9/28/2005	21.1	0.34
Spring 9A	9/20/2006	18	0.91

Table B-1.32

Dissolved Oxygen and Oxidation Reduction Potential Data for Nonfiltered Alluvial Groundwater

Location Name	Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)
LAO-B	3/3/2005	5.12	
LAO-B	5/10/2005	5.7	
LAO-B	8/3/2006	3.44	390.6
LAO-B	4/9/2007	7.42	244

Table B-1.33
Dissolved Oxygen and Oxidation Reduction Potential Data for Nonfiltered Intermediate Groundwater

Location Name	Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)
Barbara Spring	3/29/2005	9.92	
Barbara Spring	5/12/2005	7	
Barbara Spring	6/15/2005	6.2	
Barbara Spring	7/13/2005	5.01	
CDV-5.0 SPRING	3/3/2005	8.08	
CDV-5.0 SPRING	7/11/2005	6.09	
Campsite Spring	5/17/2005	6.69	
Campsite Spring	6/8/2005	6.5	
Campsite Spring	7/14/2005	4.94	
LAOI-1.1(a)	3/4/2005	15.25	
LAOI-1.1(a)	3/7/2005	7.4	
LAOI-1.1(a)	5/7/2005	7.42	
LAOI-1.1(a)	8/4/2006	9.78	367.1
Seven Springs	3/10/2005	7.43	
Seven Springs	5/9/2005	7.6	
Seven Springs	7/15/2005	5.35	
Water Canyon Gallery	3/4/2005	4.41	
Water Canyon Gallery	7/11/2005	8.09	

Table B-1.34
Dissolved Oxygen and Oxidation Reduction Potential Data for Nonfiltered Regional Groundwater

Location Name	Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)
Ancho Spring	2/2/2005		
Ancho Spring	9/19/2006	8.02	
G-1A	5/18/2005		
G-1A	2/22/2006	4.65	
G-2A	5/18/2005		
G-2A	5/17/2006		
G-3A	5/18/2005		
PM-2	5/24/2006	9.55	
PM-2	8/24/2006	5.55	
PM-4	2/22/2006	4.83	
PM-5	8/24/2006	5.22	
R-1	5/19/2005	4.5	29
R-1	9/12/2005	4.43	-112.5
R-1	11/28/2005	4.25	111.4
R-1	1/25/2006	4.1	106.2
R-1	4/19/2006	4.8	-2.5
R-1	7/6/2006	4.49	38.5
R-1	10/26/2006	2.52	110.7
R-1	3/7/2007	4.94	140
R-13	3/10/2005	4.53	
R-13	5/26/2005	6	
R-13	9/1/2005	5.25	150.4
R-13	2/2/2006	4.78	189.8
R-13	7/3/2006	5.73	51.5
R-13	10/25/2006	5.78	214.3
R-13	2/28/2007	5.2	378
R-21	6/6/2005	4.33	
R-21	7/7/2006	4.32	65.2
R-21	11/6/2006	3.98	49.4
R-21	3/15/2007	4.43	105.6
Sacred Spring	7/13/2005		529.4
Sacred Spring	9/14/2006	3.1	40.7
Spring 1	9/26/2005	116.5	
Spring 1	9/18/2006	6.94	
Spring 6	3/24/2005	7.05	
Spring 6	4/29/2005	6.8	

Table B-1.34 (continued)

Location Name	Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)
Spring 6	9/27/2005	7.47	
Spring 6	9/19/2006	7.2	
Spring 6A	9/27/2005	6.14	
Spring 6A	9/19/2006	3.5	
Spring 8A	9/19/2006	7.26	
Spring 9	9/28/2005	6.7	
Spring 9	9/19/2006	6.11	
Spring 9A	3/8/2005	5.66	
Spring 9A	4/29/2005	6.2	
Spring 9A	7/20/2005	4.09	
Spring 9A	9/28/2005	4.14	
Spring 9A	9/20/2006	7.35	

Appendix C

Statistical Plots

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The figures presented here in Appendix C are based on the raw data presented in Appendix B-2. Sigma Plot was used to create the figures. The data are presented in the form found in Appendix B-2 with some minor exceptions. For each constituent, there are three figures—a box plot representing variation by location, a box plot representing variation between filtration type and mode of groundwater, and a time series also showing occurrence of nondetects.

Box plots: There are two box plots presented for each constituent; one separated by location and the other by aquifer and filtration. In the location box plot, only filtered values are shown with the exception of water supply wells (G-1A, G-2A, G-3A, G-4A, G-5A, PM-2, PM-4, PM-5). Due to the nature of the analyses, pH, specific conductance, total suspended solids, tritium, dissolved oxygen, oxidation reduction potential, temperature, and turbidity show non filtered values for the location box plots. Box plots are used to show differences between two or more sample locations or other data groupings. Box plots summarize information about the shape and spread of the distribution of concentrations for an analyte. Box plots consist of a box, a (median) line across the box, and a mean line. The *y*-axis displays the observed concentrations in the reported units. The area enclosed by the box shows the concentration range containing the middle half of the data; that is, the lower box edge is at the 25th percentile, and the upper box edge is at the 75th percentile. The length of the box is a measure of the spread of the range of concentrations. The black horizontal line across the box represents the median (50th percentile) of the data, a measure of the center of the concentration distribution. If the median line divides the box into two approximately equal parts, the shape of the distribution of concentrations is symmetric; if not, the distribution is skewed or nonsymmetrical. The red horizontal line across the box represents the mean of the data, a measure influenced by exceptionally low or high values. The top and bottom horizontal lines represent the 5th and 95th percentiles. Concentrations outside the 25th to 75th percentiles are plotted as points outside the box.

Time series analysis: A time versus concentration scatter plot is provided for each constituent measured. Time is plotted along the *x*-axis, and the constituent concentration is plotted along the *y*-axis. Any long-term trends can be deduced from these plots. Nondetects are shown in open symbols and plotted as one-half the detection limit. Figures show the impact of the number of nondetects, the detection limit to the total data set, and variation between filtered and nonfiltered results.

Note: R-18 was removed from the background data set as this report was going to final printing. The data from R-18 have not been removed from these plots.

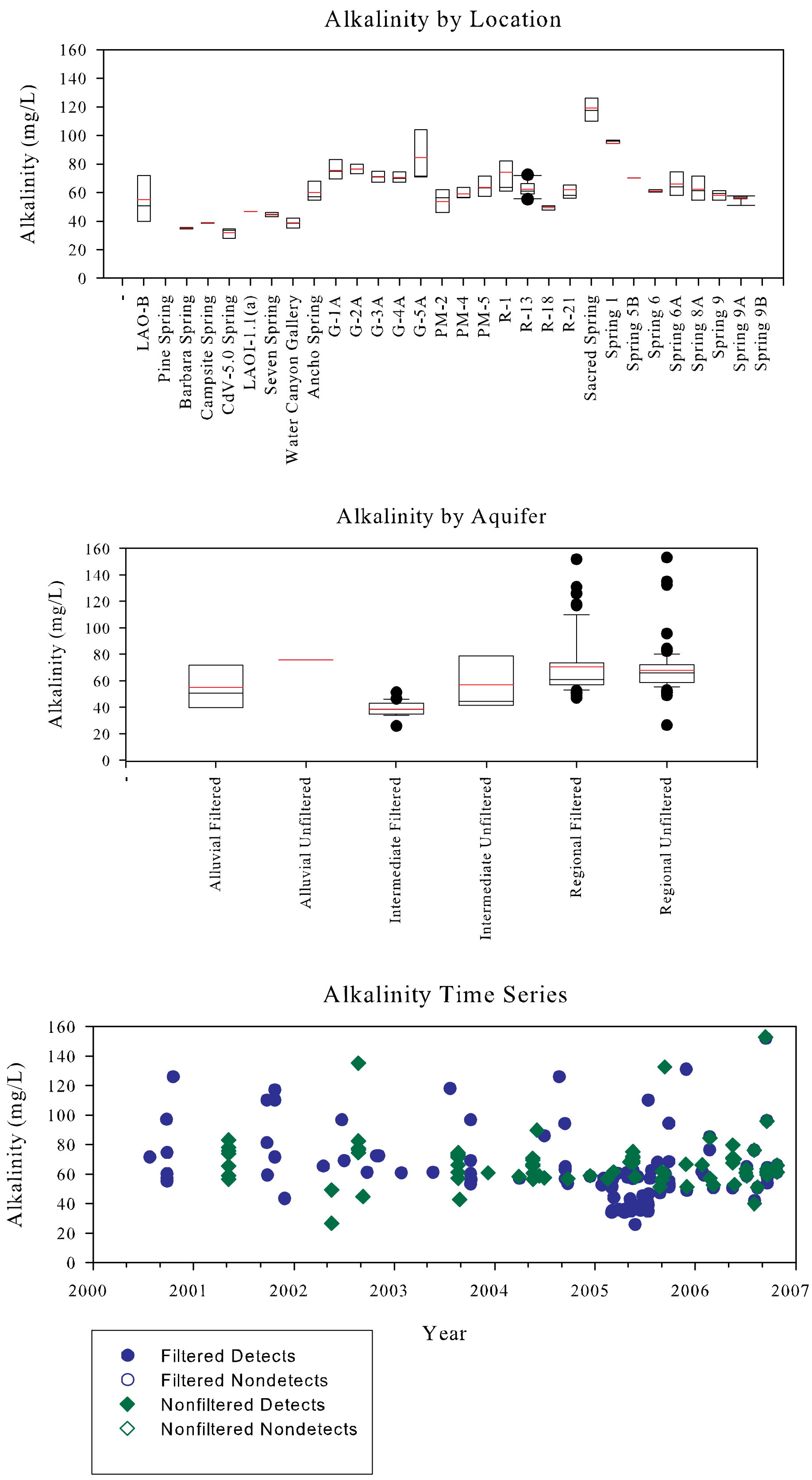


Figure C-1 Alkalinity

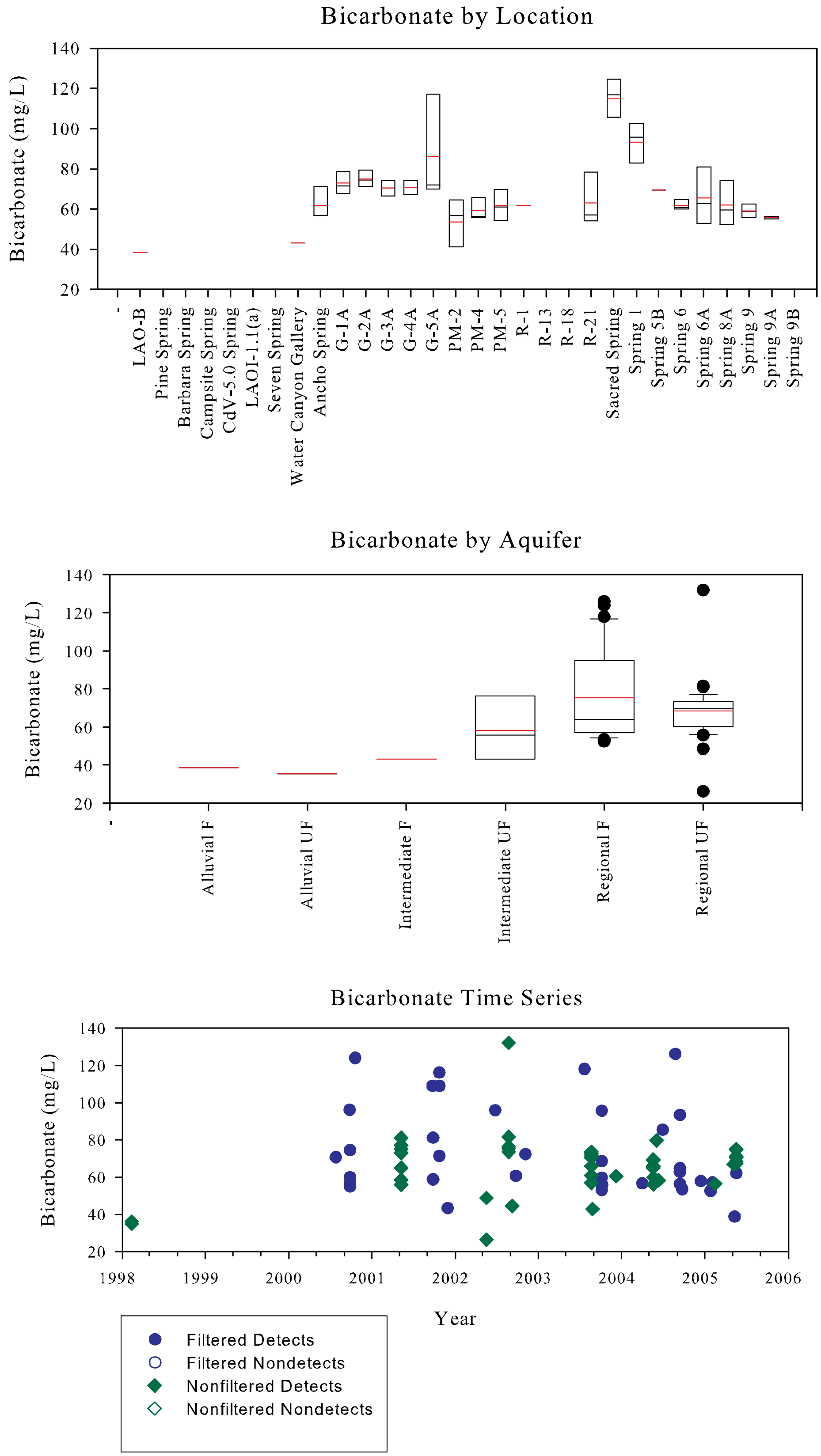


Figure C-2 Bicarbonate

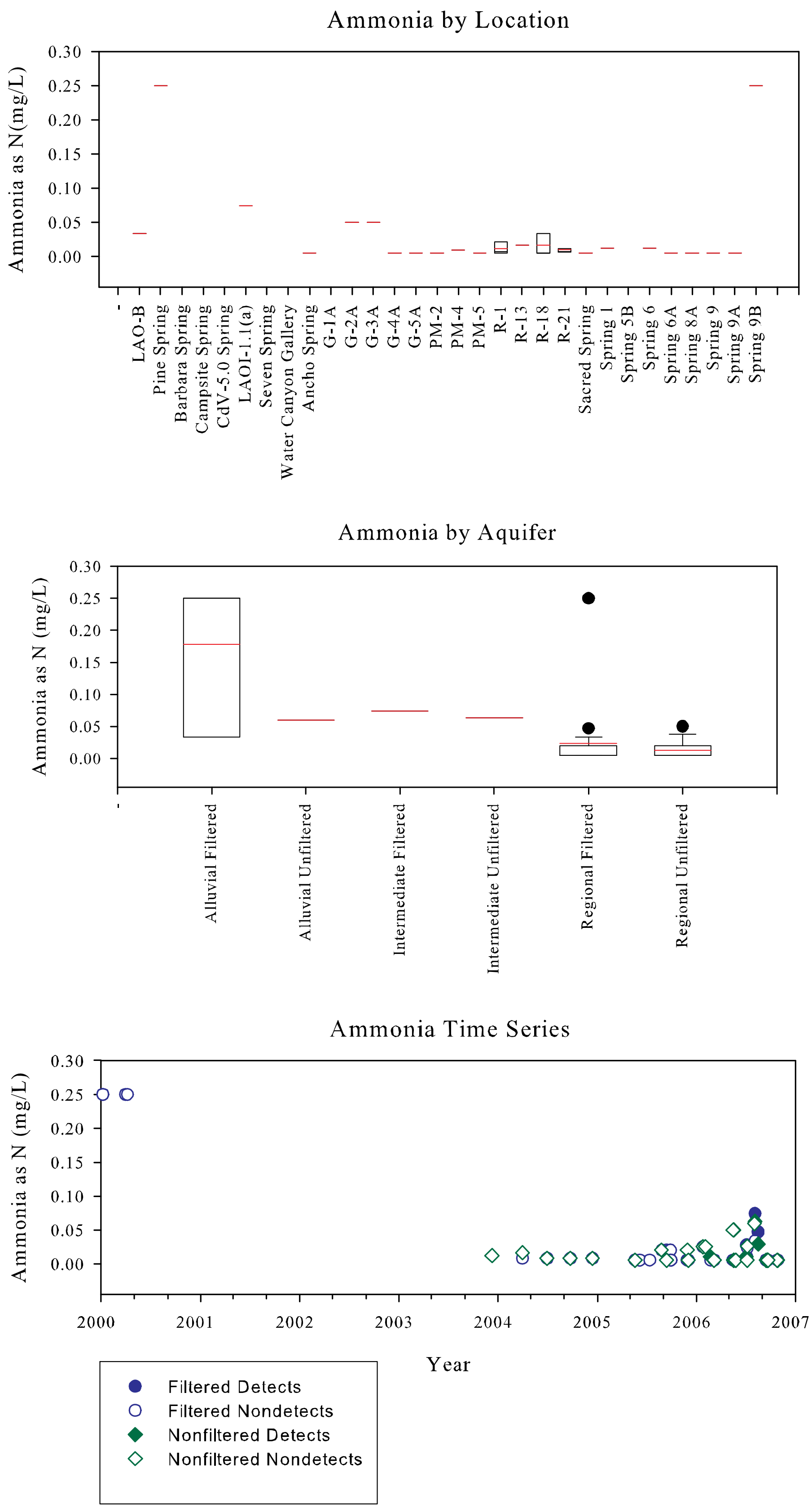


Figure C-3 Ammonia

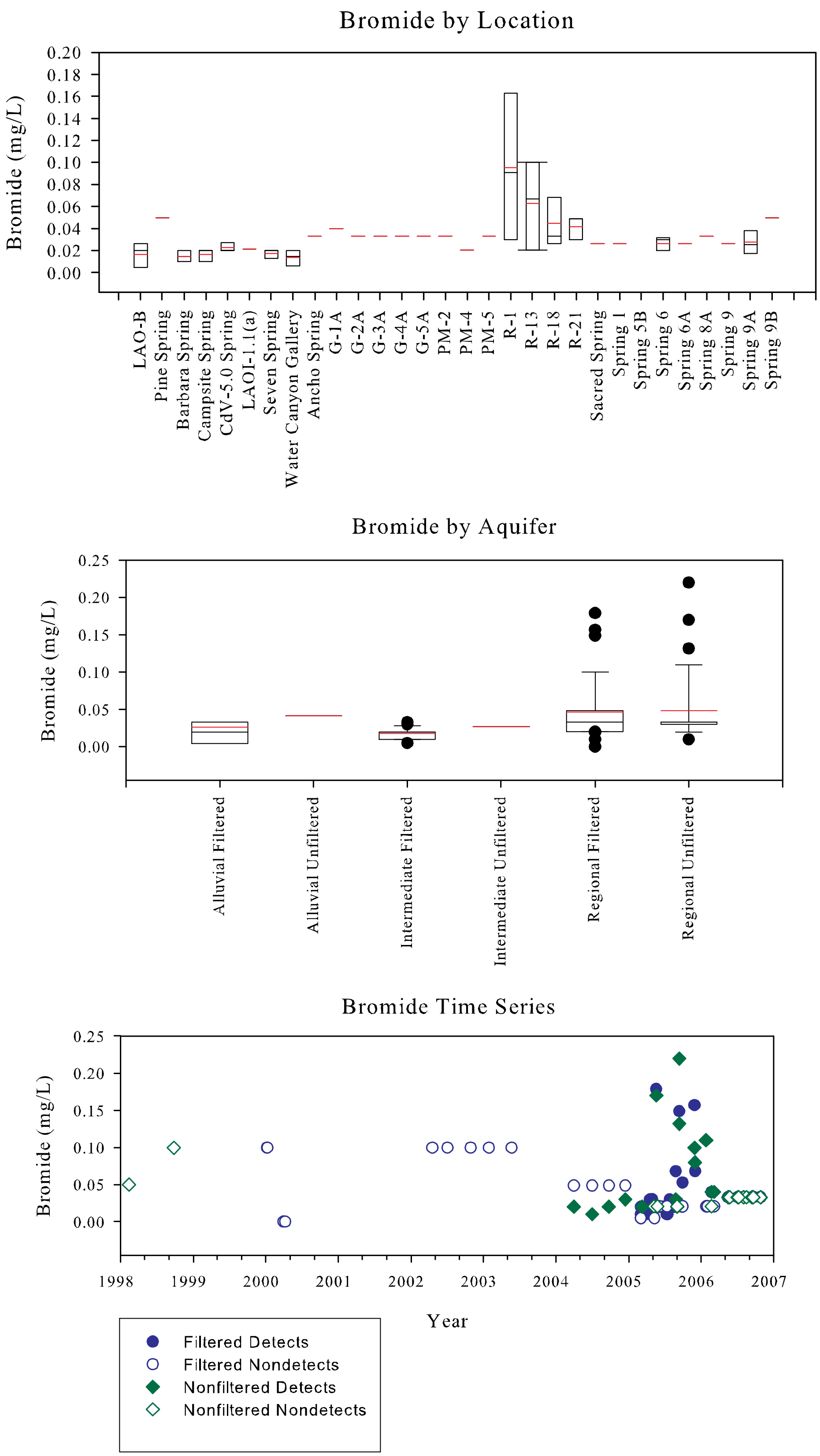


Figure C-4 Bromide

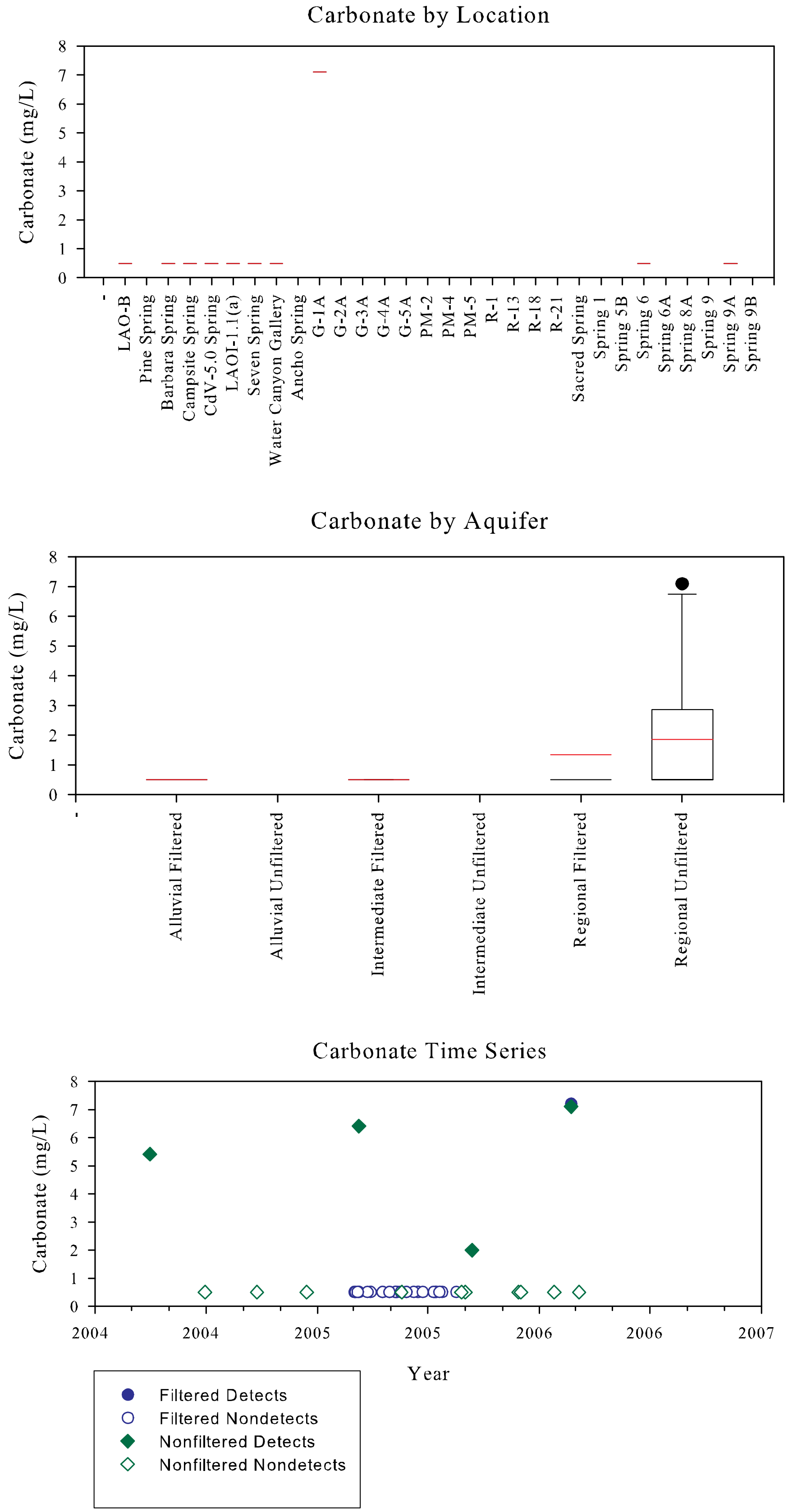
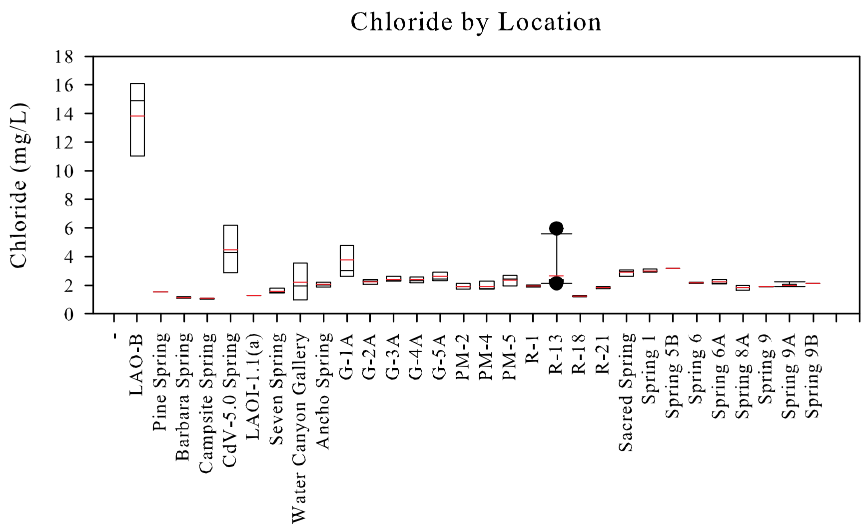
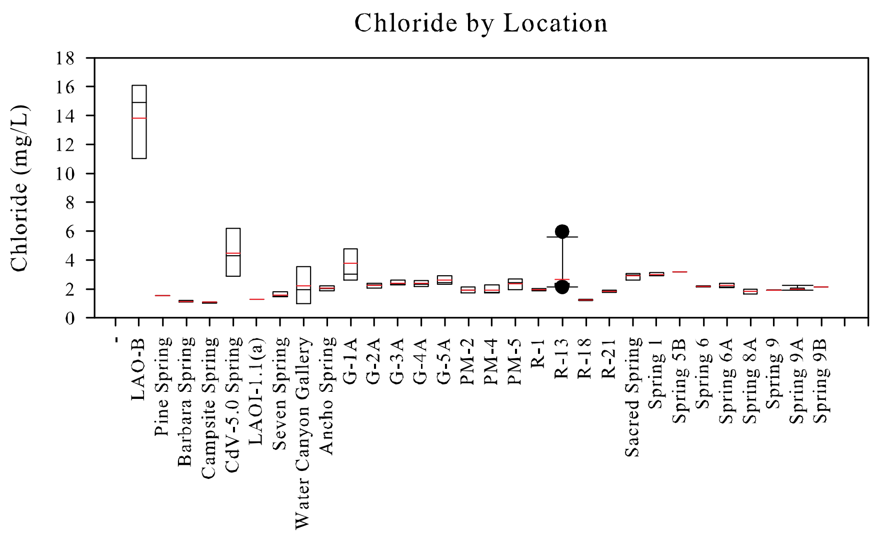


Figure C-5 Carbonate





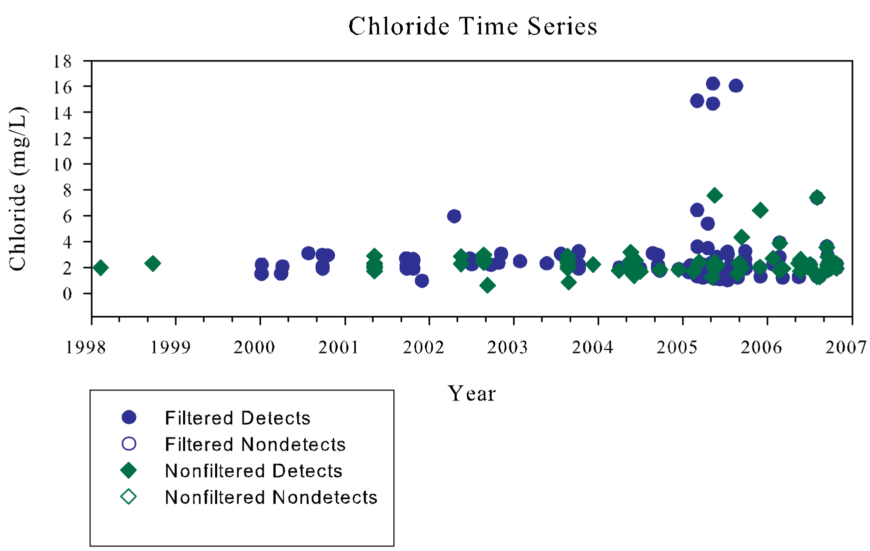
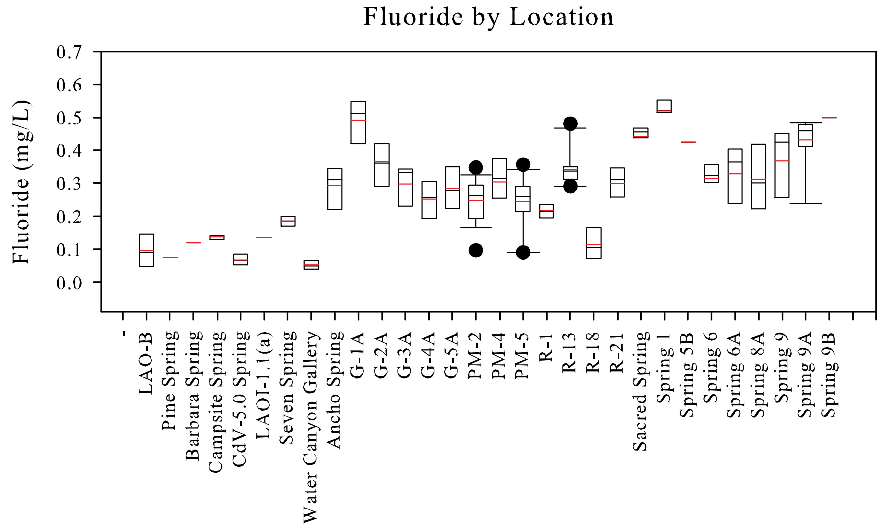
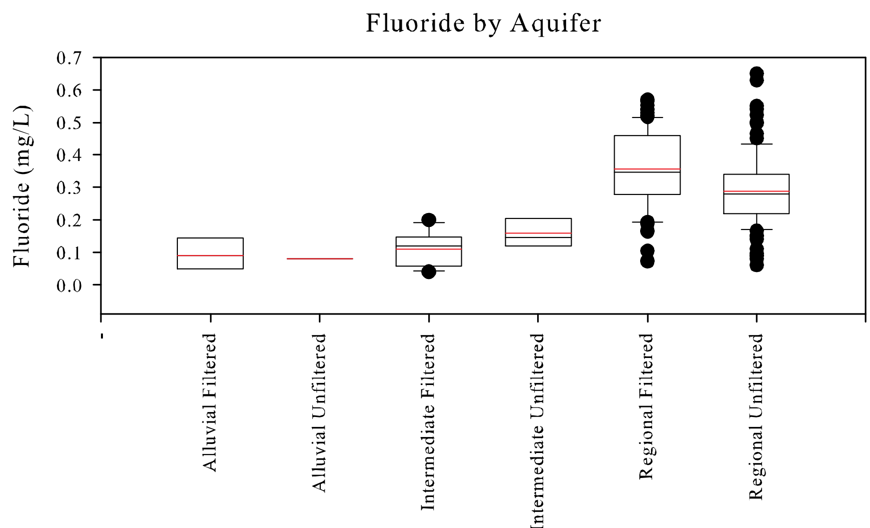


Figure C-6 Chloride





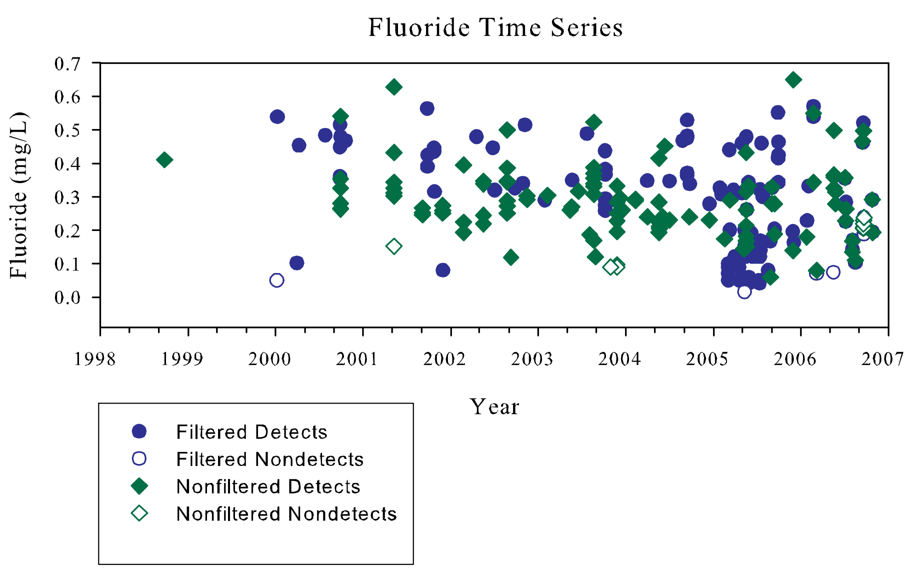


Figure C-7 Fluoride

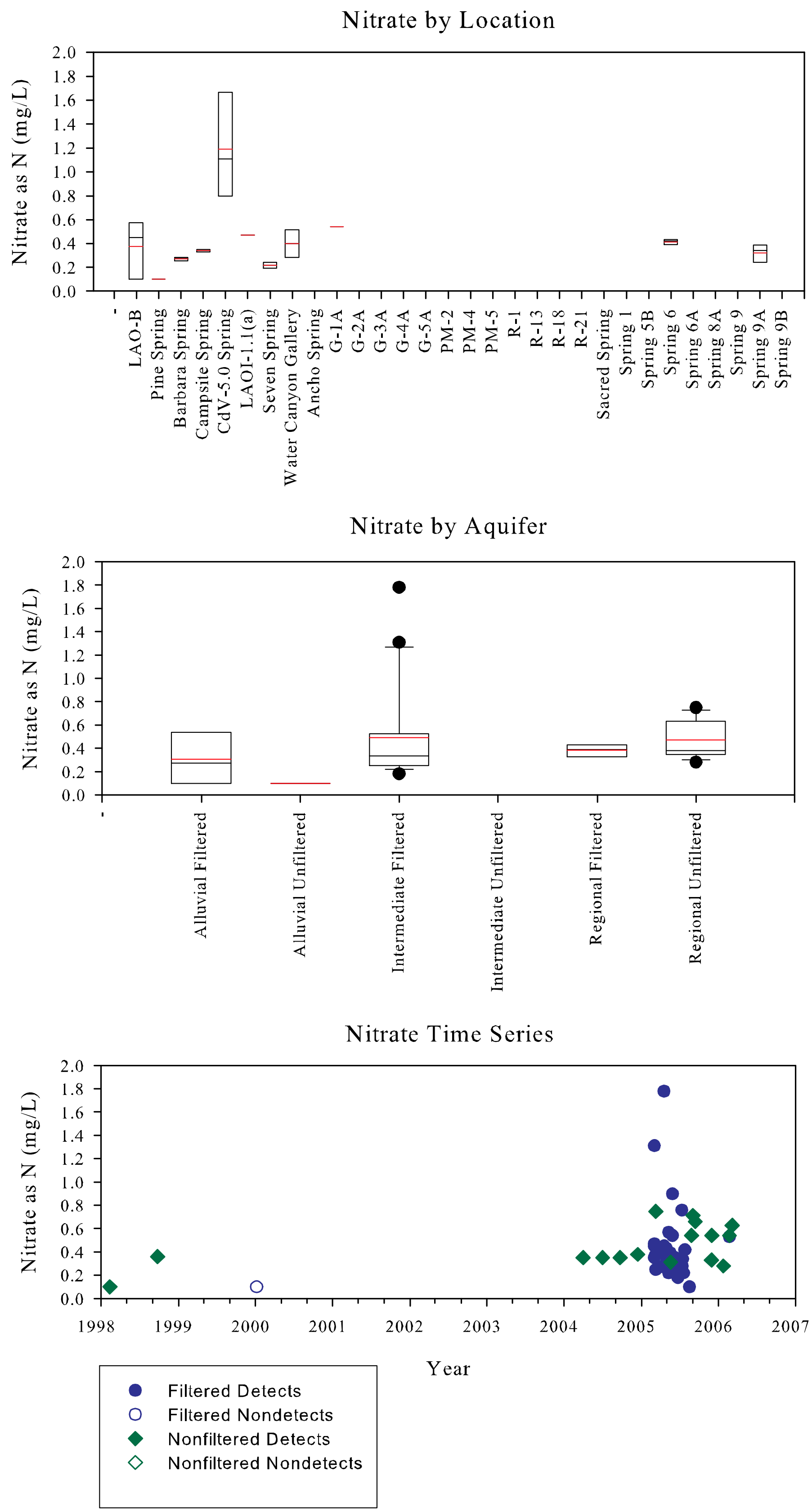


Figure C-8 Nitrate

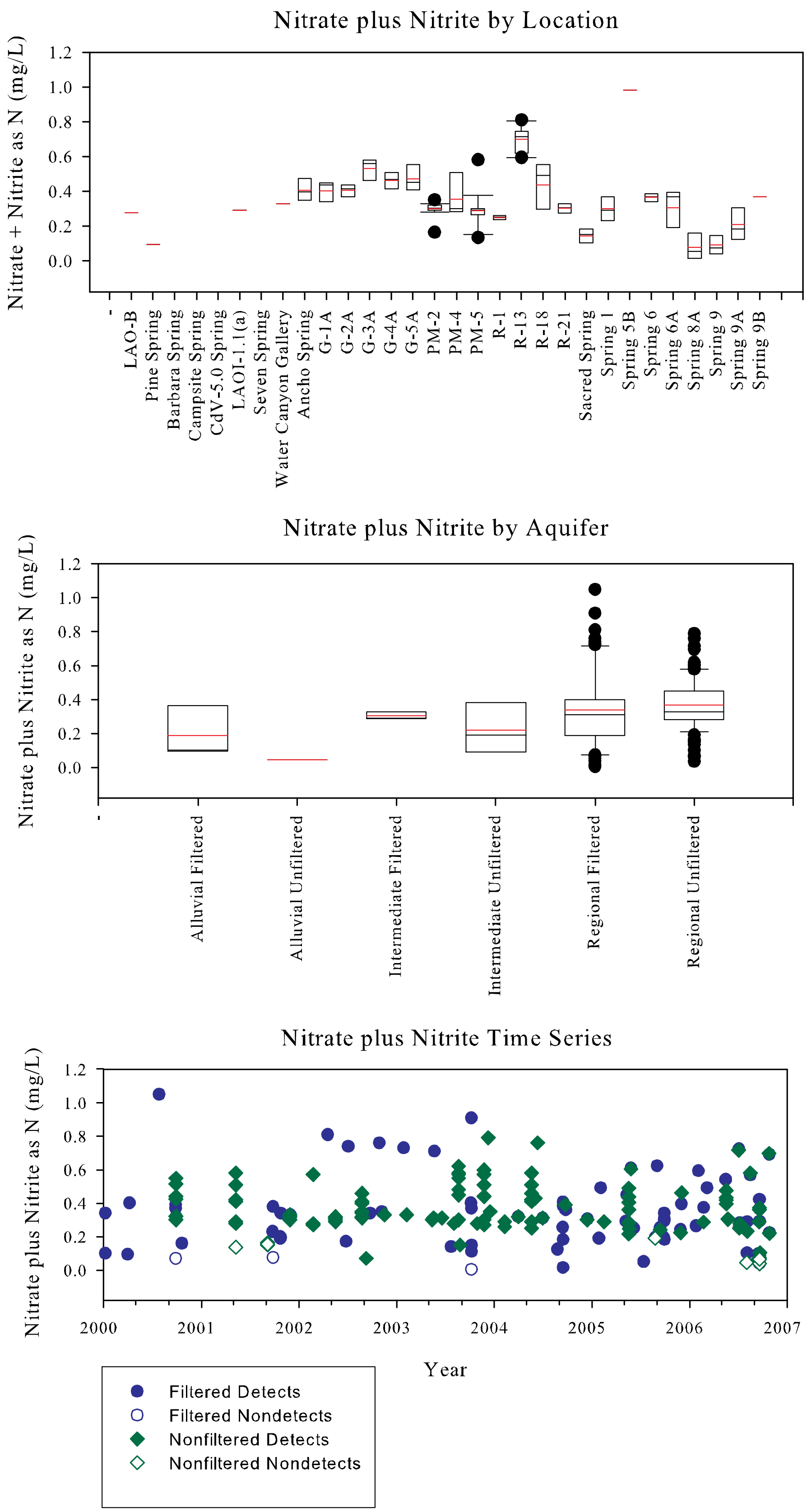


Figure C-9 Nitrate + Nitrite

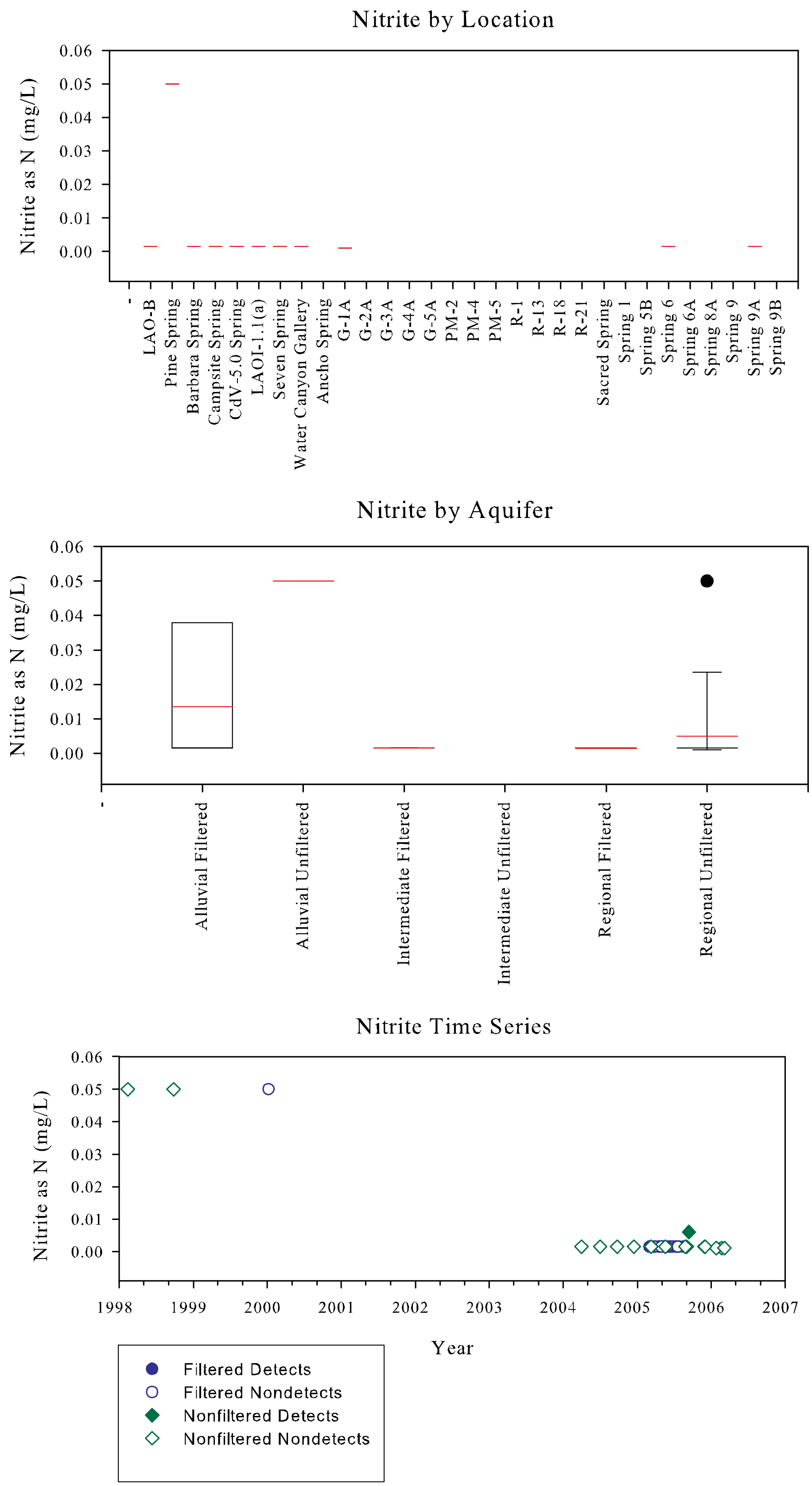
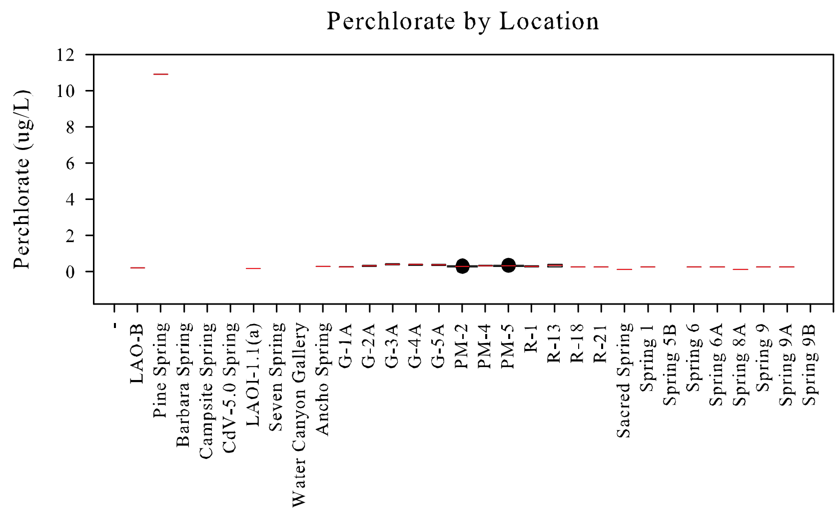
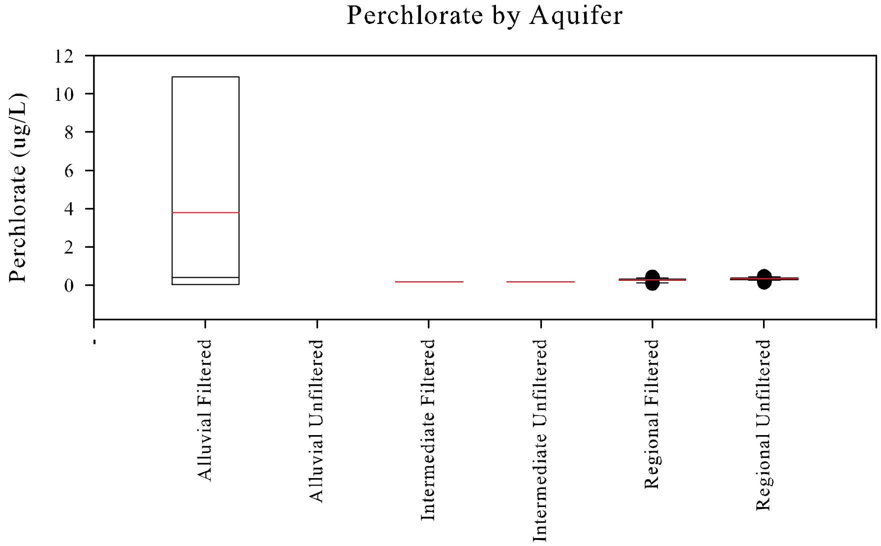


Figure C-10 Nitrite





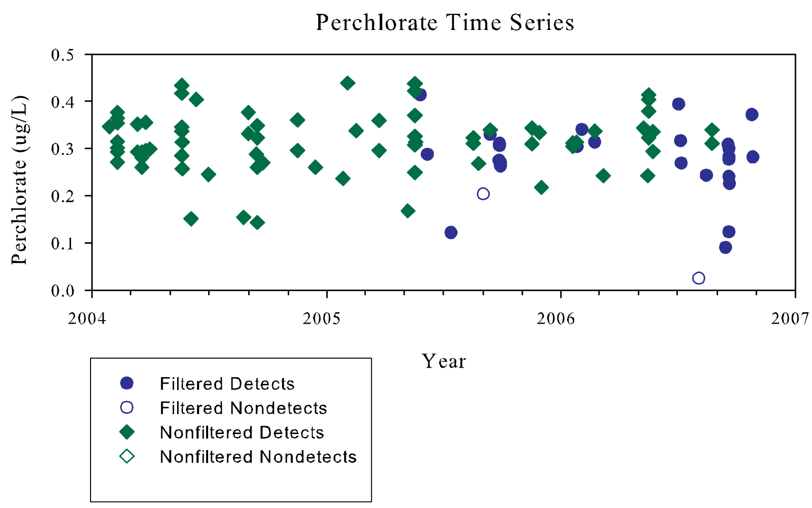


Figure C-11 Perchlorate

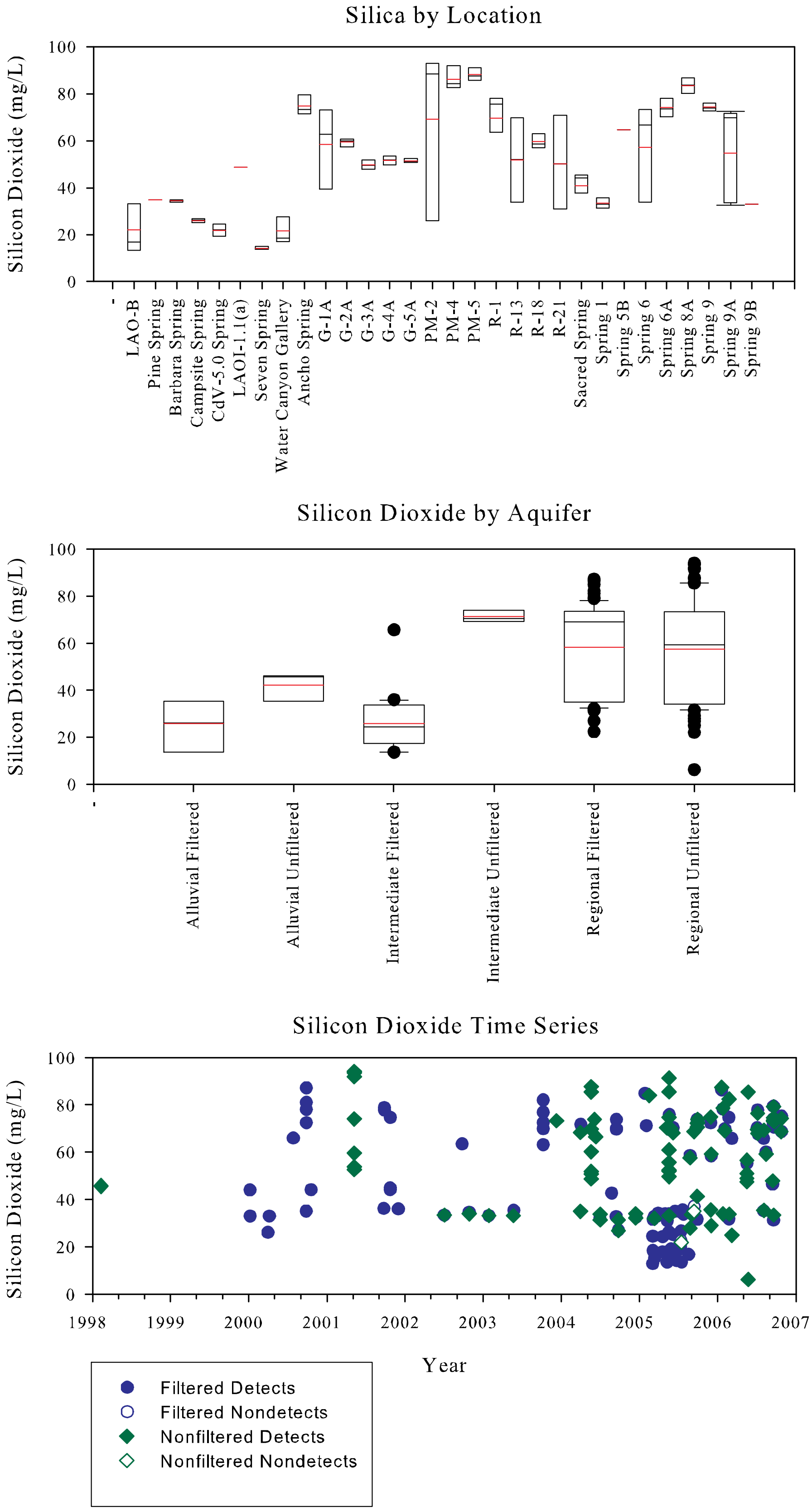


Figure C-12 Silicon Dioxide

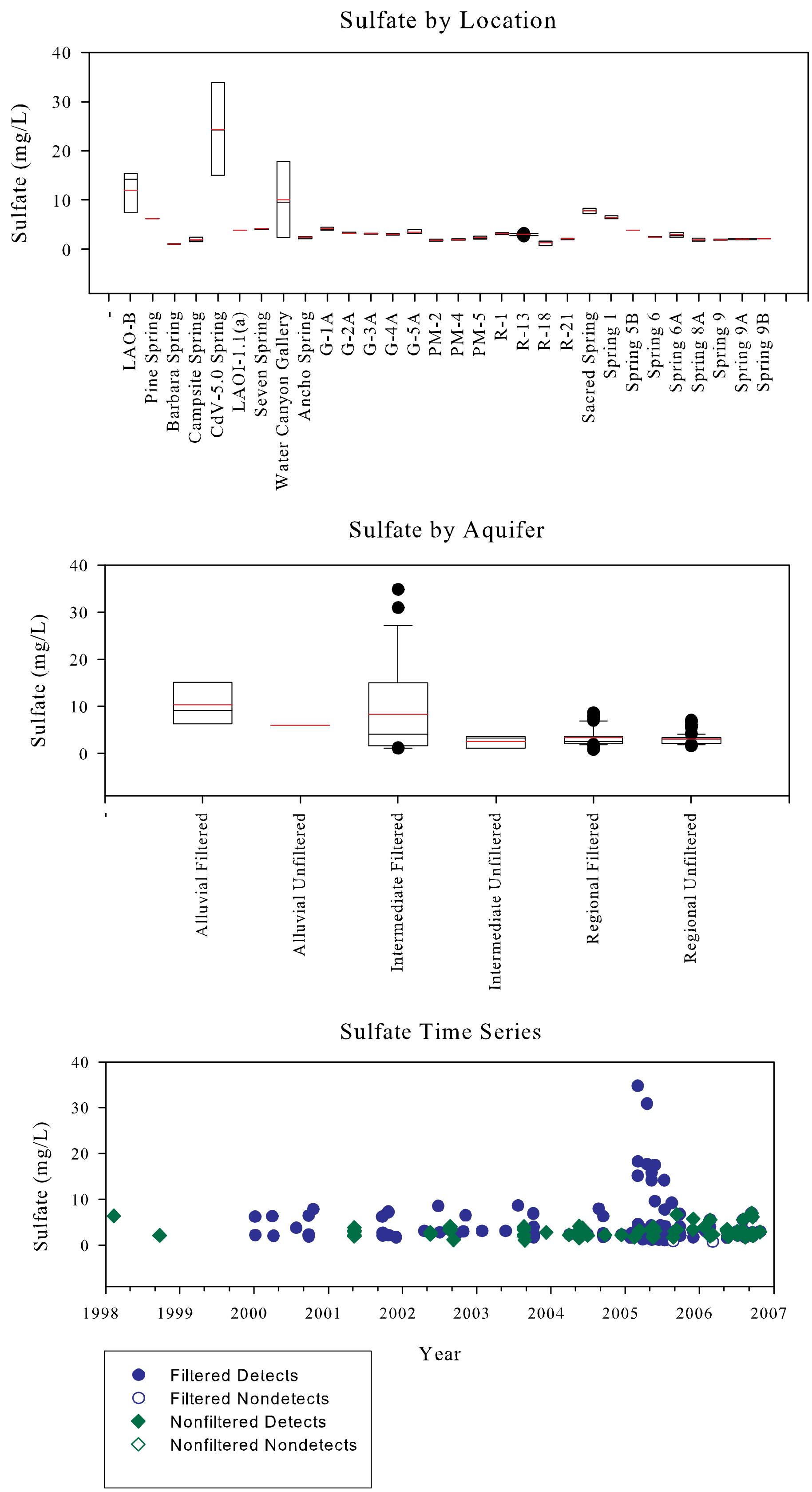


Figure C-13 Sulfate

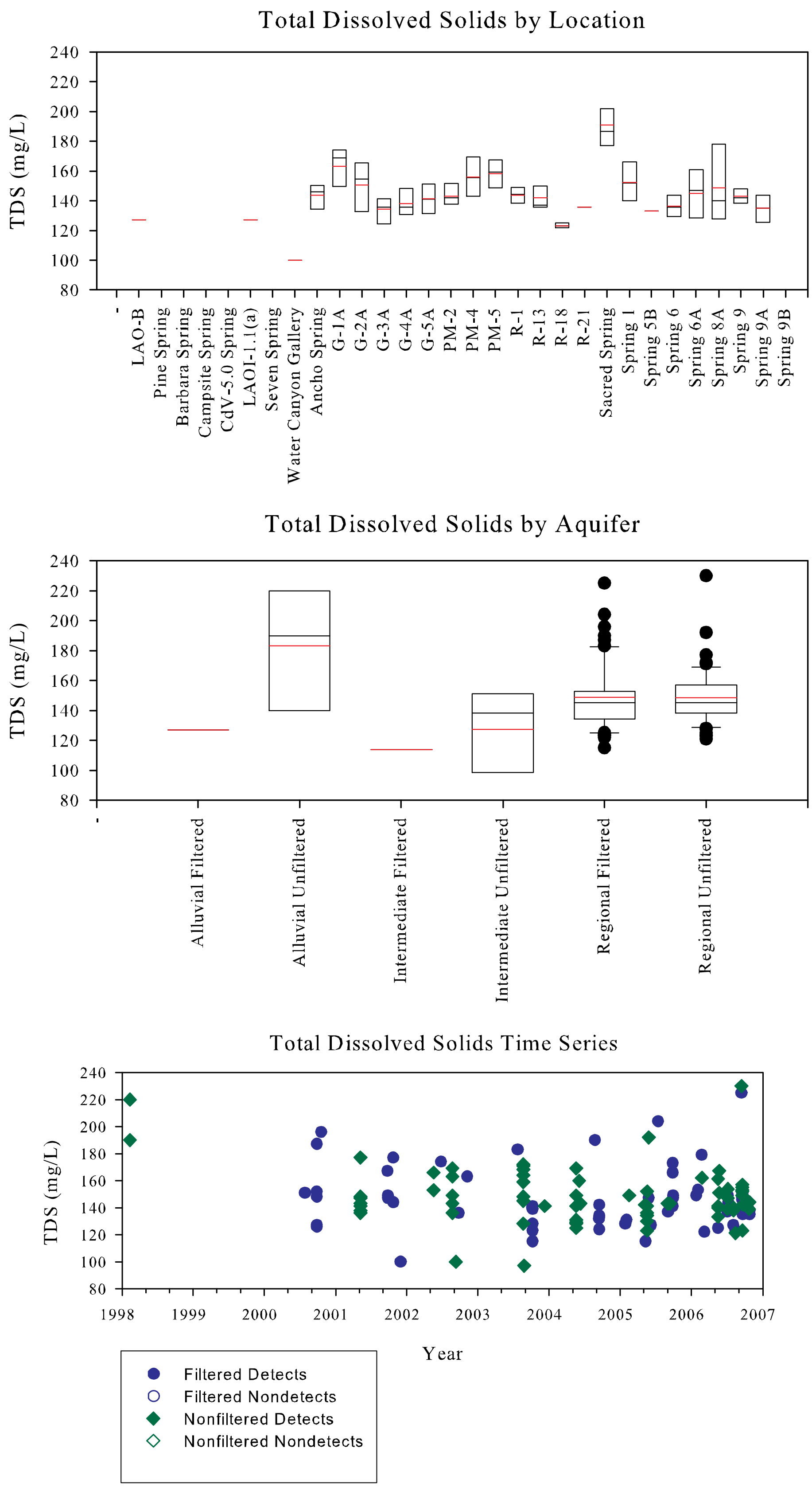


Figure C-14 Total Dissolved Solids

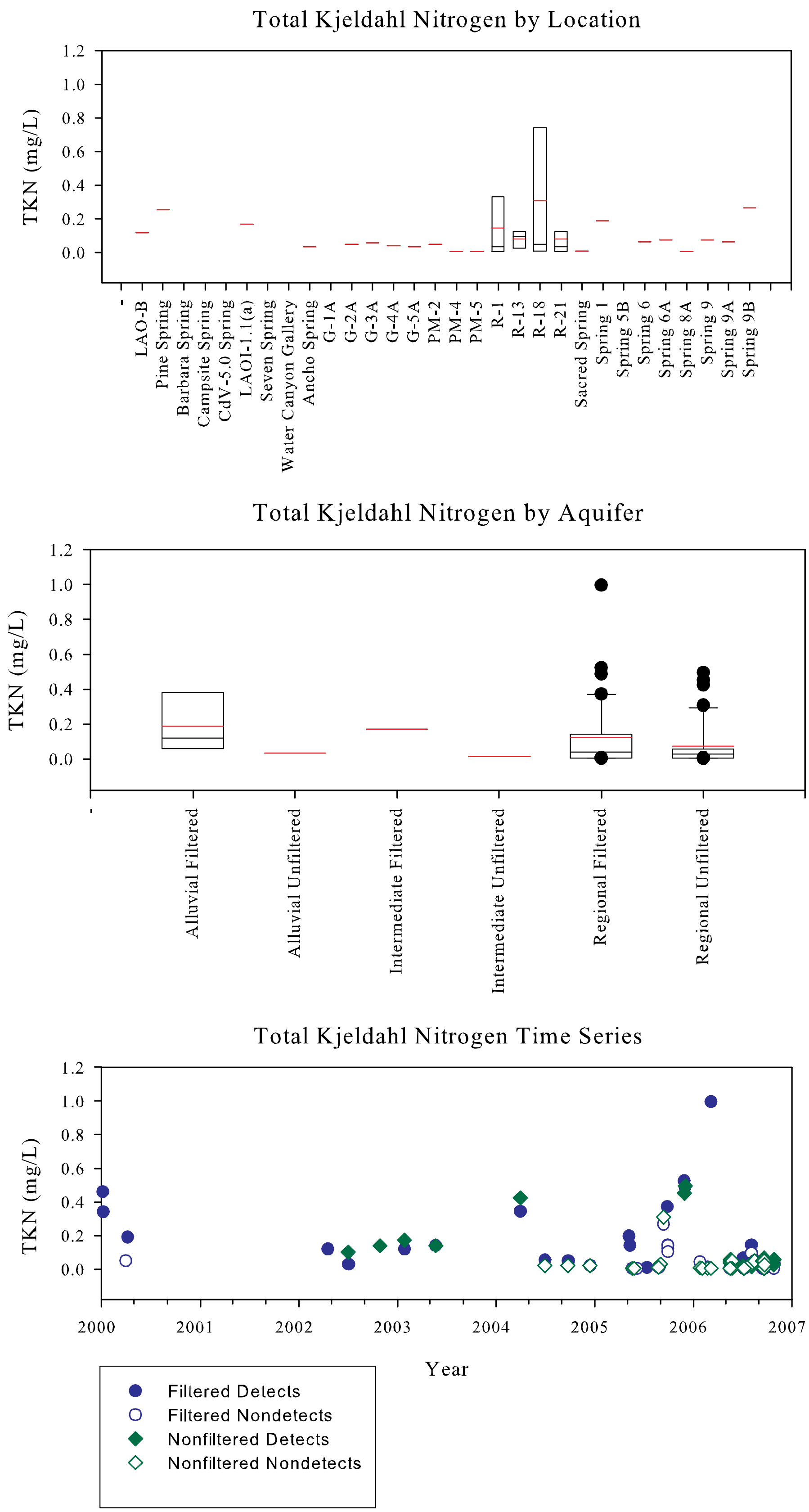


Figure C-15 Total Kjeldahl Nitrogen

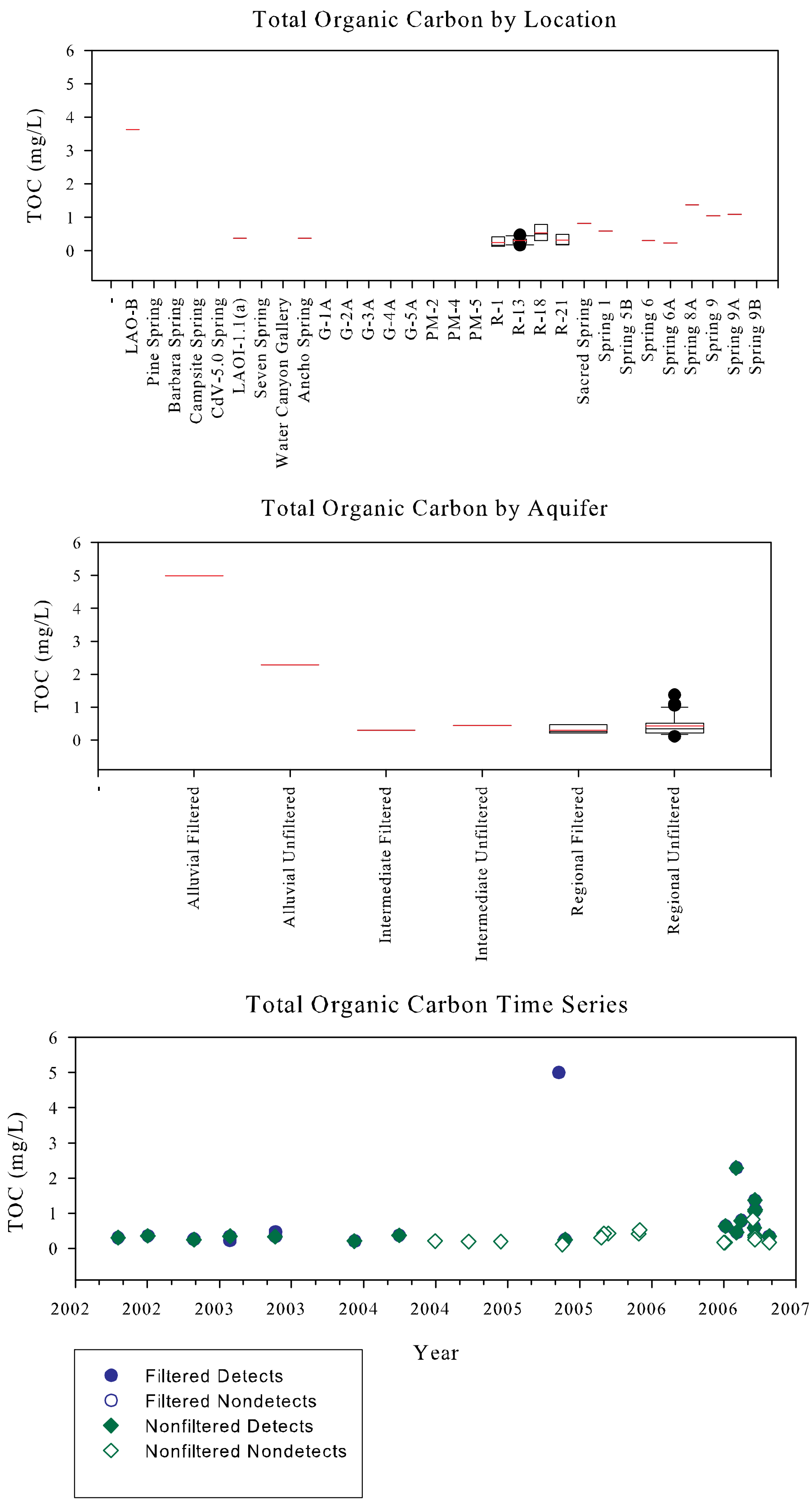


Figure C-16 Total Organic Carbon

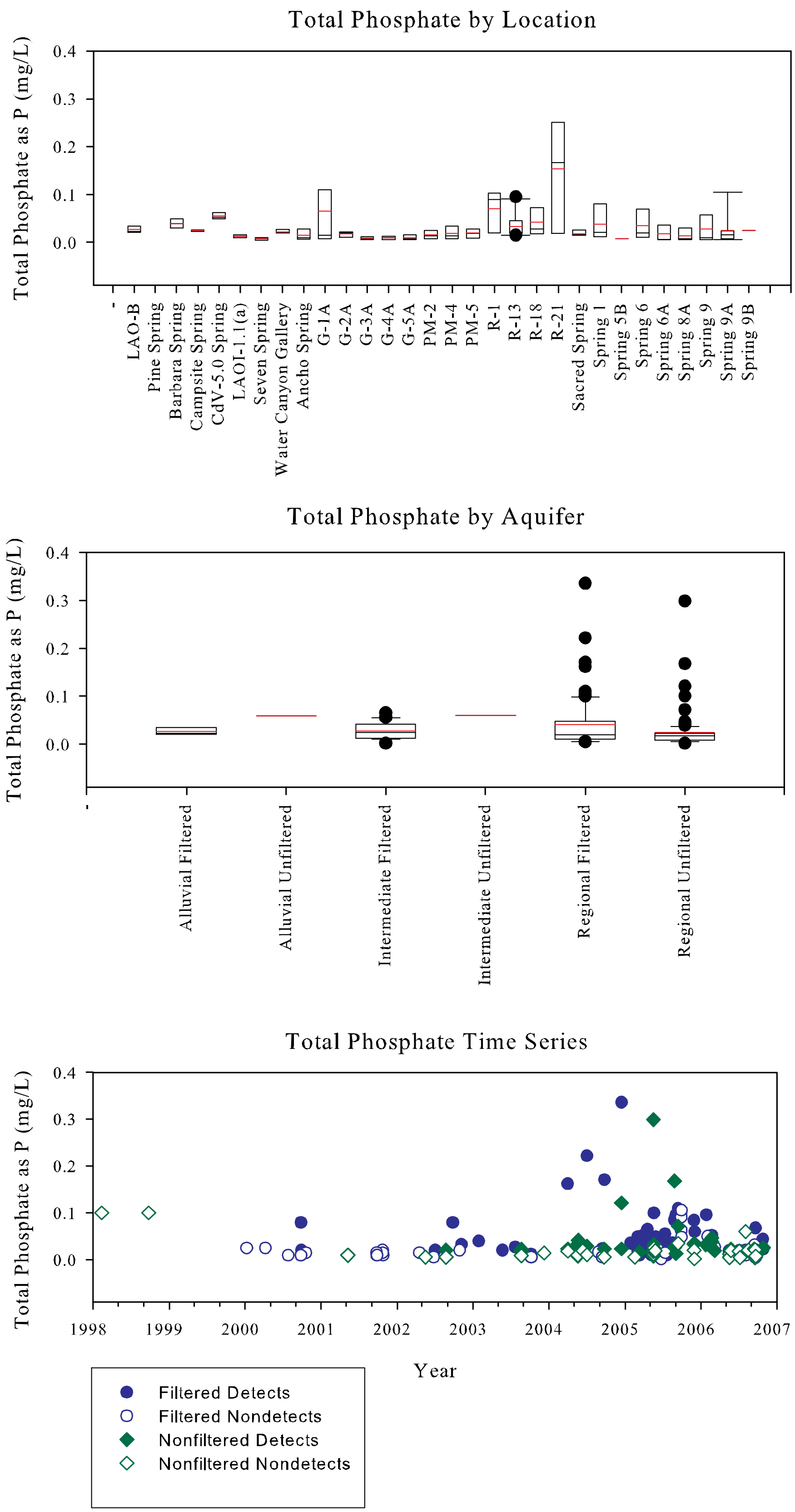
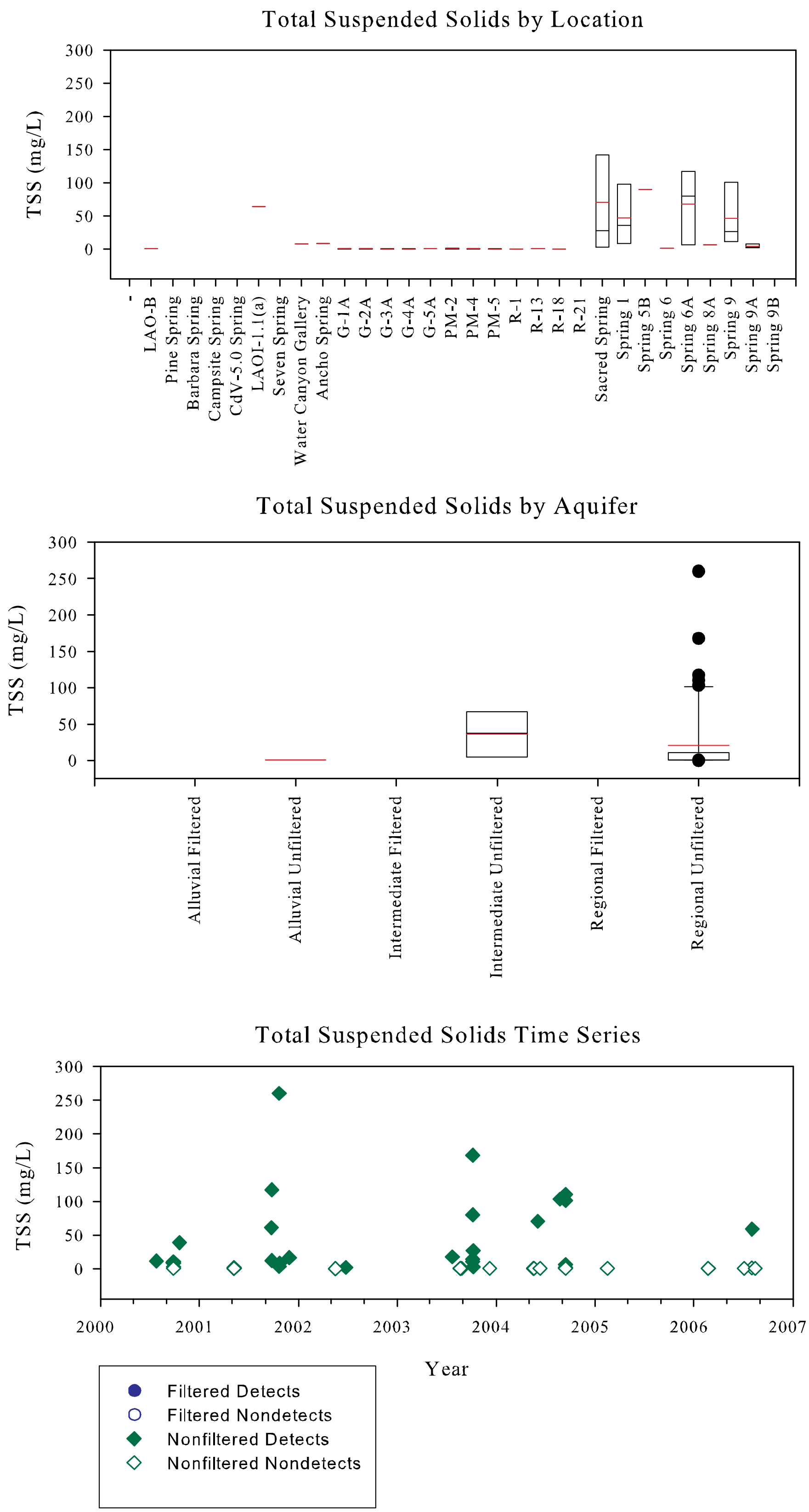
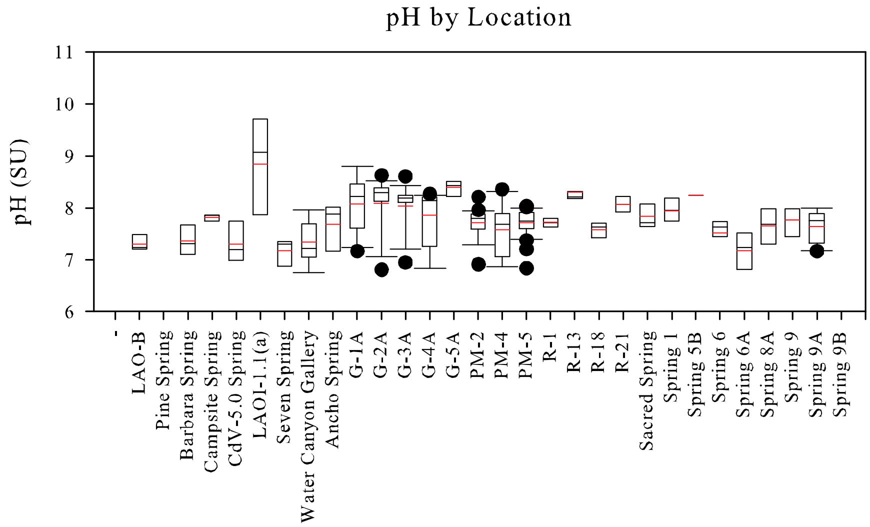


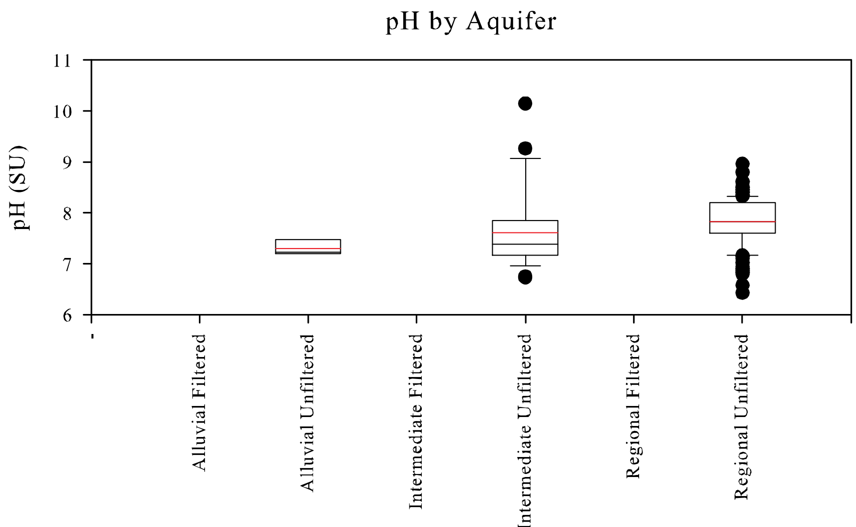
Figure C-17 Total Phosphate as Phosphorus

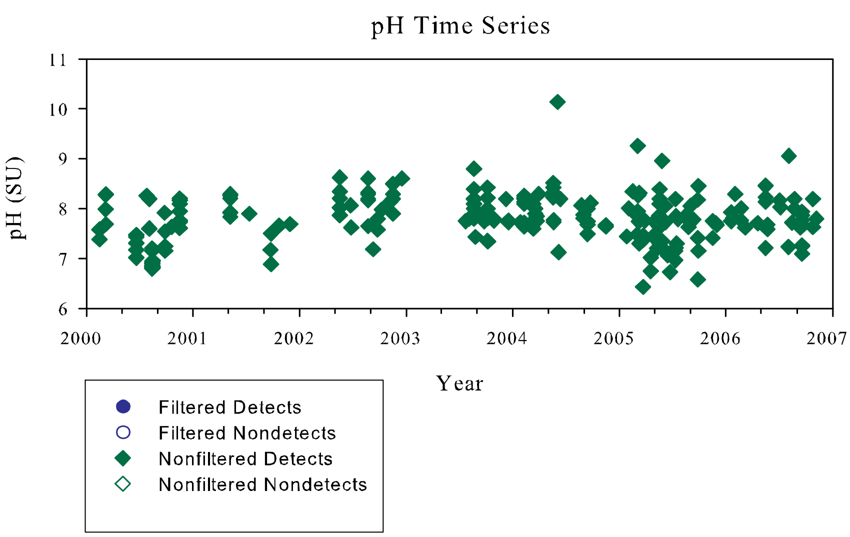


Note: Location box plot shows all nonfiltered data due to the nature of the analytical technique used.

Figure C-18 Total Suspended Solids

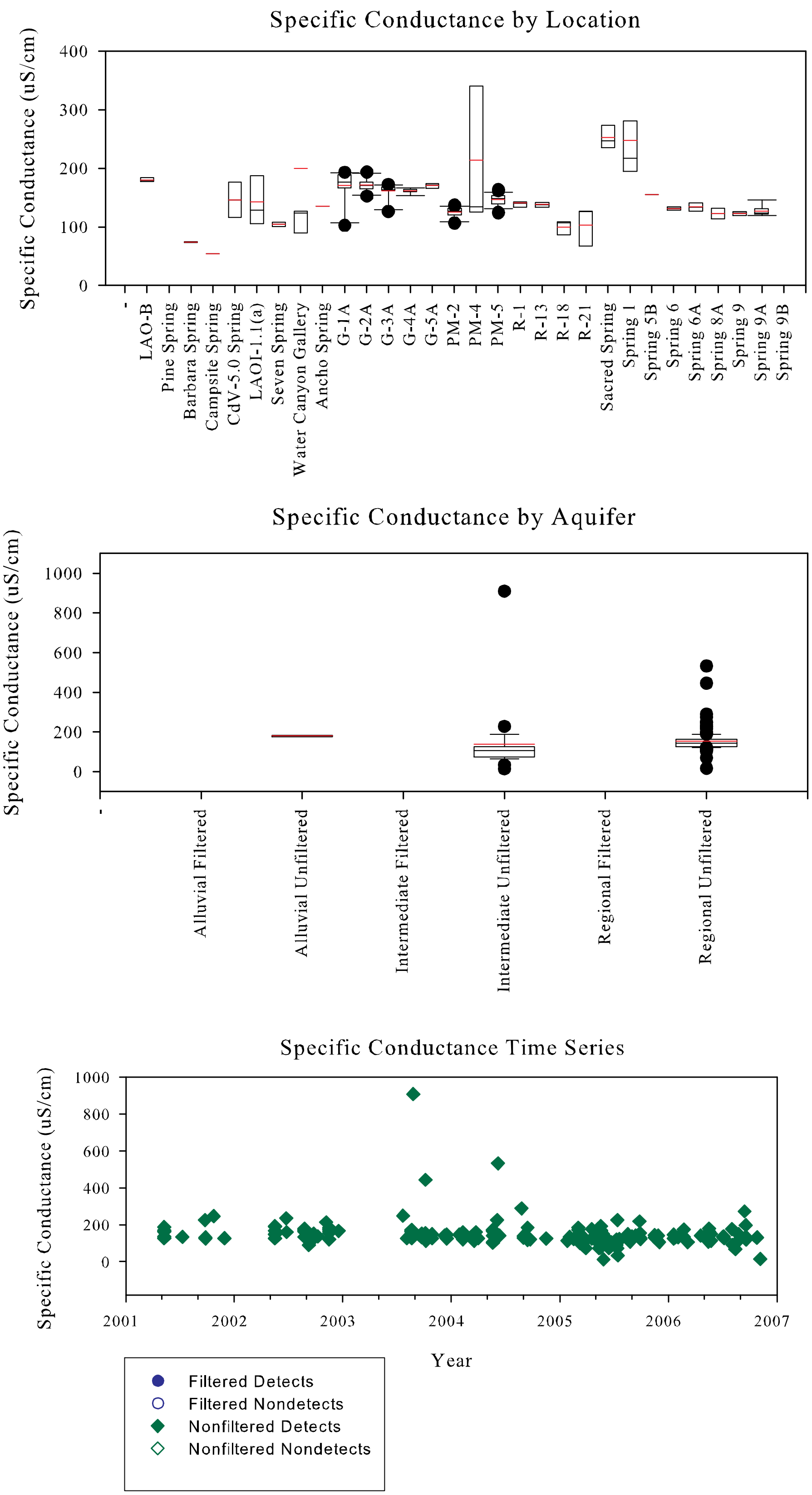






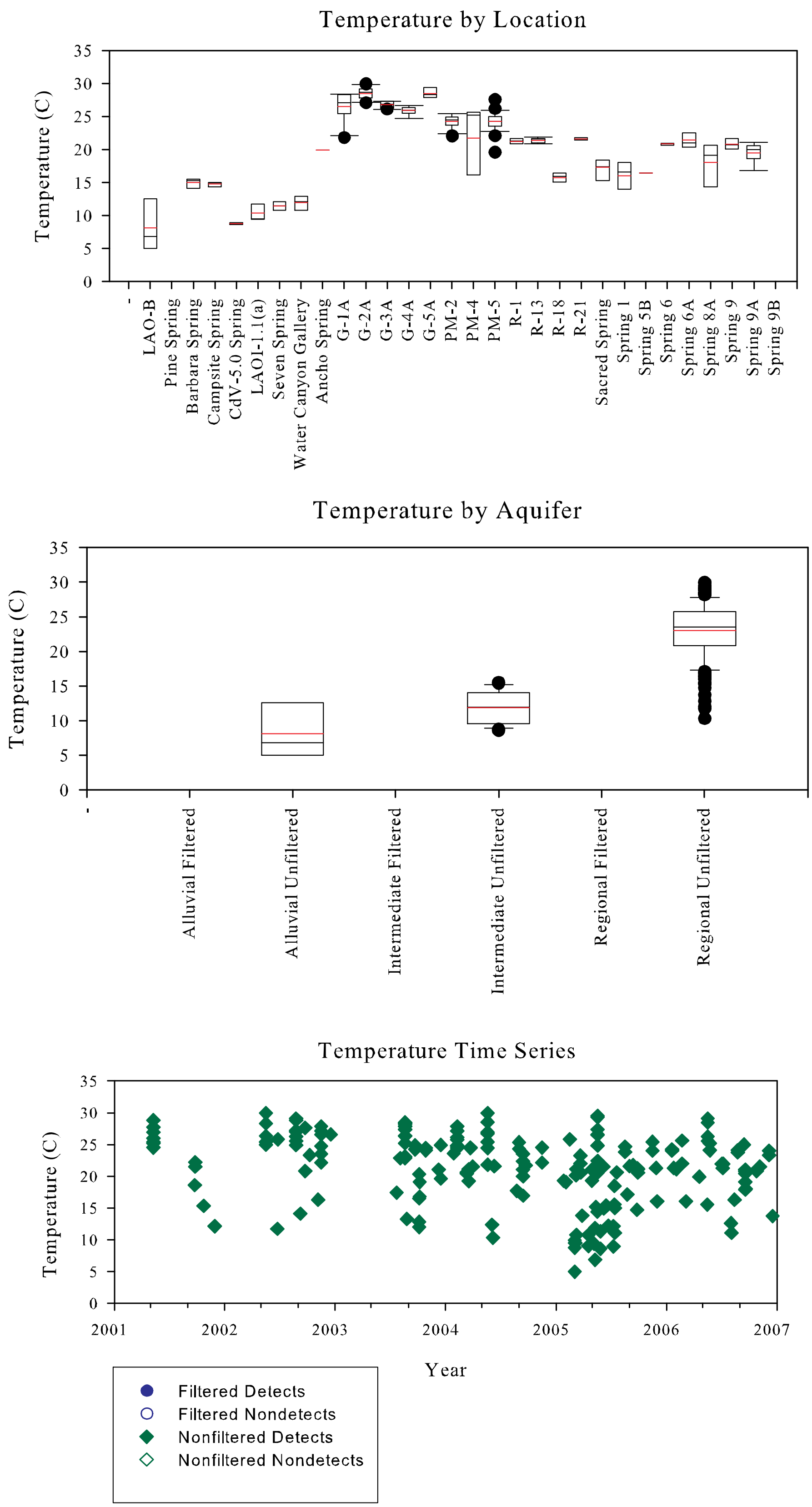
Note: Location box plot shows all nonfiltered data due to the nature of the analytical technique used.

Figure C-19 pH



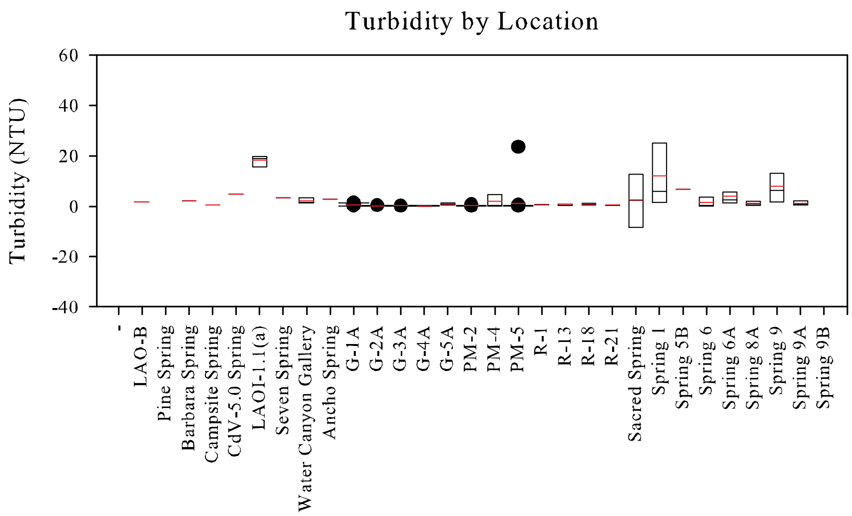
Note: Location box plot shows all nonfiltered data due to the nature of the analytical technique used.

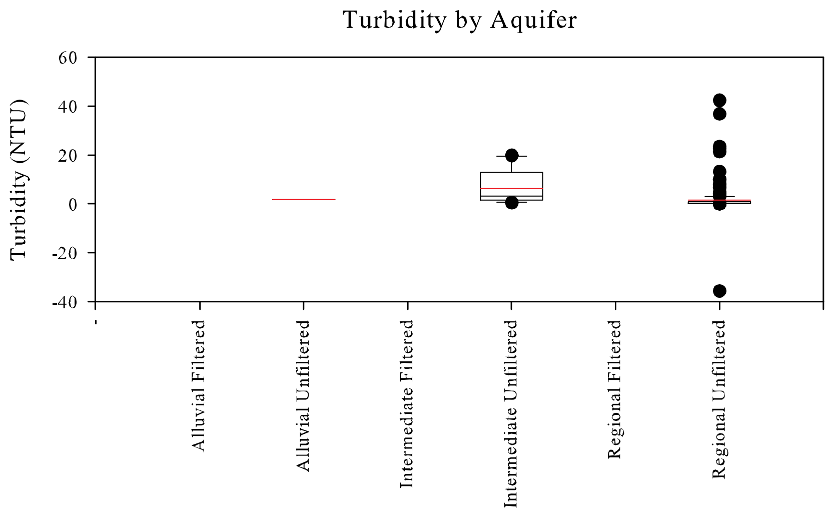
Figure C-20 Specific Conductance

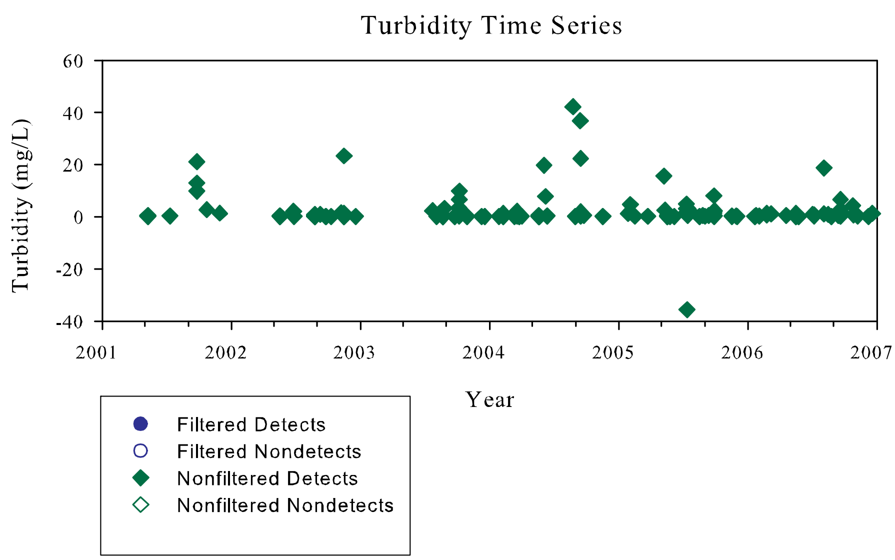


Note: Location box plot shows all nonfiltered data due to the nature of the analytical technique used.

Figure C-21 Temperature

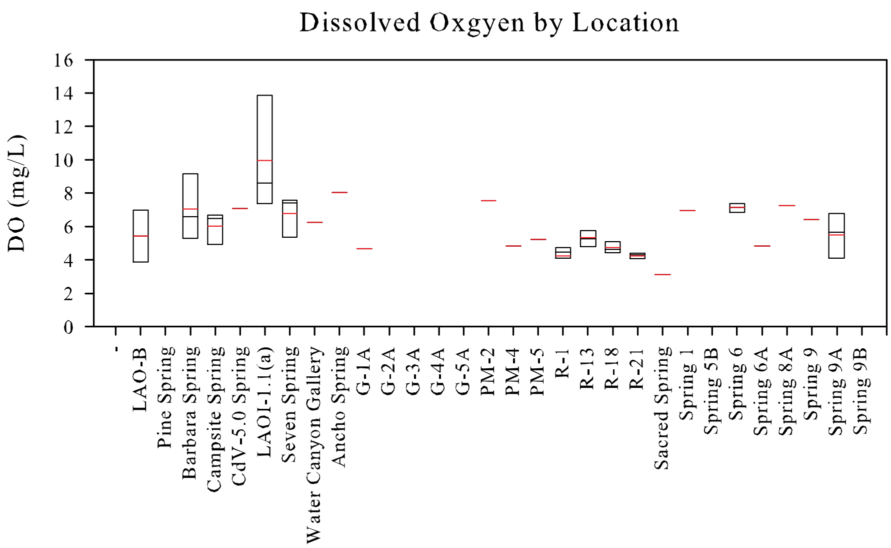


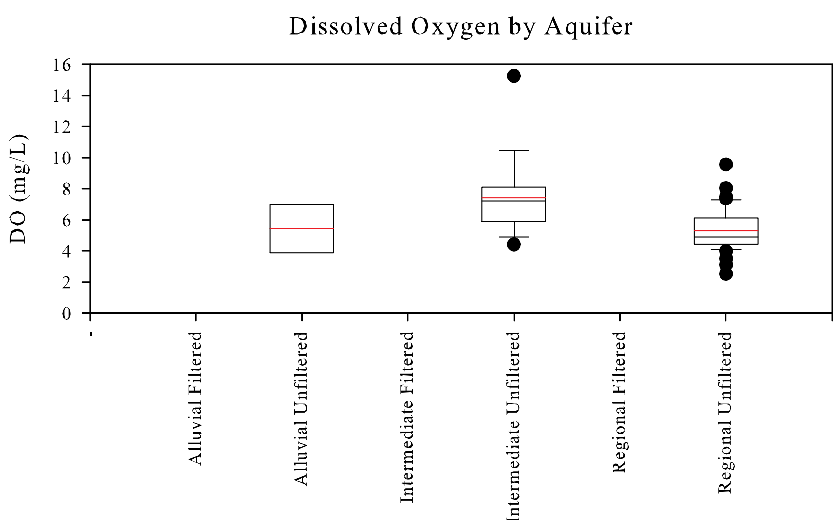


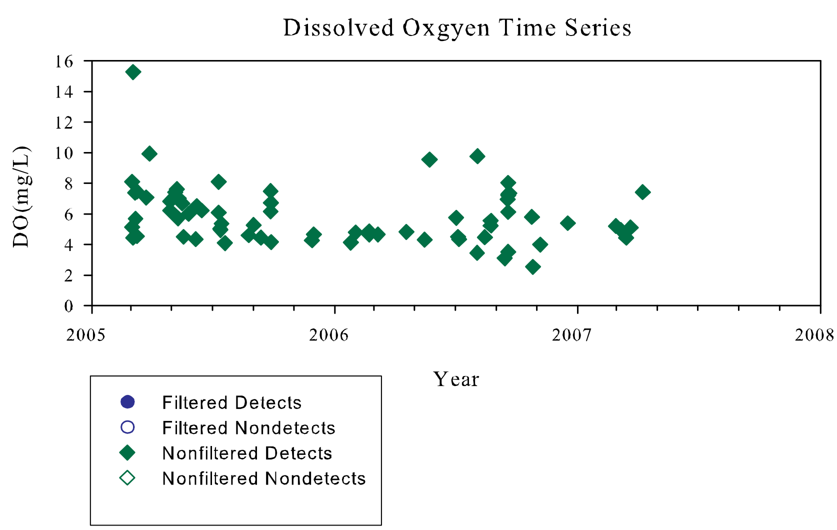


Note: Location box plot shows all nonfiltered data due to the nature of the analytical technique used.

Figure C-22 Turbidity

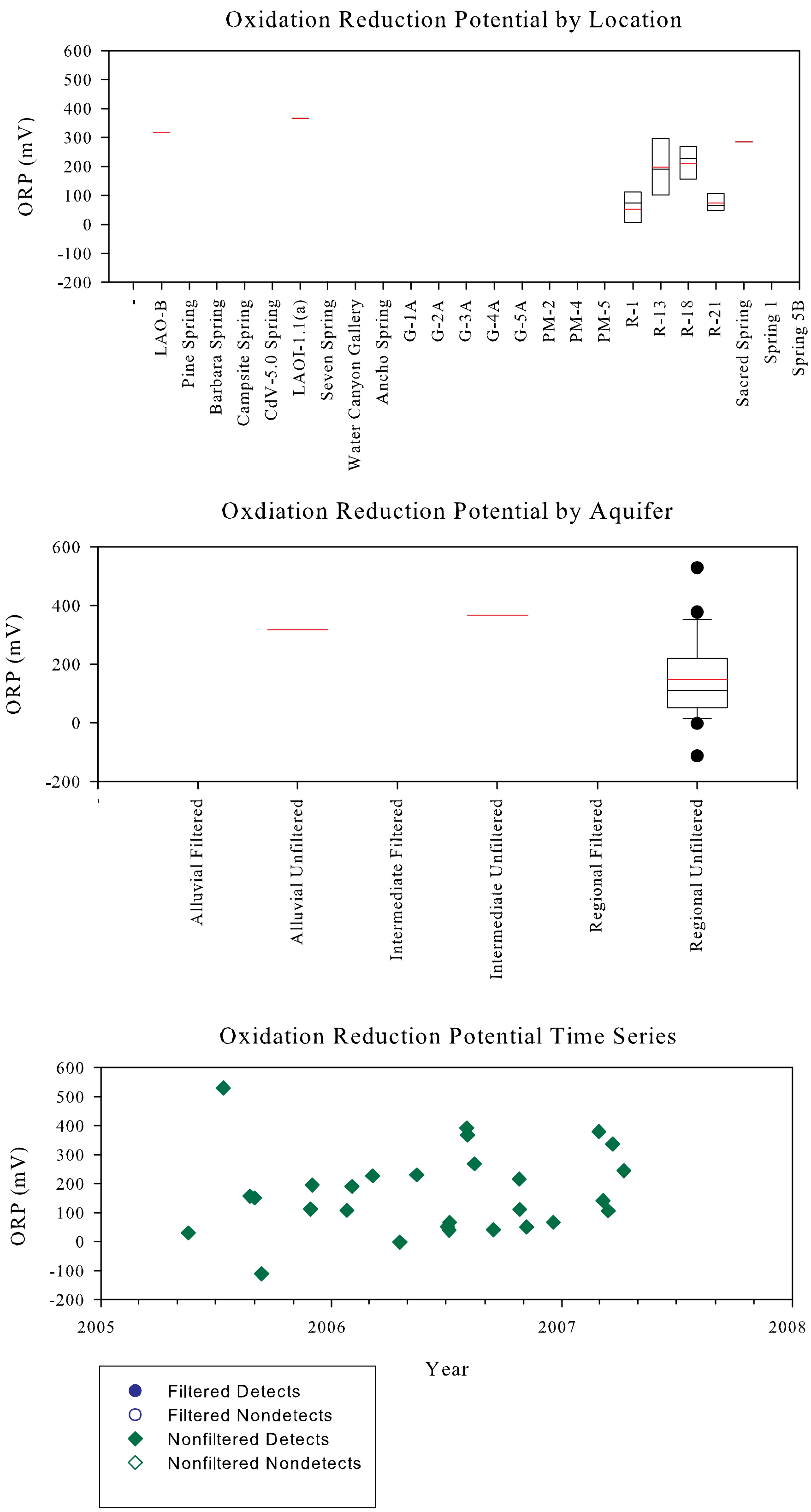






Note: Location box plot shows all nonfiltered data due to the nature of the analytical technique used.

Figure C-23 Dissolved Oxygen



Note: Location box plot shows all nonfiltered data due to the nature of the analytical technique used.

Figure C-24 Oxidation Reduction Potential

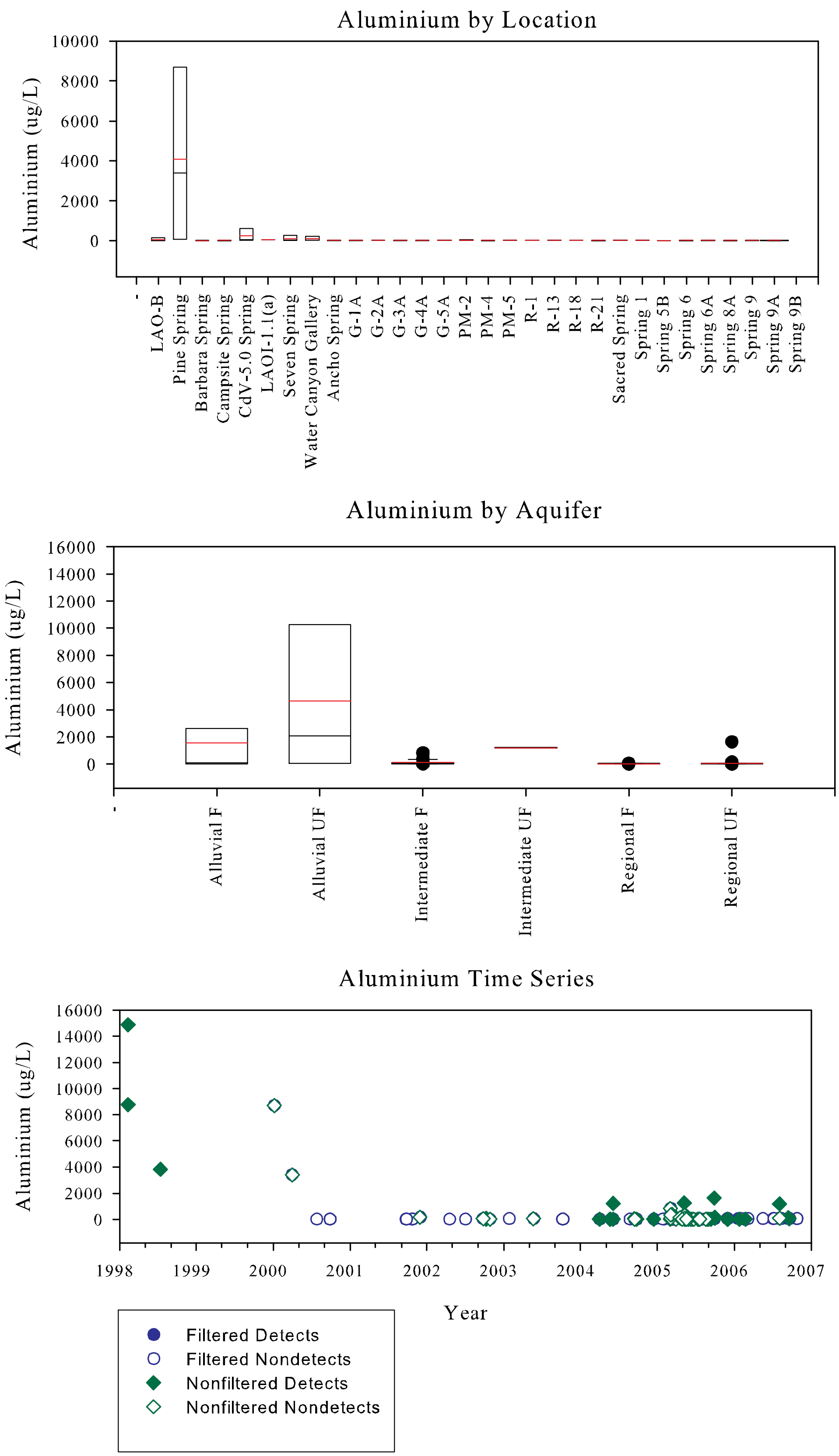


Figure C-25 Aluminium

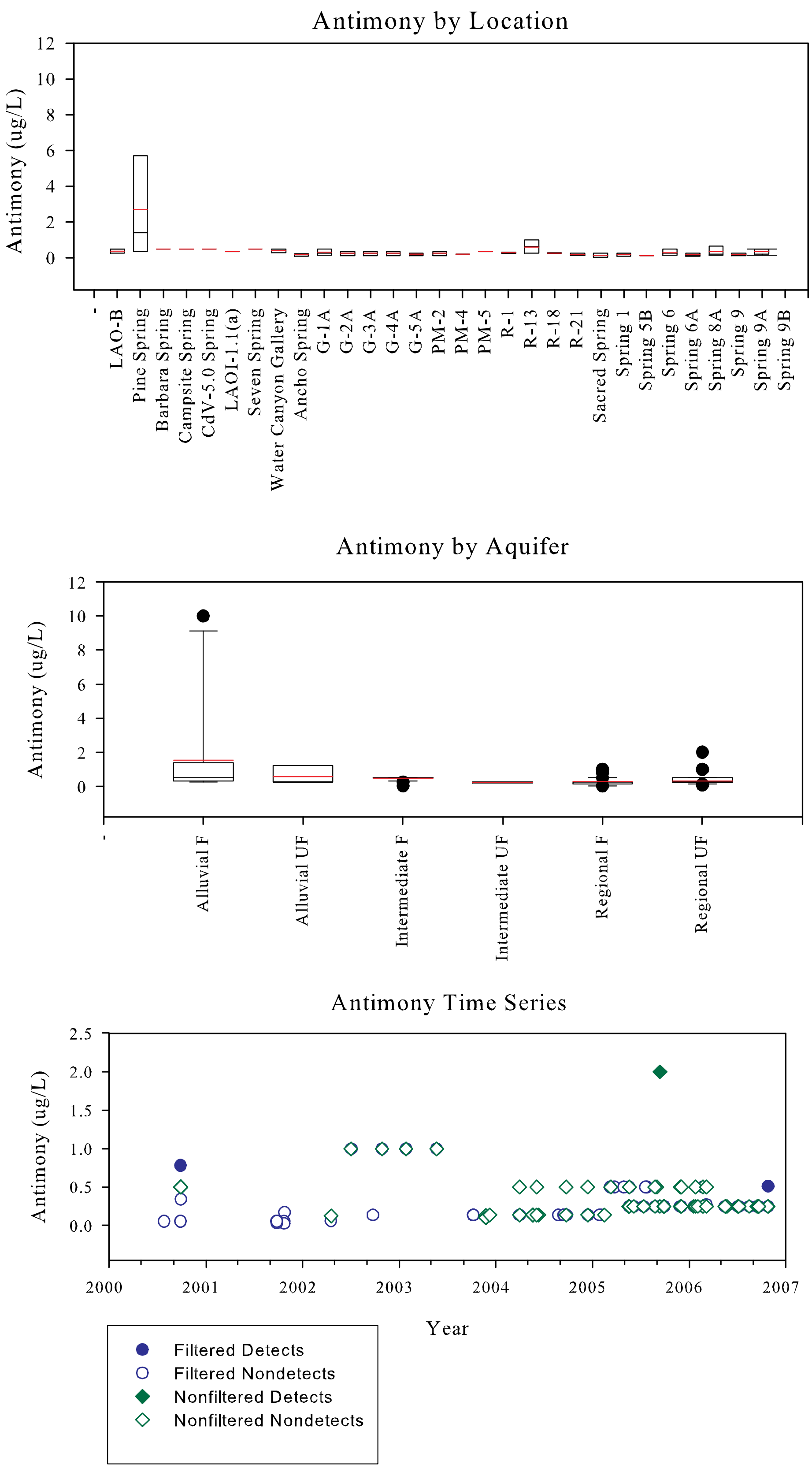


Figure C-26 Antimony

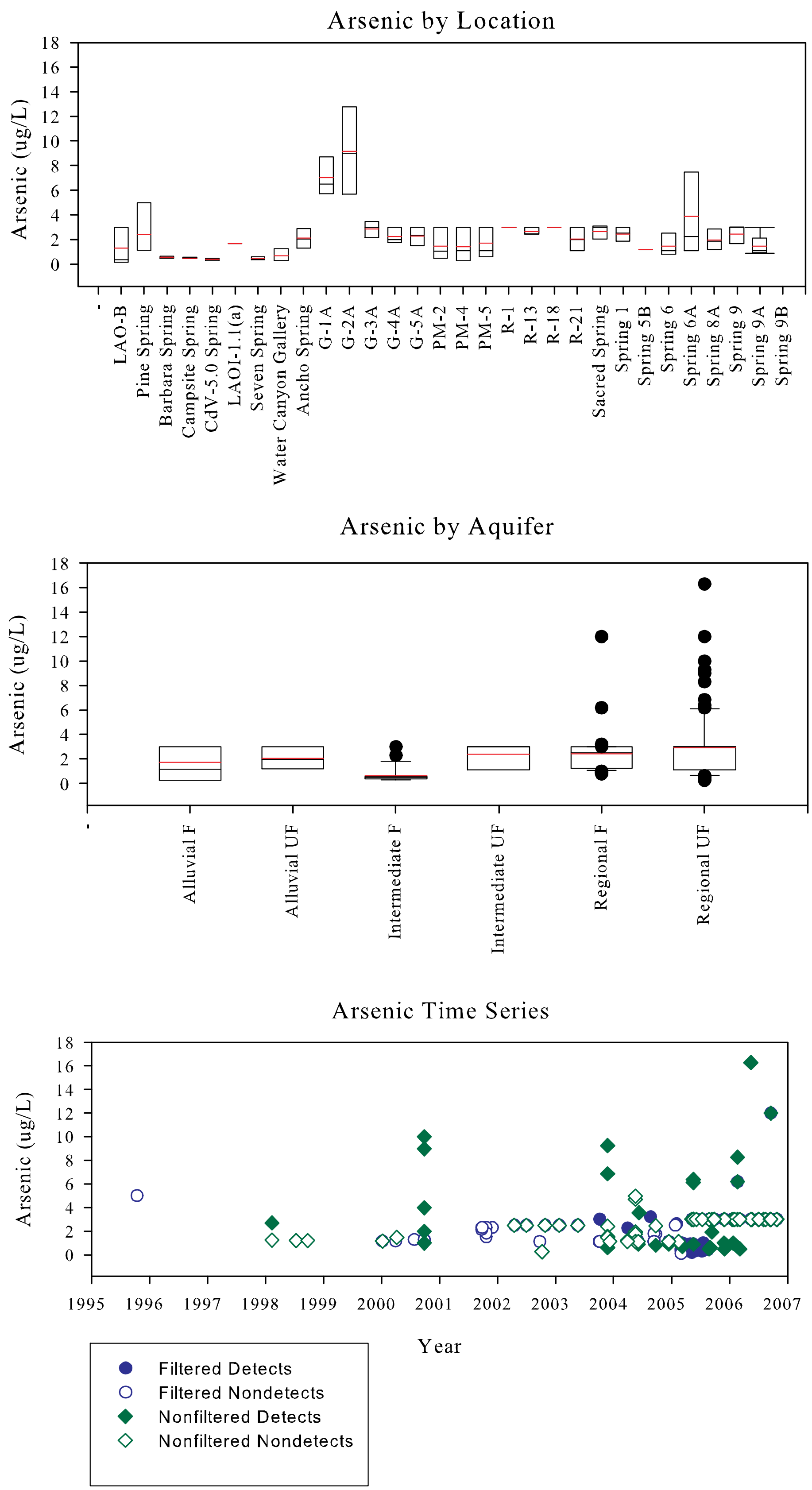


Figure C-27 Arsenic

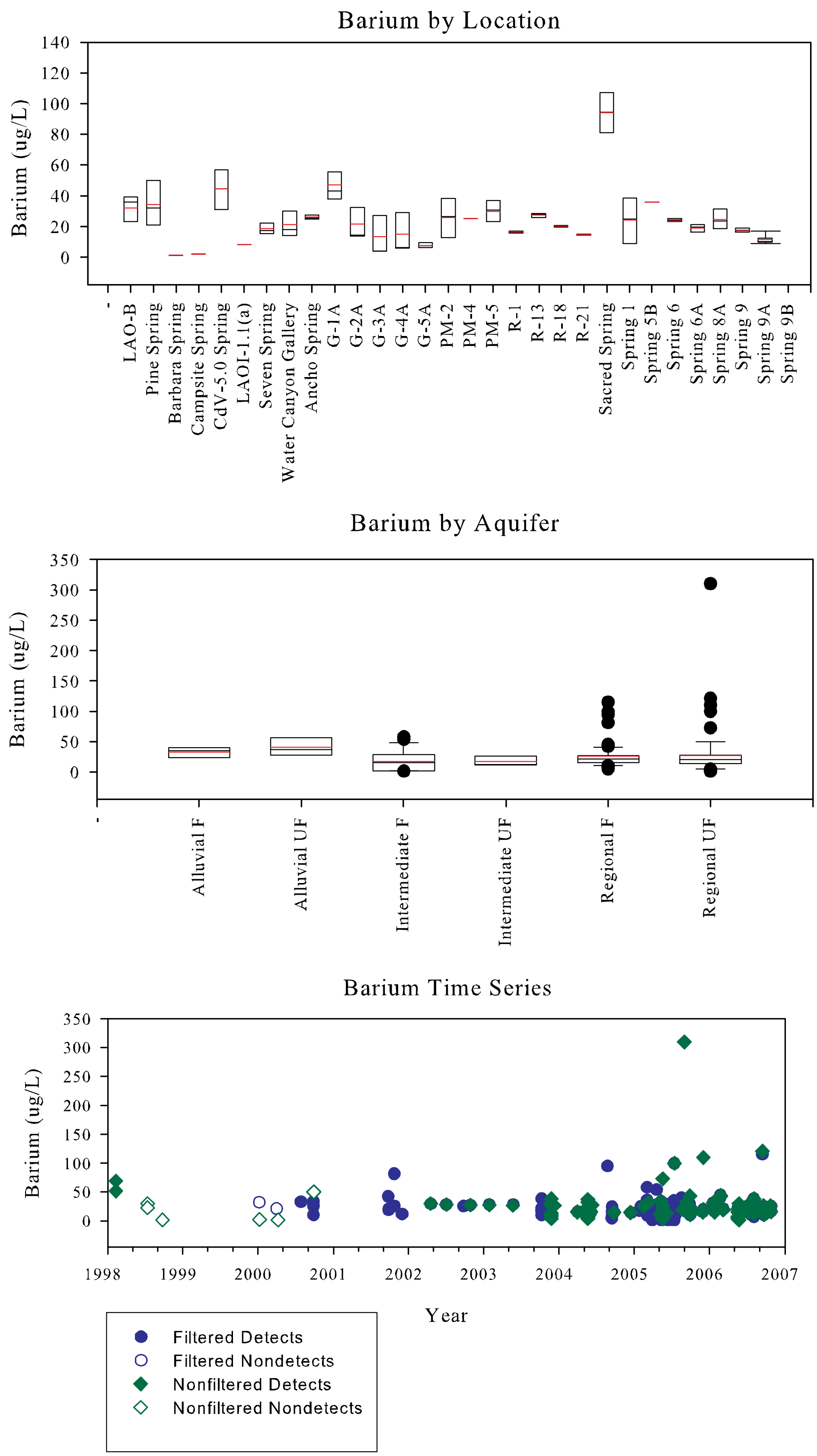


Figure C-28 Barium

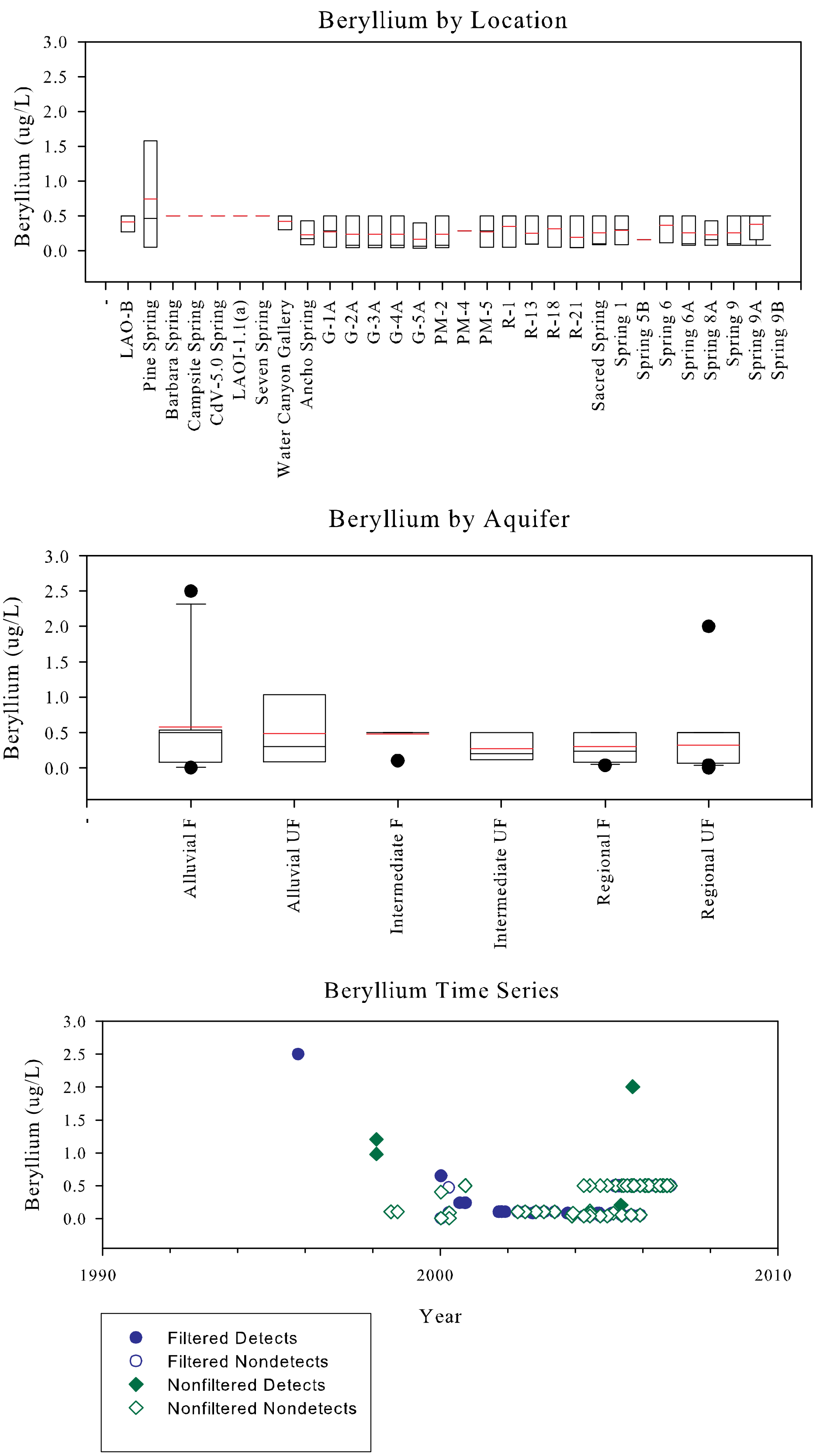


Figure C-29 Beryllium

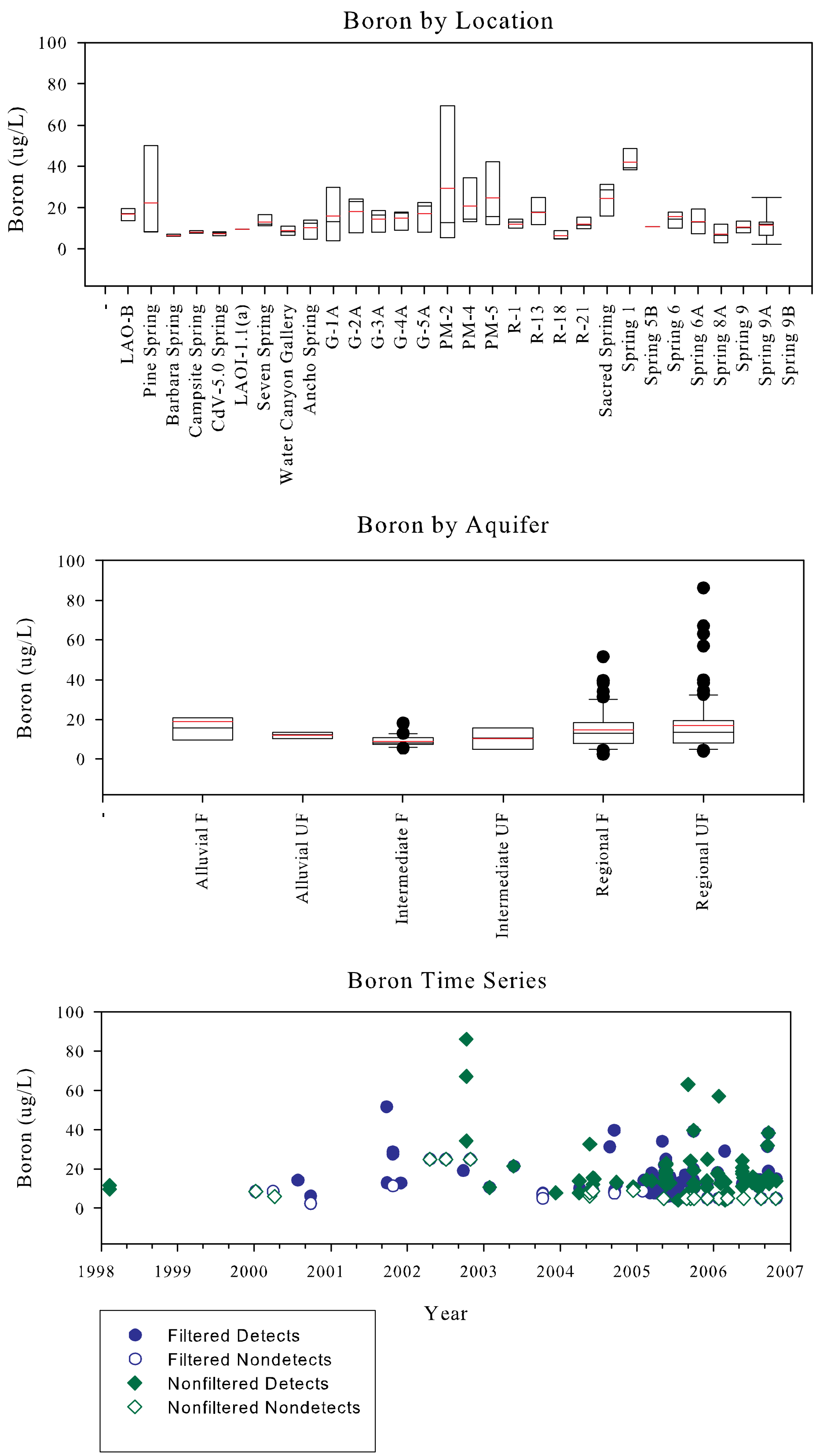
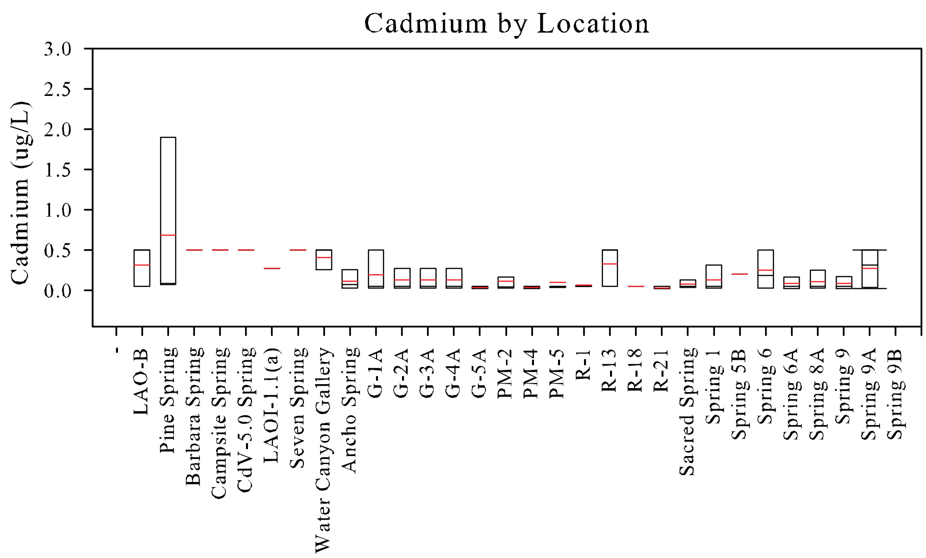
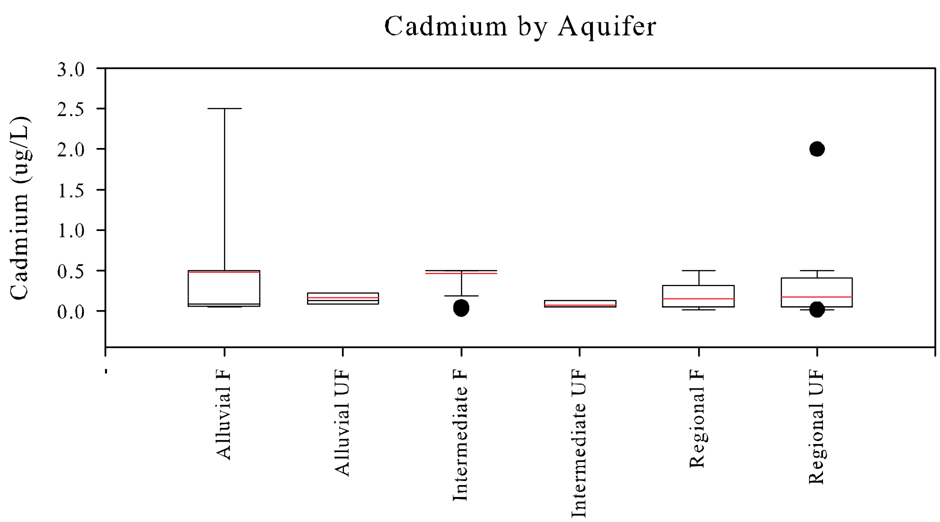


Figure C-30 Boron





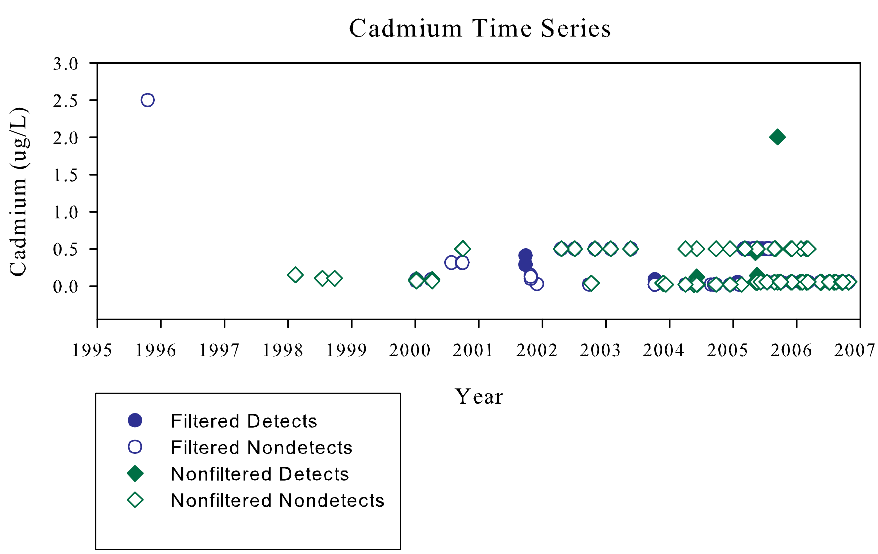


Figure C-31 Cadmium

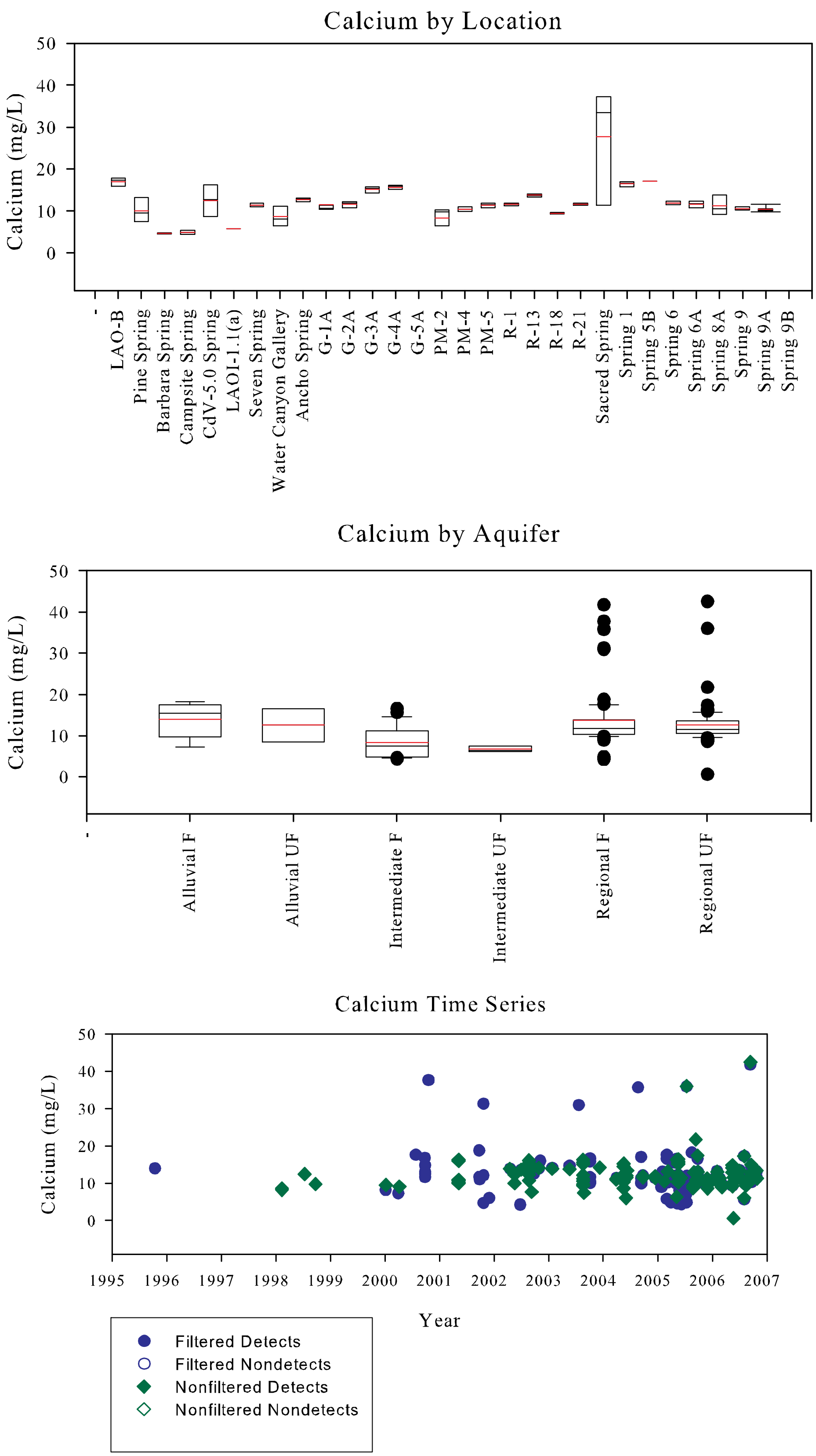


Figure C-32 Calcium

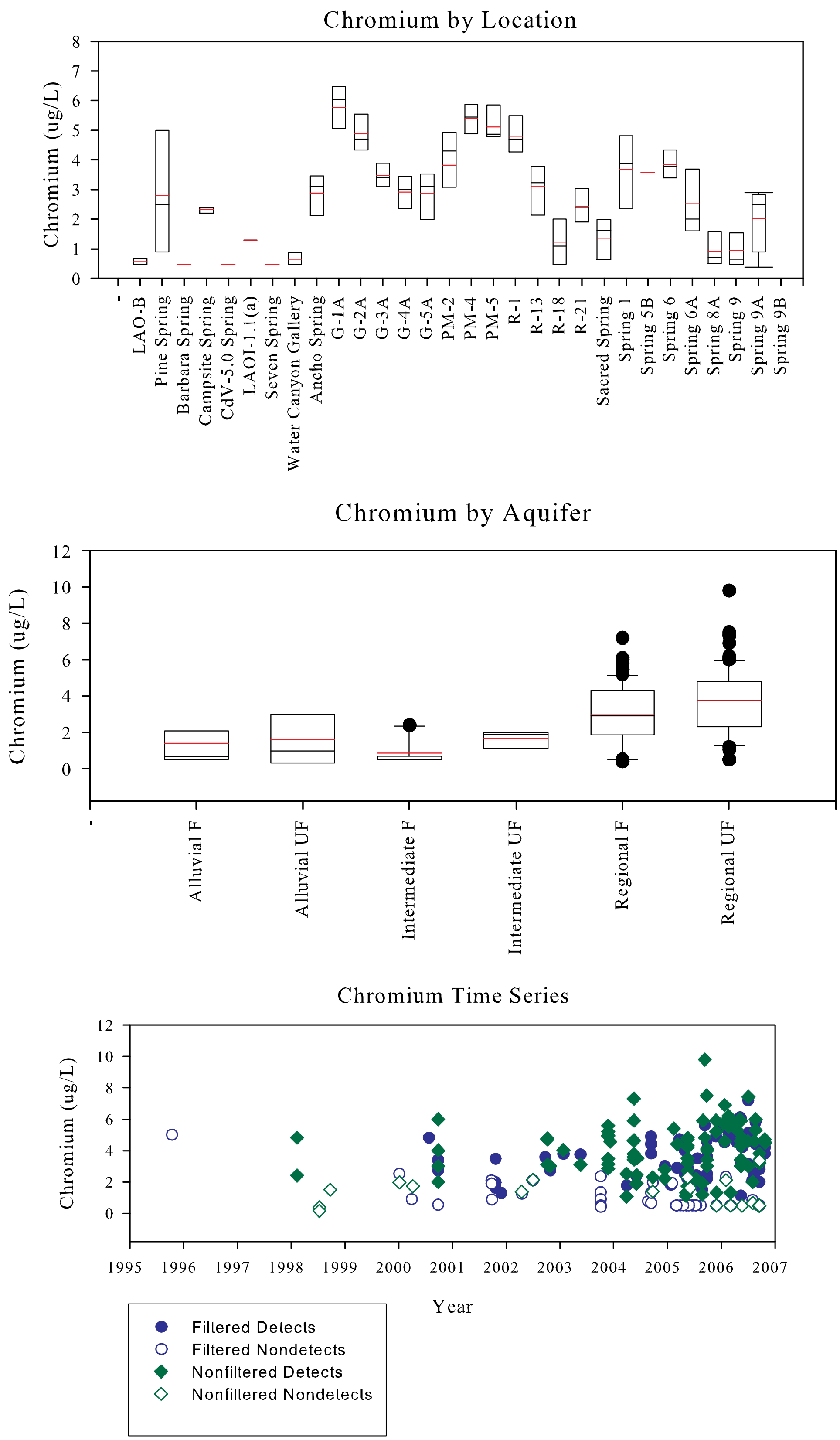


Figure C-33 Chromium

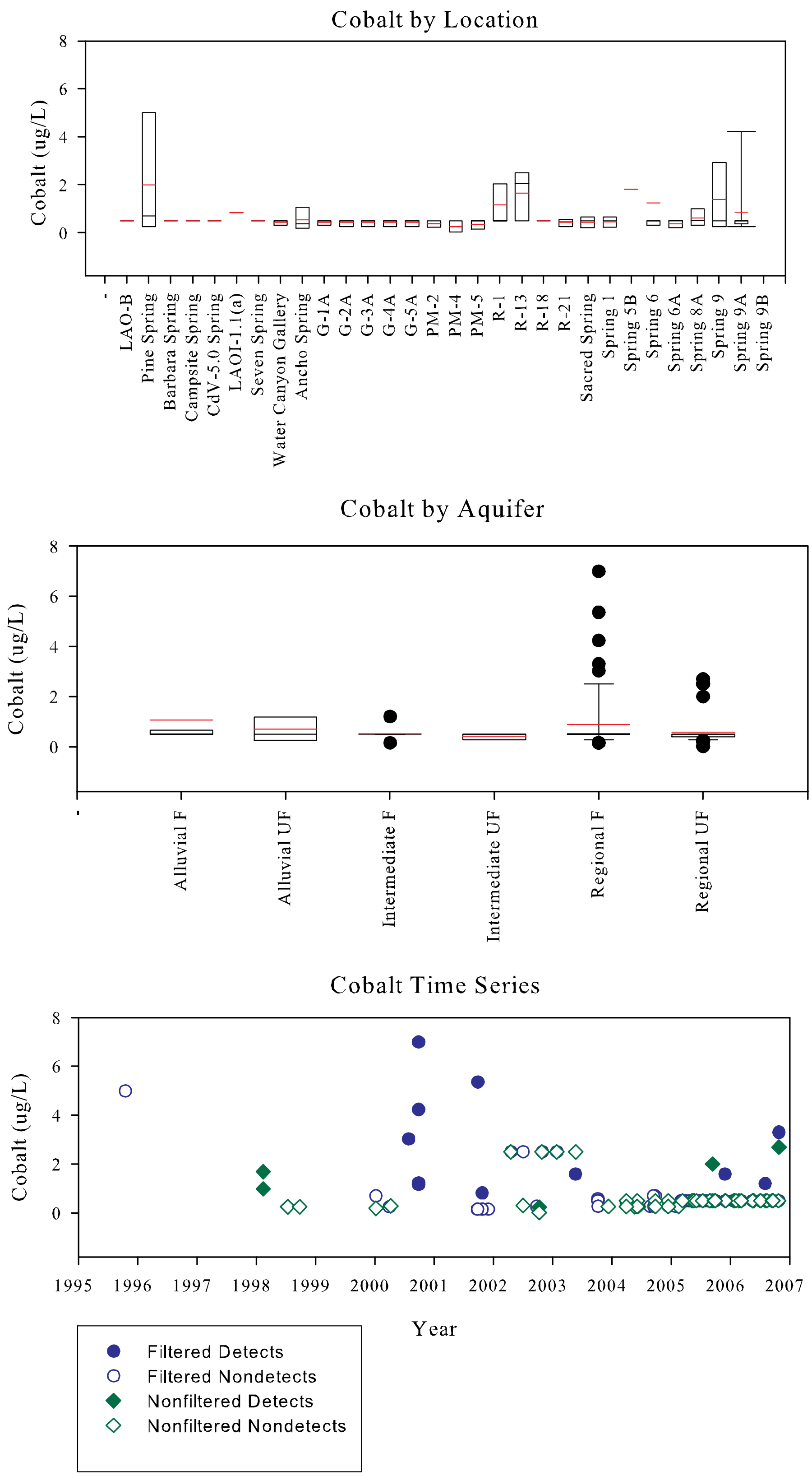


Figure C-34 Cobalt

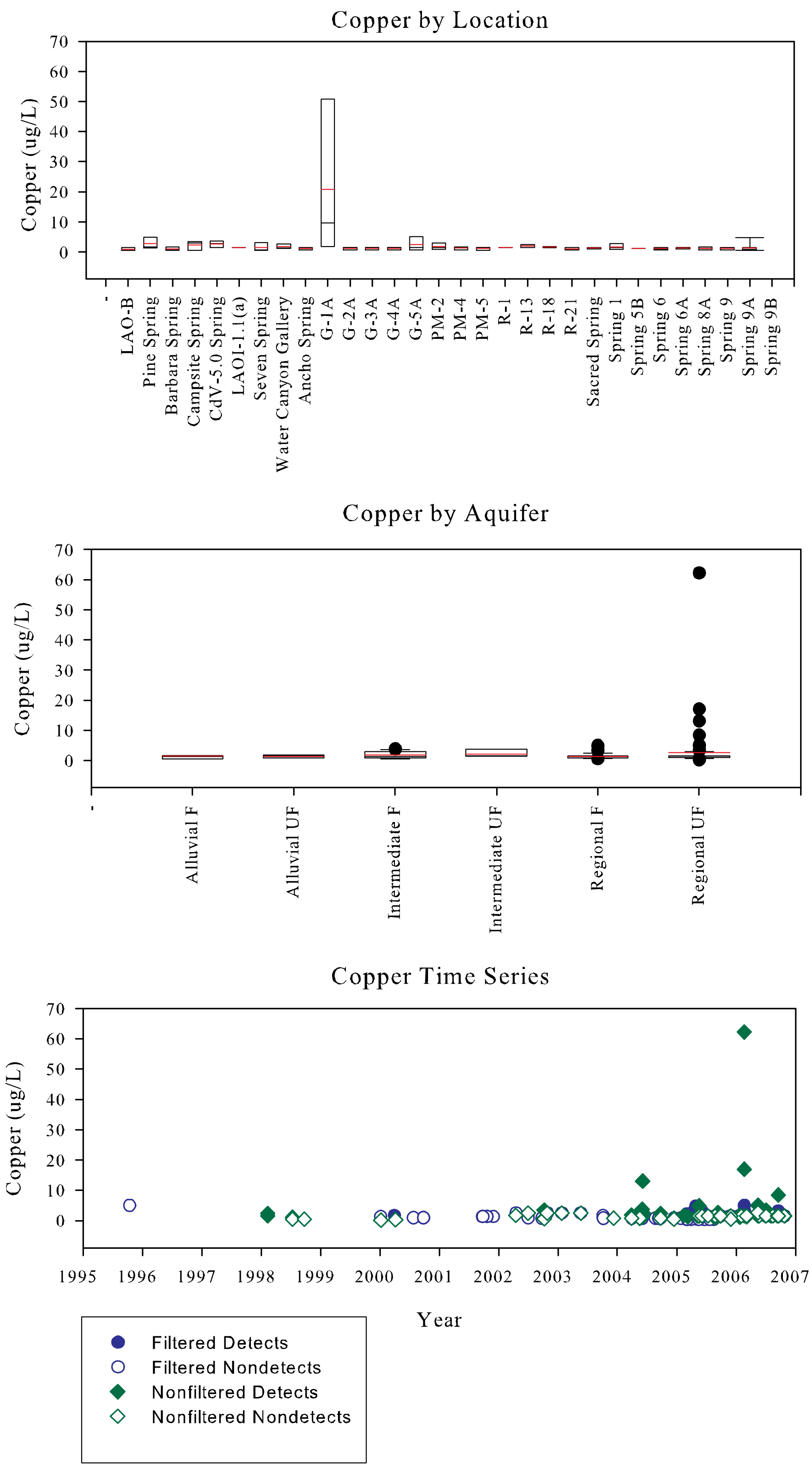


Figure C-35 Copper

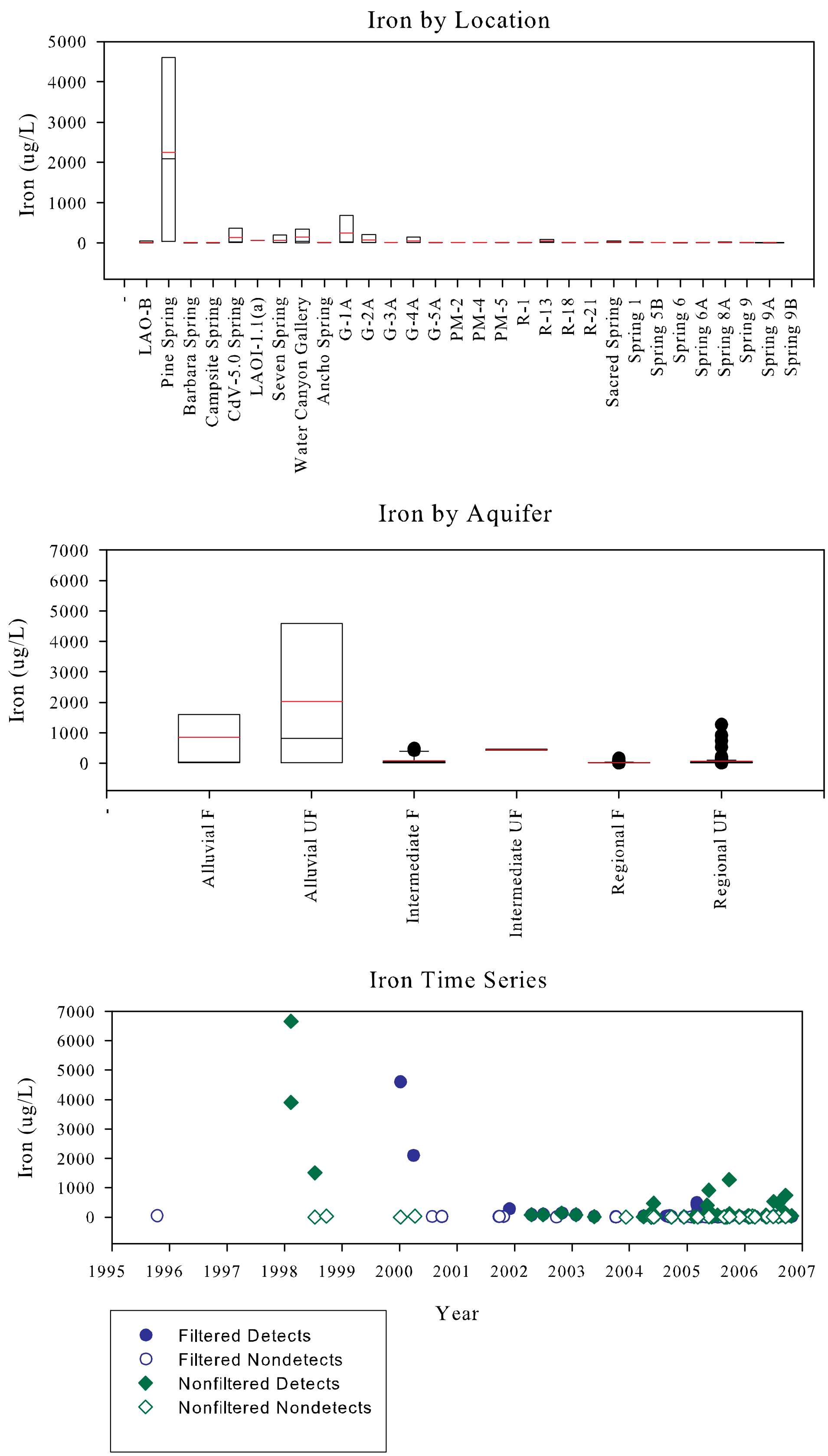


Figure C-36 Iron

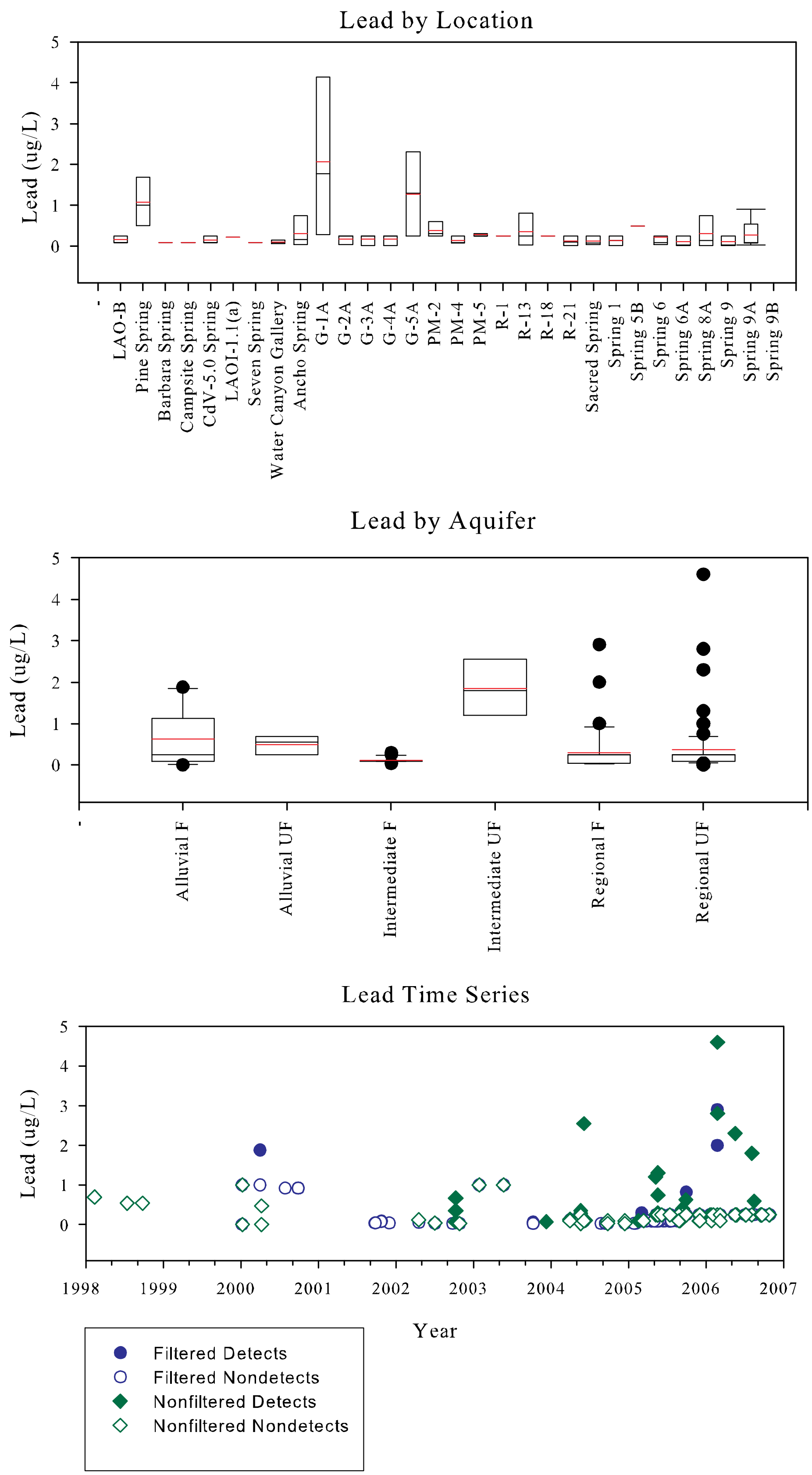
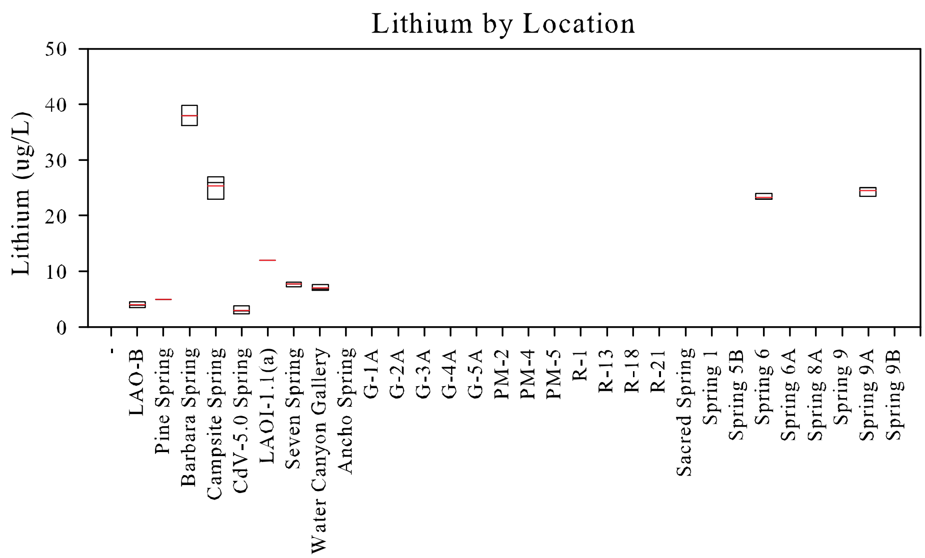
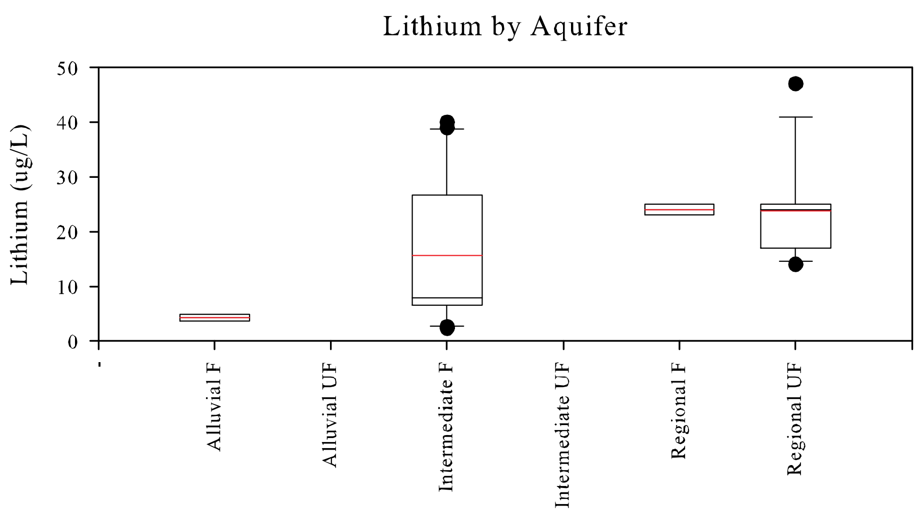


Figure C-37 Lead





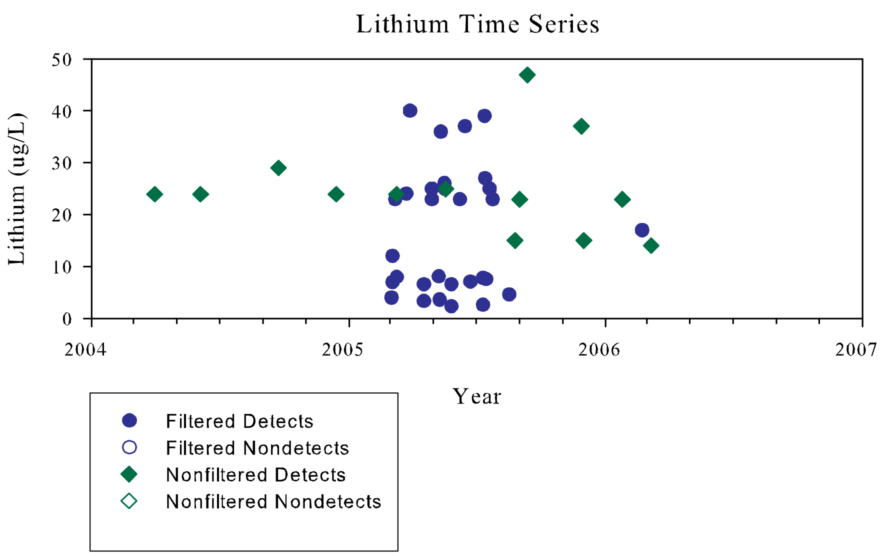


Figure C-38 Lithium

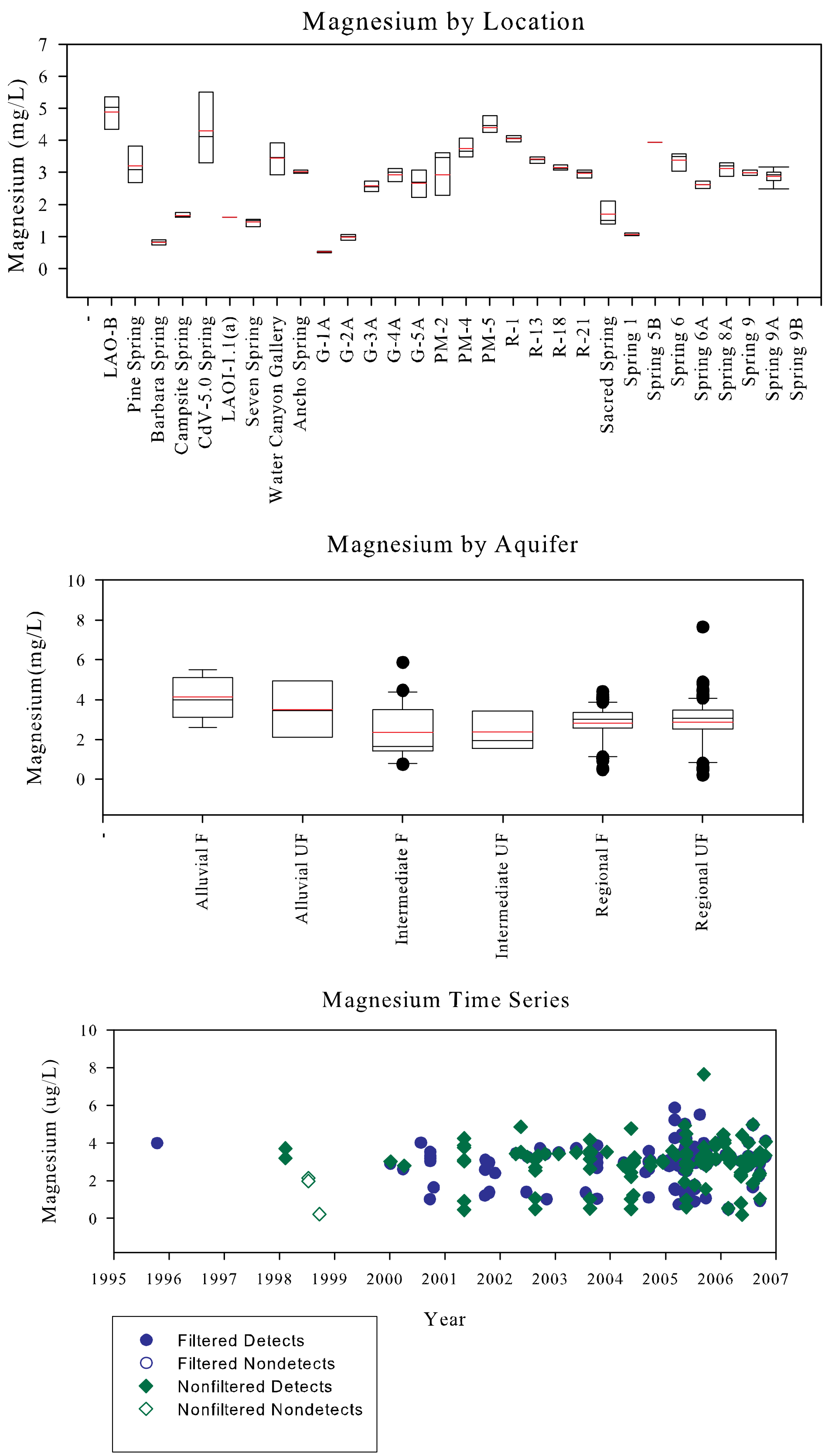


Figure C-39 Magnesium

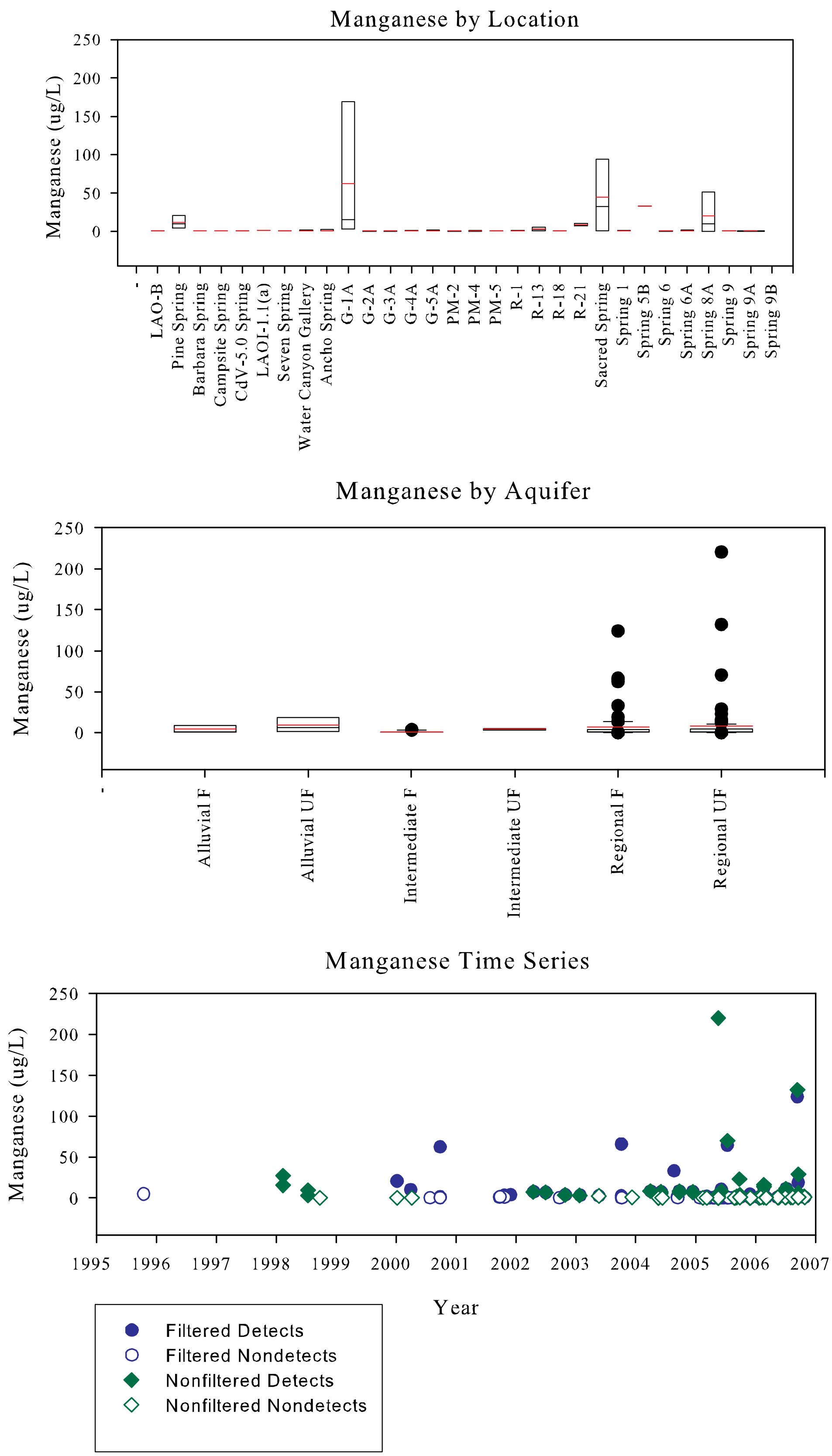


Figure C-40 Manganese

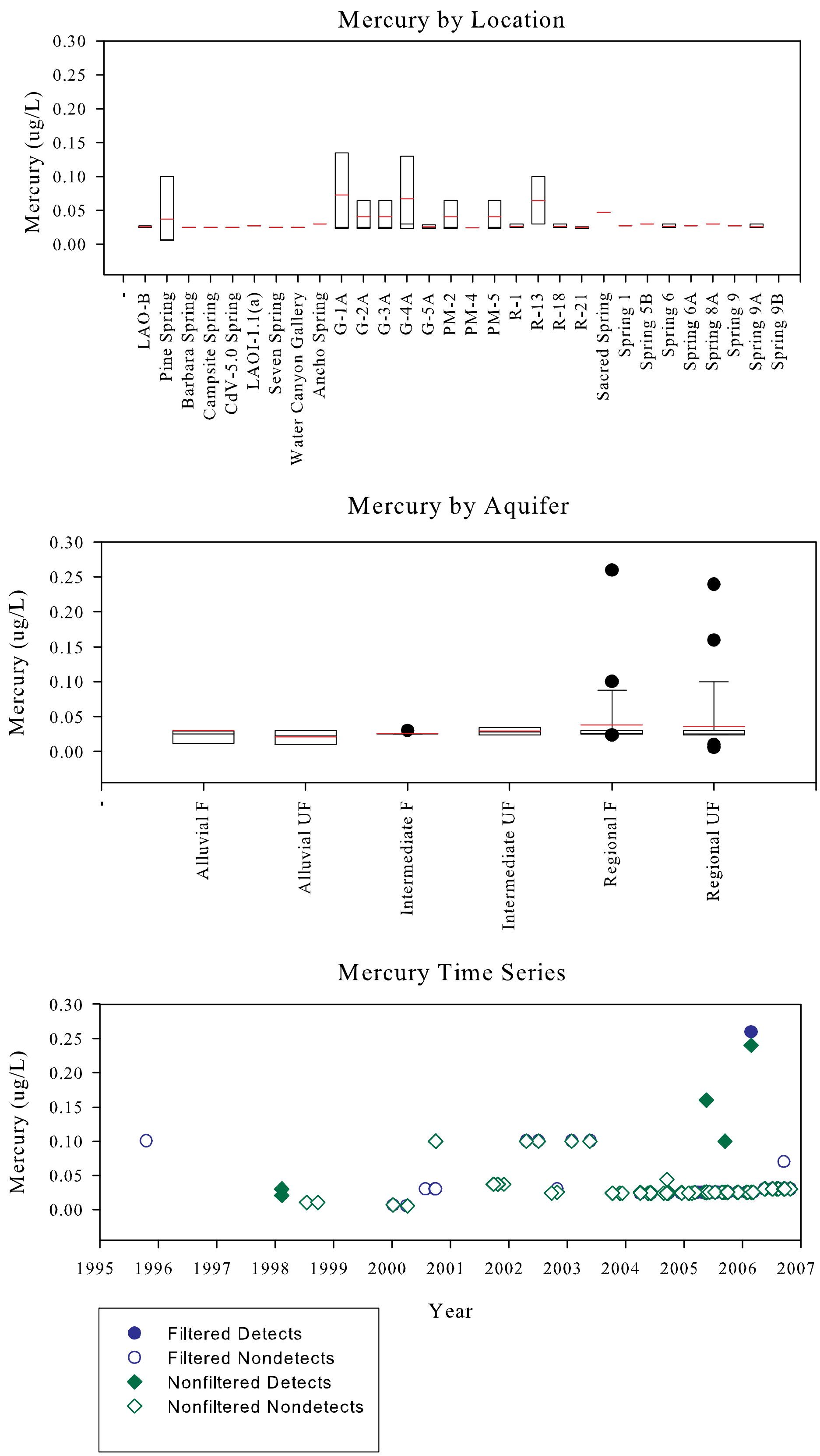
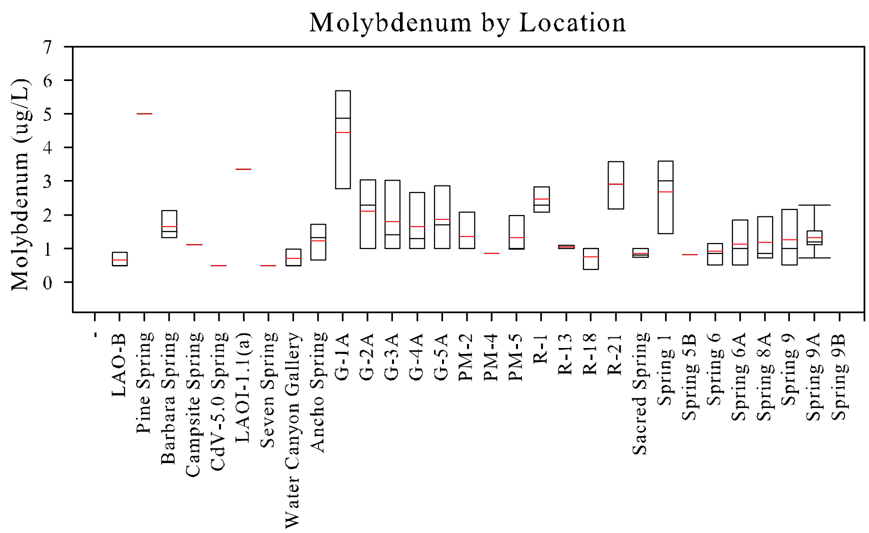
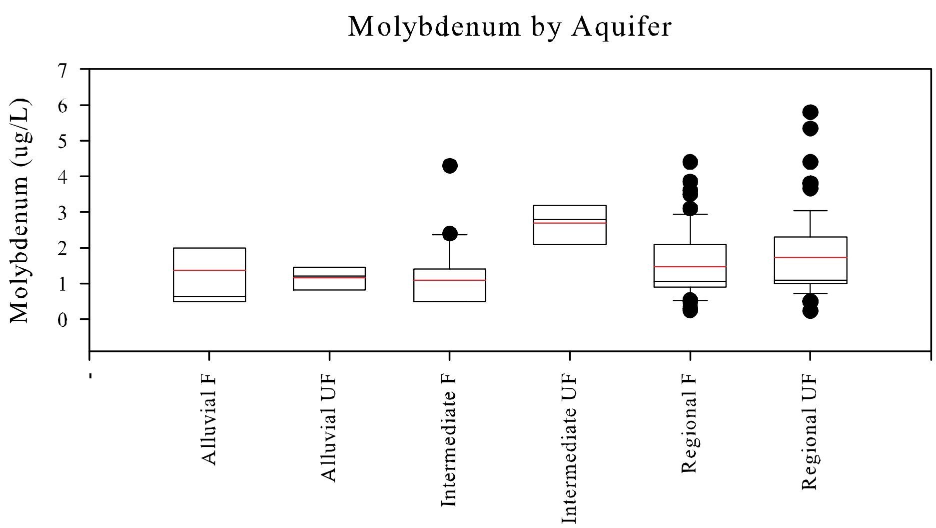


Figure C-41 Mercury





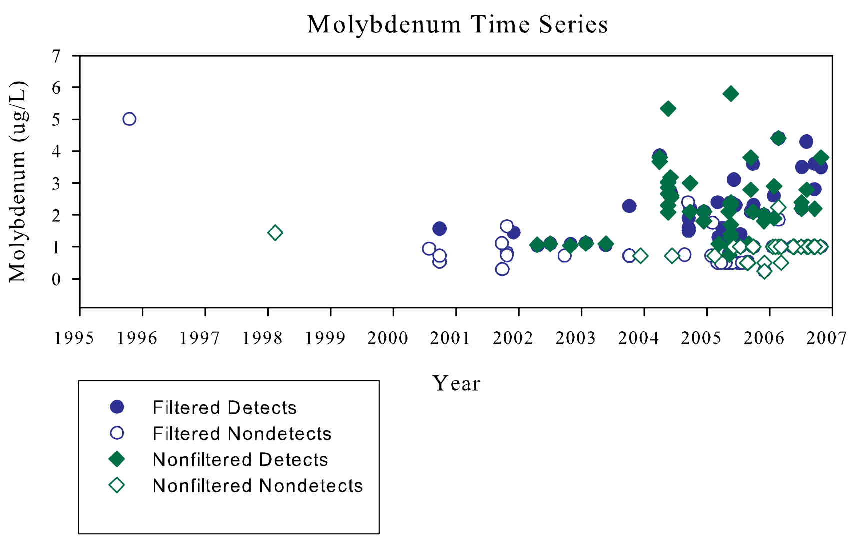


Figure C-42 Molybdenum

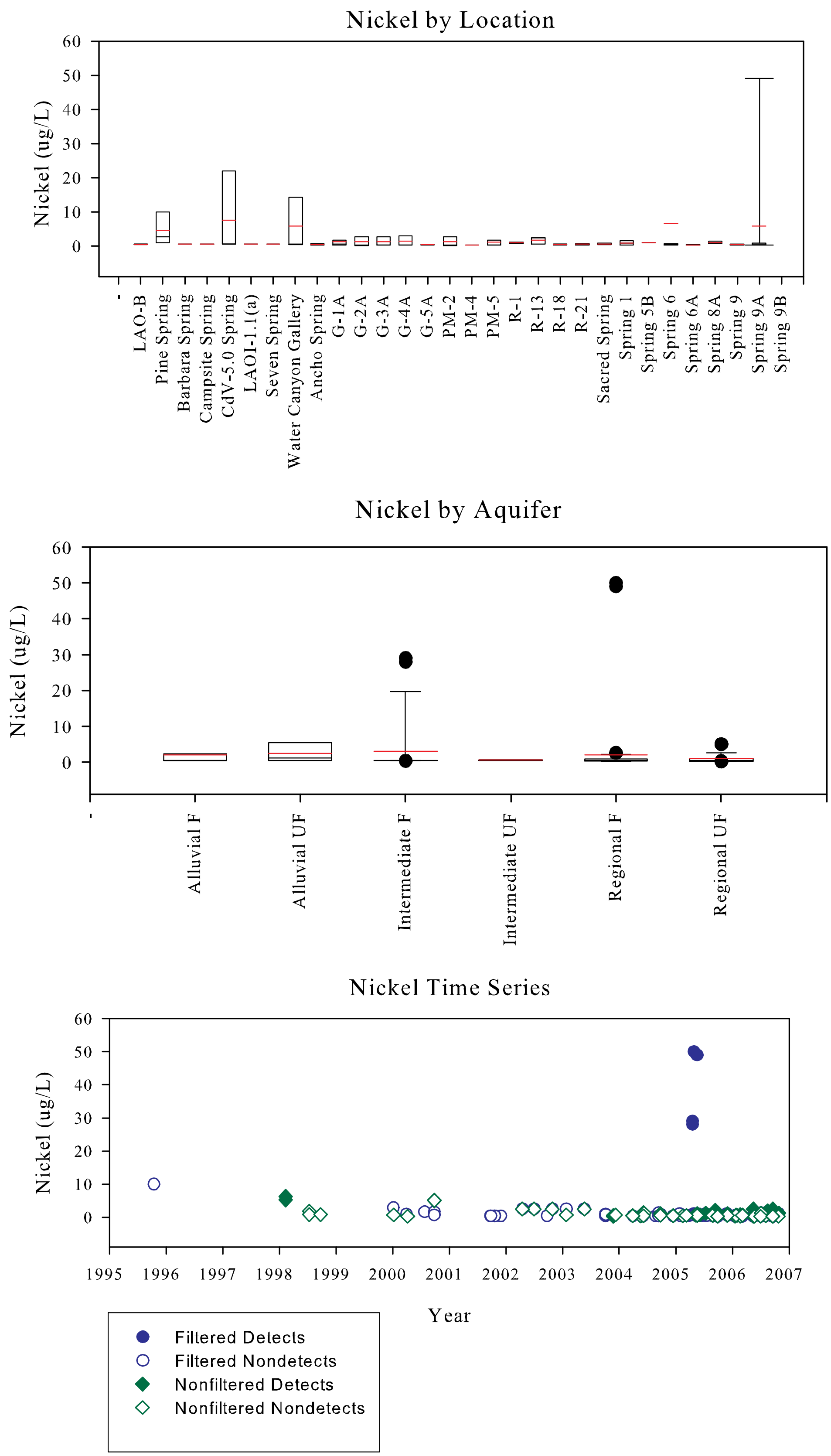


Figure C-43 Nickel

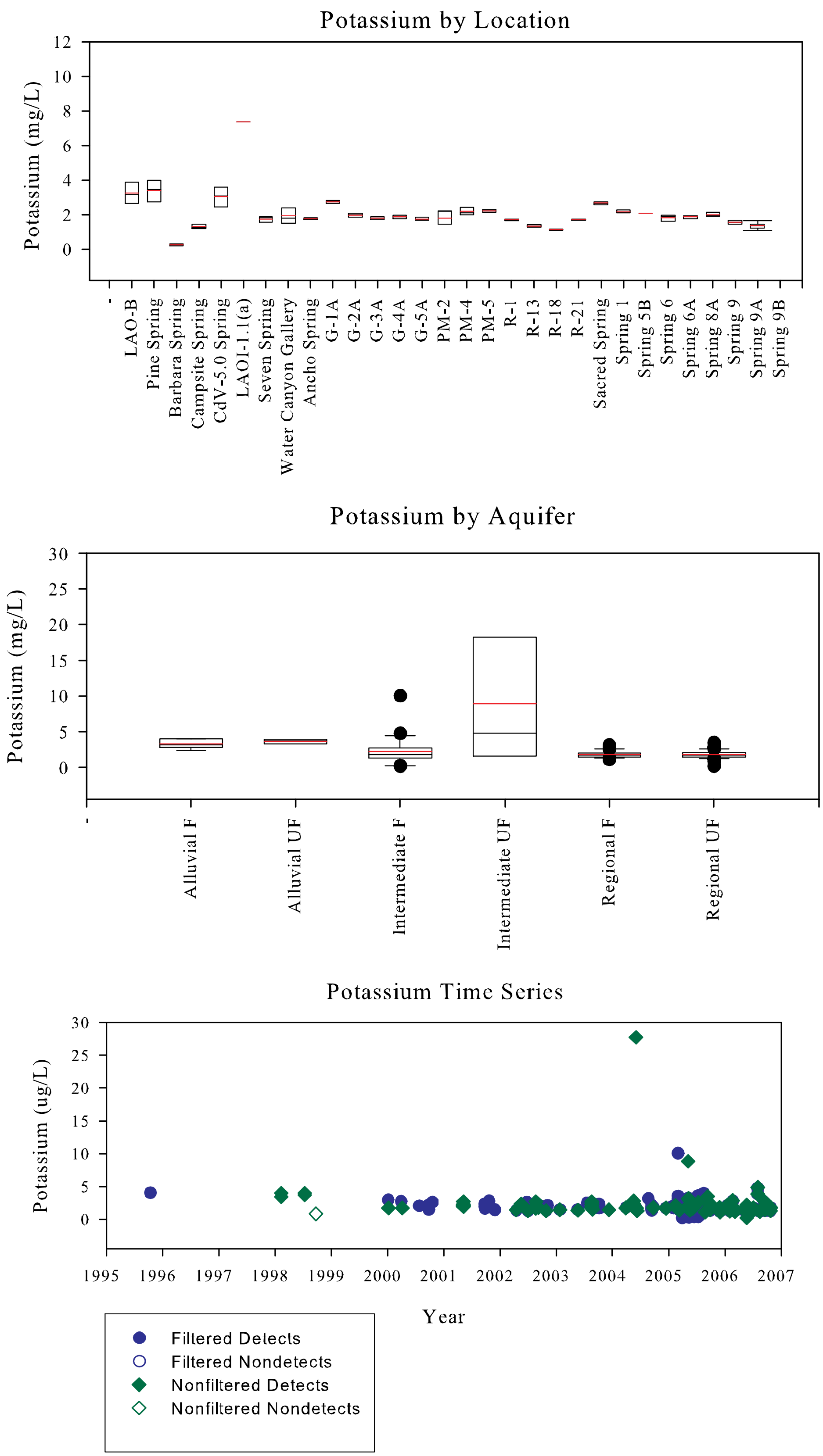


Figure C-44 Potassium

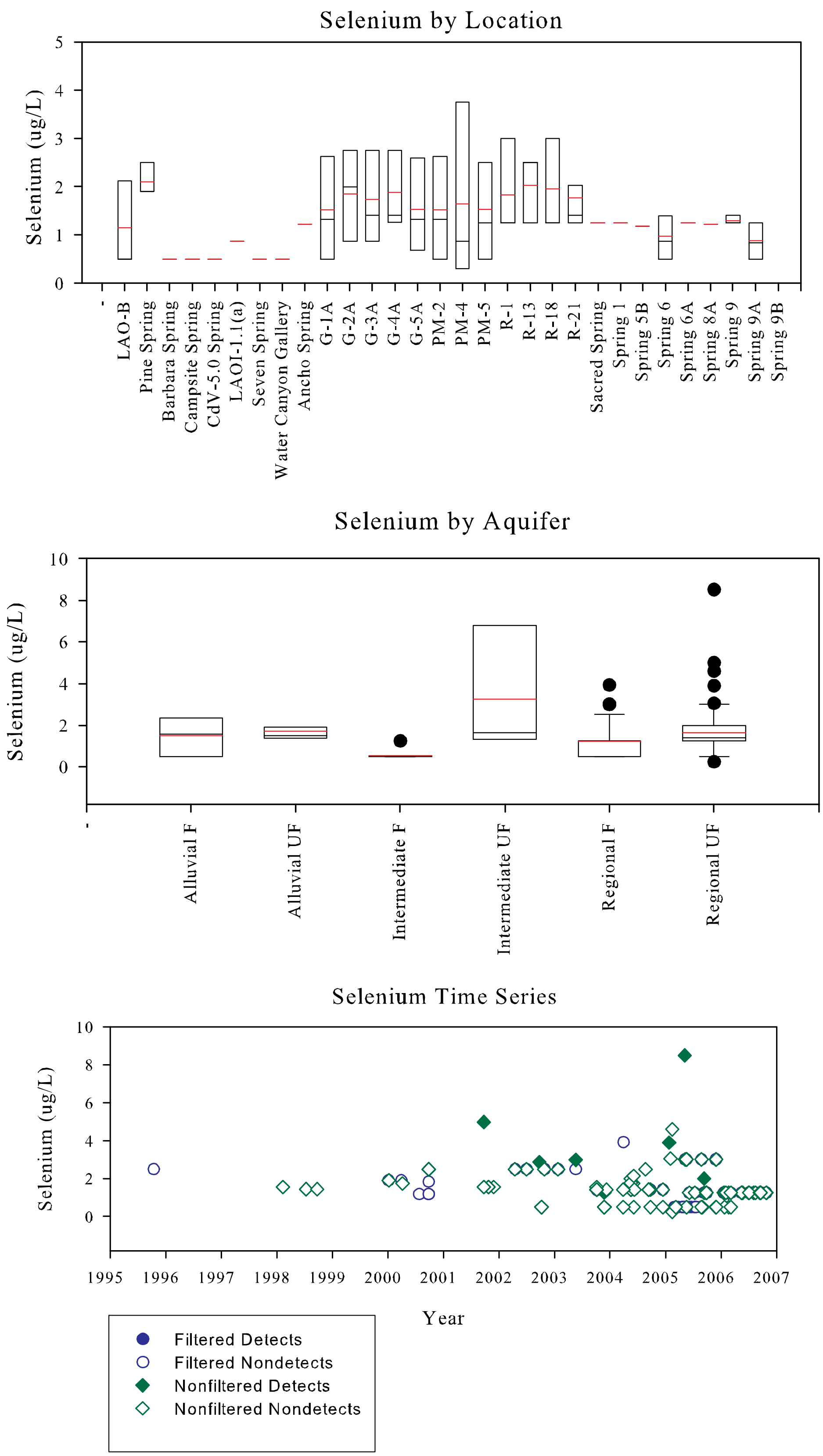


Figure C-45 Selenium

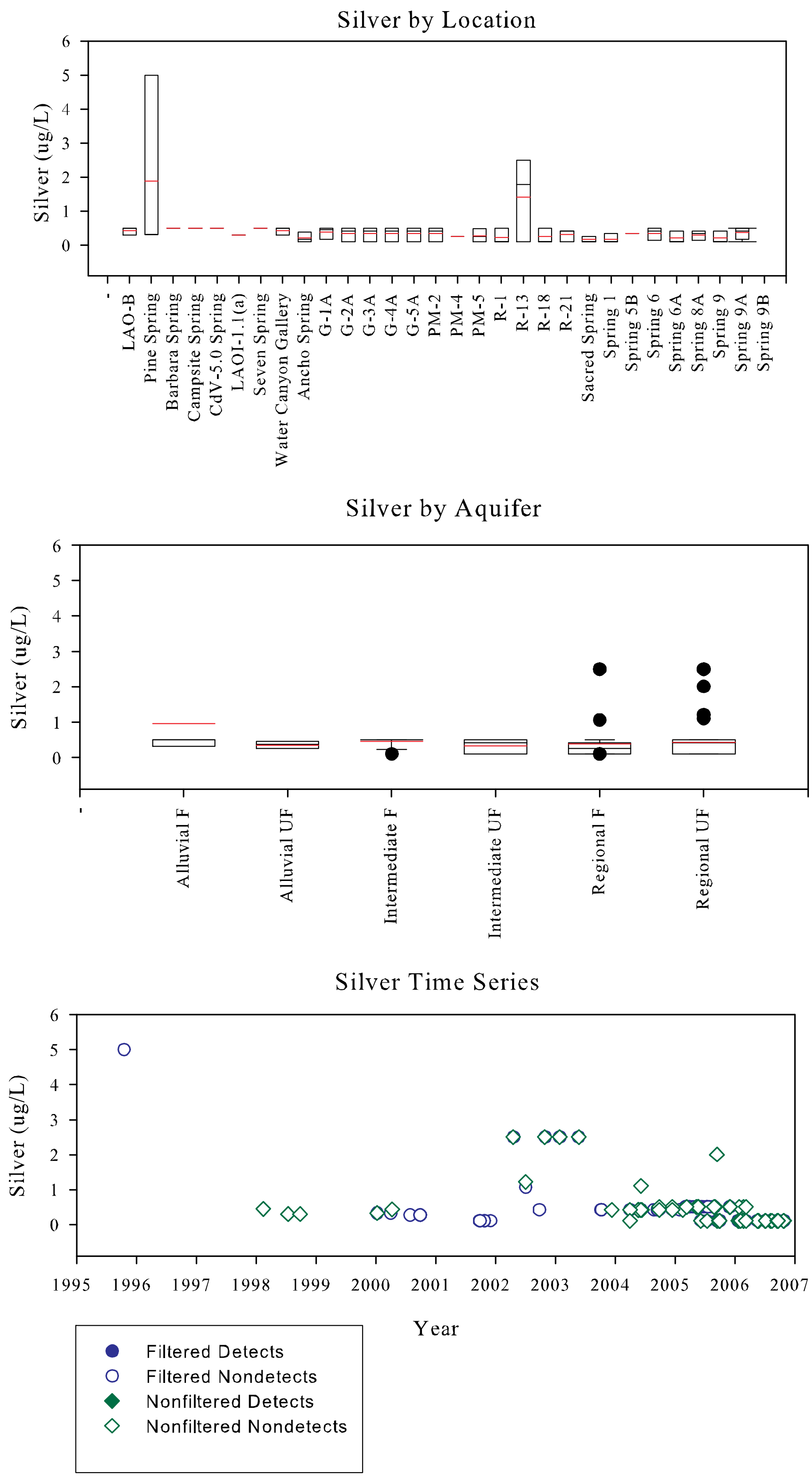


Figure C-46 Silver

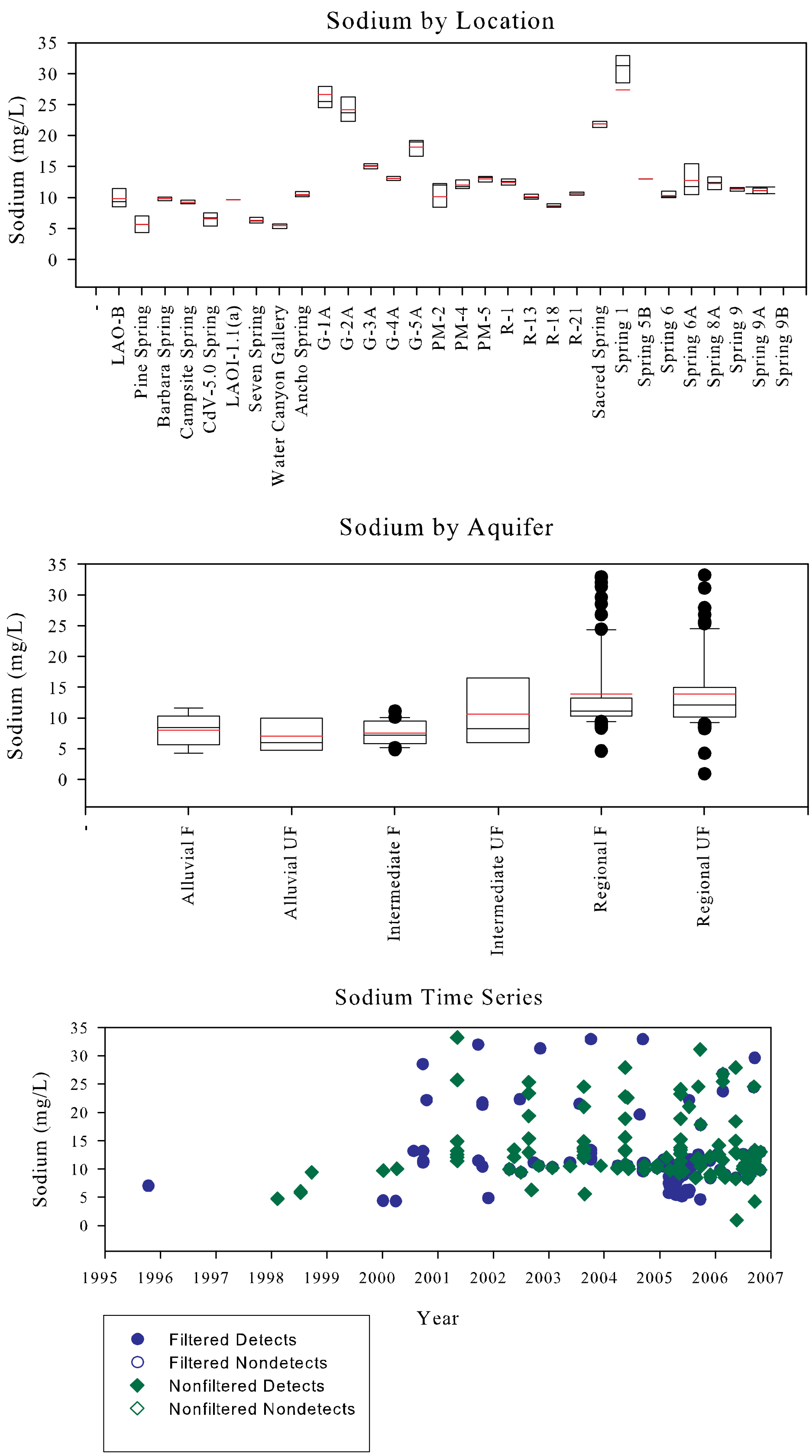


Figure C-47 Sodium

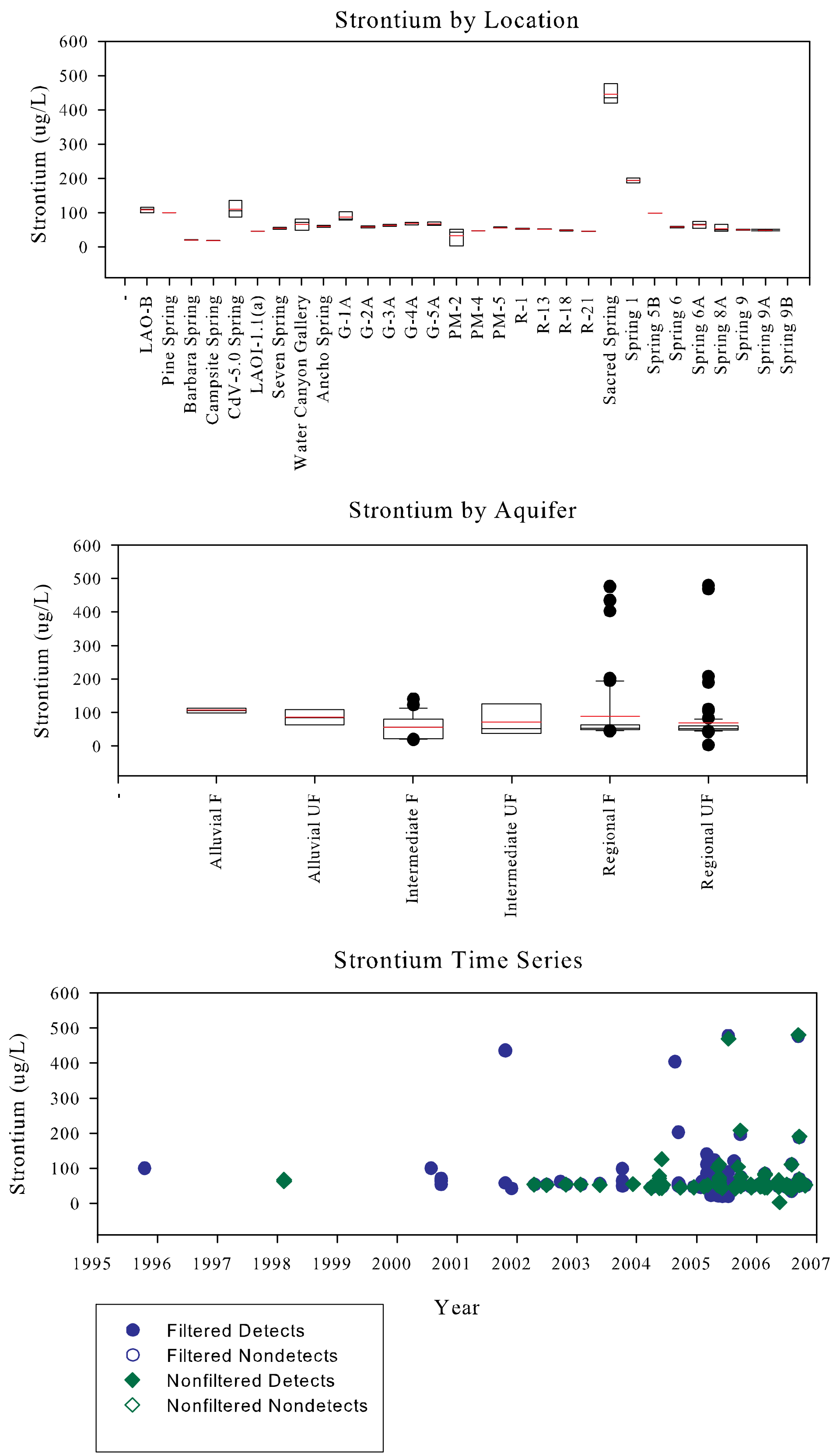


Figure C-48 Strontium

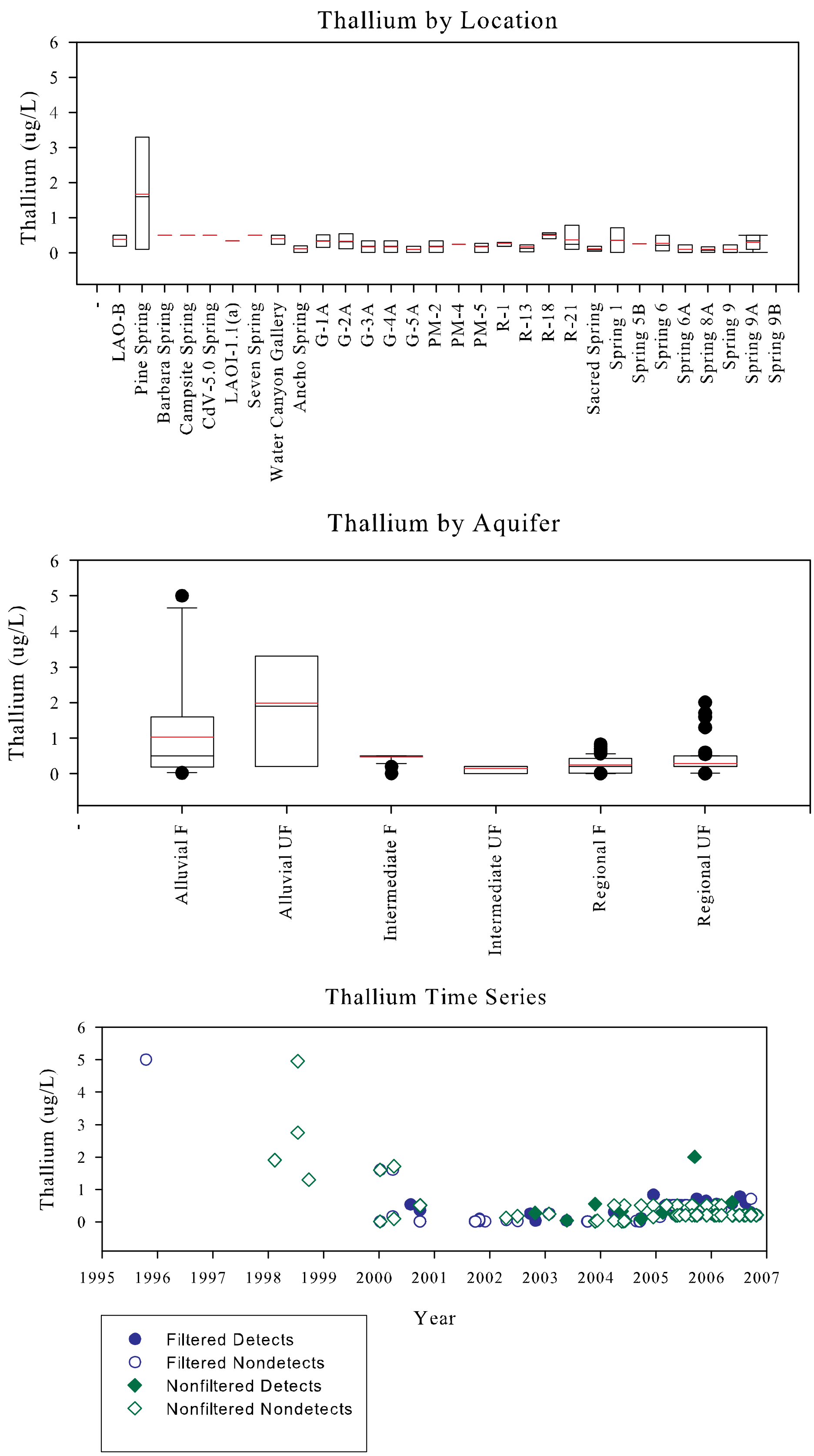


Figure C-49 Thallium

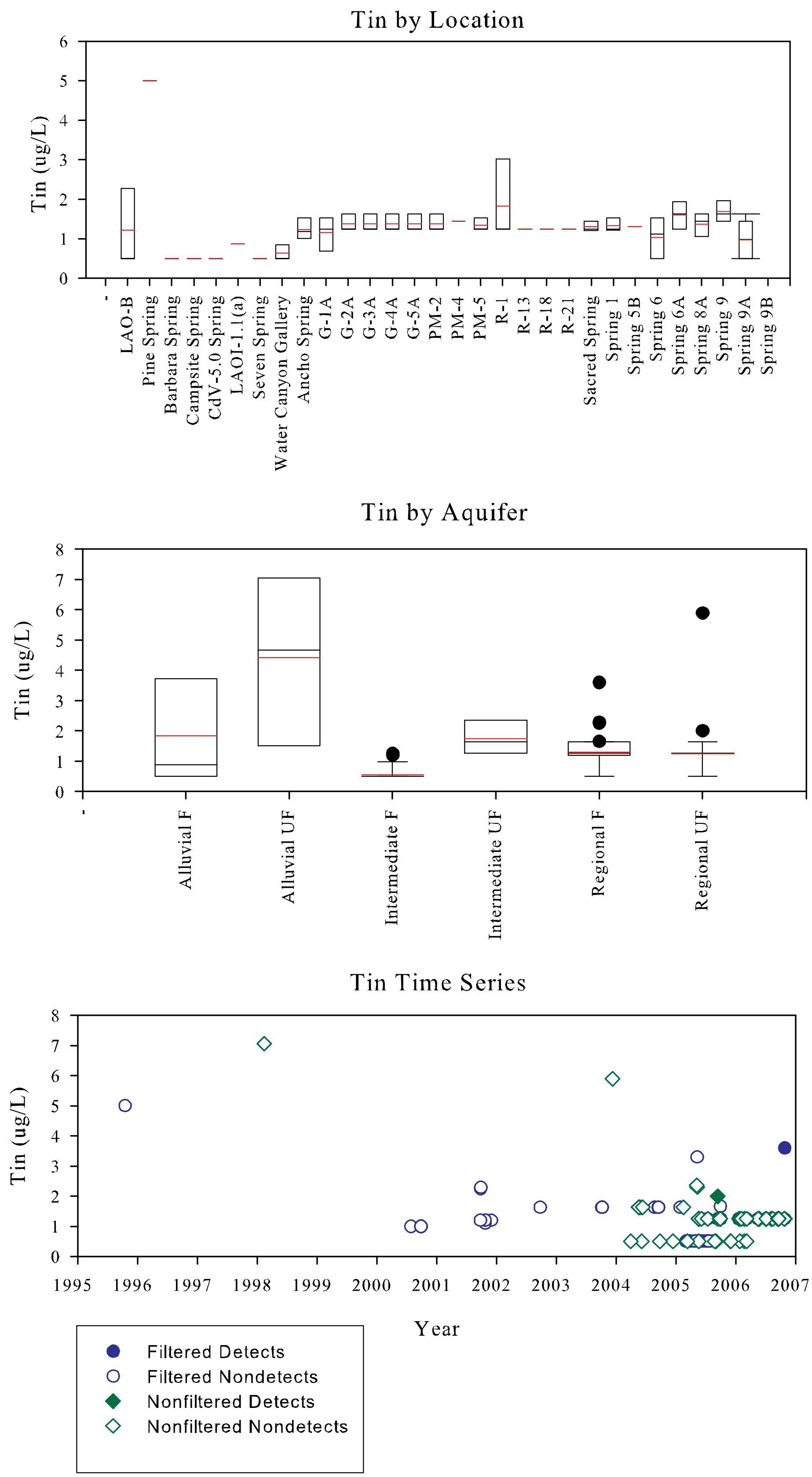


Figure C-50 Tin

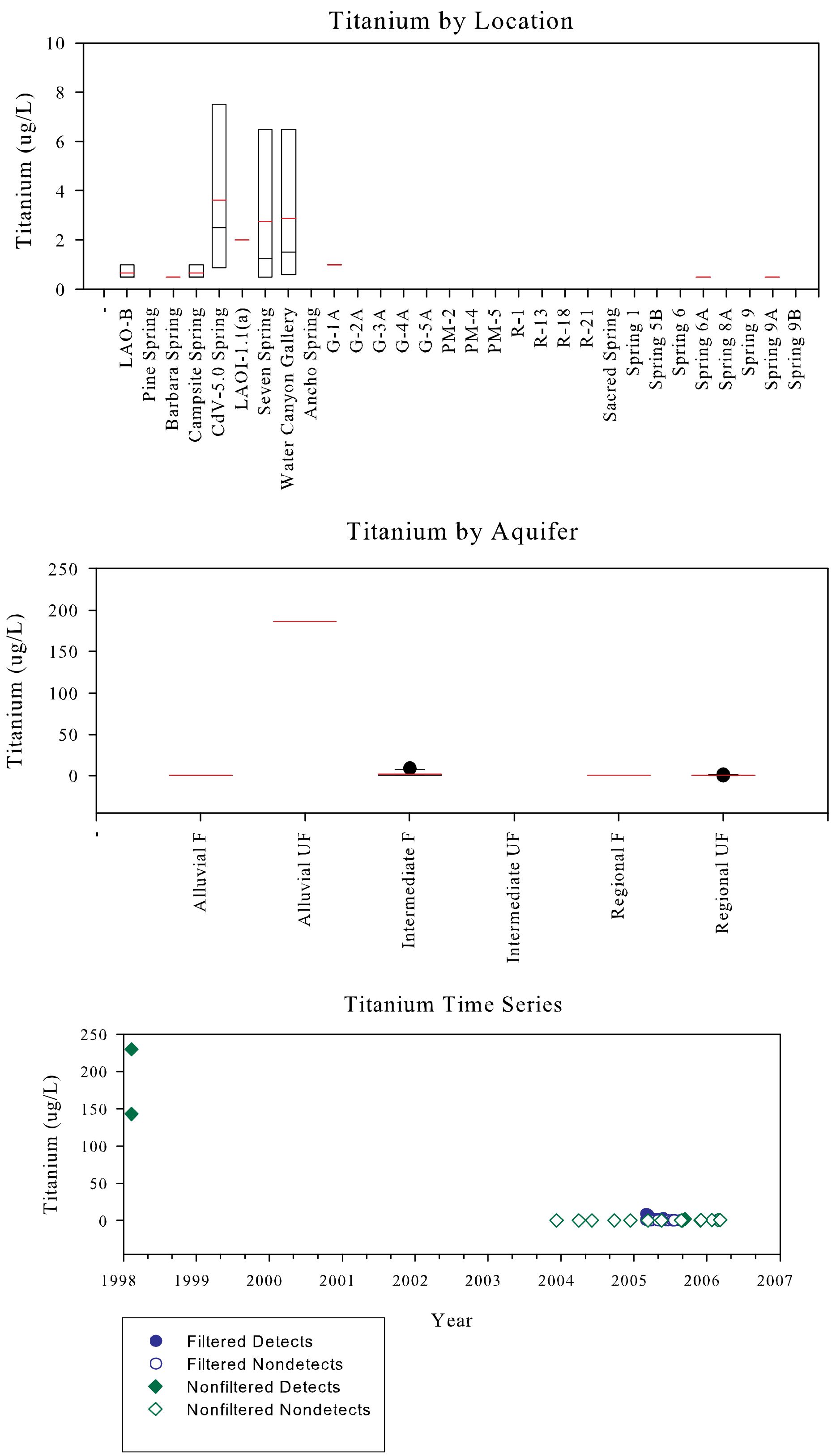


Figure C-51 Titanium

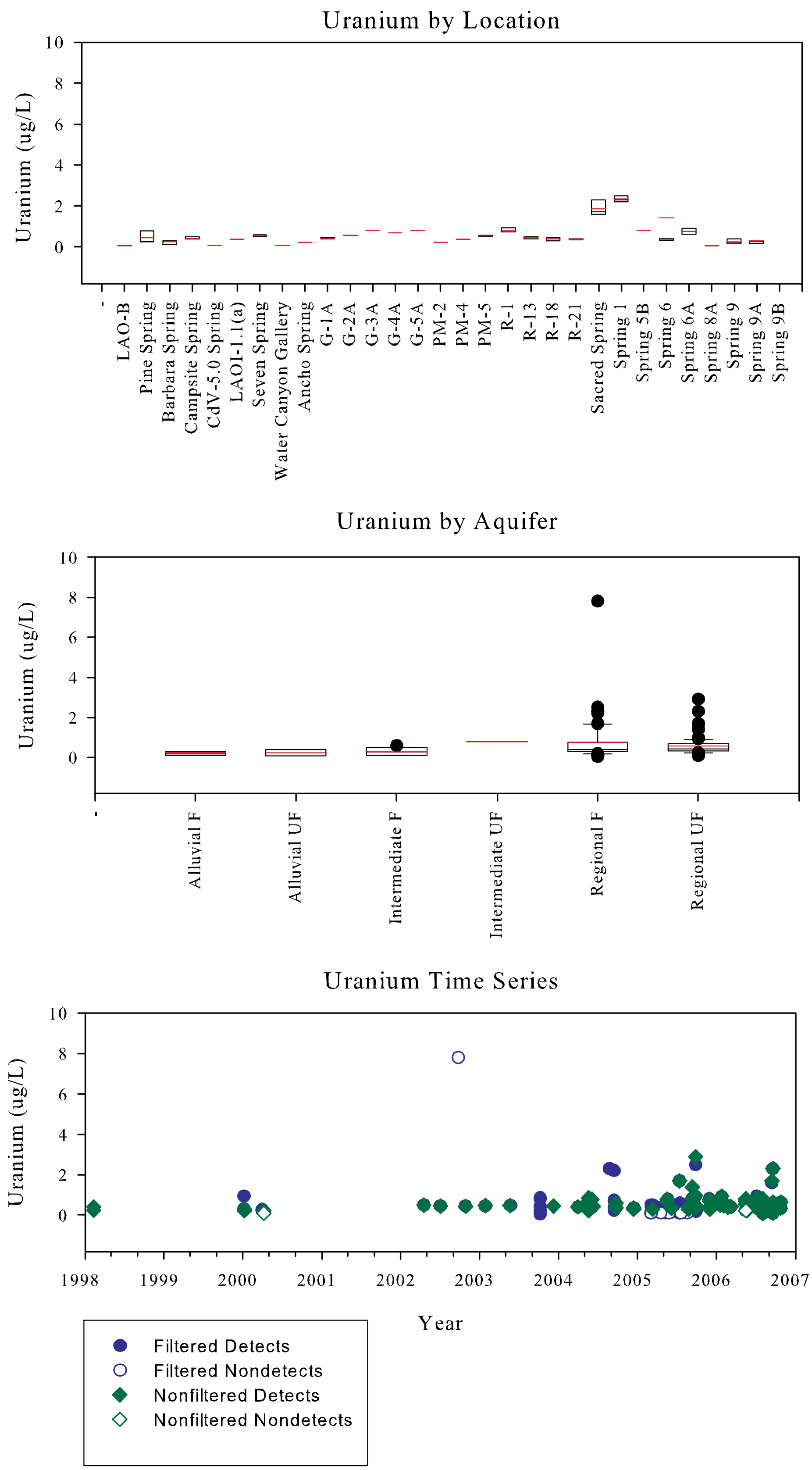


Figure C-52 Uranium

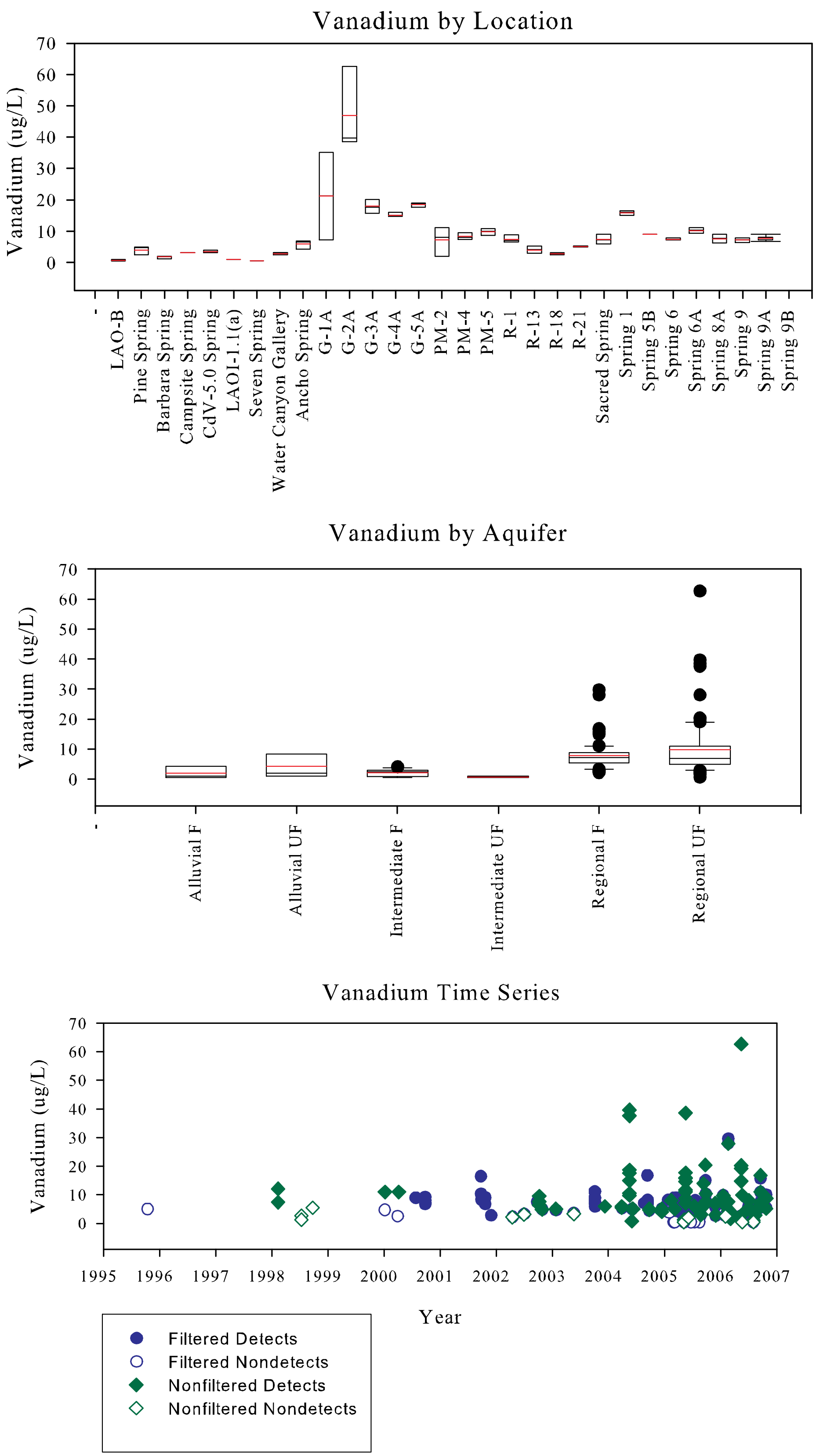


Figure C-53 Vanadium

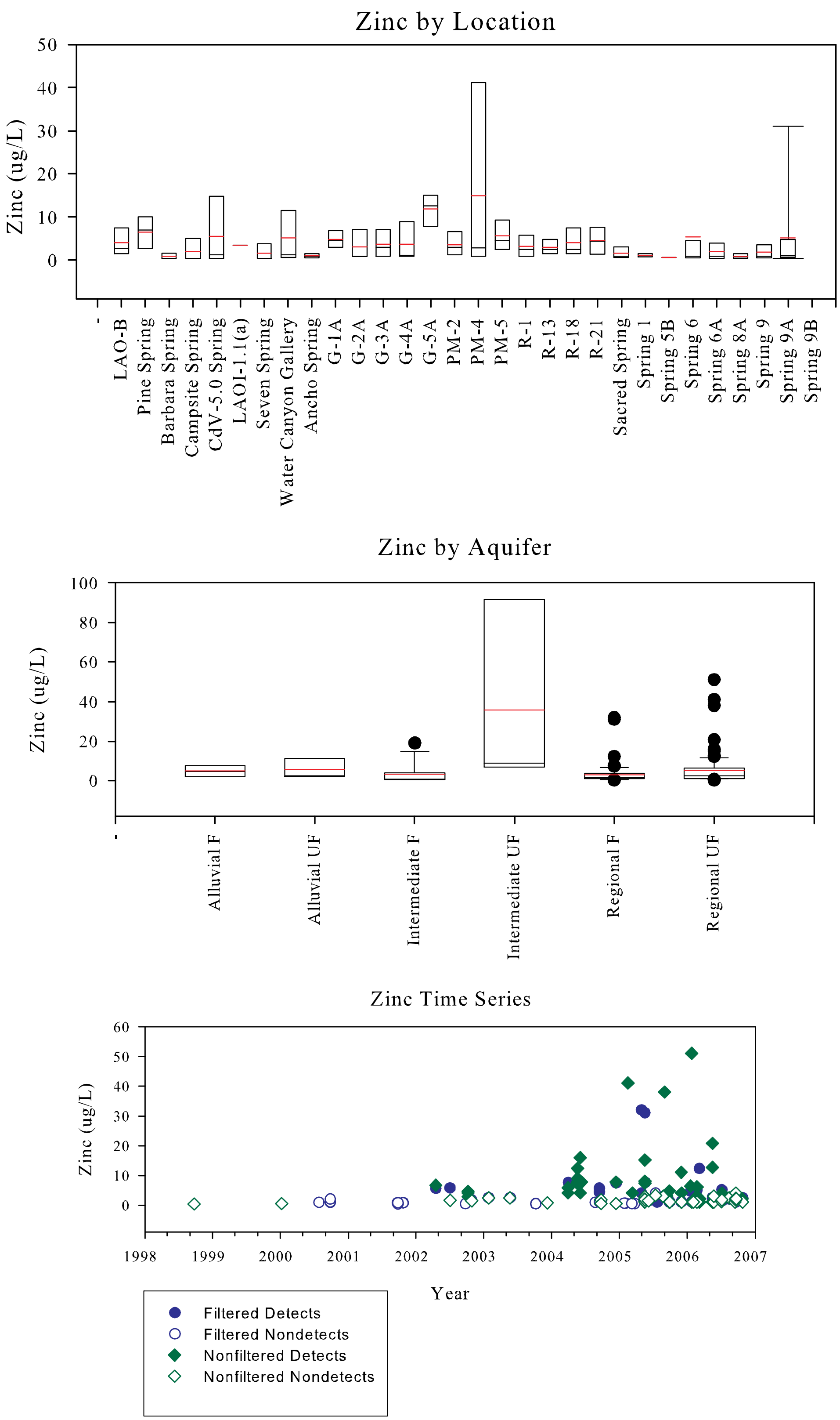
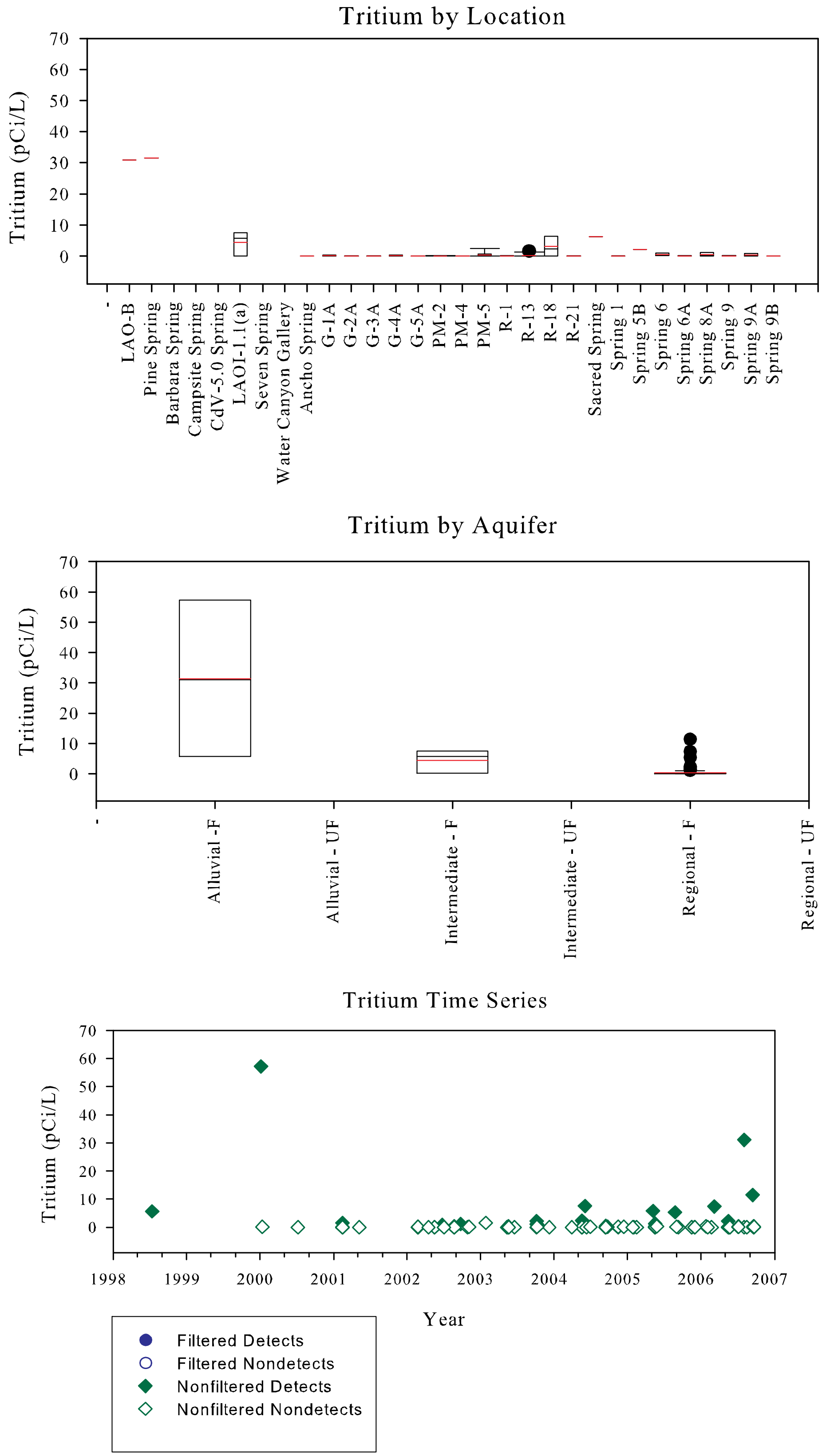
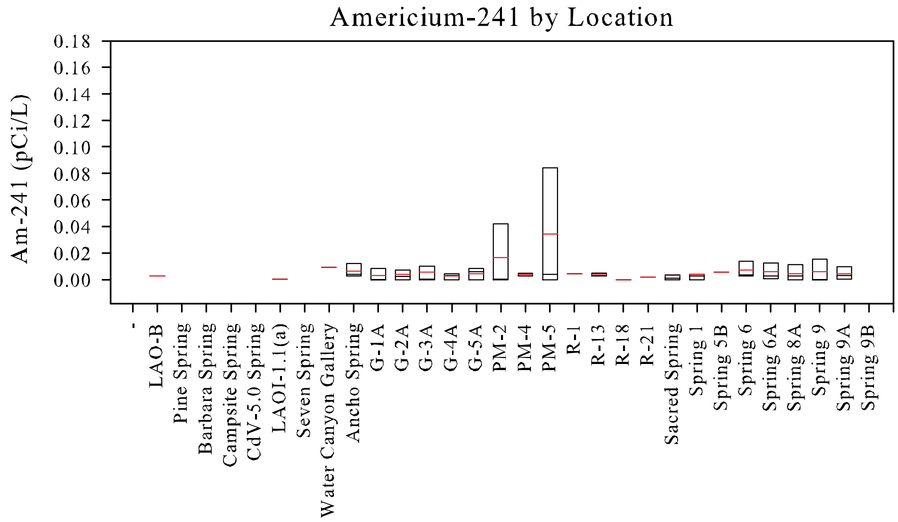


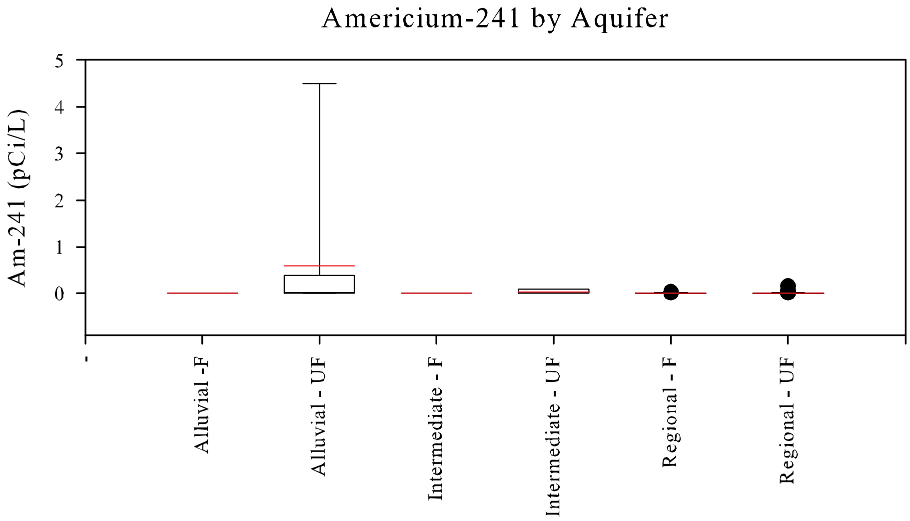
Figure C-54 Zinc



Note: Location box plot shows all nonfiltered data due to the nature of the analytical technique used.

Figure C-55 Tritium





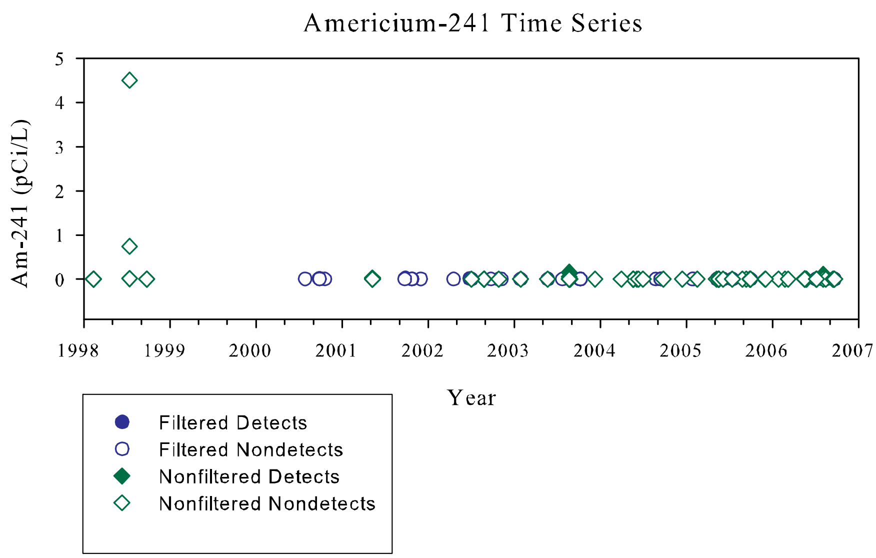


Figure C-56 Americium-241

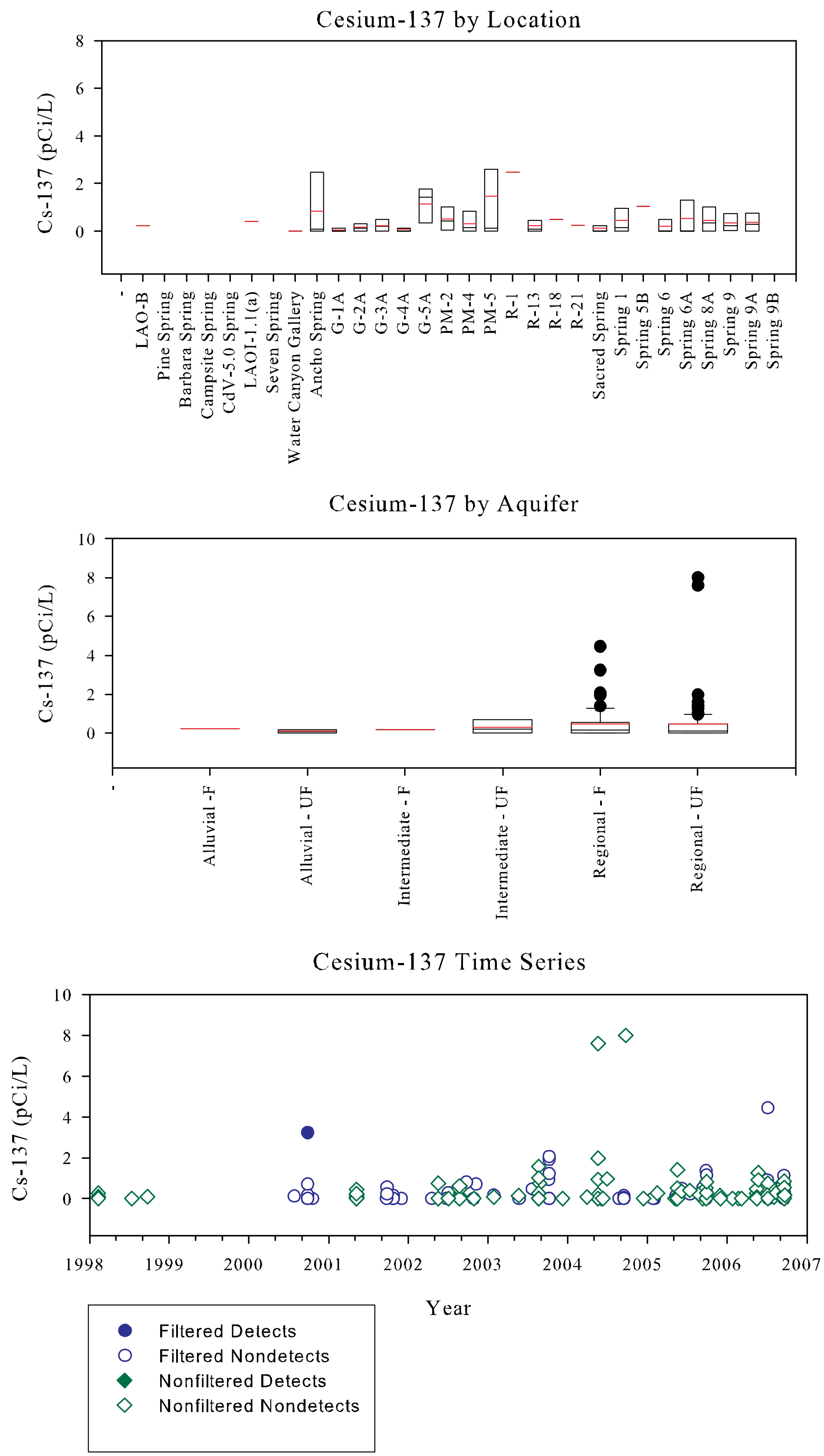


Figure C-57 Cesium-137

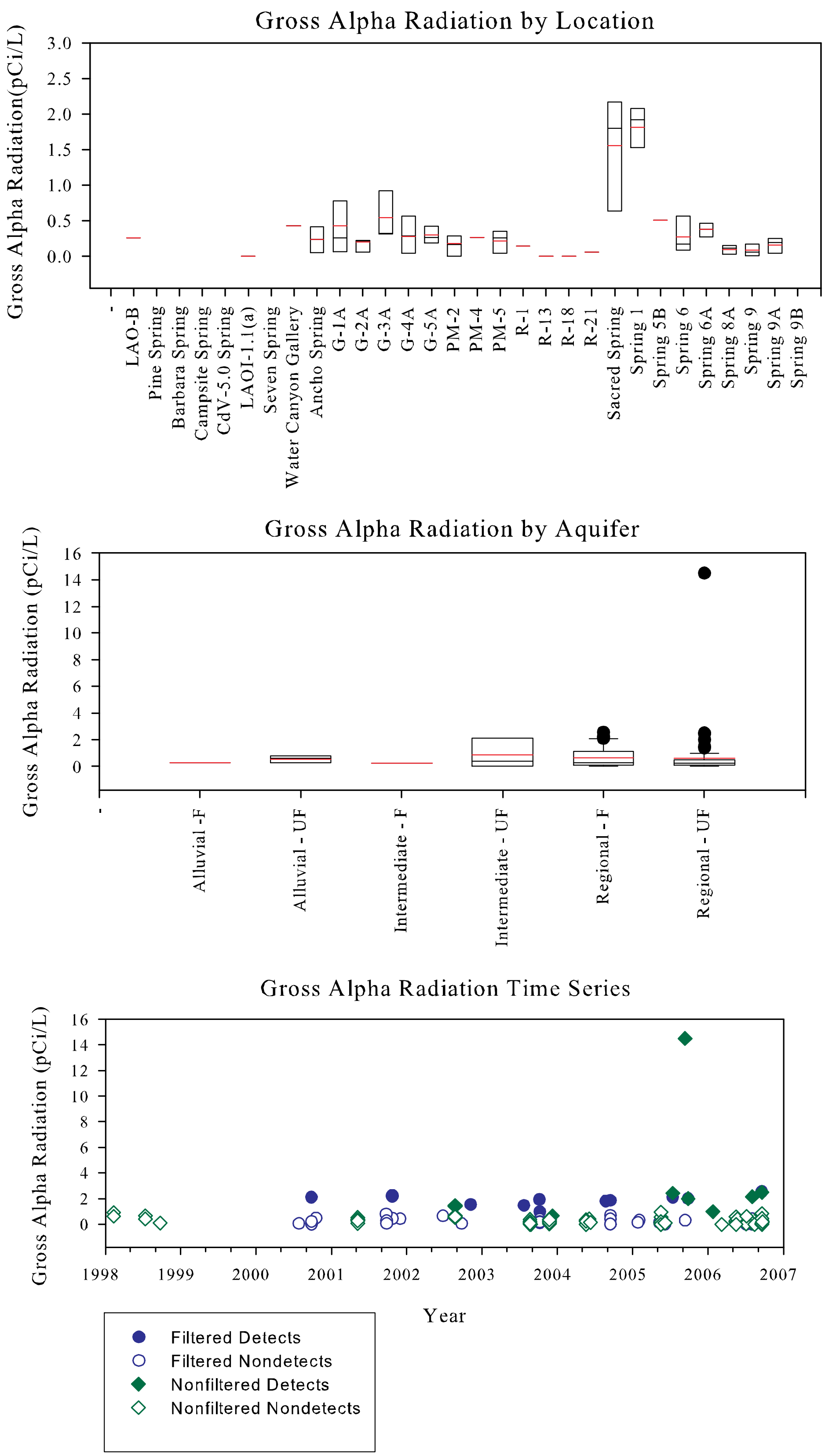


Figure C-58 Gross Alpha

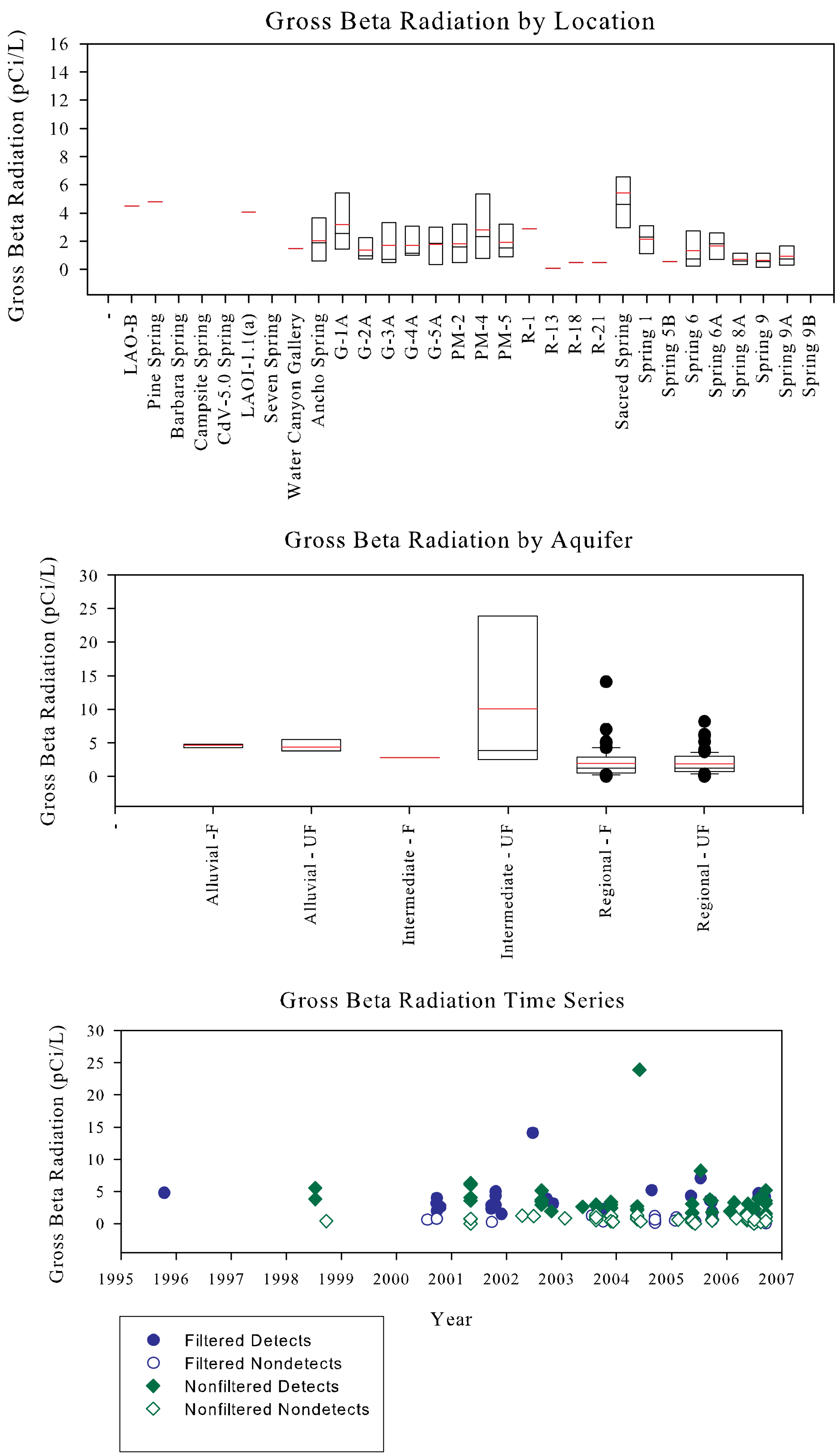
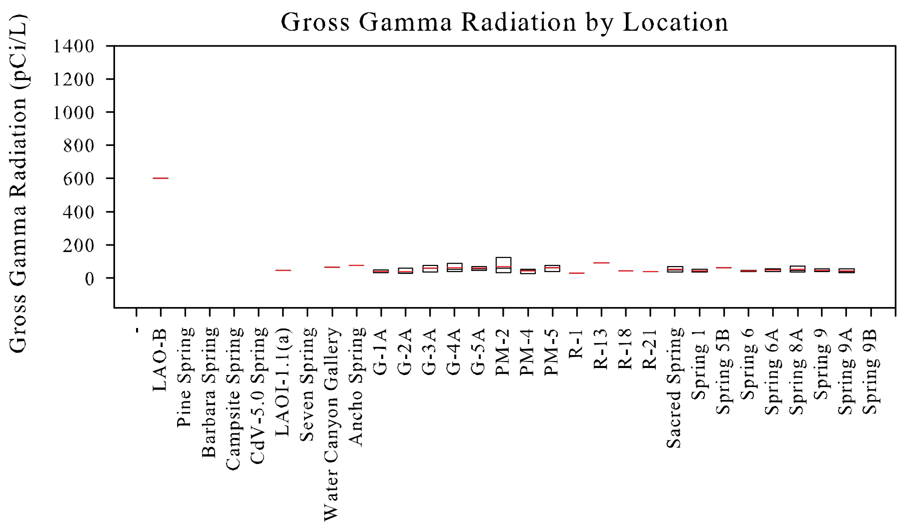
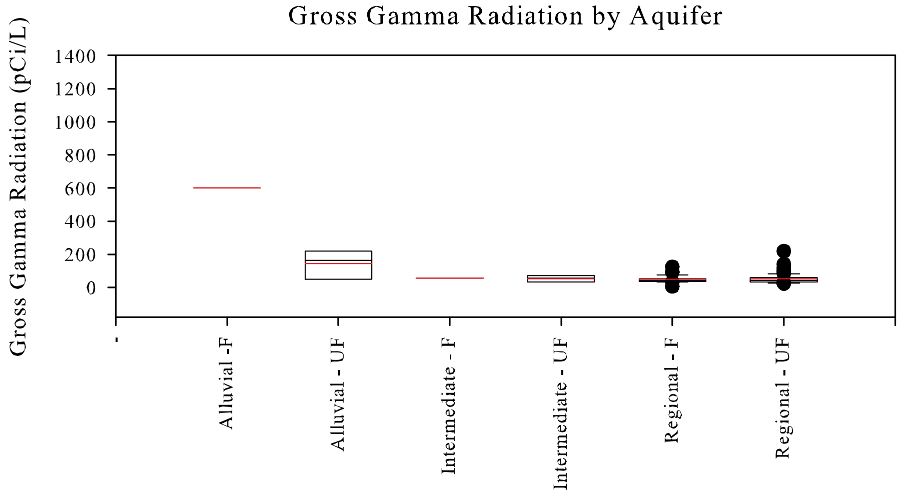


Figure C-59 Gross Beta





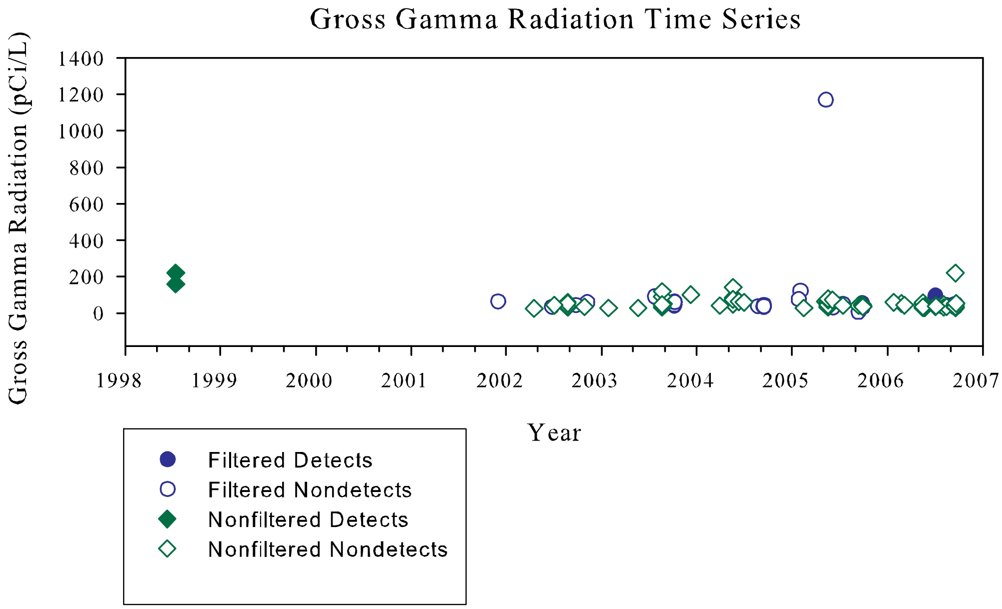


Figure C-60 Gross Gamma

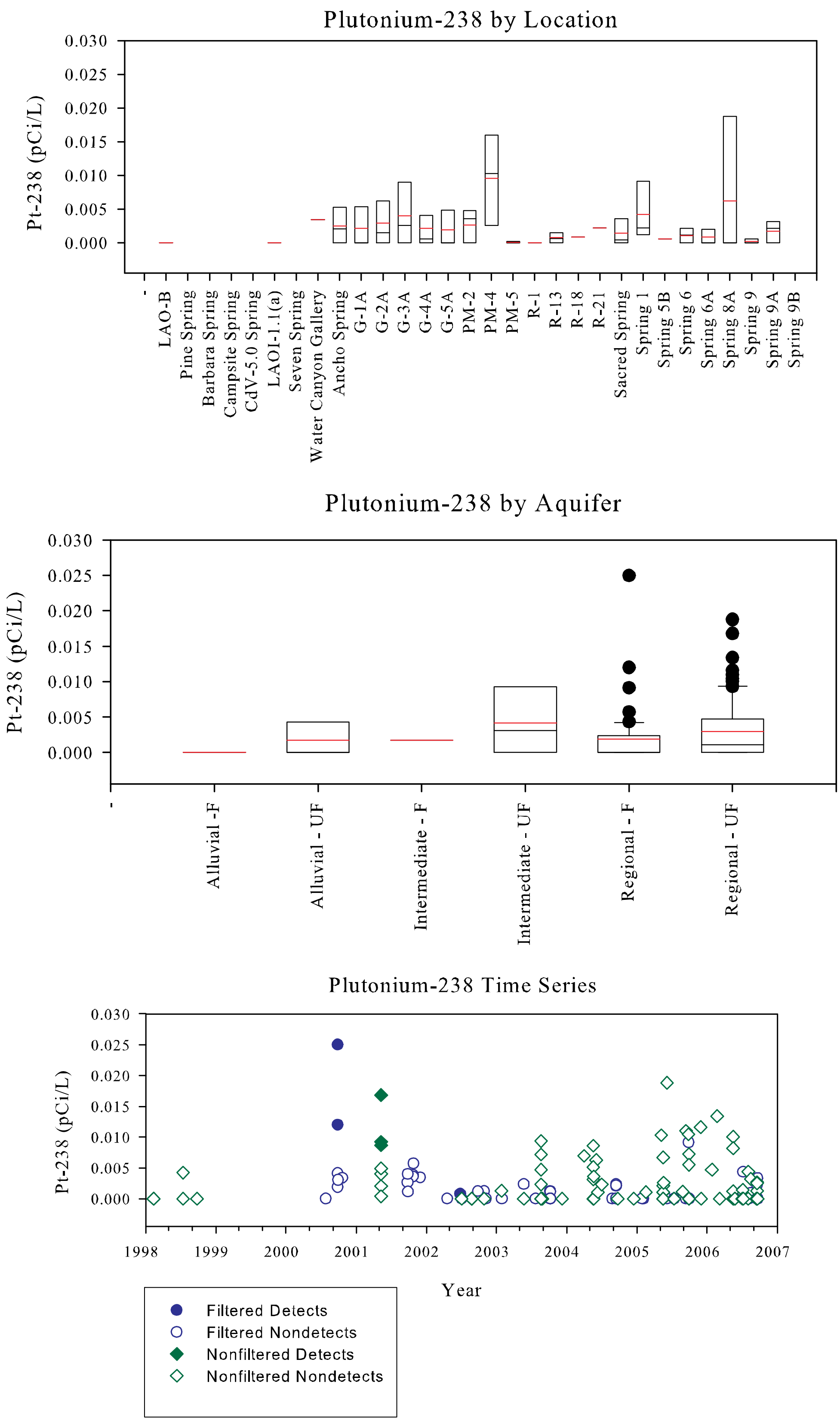


Figure C-61 Plutonium-238

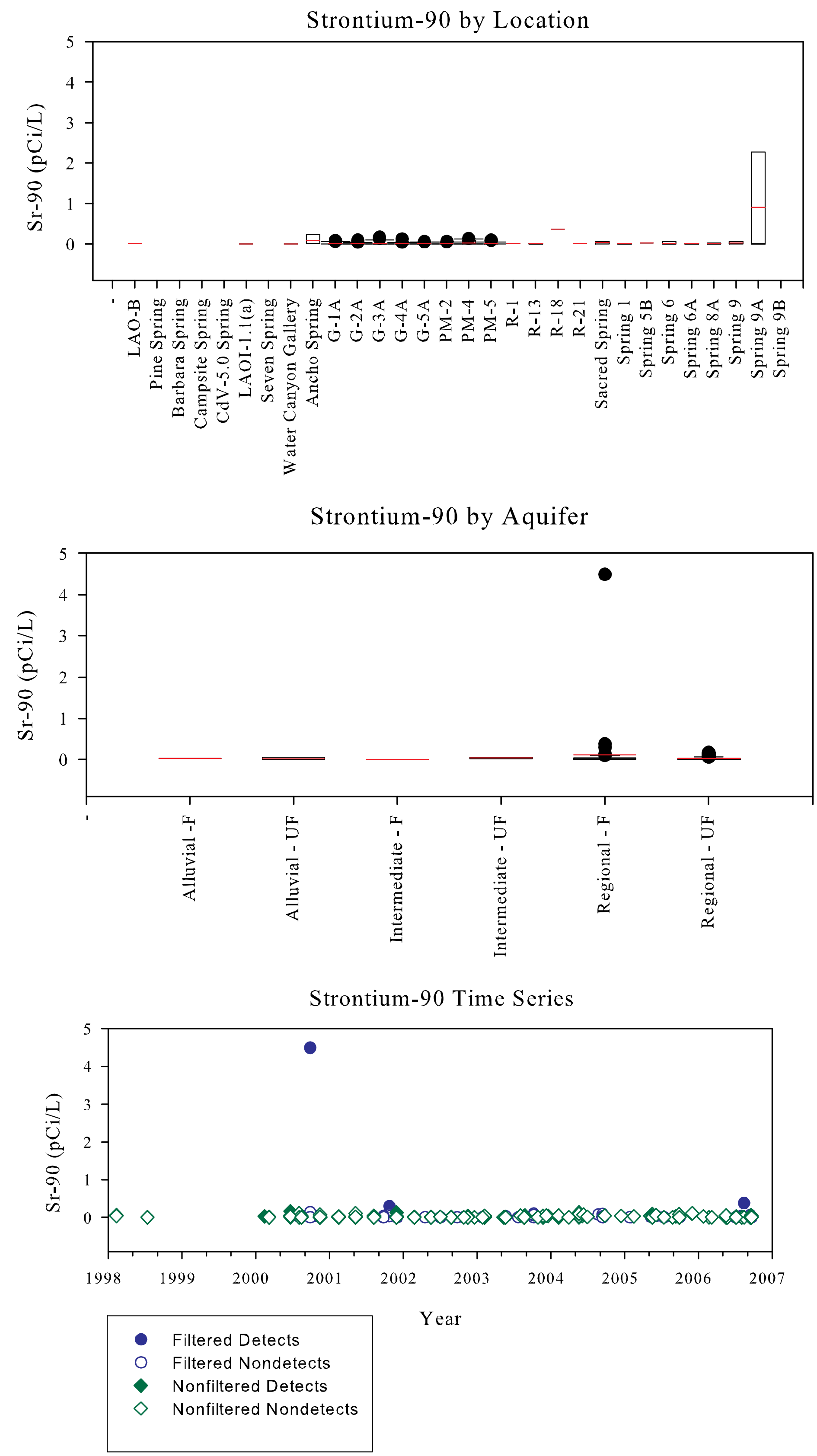


Figure C-62 Strontium-90

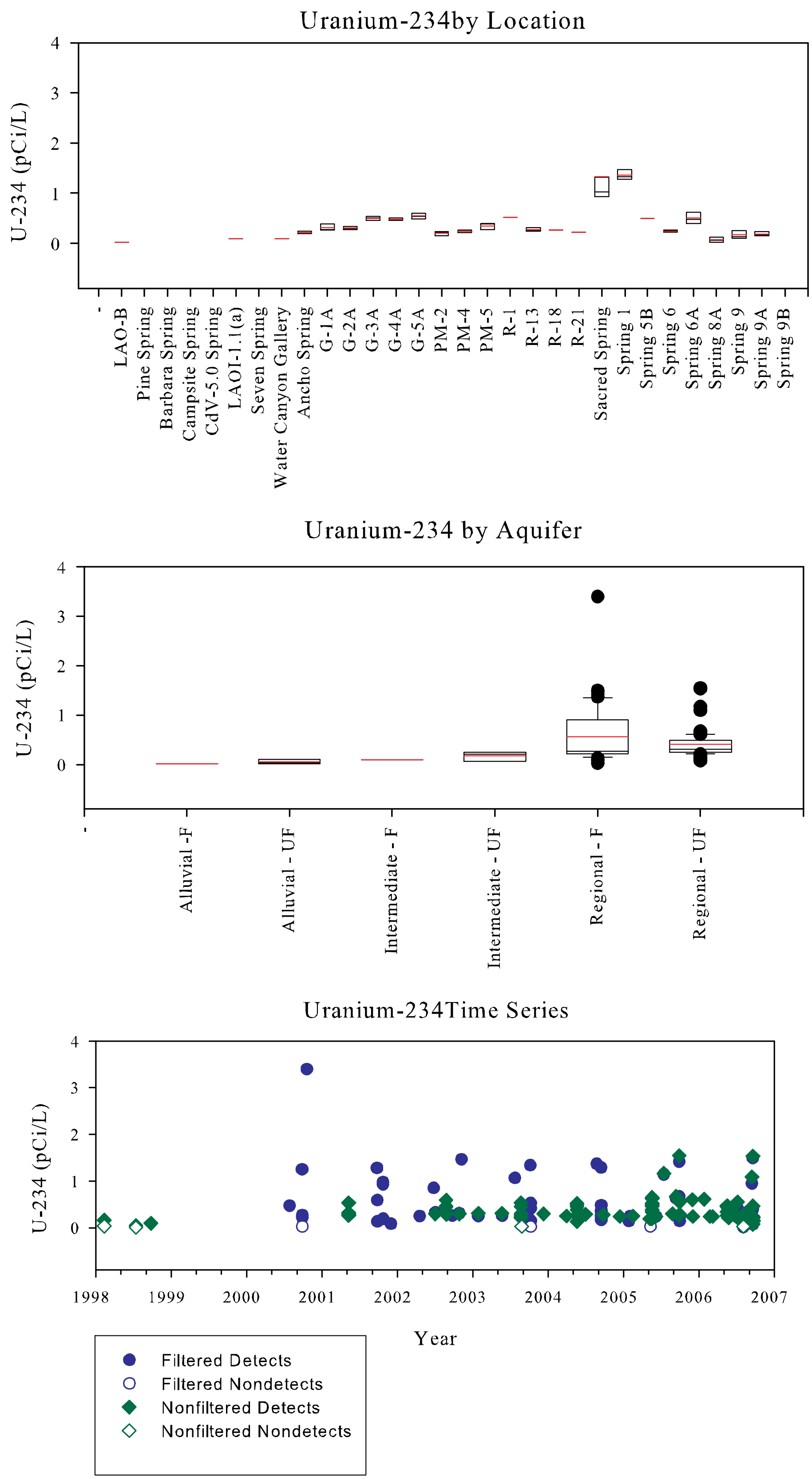


Figure C-63 Uranium-234

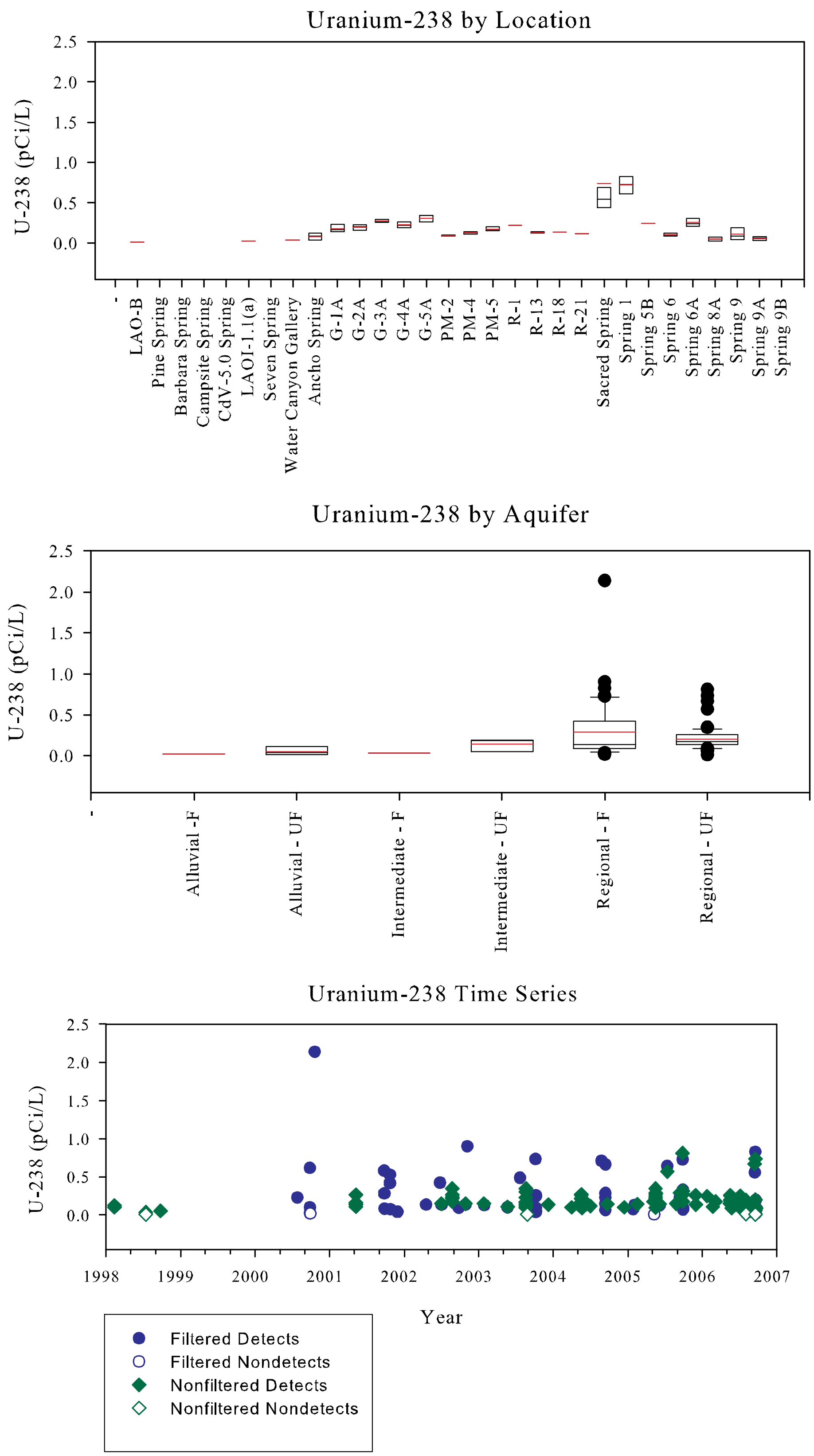


Figure C-64 Uranium-238

Appendix D

Statistical Analyses of Pre-1997 Hydrogeochemical Data

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D-1.0 STATISTICAL ANALYSES OF PRE-1997 HYDROGEOCHEMICAL DATA

This section presents results of statistical analyses performed on pre-1997 groundwater-quality data collected within and surrounding the Los Alamos national Laboratory (the Laboratory). This statistical analysis was performed as a basis of comparison to the data collected in 1997 and later years. Sources of groundwater-quality data are defined, and the accuracy and precision of the data are evaluated. Analytical precision for nonfiltered water samples is usually poor because of the presence of suspended solids, which when partially or completely digested with nitric acid at pH 2 or less introduces false positives for metals and trace elements. Therefore, groundwater data were screened to evaluate analytical results mainly for those samples that were filtered before analyses.

D-1.1 Methodology

D-1.1.1 Data Adequacy of Water Samples

Data adequacy of the pre-1997 groundwater background data was evaluated by both qualitative and quantitative methods. Analytical results for filtered groundwater samples from different data sources were evaluated. Removal of suspended solids in filtered samples was essential to evaluate baseline or background hydrochemistry. The presence of suspended solids positively biases concentrations of analytes because of partial or complete dissolution of the solids during acidification of the water samples. Digestion of suspended solids in water samples also results in poor charge balances (> ±10%), and the charge balance relationship is one quantitative metric of data quality.

The overall adequacy of the data was assessed by evaluating the standardized residuals from the regression analysis of total dissolved anions versus total dissolved cations. One metric is based on the frequency of standardized residuals with an absolute value greater than 1.96. The expected value of residuals with this magnitude is 5%, and the data set would be judged to be in charge balance if the frequency of residuals is not statistically different from 5%.

Charge-balance errors for the pre-1997 analytical results were calculated for major and trace ions as follows:

$$(100)[(\sum \text{milliequivalents cations} - \sum \text{milliequivalents anions}) \text{ divided by } (\sum \text{milliequivalents cations} + \sum \text{milliequivalents anions})]$$

Other quantitative metrics of data quality employed the calculation of variability resulting from replicate laboratory analyses of the same sample. This value provided a baseline for temporal variation in samples collected from a given location, as well as differences in concentration between sampling locations.

D-1.1.2 Exploratory Data Analyses

Statistical analyses of the selected pre-1997 background data involve several exploratory data analysis (EDA) tools. The purpose of EDA is to identify possible outliers in the data, understand relationships between analytes, evaluate parametric and nonparametric statistical modeling options, and determine the frequency of nondetect values by analyte and by potential data subpopulations.

One of these methods involves bivariate plots. A bivariate plot of anion sum versus cation sum is shown in Figure D-1.1. A bivariate plot of laboratory duplicates (mean values) versus relative standard deviation is shown in Figure D-1.2. A correlation matrix for major ions, cation sum, and anion sum is provided in Figure D-1.3. Figure D-1.4 consists of total dissolved solids (TDS) versus bicarbonate concentrations for different aquifer material made up of alluvial and perched intermediate groundwater and the regional aquifer.

The first step for EDA is to assemble the data set under evaluation, which includes a summary of the number of samples collected from each location (Table D-1.1). Other tools include normal quantile plots of untransformed and transformed data (Figure D-1.5), box plots to compare possible data groups (Figure D-1.6), and statistical data summaries (Tables D-1.2 and D-1.3). Based on these sample data, the concentration range of nondetect and detect data can be summarized.

Box plots: Box plots are used to show differences between two or more sample collection areas or depths. This type of plot is shown as Figures D-1.5 and D-1.6. Box plots summarize information about the shape and spread of the distribution of concentrations for an analyte. They consist of a box and a (median) line across the box. The y-axis shows the observed concentrations in the reported units. The area enclosed by the box shows the concentration range containing the middle half of the data; that is, the lower box edge is at the 25th percentile, and the upper box edge is at the 75th percentile. The height of the box is a measure of the spread of the concentrations. The horizontal line across the box represents the median (50th percentile) of the data, which is a measure of the center of the concentration distribution. If the median line divides the box into two approximately equal parts, the shape of the distribution of concentrations is symmetric; if not, the distribution is skewed or nonsymmetrical. All concentrations are plotted as points overlying the box plot.

Normal quantile plots: As a companion plot to some box plots, the normal quantile plots for the data groups are also depicted in Figures D-1.5 and D-1.6. Normal quantile plots (also known as a normal quantile-quantile or q-q plot) are a particular type of quantile plot. The data set concentrations is plotted in increasing order and spread out to allow for comparison of its distribution to that of a theoretical distribution, the standard normal distribution. The quantiles of the data set (y-axis) are plotted against the quantiles for a standard normal (x-axis). The quantiles of a standard normal, that is normal with mean = 0 and standard deviation = 1, are those for the theoretical distribution and can be found in published tables of the cumulative normal distribution. For example, the 50th quantile is 0, the 90th quantile is approximately 1.282, the 95th quantile is about 1.645, etc. If data are derived from a normal statistical distribution, the points in the plot will lie close to the diagonal straight line overlying the data points. The subsets of the data set that differ the most from those expected from a normal distribution are seen as points straying from the line. Multiple data groups can be compared with each other and woth a normal distribution by plotting a separate line for each data set in the same display. The observer can see where, if anywhere, the two plots follow the same line, overlap or intersect, indicating that they have equal concentrations at that (those) associated quantile(s).

Regression analysis and scatter plots: Regression analysis provides a measure of the association between pairs of variables. An *x-y* scatter plot is used to graphically depict this relationship. Regression analysis provides a correlation coefficient and an associated measure of statistical significance (or p-value). The correlation coefficients can potentially range between –1 and +1. A correlation coefficient of zero indicates no correlation between the two measurements. A correlation coefficient of +1 indicates a perfect positive relationship between the measurements. A correlation coefficient of –1 indicates a perfect negative relationship (no correlation) between the measurements.

D-2.0 STATISTICAL AND GEOCHEMICAL ANALYSES OF PRE-1997 WATER-QUALITY DATA SETS

D-2.1 Data Evaluation

Table D-1.1 presents a summary of the analytes included in the available background hydrogeochemical data and the range of nondetect and detected values. These data and locations apply to Revision 0 of this report. The pre-1997 data were derived from seven data sources and were collected at irregular intervals from June 1978 to July 1996. Most of the major elements were always detected, but many of the trace elements had low detection rates. A low detection rate limits the utility of many statistical analyses. Varying analytical methods greatly influence analytical method detection limits (MDLs) for the analytes. Chemical results for water samples reported by the Laboratory's Earth and Environmental Sciences group, EES-6, Shevenell et al. (1987, 06673), Vuataz and Goff (1986, 73686), Dale et al. (1996, 57014), and Yanicak (1998, 57583) were analyzed by either AA (metals), ICPAES (metals), ion chromatography (anions), and/or ICPMS (metals). Water samples collected under the National Uranium Resource Evaluation Project were analyzed by neutron activation analysis (NAA) and delayed neutron activation analysis. Analytical results for nitrogen species were reported as nitrogen compounds (nitrate and nitrite) and not as nitrogen. The same reporting procedure applies to phosphorus (phosphate).

The analysis of the charge balance for 55 water samples showed good agreement between the cation sum and the anion sum (Figure D-1.1 and Table D-2.2). In five values out of 55, the absolute value of the standardized residual exceeded 1.96 (mean plus 2 σ), which represents 9% rather than the expected 5%. This outcome is not improbable under the assumption that the statistical problem represents a binomial experiment of 55 trials with a probability of success of 5% per trial.

There were 10 laboratory duplicates for the groundwater samples. Because many of the trace element results (e.g., beryllium, antimony, cadmium) were nondetects, the agreement between the laboratory duplicates could not be calculated for many analytes. Figures D-1.2a and 2b show the laboratory duplicate variation as a function of the mean concentration of the laboratory duplicate results. The data show, excluding sample AAB1336 (Figure D-1.2b), that with the exception of two values with mean analyte concentrations near zero, laboratory variation is less than a 20% relative standard deviation.

The interrelationship of five major solutes (silica, calcium, sodium, bicarbonate, and chloride) with TDS, anion sum, and cation sum is shown in Figure D-1.3. This correlation matrix suggests significant correlations between sodium, bicarbonate, TDS, and anion/cation sums. This correlation implies that there are geochemical interactions between sodium and bicarbonate and that these two solutes contribute to TDS and anion/cation sums. These geochemical distinctions were used to separate different aquifers (e.g., alluvial, intermediate, and regional). For example, La Mesita spring is a sodium-bicarbonate-type water. However, silica correlates poorly with sodium and bicarbonate, and this demonstrates that silica does not form complexes with sodium and bicarbonate in this groundwater. The correlation matrix also shows an apparent outlier value for calcium.

A more detailed correlation plot shows the relationship between bicarbonate and TDS (Figure D-1.4). This plot shows that groundwater samples collected from the Santa Fe Group (regional aquifer) have the highest concentrations of both bicarbonate and TDS and exhibit the greatest variation.

To evaluate the appropriate parametric distribution for statistically modeling the groundwater background data, two types of graphical displays are used to interpret the data. Figure D-1.5 shows histograms and probability plots for bicarbonate and TDS for all data combined over aquifers. Bicarbonate was selected because it is the dominant anion contributing to TDS. Figure D-1.6 shows box plots and probability plots by aquifer group for bicarbonate and TDS. These plots suggest that the combined data represent a mixture distribution based on differences in aqueous geochemistry between aquifers, where the major difference is between the Santa Fe Group/Puye Formation versus the alluvial/Bandelier Tuff/Cerros del Rio basalt/Tschicoma Formation.

D-3.0 CONCLUSIONS

Adequacy of the pre-1997 groundwater background data was evaluated by both qualitative and quantitative methods. Analytical results for filtered groundwater samples from different data sources were evaluated. The removal of suspended solids by filtration of samples was essential for evaluating background hydrochemistry.

The analysis of the charge balance for 55 water samples showed good agreement between the cation sum and the anion sum. There were five values out of 55 where the absolute value of the standardized residual exceeded 1.96, which represents 9% rather than the expected 5%.

There were 10 laboratory duplicates for the 55 groundwater samples. Because many of the results were nondetect, the agreement between the laboratory duplicates could not be calculated for many analytes.

The interrelationships of five major solutes (silica, calcium, sodium, bicarbonate, and chloride) with TDS, anion sum, and cation sum were evaluated. This correlation matrix suggests significant correlations between sodium, bicarbonate, TDS, and anion sum and cation sum.

Groundwater samples collected from the Santa Fe Group (regional aquifer) have the highest concentrations of bicarbonate and TDS. The regional aquifer also shows the greatest variation in TDS and individual solutes.

To evaluate the appropriate parametric distribution to statistically model the groundwater background data, two types of graphical displays are used to interpret the data. Histograms and probability plots for bicarbonate and TDS for all data were combined for the three aquifer types: alluvial, volcanic (perched intermediate), and the regional aquifer. Box plots and probability plots by aquifer group for bicarbonate and TDS suggest that the combined data represent a mixture distribution based on differences in aqueous geochemistry between aquifers. The major difference is between the Santa Fe Group/Puye Formation versus the alluvial/Bandelier Tuff/Cerros del Rio basalt/Tschicoma Formation.

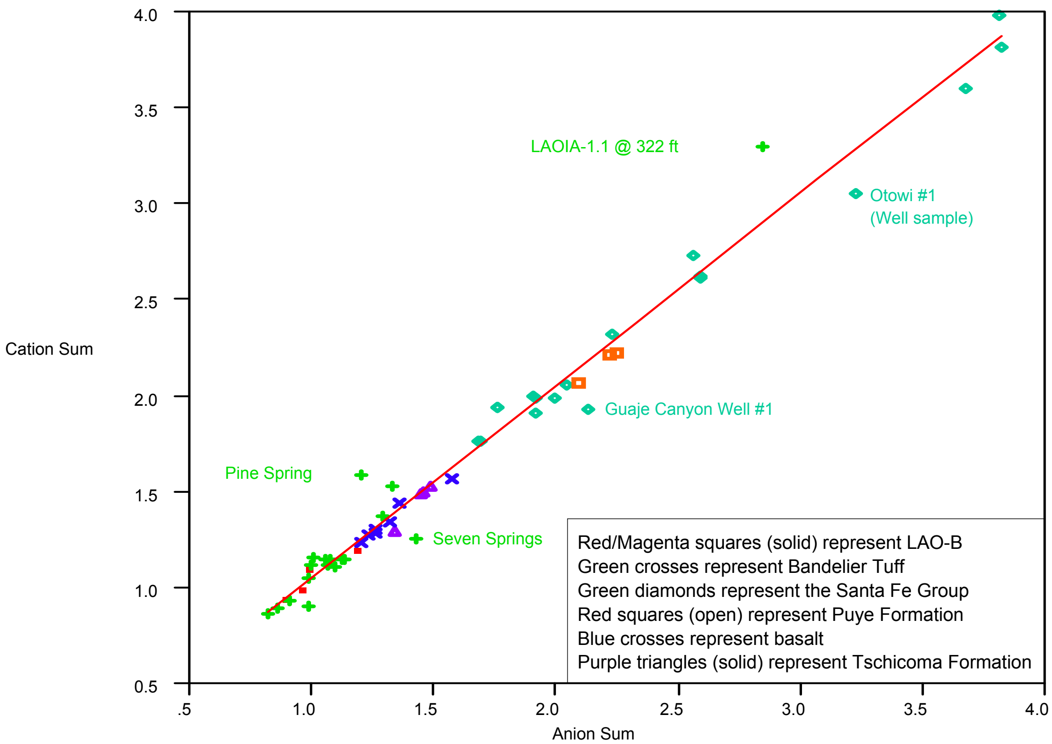


Figure D-1.1. Evaluation of charge balance for background water samples (filtered) (cation sum = 0.04429 + 1.00292 anion sum, r^2 = 0.982, n = 55 samples)

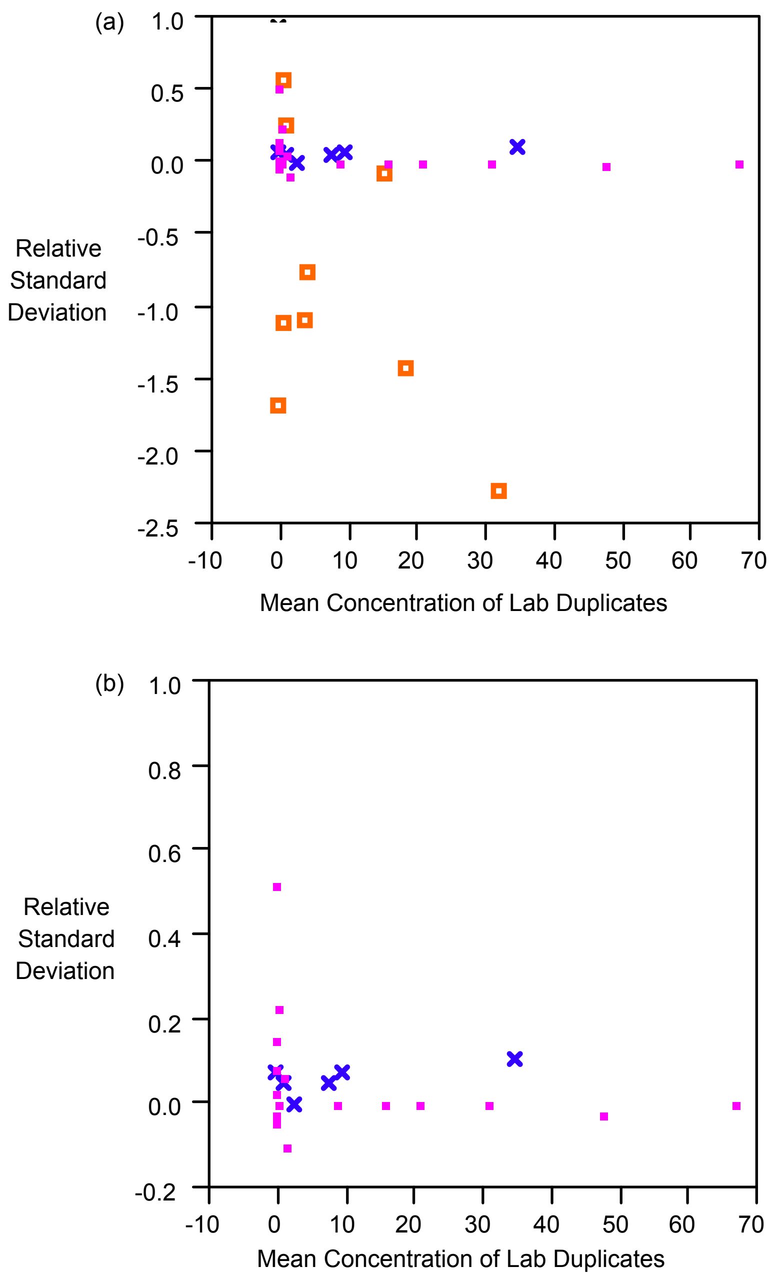


Figure D-1.2. Summary of variability from Laboratory duplicate analyses. (a) Samples AAB1336, AAB8498, AAB8512, and 0441-95-0013. (b) Samples AAB8498, AAB8512, and 0441-95-0013. Excluding sample AAB1336 in plot (b) results in a laboratory variation of less than 20% of the relative standard deviation, with the exception of two samples with mean analyte concentrations near zero. See Figure D-1-1 for symbols representing sample sites.

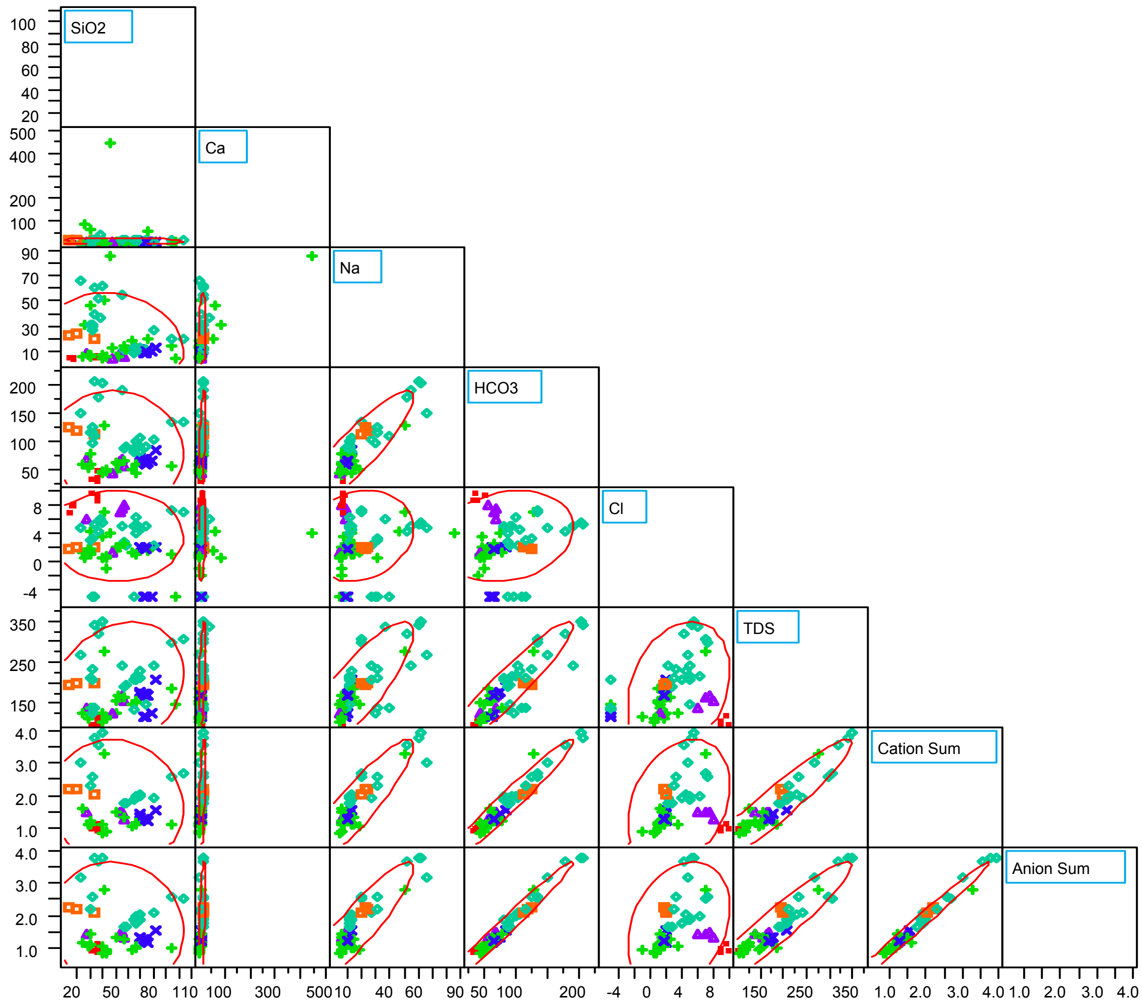


Figure D-1.3. Correlation matrix of major solutes, anion sum, and cation sum. See Figure D-1.1 for symbols representing sample sites.

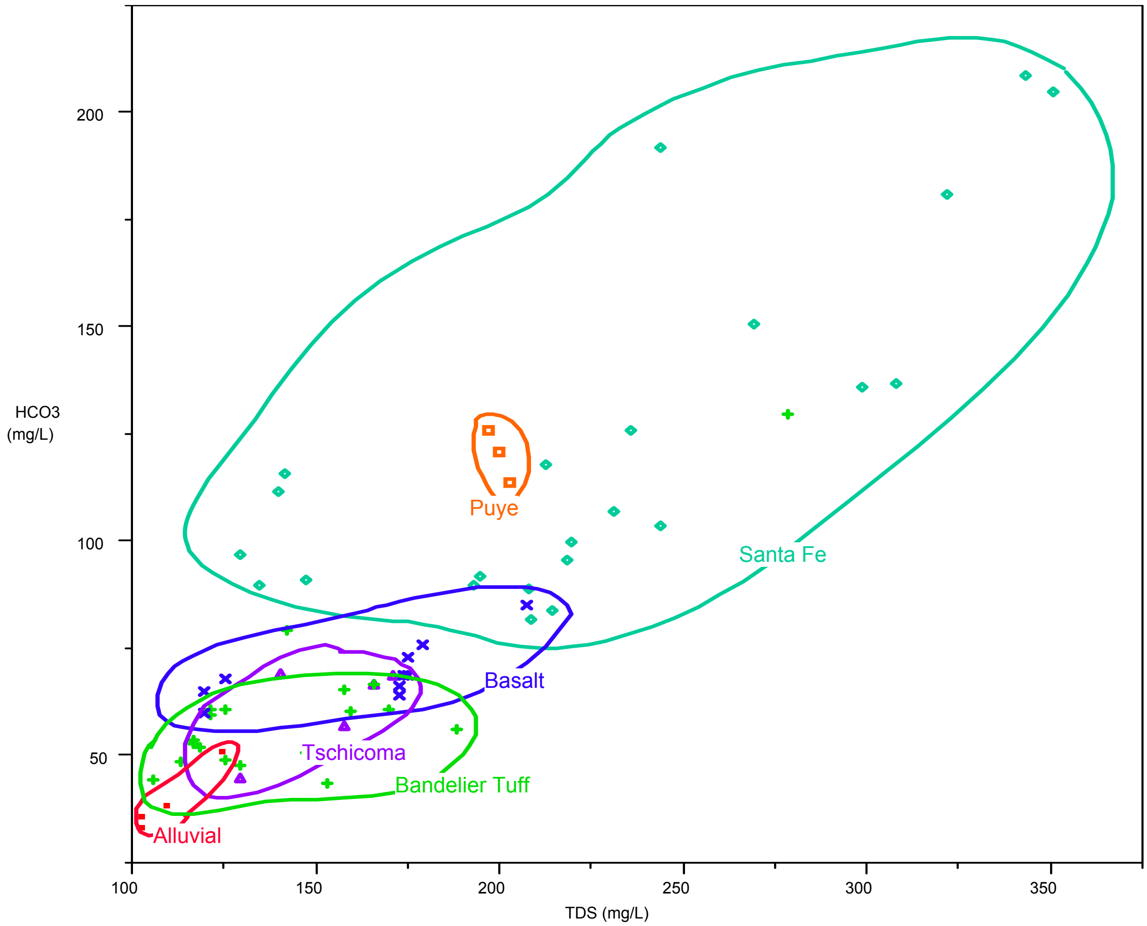
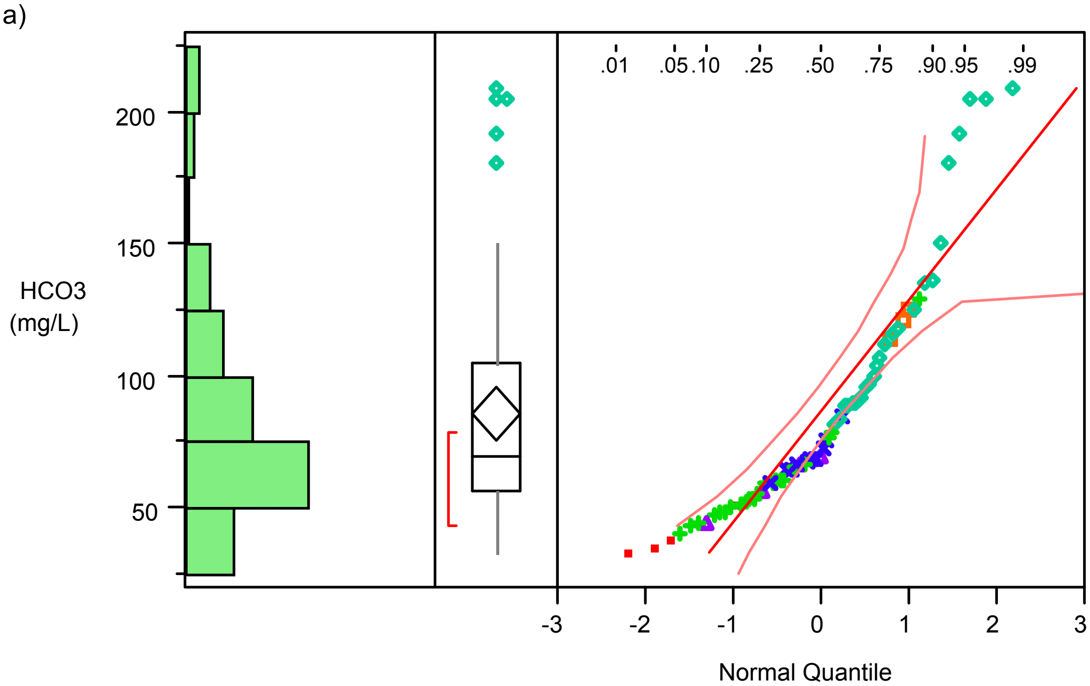


Figure D-1.4. Relationship between TDS and bicarbonate for pre-1997 background groundwater samples. See Figure D-1.1 for symbols representing sample sites.

a)



b)

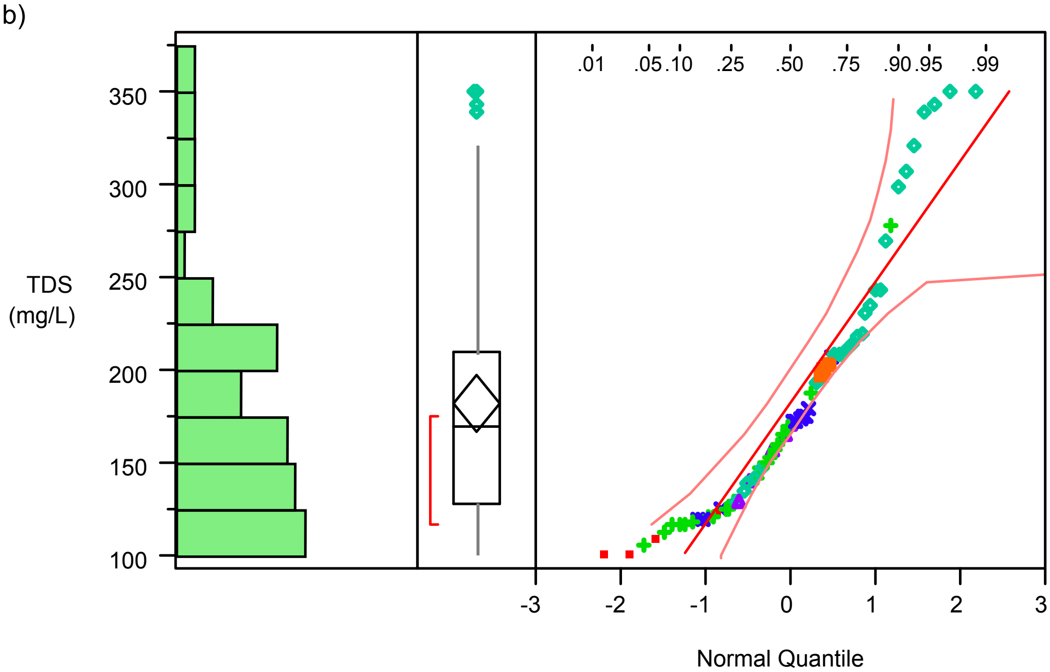
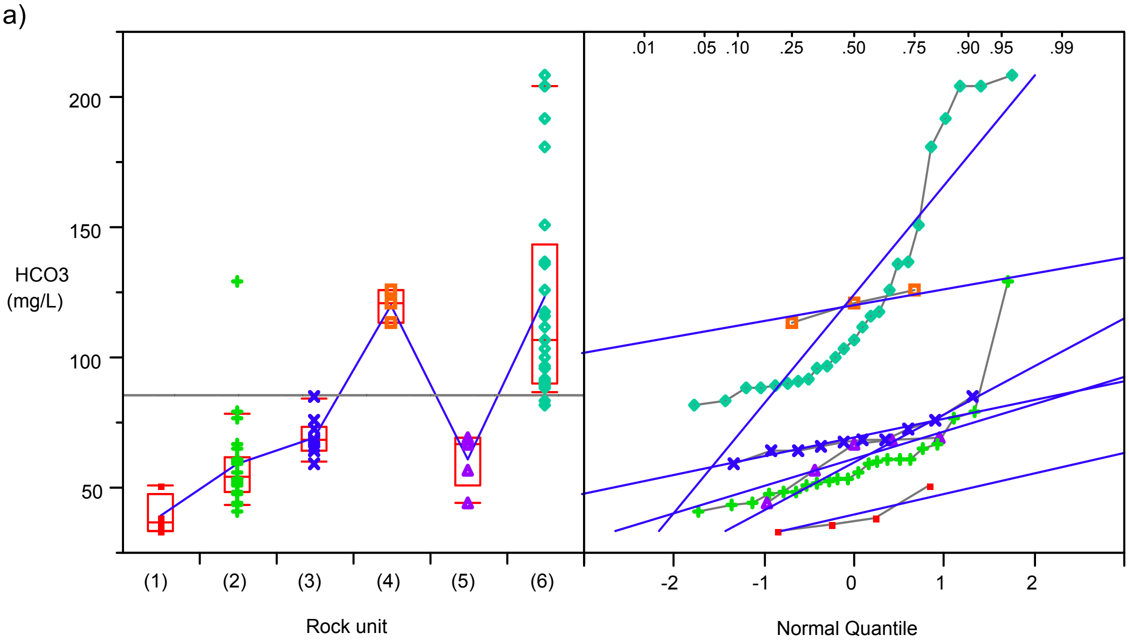


Figure D-1.5. Histogram and normal probability plots for a) bicarbonate (HCO_3) and b) TDS for pre-1997 background groundwater samples (filtered). See text for statistical nomenclature and Figure D-1.1 for symbols representing sample sites.

a)



b)

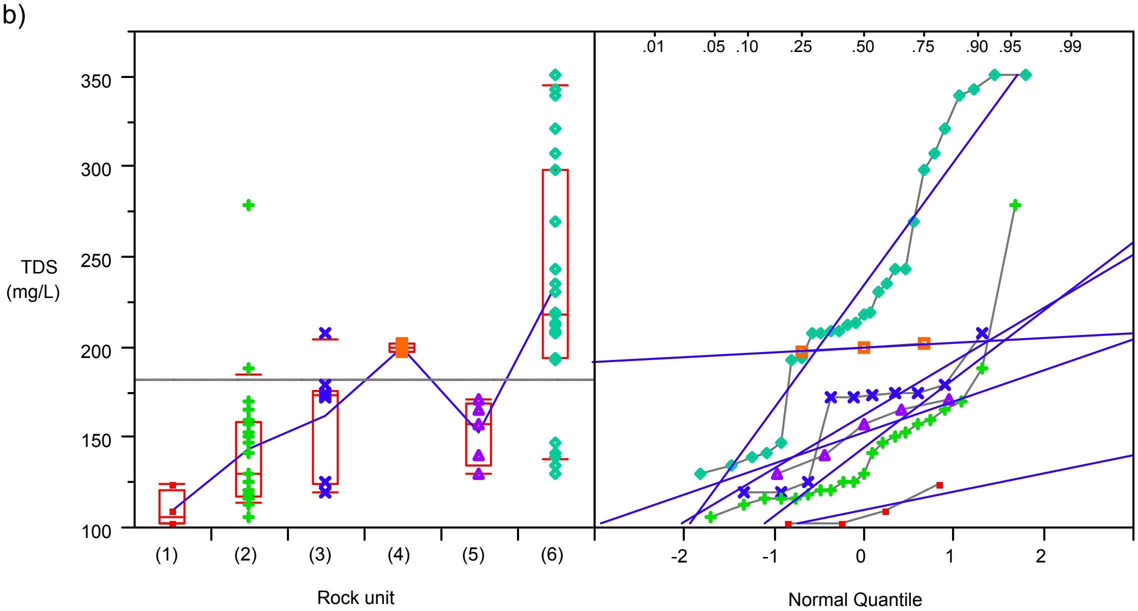


Figure D-1.6. Box plots showing a) bicarbonate and b) TDS by aquifer material for pre-1997 background groundwater samples. See text for statistical nomenclature and Figure D-1.1 for symbols representing sample sites.

Table D-1.1
Summary of pre-1997 Filtered Groundwater Samples Collected by Location

Group	Location	Data Sources							
		Blake et al. (1995, 49931)	EES-6 (1994-1995)	ER Project (1994-1995)	Meeker et al. (1990, 54783)	Dale et al. (1996, 57014); Yanicak (1998, 7583)	Shevenell et al. (1987, 06673)	NURE	Total
(1) Alluvial	LAO-B	0	4	7 (3)	0	0	0	0	**11 (3)**
	Pine Spring	1	1	0	0	5	0	1	**8**
(2) Volcanic rocks	Apache Spring	1	2	0	0	0	1	0	**4**
	LAOI-1.1(a)	0	3	1 (4)	0	0	0	0	**4 (4)**
	Seven Springs	1	1	0	1	0	3	1	**7**
	Upper Cañon de Valle	0	0	0	0	1	0	0	**1**
	Water Canyon Gallery	2	1	0	0	0	1	0	**4**
(3) Regional aquifer	Doe Spring	1	5	0	0	2	0	0	**8**
	Guaje Canyon Well #5	2	0	0	0	0	0	0	**2**
	Otowi #4	2	0	0	0	0	0	0	**2**
	Pajarito Spring	2	4	0	0	2	1	0	**9**
	Sacred Spring	1	1	0	0	0	1	0	**3**
	Spring 1	0	2	0	0	3	0	0	**5**
	Spring 9B	0	1	0	0	1	0	0	**2**
Total		**13**	**25**	**8 (7)**	**1**	**14**	**7**	**2**	**70 (7)**

Note: Values in parentheses represent Laboratory duplicate results.
NURE = National uranium resource evaluation.

Table D-2.1
Summary of pre-1997 Groundwater Data for Background Locations
(Concentration Units in mg/L or ppm)

Analyte	Nondetects Count	Nondetects Min	Nondetects Max	Detects Count	Detects Min	Detects Max	Detection Rate
Anion Sum	0	n/a*	n/a	46	0.832	2.85	100%
Balance	4	0.0026	0.012	34	0.0046	0.2757	89%
Cation Sum	0	n/a	n/a	46	0.865	3.298	100%
DOC	0	n/a	n/a	3	2.4	5.8	100%
TDS	0	n/a	n/a	58	102.4	308.2	100%
B	30	0.003	0.1	38	0.003	0.73	56%
Br	22	0.00001	0.001	23	0.00001	0.00027	51%
Ca	0	0	0	72	1.63	67	100%
Cl	10	0.001	0.005	55	0.00064	0.00985	85%
CO_3	43	0	0.005	4	0.0059	0.008	9%
F	10	0.00001	0.0005	57	0.00003	0.00098	85%
HCO_3	0	0	0	58	0.0335	0.137	100%
K	2	2.2	2.6	68	1.4	21	97%
Li	22	0.004	0.02	40	0.005	0.08	65%
Mg	3	1	3.08	69	0.29	16	96%
Na	0	0	0	70	4.9	58	100%
SiO_2	0	0	0	68	0.014	0.105	100%
SO_4	7	1	50	60	1.05	66	90%
Sr	2	0.1	0.1	66	0.02	3.5	97%
Ag	66	0.0002	0.1	1	0.014	0.014	1%
Al	16	0.1	0.2	42	0.03	2.71	72%
As	37	0.0002	0.1	23	0.0002	0.013	38%
Ba	19	0.01	0.12	50	0.01	0.35	72%
Be	34	0.001	0.1	2	0.009	0.01	6%
Cd	63	0	0.03	6	0.001	0.03	9%
Co	65	0	0.06	4	0.003	0.081	6%
Cr	40	0	0.03	29	0.001	0.066	42%
Cs	35	0	0.01	4	0.002	0.008	10%
Cu	36	0	0.04	33	0.002	0.06	48%
Fe	27	0.01	0.1	44	0.01	4.17	62%
Hg	51	0.0002	0.2	5	0.0004	0.2	9%
I	38	0	0	0	0	0	0%
Mn	54	0.002	0.05	15	0.001	8.8	22%

Table D-2.1 (continued)

Analyte	Nondetects			Detects			Detection
	Count	Min	Max	Count	Min	Max	Rate
Mo	46	0	0.1	14	0.001	0.027	23%
Ni	45	0	0.1	6	0.002	0.16	12%
Pb	32	0	0.15	19	0.002	0.46	37%
Ru	30	0.0001	0.1	17	0.0004	0.01	36%
S_2O_3	22	0	0.1	5	0.02	0.03	19%
Sb	50	2e-05	0.1	3	0.00003	0.012	6%
Se	41	2e-05	0.1	0	0	0	0%
Sn	6	0	0.1	3	0.005	0.02	33%
Ti	13	0	0.01	1	0.014	0.014	7%
Tl	18	0.001	0.1	1	0.001	0.001	5%
U	20	0.001	1.2	8	0.003	0.04	29%
V	33	0.002	0.1	24	0.001	0.25	42%
Zn	27	0.01	0.5	9	0.01	1.4	25%
NH_4	34	0	0.1	22	0.002	0.18	39%
NO_2	20	0.01	0.04	25	0.02	4.32	56%
NO_3	39	0	0.2	23	0.002	2.76	37%
PO_4	15	0.02	0.2	29	0.002	0.13	66%

*n/a = Not applicable.

Table D-2.2
Summary of pre-1977 Samples Where Anions Do Not Balance Cations

Data Source	Rock Unit	Location	Sample ID	Standardized Residual
Blake et al. (1995, 49931)	Santa Fe	Guaje Canyon Well #1	G-1	-2.30
EES-6	Bandelier Tuff	LAOI-1.1(a) @ 322 ft	PP94-113	+3.73
EES-6	Santa Fe	Otowi #1	OT-1	-2.14
Blake et al. (1995, 49931)	Bandelier Tuff	Pine Spring	VA-356	+3.14
Meeker et al. (1990, 54783)	Bandelier Tuff	Seven Springs	VC2B-28	-2.08

Appendix E

Descriptions of Wells and Springs

Figures

Figure E-1.1 Photograph looking toward the northwest wall of White Rock Canyon showing the location of Spring 9B relative to the local geology. 9

Figure E-1.2 Photograph of Spring 9B taken May 5, 2000; the temperature is 15°C, and the flow rate is <0.3 L/min. 10

Figure E-1.3 Closeup photograph of hydromagmatic (maar) deposits about 5 m below and north of Spring 9B. 11

Figure E-2.1 Photograph of Pine Spring taken May 4, 2000; the temperature is 21°C, and the spring is not flowing 12

Figure E-2.2 Photograph of weathered, fractured andesite lava exposed in bluff downstream and east of Pine Spring. 13

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E-1.0 SPRING 9B (LAVA AND HYDROMAGMATIC DEPOSITS IN CERROS DEL RIO VOLCANIC FIELD)

Location: White Rock 7.5 min USGS topo quad (latitude N35˚45'40.46", longitude W106˚14'36.88", elevation 1674 m)

Ownership: U.S. Department of Energy

Geologic Map: Smith et al. 1970, 009752; Dethier 1997, 049843

Description: Spring 9B issues from a small cave eroded into the intersection of a cooling joint and basal scoria at the bottom of a lava flow (Figure E-1.2). The spring occurs on the northwest side of White Rock Canyon, roughly 200 m downstream of the mouth of Chaquehui Canyon. The spring is about 25 m above the Rio Grande. The flow rate is ≤3 L/min. The spring water supports the growth of a wedge of trees and shrubs that fills a shallow ravine descending toward the river (Figure E-1.1).

The geology of White Rock Canyon at this location has been described by Heiken et al. (1996, 054425). From bottom to top, the stratigraphy consists of hydromagmatic (maar) deposits, a sequence of interbedded basalt flows and hydromagmatic deposits, a thick lava flow of benmoreite (a type of chemically evolved basalt), and the Tshirege Member of the Bandelier Tuff (Figures E-1.1 and E-1.3). The mafic deposits beneath the tuff are part of the Cerros del Rio volcanic field.

The lava flow hosting Spring 9B is the lowest exposed lava in this sector of the canyon wall and is a tholeiite dated at 2.78 ±0.04 Ma. The benmoreite is dated at 2.75 ± 0.08 Ma (WoldeGabriel et al. 1996, 054427) and is an important stratigraphic marker. It consists of at least two flow units of highly foliated lava, locally exceeds 100 m in thickness, and extends into Frijoles Canyon. It is the highest lava flow in the sequence at Upper Falls in Frijoles Canyon. The dates indicate that roughly 215 m of Cerros del Rio deposits was emplaced in <100 ka.

The hydromagmatic beds beneath Spring 9B display classic characteristics of such deposits (Fisher and Schminke 1984, 088744; Heiken et al. 1996, 054425; Figure E-1.3). They consist of massive to cross-bedded sandstone, siltstone, and mudstone composed of basalt and basaltic glass with subordinate quartz, microcline, and crystalline rock grains. The basaltic glass has been altered to a pale-brown-to-yellow palagonite clay. Accretionary lapilli up to 0.5 cm in diameter are found in some of the muddy layers. Basalt bomb sags deform the beds, particularly the mudstone layers. Lithic fragments consist of angular basalt and rounded-to-subrounded cobbles and pebbles of quartzite, microcline, granite, gneiss, and intermediate-composition volcanic rocks. Occasional coarse-grained lenses of the latter rocks are scattered throughout the beds. These lithologies originate from beds in the Santa Fe Group underlying Cerros del Rio deposits.

E-2.0 PINE SPRING (PUYE FORMATION AND LAVAS OF THE KERES GROUP)

Location: Guaje Mountain 7.5 min USGS topo quad (latitude N35˚57'21.95", longitude W106˚17'04.52", elevation 2206 m)

Ownership: U.S. Forest Service

Geologic Map: Smith et al. 1970, 009752; Kempter and Kelley 2002, 088777

Description: Pine Spring is located in upper Garcia Canyon on the east side of Forest Service Road 445 at Bench Mark 7216, about 6 km north of Los Alamos. The foundation of a burned log cabin stands in a small clearing on a rise west of the road. The spring is surrounded by a circular crib of cemented stone, which is breached on the south side and from which grows a ponderosa pine tree (Figure E-2.1). The water is generally murky, and the flow rate rarely exceeds 2 L/min. Other springs occur in the gullies 0.2 to 0.5 km west of the road. The springs are used by livestock and game but are not considered potable for humans.

Pine Spring lies on the down-thrown side of a north-south-trending fault juxtaposing alluvium consisting of boulder-bearing sediments of the Puye Formation (to the west) against mafic-to-intermediate composition lavas and overlying Puye deposits (to the east) (Smith et al. 1970, 009752; Kempter and Kelley 2002, 088777). The Tshirege Member of the Bandelier Tuff covers the mesa tops. Poorly exposed fall deposits of the Cerro Toledo Rhyolite occur between the Puye sediments and the Bandelier Tuff in a gully on the bluff east of the spring.

The lowermost lava in the bluff east of the fault is exposed about 150 m downstream of the spring (Figure E-2.2). It is highly fractured and weathered, and appears to be an olivine andesite. It contains rare phenocrysts of plagioclase and microphenocrysts of iddingsite-bearing olivine in a sugary groundmass of plagioclase, orthopyroxene, and clinopyroxene. Smith et al. (1970, 009752) assigned the andesite to the Lobato Basalt.

E-3.0 SEVEN SPRINGS (OTOWI MEMBER, BANDELIER TUFF)

Location: Seven Springs 7.5 min USGS topo quad (latitude N35˚48'14.05", longitude W106˚42'14.0", elevation 2482 m)

Ownership: U.S. Forest Service

Geologic Map: Smith et al. 1970, 009752

Description: Seven Springs discharges from the west side of a narrow valley in Calaveras Canyon, about 400 m upstream of State Highway 126, west of the Valles Caldera on the Jemez Plateau. There are several springs in the immediate vicinity, some discharging from valley alluvium, some from outcrops of densely welded rhyolite tuff. University of New Mexico researchers (C. Dahm, L. Crossey, and M. Campana) have been conducting long-term hydrologic and geochemical measurements nearby. Water from the springs is collected into a 10-in.-diameter pipeline that heads downstream toward the Fish Hatchery on the Rio Cebolla and the small community of Seven Springs.

The Laboratory took samples from the largest spring, which issues from an open crack in a low cliff of welded tuff about 2 m above the valley floor (Figure E-3.1). Flow rates over the past 20 years have varied considerably. On some occasions, spring water literally forms a 1-m-high fountain or "rooster tail" at the crack. Shevenell et al. (1987, 006673) report a flow rate of 60 L/min. During dry periods, the flow is much less. Immediately below the spring, the water flows through a small pool filled with watercress.

The tuff, which is the Otowi Member of the Bandelier Tuff, is quite different in appearance at Seven Springs than on the Pajarito Plateau east of Valles Caldera. At Seven Springs, it is a gray, densely welded, lithic rich, and devitrified ignimbrite, with pale gray fiamme. The tuff has a pronounced horizontal foliation and erodes into hackly plates about 3- to 10-cm wide. Phenocrysts consist of clear quartz, clear sanidine, and tiny dark-green-to-black clinopyroxene. Lithic fragments consist primarily of black andesitic rocks.

The Otowi Member forms a steep slope that rises about 50 m to a cliff formed of the Tshirege Member of the Bandelier Tuff (Smith et al. 1970, 009752). There is no Tsankawi pumice fall deposit at the contact immediately above the springs. Rather, the contact is undulating, suggesting that there was too much relief for fall deposits to remain in place. The basal part of the Tshirege is composed of nonwelded tuff with occasional large pumice fragments (≤20 cm). Lithic fragments consist primarily of black andesitic rocks.

E-4.0 SPRING 1 (LANDSLIDE BLOCK IN CERROS DEL RIO VOLCANIC FIELD, TOTAVI LENTIL, AND SANTA FE GROUP)

Location: White Rock 7.5 min USGS topo quad (latitude N35˚51'32.55", longitude W106˚08'34.08", elevation 1702 m)

Ownership: San Ildefonso Pueblo

Geologic Map: Smith et al. 1970, 009752; Dethier 1997, 049843

Description: Spring 1 issues from a small bench covered with trees and vegetation about 40 m above the northeast side of the Rio Grande and about 1.5 km downstream of Otowi Bridge. Water flows from several discharge points, creating a marshy area with abundant grasses, and the combined total flow is ≤30 L/m (Figure E-4.1).

The bench from which the spring issues occurs within a landslide complex made up primarily of pale-pink-to-tan bedded pebble conglomerate, sandstone, siltstone, and mudstone of the Santa Fe Group (Figure E-4.2). Lithic fragments consist of quartz, microcline, gneiss, schist, granite, quartzite, and rare volcanics. About 20 m above the spring, the beds dip about 5° to the WNW. At the top of the complex and roughly 100 m to the west is another landslide block in which highly tilted columnar basalt overlies coarse boulder conglomerate of mostly quartzite and crystalline rocks. These lithologies belong to the Cerros del Rio volcanic field and Totavi Lentil.

E-5.0 UPPER CAÑON DE VALLE SPRING (TSHIREGE MEMBER, BANDELIER TUFF)

Location: Bland 7.5 min USGS topo quad (latitude N35˚51'32.38", longitude W106˚22'47.09", elevation 2569 m)

Ownership: U.S. Forest Service

Geologic Map: Smith et al. 1970, 009752

Description: Upper Cañon de Valle spring issues about 6 m in front of a collapsed, wood-framed tunnel entrance (Figure E-5.1), about 2.4 km west of State Highway 501. The spring and tunnel are situated on a tiny bench on the north canyon wall, about 20 m above the bottom of upper Cañon de Valle. Measured flow rates of the spring are generally small (≤5 L/m). The horizontal penetration distance of the tunnel into the bedrock is not known.

The tunnel is constructed into pale-tan-to-gray, devitrified, densely welded Tshirege Member of the Bandelier Tuff. At this location, open horizontal and vertical joints break the tuff, forming slabs about 0.2 m thick. Some zones in the tuff contain cream-to-white lithophysal cavities up to 4 cm wide. The tuff is relatively crystal-rich with phenocrysts of clear quartz, chatoyant sanidine, and tiny black clinopyroxene. Lithic fragments are rare. Fiamme appear as white devitrified streaks.

About 50 m downstream of the spring, an outcrop of flow-banded porphyritic dacite (Tschicoma Formation) occurs along the north side of the canyon drainage. Another 200 m downstream is a 50-m-tall spire and an underlying talus pile of similar dacite. Thus, it appears that the Tshirege Member fills preexisting topography near the spring and that the thickness of tuff is not uniform.

E-6.0 WATER CANYON GALLERY (TSHIREGE MEMBER, BANDELIER TUFF)

Location: Frijoles 7.5 min USGS topo quad (latitude N35˚50'39", longitude W106˚22'19", elevation 2439 m)

Ownership: The U.S. Forest Service with water rights granted to the U.S. Department of Energy

Geologic Map: Smith et al. 1970, 009752 ; Goff et al. 2002, 088776

Description: Water Canyon Gallery is an improved spring occurring in the north branch of uppermost Water Canyon, about 1.3 km west of State Highway 501 and just west of the Pajarito Plateau. The spring issues from a horizontal tunnel about 1.3 m high and roughly 35 m long extending into a cliff of densely welded rhyolite tuff. Stone blocks flank the mouth of the tunnel, and the tunnel entrance is built at the top of a talus pile of tuff (Figure E-6.1). Water is collected in a 10-in.-diameter pipe inside the tunnel, and the pipe follows the canyon downhill. About 200 m southeast of the gallery, the pipe is disconnected, and spring water empties into the canyon bottom drainage (Figure E-6.2). The Laboratory's TA-16 used the water previously. Flow rates during the last 20 yr have varied from 50 to at least 200 L/min. (The 1989 annual average was 166 L/min [Stoker et al. 1992, 012017]; the annual average was 65 L/min [Purtymun et al. 1993, 015371]).

The tuff at the gallery consists of dark gray, densely welded, devitrified ignimbrite of the Tshirege Member of the Bandelier Tuff. The tuff at the gallery mouth is massive, with broadly spaced vertical cooling joints and other open cracks. About 10 m above the spring is a discontinuous, up to 1-m-wide zone of open, horizontally flattened cavities resembling large vesicles (Figure E-6.3). These cavities may mark a flow unit boundary within Qbt4. No surge beds were found in the tuff immediately near the gallery. Above the zone of cavities, the tuff displays horizontal jointing.

Phenocrysts in the tuff consist of clear quartz and sanidine, the latter displaying chatoyancy. Tiny clinopyroxene phenocrysts are oxidized to orange iron (oxy)hydroxides. The tuff contains conspicuous fiamme but extremely rare lithic fragments.

E-7.0 LAOI-1.1(a) WELL (GUAJE PUMICE BED, OTOWI MEMBER, BANDELIER TUFF)

Location: Guaje Mountain 7.5 min USGS topo quad (latitude N35° 52' 31.6", longitude W106°17' 13.5", elevation 2084 m)

Ownership: U.S. Department of Energy

Geologic Map: Smith et al. 1970, 009752; Kempter and Kelley 2002, 088777

Total Drilled Depth: 98.5 m

Description: Well LAOI-1.1(a) is an observation well that was drilled in upper Los Alamos Canyon in 1994. It contains a 3-in.-diameter, schedule-80 PVC casing and is screened to accept water from a perched zone in the Guaje Pumice Bed at the base of the Otowi Member of the Bandelier Tuff (Figure E-7.1). The Guaje Pumice Bed is about 6.7 m thick at this location. The well actually penetrated the top of the Puye Formation at 96-m depth, but the hole in the Puye section collapsed. Three wellbore volumes, or about 55 gal. of water, are withdrawn before each sampling round, using nitrogen gas and a bladder pump. Most water originates from an approximate depth of 94.5 m.

E-8.0 LAO-B WELL (VALLEY-FILL ALLUVIUM OF TSCHICOMA FORMATION AND TSHIREGE MEMBER, BANDELIER TUFF)

Location: Guaje Mountain 7.5 min USGS topo quad (latitude N35°52’ 43.8", longitude W106°20' 7.1", elevation 2233 m)

Ownership: U.S. Department of Energy

Geologic Map: Smith et al. 1970, 009752; Kempter and Kelley 2002, 088777

Total Drilled Depth: 5.61 m

Description: Well LAO-B is an observation well drilled into valley-fill alluvium in upper Los Alamos Canyon. The casing diameter is about 4 in. (Figure E-8.1). Rocks penetrated consist of boulders, cobbles, and pebbles of porphyritic dacitic rocks of the Tschicoma Formation and nonwelded-to-welded rhyolitic tuff of the Tshirege Member of the Bandelier Tuff in a volcanic sand-to-silt matrix. Three wellbore volumes, or about 40 gal. of water, are withdrawn before each sampling round, using an air compressor and bladder pump. The groundwater originates from the bottom of the well.

E-9.0 ANCHO SPRING (TOTAVI LENTIL)

Location: White Rock 7.5 min USGS topo quad (latitude N35°46’41”, longitude W106°14’26”, elevation 1737 m)

Ownership: U.S. Department of Energy

Geologic Map: Smith et al. 1970, 009752; Dethier 1997, 049843)

Description: Ancho Spring is located approximately 400 m above the mouth of Ancho Canyon, within that canyon. It occurs within gravels below basalt in the canyon channel at elevation 1737 m, and it discharges at approximately 8 L/m from the Totavi Lentil. No photograph was available for this spring.

E-10.0 SPRING 5B (TESUQUE FORMATION, COARSE GRAINED)

Location: White Rock 7.5 min USGS topo quad (latitude N35°46’35”, longitude W106°12’52”, elevation 1646 m)

Ownership: U.S. Department of Energy

Geologic Map: Smith et al. 1970, 009752; Dethier 1997, 049843

Description: Spring 5B is located approximately 800 m north of the mouth of Ancho Canyon, on the north side of White Rock Canyon between Ancho and Water Canyons. The spring occurs on a steep slope at the edge of the river, at elevation 1646 m, and it discharges at approximately 15 L/m from the Tesuque Formation. No photograph was available for this spring.

E-11.0 SPRING 6 (TESUQUE FORMATION, COARSE GRAINED)

Location: White Rock 7.5 min USGS topo quad (latitude N35°46’02”, longitude W106°13’36”, elevation 1640 m)

Ownership: U.S. Department of Energy

Geologic Map: Smith et al. 1970, 009752; Dethier 1997, 049843

Description: Spring 6 is located approximately 200 m south of the mouth of Ancho Canyon, on the north side of White Rock Canyon, above the river. The spring occurs in fractures in the basalt at the edge of the river, at elevation 1640 m, and discharges at approximately 20 L/m from the Tesuque Formation. No photograph was available for Spring 6.

E-12.0 SPRING 6A (TESUQUE FORMATION, COARSE GRAINED)

Location: White Rock 7.5 min USGS topo quad (latitude N35°46'01", longitude W106°13'41", elevation 1638 m)

Ownership: U.S. Department of Energy

Geologic Map: Smith et al. 1970, 009752; Dethier 1997, 049843

Description: Spring 6A (Figure E-12.1) is located between Ancho and Chaquehui Canyons, on the north side of White Rock Canyon, above the river. It is located approximately 1 km WSW of Ancho Canyon. The spring occurs in fractures in the basalt at river level, at elevation 1638 m, and it discharges at approximately 18 L/m from the Tesuque Formation.

E-13.0 SPRING 8A (LAVA AND HYDROMAGMATIC DEPOSITS IN CERROS DEL RIO VOLCANIC FIELD-QLS LANDSLIDE DEPOSITS)

Location: White Rock 7.5 min USGS topo quad (latitude N35°45'59", longitude W106°13'55", elevation 1682 m)

Ownership: U.S. Department of Energy

Geologic Map: Smith et al. 1970, 009752; Dethier 1997, 049843

Description: Spring 8A (Figure E-13.1) is located northeast of Spring 9. The spring occurs on the northwest side of White Rock Canyon as a seep area on the canyon wall above the river, approximately 800 m northeast of the mouth of Chaquehui Canyon, at elevation 1682 m, and it discharges at approximately 4 L/m.

E-14.0 SPRING 9 (TESUQUE FORMATION)

Location: White Rock 7.5 min USGS topo quad (latitude N35°45'53", longitude W106°14'21", elevation 1674 m)

Ownership: U.S. Department of Energy

Geologic Map: Smith et al. 1970, 009752; Dethier 1997, 049843

Description: Spring 9 (Figure E-14.1) is located northeast of Spring 9A. The spring occurs on the northwest side of White Rock Canyon as a large seep area above the river, approximately 400 m northeast of the mouth of Chaquehui Canyon, at elevation 1674 m, and it discharges at approximately 8 L/m.

E-15.0 SPRING 9A (TESUQUE FORMATION)

Location: White Rock 7.5 min USGS topo quad (latitude N35°45’51”, longitude W106°14’27”, elevation 1674 m)

Ownership: U.S. Department of Energy

Geologic Map: Smith et al. 1970, 009752; Dethier 1997, 049843

Description: Spring 9A (Figure E-15.1) is located southwest of Spring 9. The spring occurs on the northwest side of White Rock Canyon as a seep area on the canyon wall above the river, approximately 160 m northeast of the mouth of Chaquehui Canyon, at elevation 1674 m. The spring discharges at approximately 12 L/m.

E-16.0 BARBARA SPRING (TSCHICOMA FORMATION CONTACT WITH BANDELIER TUFF)

Location: Frijoles 7.5 min USGS topo quad (latitude N35°49’36”, longitude W106°21’21”, Elevation 2357m)

Ownership: U.S. Department of Interior

Geologic Map: Smith et al. 1970, 009752

Description: Barbara Spring is a newly-identified spring located in Frijoles Canyon about 3.4 miles west-southwest of the Laboratory boundary. It discharges from a location near the contact of the Bandelier Tuff and Tschicoma Formation (Smith et al. 1970, 009752). It has three southwest-sloping discharge points at an elevation of 2357 m, and it discharges from a perched-intermediate groundwater zone. No photograph of this spring was available.

E-17.0 CAMPSITE SPRING (TSCHICOMA FORMATION)

Location: Valle Toledo 7.5 min USGS topo quad (latitude N35°56’17”, longitude W106°22’55”, elevation 2622 m)

Ownership: U.S. Forest Service

Geologic Map: Smith et al. 1970, 009752

Description: Campsite Spring is a newly-identified spring located in Guaje Canyon about 5.3 miles northwest of the Laboratory boundary. It discharges from the Tschicoma Formation (perched-intermediate groundwater zone) (Smith et al. 1970, 009752). It has a southward-sloping discharge with three discharge points about 20 ft above a channel at an elevation of 2622 m. No photograph of this spring was available.

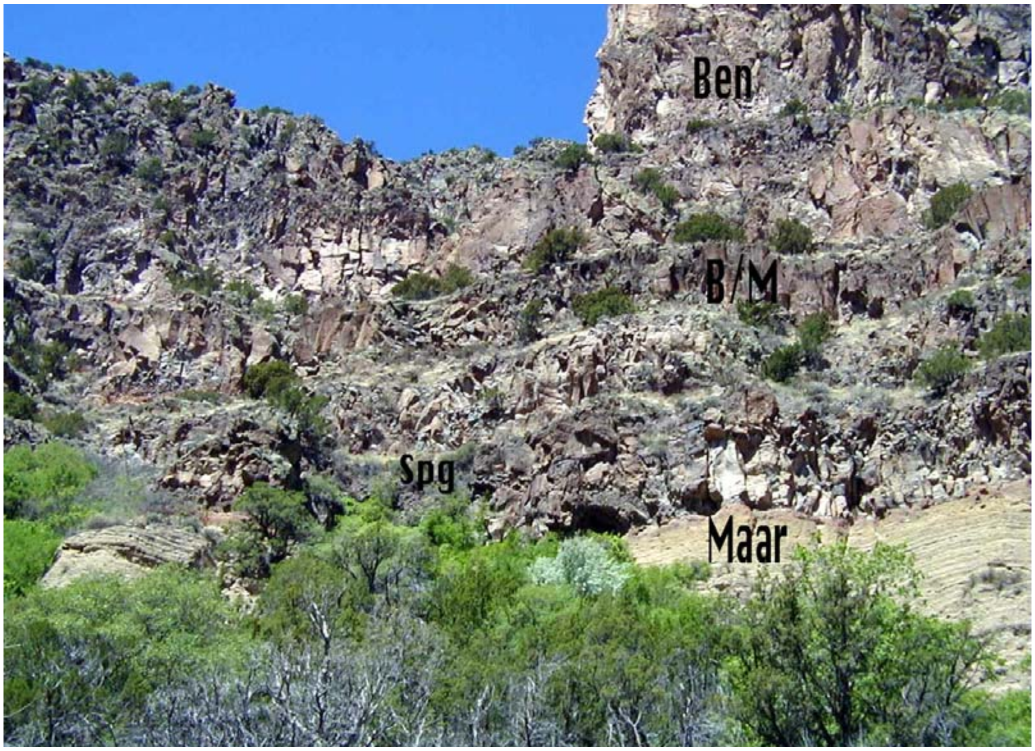


Figure E-1.1 **Photograph looking toward the northwest wall of White Rock Canyon showing the location of Spring 9B relative to the local geology. The spring issues from the approximate contact of basaltic hydromagmatic (maar) deposits and an overlying basalt flow. At least two more basalt lavas are interbedded with thin intervals of maar deposits (symbol B/M, located on uppermost basalt). The lava sequence is capped by a thick benmoreite flow (Ben).**

Figure E-1.2 Photograph of Spring 9B taken May 5, 2000; the temperature is 15°C, and the flow rate is <0.3 L/min. A hammer straddles the contact between the basal lava breccia and the underlying hydromagmatic deposits.

Figure E-1.3 Closeup photograph of hydromagmatic (maar) deposits about 5 m below and north of Spring 9B. Note large bomb sag (to the left of the hammer) in cross-bedded sandstone to mudstone, caused by the impact of the basalt bomb.

Figure E-2.1 Photograph of Pine Spring taken May 4, 2000; the temperature is 21°C, and the spring is not flowing

Figure E-2.2 Photograph of weathered, fractured andesite lava exposed in bluff downstream and east of Pine Spring.

Figure E-3.1 Photograph of the largest discharge point at Seven Springs taken April 27, 2000; the temperature is 15°C, and the flow rate is 6 L/min (±10%). The water issues from a vertical crack in a horizontally foliated and welded Otowi Member of the Bandelier Tuff.

Figure E-4.1 Photograph of Spring 1 taken May 4, 2000; the temperature is 10°C, and the flow rate is approximately 20 L/min.

Figure E-4.2 Photograph of bedded sandstone and siltstone in the Santa Fe Group about 20 m above Spring 1. The sediments and overlying rubble of basalt are part of a landslide block from which the spring issues.

Figure E-5.1 Photograph of Upper Cañon de Valle Spring taken on April 29, 2000; the temperature is 15°C, and the flow rate is 0.8 L/min.

Figure E-6.1 Photograph of the entrance to Water Canyon Gallery taken on April 27, 2000.

Figure E-6.2 Photograph of disconnected discharge pipe from Water Canyon Gallery taken April 27, 2000; the temperature is 14°C, and the flow rate is 120 L/min (±25%).

Figure E-6.3 Photograph of vesicular cavities in a flow unit of densely welded Tshirege Member, Bandelier Tuff, about 10 m above the entrance to Water Canyon Gallery.

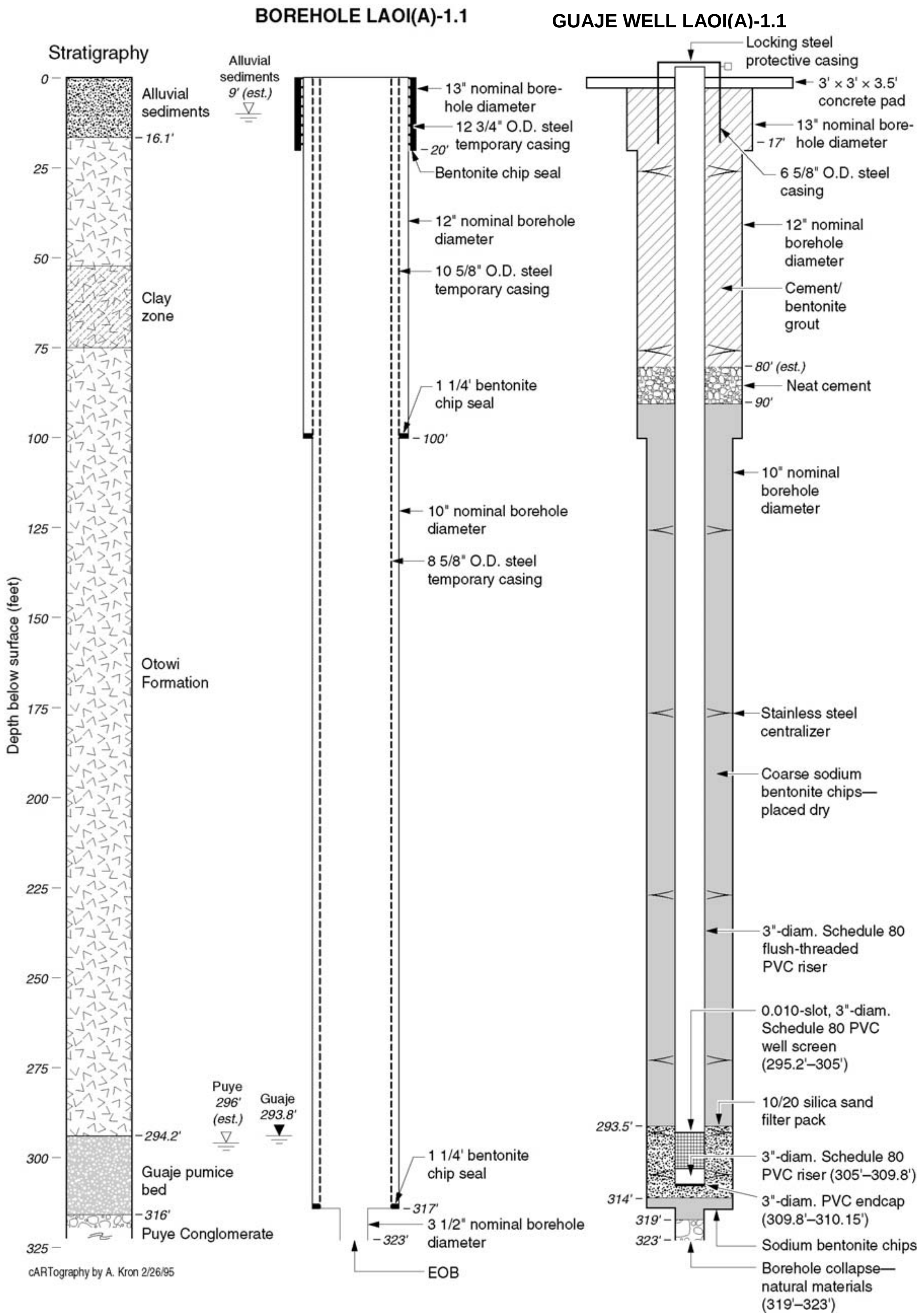


Figure E-7.1 Stratigraphy and completion diagram of LAOI-1.1(a) well

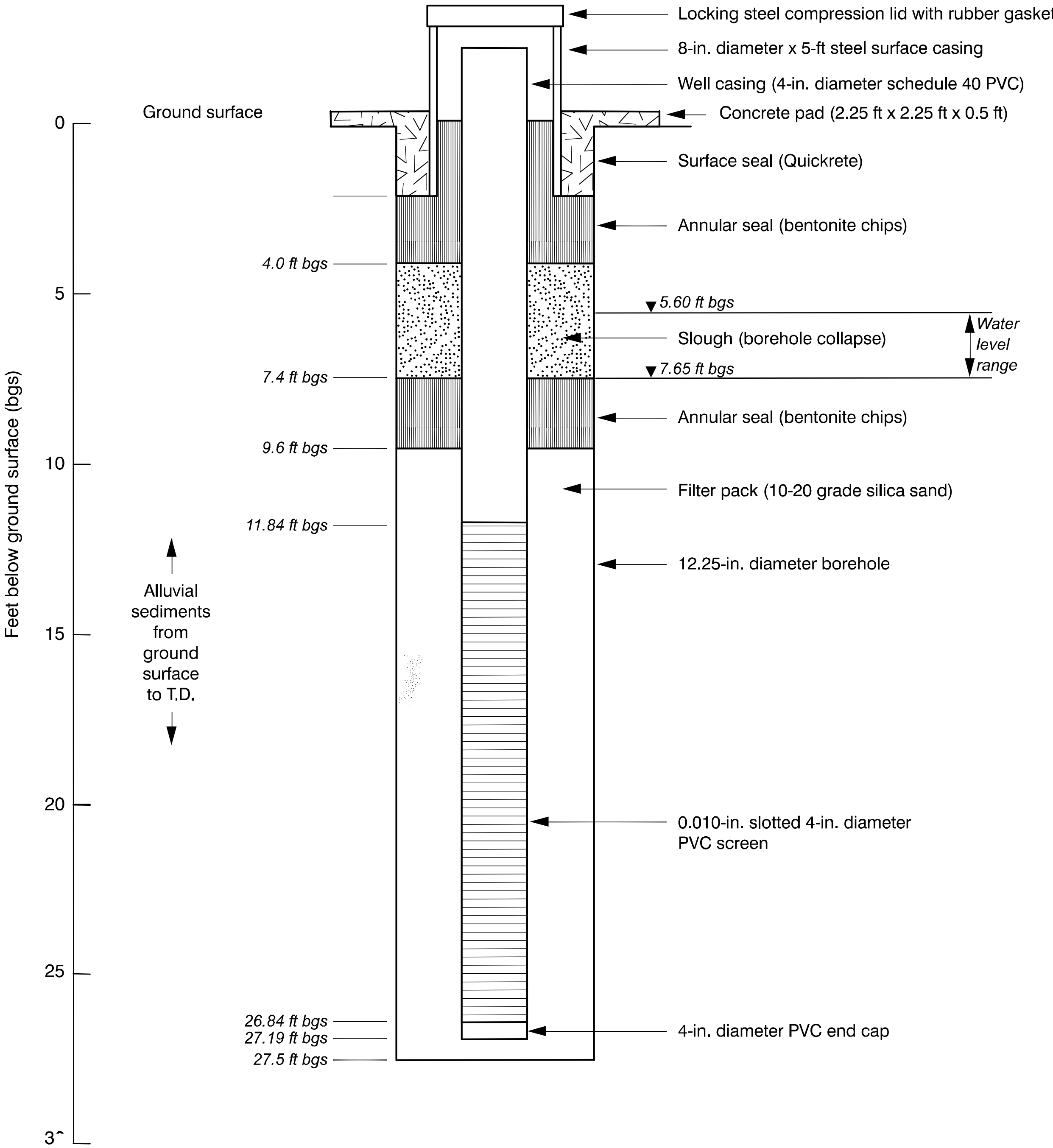


Figure E-8.1 Completion diagram of LAO-B well

Figure E-12.1 Photograph of sampling at Spring 6A, taken September 14, 2004.

Figure E-13.1 Photograph of discharge area of Spring 8A, taken April 14, 2004.

Figure E-14.1 Photograph of Spring 9 sampling location, taken September 28, 2005.

Figure E-15.1 Photograph of Spring 9A sampling location, taken September 28, 2005.

The following section shows figures that illustrate the stratigraphy for wells PM-2, PM-4, PM-5, G-1A, G-2A, G-3A, G-4A, G-5A, R-1, R-13, and R-21. Brief well descriptions are included in Section 3.3.2, and elevation and location data are provided in Table 3.1-2 of this report. The reader also is referred to Collins et al. (2005, 088767) for further information in the R series wells.

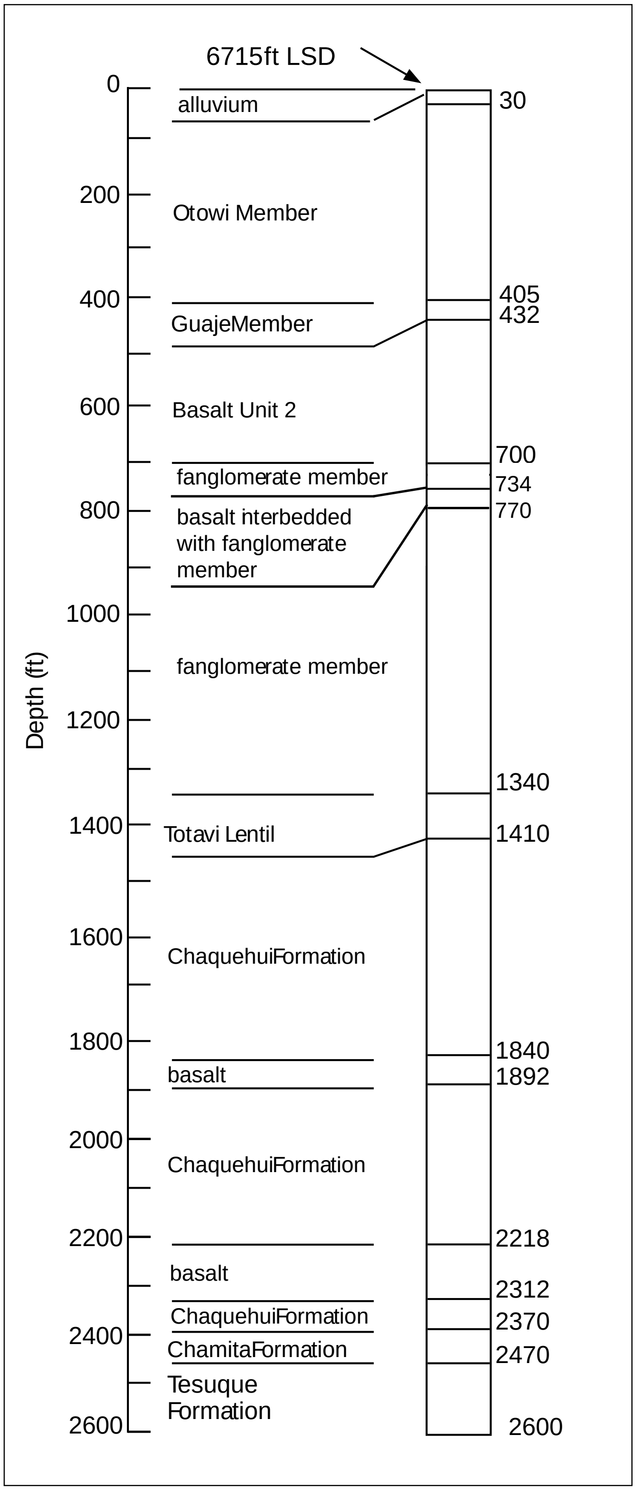


Figure E-16.1 Stratigraphy at well PM-2

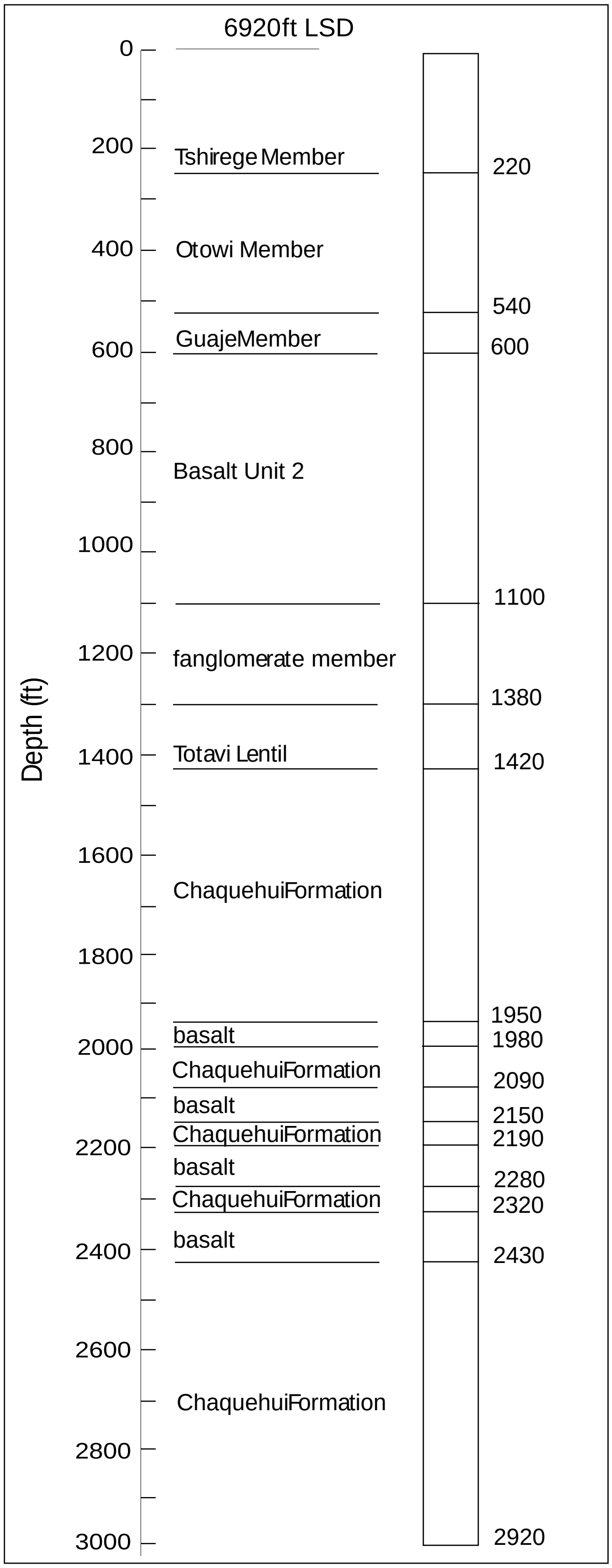


Figure E-16.2 Stratigraphy at well PM-4

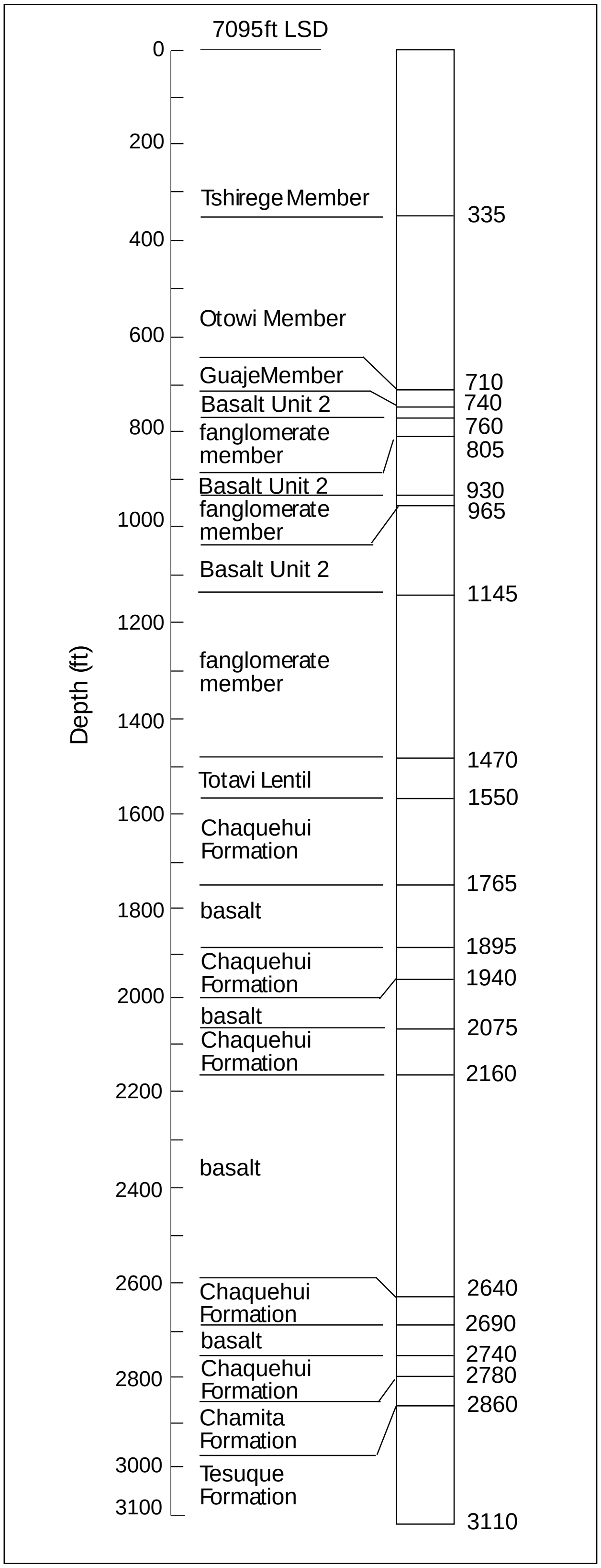


Figure E-16.3 Stratigraphy at well PM-5

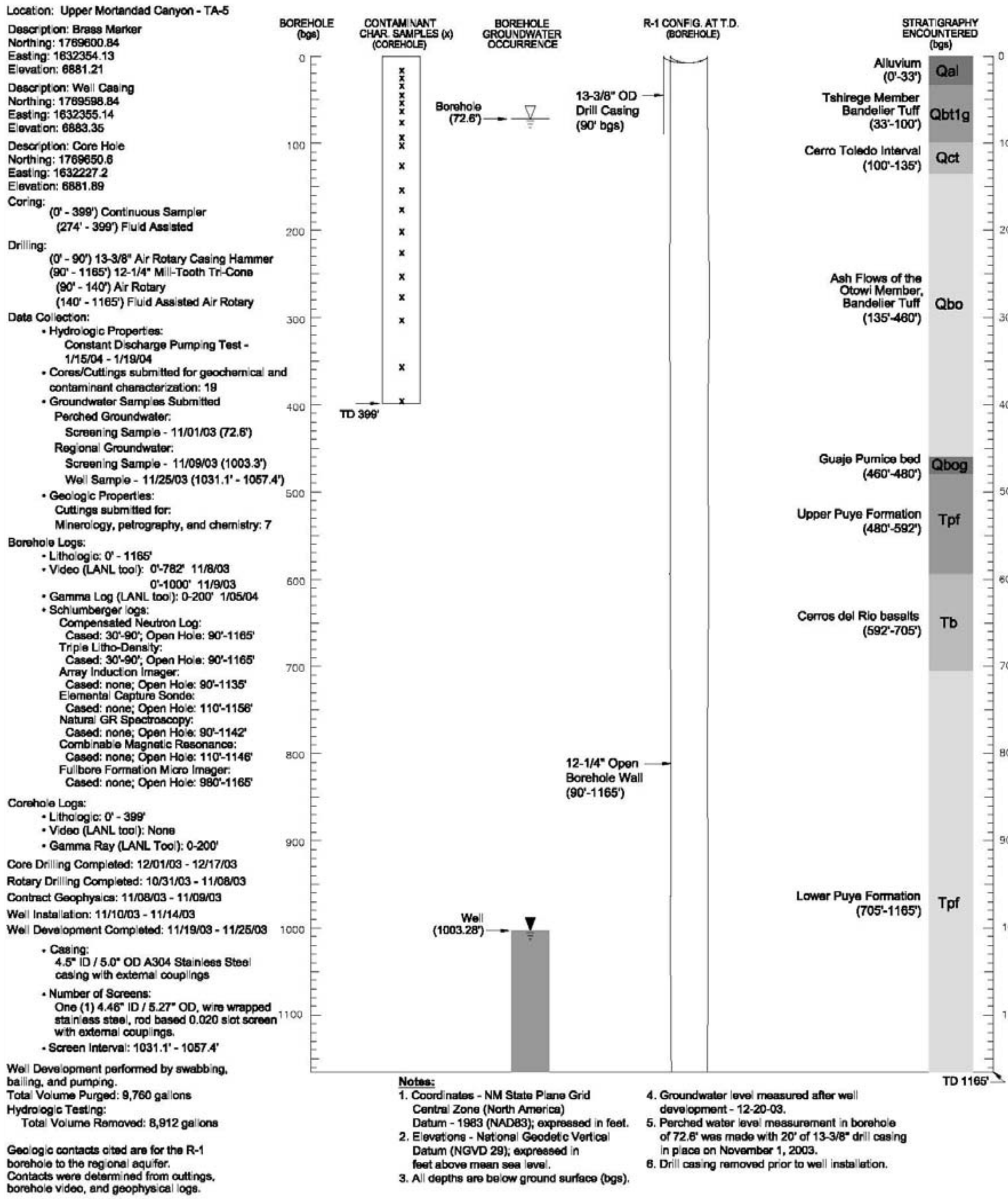


Figure E-16.4 Completion information and stratigraphy for well R-1

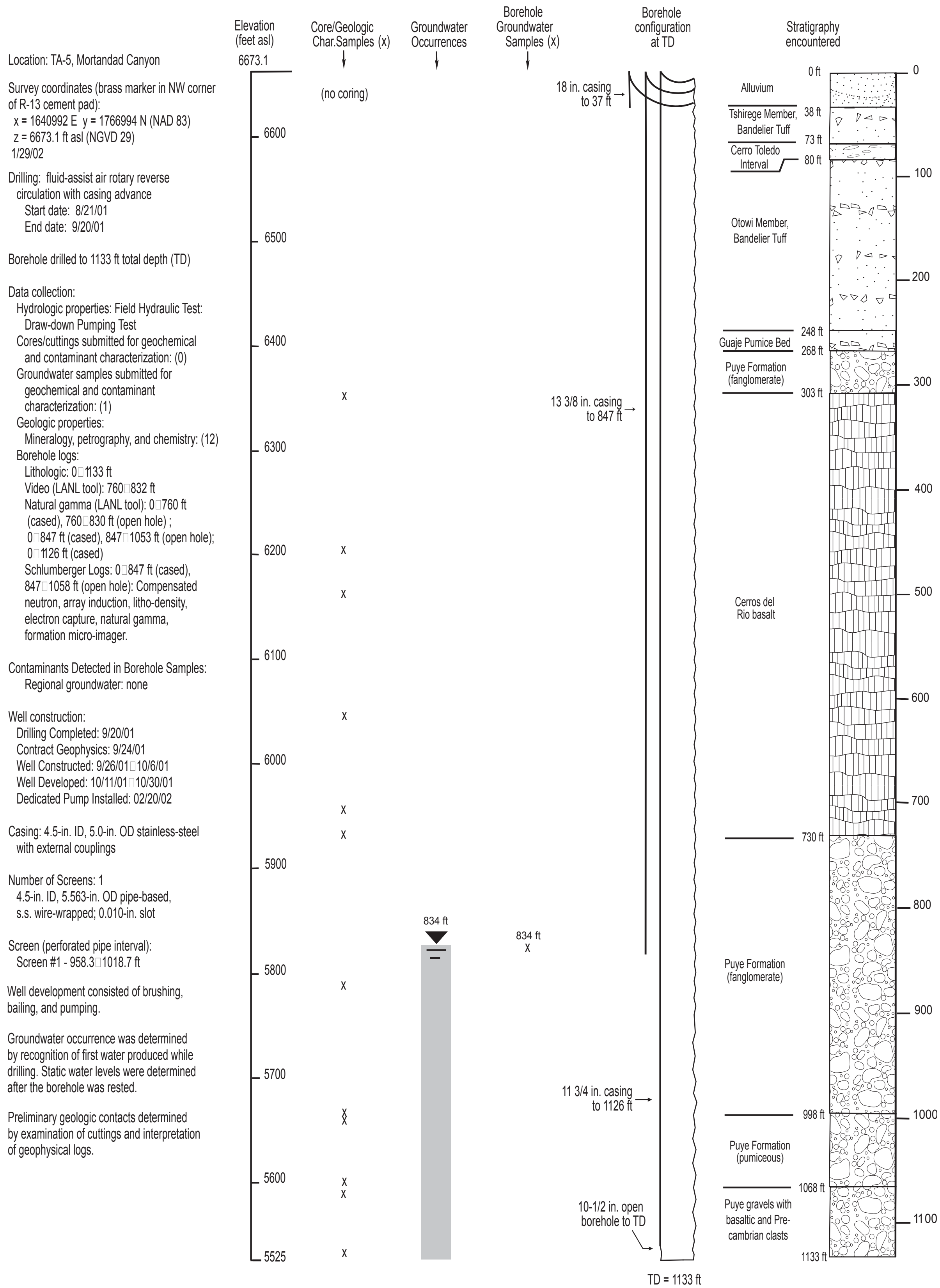
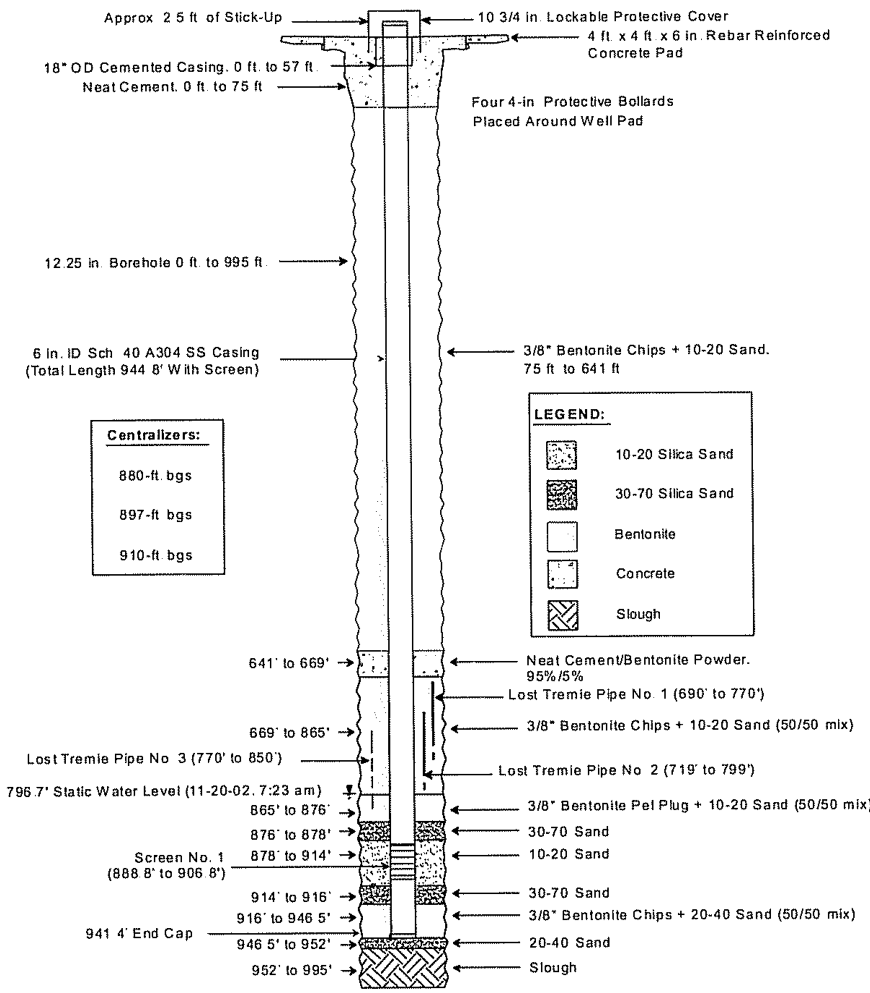


Figure E-16.5 Completion information and stratigraphy for well R-13



NOTES:

Well T.D. 941 4 ft
Boring T.D. 995 ft

1. The screen interval lists the footage of pipe perforations and not the top and bottom of screen joints
2. Well screen is 6 in. inside diameter (ID), 6 5/8 in. outside diameter (OD). 0 020-inch (in.) wire wrapped A304 stainless steel
3. Well blank is 6 in ID, 6 5/8 in OD. A304 stainless steel with stainless steel couplings.
4. Stainless steel sump is located at 906 8-feet (ft.) below ground surface (bgs) to 941 4-ft bgs
5. All depths are below ground surface.
6. Sample pump consists of 4-in. OD, Grundfos Model 5S20-39DS, 2-Horsepower, single phase, 230-Volt.
7. Pump intake located at 864 ft below top of casing
8. Pump discharge connection consists of 1-in stainless steel female pipe thread fitting
9. Drawing is not to scale.
10. Lost tremie pipe lengths and locations are interpreted based on video log and field observations Lengths are dashed where inferred

Figure E-16.6 Completion diagram of well R-21

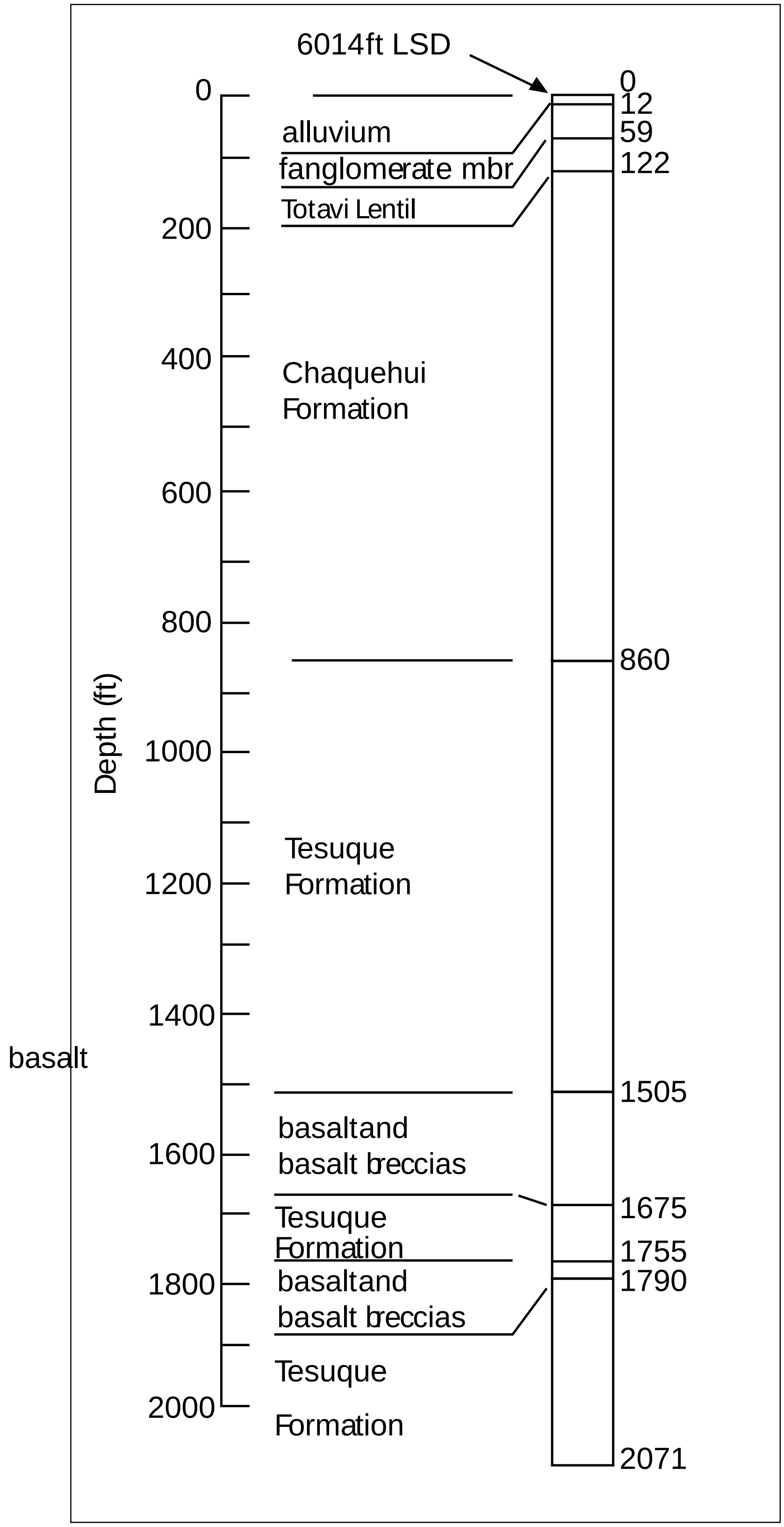


Figure E-16.7 Stratigraphy at well G-1A

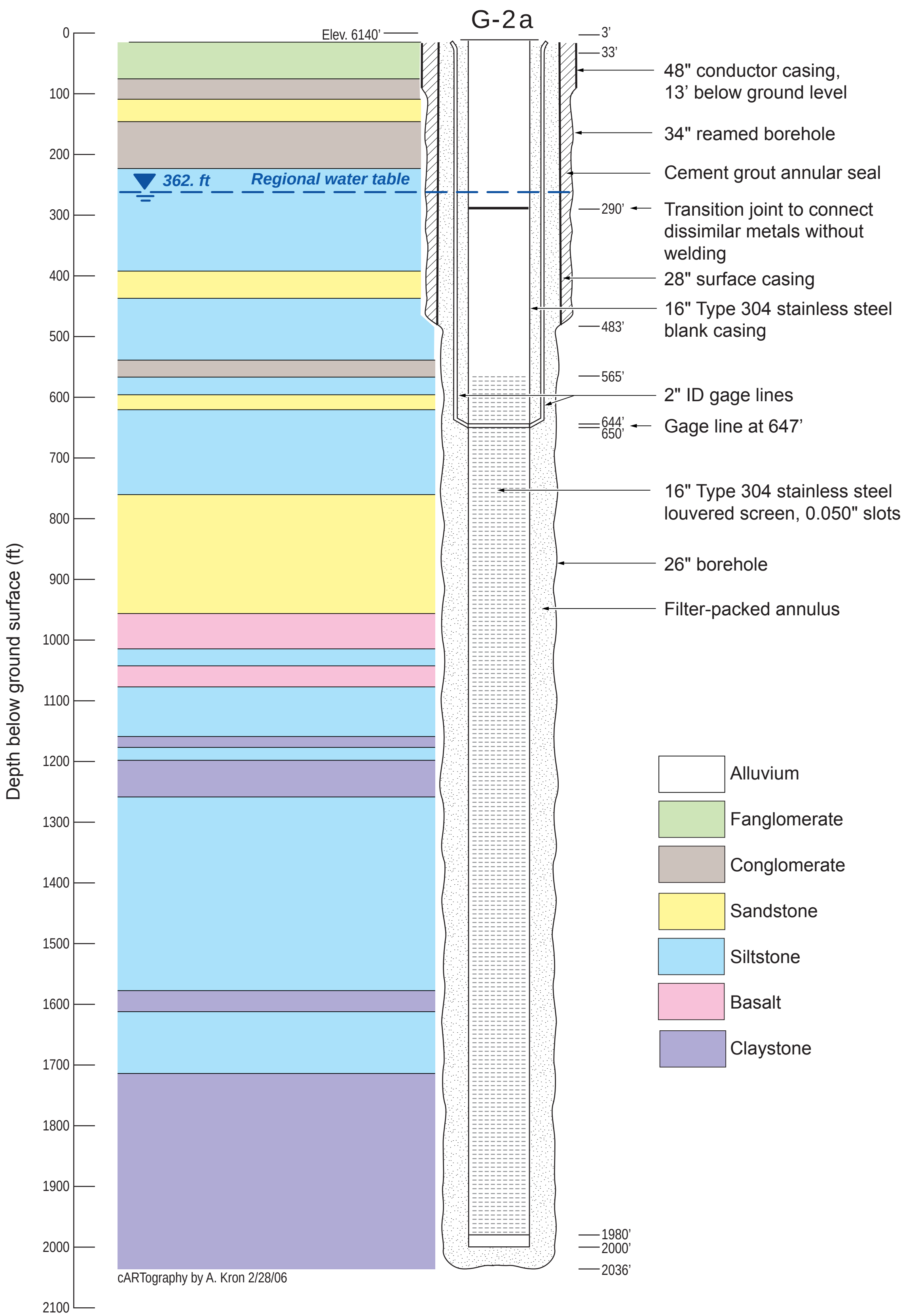


Figure E-16.8 Completion diagram and stratigraphy of well G-2A

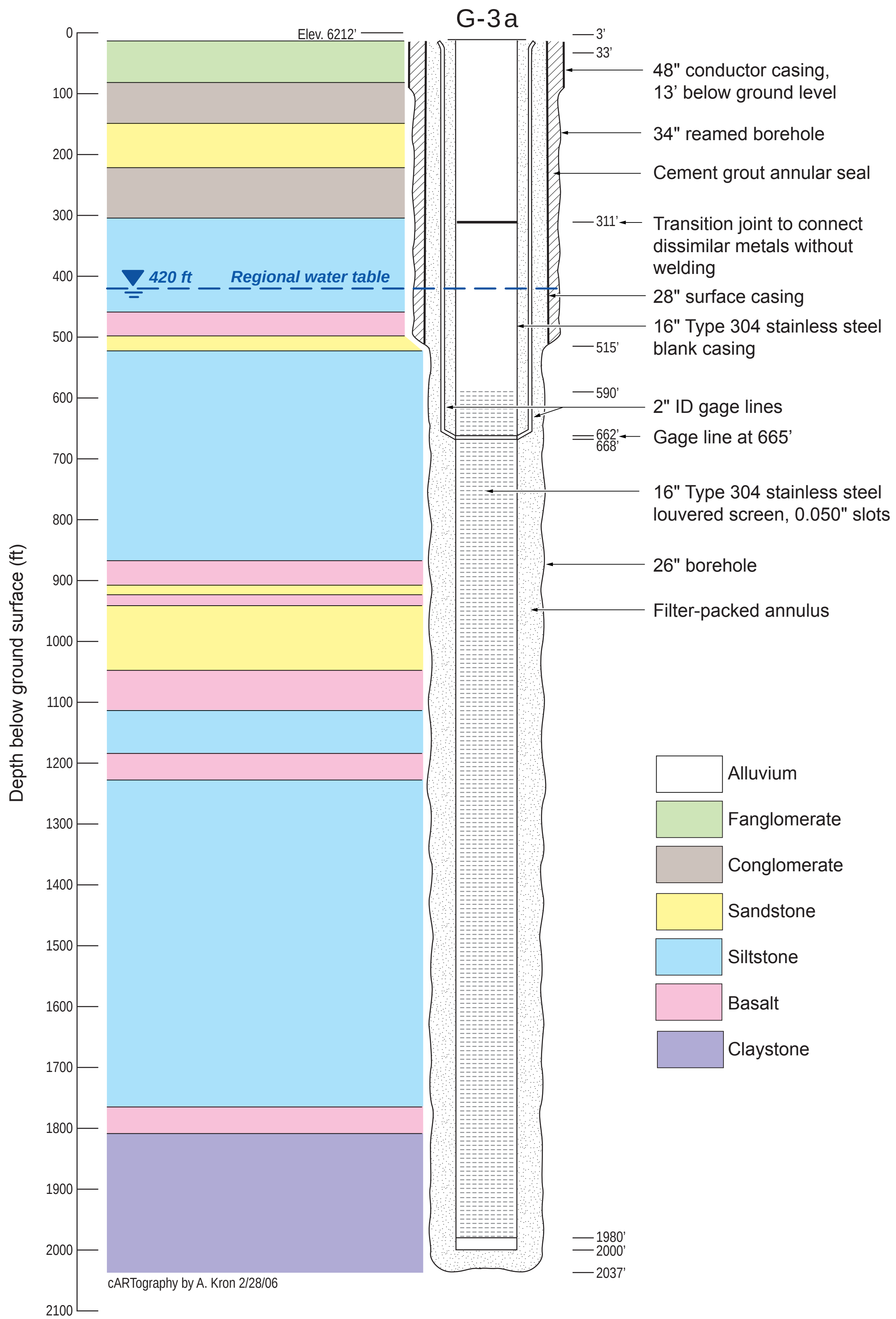


Figure E-16.9 Completion diagram and stratigraphy of well G-3A

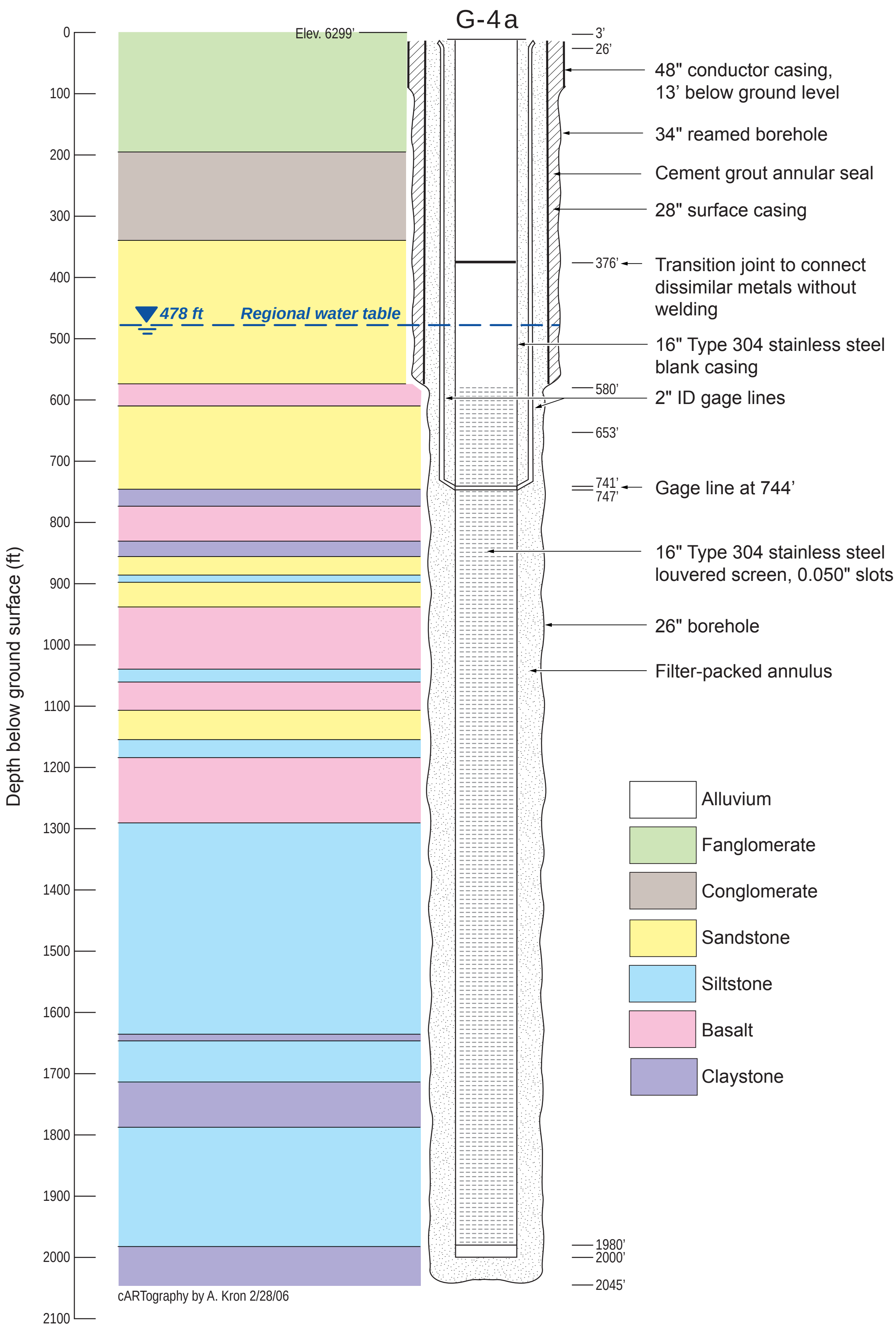


Figure E-16.10 Completion diagram and stratigraphy of well G-4A

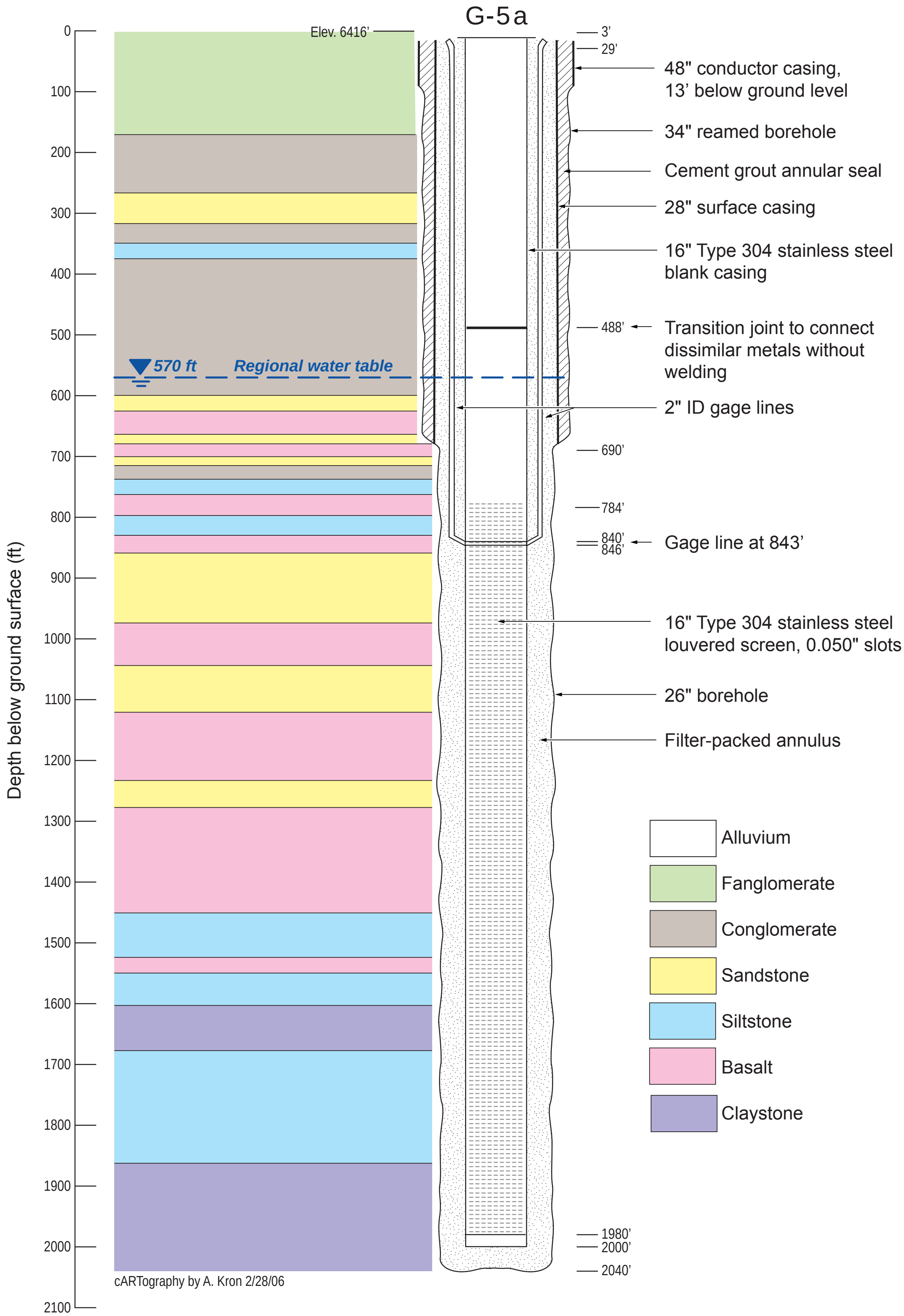


Figure E-16.11 Completion diagram and stratigraphy of well G-5A

Appendix F

Data Collection, Analysis, and Interlaboratory Comparison Data in Rev. 0 and Rev. 1

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F-1.0 SCOPE OF ACTIVITIES AND METHODS

The following text is a direct quote of revision 1 of this report, Section 3.0, with the exception that sections, figures, and tables have been renumbered to fit the appendix format and Section 4.4 (original), "Chemical Effects of the Cerro Grande fire," was retained and updated in the main body of this report (Section 4.5).

F-1.1 Data-Quality Objectives

Before conducting this investigation, the Laboratory used EPA data-quality objective (DQO) process (EPA 1987, 57589; 1992, 54947; and 1994, 48639), a strategic planning approach for a data collection activity. By using the DQO process, the Laboratory has ensured that the type, quantity, and quality of background hydrogeochemical data and information used in the decision-making process will be appropriate to meet the objective of determining natural background concentrations of inorganic and organic solutes and radionuclides in groundwater.

The DQO process used in this investigation consisted of seven steps, which are described below. The output from each step influences the choices that will be made in the next steps of the DQO process. This process is iterative; therefore, the outputs from one step may lead to reconsideration of previous steps. The DQO process consists of the following: (1) problem definition, (2) data evaluation or decision criteria, (3) data input for the different aquifer types, (4) spatial and temporal boundaries for sample stations, (5) decision rules, (6) uncertainty (statistical testing), and (7) design optimization.

F-1.1.1 Problem Definition

Adequate data to represent the distribution of solutes and total (suspended and dissolved fractions) concentrations in groundwater that represent background (or pre-Laboratory-induced) conditions are generally lacking before 1997. The ability to distinguish between natural and Laboratory-impacted conditions is essential for assessing data collected during site investigations, establishing cleanup levels, and understanding hydrologic and geochemical processes.

Although the Laboratory, U.S. Geological Survey (USGS), DOE, University of New Mexico, and consulting companies have published hydrogeochemical data collected before 1997, there are problems with using these data to represent background groundwater conditions because of issues with consistency. For example, many of the groundwater samples collected by the Laboratory were not filtered before analyses. Subsequently, analytical accuracy and precision vary from sample to sample, depending on the amount of suspended solids.

In 1997, groundwater-quality databases were reviewed in terms of sample collection and preservation, chemistry, hydrogeology, time of sample collection, and completeness and accuracy of reported analytical results. From this evaluation, both analytical and data gaps were identified. Different sample preparation and analytical techniques had been used. Thus, groundwater-quality data collected under different Laboratory programs generally were not directly comparable. Background subsurface databases provided for the former Environmental Restoration (ER) Project before 1997 were generally internally consistent in terms of sample collection, filtering, field preservation, selection of analytes, analytical methods, and precision and accuracy.

Analyses of the pre-1997 groundwater background data considered issues relating to data quality and exploratory data analysis of various sample locations. Only filtered data were evaluated because nonfiltered samples are known to have a positive bias for inorganic chemicals typically found in suspended sediments. High-quality data for major ions are evidenced in the pre-1997 data by the close agreement in the calculated charge balance of anions and cations. In addition, variability of the measurement process through laboratory duplicate samples was measured at ±20%, excluding one measurement. The analysis of the pre-1997 samples showed variability between aquifer types (alluvial, perched intermediate, and the regional aquifer) with concentrations of bicarbonate and TDS being greatest in groundwater samples collected from the regional aquifer (Santa Fe Group and Puye Formation). However, the nonuniform sample intervals and timing of sampling events between locations hinder the use of the pre-1997 data as possible background sample locations. Appendix D provides additional information on geochemical and statistical analyses using the pre-1997 hydrogeochemical data.

Numerous nonfiltered groundwater samples have been collected and analyzed for inorganic chemicals and radionuclides. Analytical results for these samples are not useful because the nonfiltered samples contained suspended particles. When the turbid water samples are acidified with nitric acid at a pH of 2, suspended particles consisting of clay minerals, ferric (oxy)hydroxide, manganese oxide, calcium carbonate, and feldspar partially or completely dissolve. This dissolution results in elevated concentrations of major ions (calcium, magnesium, potassium, and sodium) and trace elements (aluminum, iron, barium, beryllium, manganese, and uranium), which produce false positives in analytical results.

Because of the limited number of background wells completed in the alluvium, Bandelier Tuff, Cerros del Rio basalt, and Puye Formation, background hydrogeochemical data available up to 1997 do not include the full range of natural concentrations for all analytes of environmental concern. Before 1994, very limited background hydrogeochemical data were available for alluvial (well LAO-B) and perched intermediate aquifers (well LAOI-1.1(a) and well R-7 [screen #1]). Limited hydrogeochemical data (filtered samples) were collected from selected springs that discharge from the Cerros del Rio basalt (Spring 9B) and hydro (phreatic)-magmatic deposits (Doe Spring) within White Rock Canyon.

For the above reasons, the decision was made in 1997 to establish new background hydrogeochemical data sets using wells and springs that are representative of various groundwater bodies along flow paths beneath the Pajarito Plateau.

F-1.1.2 Data Evaluation Criteria

If analytical results for both filtered and nonfiltered groundwater samples, with turbidity values of less than five nephalometric turbidity units (NTUs), are considered to be free from the influence of well installation and meet data assessment criteria, then those groundwater data obtained from specified background locations will be considered representative of background conditions. The Laboratory uses quantitative and qualitative approaches to data evaluation, which are supported by statistical analyses and geochemical evaluation. Statistical analyses include mean, maximum, minimum, standard deviation, Student’s T-tests normal quantile plots, and box plots. Geochemical evaluation of the background data includes comparing cation-anion distributions; determining the presence or absence of tritium in relation to recharge and discharge zones; observing the absence of specific Laboratory-derived contaminants, including chlorate, perchlorate, and nitrate; evaluating trace-element geochemistry; and measuring stable isotope ratios of hydrogen, nitrogen, and oxygen.

F-1.1.3 Data Inputs

The hydrogeologic conceptual model for groundwater beneath the Pajarito Plateau (see Section 2.1.5) indicates that groundwater occurs in three modes: alluvial, perched intermediate, and the regional aquifer.

The groundwater chemistry within each mode varies because of differences in aquifer mineralogy (reactive phases controlling water composition), hydrogeochemical processes, including adsorption/desorption and mineral precipitation/dissolution reactions, source(s) of water, and residence time of groundwater and solutes (Section 2.2). Variations in groundwater temperature are also observed among the three aquifer types, where increasing temperature is observed with depth. Therefore, establishing background conditions requires the data inputs for each mode of groundwater provided in Table F-1.1-1. Names and locations of background stations are provided in Table F-1.1-2.

F-1.1.4 Spatial and Temporal Boundaries

Available groundwater-quality data were compiled, and the following specific criteria were applied to identify groundwater beneath the Pajarito Plateau that is not affected by Laboratory operations:

- Greater than 60 yr old, based on the activity of tritium, except for alluvial groundwater upgradient of the Laboratory and springs discharging within Sierra de los Valles or within other recharge zones
- Located hydrologically upgradient of the Laboratory or downgradient in areas not containing Laboratory-derived contaminants
- Generally known mode of groundwater occurrence (alluvial groundwater, perched intermediate zones, and regional aquifer)

Groundwater quality at two alluvial sampling stations (Pine Spring and well LAO-B) may vary seasonally, particularly during seasons with greater precipitation that provide input to the hydrologic system. Hydrogeochemical data consist of verified analytical results from both filtered and nonfiltered samples collected quarterly over a period of 1 to 1.5 yr (six rounds of sampling). Evaluation of the historical water-quality data suggests that the variability of major ions and trace solutes was greatest in alluvial groundwater because of chemical variability over time with recent recharge from surface water.

F-1.1.5 Data Assessment

For this study, all analytical results in the data set were used to calculate statistical results and develop box plots. (In other words, no data were excluded from statistics as being outliers.) The data were assessed using the criteria below.

If analytical results for groundwater samples collected from a single mode of groundwater occurrence meet the data assessment criteria, then these data were included in statistical analyses to establish background distributions for each analyte for that mode of groundwater occurrence.

Steps in the data assessment are as follows.

- Evaluate the sample analytical results for each analyte to determine the overall variability and to verify the hypothesized differences between water sources (alluvial, perched intermediate, and regional aquifer) (Appendix C).
- Assess variability. Variability from laboratory analyses should be small compared with temporal/spatial variability of groundwater samples; a target value should have less than 25% relative standard deviations from laboratory duplicates.

F-1.1.6 Design Optimization

Because groundwater sample locations for background must be defined (i.e., locations must be credible upgradient or in unimpacted areas), a statistical design optimization is not practical. Rather, the available locations were evaluated and selected using expert judgment to encompass geographic and hydrological variation.

Based on the spatial boundary criteria listed in Section 3.1.4, the 12 sampling stations represent locations whose groundwater is hypothesized to be unaffected by Laboratory operations (Table F-1.1-2). Information on the geologic and hydrologic system at the Laboratory (see Section 2.0) was used to categorize background sampling sites as part of an alluvial system, an intermediate-depth perched system, or a deep regional system (Table F-1.1-2). Different criteria were used for the assignment of waters from these sites, depending on whether they came from wells or springs.

Classification of groundwater was based on (1) well depth, (2) hydrogeologic units penetrated, (3) depth to the zone of saturation sampled and observed, or (4) the projected position of the regional water table at that location. Groundwater collected from well LAO-B was considered to be perched in the alluvium because it was the only well penetrating the alluvium upgradient of the Laboratory boundary. Water from well LAOI-1.1(a) (Guaje Pumice Bed) was assigned to the intermediate-depth perched system because the saturated zone from which it came lies above the projected position of the regional water table. Groundwater samples collected from supply wells Otowi-4 and Guaje-5 were classified as regional groundwater because those wells are only screened in the deep groundwater system.

Classification of spring waters is more difficult because of a lack of subsurface data and information. Several criteria were applied in classification: position relative to the regional water table, geologic material at the spring outlet, hydrologic conditions in the area, height relative to the Rio Grande, and water chemistry. Several springs are within recharge boundaries in the Sierra de los Valles (Water Canyon Gallery, Pine Spring [alluvium], Apache Spring, and upper Cañon de Valle Spring). This hydrologic setting indicates that these groundwaters had relatively short travel or residence times within the volcanic rocks and alluvium. Several springs in White Rock Canyon discharge from the Cerros del Rio basalt (Spring 9B) and from hydromagmatic deposits (Doe Spring) and were assigned to the regional aquifer. Some spring waters discharging from elevations slightly above that of the Rio Grande were also assigned to the regional groundwater system. These springs occur in an area of known artesian conditions and had low tritium activity, suggesting that they have had a long travel time (e.g., Spring 1).

Although the position of the groundwater divide west of the Laboratory is uncertain, Seven Springs clearly lies west of the divide. Nonetheless, it is included here because it discharges from the Bandelier Tuff and its major ion chemistry is similar to that of well LAO-1.1(a).

The sampling design included an analysis of groundwater samples to characterize both inorganic constituents and radionuclides. Primary inorganic constituents of concern (anions) found in groundwater at the Laboratory include nitrate, chloride, perchlorate, sulfate, and fluoride. Radionuclides observed in groundwater at the Laboratory consist mainly of tritium, strontium-90, cesium-137, uranium-234, uranium-235, uranium-238, plutonium-238, plutonium-239/240, and americium-241. Background level distributions of these anions and radionuclides were determined by sampling:

- Springs that discharge east, west, and north of the Laboratory boundary and east of the Rio Grande
- Upgradient characterization/monitoring wells installed by the former ER Project

- Supply wells, characterization wells, and springs that contain concentrations of anions less than those observed in contaminated groundwater
- Supply wells, characterization wells, and springs downgradient of Laboratory releases that contain concentrations of tritium less than 1 pCi/L and/or activities of fallout-derived radionuclides (strontium-90, cesium-137, plutonium-238, plutonium-239/240, and americium-241) less than detection, except for naturally occurring uranium isotopes.

F-1.2 Field and Laboratory Analytical Methods

Over the course of this investigation, both the field instrumentation used and the types of groundwater samples collected for chemical analyses varied. From 1997 to 2000, six sampling rounds were completed. Results of field measurements taken at the sampling stations are provided in Table F-1.2-1. Most of the groundwater samples were collected in 1997, 1998, and 2000; only a few additional samples were collected in late 1999. During 1998 and early 2000, supply well Guaje-5 was not available for sampling because the well was taken off-line for pump repair; in 2000, supply well Otowi-4 was not available for sampling for the same reason. The following laboratories collected groundwater samples for chemical and radiochemical analyses:

- Los Alamos National Laboratory's Earth and Environmental Sciences-6 (EES-6) geochemistry laboratory for general aqueous geochemistry (1997 through early 2000, five sampling rounds)
- University of Miami (UM) for low-level tritium analyses (1997 through 2000, six sampling rounds)
- Teledyne for tritium analyses (1998, two sampling rounds)
- Paragon Analytics, Inc., for radionuclides using both different analytes and different methods (1997 through 1998, three sampling rounds) and general aqueous geochemistry analyses (1998 through 2000, four sampling rounds)
- Huffman Laboratory for DOC fractionation analyses (1997 through 1998, three sampling rounds)
- Western Michigan University (WMU) for stable isotope analyses of δD and $\delta^{18}O$ (1997 through 1998, four sampling rounds)
- Geochron Laboratory for stable isotope analyses of δD and $\delta^{18}O$ (1999 through 2000, two sampling rounds)
- General Engineering Laboratories (GEL) for selected trace elements (1999 through 2000, two sampling rounds)
- Coastal Sciences Laboratory for $\delta^{15}N$ isotopes (late 1998 to 2000, two sampling rounds)

F-1.2.1 Field Methods

In general, most groundwater samples were collected in plastic bottles. Samples collected for stable isotope and DOC fractionation analyses were collected in clear and brown glass bottles, respectively. Samples for DOC fractionation were filtered through 0.45-μm silver filters to inhibit microbial degradation of organic carbon. Other filtered samples were processed using 0.45μm acetate filter membranes. Before 1998, a hand-operated vacuum pump was used to filter groundwater samples. The samples were filtered on-site immediately following collection or within 6 h of the collection time. In 1998 and subsequent sampling rounds, the field team used a battery-operated vacuum pump to filter the water. A sample duplicate was collected in the field for every five primary samples. The field duplicate samples were separate aliquots collected during the same sampling event for a location. Total carbonate alkalinity was determined in the laboratory using standard titration techniques within 48 h of sample collection.

Groundwater samples were preserved either with ice at 4°C or by using concentrated HNO_3 or concentrated H_2SO_4. The pH of acidified samples (metals, nitrogen isotopes, nitrate plus nitrite, and radionuclides excluding tritium) was lowered by the dropwise addition of acid to a pH of <2. Care was taken to avoid the trapping of air in the nonacidified samples.

The field parameters recorded for each of the 15 sampling stations included pH, temperature (°C), specific conductance (μS/cm), and NTU. Appendix A provides the field-measured parameters taken at each sampling station and the sampling dates. In 1997, a Horiba meter was used to determine pH, conductivity, and turbidity. The meter was calibrated daily, according to manufacturer specifications, using Autocal solution. Temperatures were measured using a Fluke 52 K/J thermometer and probe.

After 1997 the field instrumentation changed. For the remainder of the investigation, an Orion temperature-compensated pH meter was used for temperature and pH. The meter was calibrated daily using three buffer solutions (pH = 4.01, 7.00, and 10.01). Specific conductance was measured with two Hanna temperature-compensated conductivity meters. The meters were calibrated at the beginning of the field season. The calibration was rechecked, and if necessary, corrected during the field season if discrepancies between the two meters occurred. Turbidity was measured with a Hach turbidmeter calibrated at the beginning of the field season. Over the course of the study, pH for a few samples was measured using limited-range pH indicator strips.

The Orion meter had a resolution of 0.01, and accuracy was reported as ±0.01 for pH. Temperature resolution and accuracy were 0.1°C and ±1.0°C, respectively. The Hanna conductivity meters had a resolution of 10 μS/cm, and accuracy was reported as ±40 μS/cm. The Hach turbidmeter had a resolution of 0.1 NTU below 100 NTU and an accuracy of ≤5% of the reading or ±0.1 NTU, whichever was greater.

Water samples at springs were generally collected through a funnel-tubing system that allowed for minimal disturbance of the bottom sediments. The funnel was placed in the spring, and the tubing was extended downhill. Sufficient time was allotted to allow the bottom sediments in the spring to settle and for the apparatus to be rinsed. The sample water was then collected from the end of the tubing. In some locations the spring consists of a deep basin with a seep-like outflow. These waters were collected by dipping a beaker into the pool, or in later samples, by pumping the water directly from the spring to the sample container. Except for turbidity measurements with the Hach meter, field parameters were collected by placing the individual meters directly into the pool of spring water. Samples collected for turbidity measurements using the Hach meter were dipped from the pool of water and were placed into a sample measurement cell.

Groundwater samples collected from supply wells Guaje-5 and Otowi-4 were collected from a spigot or from tubing connected in line with the pump. Groundwater pumped from the supply wells was collected after running the water for 5 min. Groundwater from wells LAO-B and LAOI-1.1(a) was collected after removing at least three well volumes of groundwater to determine the field parameters had stabilized. At these wells, the field parameters were measured at 5-gal. intervals. Field parameters for all the wells were measured in a bucket filled with the well water.

F-1.2.2 Analytical Methods

Paragon Analytics, **Inc.**, also analyzed groundwater samples collected as part of this investigation. Paragon used standard techniques specified by USGS (USGS 1989, 88750), the American Public Health Association (American Public Health Association 1985, 88769), the Annual Book of ASTM Standards (ASTM 1988, 68413), and EPA method SW-846 (EPA 1987, 31732). Paragon Analytics, Inc., used ion chromatography (IC) to determine concentrations of bromide, chloride, fluoride, oxalate, nitrate, nitrite, phosphate, and sulfate in the water samples. Concentrations of aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, potassium, selenium, silicon, silver, sodium, strontium, thallium, vanadium, and zinc were determined by inductively coupled plasma atomic (optical) emission spectroscopy (ICPAES). Colorimetry was used to analyze for total cyanide. Cold-vapor atomic absorption (CVAA) was used to analyze for mercury. Inductively coupled plasma mass spectrometry (ICPMS) was used to analyze for antimony, beryllium, cadmium, lead, thallium, and uranium for two sampling rounds (December 1999 and January 2000, and March and April 2000).

Paragon Analytics, Inc., performed radiochemical analyses on water samples. The methods used included laser-induced kinetic phosphorimetric analysis (LIKPA) for uranium; alpha spectrometry for americium-241, plutonium-238, plutonium-239/240, uranium-234, uranium-235, and uranium-238; gamma spectrometry for cesium-137, and other gamma-emitting isotopes; and gas proportional counting for strontium-90.

GEL analyzed groundwater samples collected in late 1999 and 2000 for antimony, beryllium, cadmium, lead, thallium, and uranium using ICPMS. Detection limits for these analytes generally ranged from 0.1 to 0.5 μg/L.

Huffman Laboratories performed DOC fractionation analyses using an in-house, EPA-modified method based on physical separation. This method consisted of separating hydrophilic (acid, base, and neutral groups) from hydrophobic functional groups (acid, base, and neutral groups). This analysis method provided information on the distribution of naturally occurring organic compounds, including fulvic and humic acids (hydrophobic groups) and small molecular-weight organic compounds (hydrophilic groups).

Groundwater samples were also analyzed for inorganic chemicals at EES-6 using additional techniques specified in EPA SW-846 (EPA 1987, 31732). Ion chromatography was used for determining concentrations of bromide, chloride, fluoride, nitrate, nitrite, oxalate, phosphate, and sulfate. EES-6 used graphite furnace atomic absorption (GFAA) in determining concentrations of cadmium, cesium, chromium, cobalt, copper, lead, molybdenum, nickel, rubidium, silver, thallium, and tin in the groundwater samples. Hydride atomic absorption (HAA) was used for measuring arsenic, antimony, and selenium concentrations in the samples. Mercury analysis was done by the CVAA method. ICPAES was the method used for determining concentrations of aluminum, barium, beryllium, boron, calcium, iron, lithium, magnesium, manganese, potassium, silicon, sodium, strontium, titanium, vanadium, and zinc in the groundwater samples. An ion-specific electrode was used to measure ammonium concentrations in the samples.

The University of Miami performed tritium analyses using direct counting for tritium and electrolytic enrichment for low-level tritium (less than 3.2 pCi/L). Teledyne performed tritium analyses using direct counting and/or liquid scintillation (300 pCi/L).

Stable isotopes of oxygen (oxygen-18 and oxygen-16, $\delta^{18}O$) and hydrogen (deuterium and hydrogen, δD) were analyzed by **Western Michigan University** and Geochron Laboratories, Cambridge, Massachusetts, using isotope ratio mass spectrometry (IRMS). Stable isotopes of nitrogen (nitrogen-15 and nitrogen-14, $\delta^{15}N$) were analyzed at Coastal Sciences Laboratories, Inc., Austin, Texas.

F-1.2.3 Analytes of Interest

Table F-1.2-2 provides field parameters, major ions, neutral species, trace elements, DOC fractionation, stable isotopes, and radionuclides measured or analyzed as part of this investigation.

F-1.3 Scope of Groundwater Background Investigations in Time and Space

This subsection presents an overview of the sampling stations selected for the groundwater background investigations from 1997 to 2000. More detailed information is provided in Appendix E, including the sampling station name, location, land ownership, geologic setting, and a brief site description for each site. The sampled locations included 4 wells and 8 springs. Sample locations are shown in Figure F-1.3-1, which also shows three sample locations that were not part of this investigation (Pajarito Spring, La Mesita Spring, and Sacred Spring).

Seven Springs is included as part of this investigation although it is separated from the Pajarito Plateau. This spring is located west of the recharge area for the Pajarito Plateau, but its major ion chemistry is similar to well LAOI-1.1(a). Seven Springs and LAOI-1.1(a) discharge and are completed, respectively, within the Otowi Member of the Bandelier Tuff and the Guaje Pumice Bed. Seven Springs discharges from the west side of Calaveras Canyon, about 400 m upstream of State Highway 126 and west of the Valles Caldera on the Jemez Plateau. Several springs are in the immediate vicinity; some discharge from alluvium and others from outcrops of densely welded rhyolite tuff. Samples were taken from the largest spring.

F-1.3.1 Springs within the Recharge Zone

Springs in the recharge area west of and upgradient of the Laboratory include Apache Spring, upper Cañon de Valle Spring, Pine Spring, and the Water Canyon Gallery. Apache Spring issues in the southern Sierra del los Valles (Figure F-1.3-1). The spring discharges from colluvium consisting of blocks of the Tshirege Member of the Bandelier Tuff and Tschicoma Formation dacite in a matrix of volcanic sand and soil.

Apache Spring impacts from road salt will preclude the use of sodium, calcium, and chloride data from this spring for comparative purposes with other anthropogenic impacts. Influences of the higher ionic data on other solutes should also be considered before these data are used for modeling or other purposes. It is useful, however, to have a sampling point that reflects anthropogenic impacts other than Laboratory contributions to aquifer chemistry.

Upper Cañon de Valle Spring issues about 2.4 km west of State Highway 501. The spring is situated about 20 m above the bottom of upper Cañon de Valle in the Tshirege Member of the Bandelier Tuff. At this location, it appears that the Tshirege Member fills preexisting topography in the vicinity of the spring because downstream are major outcrops of preexisting Tschicoma Formation dacite.

Water Canyon Gallery is an improved spring occurring in the north branch of uppermost Water Canyon, about 1.3 km west of State Highway 501 and just west of the Pajarito Plateau. The spring issues from a tunnel that extends into a cliff of densely welded ignimbrite of the Tshirege Member of the Bandelier Tuff.

Pine Spring is located in upper Garcia Canyon about 6 km north of Los Alamos. Pine Spring discharges within the alluvium on the downthrown side of a north-south-trending fault juxtaposing boulder-bearing sediments of the Puye Formation (to the west) against mafic-to-intermediate composition lavas and overlying Puye deposits (to the east) (Smith et al. 1970, 09752; Kempter and Kelley 2002, 88777).

F-1.3.2 Sampling Stations on the Pajarito Plateau

Wells LAOI-1.1(a) (intermediate-perched system), LAO-B (the only background well completed in the alluvium), Otowi-4 (regional aquifer), and Guaje-5 (regional aquifer) are positioned along the regional flow path downgradient of the recharge zone for the Pajarito Plateau (Figure F-1.3-1).

Well LAOI-1.1(a) is an observation well that was drilled in upper Los Alamos Canyon in 1994. It is screened within a perched zone in the Guaje Pumice Bed at the base of the Otowi Member of the Bandelier Tuff. Perched intermediate groundwater at the well occurs at a depth of 94.5 m.

Well LAO-B is an observation well drilled into valley-fill alluvium in upper Los Alamos Canyon west of the Laboratory boundary. The groundwater occurs within alluvium.

Guaje Canyon Well G-5 was completed in May 1951 to a depth of 608.8 m (Purtymun 1995, 45344) and was reliably used as a water supply well until it was plugged and abandoned in 1998. The initial static water level was 125 m below surface, but through time the water level has descended as a result of production and drawdown (148 m in 1991). The production rate was about 1960 L/min. The screened interval and production horizon of the well were entirely within the Santa Fe Group.

Otowi-4 is a water supply well in Los Alamos Canyon that was completed to a final depth of 788.1 m in March 1990 (Stoker et al. 1992, 12017). Aside from a section of Miocene basalts, the screened interval at Otowi-4 is entirely within older fanglomerates from 340m- to 785-m-depth.

F-1.3.3 Sampling Stations within the Discharge Zone

Three springs are located within the discharge zone for the regional system. These include Spring 9B, Doe Spring, and Spring 1 (Figure F-1.3-1).

Spring 9B issues from the bottom of a basaltic lava flow on the northwest side of White Rock Canyon, roughly 200 m downstream of the mouth of Chaquehui Canyon. It is located in hydromagmatic deposits and flows of the Cerros del Rio volcanic field. The spring is about 25 m above the Rio Grande.

Doe Spring is located in these same hydromagmatic deposits. It flows from lower Chaquehui Canyon, about 30 m above the canyon floor. Both springs discharge from the regional aquifer.

Spring 1 issues from a small bench about 40 m above the northeast side of the Rio Grande and about 1.5 km downstream of the Otowi Bridge. The bench occurs within a landslide complex made up of a variety of sediment types within the Santa Fe Group.

F-2.0 RESULTS

F-2.1 Sample Collection, Preparation, and Evaluation

This section describes methods of data validation conducted on groundwater samples collected during the investigations that took place for Rev. 0, Rev. 1, and this Rev. 2. Data validation considered holding times, experimental bias, and accuracy and precision of data.

The collection process consisted of taking filtered and nonfiltered groundwater samples at each of the stations in up to 6 sampling rounds. One duplicate sample (filtered) was also collected per five groundwater samples for each sampling event. Groundwater samples analyzed for major cations, trace elements, metals, and radionuclides were either filtered through a 0.45-μm membrane or not filtered before sample preservation with concentrated nitric acid. Anion analyses, including sulfate, chloride, bromide, and fluoride, were performed on nonpreserved filtered and nonfiltered groundwater samples. Filtered samples were analyzed for DOC and DOC fractionation.

Chemical and radiochemical analyses performed by external contract laboratories (Paragon Analytics, Inc., Huffman Laboratories, and the University of Miami) are listed in Table F-2.1-1. Paragon Analytics, Inc., also performed analyses for bicarbonate and anions using EPA methods (EPA 1987, 31732). In addition, Paragon Analytics, Inc., sent samples to a subcontractor laboratory, Huffman Laboratories, for DOC, DOC fractionation (humic acids), and dissolved silica analyses. These analyses were conducted using methods specific to the type of analysis. The external laboratory followed the ER Project statement of work (SOW) (LANL 1995, 49738) for quality control (QC) of sample analyses for holding time and sample preservation, storage, and preparation.

Additional chemical analyses were provided by EES-6. Table F-2.1-2 provides information on analytes, analytical instruments, EPA method numbers, and instrument detection limits (IDLs).

Analytical results of inorganic analytes were evaluated using the Laboratory QC data reported for laboratory blanks, laboratory duplicates, laboratory spike samples, laboratory control samples (LCSs), and calibration samples.

The data-validation process consisted of conducting a systematic baseline review followed by a more focused validation. Analytical results for trace metals and uranium (analyzed by LIKPA) were evaluated by following procedures identified in the ER Project baseline data validation standard operating procedure. This procedure applies a subset of the National Functional Guidelines for data review (EPA 1994, 48639; EPA 1994, 48640). The EPA National Functional Guidelines were also used to define the review conducted for the focused validation described in this section. The baseline validation used only the data reported by the laboratory on the forms provided as part of the deliverable, but the focused validation used the much more detailed information of the raw data provided by the laboratory. The focused validation included checks for sample-specific QC results, but the baseline validation applied QC results on a more global basis. The National Functional Guidelines (EPA 1994, 48639; EPA 1994, 48640) were applied as closely as possible to the anion, bicarbonate, dissolved silica, and total uranium analyses although these methods are not specifically covered by the guidelines.

F-2.1.1 Results of Data Validation

The results for all analyses were accepted as qualified. Analytical results for specific metals were rejected because of interferences indicated in the preparation blank analyses, (discussed further in this section). The results for several anions were rejected because the samples were analyzed after the 48-h holding time for nitrate, nitrite, and orthophosphate. The holding time problems are discussed further in Section F-2.1.1-2.

F-2.1.1.1 Trace Element Analyses

Groundwater samples were all prepared and analyzed following EPA Contract Laboratory Program SOW ILM 03.0 (EPA 1994, 48640). Technical holding times were met for all trace metal analyses. Analytes and IDLs for the trace elements and metals provided by Paragon Analytics, Inc., are given in Table F-2.1-3.

The bias of the trace-element measurements was evaluated by the concurrent analysis of preparation and calibration blanks. There were several analytes detected above the instrument detection limit (IDL) in several of the blanks reported by Paragon Analytics, Inc., in February 1998. Following the criteria given in the National Functional Guidelines for data review (EPA 1994, 48639), the results for these analytes were qualified as nondetected (U) because the reported sample results were less than five times the greatest amount found in an associated blank. In addition, several analytes were detected at a negative amount in the preparation blanks analyzed. Selected trace elements were detected in the blanks at levels that were negative (relative to the initial calibration) and greater in absolute value than the amounts detected in samples in the same batch. Following the criteria given in the National Functional Guidelines for Data Review (EPA 1994, 48639), the results for these analytes were qualified in one of two ways:

- The results were rejected (qualified with an R) when the reported sample results were less than the estimated detection limit or less than the absolute value of the amount found in the blank, or
- The results were qualified as estimated with a potential low bias (qualified with a J) when the reported sample results were greater than the absolute value of the amount found in the preparation blank, but less than five times the absolute value of the amount found in the preparation blank.

Rejected analytical results occurred for 32 groundwater samples, consisting of 74 analyses of aluminum (5 analyses), beryllium (1 analysis), copper (7 analyses), lead (1 analysis), manganese (6 analyses), mercury (18 analyses), nitrate (17 analyses), nitrite (17 analyses), and zinc (2 analyses), collected during February, July, September, and October 1998 (Paragon Analytics, Inc.).

The bias of the trace-element measurements was also assessed by analysis of matrix spike samples. All spike recoveries were acceptable with no apparent bias for all trace-metal analytes that were spiked into the water matrices.

The accuracy of the trace-element measurements was checked by the concurrent analysis of aqueous LCSs. Results for individual samples were qualified on the basis of the LCS analyzed in the same batch according to the criteria given in the National Functional Guidelines (EPA 1994, 48639). No data qualifiers were added to the sample results on the basis of the LCS recoveries.

The precision of the inorganic measurements was assessed by the analysis of laboratory duplicate samples. The results for one laboratory duplicate sample were reported for each batch in the data set. The relative percent differences (RPDs) for duplicate measurements of the target analytes were acceptable, and no results were qualified with deficiencies of laboratory-induced errors based on the duplicate sample analyses. The analytical data are useable as qualified by this process.

F-2.1.1.2 Anion and Bicarbonate Analyses

Groundwater samples were prepared and analyzed following EPA Method 310.0 for bicarbonate using titration and EPA Method 300.0 for anions using ion chromatography. Technical holding times were met for all analyses except nitrite, nitrate, and orthophosphate collected during February 1998, which were analyzed by Paragon Analytics, Inc., outside the 48-h holding time. The results for these analytes were rejected for use (qualified R) because of the missed holding time and because the concentrations of nitrite, nitrate, and orthophosphate are affected by the length of holding times. Sample duplicates were collected and analyzed within appropriate holding times by EES-6 in February 1998, and these results were used for data analysis and interpretation.

The bias of the anion measurements was evaluated by the concurrent analysis of blanks. Interference for orthophosphate was detected above the MDL in some of the blanks associated with several water samples collected in February 1998. The laboratory raised the detection limit for the affected samples to 0.2 mg/L so the interference would not be detected in the blank. The results were not qualified for blank contamination because orthophosphate was then not detected in the affected samples.

The accuracy of the anion and bicarbonate measurements was monitored by the concurrent analysis of aqueous LCSs. Results for individual samples were evaluated on the basis of the LCS analyzed in the same batch, according to the criteria given in the National Functional Guidelines (EPA 1994, 48639). No data qualifiers were added to the sample results on the basis of the LCS recoveries.

The precision of the anion and bicarbonate measurements was assessed by the analysis of laboratory duplicate samples. The results for one laboratory duplicate sample were reported for each batch in the data set. The RPDs for duplicate measurements of the target analytes were acceptable, and no results were qualified based on the duplicate sample analyses. The analytical data are useable as qualified by this process unless the results were rejected as described above.

F-2.1.1.3 Dissolved Silica Analyses

Groundwater samples were prepared and analyzed following EPA Method 370.1 for silica analyses. The analyses were conducted using colorimetry. Technical holding times were met for all analyses. The bias of the dissolved silica measurements was monitored by the concurrent analysis of blanks. No problems were noted with the blanks.

The accuracy of the dissolved silica measurements was assessed by the concurrent analysis of aqueous LCSs. Results for individual samples were qualified on the basis of the LCS that was analyzed in the same batch, according to the criteria given in the National Functional Guidelines (EPA 1994, 48639). No data qualifiers were added to the sample results on the basis of the LCS recoveries.

The precision of the dissolved silica measurements was assessed by the analysis of laboratory duplicate samples. The results for one laboratory duplicate sample were reported for each batch in the data set. The RPDs for duplicate measurements of the target analytes were acceptable, and no results were qualified based on the duplicate sample analyses. The analytical data are useable as qualified by this process.

F-2.1.1.4 Uranium Analyses

Groundwater samples were prepared and analyzed for uranium following an external laboratory procedure (Paragon Analytics, Inc.). The analyses were conducted using LIKPA methods. Technical holding times were met for all analyses. The bias of the total uranium concentration measurements was monitored by the concurrent analysis of blanks. No problems were noted with the blanks.

The accuracy of the total uranium measurements was assessed by the concurrent analysis of aqueous LCSs. Results for individual samples were evaluated on the basis of the LCS that was analyzed in the same batch, according to the criteria given in the National Functional Guidelines for data review (EPA 1994, 48639). No data qualifiers were added to the sample results on the basis of the LCS recoveries.

The precision of the total uranium measurements was assessed by the analysis of laboratory duplicate samples. The results for one laboratory duplicate sample were reported for each batch in the data set. The RPDs for duplicate measurements of the target analytes were acceptable, and no data qualifiers were added to the results, based on the duplicate sample analyses. The analytical data are useable as qualified by this process.

F-2.2 Statistical Analyses of 1997 to 2000 Groundwater Data

This section provides results of statistical analyses of a comprehensive database of organic and inorganic chemical, stable isotope, and radionuclide analyses of groundwater analyses from 208 samples collected from 12 springs and wells located in and around the Laboratory. The region considered in this investigation extends from the western edge of the Jemez Mountains eastward to the Rio Grande and from Frijoles Canyon northward to Garcia Canyon.

F-2.2.1 Statistical Methods and Results

F-2.2.1.1 Statistical Methods

Several data-preparation steps were needed before statistical analyses could be performed on the water chemistry data. First, the data were subjected to a data validation (see Section F-2.1.1). Second, the data were inspected for suspect values that were exceptionally high or low relative to the rest of the data. All analytical data, excluding low-level tritium and DOC fractionation, were the subject of focused data validation (also reported in Section F-2.1.1). Third, the data qualifiers were reviewed, and any data identified as R-qualified were not used in statistical analyses. Fourth, nondetected sample results were noted. Nondetected sample results were typically reported as less than (<) the IDL for that chemical. Values reported as nondetected by the analytical laboratory were replaced by one-half of the detection-limit value for statistical analyses. This replacement method is recommended by the EPA when the frequency of nondetected values is relatively low (EPA 1992, 12544).

Analytical suites, field parameters, and sampling dates for the background stations are provided in Appendix A of Rev. 0 and Rev. 1 of this report. Sample results and data qualifiers based on validation for inorganic analytes, radionuclides, and other analytes (water-quality parameters and stable isotopes) are provided in Appendix B of Rev. 0 and Rev. 1. Because of space limitations and to avoid confusion with the Rev. 2 background data set, this information is not repeated in Rev. 2.

The data were reviewed to identify laboratory-reporting or analysis errors. During this review process, two uranium results for samples collected on December 16, 1999, were found to be inconsistent between methods and with other uranium results for the locations sampled.

A Student's T-test of means was performed between more frequently detected analyte data sets. Results are presented in Table F-2.2-1 and discussed below in Section F-2.2.1.2.3. The T-test is used to determine if there is a real difference between two independent sets of results or if they are a part of the same population. Mean values of sets of data for each major analyte (e.g., sodium, chloride, TDS) were compared between each aquifer type. Test statistics were evaluated against 95% and 99% critical values in a two-tailed test. For test statistics less than the critical value, the null hypothesis (that the data sets are not different) is true. The table shows the probabilities (p-value) that indicate whether the null hypothesis is true (that the data sets are the same), as well as the probabilities that a significant or very significant difference exists between compared data sets.

The statistical analysis of the background data involves several exploratory data analysis (EDA) tools, including normal quantile plots, box plots, time series, and statistical data summaries. The purpose of EDA is to understand relationships between analytes, understand relationships between sampling locations, understand relationships between aquifer types, evaluate parametric and nonparametric statistical modeling options, and determine the frequency of nondetect values by analyte and by potential data subpopulations. While EDA can be used to identify outliers, no outlier identification was performed for this analysis, and no data were excluded from this data set. Three types of data plots were made, as explained below.

Normal quantile plots: The quantiles of the data set (y-axis) are sorted in ascending order and plotted against the quantiles for a standard normal data set (x-axis). The quantiles of a standard normal data set (i.e., a normal with a mean = 0 and a standard deviation = 1) are those for the theoretical distribution and can be found in published tables of the cumulative normal distribution. For example, the 50th quantile is 0, the 90th quantile is approximately 1.282, the 95th quantile is about 1.645, etc. If the data are derived from a normal statistical distribution, the points will plot in a linear trend. The subsets of the data set that differ the most from those expected from a normal distribution are seen as points straying from the linear trend.

Box plots: Box plots are used to show differences between two or more sample locations or other data groupings. Box plots summarize information about the shape and spread of the distribution of concentrations for an analyte. Box plots consist of a box, a (median) line across the box, and a mean line. The *y*-axis displays the observed concentrations in the reported units. The area enclosed by the box shows the concentration range containing the middle half of the data; that is, the lower box edge is at the 25^{th} percentile and the upper box edge is at the 75^{th} percentile. The length of the box is a measure of the spread of the range of concentrations. The black horizontal line across the box represents the median (50^{th} percentile) of the data, a measure of the center of the concentration distribution. If the median line divides the box into two approximately equal parts, the shape of the distribution of concentrations is symmetric; if not, the distribution is skewed or nonsymmetrical. The red horizontal line across the box represents the mean of the data, a measure influenced by exceptionally low or high values. The top and bottom horizontal lines represent the 5^{th} and 95^{th} percentile. Concentrations outside the 25^{th} to 75^{th} percentile are plotted as points outside the box.

Time series analysis: A time versus concentration scatter plot was provided for each constituent measured. Time is plotted along the x-axis, and the constituent concentration is plotted along the y-axis. Long-term trends can be deduced from these plots. These plots appeared in Appendix C of Rev. 0 and Rev. 1 of this report and are not repeated here.

F-2.2.1.2 Statistical Results

Results of statistical analyses of all post-1997 data, including minimum, mean, median, maximum, one sigma (standard deviation) error, and percent coefficient of variation, number of samples, number of rejected samples, and number of nondetected values for filtered and nonfiltered samples of alluvial groundwater, volcanic perched intermediate groundwater, and the regional aquifer were provided in Appendix B tables of Rev. 0 and Rev. 1 of this report and are not repeated here. These tables include pre-1997 and 1997 to 2000 analytical results (combined and separate) using 0.5 and 1.0 detection limits. Several analytes, including antimony, beryllium, cadmium, lead, thallium, and uranium had high IDLs, which increase the mean, median, maximum, standard deviation, and coefficient of variation for the pre-1997 data. For these reasons, the post-1997 data were also included separately because the IDLs for several analytes are lower using more advanced instrumentation.

During the period from 1997 to 2000, the background locations were sampled during six sampling events to provide equal information over time at each location. The intended goal was to characterize background concentrations; therefore, analytical methods with low IDLs were specified. Appendix B figures in Rev. 0 and Rev. 1 of this report present the concentration results over time for all analytes. The plots illustrate the improvement of detection limits for analytes with large pre-1997 IDLs and show the relative consistency attained, beginning in 1997. The post-1997 analytical results are more representative of background concentrations within the three aquifer types. They also provide a more conservative approach for establishing background concentrations in groundwater.

Analytical results for major ions and trace elements reported by EES-6 and Paragon Analytics, Inc., were combined for each analyte. The data summary in Appendix B of Rev. 0 and Rev. 1 of this report includes the field duplicate samples collected during the investigation and the three samples collected by NMED, with summaries for 111 analytes. The detection frequency for water chemistry analytes varied greatly from 0% to 100%. The background concentrations of antimony and cadmium with <20% detection rate were evaluated by considering minimum values, including the detection limit and half the detection limit. Beryllium, cadmium, cobalt, lead, selenium, silver, and thallium were typically not detected in the background water samples.

F-2.2.1.2.1 Evaluation of Field Duplicate Samples

As a quality assessment measure for the investigation, field duplicate samples were collected and submitted for analysis to contract analytical laboratories or the EES-6 analytical laboratory. Field duplicate samples provide a measure of the variability within a sampling event (sample collection and preparation) and analytical laboratory measurement variability.

The differences between field duplicate measurements for all water-chemistry analytes were assessed by comparing concentrations for samples noted as "duplicate" and "sample" in Appendix B of Rev. 0 and Rev. 1 of this report. Fifteen analytes were selected as representatives of the more frequently detected analytes. A comparison of field duplicates to the original sample for these analytes is provided in Figure F-2.2-1.

The scatter plots in Figure F-2.2-1 illustrate that field duplicate sample results are identical, or nearly identical, to the original sample result for most of these analytes. The field duplicate sample results were also unbiased, as shown by the linear regression slope being close to or equal to 1.0 and the intercept being close to 0.0. The coefficient of determination (r^2) also illustrates the strong agreement of field duplicate results to original sample results.

Ammonium provides an example of the variability observed for less frequently detected analytes. Although a strong relationship occurs between the field duplicate results and the original sample results, more variation is evident on the ammonium scatter plot (Figure F-2.2-1). Infrequently detected analytes tend to have more sample results near the IDL, which is a concentration range associated with greater variability in the laboratory measurement process. Thus, reported values for infrequently detected analytes need to be evaluated more carefully for use as background (no Laboratory impact) concentrations.

F-2.2.1.2.2 Comparison of Results by Analytical Laboratory and Method

For the investigation conducted for Rev. 0 and Rev. 1 of this report, sample results from the contract analytical laboratories were compared with the EES-6 analytical laboratory as another quality-assurance (QA) measure. The laboratories used different analytical methods for some analytes (e.g., uranium, tritium, and trace metals).

Contract and EES-6 analytical laboratory sample results for seven inorganic chemicals and six water-quality parameters (anions, cations, silica, and TDS) were compared. These analytes were selected based on the number of samples submitted to each laboratory and the detection frequency. Selection preference was given to analytes detected by both EES-6 and the contract laboratory so that measured values were compared rather than IDLs.

Charge balance errors calculated from groundwater samples analyzed at the EES analytical laboratory ranged from –3% to +61%. About 87% of the charge balance errors were within the EPA-recommended value of ±10%. The anomalous charge balance error of +61% occurred for a filtered water sample collected from the upper Cañon de Valle Spring.

Reporting limits and analytical methods provided by EES and Paragon Analytics, Inc., are shown in Table F-2.2-2. The EES-6 laboratory generally provides additional analytes with lower reporting limits using atomic absorption (AA) methods (including GFAA and HAA) as compared with Paragon Analytics, Inc., using ICPAES. Paragon Analytics, Inc., generally reports concentrations of calcium, iron, and strontium above reporting limits, but concentrations of antimony, arsenic, beryllium, boron, cadmium, chromium, lead, mercury, molybdenum, selenium, silver, and tin are less than detection.

Concentrations of aluminum, barium, copper, manganese, nickel, thallium, titanium, vanadium, and zinc were generally detected, but sometimes they were below the limits of quantification or reporting limits (J-qualified sample results). Concentrations of chloride, sulfate, bicarbonate, calcium, magnesium, sodium, and potassium reported by EES-6 and Paragon Analytics, Inc., were in good agreement and were also within experimental error. The reporting limits are sample specific, depending on matrix interferences and the general nature of the groundwater sample.

The results of this comparison indicated that the analytical results from the EES-6 analytical laboratory are comparable to the values reported by the contract analytical laboratories (Figure F-2.2-2). Results for barium, calcium, magnesium, potassium, and chloride are nearly identical between the EES-6 and contract analytical laboratories, as illustrated by the scatter plots for these analytes (Figure F-2.2-2). The linear regression statistics for barium, calcium, potassium, magnesium, chloride, and nitrate were close to the ideal slope of 1.0, intercept of 0.0, and coefficient of determination of 1.0. Greater variability is seen for the between-laboratory comparisons (EES-6 and Paragon Analytics, Inc.) for selected analytes (e.g., barium, tritium, manganese) and TDS, as shown in Figure F-2.2-2).

For other analytes, the sample results from the EES-6 analytical laboratory correlate to the contract analytical laboratory, but positive or negative bias between the laboratories can be found. The EES-6 analytical laboratory sample results for manganese, sodium, bicarbonate, and TDS are greater than the comparable contract analytical laboratory sample results (the slope is greater than 1.0 for these analytes; see Figure F-2.2-2). The EES-6 analytical laboratory sample results for silica and fluoride are less than the comparable contract analytical laboratory sample results (the slope is less than 1.0 for these analytes; see Figure F-2.2-2).

Two methods, ICPMS and LIKPA, were used to determine uranium concentrations in groundwater. These methods were used for 27 samples. The concentrations reported for ICPMS and LIKPA agree reasonably well, as noted in Section F-2.2.1.1.

Tritium was determined at two contract laboratories: Teledyne and the University of Miami. The University of Miami's method is designed for low-level tritium detection, while Teledyne uses the more standard method that has a nominal IDL of 300 pCi/L. The results from these analytical methods correlate weakly (Figure F-2.2-2). The University of Miami data are preferred for resolving differences in low levels of tritium.

Trace metals were analyzed by ICPMS in the last sampling round in 2000 to supplement previous inorganic chemical ICPAES results. The ICPMS method was needed to obtain IDLs at concentrations less than EPA MCLs for antimony, beryllium, cadmium, lead, thallium, and uranium. Antimony was detected above the IDL of 0.1 µg/L in <3% of the samples.

F-2.2.1.2.3 Spatial Trends in Water Chemistry Results

Spatial trends for average dissolved concentrations of selected analytes are shown in Figure F-2.2-3, which illustrates the distribution of the background sampling stations for the three identified aquifer types: alluvium, perched intermediate, and the regional aquifer. Five of the original regional aquifer stations are located northeast of the Laboratory boundary. The perched intermediate stations are in the Jemez Mountains and Sierra de los Valles. The two alluvial background sampling stations are located northwest and west of the Laboratory.

The average tritium concentrations for sampling stations located near recharge areas (Water Canyon Gallery, Apache Spring, Upper Cañon de Valle, and Pine Spring) in the Sierra de los Valles are greater than from springs that discharge to the Rio Grande. In general, concentrations of other analytes (specific conductance, barium, calicium, sodium, and bicarbonate s) follow an inverse pattern between specific end members, such as LAO-B versus Spring 1, where higher concentrations (increasing residence times) are reported for locations with low tritium (smaller amounts of recent recharge). This trend is more pronounced from the east than from the northwest-southeast. Some sample locations are spaced closely together, and the pair of locations most closely spaced also emerging from the same aquifer type (Doe Spring and Spring 9B) tend to have similar average concentrations for the analytes illustrated in Figure F-2.2-3. Mean concentrations of dissolved uranium range from 0.1 to 0.8 µg/L in the Sierra de los Valles and beneath the Pajarito Plateau. Somewhat higher mean concentrations of natural dissolved uranium occur along the Rio Grande northeast of the Laboratory boundary (Spring 1 [0.8 to 2.6 µg/L]).

Similarity of means testing was conducted using a Student's T-test to determine if the mean values of selected constituents in different aquifer types were from the same population. Results are shown in Table F-2.2-1. Alluvial groundwater versus perched intermediate water, perched intermediate versus regional groundwater, and alluvial versus regional groundwater were compared with filtered samples, major cations and anions. Based on the probability that data sets are significantly different, each constituent comparison is assigned to one of three groups; significant (probability ≤ 0.05), very significant (probability ≤ 0.01), and null (probability > 0.05, not equal to 0).

The alluvial-intermediate aquifer comparisons showed the greatest number of constituent mean values that appear to be from the same population. TDS, arsenic, barium, potassium, sodium, strontium, alkalinity, ammonium, bicarbonate, bromide, chloride, and fluoride are included in this group. Major ions calcium, magnesium, nitrate, and sulfate were judged to have a very significant difference in population, along with the constituents pH, chromium, and nickel, while aluminium, boron, and uranium showed a significant difference. Between the intermediate and regional aquifers, only magnesium and nickel cations were from the same population, along with anions ammonium, chloride, and sulfate. The remaining constituents showed either very significant or significant differences between populations. Finally, the alluvial-regional aquifer comparison showed only calcium, magnesium, nickel, strontium, ammonium, and bromide as being from the same population. The remaining constituents were significantly or very significantly different. It is important to note that these comparisons are between means, and they do not necessarily reflect changes along specific flow paths or between sampling points. In some cases for the alluvial aquifer data, they include Cerro Grande fire-impacted results. Results from a similar population do not necessarily share the same geochemical origin or evolution.

F-2.2.1.2.4 Evaluation of Analytes

In Rev. 0 and Rev. 1 of this report, the entire list of analytes from the contract analytical laboratories and the EES-6 analytical laboratory was trimmed to those that are most important, based on regulatory needs and conceptual geochemical and hydrogeologic framework understanding. Statistical plots for these analytes are provided in Appendix C of Rev. 0 and Rev. 1, but are not repeated here, although a brief narrative is provided below for each analyte. The statistical plots provide a visual summary of 1997 to 2000 data from the combined results from all laboratories. See tables F-2.2-3a through F-2.2-3f for 1997–2000 statistical data discussed in the following section.

Field Measurements: Temperature, *turbidity*, *specific conductance* (conductivity), and *pH* were measured for nearly all sampling events at each location. Temperature increases with depth in a geothermal gradient from the alluvial stations to the perched intermediate stations and is greatest in the regional aquifer sampling locations. Specific conductance is greatest in the regional aquifer, with greatest variance in the perched intermediate aquifer. The pH in background locations tends to be slightly alkaline, and its greatest variation is in the perched intermediate aquifer.

Major Cations: The major cations *calcium*, *magnesium*, *potassium*, and *sodium* were detected in nearly all samples (98% detection in magnesium). There is no significant difference between water types, except for sodium where the regional aquifer has the highest concentrations. Some trends can be distinguished from specific data based on flow path and location along the path. LAOI-1.1(a) exhibits the highest potassium concentration, and Otowi 4 exhibits the highest magnesium and calcium concentrations. Apache Spring water contains a component of road salt runoff, based on measured concentrations of sodium and chloride. With the exception of the noted elevated sodium concentration, major cation concentrations are generally consistent within each location.

Major Anions: The regional aquifer has elevated levels of *alkalinity*, *bicarbonate*, and *fluoride* when compared with the other aquifer types. Other potential major anions such as *ammonium*, *bromide*, *chloride*, and *sulfate* do not show significant variation between aquifer type. Nitrate concentrations are lowest in the alluvial aquifer, which is likely a result of biogeochemical cycling in the shallow subsurface or low anthropogenic inputs (e.g., agricultural or septic). In the shallow subsurface microsites of anoxia in otherwise oxic environments can develop that lead to reduction of nitrate to nitrogen gas (Koba et al., 1997, 93667). Anion values tend to be consistent at each location, with the exception of chloride at Apache Spring (see discussion above). The range of fluoride concentrations in springs is much greater than in wells. Ammonium concentrations were greatest at LAOI-1.1(a). Major anions were detected as a high frequency (100% detection exceptions noted: *fluoride* 94%; *nitrate* 87%; *sulfate* 93%, and *bromide* 60%).

Trace Metals: The detection rate of trace metals varied greatly (*aluminum* 62%; *antimony* 5%; *arsenic* 5%; *barium* 99%; *beryllium* 8%; *boron* 77%; *cadmium* 3%; *chromium* 48%; *cobalt* 8%; *copper* 49%; *iron* 55%; *lead* 15%; *manganese* 57%; *mercury* 29%; *molybdenum* 27%; *nickel* 18%; *selenium* 11%; *strontium* 99%; *silver* 5%; *thallium* 7%; *uranium* 100%; *zinc* 44%). Nondetects are plotted in Appendix C of Rev. 0 and Rev. 1 as one-half of the detection limit. For constituents detected at low frequency, box plots must be evaluated with care. Antimony, beryllium, and nickel were detected more frequently in the final sampling rounds as improved analytical techniques were used but still generally were not detected. Cadmium, cobalt, lead, mercury, molybdenum, selenium, silver, and thallium were each detected in few samples (fewer than 29%) and showed no appreciable trends or elevated levels. Barium, copper, manganese, and strontium results were generally consistent by sample location with no significant difference between aquifer types. Aluminum sample results showed little variation by sample type or aquifer type; however, Pine Spring aluminum results were 10 to 100 times greater than results from other sampling locations. Arsenic results were typically consistent for sample location, with most detected results within the regional aquifer. Boron concentrations were greatest in the regional aquifer. Chromium results typically were not variable between aquifer type and location.

One anomalous chromium result was noted: the filtered result for sample RE-16-98-9012 was 44.7 μg/L, about 10 times larger than other total chromium results. The nonfiltered, paired result was 3.2 μg/L, suggesting the filtered result for total chromium is not representative. The presence of colloids that were not removed by a 0.45-μ filter can contribute to variability of this type, as can analytical error. The mean concentration within the regional aquifer is skewed as a result of the anomalous chromium result discussed above. Without this result, the regional aquifer has only a slightly higher mean concentration. Iron results tend to be variable for both location and aquifer type. Pine Spring iron results are 10 to 100 times larger than results from other sample locations.

Two anomalous results were noted for nickel; the filtered result for sample RE16-98-9012 was 19.8 μg/L or about two times larger than other nickel results. The nonfiltered paired result was 0.9 μg/L, suggesting that this filtered sample result for nickel is not representative. The nickel filtered result for sample CABG-00-0057 may also be anomalous, but it has no paired nonfiltered result for comparison. Again, nonfiltering colloids or analytical error can produce such a result. Nickel concentrations from Pine Spring are greater than for other locations (except for the two anomalous results discussed above). Uranium results typically show little variance from location to location and between aquifer type. Uranium in Spring 1 appears significantly elevated compared with other sample locations. Zinc concentrations are greatest at Otowi-4 and vary more by location than between aquifer types.

Radionuclides: Radionuclides typically did not exhibit a high rate of detection (*americium-241* 16%; *plutonium-238* 5%; *plutonium 239/240* 5%; *strontium-90* 0%). Americium-241 detected results were most probably from a single sampling event in 1997, which raises questions regarding possible analytical laboratory problems with the values from this date. Because of the high percentage of nondetects, plutonium-238, plutonium 239/240, and strontium-90 statistical plots represent instrument noise rather than representative values. Gross-alpha radioactivity was detected in about 76% of the samples with little variation between sample locations. Tritium was characterized using University of Miami results. It was detected in 100% of the samples. Tritium varies by location and exhibits a decreasing trend from the alluvial to the perched intermediate and from there to the regional aquifer. Uranium sample results show disequilibrium between isotope ratios compared with natural uranium isotope ratios in solid media. This phenomenon has been noted in water samples collected in other parts of the world, and the ratios of natural uranium (and uranium daughters) have been shown to vary based on the temperature and mineral content of groundwater (Hakam et al. 2000, 70168).

Other Constituents: Dissolved organic carbon was detected in 100% of the samples. The regional aquifer exhibits the lowest mean value and the least variation; little difference was found between the alluvial and intermediate aquifers. *Nitrite* was detected in 14% of the samples. *Silica* (99% detection) varies by location but does not vary notably by aquifer type. *TDS* did not vary notably between alluvial and intermediate aquifers. The regional aquifer does exhibit the highest TDS concentrations. Variation between location types appears to be dictated by the overlying aquifer relationships. *Deuterium* and *oxygen* isotopes show that Seven Springs differs from other sample locations because of its elevation and location west of the Laboratory.

Perchlorate: See Section F-2.2.1.2.5.

In summary, major cations (calcium, magnesium, sodium, and potassium), major anions (bicarbonate, chloride, fluoride, and sulfate) and silica were measured in all background water samples. Nitrate, nitrite, and uranium had variable detections for the 1997 to 2000 analytical results. Other trace elements showed considerable ranges in which beryllium, cadmium, cobalt, copper, iron, lead, mercury, molybdenum, selenium, silver, and thallium were detected is less than 30% of the 1997 to 2000 sampling rounds.

The IDLs for antimony, arsenic, barium, beryllium cadmium, chromium, copper, lead, mercury, nickel, and selenium using ICPAES were below the respective IDLs promulgated by EPA. The MDLs using ICPAES for other constituents, including aluminum, chloride, fluoride, iron, manganese, silver, sulfate, and zinc, are below their respective secondary levels. Radionuclides derived from fallout, including americium-241, plutonium-238, and plutonium 239/240 were generally not detected, except during one sampling round conducted in August 1997. On the whole, analytical results for background inorganic species and radionuclides are of high quality and may be applied to Laboratory sites.

Data for the other analytes (major ions, stable isotopes, DOC fractionation, and a majority of trace elements) are acceptable as background within their detectable ranges.

F-2.2.1.2.5 Low-Level Perchlorate

The ubiquitous nature of trace levels of perchlorate (<1 µg/L) in groundwater near the Laboratory and elsewhere in northern New Mexico was determined by both NMED and the Laboratory (NMED 2004, 88768). Widespread and consistent low-level detection of the chemical in nonimpacted (no industrial source) groundwater samples collected from local springs and wells are the basis for this interpretation. The concentration and persistence of perchlorate in both spatial and temporal dimensions, however, are not yet fully understood.

NMED and the Laboratory undertook a preliminary investigation to determine the concentration of perchlorate in selected waters within the northern Rio Grande Basin. Sampling sites for low-level perchlorate included Sandia Spring, Spring 1, Spring 2, Springs 5, 5A, 5B, Springs 6, 6A, Spring 8A, and Springs 9, 9A, 9B, 9C for the regional aquifer. Perched intermediate sites included Alamo Canyon 10.3 Spring, Barbara's Spring, Campsite Spring, Cañon de Valle Spring, PC Spring, Colonel Spring, Water Canyon Gallery, Yak Spring, Young Spring, Pajarito Ski Well #2, and well LAOI-1.1(a).

NMED compiled 76 low-level perchlorate results from 47 groundwater wells and springs within the northern Rio Grande Basin, with 56 of these samples collected around the Pajarito Plateau (NMED 2004, 88768; Dale, 2005, 88774). All water samples were selected based on technical considerations such as aquifer location, age, and water quality. Six different groundwater zones were sampled, with about half representing the regional aquifer beneath the Laboratory.

NMED-selected sample stations were verified as background candidates through the analysis of major ions, including chloride and nitrate. These supplemental water-quality parameters showed sample results indicative of natural levels of nitrate (as N) at less than 0.5 mg/L. Additionally, tritium was measured because it can be found as a naturally occurring radioactive isotope of hydrogen that is commonly used for groundwater dating and to provide estimates on residence times and flow paths. Tritium results, coupled with local hydrogeologic relationships, show that springs located on the east-facing slope of Sierra de Los Valles represent young water (<60 yr) in the early stage of the local hydrologic cycle. Most springs within White Rock Canyon illustrate old water (>60 yr) discharging at the end of the hydrologic cycle.

The NMED and Laboratory studies used a liquid chromatography-mass spectrometry/mass spectrometry (LC-MS/MS) method (EPA SW846 8321MA) that is able to detect perchlorate at 0.05 µg/L or ppb. The conventional EPA method (SW846 314.0) is less sensitive and can only detect perchlorate at 4 ppb.

The 56 analytical results for groundwater show an average Laboratory background perchlorate concentration of 0.27 ± 0.08 (1 σ) ppb or µg/L (Table F-2.2-4). The minimum and maximum concentrations of perchlorate were 0.05 and 0.46 µg/L, respectively (Table F-2.2-4). Only one water sample collected near the Pajarito Plateau had a perchlorate concentration of less than 0.05 µg/L (Table F-2.2-4), the IDL for LC-MS/MS.

Seven precipitation samples were collected and analyzed using the LC-MS/MS method to rule out the presence of trace levels in precipitation as a source for the perchlorate in groundwater. Perchlorate was not detected in these samples above the IDL of 0.05 µg/L. In late August 2004, two additional rain samples were collected and analyzed by NMED using a method similar to LC-MS/MS but with an IDL of 0.0012 µg/L or about 40 times lower than that of the LC-MS/MS method. Although preliminary and not yet validated, the results show that perchlorate may be present in these precipitation samples at 0.006 and 0.017 µg/L.

Plummer et al. (2006, 93669) measured perchlorate, bromide, chloride, and sulfate concentrations in groundwater in the Middle Rio Grande Basin (MRGB), south of Los Alamos County. The samples were free of anthropogenic perchlorate because of either age or location. Samples with near atmospheric nitrate over chloride ratios showed relatively high perchlorate$^-$ concentrations (1.0-1.8 μg/L) that predict an average perchlorate$^-$ concentration of 0.093 ± 0.005 μg/L in atmospheric deposition during late Holocene dry conditions. Their interpretations suggest that evapotranspiration (ET) and other processes such as leaching of accumulated salts are significant in producing high perchlorate$^-$ concentrations in groundwater from atmospherically sourced perchlorate$^-$, even when atmospheric deposition concentrations are much lower. Lower values of perchlorate in groundwater may indicate depletion by microbial soil processes. Plummer et al. (2006, 93669) calculate a value as high as 4 μg/L as a maximum potential value for preanthropogenic groundwater where ET approaches a factor of 40.

Water from the three locales at the Laboratory—alluvium, perched-intermediate, and regional aquifers—all had approximately the same level of perchlorate (0.26 μg/L) (Table F-2.2-4). This falls in the low range of the concentrations in waters tested by Plummer et al. (2006, 93669). Their inferred ClO_4^-/Cl^- ratio in bulk atmospheric deposition is ≥ 3.8×10^{-4} (weight ratio), which is indicative of the level of ET influence when compared with the ClO_4^-/Cl^- ratios of groundwater samples. A rough calculation of the Laboratory ClO_4^-/Cl^- ratio in groundwater is 9×10^{-5} (weight ratio), within a reasonable range of the Plummer et al. (2006, 93669) value. ET values for Los Alamos are expected to be less than or similar to those in the MRGB, based on altitude and regional weather patterns.

Values for perchlorate in precipitation samples taken by the Laboratory were nondetectable or quite low (see above). Because of this, a definitive statement about perchlorate source is difficult, but Plummer et al. (2006, 93669) hypothesized the processes. They showed perchlorate concentrations of up to 0.3 μg/L in groundwater up to 30,000 years old, indicating that perchlorate appears to come from a long-term atmospheric deposition source. They reported ET-adjusted bulk-atmospheric deposition concentrations of between 0.08 and 0.10 μg/L, somewhat higher than the detected samples for precipitation from the Laboratory (0.006 and 0.017 μg/L), but they also showed ET-adjusted groundwater samples within the range of 0.01 to 0.06 μg/L of perchlorate in groundwater, indicating that the precipitation values available for the Laboratory are hypothesized to compare reasonably with their data. Further, they described a value of 0.025 ± 0.011μg/L as possible for ClO_4^- concentration in Pleistocene-Holocene bulk atmospheric deposition in New Mexico.

F-2.3 Summary of Interlaboratory Comparison of Stable Isotopes, Tritium, and Uranium

This section summarizes interlaboratory comparisons of analytical data for stable isotopes of hydrogen and oxygen, tritium, and uranium. The analyses for stable isotopes are performed for nonregulatory purposes, including determining the origin, recharge elevation, and relative age of the groundwater sample; however, uranium is measured for both regulatory and hydrogeochemical purposes. For this investigation, four separate university laboratories, one commercial laboratory, and a government laboratory performed stable isotope analyses. One university analytical laboratory and a commercial laboratory provided analytical results for tritium. Two commercial laboratories performed uranium analyses using LIKPA and ICPMS. Analytical results varied with each laboratory, depending on the precision, accuracy, and method of analysis.

F-2.3.1 Analytical Comparisons, Stable Isotopes

At the beginning of this investigation, EES-6 personnel used the University of Western Michigan (UWM) to provide analyses of stable isotopes (hydrogen and oxygen, δD, and $\delta^{18}O$) for background waters sampled as part of this investigation. Within a year, EES-6 personnel noticed that UWM's analytical results were shifted to slightly higher (heavier) isotope values compared with data received in the past from sites previously sampled. Figure F-2.3-1 compares δD versus $\delta^{18}O$ same-site data reported by UWM and previous laboratories. The UWM data from 1997 are systematically displaced roughly +5‰ in δD and about –0.5‰ to –1.5‰ in $\delta^{18}O$ compared with previous stable isotope data collected from 1978 to 1993.

Coincidentally, EES-6 personnel used UWM during 1996 and 1997 for stable isotope analyses of geothermal fluids for a project in Dixie Valley, Nevada (Goff et al. 2002, 88766). Figure F-2.3-2 shows a comparison of same-site data analyzed by UWM and USGS in Reston, Virginia. In this case, these data are generated from splits of the same water samples. Repeatedly, the UWM data are skewed roughly by the same amount as in Figure F-2.3-1. However, the UWM data in both cases appear to be internally consistent, which are precise but not accurate. The trends and general characteristics of the data are similar, but because they are skewed, the data are not comparable with data reported by other analytical laboratories.

Because of this problem, EES Division personnel decided to compare the results of numerous external laboratories performing stable isotope analyses on water samples. A large quantity of cold meteoric water was collected from S-Site (TA-16) and placed in a Teflon-lined, sealed, 55-gal. drum. Double or triple aliquots of this water were then sent to the following laboratories for analysis: Global, Geochron, New Mexico Technical Institute (NMTI), USGS, University of Miami, University of New Mexico (UNM), and UWM. Three laboratories (Geochron, USGS, and University of Miami) produced results that straddle the worldwide meteoric water line (WMWL) and the Jemez Mountains meteoric water line (JMWL) (Figure F-2.3-3) (Craig 1961, 88748; Vuataz and Goff 1986, 73687). These data provide the most reasonable results, considering previous analytical results for the springs (Figure F-2.3-1). Because these were cold meteoric waters, it was impossible to evaluate which of these three laboratories was the most precise and accurate without performing additional analyses and thoroughly evaluating each laboratory's analytical procedures and methods. Stable isotope analyses are now performed by EES-6, producing appropriate QA, as required by EP-WSP.

In contrast, UWM data are considerably different than analytical data from the other laboratories, having higher δD values and lower $\delta^{18}O$ values. Analytical results provided by the University of New Mexico (UNM) are slightly skewed to higher δD values, but stable isotope data reported by Global and NMTI are skewed to lower δD and higher $\delta^{18}O$ values, respectively. It appears that each of the laboratories produces internally consistent data; however, the data do not compare well with analytical results provided by the other laboratories.

Stable isotope data reported from Geochron, USGS, and University of Miami are most representative of the Pajarito Plateau and Sierra de los Valles. Stable isotope analyses for geochemical and hydrologic evaluation of groundwater for Laboratory sites may be compared with background and water derived from meteoric sources during environmental investigations.

F-2.3.2 Analytical Comparisons: Tritium Analyses Performed by the University of Miami and Teledyne

Hydrologic and geochemical information regarding groundwater residence times and flow paths are obtained by performing tritium analyses on water samples. The half-life for tritium is 12.33 yr, and this isotope decays by emission of a β particle (electron) to helium (^3He). The source and age of a particular water sample may be inferred by its tritium activity. Groundwater samples with less than 1 to 2 pCi/L generally are greater than 60 yr old (Shevenell and Goff 1995, 73689) and have been isolated from recent sources of tritium, including treated Laboratory discharges and local precipitation.

The University of Miami performed tritium analyses on water samples using liquid scintillation, direct counting, and electrolytic enrichment, depending on the activity of tritium in a given sample. Electrolytic enrichment is the most sensitive method, providing an IDL of 0.5 pCi/L. Liquid scintillation is an appropriate method for water samples containing 300 pCi/L or greater of tritium. Direct counting is an appropriate method when activities of tritium range between 3.2 and 300 pCi/L.

F-2.3.2.1 Quality Assurance and Quality Control

The quality of analytical results reported by the University of Miami was evaluated through primary and duplicate water samples, analytical method(s), analytical consistency, and data-trend analysis. Analytical results of tritium, reported by the University of Miami and Teledyne, are discussed in this section. The groundwater samples were analyzed by Teledyne during 1997 and 1998.

The primary and duplicate water samples analyzed by the University of Miami show strong agreement, characterized by an r^2 value equal to 0.998, as shown in Figure F-2.3-4. Figure F-2.3-5 shows tritium activities reported by the University of Miami and Teledyne for the 15 background stations sampled in 1997 and 1998. The two analytical laboratories show poor agreement. Only samples that contain activities of tritium near or at the IDL (0.5 pCi/L) compare reasonably well. Both laboratories used direct counting methods for groundwater samples containing activities of tritium greater than 3.2 pCi/L. Activities of tritium reported by the University of Miami generally are greater than those reported by Teledyne.

Reasonable consistency in tritium activities was reported by the University of Miami for several background sampling stations, as shown in Figures F-2.3-6 (Apache Spring), F-2.3-7 (well LAO-B), and F-2.3-8 (Spring 9B). Variation in tritium activity at some sampling stations is expected because of varying tritium activities in precipitation that provide recharge to several springs within the Sierra de Los Valles (Apache Spring, Water Canyon Gallery, and upper Cañon de Valle Spring). The interlaboratory comparison also included well LAO-B (alluvial groundwater, upper Los Alamos Canyon), Pine Spring, Seven Springs, Spring 9B, and Water Canyon Gallery. Water samples analyzed by Teledyne do not compare well with analytical results reported by the University of Miami. Tritium results provided by the University of Miami are more consistent for all of the springs sampled as part of this investigation.

Water samples collected during this investigation were submitted to the University of Miami for analysis and underwent QA/QC analysis. The tritium analytical results reported by the University of Miami are of high quality, and they are consistent over time for each background sampling station. These factors help make the University of Miami data technically defensible. Reasonable decisions regarding groundwater flow paths, residence times, and the presence or absence of tritium can be made using these University of Miami data.

F-2.3.3 Analytical Comparisons: Uranium Analyses Performed by Paragon Analytics, Inc., and General Engineering Laboratories

An analytical method for aqueous uranium requires a low IDL of less than 1 μg/L because dissolved background concentrations of this analyte typically are lower than this level in groundwater at the Laboratory. Paragon Analytics, Inc., performed uranium analyses on groundwater samples using LIKPA, which has an IDL of 0.1 μg/L. GEL analyzes uranium by using the ICPMS method, which provides a similar IDL. The LIKPA method was available before the use of ICPMS during this investigation. LIKPA is a viable analytical method if the ionic strength of the solution is less than 0.7 molal and if dissolved concentrations of chloride are less than 1000 mg/L. However, elevated concentrations of chloride, especially in solid samples, produce interference that biases the results. Groundwater samples collected during this investigation and analyzed for uranium using the LIKPA method have chloride concentrations of less than 20 mg/L.

Figure F-2.3-9 shows distributions of dissolved uranium within background spring and well samples analyzed by both LIKPA and ICPMS for the late 1999 and early 2000 sampling round. The correlation is excellent with an r^2 value equal to 1.0, suggesting that for the Laboratory background water samples both methods produce high-precision and accurate analytical results. Concentrations of dissolved uranium analyzed by ICPMS at most background-sampling stations are less than 1 μg/L. This result is consistent with the other sampling rounds conducted in 1997 and 1998. In summary, both LIKPA and ICPMS provided consistent analytical results for uranium, and results for all analyses are suitable for use to determine statistical distributions of this analyte. Based on these comparisons, it was determined that both GEL and Paragon Analytics, Inc., provided acceptable results; these data have been incorporated into the data set.

F-2.3.4 EES-6 Screening Analyses for Inorganic Analytes

This section and Section F-3 present a summary of the procedures, methods, and equipment used by EES-6 for analyzing groundwater samples collected as part of this investigation. Analyses of major cations and anions and trace elements were performed by EES-6. A summary of interlaboratory comparisons of chemical data for inorganic analytes performed by EES-6, Paragon Analytics, Inc., and other contract laboratories for the NMED Oversight Bureau (OB) is also presented. The EES-6 aqueous chemistry laboratory provided analytical results for groundwater and surface water samples, which are used for screening purposes to make decisions in the field. These screening data are supported by validated laboratory analytical results external to the Laboratory.

The EES-6 analytical laboratory uses methods developed from EPA, SW 846 (EPA 1987, 31732) for analyzing inorganic chemicals in aqueous solutions. Laboratory standards, blanks, duplicates, blind samples, and National Institute of Standards and Technology reference waters are run as part of the QA and QC programs. Analytical results from EES-6 compare very well with those provided by Paragon Analytics, Inc. EP-WSP has approved the EES-6 laboratory for providing high-precision data for anions and metals and fully validated QA/QC stable isotopes.

F-2.3.4.1 Analytical Comparisons

Splits of groundwater samples were collected by NMED-OB during this investigation and were analyzed at external laboratories. Shortly after sampling, Laboratory personnel delivered groundwater samples to EES-6 for chemical analyses and also shipped samples to Paragon Analytics, Inc., and other EP-ERSS laboratories. Paragon Analytics, Inc., performed chemical and radiochemical analyses on the groundwater samples collected as part of this investigation. Paragon Analytics, Inc., uses the ICPAES method for metal and trace-element analyses, including aluminum, antimony, arsenic, barium, beryllium, boron, calcium, cadmium, cobalt, chromium, copper, iron, lead, magnesium, manganese, molybdenum, nickel, potassium, selenium, silicon, silver, sodium, strontium, thallium, vanadium, and zinc. The EES-6 laboratory used AA methods for specific trace analytes, including arsenic, antimony, cadmium, cesium, chromium, cobalt, copper, lead, molybdenum, nickel, potassium, rubidium, selenium, silver, sodium, thallium, and tin. EE-6 also used the ICPAES method to analyze for aluminum, barium, beryllium, boron, calcium, iron, magnesium, manganese, potassium, sodium, silicon, strontium, titanium, vanadium, and zinc. Both laboratories used the CVAA method for mercury analysis. AA provides lower detection limits than ICPAES for many trace analytes and better precision for low-level sodium and potassium. The ICPMS method provides even better sensitivity for most analytes, including important analytes not normally included, such as uranium and thorium. GEL analyzed the groundwater samples collected in late

1999 and in 2000 for antimony, beryllium, cadmium, lead, thallium, and uranium, using the ICPMS method.

Section F-3 provides a comparison of analytical results reported by EES-6 and Paragon Analytics, Inc., for several selected springs and alluvial well LAO-B. Apache Spring and Doe Spring are representative of groundwater within perched intermediate zones and the regional aquifer.

F-2.3.4.2 Summary for Inorganic Analytes

Analytical results provided by EES-6 compare very favorably with Paragon Analytics, Inc., for major ions and most trace elements. The EES-6 screening analytical methods include ICPAES, AA, IC, and ISE. The AA method, however, provides lower IDLs for many trace elements in aqueous solution than does the ICPAES method used by Paragon Analytics, Inc. Instrument detection limits associated with ICPAES vary between laboratories, depending on the specific instrument and the configuration being used (axial vs radial view). Analytical results provided by NMED-OB and Paragon Analytics, Inc., showed some inconsistencies in IDLs inherent from the ICPAES method. Because of the favorable comparison, EES-6 data have been combined with the rest of the data since they are suitable and representative of the background geochemistry.

F-2.3.5 Summary for Stable Isotopes and Tritium

Stable isotope data reported by Geochron, USGS, and the University of Miami are most representative of the Pajarito Plateau and surrounding areas. These data, in conjunction with Laboratory site data, are used to evaluate the source and elevation of recharge water. Tritium results provided by the University of Miami are the most accurate for the background stations sampled during this investigation. These analytical results can be compared with Laboratory site data to quantitatively place a general age on water. Deep groundwaters with an activity of tritium of <1 pCi/L are greater than 60 yr old. Analytical results provided by EES-6, Paragon Analytics, Inc., and GEL compare very well, and data from these analytical laboratories have been combined for alluvial groundwater, perched intermediate groundwater, and the regional aquifer.

F-3.0 STANDARD OPERATING PROCEDURES

This section contains the original Appendix F text from revision 1 of this report. This section presents a summary of the standard operating procedures (SOPs) used by Earth and Environmental Science Division (EES-6). Analytical instruments and their application for sample characterization are listed to provide the basis of selecting EES-6 for screening analyses during this investigation. Analytical methods used during this investigation included inductively coupled plasma atomic (optical) emission spectroscopy (ICPAES), graphite furnace atomic absorption (GFAA), cold vapor atomic absorption (CVAA), ion chromatography IC, ion-specific electrode ISE, alkalinity titration, and gaseous hydride generation atomic absorption (GHAA) spectroscopy.

F-3.1 Elements by ICP Atomic Emission Spectroscopy

Los Alamos National Laboratory SOP-01.1, R0 describes the procedure used in determining the following elements by ICPAES: aluminum, boron, barium, beryllium, calcium, cadmium, cobalt, chromium, copper, iron, potassium, lithium, magnesium, manganese, molybdenum, sodium, nickel, lead, silicon, silver, strontium, titanium, vanadium, and zinc. This method is comparable to SW-846 Method 6010A and Environmental Protection Agency (EPA) Method 200.7 (EPA 1987, 31732).

The following equipment may be used and will be controlled in accordance with LANL-EES-6-AP-01.11, Control of Measuring and Test Equipment and Standards:

- ICPAES: Leeman's Model PS1000UV inductively coupled plasma ICP emission spectrophotometer (PN 738144) and the following accessories
  - Autosampler
  - Integrated software for system control and data management
  - Questron Qwave 3000 microwave (PN 971309)
  - Mettler PE 1600 balance (PN 624733)
  - Mettler AE 240 balance (PN 656788)
  - Pipettes and appropriate labware

This SOP applies to samples requiring ICPAES for work under the EES quality management plan (QMP) by EES-6 personnel. Any sample that can be put into a solution and for which the element concentrations are within the instrument's detection range can be analyzed by ICPAES. Elements that have detection limits insufficient for the samples being analyzed must be determined using alternative methods, such as GFAA or gaseous hydride atomic absorption spectroscopy (GHAA).

F-3.2 Elements by Graphite Furnace Atomic Absorption Spectroscopy

EES-1-SOP-01.2, R0 describes the procedure used for analyzing the following trace elements by GFAA spectroscopy: antimony, arsenic, cadmium, cobalt, chromium, cesium, copper, molybdenum, nickel, lead, rubidium, selenium, silver, tin, and thallium. This SOP is comparable to EPA Method 200.9 (EPA 1987, 31732).

The following equipment may be used and will be controlled in accordance with AP-01.11, Control of Measuring and Test Equipment and Standards:

- Perkin Elmer Model 5500 Atomic Absorption Spectrophotometer with continuum background corrector (PN 487640) and the following accessories
  - Model HGA 500 furnace accessory (PN 487638)
  - AS40 autosampler (PN 733079)
  - Single or multielement hollow cathode lamps, or electrode discharge lamps (EDLs) (PN 834654) with Perkin Elmer system two- power supply
  - Perkin Elmer 7700 computer system (PN 656260) with HGA Graphics II data software
  - Questron Qwave 3000 microwave (PN 971309)
  - Mettler PE 1600 Balance (PN 624733)
  - Mettler AE 240 Balance (PN 656788)
  - Pipettes and appropriate labware

This SOP applies to samples, with low-level concentrations of dissolved elements, requiring GFAA for work under the EES-QMP. Any sample that can be put into a solution and for which the sample matrix does not create an interference that cannot be compensated for by background correction or matrix modification can be analyzed by GFAA.

F-3.3 Elements by Gaseous Hydride Atomic Absorption Spectroscopy

LANL-EES-1-SOP-01.3, R0 describes the procedure used for analyzing the following elements by GHAA: antimony, arsenic, and selenium. This SOP is comparable to SW-846 Methods 7062 and 7742 (EPA 1986, 31732).

The following equipment may be used in this SOP and will be controlled in accordance with EES-6-AP-01.11, Control of Measuring and Test Equipment and Standards:

- Perkin Elmer Model 5500 Atomic Absorption Spectrophotometer (PN 487640) and the following accessories:
  - Single or multielement hollow cathode lamps, or estimated detection limit (EDL) (PN 834654) with Perkin Elmer System two- power supply
  - Perkin Elmer 7700 computer system (PN 656260) with HGA Graphics II data software
  - Cold-vapor/hydride generator, Perkin Elmer Model MHS-10 (PN 838904)
  - Argon, acetylene, and compressed air
  - Questron Qwave 3000 microwave (PN 971309)
  - Mettler PE 1600 balance (PN 624733)
  - Mettler AE 240 balance (PN 656788)
  - pipettes and appropriate lab ware

This SOP applies to liquid, solid, and slurry samples requiring GHAA for work under the EES-QMP.

F-3.4 Cold Vapor Atomic Absorption Spectroscopy

EES-1-SOP-01.4, R0 describes the equipment used for CVAA analysis of the organic and inorganic mercury in aqueous, solid, and semisolid samples. This SOP is comparable to SW-846 Methods 7470A and 7471A and EPA Method 245.1 (EPA 1987, 31732).

The following equipment may be used in this SOP and will be controlled in accordance with LANL-EES-6-AP-01.11, Control of Measuring and Test Equipment and Standards:

- Perkin Elmer Model 5500 Atomic Absorption Spectrophotometer (PN 487640) and the following accessories
  - Single or multielement hollow cathode lamps, or EDLs (PN 834654) with Perkin Elmer System 2 power supply.
  - Perkin Elmer 7700 computer system (PN 656260) with HGA Graphics II data software
  - Cold-vapor/hydride generator, Perkin Elmer Model MHS-10 (PN 838904)
  - Questron Qwave 3000 microwave (PN 971309)
  - Mettler PE 1600 balance (PN 624733)
  - Mettler AE 240 balance (PN 656788)
  - Pipettes and appropriate labware
  - Argon gas

This SOP applies to liquid, solid, and slurry samples to be analyzed under the EES-QMP.

F-3.5 Alkalinity Titration

EES-1-SOP-01.8, R0 describes the procedure used for determining alkalinity in water samples and reporting this alkalinity as bicarbonate, carbonate, and hydroxide, or as total alkalinity, as applicable.

The following equipment may be used in this SOP and will be controlled in accordance with EES-6-AP-01.11, Control of Measuring and Test Equipment and Standards:

- Mettler DL25 Titrator (PN 843449) and the following accessories
  - Mettler ST20 sample changer
  - Printer
  - Combination pH electrode
  - Automatic temperature compensator probe
  - Mettler PE 1600 balance (PN 624733)
  - Pipettes and appropriate labware

This SOP applies to aqueous solutions with a pH above the bicarbonate endpoint to be analyzed under the EES QMP.

F-3.6 Specific Conductance

EES-1-SOP-01.7, R0 describes the procedure used to determine the specific conductance of a solution using an Orion Model 160 Conductivity meter and an Orion Model 016010 Electrode conductivity cell.

The following equipment may be used in this SOP and will be controlled in accordance with EES-6-AP-01.11, Control of Measuring and Test Equipment and Standards:

- Conductivity meter, Orion Model 160 (S/N 23637032)
- Four-electrode conductivity cell, Orion Model 016010

This SOP applies to aqueous samples requiring a conductivity measurement for work under the EES-QMP.

F-3.7 Ion Chromatography

EES-1-SOP-01.5, R0 describes the procedure used for preparing and analyzing the following analytes for IC, including: fluoride, chloride, nitrite, bromide, nitrate, phosphate, sulfate, iodide, chlorate, perchlorate, thiosulfate, and thiocyanate. Other analytes may be included if their characteristics make them amenable to this SOP. This SOP is comparable to SW-846 Method 9056 and EPA Method 300.0 (EPA 1987, 31732).

The following equipment may be used in this SOP and will be controlled in accordance with EES-6-AP-01.11, Control of Measuring and Test Equipment and Standards:

- Ion Chromatograph, Dionex Model 4000 and 4500i with conductivity and ultraviolet/visible (UV/Vis) detectors and the following accessories:
  - Dionex AutoIon 450 data system
  - automated sampler
  - suppressor system

– ion exchange columns
– pipettes and appropriate labware

This SOP applies to aqueous samples, or samples that through pretreatment can be made aqueous, requiring IC for work under the EES-QMP.

F-3.8 Ion-Selective Electrode Measurements

LANL-EES-1-SOP-01.10, R0 describes the procedure used for measuring the concentration of the following ions in solution using electrochemical sensors: ammonium, fluoride, and sulfide. The potential for the electrochemical sensors varies with the logarithm of the ion's activity in solution.

The following equipment may be used in this SOP and will be controlled in accordance with EES-6-AP-01.11, Control of Measuring and Test Equipment and Standards:

- Orion combination fluoride electrode, model 96-09
- Orion ammonium electrode, model 95-12
- Orion silver/sulfide electrode, model 94-16
- Orion double junction reference electrode, model 90-02
- Magnetic stirrer

This SOP applies to solutions requiring ammonium, fluoride, and sulfide measurements for work under the EES-QMP.

F-4.0 EES AND PARAGON ANALYTICS, INC. COMPARISONS

Apache Spring was sampled six times during the course of the investigation conducted for Rev. 0 and Rev. 1 of this report. Analytical results (trace elements) for duplicate samples analyzed by both EES-6 and Paragon Analytics, Inc., during February 1998 are provided in Figure F-4-1. Method-detection limits are lower for those trace elements (arsenic, cadmium, cobalt, and nickel) analyzed by AA methods compared to the same elements analyzed by the ICPAES method, as shown in Figure F-4-1. The units of mg/L and ppm are equivalent in these low-ionic-strength waters. Sample results reported by Paragon Analytics, Inc., showed some inconsistencies in detection limits inherent from the ICPAES method (Figure F-4-1). Paragon Analytics, Inc., reported higher concentrations of aluminum, iron, manganese, and vanadium compared to EES-6 results for this sampling event, but there is good agreement between the two laboratories for barium, lead, and strontium.

Figure F-4-2 shows an excellent comparison between analytical results for major cations reported by EES-6 and Paragon Analytics, Inc., for alluvial well LAO-B sampled in February and October 1998. Concentrations of calcium, potassium, magnesium, and generally sodium are within analytical uncertainties measured by each laboratory and data plot on or close to the line characterized by a 1:1 slope (exact agreement). Both laboratories used the ICPAES method for the major ion analysis. There is some variation in solute concentrations for well LAO-B, reflecting both short residence time within alluvial groundwater and variation in surface water chemistry. During 1998, concentrations of calcium, magnesium, potassium, and sodium were lower in February than those reported for the October samples.

Figure F-4-3 is a plot of analytical results for major ions and TDS reported by both EES-6 and Paragon Analytics, Inc., for duplicate groundwater samples collected at Apache Spring during February 1998. For most of the major ions, there is an excellent agreement in analytical results reported by the two laboratories. The EES-6 analytical laboratory, however, reported a bicarbonate concentration of 65 ppm, but Paragon Analytics, Inc., reported a value of 54 mg/L for this sampling event. Discrepancy in the reported bicarbonate concentrations could be caused by carbon dioxide gas diffusion from the sample bottle sent to Paragon Analytics, Inc. (analyzed one to two weeks later than EES-6), resulting in a lower bicarbonate concentration. The EES-6 laboratory also reported higher TDS of 175 ppm (or mg/L) as compared with Paragon's reported value of 160 mg/L, which is reflected by the higher bicarbonate concentration.

Figure F-4-4 shows an excellent comparison of analytical results between Paragon Analytics, Inc., and EES-6 for major ion concentrations at Doe Spring sampled in February and September 1998. Concentrations of calcium and sodium show some variation within 1 to 2 mg/L or ppm. Calcium concentrations were slightly higher in February 1998, but sodium concentrations were higher in September 1998. There is very little variation in analyte concentrations for chloride, magnesium, potassium, and sulfate measured during the two sampling events, suggesting a longer residence time for intermediate perched groundwater discharging at Doe Spring as compared with alluvial groundwater (LAO-B).

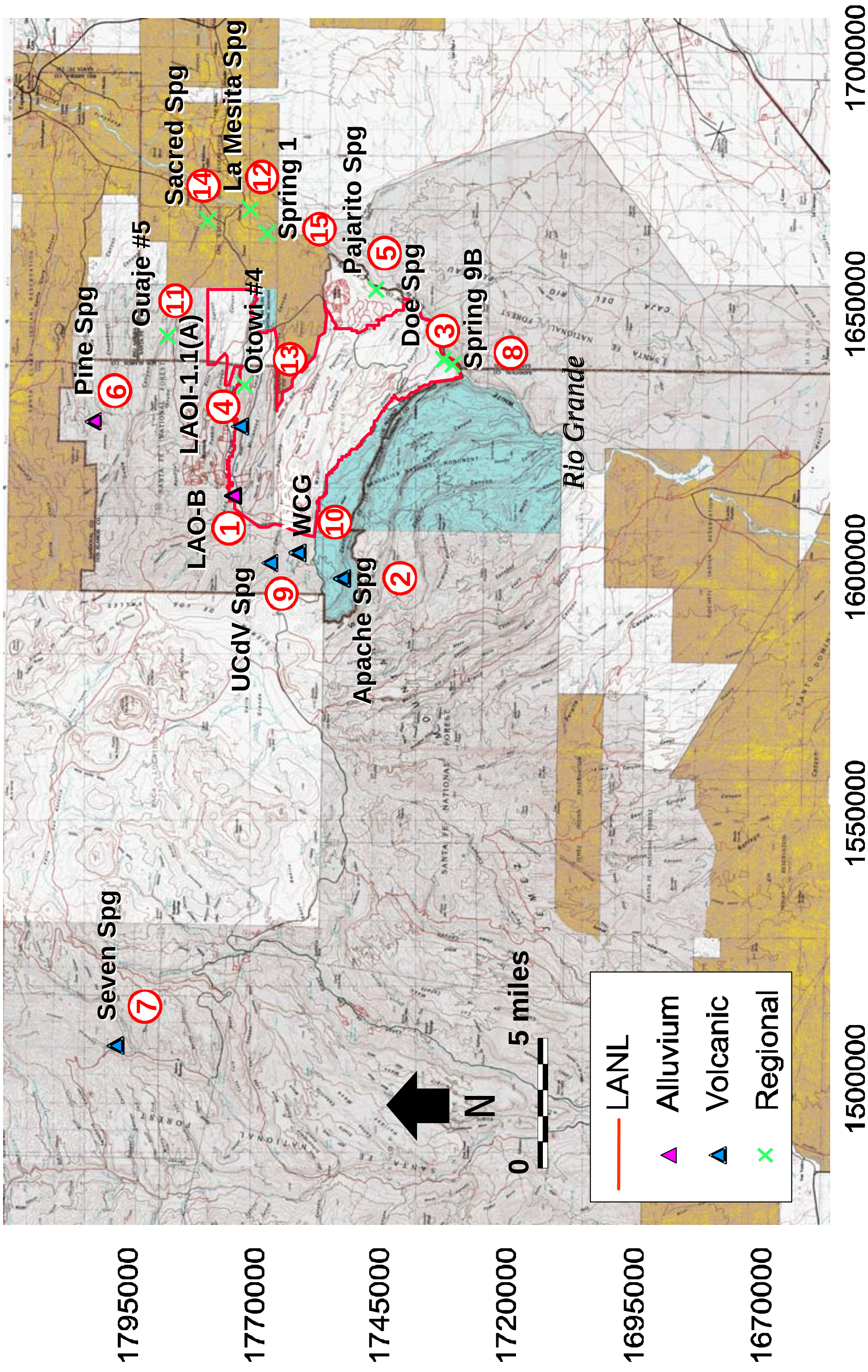
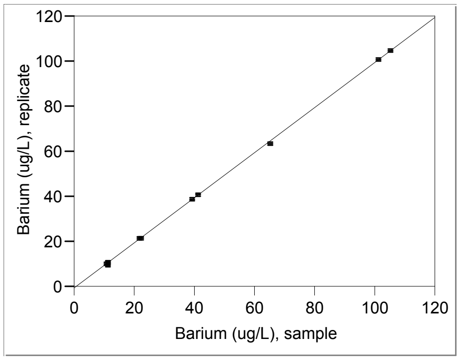
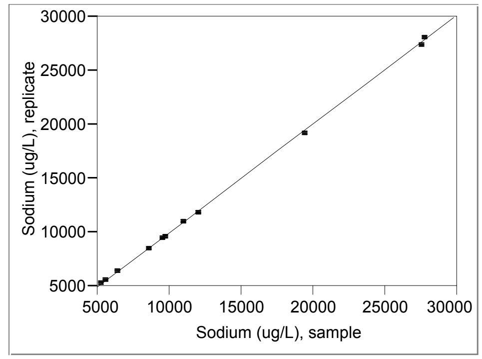


Figure F-1.3-1. Location of 15 sampling sites in the Jemez Mountains and near Los Alamos National Laboratory, New Mexico

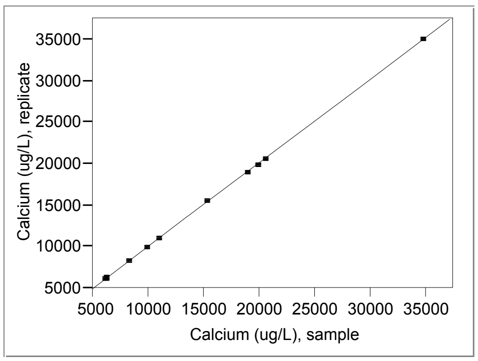
(Note: Sites 5, 12, and 14 are not background locations.)



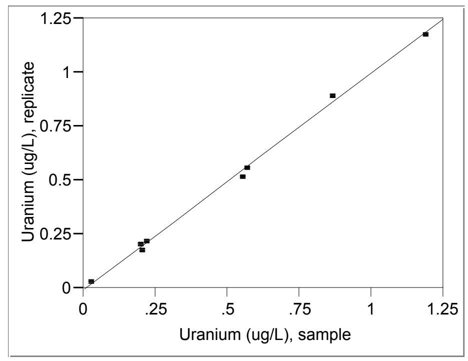
Ba [dup.] = -0.3 + 1.00*Ba, $r^2 > 0.99$, n = 11



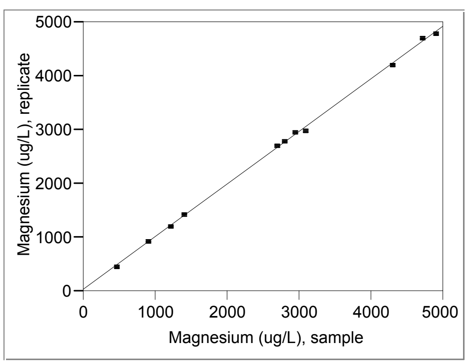
Na [dup.] = -89 + 1.01*Na, $r^2 > 0.99$, n = 11



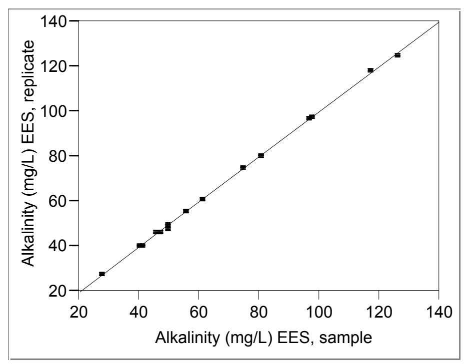
Ca [dup.] = -65 + 1.01*Ca, $r^2 > 0.99$, n = 11



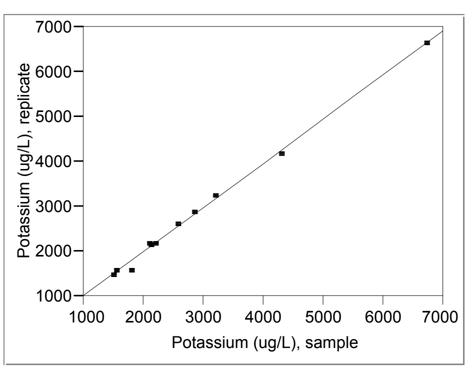
U [dup.] = -0.01 + 1.00*U, $r^2 > 0.99$, n = 8



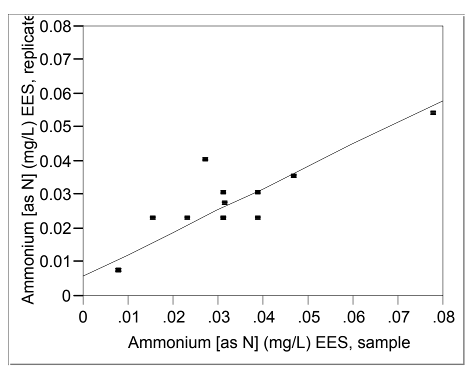
Mg [dup.] = 29 + 0.98*Mg, $r^2 > 0.99$, n = 11



Alk. [dup.] = -0.6 + 1.00*Alk., $r^2 > 0.99$, n = 15

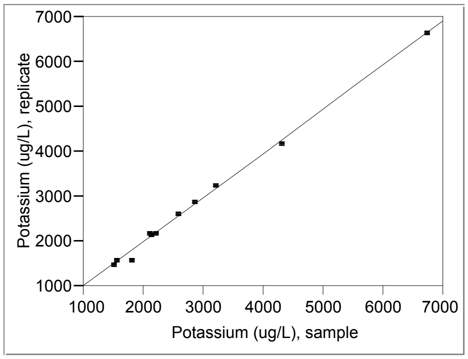


K [dup.] = 33 + 0.98*K, $r^2 > 0.99$, n = 11

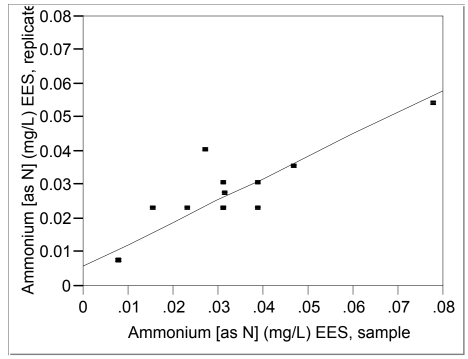


NH_4^+ [dup.] = 0.006 + 0.65*NH_4^+, $r^2 >= 0.81$, n = 16

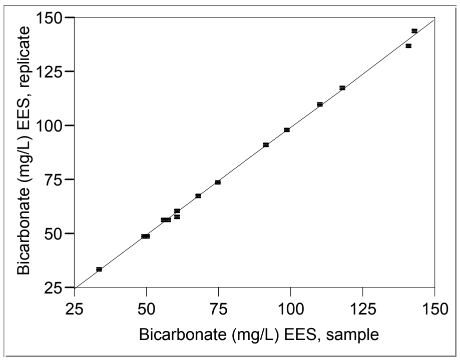
Figure F-2.2-1. Comparison of field replicate (dup.) samples (“plus” symbols are nonfiltered samples, and squares are filtered samples)



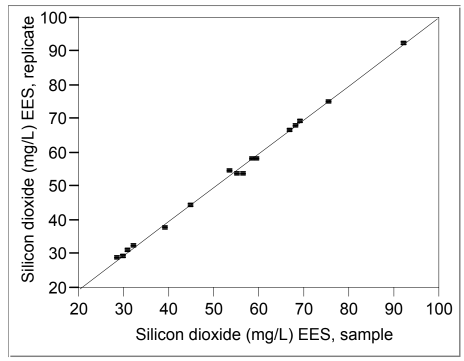
K [dup.] = 33 + 0.98*K, $r^2 > 0.99$, n = 11



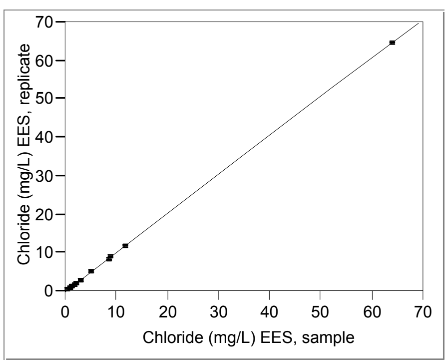
NH_4^+ [dup.] = 0.006 + 0.65*NH_4^+, $r^2 >= 0.81$, n = 16



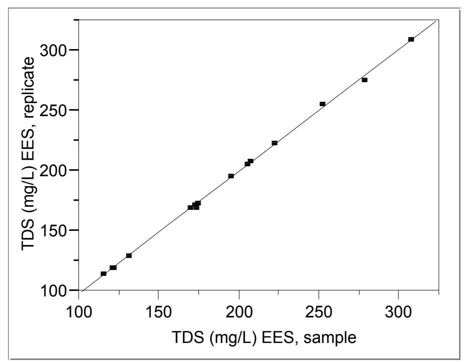
HCO_3^- [dup.] = -0.2 + 1.00*HCO_3^-, $r^2 > 0.99$, n = 15



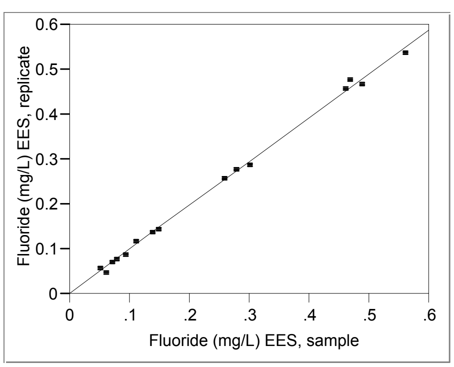
SiO_2 [dup.] = -0.5 + 1.00*SiO_2, $r^2 > 0.99$, n = 16



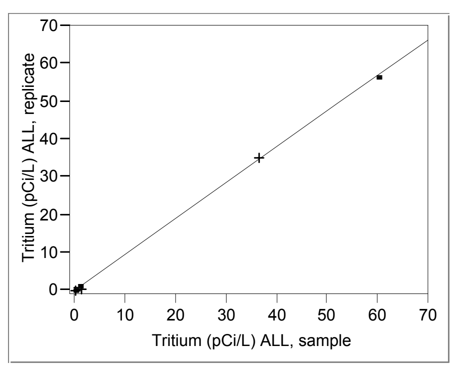
Cl^- [dup.] = -0.1 + 1.01*Cl^-, $r^2 > 0.99$, n = 15



TDS [dup.] = -4 + 1.01*TDS, $r^2 > 0.99$, n = 15

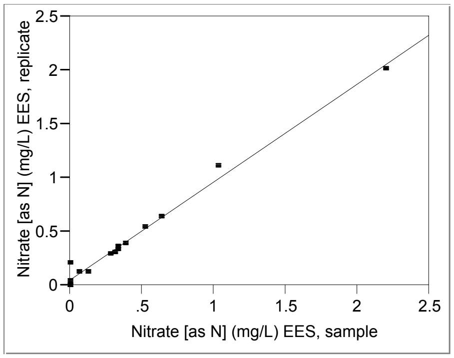


F^- [dup.] = 0.002 + 0.98*F^-, $r^2 > 0.99$, n = 15



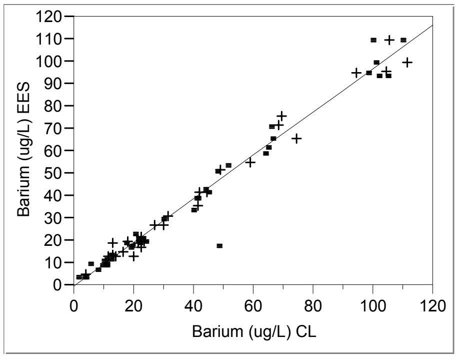
H-3 [dup.] = -0.08 + 0.95*H-3, $r^2 > 0.99$, n = 7

Figure F-2.2-1 (continued)

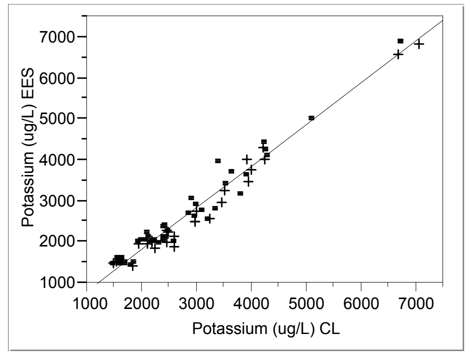


NO_3^- [dup.] = 0.06 + 0.91*NO_3^-, r^2 = 0.99, n = 15

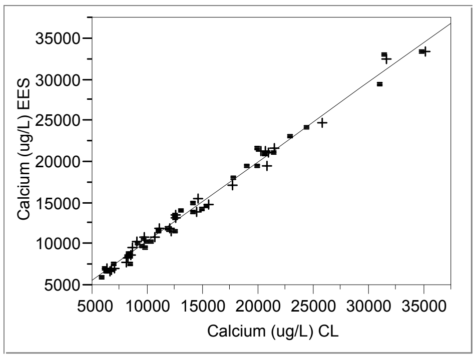
Figure F-2.2-1. (continued)



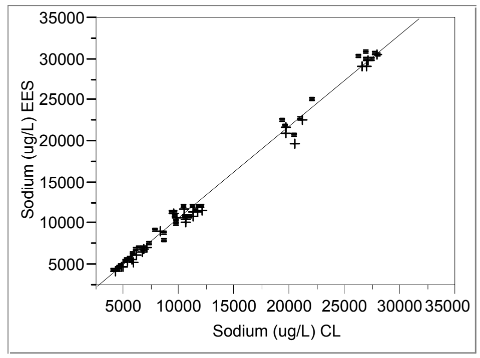
Ba EES = -0.2 + 0.97*Ba, r^2 = 0.97, n = 70



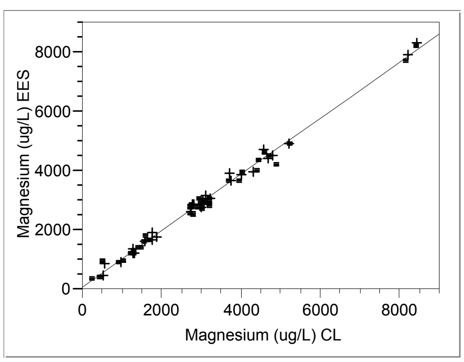
K EES = -210 + 1.01*K, r^2 = 0.97, n = 70



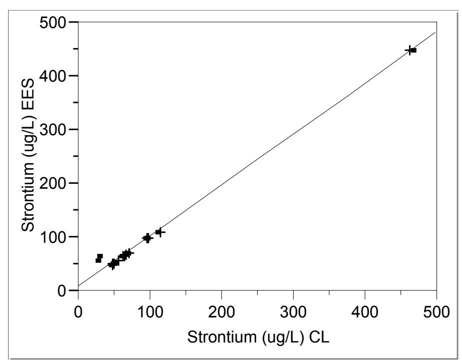
Ca EES = 730 + 0.97*Ca, r^2 = 0.97, n = 70



Na EES = -530 + 1.12*Na, r^2 = 0.99, n = 70

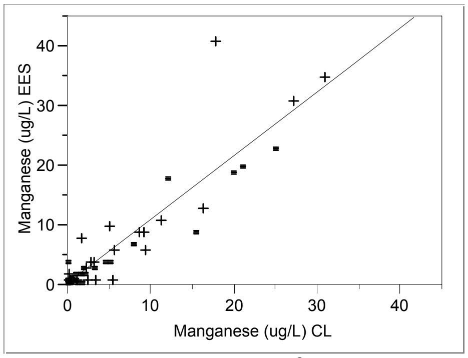


Mg EES = 99 + 0.95 Mg (μg/L), r^2 = 0.99, n = 70

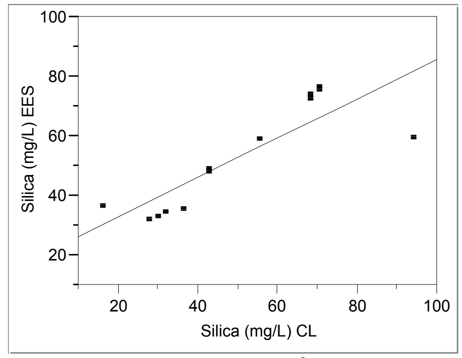


Sr EES = 8.8 + 0.94*Sr, r^2 = 0.99, n = 24

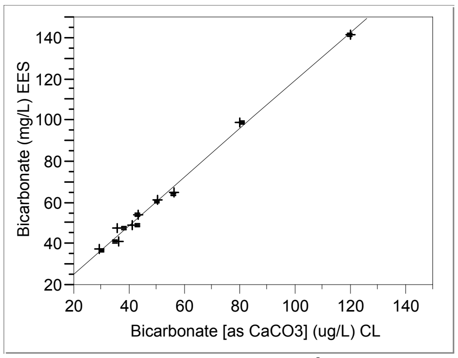
Figure F-2.2-2. Comparison of water chemistry results for analytical laboratories and methods (“plus” symbols are nonfiltered samples, and squares are filtered samples)



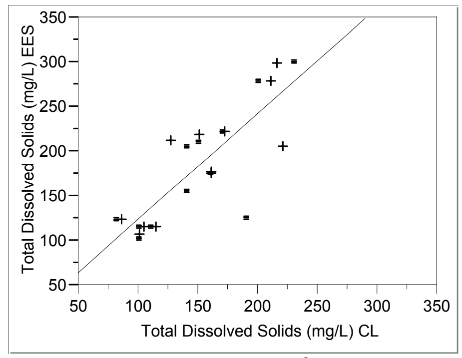
Mn EES = 0.41 + 1.07 Mn, $r^2 = 0.83$, n = 62



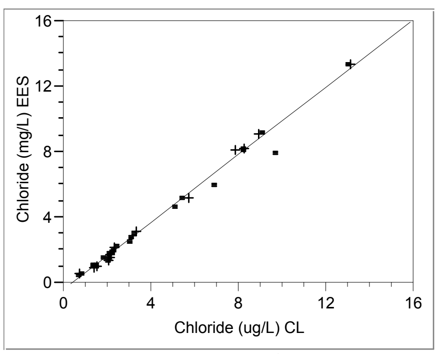
SiO_2 EES = 20 + 0.66 SiO_2, $r^2 = 0.72$, n = 13



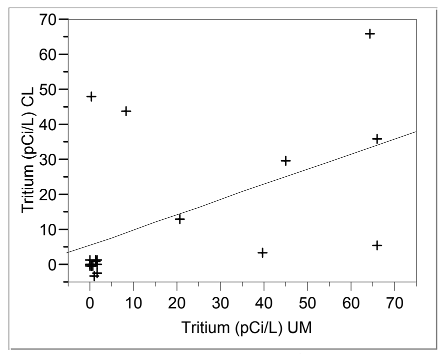
HCO_3^- EES = 2.2 + 1.17 HCO_3^-, $r^2 > 0.99$, n = 18



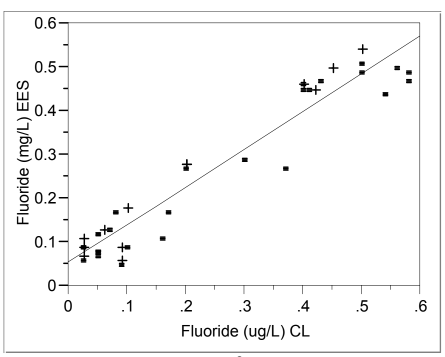
TDS EES = 5.7 + 1.18 TDS, $r^2 = 0.69$, n = 24



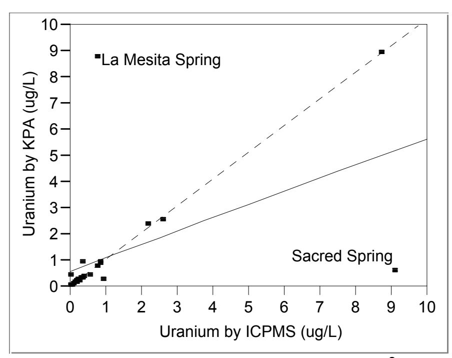
Cl^- EES = -0.4 + 1.03*Cl^-, $r^2 = 0.99$, n = 39



H-3 CL = 5.7 + 0.43*H-3 UM, $r^2 = 0.27$, n = 19

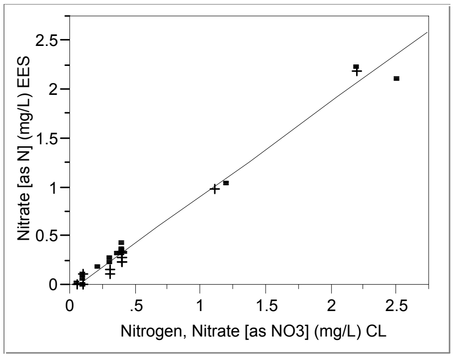


F^- EES = 0.05 + 0.86 F^-, $r^2 = 0.92$, n = 39



U by LIKPA = 0.61 + 0.51*U by ICPMS, $r^2 = 0.26$,n = 27
U by LIKPA = 0.04 + 1.02*U by ICPMS, $r^2 = 0.99$, 25*
* without two outliers

Figure F-2.2-2. (continued)



NO_3^- EES = -0.06 + 0.96*NO_3^-, r^2 = 0.98, n = 31

EES = Earth and Environmental Sciences
CL = contract laboratory
LIKPA= laser-induced kinetic phosphorometric analysis
ICPMS = inductively coupled plasma mass spectrometry
UM = University of Miami

Figure F-2.2-2. (continued)

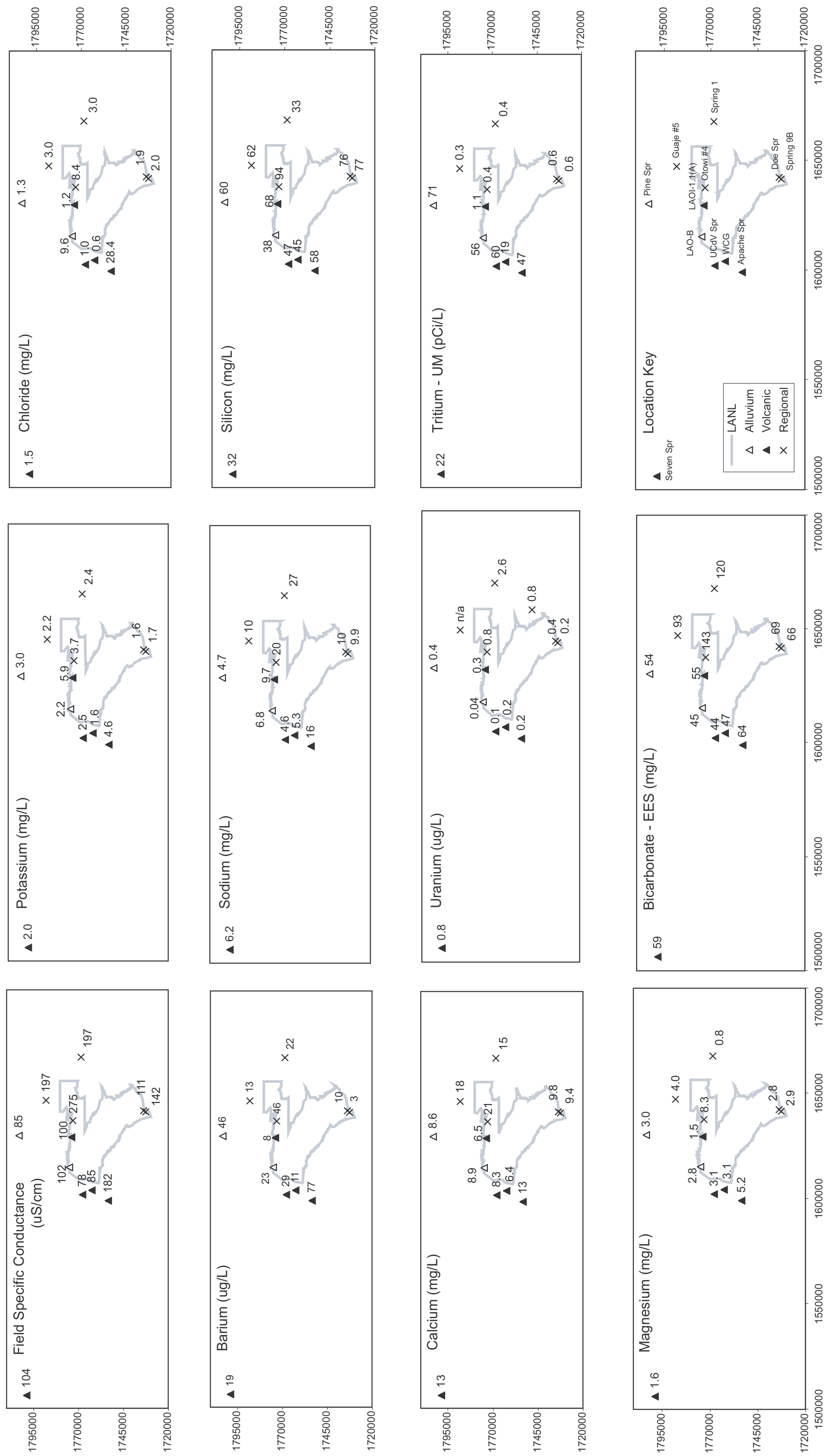
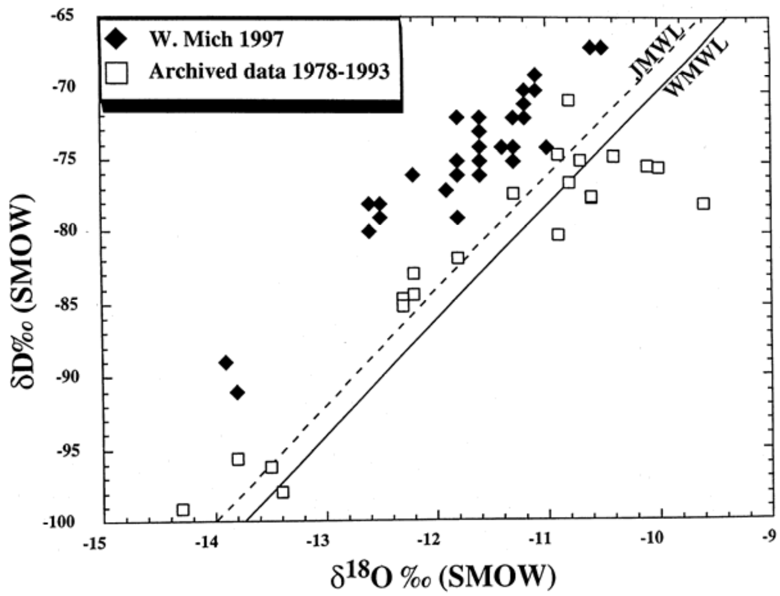
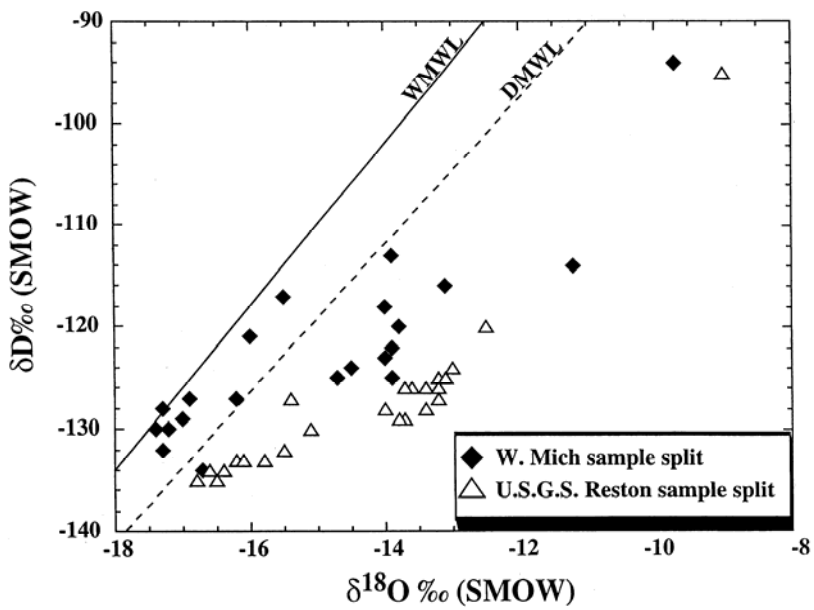


Figure F-2.2-3. Average spatial distributions (n = 6) for key analytes at Laboratory background wells and springs



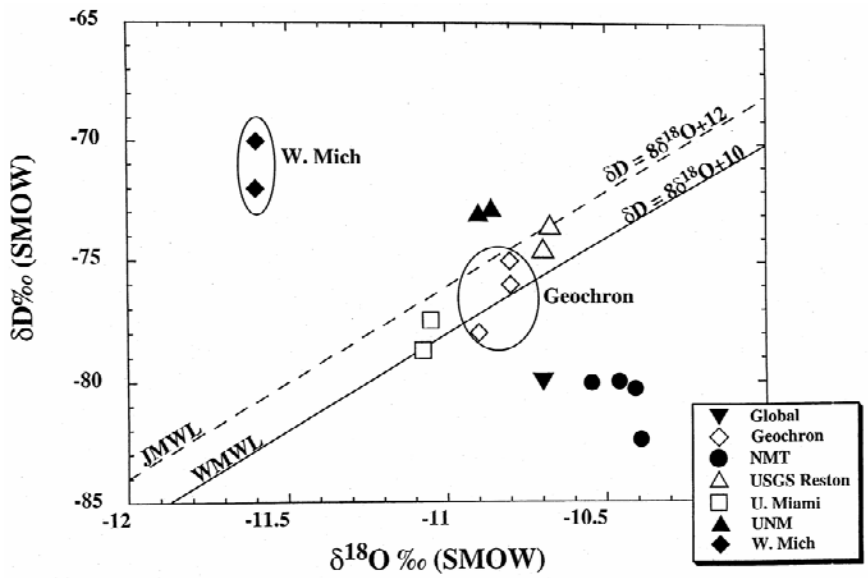
WMWL = worldwide meteoric water line
JMWL = Jemez meteoric water line

Figure F-2.3-1. Comparison of archived stable isotope data with University of Western Michigan 1997 data



WMWL = worldwide meteoric water line
DMWL = Dixie Valley meteoric water line

Figure F-2.3-2. Laboratory comparison of sample splits from Dixie Valley, Nevada (Goff et al. 2002, 88776)



WMWL = worldwide meteoric water line
JMWL = Jemez meteoric water line

Figure F-2.3-3. Comparative stable isotope results from Los Alamos National Laboratory internal standard

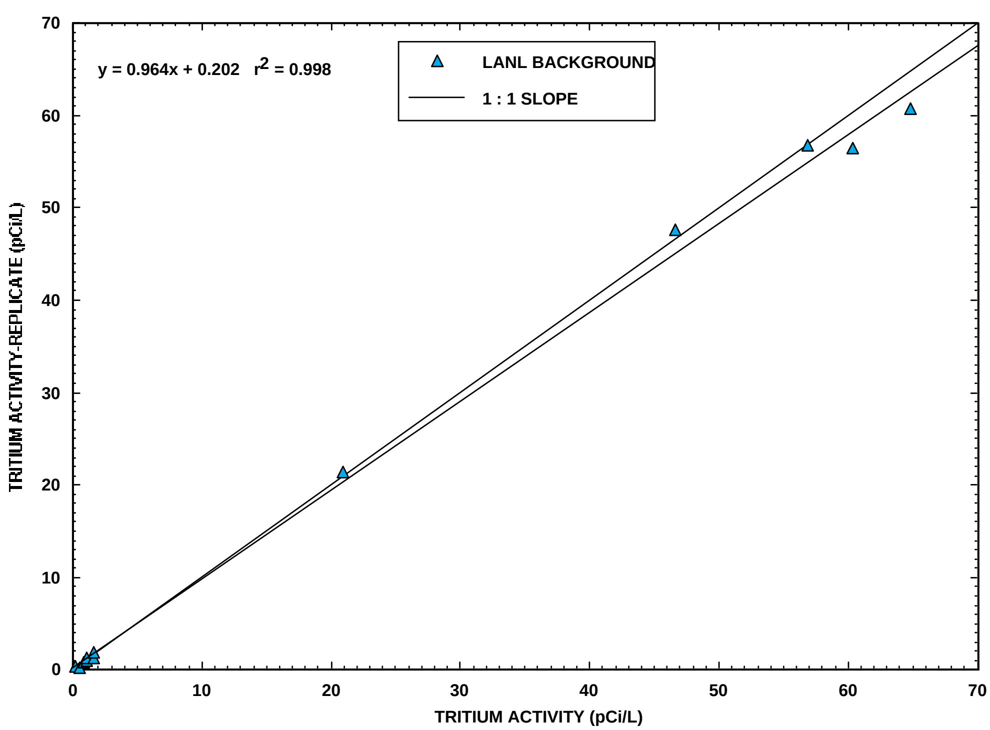


Figure F-2.3-4. Comparison of primary and duplicate water samples analyzed for tritium by the University of Miami, Los Alamos National Laboratory background sites, 1997–1998

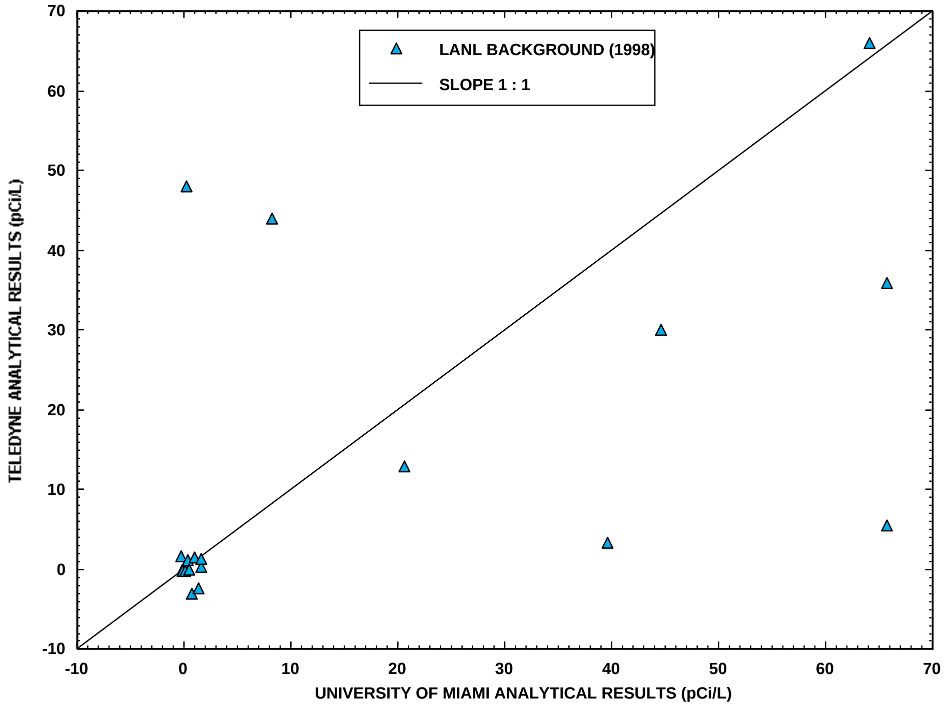


Figure F-2.3-5. Comparison of tritium results reported by the University of Miami and Teledyne for Los Alamos National Laboratory background groundwater samples collected from April through October, 1998

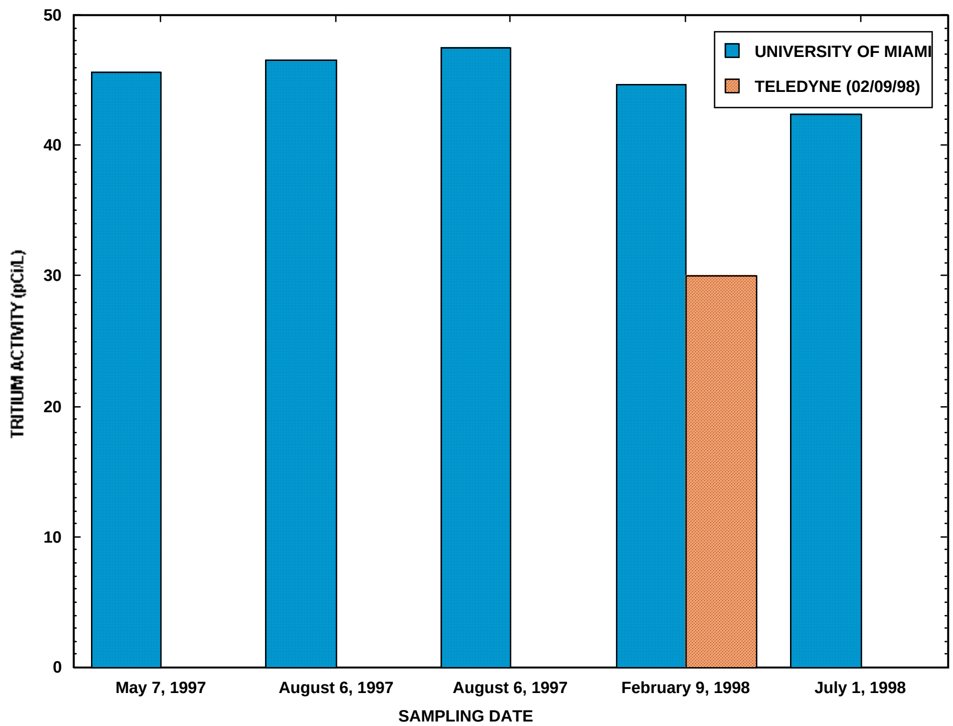


Figure F-2.3-6. Comparison of tritium results reported by the University of Miami and Teledyne for Apache Spring; (left to right) groundwater samples were collected during May 7, 1997; August 6, 1997; August 6, 1997 (dup.);February 9, 1998; and July 1, 1998

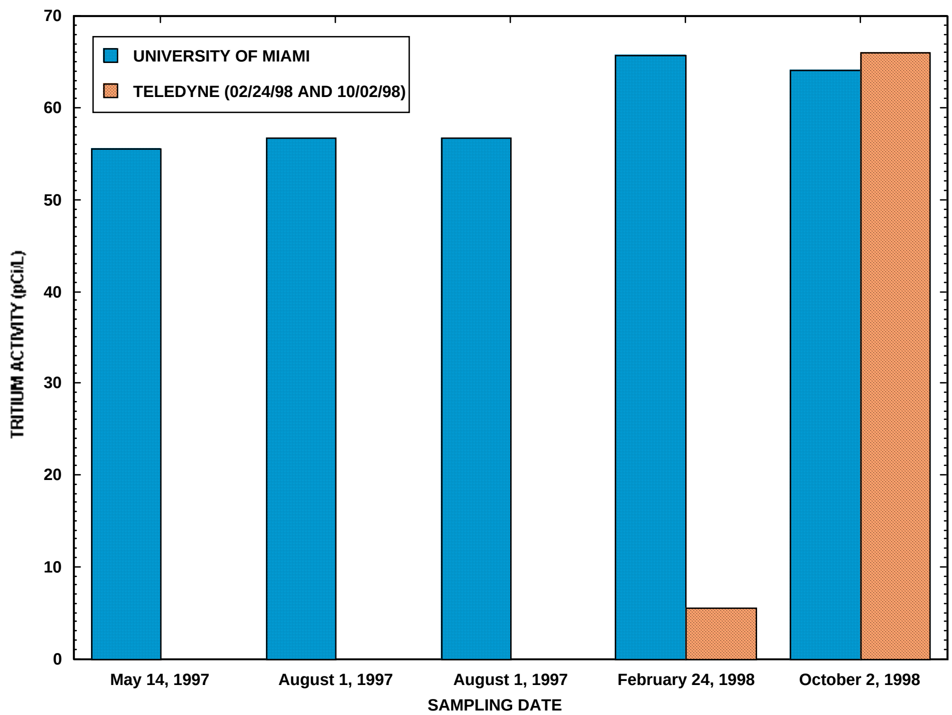


Figure F-2.3-7. Comparison of tritium results reported by the University of Miami and Teledyne for LAO-B well; (left to right) groundwater samples collected during May 14, 1997; August 1, 1997; August 1, 1997 (dup.); February 24, 1998; and October 2, 1998

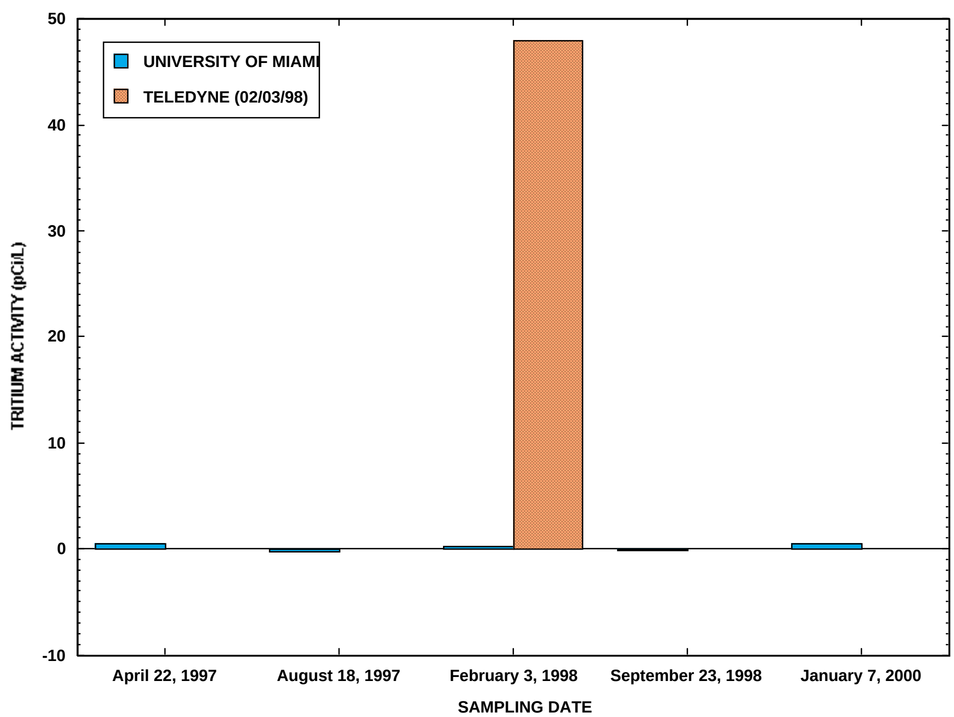


Figure F-2.3-8. Comparison of tritium results reported by the University of Miami and Teledyne for Spring 9B; (left to right) groundwater samples collected during April 22, 1997; August 18, 1997; February 3, 1998; and September 23, 1998; and January 7, 2000

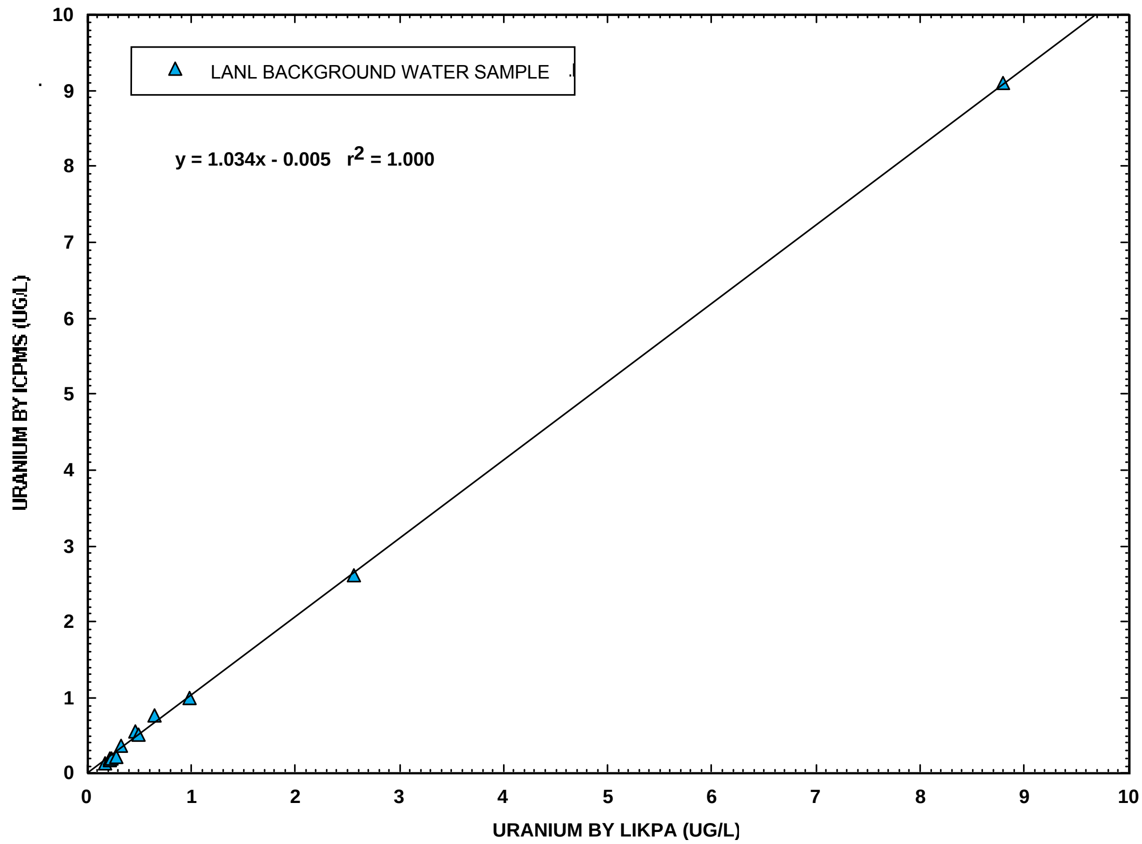


Figure F-2.3-9. Comparison of dissolved uranium analyzed by laser-induced kinetic phosphorimetric analysis and inductively coupled plasma mass spectrometry for Laboratory background sampling stations, December 1999 and January 2000

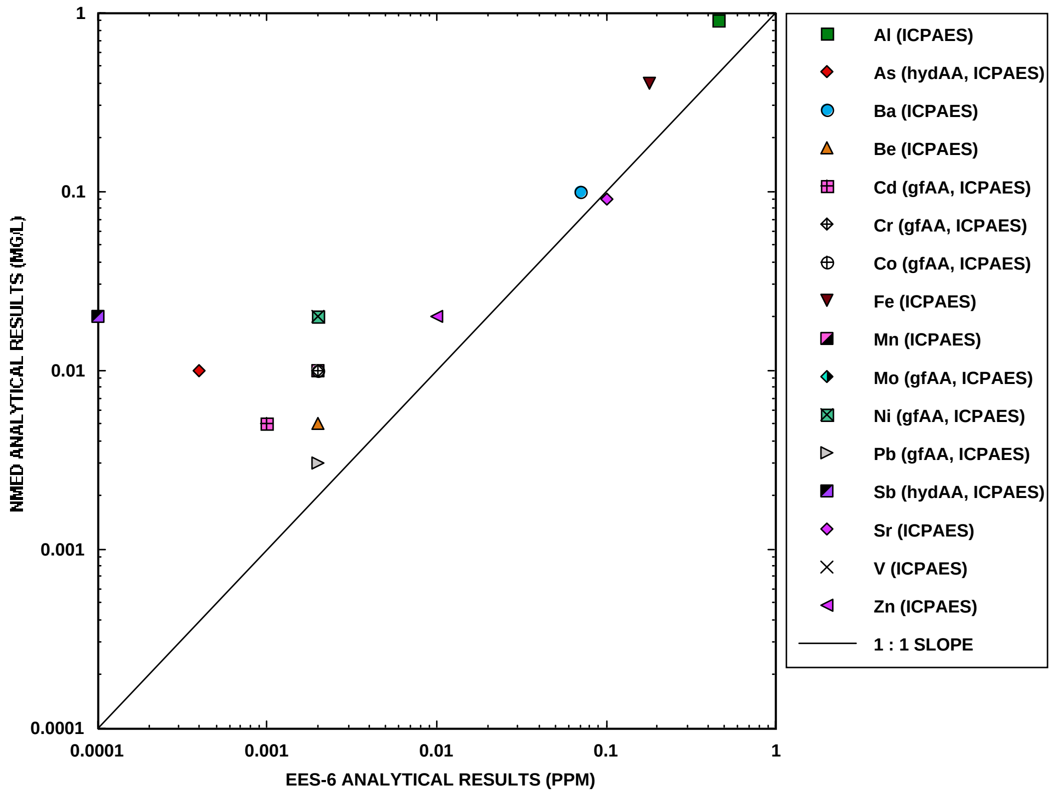


Figure F-4-1. Comparison of trace element chemistries reported by EES-6 and NMED for Apache Spring (Tschicoma Formation) sampled in February 1998

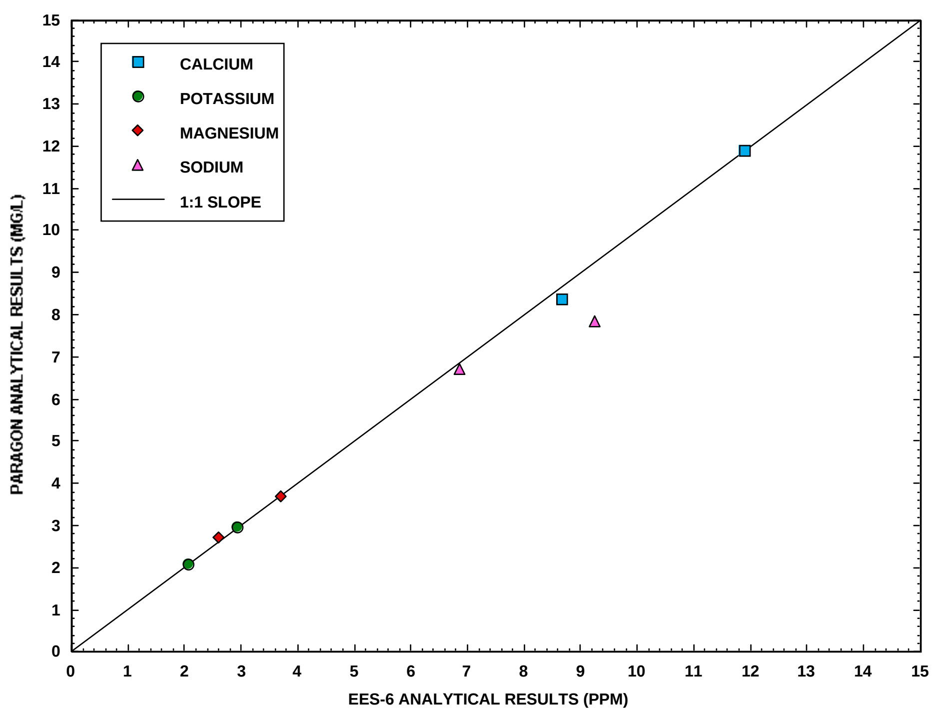


Figure F-4-2. Comparison of major ion chemistries reported by EES-6 and Paragon Analytics, Inc., for well LAO-B (alluvium) in February and October 1998

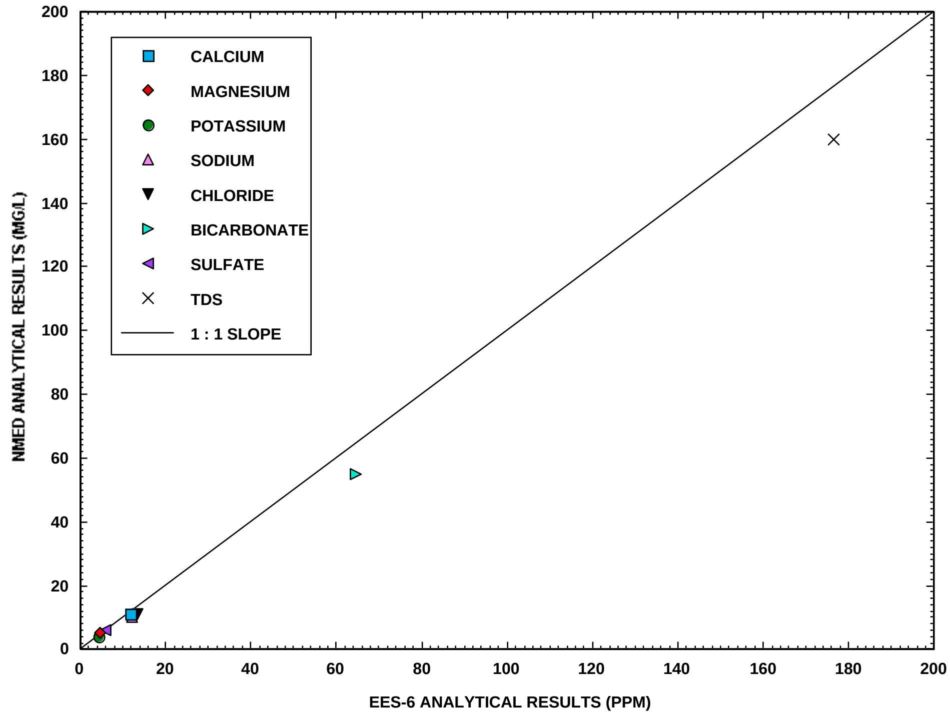


Figure F-4-3. Comparison of major ion chemistries and total dissolved solids reported by EES-6 and NMED for Apache Spring (Tschicoma Formation) sampled in February 1998

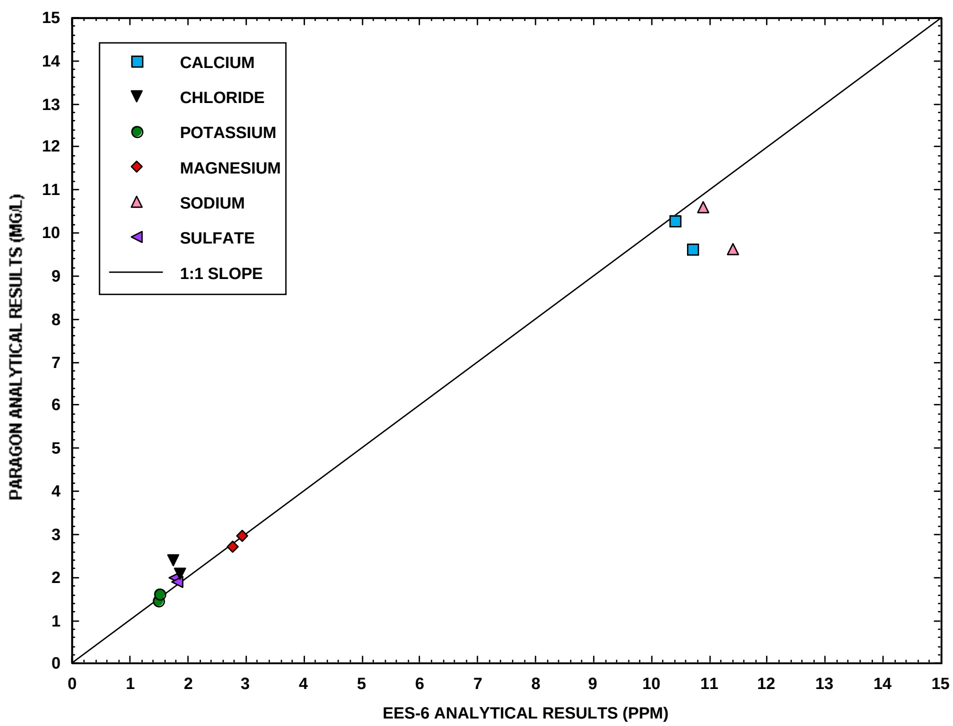


Figure F-4-4. Comparison of major ion chemistry (dissolved) reported by EES-6 and Paragon Analytics, Inc., for Doe Spring (basalt) sampled in February and September 1998

Table F-1.1-1
Data Input Requirements for Laboratory Background Hydrogeochemistry Investigation

Water Quality Database Conditions	
Condition	Reason
Lab Sample Type Code = 'CS'	Eliminate analytical laboratory duplicates or blanks
Lab Code NOT IN 'CST'	Eliminate results from contract laboratory CST
Start Date > '1-1-2000'	Eliminate older results
Lab Qual Code NOT IN 'R', 'X'	Eliminate results rejected by either laboratory or secondary validation
Lab Code LIKE 'UMTL' for 'H3'	Limit tritium results to lower detection limit method
Well Class NOT IN 'Borehole'	Eliminate borehole samples
Anyl Meth Code NOT IN 'EPA:901.1' for 'Cs-137'	Limit Cesium-137 results to lower detection limit method
Anyl Meth Code IN 'SW-846:8321A(M)' or 'SW846 6850 Modified' for 'ClO4'	Limits perchlorate results to lower detection limit method
Field QC Type Code IS 'NULL'	Eliminate field duplicates or blanks
Environmental Remediation Database Conditions	
Condition	Reason
Location in Pine Spring or Spring 9B	Limits locations to Pine Spring and Spring 9B
Analyte Description listed in table 3.1-1b	Limits data to analytes pulled from WQDB
Start Date listed	Eliminates data without a start date
FLD_QC_TYPE_CODE either 'NULL' or 'NA'	Eliminates field duplicates or blanks

Table F-1.1-2
Names and General Locations of Background Sample Stations

Station Name	Location	Latitude and Longitude	Groundwater Category
Apache Spring	Sierra de los Valles, west of LANL	N35˚49'28.3"; W106˚23'23.38"	Perched Intermediate
Doe Spring	White Rock Canyon	N35˚45'53.51"; W106˚14'34.55"	Regional Aquifer
Pine Spring	Pajarito Plateau, north of Laboratory	N35˚57'21.95"; W106˚17'04.52"	Alluvial
Seven Springs	West Jemez Mountains	N35˚48'14.05"; W106˚42'14.0"	Perched Intermediate
Spring 1	White Rock Canyon, San Ildefonso Pueblo	N35˚51'32.55"; W106˚08'34.08"	Regional Aquifer
Spring 9B	White Rock Canyon	N35˚45'40.46"; W106˚14'36.88"	Regional Aquifer
Upper Cañon de Valle Spring	West of Laboratory	N35˚51'32.38"; W106˚22'47.09"	Perched Intermediate
Water Canyon Gallery	West of Laboratory	N35˚50'39"; W106˚22'19"	Perched Intermediate
Water Supply Well O-4	Middle Los Alamos Canyon	N35˚52'22"; W106˚15'35"	Regional Aquifer
Water Supply Well G-5	Guaje Canyon, north of Laboratory	N35˚54'51"; W106˚13'37"	Regional Aquifer
Well LAOI-1.1(a)	Upper Los Alamos Canyon	N35°52'31.6"; W106°17'13.5"	Perched Intermediate
Well LAO-B	Upper Los Alamos Canyon	N35°52’43.8"; W106°20'7.1"	Alluvial

Table F-1.2-1
Summary of Field Parameters Measured at LANL Background Sampling Stations, 1997–2000

Sample Station	Date MM/DD/YY	Temperature (°C)	Specific Conductance (µS/cm)	pH[a]	Turbidity[b] (NTU)
Doe Spring, filtered	04/22/97	17.5	125L[c]	8.19	—[d]
Doe Spring, nonfiltered	04/22/97	17.5	124L	8.19	—
Spring 9B, filtered	04/22/97	20.1	122L	7.82	—
Spring 9B, nonfiltered	04/22/97	20.1	122L	7.82	—
Seven Springs, filtered	04/27/97	12.4	83	7.49	0
Seven Springs, nonfiltered	04/27/97	12.4	83	7.49	0
Pine Spring, filtered	05/07/97	6.8	100	5.81	0
Pine Spring, nonfiltered	05/07/97	6.8	100	5.81	0
Apache Spring, filtered	05/07/97	8.3	199	7.27	0
Apache Spring, nonfiltered	05/07/97	8.3	199	7.27	0
Water Canyon Gallery, filtered	05/07/97	11.3	104	7.42	0
Water Canyon Gallery, nonfiltered	05/07/97	11.3	104	7.42	0
LAOI-1.1(a), filtered	05/09/97	9.7	114	6.82	0
LAOI-1.1(a), nonfiltered	05/09/97	9.7	114	6.82	0
LAOI-1.1(a), filtered, duplicate	05/09/97	9.7	114	6.82	0
Upper Cañon de Valle, filtered, duplicate	05/13/97	8.9	70	7.33	0
Upper Cañon de Valle, filtered	05/13/97	8.9	70	7.33	0
Upper Cañon de Valle, nonfiltered	05/13/97	8.9	70	7.33	0
LAO-B, filtered	05/14/97	4.8	105	6.64	0
LAO-B, nonfiltered	05/14/97	4.8	105	6.64	0
Spring 1, filtered	05/21/97	16.8	218	7.43	0
Spring 1, nonfiltered	05/21/97	16.8	218	7.43	0
Otowi 4, filtered	05/29/97	27.9	306	6.92	—
Otowi 4, nonfiltered	05/29/97	27.9	306	6.92	—
Otowi 4, filtered, duplicate	05/29/97	27.9	306	6.92	—
Guaje 5, filtered	05/29/97	26.8	186	7.86	—
Guaje 5, nonfiltered	05/29/97	26.8	186	7.86	—
Guaje 5, filtered, duplicate	05/29/97	26.8	186	7.86	—
LAO-B, filtered	08/01/97	9.6	98	6.79	1
LAO-B nonfiltered	08/01/97	9.6	98	6.79	1
LAO-B, filtered, duplicate	08/01/97	9.6	98	6.79	1
Upper Cañon de Valle, filtered	08/04/97	8.2	94	7.30	0
Upper Cañon de Valle, nonfiltered	08/04/97	8.2	94	7.30	0
Pine Spring, filtered	08/04/97	12.5	146	6.46	0
Pine Spring, nonfiltered	08/04/97	12.5	146	6.46	0
Pine Spring, filtered, duplicate	08/04/97	12.5	146	6.46	0
Spring 1, filtered	08/05/97	17.3	231L	6.5	—
Spring 1, nonfiltered	08/05/97	17.3	234L	6.5	—

Table F-1.2-1 (continued)

Sample Station	Date MM/DD/YY	Temperature (°C)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)
Water Canyon Gallery, filtered	08/06/97	11.2	78.7L	7.21	—
Water Canyon Gallery, nonfiltered	08/06/97	11.2	79.3L	7.21	—
Apache Spring, filtered	08/06/97	8.6	330L	7.26	—
Apache Spring, nonfiltered	08/06/97	8.6	334L	7.26	—
Apache Spring, filtered, duplicate	08/06/97	8.6	337L	7.26	—
Seven Springs, filtered	08/07/97	11.7	112L	7.33	—
Seven Springs, nonfiltered	08/07/97	11.7	113L	7.33	—
Seven Springs, filtered, duplicate	08/07/97	11.7	114L	7.33	—
Spring 9B, filtered	08/18/97	20.5	225	7.85	—
Spring 9B, nonfiltered	08/18/97	20.5	225	7.85	0
Doe Spring, filtered	08/18/97	20.2	51	8.27	0
Doe Spring, nonfiltered	08/18/97	20.2	51	8.27	0
Guaje 5, filtered	08/19/97	26.4	216	6.81	0
Guaje 5, nonfiltered	08/19/97	26.4	216	6.81	0
Otowi 4, filtered	08/19/97	27.9	219	7.40	0
Otowi 4, nonfiltered	08/19/97	27.9	219	7.40	0
LAOI-1.1(a), filtered	09/05/97	10.3	109	7.01	4
LAOI-1.1(a), nonfiltered	09/05/97	10.3	109	7.01	4
Doe Spring, filtered	02/03/98	13.8	120	8.12	15.3
Doe Spring, nonfiltered	02/03/98	13.8	120	8.12	15.3
Spring 9B, filtered	02/03/98	19.4	130	7.73	0.5
Spring 9B, nonfiltered	02/03/98	19.4	130	7.73	0.5
Water Canyon Gallery, filtered	02/09/98	11.1	90	7.74	1.8
Water Canyon Gallery, nonfiltered	02/09/98	11.1	90	7.74	1.8
Water Canyon Gallery, filtered, duplicate	02/09/98	11.1	90	7.74	1.8
Apache Spring, filtered	02/09/98	6.5	165	7.96	5.0
Apache Spring, nonfiltered	02/09/98	6.5	165	7.96	5.0
Pine Spring, filtered	02/10/98	3.6	70	6.78	41.7
Pine Spring, nonfiltered	02/10/98	3.6	70	6.78	41.7
Seven Springs, filtered	02/10/98	10.5	120	7.50	2.2
Seven Springs, nonfiltered	02/10/98	10.5	120	7.50	2.2
Upper Cañon de Valle, filtered	02/23/98	6.7	80	8.04	1.4
Upper Cañon de Valle, nonfiltered	02/23/98	6.7	80	8.04	1.4
LAO-B, filtered	02/24/98	4.4	90	6.91	4.1
LAO-B, nonfiltered	02/24/98	4.4	90	6.91	4.1
LAOI-1.1(a), filtered	02/25/98	8.7	100	6.68	27.2
LAOI-1.1(a), nonfiltered	02/25/98	8.7	100	6.68	27.2
Guaje 5, filtered (not sampled)	—	—	—	—	—
Guaje 5, nonfiltered (not sampled)	—	—	—	—	—
Otowi 4, filtered	02/26/98	26.1	290	7.58	1.4

Table F-1.2-1 (continued)

Sample Station	Date MM/DD/YY	Temperature (°C)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)
Otowi 4, nonfiltered	02/26/98	26.1	290	7.58	1.4
Spring 1, filtered	04/07/98	15.6	215	7.99	5.4
Spring 1, nonfiltered	04/07/98	15.6	215	7.99	5.4
Upper Cañon de Valle, filtered	07/01/98	7.3	65	7.76	4.6
Upper Cañon de Valle, nonfiltered	07/01/98	7.3	65	7.76	4.6
Apache Spring, filtered	07/01/98	9.1	130	7.32	23.8
Apache Spring, nonfiltered	07/01/98	9.1	130	7.32	23.8
Seven Springs, filtered	07/06/98	10.7	100	7.51	2.7
Seven Springs, nonfiltered	07/06/98	10.7	100	7.51	2.7
Spring 1, filtered	07/07/98	17.6	190	7.81	2.6
Spring 1, nonfiltered	07/07/98	17.6	190	7.81	2.6
Spring 1, filtered, duplicate	07/07/98	17.6	190	7.81	2.6
Water Canyon Gallery, filtered	07/08/98	10.8	65	7.23	1.7
Water Canyon Gallery, nonfiltered	07/08/98	10.8	65	7.23	1.7
Pine Spring, filtered	07/14/98	12.7	80	6.34	17.8
Pine Spring, nonfiltered	07/14/98	12.7	80	6.34	17.8
Pine Spring at source, filtered	07/14/98	9.8	—	7.14	—
Doe Spring, filtered	09/23/98	21.0	167	7.71	—
Doe Spring, nonfiltered	09/23/98	21.0	167	7.71	—
Spring 9B, filtered	09/23/98	20.5	111	7.26	—
Spring 9B, nonfiltered	09/23/98	20.5	111	7.26	—
Otowi 4, filtered	09/28/98	27.5	285	7.45	0.6
Otowi 4, nonfiltered	09/28/98	27.5	285	7.45	0.6
Guaje 5, filtered	09/28/98	24.2	190	8.11	1.1
Guaje 5, nonfiltered	09/28/98	24.2	190	8.11	1.1
LAO-B, filtered	10/02/98	9.8	140	6.83	0.6
LAO-B, nonfiltered	10/02/98	9.8	140	6.83	0.6
LAOI-1.1(a) , filtered	10/14/98	12.8	95	7.3	>30
LAOI-1.1(a), nonfiltered	10/14/98	12.8	95	7.3	>30
LAOI-1-1(a), filtered, duplicate	10/14/98	12.8	95	7.3	>30
Spring 1, filtered	12/16/99	15.2	220	8.23	4.6
Seven Springs, filtered	12/20/99	11.1	105	8.39	1.4
Apache Spring, filtered	01/05/00	6.0	135	9.15	3.1
Apache Spring, filtered, duplicate	01/05/00	6.0	135	9.15	3.1
Water Canyon Gallery, filtered	01/05/00	11.7	90	8.53	1.9
Upper Cañon de Valle, filtered	01/05/00	6.8	90	8.74	2.2
Pine Spring, filtered	01/06/00	4.8	60	8.44	43.2
Doe Spring, filtered	01/07/00	12.2	135	8.54	3.5
Doe Spring, filtered, duplicate	01/07/00	12.2	135	8.54	3.5
Spring 9B, filtered	01/07/00	18.5	145	8.54	1.6

Table F-1.2-1 (continued)

Sample Station	Date MM/DD/YY	Temperature (°C)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)
LAO-B, filtered	01/10/00	5.7	105	7.59	4.8
LAO-B, filtered, duplicate	01/10/00	5.7	105	7.59	4.8
LAOI-1.1(a), filtered	01/20/00	9.0	120	7.40	19.6
Doe Spring, nonfiltered	04/06/00	15.7	80	6.89	7.4
Doe Spring, filtered	04/06/00	15.7	80	6.89	7.4
Guaje 5, filtered (not sampled)	—	—	—	—	—
Guaje 5, nonfiltered (not sampled)	—	—	—	—	—
Otowi 4, filtered (not sampled)	—	—	—	—	—
Otowi 4, nonfiltered (not sampled)	—	—	—	—	—
LAOI-1.1(a), filtered	04/13/00	11.9	70	6.85	12.8
LAOI-1.1(a), nonfiltered	04/13/00	11.9	70	6.85	12.8
Spring 9B, filtered	04/06/00	20.0	100	6.44	0.7
Spring 9B, nonfiltered	04/06/00	20.0	100	6.44	0.7
Water Canyon Gallery, filtered	03/30/00	11.3	70	7.4	1.2
Water Canyon Gallery, nonfiltered	03/30/00	11.3	70	7.4	1.2
Water Canyon Gallery, duplicate	03/30/00	11.3	70	7.4	1.2
Water Canyon Gallery, nonfiltered	03/30/00	11.3	70	7.4	1.2
Apache Spring, filtered	03/29/00	7.6	270, 290[e]	7.33	7.3
Apache Spring, nonfiltered	03/29/00	7.6	270, 290[e]	7.33	7.3
Pine Spring, filtered	03/30/00	6.8	70, 70[e]	6.69	44.9
Pine Spring, nonfiltered	03/30/00	6.8	70, 70[e]	6.69	44.9
Pine Spring, filtered	03/30/00	6.8	70, 70[e]	6.69	44.9
Pine Spring, nonfiltered	03/30/00	6.8	70, 70[e]	6.69	44.9
Seven Springs, filtered	03/29/00	10.8	110, 110[e]	7.22	3
Seven Springs, nonfiltered	03/29/00	10.8	110, 110[e]	7.22	3
Upper Cañon de Valle, filtered	04/05/00	7.2	70	6.41	4.8
Upper Cañon de Valle, nonfiltered	04/05/00	7.2	70	6.41	4.8
LAO-B, filtered	03/24/00	3.5	78, 80[e]	6.93	3
LAO-B, nonfiltered	03/24/00	3.5	78, 80[e]	6.93	3
Spring 1, filtered	04/04/00	18.5	150, 150[e]	7.26	10.3
Spring 1, nonfiltered	04/04/00	18.5	150, 150[e]	7.26	10.3

a pH is in standard units.
b NTU = nephelometric turbidity unit.
c L denotes that specific conductance was measured in the EES-6 analytical laboratory.
d — = Not analyzed.
e Specific conductance measurements were recorded with two instruments.

Table F-1.2-2
Post-1997 Samples and Types of Analyses

Location	Prep	Type	Date MM/DD/YY	Event	Groundwater Sample ID	Sample ID	Sample ID and Method	Request Numbers	Inorganics	Inorganics EES	Rads	Tritium	Gross a, b, g	G-Scan Rads	Other	Temp (°C)	Average Specific Conductance (µS/cm)	pH	Turbidity (NTU)
Apache Spring	filtered	sample	5/7/1997	1	PP97-07	PP97-7	PP97-7 filtered	na[a]	o[b]	x[b]	o	x	o	o	x	8.3	199	7.27	0
Apache Spring	filtered	original	8/6/1997	2	PP97-29	0816-97-1043	0816-97-1043 filtered	3513R, 3514R	o	x	x	o	o	x	x	8.6	[d]—	7.26	—
Apache Spring	filtered	duplicate[c]	8/6/1997	2	PP97-30	0816-97-1044	0816-97-1044 filtered	3513R, 3514R	o	x	x	o	o	x	x	8.6	—	7.26	—
Apache Spring	filtered	sample	8/6/1997	2	PP97-30	PP97-30	PP97-30 filtered	(lab sample #0816-97-1044)	o	x	o	x	o	o	x	8.6	—	7.26	—
Apache Spring	filtered	sample	2/9/1998	3	PP98-05	0816-98-0009	0816-98-0009 filtered	4094R, 4095R, 4097R	x	x	x	o	x	x	x	6.5	165	7.96	5
Apache Spring	filtered	sample	7/1/1998	5	PP98-20	RE16-98-9025	RE16-98-9025 filtered	4384, 4385R, 4387R	x	x	x	o	x	x	x	9.1	130	7.32	23.8
Apache Spring	filtered	duplicate	1/5/2000	7	PP00-1	CABG-00-0012	CABG-00-0012 filtered	6303R, 6304R, 6302R	x	x	o	o	o	o	x	6	135	9.15	3.1
Apache Spring	filtered	original	1/5/2000	7	PP00-2	CABG-00-0013	CABG-00-0013 filtered	6303R, 6304R, 6302R	x	x	o	o	o	o	x	6	135	9.15	3.1
Apache Spring	filtered	sample	3/29/2000	8	PP00-16	CABG-00-0047	CABG-00-0047 filtered	6635R, 6634R, 6637R, 6636R	x	o	o	o	o	o	x	7.6	280	7.33	7.3
Doe Spring	filtered	sample	4/22/1997	1	PP97-01	PP97-1	PP97-1 filtered	—	o	x	o	x	o	o	x	17.5	—	8.19	—
Doe Spring	filtered	sample	8/18/1997	2	PP97-36	0816-97-1051	0816-97-1051 filtered	3586R	o	x	x	o	o	x	x	20.2	51	8.27	0
Doe Spring	filtered	sample	2/3/1998	3	PP98-01	0816-98-0002	0816-98-0002 filtered	4079R,4082R	x	x	x	o	x	x	x	13.8	120	8.12	15.3
Doe Spring	filtered	sample	9/23/1998	6	PP98-31	RE16-98-9006	RE16-98-9006 filtered	4695R, 4696R	x	x	x	o	x	x	x	21	167	7.71	—
Doe Spring	filtered	duplicate	1/7/2000	7	PP00-7	CABG-00-0018	CABG-00-0018 filtered	6320R, 6319R, 6321R	x	x	o	o	o	o	x	12.2	135	8.54	3.5
Doe Spring	filtered	original	1/7/2000	7	PP00-8	CABG-00-0019	CABG-00-0019 filtered	6320R, 6319R, 6321R	x	x	o	o	o	o	x	12.2	135	8.54	3.5
Doe Spring	filtered	sample	4/6/2000	8	PP00-36	CABG-00-0059	CABG-00-0059 filtered	6700R, 6699R, 6698R, 6701R	x	o	o	o	o	o	x	15.7	80	6.89	7.4
Guaje #5	filtered	original	5/29/1997	1	PP97-18	PP97-18	PP97-18 filtered	—	o	x	o	x	o	o	x	26.8	186	7.86	—
Guaje #5	filtered	duplicate	5/29/1997	1	PP97-19	PP97-19	PP97-19 filtered	—	o	x	o	x	o	o	x	26.8	186	7.86	—
Guaje #5	filtered	sample	8/19/1997	2	PP97-37	0816-97-1100	0816-97-1100 filtered	3603R	o	x	x	o	o	x	x	26.4	216	6.81	0
Guaje #5	filtered	sample	9/28/1998	6	PP98-34	RE16-98-9010	RE16-98-9010 filtered	4714R, 4715R, 4716R	x	x	x	o	x	x	x	24.2	190	8.11	0.55
LAO-B	filtered	sample	5/14/1997	1	PP97-13	PP97-13	PP97-13 filtered	—	o	x	o	x	o	o	x	4.8	105	6.64	0
LAO-B	filtered	original	8/1/1997	2	PP97-21	0816-97-1029	0816-97-1029 filtered	3481R, 3482R	o	x	x	o	o	x	x	9.6	98	6.79	1
LAO-B	filtered	duplicate	8/1/1997	2	PP97-22	0816-97-1030	0816-97-1030 filtered	3481R, 3482R	o	x	x	o	o	x	x	9.6	98	6.79	1
LAO-B	filtered	sample	8/1/1997	2	PP97-22	PP97-22	PP97-22 filtered	(lab sample #0816-97-1030 filtered)	o	o	o	x	o	o	x	9.6	98	6.79	1
LAO-B	filtered	sample	2/24/1998	3	PP98-11	0816-98-0049	0816-98-0049 filtered	4131R, 4132R, 4134R	x	x	x	o	x	x	x	4.4	90	6.91	4.1
LAO-B	filtered	sample	10/2/1998	6	PP98-35	RE16-98-9023	RE16-98-9023 filtered	4817R, 4818R	x	x	x	o	x	x	x	9.8	140	6.83	0.6
LAO-B	filtered	original	1/10/2000	7	PP00-10	CABG-00-0021	CABG-00-0021 filtered	6326R, 6325R, 6327R	x	x	o	o	o	o	x	5.7	105	7.59	4.8
LAO-B	filtered	duplicate	1/10/2000	7	PP00-11	CABG-00-0022	CABG-00-0022 filtered	6326R, 6325R, 6327R	x	o	o	o	o	o	x	5.7	105	7.59	4.8
LAO-B	filtered	sample	3/24/2000	8	PP00-14	CABG-00-0046	CABG-00-0046 filtered	6607R, 6609R, 6608R, 6606R	x	o	o	o	o	o	x	3.5	79	6.93	3
LAOI-1.1(a)	filtered	duplicate	5/9/1997	1	PP97-10	PP97-10	PP97-10 filtered	—	o	x	o	x	o	o	x	9.7	114	6.82	0
LAOI-1.1(a)	filtered	original	5/9/1997	1	PP97-09	PP97-9	PP97-9 filtered	—	o	x	o	x	o	o	x	9.7	114	6.82	0
LAOI-1.1(a)	filtered	sample	9/5/1997	2	PP97-39	0816-97-1096	0816-97-1096 filtered	3699R, 3700R	o	x	x	o	o	x	x	10.3	109	7.01	4
LAOI-1.1(a)	filtered	sample	2/25/1998	3	PP98-12	0816-98-0051	0816-98-0051 filtered	4136R, 4137R, 4139R	x	x	x	o	x	x	x	8.7	100	6.68	27.2

Table F-1.2-2 (continued)

Location	Prep	Type	Date MM/DD/YY	Event	Groundwater Sample ID	Sample ID	Sample ID and Method	Request Numbers	Inorganics	Inorganics EES	Rads	Tritium	Gross a, b, g	G-Scan Rads	Other	Temp (°C)	Average Specific Conductance (µS/cm)	pH	Turbidity (NTU)
LAOI-1.1(a)	filtered	sample	10/14/1998	6	PP98-37	PP98-37	PP98-37 filtered	(lab sample #RE16-98-9021 filtered)	o	o	o	x	o	o	x	12.8	95	7.3	>30
LAOI-1.1(a)	filtered	original	10/14/1998	6	PP98-36	RE16-98-9020	RE16-98-9020 filtered	4886R, 4887R, 4888R	x	x	x	o	x	x	x	12.8	95	7.3	>30
LAOI-1.1(a)	filtered	duplicate	10/14/1998	6	PP98-37	RE16-98-9021	RE16-98-9021 filtered	4886R, 4887R, 4888R	x	x	x	o	x	x	x	12.8	95	7.3	>30
LAOI-1.1(a)	filtered	sample	1/20/2000	7	PP00-12	CABG-00-0025	CABG-00-0025 filtered	6368R, 6370R	x	x	o	o	o	o	x	9	120	7.4	19.6
LAOI-1.1(a)	filtered	sample	4/13/2000	8	PP00-44	CABG-00-0061	CABG-00-0061 filtered	6744R, 6743R, 6745R, 6742R	x	o	o	o	o	o	x	11.9	70	6.85	12.8
Otowi #4	filtered	original	5/29/1997	1	PP97-16	PP97-16	PP97-16 filtered	—	o	x	o	x	o	o	x	27.9	306	6.92	—
Otowi #4	filtered	duplicate	5/29/1997	1	PP97-17	PP97-17	PP97-17 filtered	—	o	x	o	x	o	o	x	27.9	306	6.92	—
Otowi #4	filtered	sample	8/19/1997	2	PP97-38	0816-97-1098	0816-97-1098 filtered	3603R	o	x	x	o	o	x	x	27.9	219	7.4	0
Otowi #4	filtered	sample	2/26/1998	3	PP98-13	0816-98-0041	0816-98-0041 filtered	4140R, 4143R	x	x	x	o	x	x	x	26.1	290	7.58	1.4
Otowi #4	filtered	sample	9/28/1998	6	PP98-33	RE16-98-9012	RE16-98-9012 filtered	4714R, 4715R, 4716R	x	x	x	o	x	x	x	27.5	285	7.45	0.6
Pine Spring	filtered	sample	5/7/1997	1	PP97-06	PP97-6	PP97-6 filtered	—	o	x	o	x	o	o	x	6.8	100	5.81	0
Pine Spring	filtered	original	8/4/1997	2	PP97-24	0816-97-1034	0816-97-1034 filtered	3484R, 3485R	o	x	x	o	o	x	x	12.5	146	6.46	0
Pine Spring	filtered	duplicate	8/4/1997	2	PP97-25	PP97-25	PP97-25 filtered	(lab sample #0816-97-1034)	o	x	o	x	o	o	x	12.5	146	6.46	0
Pine Spring	filtered	sample	2/10/1998	3	PP98-06	0816-98-0039	0816-98-0039 filtered	4102R, 4103R, 4105R	x	x	x	o	x	x	x	3.6	70	6.78	41.7
Pine Spring	filtered	sample	7/14/1998	5	PP98-29	RE16-98-9033	RE16-98-9033 filtered	4435R, 4436R, 4437R	x	x	x	o	x	x	x	12.7	80	6.34	17.8
Pine Spring	filtered	sample	1/6/2000	7	PP00-6	CABG-00-0017	CABG-00-0017 filtered	6313R, 6312R, 6314R	x	x	o	o	o	o	x	4.8	60	8.44	43.2
Pine Spring	filtered	sample	3/30/2000	8	PP00-23	CABG-00-0051	CABG-00-0051 filtered	6642R, 6641R, 6644R, 6643R	x	o	o	o	o	o	x	6.8	70	6.69	44.9
Pine Spring	filtered	sample	3/30/2000	8	PP00-26	CABG-00-0052	CABG-00-0052 filtered	6649R, 6648R, 6651R	x	o	o	o	o	o	x	6.8	70	6.69	44.9
Pine Spring NMED	filtered	NMED	7/14/1998	5	PP98-30	PP98-30	PP98-30 filtered	—	o	o	o	x	o	o	x	9.8	—	7.14	—
Rio Grande	filtered	sample	4/22/1997	1	PP97-03	PP97-3	PP97-3 filtered	—	o	x	o	x	o	o	x	12.6	—	8.34	—
Seven Springs	filtered	sample	4/27/1997	1	PP97-05	PP97-5	PP97-5 filtered	—	o	x	o	x	o	o	x	12.4	83	7.49	0
Seven Springs	filtered	original	8/7/1997	2	PP97-32	0816-97-1048	0816-97-1048 filtered	3536R, 3537R	o	x	x	o	o	x	x	11.7	—	7.33	—
Seven Springs	filtered	duplicate	8/7/1997	2	PP97-33	0816-97-1049	0816-97-1049 filtered	3536R, 3537R	o	x	x	o	o	x	x	11.7	—	7.33	—
Seven Springs	filtered	sample	8/7/1997	2	PP97-33	PP97-33	PP97-33 filtered	(lab sample #0816-97-1049)	o	o	o	x	o	o	x	11.7	—	7.33	—
Seven Springs	filtered	sample	2/10/1998	3	PP98-07	0816-98-0037	0816-98-0037 filtered	4102R, 4105R	x	x	x	o	x	x	x	10.5	120	7.5	1.1
Seven Springs	filtered	sample	7/6/1998	5	PP98-22	RE16-98-9037	RE16-98-9037 filtered	4395R, 4396R, 4397R	x	x	x	o	x	x	x	10.7	100	7.51	2.7
Seven Springs	filtered	sample	12/20/1999	7	PP99-6	CABG-99-0008	CABG-99-0008 filtered	6288R, 6287R, 6289R	x	x	o	o	o	o	x	11.1	105	8.39	1.4
Seven Springs	filtered	sample	3/29/2000	8	PP00-18	CABG-00-0048	CABG-00-0048 filtered	6635R, 6634R, 6637R, 6636R	x	o	o	o	o	o	x	10.8	110	7.22	3
Spring 1	filtered	sample	5/21/1997	1	PP97-14	PP97-14	PP97-14 filtered	—	o	x	o	x	o	o	x	16.8	218	7.43	0
Spring 1	filtered	sample	8/5/1997	2	PP97-26	0816-97-1037	0816-97-1037 filtered	3489R, 3490R	o	x	x	o	o	x	x	17.3	—	6.5	—
Spring 1	filtered	sample	4/7/1998	4	PP98-14	0816-98-0045	0816-98-0045 filtered	4204R, 4207R	x	x	x	o	x	x	x	15.6	215	7.99	5.4
Spring 1	filtered	sample	7/7/1998	5	PP98-24	PP98-24	PP98-24 filtered	(lab sample #RE16-98-9018 filtered)	o	o	o	x	o	o	x	17.6	190	7.81	2.6
Spring 1	filtered	original	7/7/1998	5	PP98-23	RE16-98-9017	RE16-98-9017 filtered	4403R, 4405R	x	x	x	o	x	x	x	17.6	190	7.81	2.6
Spring 1	filtered	duplicate	7/7/1998	5	PP98-24	RE16-98-9018	RE16-98-9018 filtered	4403R, 4405R	x	x	x	o	x	x	x	17.6	190	7.81	2.6
Spring 1	filtered	sample	12/16/1999	7	PP99-3	CABG-99-0005	CABG-99-0005 filtered	6266R, 6265R, 6267R	x	x	o	o	o	o	x	15.2	220	8.23	4.6
Spring 1	filtered	sample	4/4/2000	8	PP00-32	CABG-00-0055	CABG-00-0055 filtered	6678R, 6676R, 6677R, 6679R	x	o	o	o	o	o	x	18.5	150	7.26	10.3
Spring 9B	filtered	sample	4/22/1997	1	PP97-02	PP97-2	PP97-2 filtered	—	o	x	o	x	o	o	x	20.1	—	7.82	—
Spring 9B	filtered	sample	8/18/1997	2	PP97-35	0816-97-1053	0816-97-1053 filtered	3586R	o	x	x	o	o	x	x	20.5	225	7.85	—
Spring 9B	filtered	sample	2/3/1998	3	PP98-02	0816-98-0004	0816-98-0004 filtered	4079R, 4080R, 4082R	x	x	x	o	x	x	x	19.4	130	7.73	0.5

Table F-1.2-2 (continued)

Location	Prep	Type	Date MM/DD/YY	Event	Groundwater Sample ID	Sample ID	Sample ID and Method	Request Numbers	Inorganics	Inorganics EES	Rads	Tritium	Gross a, b, g	G-Scan Rads	Other	Temp (°C)	Average Specific Conductance (µS/cm)	pH	Turbidity (NTU)
Spring 9B	filtered	sample	9/23/1998	6	PP98-32	RE16-98-9008	RE16-98-9008 filtered	4695R, 4696R	x	x	x	o	x	x	x	20.5	111	7.26	—
Spring 9B	filtered	sample	1/7/2000	7	PP00-9	CABG-00-0020	CABG-00-0020 filtered	6320R, 6319R, 6321R	x	x	o	o	o	o	x	18.5	145	8.54	1.6
Spring 9B	filtered	sample	4/6/2000	8	PP00-38	CABG-00-0060	CABG-00-0060 filtered	6700R, 6699R, 6698R, 6701R	x	o	o	o	o	o	x	20	100	6.44	0.7
Upper Cañon de Valle Spring	filtered	original	5/13/1997	1	PP97-11	PP97-11	PP97-11 filtered	—	o	x	o	x	o	o	x	8.9	70	7.33	0
Upper Cañon de Valle Spring	filtered	duplicate	5/13/1997	1	PP97-12	PP97-12	PP97-12 filtered	—	o	x	o	x	o	o	x	8.9	70	7.33	0
Upper Cañon de Valle Spring	filtered	sample	8/4/1997	2	PP97-23	0816-97-1032	0816-97-1032 filtered	3484R, 3485R	o	x	x	o	o	x	x	8.2	94	7.3	0
Upper Cañon de Valle Spring	filtered	sample	2/23/1998	3	PP98-10	0816-98-0035	0816-98-0035 filtered	3979R, 4127R, 4128R, 4130R	x	x	x	o	x	x	x	6.7	80	8.04	1.4
Upper Cañon de Valle Spring	filtered	sample	7/1/1998	5	PP98-19	RE16-98-9029	RE16-98-9029 filtered	4384R, 4385R, 4387R	x	x	x	o	x	x	x	7.3	65	7.76	4.6
Upper Cañon de Valle Spring	filtered	sample	1/5/2000	7	PP00-4	CABG-00-0015	CABG-00-0015 filtered	6309R, 6308R, 6310R	x	x	o	o	o	o	x	6.8	90	8.74	2.2
Upper Cañon de Valle Spring	filtered	sample	4/5/2000	8	PP00-34	CABG-00-0058	CABG-00-0058 filtered	6694R, 6693R, 6692R, 6695R	x	o	o	o	o	o	x	7.2	70	6.41	4.8
Water Canyon Gallery	filtered	sample	5/7/1997	1	PP97-08	PP97-8	PP97-8 filtered	—	o	x	o	x	o	o	x	11.3	104	7.42	0
Water Canyon Gallery	filtered	sample	8/6/1997	2	PP97-28	0816-97-1041	0816-97-1041 filtered	3513R, 3514R	o	x	x	o	o	x	x	11.2	—	7.21	—
Water Canyon Gallery	filtered	original	2/9/1998	3	PP98-03	0816-98-0006	0816-98-0006 filtered	4094R, 4095R, 4097R	x	x	x	o	x	x	x	11.1	90	7.74	1.8
Water Canyon Gallery	filtered	duplicate	2/9/1998	3	PP98-04	0816-98-0007	0816-98-0007 filtered	4094R, 4095R, 4097R	x	x	x	o	x	x	x	11.1	90	7.74	1.8
Water Canyon Gallery	filtered	sample	2/9/1998	3	PP98-04	PP98-4	PP98-4 filtered	(lab sample #0816-98-0007 and -0054 filtered)	o	o	o	x	o	o	x	11.1	90	7.74	1.8
Water Canyon Gallery	filtered	sample	7/8/1998	5	PP98-28	RE16-98-9027	RE16-98-9027 filtered	4411R, 4412R, 4413R	x	x	x	o	x	x	x	10.8	65	7.23	1.7
Water Canyon Gallery	filtered	sample	1/5/2000	7	PP00-3	CABG-00-0014	CABG-00-0014 filtered	6309R, 6308R, 6310R	x	x	o	o	o	o	x	11.7	90	8.53	1.9
Water Canyon Gallery	filtered	original	3/30/2000	8	PP00-21	CABG-00-0049	CABG-00-0049 filtered	6642R, 6641R, 6644R, 6643R	x	o	o	o	o	o	x	11.3	70	7.4	1.2
Water Canyon Gallery	filtered	duplicate	3/30/2000	8	PP00-22	CABG-00-0050	CABG-00-0050 filtered	6642R, 6641R, 6644R, 6643R	x	o	o	o	o	o	x	11.3	70	7.4	1.2
Apache Spring	nonfiltered	sample	5/7/1997	1	PP97-07	PP97-7	PP97-7 nonfiltered	—	o	x	o	o	o	o	x	8.3	199	7.27	0
Apache Spring	nonfiltered	sample	8/6/1997	2	PP97-29	0816-97-1042	0816-97-1042 nonfiltered	3514R	o	x	x	o	o	x	x	8.6	—	7.26	—
Apache Spring	nonfiltered	sample	8/6/1997	2	PP97-29	PP97-29	PP97-29 nonfiltered	(lab sample #0816-97-1042 raw, -1043 filtered)	o	o	o	x	o	o	x	8.6	—	7.26	—
Apache Spring	nonfiltered	sample	2/9/1998	3	PP98-05	0816-98-0008	0816-98-0008 nonfiltered	4094R, 4096R, 4097R	x	x	x	x	x	x	x	6.5	165	7.96	5
Apache Spring	nonfiltered	sample	2/9/1998	3	PP98-05	PP98-5	PP98-5 nonfiltered	(lab sample #0816-98-0008 raw, -0009 filtered)	o	o	o	x	o	o	x	6.5	165	7.96	5
Apache Spring	nonfiltered	sample	7/1/1998	5	PP98-20	PP98-20	PP98-20 nonfiltered	(lab sample #RE16-98-9024 raw and 9025 filtered)	o	o	o	x	o	o	x	9.1	130	7.32	23.8
Apache Spring	nonfiltered	sample	7/1/1998	5	PP98-20	RE16-98-9024	RE16-98-9024 nonfiltered	4384R, 4387R	x	x	x	o	x	x	x	9.1	130	7.32	23.8
Apache Spring	nonfiltered	original	1/5/2000	7	PP00-1	CABG-00-0001	CABG-00-0001 nonfiltered	6307R, 6305R, 6306R	o	o	o	x	o	o	x	6	135	9.15	3.1
Apache Spring	nonfiltered	duplicate	1/5/2000	7	PP00-2	CABG-00-0002	CABG-00-0002 nonfiltered	6307R, 6305R, 6306R	o	o	o	x	o	o	x	6	135	9.15	3.1
Apache Spring	nonfiltered	sample	3/29/2000	8	PP00-15	CABG-00-0029	CABG-00-0029 nonfiltered	6638R, 6640R	o	o	o	x	o	o	x	7.6	280	7.33	7.3
Doe Spring	nonfiltered	sample	4/22/1997	1	PP97-01	PP97-1	PP97-1 nonfiltered	—	o	x	o	o	o	o	x	17.5	—	8.19	—

Table F-1.2-2 (continued)

Location	Prep	Type	Date MM/DD/YY	Event	Groundwater Sample ID	Sample ID	Sample ID and Method	Request Numbers	Inorganics	Inorganics EES	Rads	Tritium	Gross a, b, g	G-Scan Rads	Other	Temp (°C)	Average Specific Conductance (µS/cm)	pH	Turbidity (NTU)
Doe Spring	nonfiltered	sample	8/18/1997	2	PP97-36	0816-97-1050	0816-97-1050 nonfiltered	3586R	o	x	x	o	o	x	x	20.2	51	8.27	0
Doe Spring	nonfiltered	sample	8/18/1997	2	PP97-36	PP97-36	PP97-36 nonfiltered	(lab sample #0816-97-1050 raw, -1051 filtered)	o	o	o	x	o	o	x	20.2	51	8.27	0
Doe Spring	nonfiltered	sample	2/3/1998	3	PP98-01	0816-98-0001	0816-98-0001 nonfiltered	4079R,4081R, 4082R	x	x	x	x	x	x	x	13.8	120	8.12	15.3
Doe Spring	nonfiltered	sample	2/3/1998	3	PP98-01	PP98-1	PP98-1 nonfiltered	(lab sample #0816-98-0001 raw, -0002 filtered)	o	o	o	x	o	o	x	13.8	120	8.12	15.3
Doe Spring	nonfiltered	sample	9/23/1998	6	PP98-31	PP98-31	PP98-31 nonfiltered	(lab sample #RE16-98-9005 raw and -9006 filtered)	o	o	o	x	o	o	x	21	167	7.71	—
Doe Spring	nonfiltered	sample	9/23/1998	6	PP98-31	RE16-98-9005	RE16-98-9005 nonfiltered	4695R	x	x	x	x	x	x	x	21	167	7.71	—
Doe Spring	nonfiltered	original	1/7/2000	7	PP00-7	CABG-00-0008	CABG-00-0008 nonfiltered	6324R, 6322R, 6323R	o	o	o	x	o	o	x	12.2	135	8.54	3.5
Doe Spring	nonfiltered	duplicate	1/7/2000	7	PP00-8	CABG-00-0009	CABG-00-0009 nonfiltered	6324R, 6322R, 6323R	o	o	o	x	o	o	x	12.2	135	8.54	3.5
Doe Spring	nonfiltered	sample	1/11/2000	7	PP99-2	CABG-00-0026	CABG-00-0026 nonfiltered	6337R, 6336R	o	o	o	x	o	o	x	—	—	6.5	—
Doe Spring	nonfiltered	sample	4/6/2000	8	PP00-35	CABG-00-0041	CABG-00-0041 nonfiltered	6702R, 6732R	o	o	o	x	o	o	x	15.7	80	6.89	7.4
Guaje #5	nonfiltered	sample	5/29/1997	1	PP97-18	PP97-18	PP97-18 nonfiltered	—	o	x	o	o	o	o	x	26.8	186	7.86	—
Guaje #5	nonfiltered	sample	8/19/1997	2	PP97-37	0816-97-1099	0816-97-1099 nonfiltered	3603R	o	x	x	o	o	x	x	26.4	216	6.81	0
Guaje #5	nonfiltered	sample	8/19/1997	2	PP97-37	PP97-37	PP97-37 nonfiltered	(lab sample #0816-97-1099 raw, -1100 filtered)	o	o	o	x	o	o	x	26.4	216	6.81	0
Guaje #5	nonfiltered	sample	9/28/1998	6	PP98-34	PP98-34	PP98-34 nonfiltered	(lab sample #RE16-98-9009 raw and -9010 filtered)	o	o	o	x	o	o	x	24.2	190	8.11	0.55
Guaje #5	nonfiltered	sample	9/28/1998	6	PP98-34	RE16-98-9009	RE16-98-9009 nonfiltered	4714R, 4715R, 4717R, 4718R	x	x	x	x	x	x	x	24.2	190	8.11	0.55
LAO-B	nonfiltered	sample	5/14/1997	1	PP97-13	PP97-13	PP97-13 nonfiltered	—	o	x	o	o	o	o	x	4.8	105	6.64	0
LAO-B	nonfiltered	sample	8/1/1997	2	PP97-21	0816-97-1028	0816-97-1028 nonfiltered	3482R	o	x	x	o	o	x	x	9.6	98	6.79	1
LAO-B	nonfiltered	sample	8/1/1997	2	PP97-21	PP97-21	PP97-21 nonfiltered	(lab sample #0816-97-1028 raw, -1029 filtered)	o	o	o	x	o	o	x	9.6	98	6.79	1
LAO-B	nonfiltered	sample	2/24/1998	3	PP98-11	0816-98-0048	0816-98-0048 nonfiltered	4131R, 4133R, 4134R	x	x	x	x	x	x	x	4.4	90	6.91	4.1
LAO-B	nonfiltered	sample	2/24/1998	3	PP98-11	PP98-11	PP98-11 nonfiltered	(lab sample #0816-98-0048 raw, -0049 filtered)	o	o	o	x	o	o	x	4.4	90	6.91	4.1
LAO-B	nonfiltered	sample	10/2/1998	6	PP98-35	PP98-35	PP98-35 nonfiltered	(lab sample #RE16-98-9022 raw and -9023 filtered)	o	o	o	x	o	o	x	9.8	140	6.83	0.6
LAO-B	nonfiltered	sample	10/2/1998	6	PP98-35	RE16-98-9022	RE16-98-9022 nonfiltered	4815R, 4816R, 4817R	x	x	x	x	x	x	x	9.8	140	6.83	0.6
LAO-B	nonfiltered	sample	1/10/2000	7	PP00-10	CABG-00-0011	CABG-00-0011 nonfiltered	6330R, 6328R	o	o	o	x	o	o	x	5.7	105	7.59	4.8
LAO-B	nonfiltered	sample	1/10/2000	7	PP00-11	CABG-00-0022	CABG-00-0022 nonfiltered	—	o	x	o	o	o	o	x	5.7	105	7.59	4.8
LAO-B	nonfiltered	sample	1/10/2000	7	PP00-11	CABG-00-0023	CABG-00-0023 nonfiltered	6330R, 6328R	o	o	o	x	o	o	x	5.7	105	7.59	4.8
LAO-B	nonfiltered	sample	3/24/2000	8	PP00-13	CABG-00-0028	CABG-00-0028 nonfiltered	6610R, 6612R	o	o	o	x	o	o	x	3.5	79	6.93	3
LAOI-1.1(a)	nonfiltered	sample	5/9/1997	1	PP97-09	PP97-9	PP97-9 nonfiltered	—	o	x	o	o	o	o	x	9.7	114	6.82	0
LAOI-1.1(a)	nonfiltered	sample	9/5/1997	2	PP97-39	0816-97-1095	0816-97-1095 nonfiltered	3700R	o	x	x	o	o	x	x	10.3	109	7.01	4
LAOI-1.1(a)	nonfiltered	sample	9/5/1997	2	PP97-39	PP97-39	PP97-39 nonfiltered	(lab sample #0816-97-1095 raw, -1096 filtered)	o	o	o	x	o	o	x	10.3	109	7.01	4
LAOI-1.1(a)	nonfiltered	sample	2/25/1998	3	PP98-12	0816-98-0050	0816-98-0050 nonfiltered	4136R, 4138R, 4139R	x	x	x	x	x	x	x	8.7	100	6.68	27.2
LAOI-1.1(a)	nonfiltered	sample	2/25/1998	3	PP98-12	PP98-12	PP98-12 nonfiltered	(lab sample #0816-98-0050 raw, -0051 filtered)	o	o	o	x	o	o	x	8.7	100	6.68	27.2

Table F-1.2-2 (continued)

Location	Prep	Type	Date MM/DD/YY	Event	Groundwater Sample ID	Sample ID	Sample ID and Method	Request Numbers	Inorganics	Inorganics EES	Rads	Tritium	Gross a, b, g	G-Scan Rads	Other	Temp (°C)	Average Specific Conductance (µS/cm)	pH	Turbidity (NTU)
LAOI-1.1(a)	nonfiltered	sample	10/14/1998	6	PP98-36	PP98-36	PP98-36 nonfiltered	(lab sample #RE16-98-9019 raw and -9020 filtered)	o	o	o	x	o	o	x	12.8	95	7.3	>30
LAOI-1.1(a)	nonfiltered	sample	10/14/1998	6	PP98-36	RE16-98-9019	RE16-98-9019 nonfiltered	4885R, 4886R, 4887R, 4889R, 4890R	x	x	x	x	x	x	x	12.8	95	7.3	>30
LAOI-1.1(a)	nonfiltered	sample	1/20/2000	7	PP00-12	CABG-00-0024	CABG-00-0024 nonfiltered	6373R, 6371R	o	o	o	x	o	o	x	9	120	7.4	19.6
LAOI-1.1(a)	nonfiltered	sample	4/13/2000	8	PP00-43	CABG-00-0043	CABG-00-0043 nonfiltered	6748R, 6746R	o	o	o	x	o	o	x	11.9	70	6.85	12.8
Otowi #4	nonfiltered	sample	5/29/1997	1	PP97-16	PP97-16	PP97-16 nonfiltered	—	o	x	o	o	o	o	x	27.9	306	6.92	—
Otowi #4	nonfiltered	sample	8/19/1997	2	PP97-38	0816-97-1097	0816-97-1097 nonfiltered	3603R	o	x	x	o	o	x	x	27.9	219	7.4	0
Otowi #4	nonfiltered	sample	8/19/1997	2	PP97-38	PP97-38	PP97-38 nonfiltered	(lab sample #0816-97-1097 raw, -1098 filtered)	o	o	o	x	o	o	x	27.9	219	7.4	0
Otowi #4	nonfiltered	sample	2/26/1998	3	PP98-13	0816-98-0040	0816-98-0040 nonfiltered	4140R,4142R, 4143R	x	x	x	x	x	x	x	26.1	290	7.58	1.4
Otowi #4	nonfiltered	sample	2/26/1998	3	PP98-13	PP98-13	PP98-13 nonfiltered	(lab sample #0816-98-0040 raw, -0041 filtered)	o	o	o	x	o	o	x	26.1	290	7.58	1.4
Otowi #4	nonfiltered	sample	9/28/1998	6	PP98-33	PP98-33	PP98-33 nonfiltered	(lab sample #RE16-98-9011 raw and -9012 filtered)	o	o	o	x	o	o	x	27.5	285	7.45	0.6
Otowi #4	nonfiltered	sample	9/28/1998	6	PP98-33	RE16-98-9011	RE16-98-9011 nonfiltered	4714R, 4715R, 4717R, 4718R	x	x	x	x	x	x	x	27.5	285	7.45	0.6
Pine Spring	nonfiltered	sample	5/7/1997	1	PP97-06	PP97-6	PP97-6 nonfiltered	—	o	x	o	o	o	o	x	6.8	100	5.81	0
Pine Spring	nonfiltered	sample	8/4/1997	2	PP97-24	0816-97-1033	0816-97-1033 nonfiltered	3485R	o	x	x	o	o	x	x	12.5	146	6.46	0
Pine Spring	nonfiltered	sample	8/4/1997	2	PP97-24	PP97-24	PP97-24 nonfiltered	(lab sample #0816-97-1033)	o	o	o	x	o	o	x	12.5	146	6.46	0
Pine Spring	nonfiltered	sample	2/10/1998	3	PP98-06	0816-98-0038	0816-98-0038 nonfiltered	4102R, 4104R, 4105R	x	x	x	x	x	x	x	3.6	70	6.78	41.7
Pine Spring	nonfiltered	sample	2/10/1998	3	PP98-06	PP98-6	PP98-6 nonfiltered	(lab sample #0816-98-0038 raw, -0039 filtered)	o	o	o	x	o	o	x	3.6	70	6.78	41.7
Pine Spring	nonfiltered	sample	7/14/1998	5	PP98-29	PP98-29	PP98-29 nonfiltered	(lab sample #RE16-98-9032 raw and -9033 filtered)	o	o	o	x	o	o	x	12.7	80	6.34	17.8
Pine Spring	nonfiltered	sample	7/14/1998	5	PP98-29	RE16-98-9032	RE16-98-9032 nonfiltered	4435R, 4437R	x	x	x	o	x	x	x	12.7	80	6.34	17.8
Pine Spring	nonfiltered	sample	1/6/2000	7	PP00-6	CABG-00-0006	CABG-00-0006 nonfiltered	6317R, 6315R, 6316R	o	o	o	x	o	o	x	4.8	60	8.44	43.2
Pine Spring	nonfiltered	sample	3/30/2000	8	PP00-24	CABG-00-0033	CABG-00-0033 nonfiltered	6645R, 6647R	o	o	o	x	o	o	x	6.8	70	6.69	44.9
Pine Spring	nonfiltered	sample	3/30/2000	8	PP00-25	CABG-00-0034	CABG-00-0034 nonfiltered	6652R, 6654R	o	o	o	x	o	o	x	6.8	70	6.69	44.9
Seven Springs	nonfiltered	sample	4/27/1997	1	PP97-05	PP97-5	PP97-5 nonfiltered	—	o	x	o	o	o	o	x	12.4	83	7.49	0
Seven Springs	nonfiltered	sample	8/7/1997	2	PP97-32	0816-97-1047	0816-97-1047 nonfiltered	3537R	o	x	x	o	o	x	x	11.7	—	7.33	—
Seven Springs	nonfiltered	sample	8/7/1997	2	PP97-32	PP97-32	PP97-32 nonfiltered	(lab sample #0816-97-1047 raw, -1048 filtered)	o	o	o	x	o	o	x	11.7	—	7.33	—
Seven Springs	nonfiltered	sample	2/10/1998	3	PP98-07	0816-98-0036	0816-98-0036 nonfiltered	4102R, 4105R	x	x	x	x	x	x	x	10.5	120	7.5	1.1
Seven Springs	nonfiltered	sample	2/10/1998	3	PP98-07	PP98-7	PP98-7 nonfiltered	(lab sample #0816-98-0036 raw, -0037 filtered)	o	o	o	x	o	o	x	10.5	120	7.5	1.1
Seven Springs	nonfiltered	sample	7/6/1998	5	PP98-22	PP98-22	PP98-22 nonfiltered	(lab sample #RE16-98-9036 raw and -9037 filtered)	o	o	o	x	o	o	x	10.7	100	7.51	2.7
Seven Springs	nonfiltered	sample	7/6/1998	5	PP98-22	RE16-98-9036	RE16-98-9036 nonfiltered	4395R, 4397R	x	x	x	o	x	x	x	10.7	100	7.51	2.7
Seven Springs	nonfiltered	sample	12/20/1999	7	PP99-6	CABG-99-0004	CABG-99-0004 nonfiltered	6292R, 6290R	o	o	o	x	o	o	x	11.1	105	8.39	1.4
Seven Springs	nonfiltered	sample	3/29/2000	8	PP00-17	CABG-00-0030	CABG-00-0030 nonfiltered	6638R, 6640R	o	o	o	x	o	o	x	10.8	110	7.22	3
Spring 1	nonfiltered	sample	5/21/1997	1	PP97-14	PP97-14	PP97-14 nonfiltered	—	o	x	o	o	o	o	x	16.8	218	7.43	0
Spring 1	nonfiltered	sample	8/5/1997	2	PP97-26	0816-97-1036	0816-97-1036 nonfiltered	3490R	o	x	x	o	o	x	x	17.3	—	6.5	—

Table F-1.2-2 (continued)

Location	Prep	Type	Date MM/DD/YY	Event	Groundwater Sample ID	Sample ID	Sample ID and Method	Request Numbers	Inorganics	Inorganics EES	Rads	Tritium	Gross a, b, g	G-Scan Rads	Other	Temp (°C)	Average Specific Conductance (µS/cm)	pH	Turbidity (NTU)
Spring 1	nonfiltered	sample	8/5/1997	2	PP97-26	PP97-26	PP97-26 nonfiltered	(lab sample #0816-97-1036 raw, -1037 filtered)	o	o	o	x	o	o	x	17.3	—	6.5	—
Spring 1	nonfiltered	sample	4/7/1998	4	PP98-14	0816-98-0044	0816-98-0044 nonfiltered	4204R, 4206R, 4207R	x	x	x	x	x	x	x	15.6	215	7.99	5.4
Spring 1	nonfiltered	sample	4/7/1998	4	PP98-14	PP98-14	PP98-14 nonfiltered	(lab sample #0816-98-0044 raw, -0045 filtered)	o	o	o	x	o	o	x	15.6	215	7.99	5.4
Spring 1	nonfiltered	sample	7/7/1998	5	PP98-23	PP98-23	PP98-23 nonfiltered	(lab sample #RE16-98-9016 raw and -9017 filtered)	o	o	o	x	o	o	x	17.6	190	7.81	2.6
Spring 1	nonfiltered	sample	7/7/1998	5	PP98-23	RE16-98-9016	RE16-98-9016 nonfiltered	4403R, 4405R	x	x	x	o	x	x	x	17.6	190	7.81	2.6
Spring 1	nonfiltered	sample	12/16/1999	7	PP99-3	CABG-99-0001	CABG-99-0001 nonfiltered	6270R, 6268R, 6269R	o	o	o	x	o	o	x	15.2	220	8.23	4.6
Spring 1	nonfiltered	sample	4/4/2000	8	PP00-31	CABG-00-0037	CABG-00-0037 nonfiltered	6680R, 6730R	o	o	o	x	o	o	x	18.5	150	7.26	10.3
Spring 9B	nonfiltered	sample	4/22/1997	1	PP97-02	PP97-2	PP97-2 nonfiltered	—	o	x	o	o	o	o	x	20.1	—	7.82	—
Spring 9B	nonfiltered	sample	8/18/1997	2	PP97-35	0816-97-1052	0816-97-1052 nonfiltered	3586R	o	x	x	o	o	x	x	20.5	225	7.85	0
Spring 9B	nonfiltered	sample	8/18/1997	2	PP97-35	PP97-35	PP97-35 nonfiltered	(lab sample #0816-97-1052 raw, -1053 filtered)	o	o	o	x	o	o	x	20.5	225	7.85	0
Spring 9B	nonfiltered	sample	2/3/1998	3	PP98-02	0816-98-0003	0816-98-0003 nonfiltered	4079R,4081R, 4082R	x	x	x	x	x	x	x	19.4	130	7.73	0.5
Spring 9B	nonfiltered	sample	2/3/1998	3	PP98-02	PP98-2	PP98-2 nonfiltered	(lab sample #0816-98-0003 raw, -0004 filtered)	o	o	o	x	o	o	x	19.4	130	7.73	0.5
Spring 9B	nonfiltered	sample	9/23/1998	6	PP98-32	PP98-32	PP98-32 nonfiltered	(lab sample #RE16-98-9007 raw and -9008 filtered)	o	o	o	x	o	o	x	20.5	111	7.26	—
Spring 9B	nonfiltered	sample	9/23/1998	6	PP98-32	RE16-98-9007	RE16-98-9007 nonfiltered	4697R	o	x	o	o	o	o	x	20.5	111	7.26	—
Spring 9B	nonfiltered	sample	1/7/2000	7	PP00-9	CABG-00-0010	CABG-00-0010 nonfiltered	6324R, 6322R, 6323R	o	o	o	x	o	o	x	18.5	145	8.54	1.6
Spring 9B	nonfiltered	sample	1/11/2000	7	PP99-1	CABG-00-0027	CABG-00-0027 nonfiltered	6337R, 6336R	o	o	o	x	o	o	x	—	—	6	—
Spring 9B	nonfiltered	sample	4/6/2000	8	PP00-37	CABG-00-0042	CABG-00-0042 nonfiltered	6702R, 6732R	o	o	o	x	o	o	x	20	100	6.44	0.7
Upper Cañon de Valle Spring	nonfiltered	sample	5/13/1997	1	PP97-12	PP97-12	PP97-12 nonfiltered	—	o	x	o	o	o	o	x	8.9	70	7.33	0
Upper Cañon de Valle Spring	nonfiltered	sample	8/4/1997	2	PP97-23	0816-97-1031	0816-97-1031 nonfiltered	3485R	o	x	x	o	o	x	x	8.2	94	7.3	0
Upper Cañon de Valle Spring	nonfiltered	sample	8/4/1997	2	PP97-23	PP97-23	PP97-23 nonfiltered	(lab sample #0816-97-1031 raw, -1032 filtered)	o	o	o	x	o	o	x	8.2	94	7.3	0
Upper Cañon de Valle Spring	nonfiltered	sample	2/23/1998	3	PP98-10	0816-98-0034	0816-98-0034 nonfiltered	4127R, 4129R, 4130R	x	x	x	x	x	x	x	6.7	80	8.04	1.4
Upper Cañon de Valle Spring	nonfiltered	sample	2/23/1998	3	PP98-10	PP98-10	PP98-10 nonfiltered	(lab sample #0816-98-0034 raw, -0035 filtered)	o	o	o	x	o	o	x	6.7	80	8.04	1.4
Upper Cañon de Valle Spring	nonfiltered	sample	7/1/1998	5	PP98-19	PP98-19	PP98-19 nonfiltered	(lab sample #RE16-98-9028 raw and -9029 filtered)	o	o	o	x	o	o	x	7.3	65	7.76	4.6
Upper Cañon de Valle Spring	nonfiltered	sample	7/1/1998	5	PP98-19	RE16-98-9028	RE16-98-9028 nonfiltered	4384R, 4387R	x	x	x	o	x	x	x	7.3	65	7.76	4.6
Upper Cañon de Valle Spring	nonfiltered	sample	1/5/2000	7	PP00-4	CABG-00-0004	CABG-00-0004 nonfiltered	6307R, 6305R, 6306R	o	o	o	x	o	o	x	6.8	90	8.74	2.2
Upper Cañon de Valle Spring	nonfiltered	sample	4/5/2000	8	PP00-33	CABG-00-0040	CABG-00-0040 nonfiltered	6696R, 6731R	o	o	o	x	o	o	x	7.2	70	6.41	4.8
Water Canyon Gallery	nonfiltered	sample	5/7/1997	1	PP97-08	PP97-8	PP97-8 nonfiltered	—	o	x	o	o	o	o	x	11.3	104	7.42	0

Table F-1.2-2 (continued)

Location	Prep	Type	Date MM/DD/YY	Event	Groundwater Sample ID	Sample ID	Sample ID and Method	Request Numbers	Inorganics	Inorganics EES	Rads	Tritium	Gross a, b, g	G-Scan Rads	Other	Temp (°C)	Average Specific Conductance (µS/cm)	pH	Turbidity (NTU)
Water Canyon Gallery	nonfiltered	sample	8/6/1997	2	PP97-28	0816-97-1040	0816-97-1040 nonfiltered	3514R	o	x	x	o	o	x	x	11.2	—	7.21	—
Water Canyon Gallery	nonfiltered	sample	8/6/1997	2	PP97-28	PP97-28	PP97-28 nonfiltered	(lab sample #0816-97-1040 raw, -1041 filtered)	o	o	o	x	o	o	x	11.2	—	7.21	—
Water Canyon Gallery	nonfiltered	sample	2/9/1998	3	PP98-03	0816-98-0005	0816-98-0005 nonfiltered	4094R, 4096R, 4097R	x	x	x	x	x	x	x	11.1	90	7.74	1.8
Water Canyon Gallery	nonfiltered	sample	2/9/1998	3	PP98-03	PP98-3	PP98-3 nonfiltered	(lab sample #0816-98-0005 and -0052 raw, -0006 and -0053 filtered)	o	o	o	x	o	o	x	11.1	90	7.74	1.8
Water Canyon Gallery	nonfiltered	sample	7/8/1998	5	PP98-28	PP98-28	PP98-28 nonfiltered	(lab sample #RE16-98-9026 raw and -9027 filtered)	o	o	o	x	o	o	x	10.8	65	7.23	1.7
Water Canyon Gallery	nonfiltered	sample	7/8/1998	5	PP98-28	RE16-98-9026	RE16-98-9026 nonfiltered	4411R, 4413R	x	x	x	o	x	x	x	10.8	65	7.23	1.7
Water Canyon Gallery	nonfiltered	sample	1/5/2000	7	PP00-3	CABG-00-0003	CABG-00-0003 nonfiltered	6307R, 6305R, 6306R	o	o	o	x	o	o	x	11.7	90	8.53	1.9
Water Canyon Gallery	nonfiltered	sample	3/30/2000	8	PP00-19	CABG-00-0031	CABG-00-0031 nonfiltered	6645R, 6647R	o	o	o	x	o	o	x	11.3	70	7.4	1.2
Water Canyon Gallery	nonfiltered	sample	3/30/2000	8	PP00-20	CABG-00-0032	CABG-00-0032 nonfiltered	6645R, 6647R	o	o	o	x	o	o	x	11.3	70	7.4	1.2

Note: The LAO-B post Cerro Grande fire samples are not included in this table.

[a] na = Not available.

[b] x = Analyzed; o = not analyzed.

[c] Duplicate = Field duplicate of the original sample; sample = sample not paired with another sample ID.

[d] — = Not measured.

Table F-1.2-3
Field Parameters and Analytes for LANL Background Hydrogeochemistry Investigation

Field Parameters
pH, Specific Conductance
Major Chemistry
Alkalinity (HCO3 + CO3), Ammonia as N, Bicarbonate, Bromide, Carbonate, Fluoride, Nitrate as N, Nitrate + Nitrite as N, Nitrite as N, Perchlorate, Silicon Dioxide, Sulfate, Total Dissolved Solids, Total Kjeldahl Nitrogen, Total Organic Carbon, Total Phosphate as P, and Total Suspended Solids
Metals
Aluminium, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc
Radionuclides
Americium-241, Cesium-137, Gross Alpha Radiation, Gross Beta Radiation, Gross Gamma Radiation, Plutonium-238, Strontium-90, Tritium, Uranium-234, Uranium-238

Table F-2.1-1
Analytical Methods Used by Contract Laboratories

Analytical Method	Analyte Suite	Analytical Laboratory
ICPAES (USEPA 6010) and CVAA (USEPA 7470)	Trace metals	Paragon Analytics, Inc.
Ion chromatography (USEPA 300.0)	Anions	Paragon Analytics, Inc.
Titrimetric (USEPA 310.1)	Bicarbonate	Paragon Analytics, Inc.
Colorimetric (USEPA 370.1)	Dissolved silica	Huffman
Laser-induced kinetic phosphorimetry	Total uranium	Paragon Analytics, Inc.
Oxidation/Combustion (SW-415.1)	Dissolved organic carbon	Huffman
(USGS/WRI 79-4)	Dissolved organic carbon fractionation	Huffman
Alpha spectrometry	^{241}Am	Paragon Analytics, Inc.
Alpha spectrometry	^{238}Pu, $^{239,240}Pu$	Paragon Analytics, Inc.
Alpha spectrometry	^{234}U, ^{235}U, ^{238}U	Paragon Analytics, Inc.
Gamma spectrometry	Gamma spectrometry analytes	Paragon Analytics, Inc.
Electrolytic enrichment/Direct counting	Tritium (low-level)	University of Miami
Gas proportional counting	^{90}Sr	Paragon Analytics, Inc.

ICPAES = Inductively coupled plasma atomic emission spectrometry.
CVAA = Cold vapor atomic adsorption.

Table F-2.1-2
EES-6 Analytical Instrumentation and Instrument-Detection Limits

Analyte	Instrument	EPA Method Number	Instrument Detection Limit (ppm)
Ag	GFAA	200.9	0.0005
	ICPAES	6010	0.002
Al	GFAA	200.9	0.002
	ICPAES	6010	0.01
As	Hydride-AA	7062	0.0002
	GFAA	200.9	0.002
	ICPAES	6010	0.05
B	ICPAES	6010	0.002
Ba	ICPAES	6010	0.002
Be	ICPAES	6010	0.002
Br	IC	300	0.005
Ca	ICPAES	6010	0.002
Cd	GFAA	200.9	0.0002
	ICPAES	6010	0.005
Cl	IC	300	0.01
ClO_3	IC	300	0.02
Co	GFAA	200.9	0.002
	ICPAES	6010	0.01
$CO_3/HCO_3/OH$	Titration	310.0	0.5
Conductivity	Electrode	—	0.5
Cr	GFAA	200.9	0.002
	ICPAES	6010	0.01
Cs	GFAA	200.9	0.002
	AA	—	0.02
Cu	GFAA	200.9	0.002
	ICPAES	6010	0.01
F	IC	300	0.01
	Electrode	—	0.01
Fe	ICPAES	6010	0.01
Hg	Cold Vapor AA	7470A	0.00002
I	IC	—	0.01
K	AA	7610	0.01
	ICPAES	6010	0.2
Li	ICPAES	6010	0.005
Mg	ICPAES	6010	0.002
Mn	ICPAES	6010	0.002
Mo	GFAA	200.9	0.002
	ICPAES	6010	0.02
Na	AA	7770	0.01
	ICPAES	6010	0.05
NH_4	Electrode	—	0.02
Ni	GFAA	200.9	0.002
	ICPAES	6010	0.01
NO_2	IC	300	0.01
NO_3	IC	300	0.01
Oxalate	IC	300	0.02
Pb	GFAA	200.9	0.002
pH	Electrode	—	0.01

Table F-2.1-2 (continued)

Analyte	Instrument	EPA Method Number	Instrument Detection Limit (ppm)
PO_4	IC	300	0.02
Rb	GFAA	200.9	0.002
	AA	—	0.01
Sb	Hydride AA	7062	0.0002
	GFAA	200.9	0.002
	ICPAES	6010	0.05
Se	Hydride AA	7742	0.0002
	GFAA	200.9	0.002
	ICPAES	6010	0.1
Si	ICPAES	6010	0.02
Sn	GFAA	200.9	0.005
SO_3	IC	300	0.01
SO_4	IC	300	0.02
S_2O_3	IC	—	0.01
Sr	ICPAES	6010	0.005
Ti	ICPAES	6010	0.002
Tl	GFAA	200.9	0.002
V	ICPAES	6010	0.002
Zn	ICPAES	6010	0.005

AA= Atomic absorption spectrometry.
GFAA =Graphite furnace atomic absorption.
IC =Ion chromatography.
ICPAES =Inductively coupled plasma atomic emission spectrometry.

Table F-2.1-3
Inorganic Target Analytes and Instrument Detection Limits for Water Samples Provided by Paragon Analytics, Inc.

Analyte	IDL (µg/L)
Ag	0.9
Al	10.2
As	2.5
B	7.9
Ba	0.1
Be	0.2
Ca	1.8
Cd	0.3
Co	0.8
Cr	0.9

Analyte	IDL (µg/L)
Cu	0.6
Fe	15.9
Hg	0.02
K	46.9
Mg	7.7
Mn	0.2
Mo	2.9
Na	2.1
Ni	0.7
Pb	1.4

Analyte	IDL (µg/L)
Sb	3.4
Se	3.1
Sn	14.1
Sr	0.5
Ti	1.3
Tl	3.8
Total U	0.1
V	0.8
Zn	0.8

Table F-2.2-1
Student's T-test Comparison of Means of Selected Analytes between Aquifer Types

Constituent	Alluvial-Intermediate			Intermediate-Regional			Alluvial-Regional		
	T value	P value	Comparison	T value	P value	Comparison	T value	P value	Comparison
pH	-6.16	0.000	VS	-2.07	0.044	S	-5.98	0.000	VS
Total dissolved solids	-0.15	0.881	Null	-6.44	0.000	VS	-5.20	0.000	VS
Aluminium	2.05	0.043	S	2.96	0.004	Vs	3.27	0.002	VS
Arsenic	1.46	0.148	Null	-7.18	0.000	VS	-4.60	0.000	VS
Barium	1.08	0.284	Null	3.09	0.003	VS	6.33	0.000	VS
Boron	2.43	0.018	S	-6.37	0.000	VS	-3.72	0.000	VS
Calcium	3.81	0.000	VS	-6.18	0.000	VS	-1.10	0.274	Null
Chromium	2.99	0.004	VS	-4.85	0.000	VS	-3.22	0.002	VS
Magnesium	3.71	0.000	VS	-1.30	0.198	Null	1.44	0.155	Null
Nickel	3.45	0.001	VS	-1.13	0.262	Null	0.43	0.669	Null
Potassium	-1.33	0.187	Null	4.48	0.000	Vs	-5.47	0.000	VS
Sodium	-1.60	0.113	Null	-5.15	0.000	VS	-7.07	0.000	VS
Strontium	0.11	0.914	Null	-2.77	0.007	S	-1.79	0.081	Null
Uranium	-2.03	0.046	S	-4.46	0.000	Vs	-4.14	0.000	VS
Alkalinity	-0.69	0.493	Null	-7.72	0.000	VS	-5.21	0.000	VS
Ammonium	-1.24	0.221	Null	1.63	0.108	Null	-0.03	0.978	Null
Bicarbonate	0.07	0.941	Null	-7.69	0.000	VS	-5.04	0.000	VS
Bromide	0.60	0.552	Null	-2.06	0.042	S	-1.12	0.267	Null
Chloride	-0.49	0.628	Null	1.30	0.196	Null	2.98	0.004	VS
Fluoride	-0.57	0.571	Null	-18.03	0.000	VS	-14.64	0.000	VS
Nitrate	-5.52	0.000	VS	-2.52	0.015	S	-6.48	0.000	VS
Sulfate	4.11	0.000	VS	0.94	0.351	Null	4.48	0.000	VS

S P<= 0.05 Significant difference between populations
VS P<= 0.01 Very significant difference between populations
Null P≠0; P>0.05 therefore null hypothesis is confirmed, probability that populations are the same is >0.05

Table F-2.2-2
Reporting Limits Provided by EES-6 and Paragon Analytics, Inc.

Analyte	Analytical Method[a]		Reporting Limit (ppm or mg/L)	
	EES-6	Paragon	EES-6	Paragon
Ag	GFAA	ICPAES	0.001	0.01
Al	ICPAES	ICPAES	0.02	0.2
Alkalinity	Titration	Titration	1	1
As	Hydride-AA	ICPAES	0.0001	0.01
B	ICPAES	ICPAES	0.002	N/A
Ba	ICPAES	ICPAES	0.002	0.1
Be	ICPAES	ICPAES	0.002	0.005
Br	IC	IC	0.01	0.01
Ca	ICPAES	ICPAES	0.02	1
Cd[b]	GFAA	GFAA	0.001	0.005
Cl	IC	IC	0.01	0.01
ClO_3	IC	IC	0.02	N/A
Co	GFAA	ICPAES	0.002	0.01
$CO_3/HCO_3/OH$	Titration	Titration	0.5	0.5
Conductivity	Electrode	Electrode	0.5	0.5
Cr	GFAA	ICPAES	0.002	0.01
Cs	GFAA	GFAA	0.002	N/A
Cu	GFAA	GFAA	0.002	0.01
F	IC	IC	0.01	0.01
Fe	ICPAES	ICPAES	0.01	0.1
Hardness	Calculated	Calculated	Calculated	Calculated
HCO_3	Titration	Titration	0.5	0.5
Hg	Cold Vapor AA	Cold Vapor AA	0.0002	0.0002
I	IC	IC	0.01	N/A
K	AA	ICPAES	0.01	1
Li	ICPAES	ICPAES	0.01	N/A
Mg	ICPAES	ICPAES	0.01	1
Mn	ICPAES	ICPAES	0.002	0.01
Mo	GFAA	ICPAES	0.002	0.01
Na	AA	ICPAES	0.01	1
NH_4	Electrode	Electrode	0.02	0.5
Ni	GFAA	ICPAES	0.002	0.02
NO_2	IC	IC	0.01	0.05
NO_3	IC	IC	0.01	0.05
OH	Titration	Titration	0.5	N/A
Pb[b]	GFAA	ICPAES	0.002	0.003
pH	Electrode	Electrode	0.05	0.05

Table F-2.2-2 (continued)

Analyte	Analytical Method[a]		Reporting Limit (ppm or mg/L)	
	EES-6	Paragon	EES-6	Paragon
PO_4	IC	IC	0.02	0.05
Rb	GFAA	ICPAES	0.002	N/A
Sb[b]	Hydride AA	ICPAES	0.0001	0.02
Se	Hydride AA	ICPAES	0.0001	0.005
Si	ICPAES	ICPAES	0.02	0.02
SO_4	IC	IC	0.02	0.02
S_2O_3	IC	IC	0.01	N/A
Sn	GFAA	ICPAES	0.005	0.02
Sr	ICPAES	ICPAES	0.002	0.02
Ti	ICPAES	ICPAES	0.002	0.002
Tl[b]	GFAA	ICPAES	0.002	0.01
TSS	Filtration 1L	Filtration 1L	0.1	N/A
U[b]	ICPMS	LIKPA	N/A	0.0002
V	ICPAES	ICPAES	0.002	0.01
Zn	ICPAES	ICPAES	0.01	0.02
TDS	Calculated	Calculated	Calculated	Calculated

AA = Atomic absorption spectroscopy.

GFAA = Graphite furnace atomic absorption.

IC = Ion chromatography.

ICPES = Inductively coupled plasma atomic emission spectroscopy.

ICPMS = Inductively coupled plasma mass spectroscopy.

LIKPA = Laser-induced kinetic phosphorimetric analysis.

ICP-MS was used for Sb, Cd, Pb, Tl, and U by the General Engineering Laboratories (GEL) for samples collected in December 1999/January 2000, and March/April 2000.N/A = Not analyzed

Table F-2.2-3a
Alluvial Groundwater Filtered Samples at Half-Detection Limit, Post-1997, R-Qualifiers Not Included

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean[a]	Std. Dev.[b]	CV[c]	Rejected	Nondetects
Metals	Aluminum	µg/L	42	10.1	60.0	19.1	15.36	0.80	0	24	33
Metals	Antimony	µg/L	43	0.1	2.6	0.5	0.67	1.35	0	40	51
Metals	Arsenic	µg/L	43	1.5	5.5	2.1	1.19	0.56	0	12	13
Metals	Barium	µg/L	43	11.9	51.0	18.1	14.22	0.78	0	1	1
Metals	Beryllium	µg/L	43	1.0	1.0	0.6	0.44	0.73	0	42	52
Metals	Boron	µg/L	37	13.0	51.0	21.0	14.73	0.70	0	7	9
Metals	Cadmium	µg/L	43	0.5	0.5	0.4	0.19	0.54	0	41	53
Metals	Calcium	µg/L	43	14100.0	21500.0	13942.7	4254.10	0.31	0	0	0
Metals	Cesium	µg/L	26	1.0	1.0	0.9	0.18	0.20	0	26	33
Metals	Chromium	µg/L	43	4.0	44.7	4.9	6.47	1.31	0	4	14
Metals	Cobalt	µg/L	43	1.0	1.0	0.7	0.35	0.52	0	42	54
Metals	Copper	µg/L	43	1.0	5.0	1.5	1.36	0.92	0	25	31
Metals	Iron	µg/L	43	12.6	120.0	18.4	22.65	1.23	0	33	39
Metals	Lead	µg/L	43	1.0	2.0	0.7	0.41	0.57	0	40	52
Metals	Lithium	µg/L	26	30.0	40.0	29.3	8.01	0.27	0	0	0
Metals	Magnesium	µg/L	43	2830.0	8430.0	3329.9	2334.29	0.70	0	1	4
Metals	Manganese	µg/L	43	1.0	15.0	1.3	2.34	1.76	0	32	33
Metals	Mercury	µg/L	40	0.0	0.1	0.0	0.02	0.85	0	35	44
Metals	Molybdenum	µg/L	29	1.0	3.0	1.3	0.69	0.53	0	22	30
Metals	Nickel	µg/L	43	1.0	19.8	1.3	2.90	2.19	0	36	44
Metals	Potassium	µg/L	43	2010.0	3920.0	2135.3	729.06	0.34	0	0	0
Metals	Rubidium	µg/L	26	3.0	8.0	3.8	1.91	0.50	0	0	1
Metals	Selenium	µg/L	43	0.1	3.6	0.7	0.88	1.23	0	41	53
Metals	Silver	µg/L	43	0.5	1.0	0.5	0.13	0.27	0	42	54
Metals	Sodium	µg/L	43	12100.0	30900.0	17057.7	8022.56	0.47	0	0	0
Metals	Strontium	µg/L	29	100.0	237.1	106.5	60.26	0.57	0	0	0
Metals	Thallium	µg/L	43	1.0	3.9	1.0	0.64	0.61	0	39	49
Metals	Thorium	µg/L	4	0.5	0.5	0.5	0.00	0.00	0	4	5
Metals	Tin	µg/L	29	2.5	9.8	2.8	1.97	0.70	0	29	38
Metals	Titanium	µg/L	29	1.0	5.9	1.4	1.31	0.92	0	25	33
Metals	Uranium	µg/L	15	0.5	2.8	1.0	1.00	1.01	0	0	0
Metals	Uranium by NATU	µg/L	0	—[d]	—	—	—	—	—	—	—
Metals	Uranium by TUICPMS	µg/L	7	0.5	2.6	0.9	1.01	1.07	0	0	0
Metals	Vanadium	µg/L	43	12.0	17.1	12.2	2.94	0.24	0	0	4
Metals	Zinc	µg/L	39	5.0	80.0	15.8	25.21	1.59	0	26	35

Table F-2.2-3a (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Metals	Vanadium	µg/L	34	0.165	1	9.4	2.187	2.439	1.115	0	12
Metals	Zinc	µg/L	31	0.155	2.5	21	4.636	4.83	1.0418	0	19
Other	Ammonia	µg/L	0	—	—	—	—	—	—	—	—
Other	Alkalinity Total	µg/L	1	95000.0	95000.0	95000.0	0.00	0.00	0	0	0
Other	Bicarbonate as Calcium Carbonate	µg/L	1	120000.0	120000.0	120000.0	0.00	0.00	0	0	0
Other	Bromide	µg/L	37	40.0	100.0	44.7	30.19	0.67	0	11	16
Other	Chloride	µg/L	37	2760.0	9140.0	3417.8	2324.33	0.68	0	0	0
Other-iso	Delta deuterium versus Std. Mean Ocean Water	n/a[e]	0	—	—	—	—	—	—	—	—
Other	Fluoride	µg/L	37	450.0	580.0	420.1	111.03	0.26	0	0	0
Other	Nitrogen Ammonia (as N)	µg/L	7	250.0	1100.0	372.1	320.96	0.86	0	6	8
Other	Nitrogen Nitrate + Nitrite (as N)	µg/L	7	340.0	910.0	410.0	226.27	0.55	0	0	2
Other	Nitrogen Nitrate (as NO_3)	µg/L	3	360.0	400.0	323.3	100.17	0.31	0	0	3
Other	Nitrogen Nitrite (as NO_2)	µg/L	3	50.0	50.0	50.0	0.00	0.00	0	3	6
Other	Nitrogen Total Kjeldahl (as N)	µg/L	7	190.0	340.0	174.3	104.22	0.60	0	2	2
Other	Oxalate	µg/L	12	10.0	10.0	9.2	2.80	0.30	0	12	17
Other	Phosphorus Orthophosphate (as PO_4)	µg/L	11	25.0	240.0	71.8	66.79	0.93	0	10	13
Other	Silica	µg/L	33	70620.0	100152.0	65489.6	21203.27	0.32	0	0	0
Other	Sulfate	µg/L	37	3670.0	7060.0	3973.2	2127.34	0.54	0	0	0
Other	Total Dissolved Solids	µg/L	28	198096.5	322445.8	211422.9	49435.55	0.23	0	0	0
Other	Carbon Dissolved Organic	µg/L	4	765.0	1500.0	830.0	569.62	0.69	0	0	0
Other	Carbon Total Organic	µg/L	5	370.0	600.0	416.0	155.34	0.37	0	0	0
Other	Conductivity	µS/cm	27	169.0	268.0	178.2	54.01	0.30	0	0	0
Other	Humic Substances Hydrophilic Acids	µg/L	2	500.0	500.0	500.0	0.00	0.00	0	0	0
Other	Humic Substances Hydrophilic Bases	µg/L	2	100.0	100.0	100.0	0.00	0.00	0	0	0
Other	Humic Substances Hydrophilic Neutrals	µg/L	1	200.0	200.0	200.0	—	—	0	0	0
Other	Humic Substances Hydrophilic Total	µg/L	2	700.0	800.0	700.0	141.42	0.20	0	0	0
Other	Humic Substances Hydrophobic Acids	µg/L	2	350.0	600.0	350.0	353.55	1.01	0	0	0
Other	Humic Substances Hydrophobic Neutrals	µg/L	2	300.0	300.0	300.0	—	—	0	0	0
Other	Humic Substances Hydrophobic Total	µg/L	2	650.0	900.0	650.0	353.55	0.54	0	0	0
Other	pH	SU	23	7.9	8.2	7.9	0.27	0.03	0	0	0
Other-iso	Nitrogen-15/Nitrogen-14 Ratio	ratio	1	0.0	0.0	0.0	0.00	0.00	0	0	0
Other-iso	Deuterium Hydrogen Ratio	ratio	8	-72.0	-70.0	-72.5	2.14	-0.03	0	0	0
Other-iso	Oxygen-18/Oxygen-16 Ratio	ratio	8	-11.3	-11.2	-11.4	0.27	-0.02	0	0	0
Other	Cyanide Reactive	µg/L	0	—	—	—	—	—	—	—	—

Table F-2.2-3a (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Other	Sulfide Reactive	µg/L	0	—	—	—	—	—	—	—	—
Other	Anion Sum	µg/L	22	1754.4	2879.7	1910.4	610.22	0.32	0	0	0
Other	Cation Sum	µg/L	22	1805.8	2820.3	1923.7	582.19	0.30	0	0	0
Other	Balance	µg/L	22	11.4	66.1	12.4	29.36	2.38	0	0	0
Other	Alkalinity(Lab) $CaCO_3$	µg/L	26	75655.7	122950.8	80555.0	25286.81	0.31	0	0	0
Other	Ammonium	µg/L	26	30.0	74.0	28.8	17.75	0.62	0	9	13
Other	Ammonium [as N]	µg/L	26	23.3	57.6	22.4	13.81	0.62	0	9	13
Other	Bicarbonate	µg/L	26	92300.0	150000.0	97565.4	30446.49	0.31	0	0	0
Other	Carbonate	µg/L	22	1805.8	2820.3	1923.7	582.19	0.30	0	0	0
Other	Chlorate (ClO_3)	µg/L	26	10.0	10.0	9.4	1.63	0.17	0	26	33
Other	Conductivity (Field)	µS/cm	12	202.5	290.0	195.8	66.12	0.34	0	0	0
Other	Dissolved Oxygen (Field)	µg/L	0	—	—	—	—	—	—	—	—
Other	Hardness	µg/L	22	41470.1	86827.5	53615.0	19162.29	0.36	0	0	0
Other	Iodide	µg/L	26	5.0	5.0	5.0	0.00	0.00	0	26	33
Other	Nitrate	µg/L	26	1625.0	3250.0	1575.9	768.03	0.49	0	0	2
Other	Nitrate [as N]	µg/L	26	366.9	733.9	355.8	173.43	0.49	0	0	2
Other	Nitrite	µg/L	26	5.0	30.0	7.9	6.19	0.79	0	22	28
Other	Nitrite [as N]	µg/L	26	0.9	5.4	1.4	1.11	0.79	0	22	28
Other	pH (Field)	SU	22	7.8	8.3	7.6	0.48	0.06	0	0	0
Other	Phosphate	µg/L	26	25.0	80.0	22.3	18.02	0.81	0	19	26
Other	Silicon	µg/L	22	33772.4	46800.0	31558.5	10470.78	0.33	0	0	0
Other	Sulfite	µg/L	26	5.0	5.0	5.0	0.00	0.00	0	26	33
Other	Total Suspended Solids	µg/L	9	196.1	82600.0	14238.7	29405.44	2.07	0	2	2
Other	Turbidity (Field)	NTU	9	1.1	5.4	1.5	1.78	1.17	0	0	0
Other-ratio	Br/Cl by wt	ratio	22	0.0	0.0	0.0	0.00	0.41	0	0	0
Other-ratio	B/Cl by wt	ratio	22	0.0	0.0	0.0	0.00	0.46	0	0	0
Other-ratio	Cs/Cl by wt	ratio	22	0.0	0.0	0.0	0.00	0.00	0	0	0
Other-ratio	F/Cl by wt	ratio	22	0.2	0.3	0.1	0.08	0.56	0	0	0
Other-ratio	HCO_3/CL by wt	ratio	22	32.7	44.2	31.0	8.66	0.28	0	0	0
Other-ratio	K/Cl by wt	ratio	22	0.7	0.9	0.7	0.15	0.23	0	0	0
Other-ratio	Li/Cl by wt	ratio	22	0.0	0.0	0.0	0.00	0.41	0	0	0
Other-ratio	Na/Cl by wt	ratio	22	5.5	10.3	5.7	2.66	0.47	0	0	0
Other-ratio	SO_4/Cl by wt	ratio	22	1.1	2.3	1.3	0.59	0.46	0	0	0
Rad-iso	Americium-241	pCi/L	28	0.0	0.2	0.0	0.06	2.02	0	25	17
Rad-iso	Plutonium-238	pCi/L	28	0.0	0.0	0.0	0.01	1.96	0	28	18
Rad-iso	Plutonium-239	pCi/L	28	0.0	0.0	0.0	0.01	1.78	0	27	17
Rad-iso	Strontium-90	pCi/L	28	0.0	0.2	0.0	0.08	-69.54	0	28	19

Table F-2.2-3a (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Rad-iso	Tritium	pCi/L	38	0.3	48.0	1.7	7.76	4.60	0	0	0
Rad-iso	Tritium	TU[f]	25	0.1	0.7	0.1	0.21	1.74	0	0	0
Rad-iso	Uranium-234	pCi/L	28	0.6	1.6	0.6	0.45	0.69	0	0	0
Rad-iso	Uranium-235	pCi/L	28	0.0	0.1	0.0	0.02	1.00	0	18	16
Rad-iso	Uranium-238	pCi/L	28	0.3	0.8	0.3	0.22	0.70	0	0	0
Rad-gross	Gross Alpha Radiation	pCi/L	18	0.0	1.8	0.3	0.79	2.45	0	4	4
Rad-gross	Gross Beta Radiation	pCi/L	18	1.1	4.0	1.5	1.30	0.88	0	6	8
Rad-gross	Gross Gamma Radiation	pCi/L	18	212.5	397.0	209.6	74.38	0.35	0	4	2
Rad-gscan[g]	Cesium-137	pCi/L	28	-0.2	1.1	-0.1	0.62	-5.02	0	28	19

[a] The mean is calculated as the arithmetic average.

[b] Std. Dev. = Standard deviation.

[c] CV = Coefficient of variation = std. dev./mean.
NATU = Natural uranium.
TUICPMS = Total uranium inductively coupled plasma mass spectrometry.
TULIKPA = Total uranium kinetic phosphorimetric analysis.

[d] — = No summary information, no samples analyzed.

[e] n/a = Not applicable.

[f] TU = tritium unit, 1 TU=3.193 pCi/kg or 3.193 pCi/L tritium.

[g] Rad-gscan = gamma spectroscopy.

Table F-2.2-3b

Alluvial Groundwater Nonfiltered Samples at Half-Detection Limit, Post-1997, R-Qualifiers Not Included

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean[a]	Std. Dev.[b]	CV[c]	Rejected	Nondetects
Metals	Aluminum	µg/L	26	55.0	3695.6	306.8	728.78	2.38	0	9	11
Metals	Antimony	µg/L	27	0.1	2.6	0.5	0.75	1.42	0	25	30
Metals	Arsenic	µg/L	27	1.9	6.7	2.4	1.40	0.59	0	4	4
Metals	Barium	µg/L	27	15.0	53.0	22.4	16.37	0.73	0	0	0
Metals	Beryllium	µg/L	27	1.0	1.0	0.8	0.39	0.51	0	27	34
Metals	Boron	µg/L	23	15.0	52.0	22.0	15.64	0.71	0	4	5
Metals	Cadmium	µg/L	27	0.5	0.5	0.4	0.18	0.45	0	27	34
Metals	Calcium	µg/L	27	15200.0	21700.0	14818.5	4466.12	0.30	0	0	0
Metals	Cesium	µg/L	19	1.0	1.0	1.0	0.00	0.00	0	19	24
Metals	Chromium	µg/L	27	4.0	16.0	5.5	3.22	0.58	0	2	6
Metals	Cobalt	µg/L	27	1.0	1.0	0.8	0.29	0.35	0	25	32
Metals	Copper	µg/L	27	3.0	23.0	4.0	4.75	1.18	0	7	10
Metals	Iron	µg/L	27	30.0	2024.0	202.7	416.21	2.05	0	10	11
Metals	Lead	µg/L	27	1.0	4.0	1.1	0.87	0.76	0	24	31
Metals	Lithium	µg/L	19	30.0	50.0	28.4	10.15	0.36	0	0	0
Metals	Magnesium	µg/L	27	2983.0	8430.0	3803.0	2491.39	0.66	0	0	1
Metals	Manganese	µg/L	27	1.0	142.8	12.1	28.59	2.36	0	16	17
Metals	Mercury	µg/L	24	0.0	0.1	0.0	0.03	1.14	0	15	20
Metals	Molybdenum	µg/L	22	1.2	8.0	1.9	1.64	0.85	0	13	17
Metals	Nickel	µg/L	27	1.0	17.0	1.6	3.09	1.92	0	22	29
Metals	Potassium	µg/L	27	1980.0	3930.0	2190.3	779.75	0.36	0	0	0
Metals	Rubidium	µg/L	19	3.0	9.0	4.1	2.11	0.51	0	0	0
Metals	Selenium	µg/L	27	0.1	3.3	0.6	0.81	1.26	0	20	25
Metals	Silver	µg/L	27	0.5	1.0	0.5	0.12	0.24	0	26	33
Metals	Sodium	µg/L	27	12000.0	30300.0	16970.3	7535.15	0.44	0	0	0
Metals	Strontium	µg/L	22	92.5	246.7	107.1	60.40	0.56	0	0	0
Metals	Thallium	µg/L	27	1.0	4.3	1.3	0.71	0.54	0	26	33
Metals	Thorium	µg/L	0	—[d]	—	—	—	—	—	—	—
Metals	Tin	µg/L	22	2.5	14.6	3.5	2.82	0.82	0	21	27
Metals	Titanium	µg/L	22	2.0	78.9	9.7	17.78	1.83	0	11	11
Metals	Uranium	µg/L	5	0.7	2.9	1.0	1.07	1.03	0	0	0
Metals	Uranium by NATU	µg/L	0	—	—	—	—	—	—	—	—
Metals	Uranium by TUICPMS	µg/L	0	—	—	—	—	—	—	—	—
Metals	Uranium by TULIKPA	µg/L	0	—	—	—	—	—	—	—	—

Table F-2.2-3b (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Metals	Vanadium	µg/L	27	12.0	19.0	12.1	3.62	0.30	0	0	1
Metals	Zinc	µg/L	27	5.0	70.0	15.9	21.95	1.38	0	19	25
Other	Ammonia	µg/L	0	—	—	—	—	—	—	—	—
Other	Alkalinity Total	µg/L	1	97700.0	97700.0	97700.0	0.00	0.00	0	0	0
Other	Bicarbonate as Calcium Carbonate	µg/L	1	120000.0	120000.0	120000.0	0.00	0.00	0	0	0
Other	Bromide	µg/L	22	40.0	100.0	41.9	21.59	0.51	0	3	5
Other	Chloride	µg/L	22	3010.3	9050.0	3774.0	2559.86	0.68	0	0	0
Other-iso	Delta deuterium versus Std. Mean Ocean Water	n/a[e]	9	-80.0	-78.0	-80.6	1.88	-0.02	0	0	0
Other	Fluoride	µg/L	22	420.0	550.0	381.1	106.64	0.28	0	0	0
Other	Nitrogen Ammonia (as N)	µg/L	0	—	—	—	—	—	—	—	—
Other	Nitrogen Nitrate + Nitrite (as N)	µg/L	0	—	—	—	—	—	—	—	—
Other	Nitrogen Nitrate (as NO_3)	µg/L	2	250.0	400.0	250.0	212.13	0.85	0	1	2
Other	Nitrogen Nitrite (as NO_2)	µg/L	2	50.0	50.0	50.0	0.00	0.00	0	2	3
Other	Nitrogen Total Kjeldahl (as N)	µg/L	0	—	—	—	—	—	—	—	—
Other	Oxalate	µg/L	6	10.0	10.0	10.0	0.00	0.00	0	6	9
Other	Phosphorus Orthophosphate (as PO_4)	µg/L	3	100.0	100.0	100.0	0.00	0.00	0	3	4
Other	Silica	µg/L	19	72879.7	99724.0	69274.3	20168.69	0.29	0	0	0
Other	Sulfate	µg/L	22	4207.7	7110.0	4213.1	2114.69	0.50	0	0	0
Other	Total Dissolved Solids	µg/L	21	198739.8	318410.2	213029.5	49814.11	0.23	0	0	0
Other	Carbon Dissolved Organic	µg/L	0	—	—	—	—	—	—	—	—
Other	Carbon Total Organic	µg/L	0	—	—	—	—	—	—	—	—
Other	Conductivity	µS/cm	19	170.0	266.0	179.4	56.88	0.32	0	0	0
Other	Humic Substances Hydrophilic Acids	µg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophilic Bases	µg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophilic Neutrals	µg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophilic Total	µg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophobic Acids	µg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophobic Neutrals	µg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophobic Total	µg/L	0	—	—	—	—	—	—	—	—
Other	pH	SU	19	7.8	8.2	7.8	0.30	0.04	0	0	0
Other-iso	Nitrogen-15/Nitrogen-14 Ratio	ratio	8	-0.6	2.6	-1.3	3.67	-2.75	0	0	0
Other-iso	Deuterium Hydrogen Ratio	ratio	14	-73.0	-68.0	-72.6	2.59	-0.04	0	0	0
Other-iso	Oxygen-18/Oxygen-16 Ratio	ratio	23	-11.2	-10.7	-11.2	0.35	-0.03	0	0	0
Other	Cyanide Reactive	µg/L	0	—	—	—	—	—	—	—	—
Other	Sulfide Reactive	µg/L	0	—	—	—	—	—	—	—	—

Table F-2.2-3b (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Other	Anion Sum	µg/L	19	1750.0	2828.4	1859.0	611.84	0.33	0	0	0
Other	Cation Sum	µg/L	19	1748.3	2783.4	1865.1	594.15	0.32	0	0	0
Other	Balance	µg/L	19	1.9	68.3	6.7	25.93	3.84	0	0	0
Other	Alkalinity(Lab) $CaCO_3$	µg/L	19	76147.5	120491.8	81060.3	25578.24	0.32	0	0	0
Other	Ammonium	µg/L	19	30.0	56.8	29.1	15.11	0.52	0	5	6
Other	Ammonium [as N]	µg/L	19	23.3	44.2	22.7	11.75	0.52	0	5	6
Other	Bicarbonate	µg/L	19	91500.0	147000.0	98326.3	31406.67	0.32	0	0	0
Other	Carbonate	µg/L	19	0.0	5300.0	278.9	1215.90	4.36	0	0	0
Other	Chlorate (ClO_3)	µg/L	19	10.0	10.0	9.2	1.87	0.20	0	19	24
Other	Conductivity (Field)	µS/cm	11	215.0	290.0	196.3	69.32	0.35	0	0	0
Other	Dissolved Oxygen (Field)	µg/L	0	—	—	—	—	—	—	—	—
Other	Hardness	µg/L	19	42278.3	88487.8	52335.0	18899.53	0.36	0	0	0
Other	Iodide	µg/L	19	5.0	5.0	5.0	0.00	0.00	0	19	24
Other	Nitrate	µg/L	19	1450.0	3220.0	1532.9	769.40	0.50	0	0	3
Other	Nitrate [as N]	µg/L	19	327.4	727.1	346.1	173.74	0.50	0	0	3
Other	Nitrite	µg/L	19	5.0	10.0	5.5	1.58	0.29	0	19	24
Other	Nitrite [as N]	µg/L	19	0.9	1.8	1.0	0.28	0.29	0	19	24
Other	pH (Field)	SU	19	7.7	8.3	7.6	0.48	0.06	0	0	0
Other	Phosphate	µg/L	19	10.0	80.0	21.3	18.99	0.89	0	16	21
Other	Silicon	µg/L	19	34055.9	46600.0	32371.2	9424.62	0.29	0	0	0
Other	Sulfite	µg/L	19	5.0	5.0	5.0	0.00	0.00	0	19	24
Other	Total Suspended Solids	µg/L	17	865.4	82600.0	12049.6	22724.03	1.89	0	4	4
Other	Turbidity (Field)	NTU	9	0.6	5.4	1.2	1.79	1.45	0	0	0
Other-ratio	Br/Cl by wt	ratio	19	0.0	0.0	0.0	0.01	0.50	0	0	0
Other-ratio	B/Cl by wt	ratio	19	0.0	0.0	0.0	0.00	0.47	0	0	0
Other-ratio	Cs/Cl by wt	ratio	19	0.0	0.0	0.0	0.00	#DIV/0!	0	0	0
Other-ratio	F/Cl by wt	ratio	19	0.2	0.3	0.2	0.08	0.54	0	0	0
Other-ratio	HCO_3/CL by wt	ratio	19	33.6	45.1	32.0	8.96	0.28	0	0	0
Other-ratio	K/Cl by wt	ratio	19	0.7	0.9	0.7	0.16	0.24	0	0	0
Other-ratio	Li/Cl by wt	ratio	19	0.0	0.0	0.0	0.00	0.43	0	0	0
Other-ratio	Na/Cl by wt	ratio	19	5.6	9.9	5.6	2.50	0.45	0	0	0
Other-ratio	SO_4/Cl by wt	ratio	19	1.0	2.3	1.3	0.55	0.44	0	0	0
Rad-iso	Americium-241	pCi/L	0	—	—	—	—	—	—	—	—
Rad-iso	Plutonium-238	pCi/L	0	—	—	—	—	—	—	—	—
Rad-iso	Plutonium-239	pCi/L	0	—	—	—	—	—	—	—	—
Rad-iso	Strontium-90	pCi/L	0	—	—	—	—	—	—	—	—
Rad-iso	Tritium	pCi/L	0	—	—	—	—	—	—	—	—

Table F-2.2-3b (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Rad-iso	Tritium	TU[f]	0	—	—	—	—	—	—	—	—
Rad-iso	Uranium-234	pCi/L	0	—	—	—	—	—	—	—	—
Rad-iso	Uranium-235	pCi/L	0	—	—	—	—	—	—	—	—
Rad-iso	Uranium-238	pCi/L	0	—	—	—	—	—	—	—	—
Rad-gross	Gross Alpha Radiation	pCi/L	0	—	—	—	—	—	—	—	—
Rad-gross	Gross Beta Radiation	pCi/L	0	—	—	—	—	—	—	—	—
Rad-gross	Gross Gamma Radiation	pCi/L	0	—	—	—	—	—	—	—	—
Rad-gscan[g]	Cesium-137	pCi/L	0	—	—	—	—	—	—	—	—

[a] The mean is calculated as the arithmetic average.

[b] Std. Dev. = Standard deviation.

[c] CV = Coefficient of variation = std. dev./mean.
NATU = Natural uranium.
TUICPMS = Total uranium inductively coupled plasma mass spectrometry.
TULIKPA = Total uranium kinetic phosphorimetric analysis.

[d] n/a = Not applicable.

[e] — = No summary information, no samples analyzed.

[f] TU = tritium unit, 1 TU=3.193 pCi/kg or 3.193 pCi/L tritium.

[g] Rad-gscan = gamma spectroscopy.

Table F-2.2-3c
Perched Intermediate Groundwater Filtered Samples at One-Half Detection Limit, Post-1997, R-Qualifiers Not Included

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean[a]	Std. Dev.[b]	CV[c]	Rejected	Nondetects
Metals	Aluminum	µg/L	55	3.95	85	4580	446.8	935.3	2.0935	0	15
Metals	Antimony	µg/L	56	0.05	0.25	1.7	0.4639	0.5868	1.2651	0	54
Metals	Arsenic	µg/L	56	0.1	0.5	3.9	0.7929	0.6203	0.7824	0	24
Metals	Barium	µg/L	56	5	19	110	29.38	27.19	0.9256	0	1
Metals	Beryllium	µg/L	55	0.005	0.5	1	0.5754	0.4273	0.7427	0	49
Metals	Boron	µg/L	49	1	8	13	7.39	2.511	0.3398	0	17
Metals	Cadmium	µg/L	56	0.065	0.5	1.99	0.37	0.3101	0.8381	0	54
Metals	Calcium	µg/L	56	5800	8085	16000	9357	3135	0.335	0	0
Metals	Cesium	µg/L	32	0.5	1	2	0.9688	0.3345	0.3453	0	30
Metals	Chromium	µg/L	56	0.15	0.995	2	0.735	0.4177	0.5683	0	48
Metals	Cobalt	µg/L	56	0.19	0.645	1	0.6616	0.3354	0.5069	0	52
Metals	Copper	µg/L	52	0.14	1	6	1.628	1.476	0.907	0	25
Metals	Iron	µg/L	56	3.65	41.75	1560	170	336.1	1.9766	0	22
Metals	Lead	µg/L	56	0.005	0.7	2.81	0.7577	0.5545	0.7318	0	49
Metals	Lithium	µg/L	32	2	5	10	5.406	1.794	0.3318	0	23
Metals	Magnesium	µg/L	56	1180	2945	6100	2847	1334	0.4684	0	0
Metals	Manganese	µg/L	53	0.05	2	9	2.439	2.306	0.9454	0	18
Metals	Mercury	µg/L	51	0.005	0.025	0.17	0.03721	0.03848	1.0341	0	41
Metals	Molybdenum	µg/L	36	0.5	1	4	1.433	0.9241	0.6447	0	27
Metals	Nickel	µg/L	56	0.255	1	2.6	0.8795	0.3939	0.4478	0	47
Metals	Potassium	µg/L	56	1500	2485	7470	3518	1916	0.5446	0	0
Metals	Rubidium	µg/L	32	3	8.5	40	13.72	11.53	0.8408	0	0
Metals	Selenium	µg/L	56	0.05	0.25	1.9	0.7652	0.7922	1.0353	0	54
Metals	Silver	µg/L	56	0.12	0.5	1.1	0.4791	0.1549	0.3234	0	52
Metals	Sodium	µg/L	56	4110	6575	36000	9153	7202	0.7869	0	0
Metals	Strontium	µg/L	38	42	69	163.5	75.93	27.6	0.3635	0	0
Metals	Thallium	µg/L	56	0.013	1	4.9	0.9928	0.7507	0.7562	0	52
Metals	Thorium	µg/L	6	0.5	0.5	0.5	0.5	0	0	0	6
Metals	Tin	µg/L	38	0.5	2.5	15	3.112	2.699	0.8673	0	37
Metals	Titanium	µg/L	37	0.65	3	96	10.86	21.93	2.019	0	15

Table F-2.2-3c (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Metals	Uranium	µg/L	18	0.108	0.2075	0.843	0.3061	0.2393	0.7819	0	0
Metals	Uranium by NATU	µg/L	0	—[d]	—	—	—	—	—	—	—
Metals	Uranium by TUICPMS	µg/L	12	0.108	0.2025	0.843	0.3049	0.2433	0.798	0	0
Metals	Uranium by TULIKPA	µg/L	12	0.14	0.215	0.92	0.3333	0.2574	0.7721	0	0
Metals	Vanadium	µg/L	56	0.215	3	6	2.493	1.58	0.6339	0	20
Metals	Zinc	µg/L	50	0.255	5	33	5.28	6.066	1.1489	0	28
Other	Ammonia	µg/L	0	—	—	—	—	—	—	—	—
Other	Alkalinity Total	µg/L	0	—	—	—	—	—	—	—	—
Other	Bicarbonate as Calcium Carbonate	µg/L	6	3.80E+04	4.30E+04	5.60E+04	4.53E+04	6501	0.1434	0	0
Other	Bromide	µg/L	49	0.025	12.38	100	29.77	35.49	1.1924	0	24
Other	Chloride	µg/L	49	530	1397	7.13E+04	6932	1.63E+04	2.3455	0	0
Other-iso	Delta deuterium versus Std. Mean Ocean Water	n/a[e]	0	—	—	—	—	—	—	—	—
Other	Fluoride	µg/L	49	25	90	210	103.5	46.08	0.4451	0	5
Other	Nitrogen Ammonia (as N)	µg/L	12	250	250	265	251.7	4.438	0.0176	0	12
Other	Nitrogen Nitrate + Nitrite (as N)	µg/L	11	200	320	400	314.5	71.74	0.2281	0	0
Other	Nitrogen Nitrate (as NO_3)	µg/L	0	—	—	—	—	—	—	—	—
Other	Nitrogen Nitrite (as NO_2)	µg/L	0	—	—	—	—	—	—	—	—
Other	Nitrogen Total Kjeldahl (as N)	µg/L	12	50	155	430	181.7	131.8	0.7253	0	4
Other	Oxalate	µg/L	13	0.3	10	5571	437.1	1543	3.5297	0	12
Other	Phosphorus Orthophosphate (as PO_4)	µg/L	18	25	66.5	200	81.67	60.2	0.7372	0	8
Other	Silica	µg/L	44	3.00E+04	4.88E+04	7.26E+04	5.02E+04	1.28E+04	0.254	0	0
Other	Sulfate	µg/L	49	950	4200	1.13E+04	4437	2372	0.5346	0	0
Other	Total Dissolved Solids	µg/L	37	8.20E+04	1.23E+05	2.56E+05	1.41E+05	3.90E+04	0.2767	0	0
Other	Carbon Dissolved Organic	µg/L	15	600	2500	8700	3353	2686	0.801	0	0
Other	Carbon Total Organic	µg/L	4	470	515	690	547.5	101.4	0.1853	0	0
Other	Conductivity	µS/cm	42	71	109	337	131.8	71.14	0.5395	0	0
Other	Humic Substances Hydrophilic Acids	µg/L	14	200	850	3100	1200	906.4	0.7553	0	0
Other	Humic Substances Hydrophilic Bases	µg/L	11	100	200	400	200	89.44	0.4472	0	0
Other	Humic Substances Hydrophilic Neutrals	µg/L	10	100	200	300	230	67.49	0.2935	0	0
Other	Humic Substances Hydrophilic Total	µg/L	14	300	1050	3700	1500	1075	0.7166	0	0
Other	Humic Substances Hydrophobic Acids	µg/L	13	100	1300	4600	1569	1542	0.9826	0	0
Other	Humic Substances Hydrophobic Neutrals	µg/L	14	100	500	3100	742.9	792	1.0661	0	0
Other	Humic Substances Hydrophobic Total	µg/L	14	500	1450	5000	2043	1643	0.8043	0	0
Other	pH	SU	34	6.6	7.4	7.71	7.402	0.2511	0.0339	0	0
Other-iso	Nitrogen-15/Nitrogen-14 Ratio	ratio	0	—	—	—	—	—	—	—	—

Table F-2.2-3c (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Other-iso	Deuterium Hydrogen Ratio	ratio	11	-91	-79	-71	-79	6.197	-0.078	0	0
Other-iso	Oxygen-18/Oxygen-16 Ratio	ratio	11	-13.9	-12.5	-11.3	-12.45	0.8153	-0.066	0	0
Other	Cyanide Reactive	µg/L	1	250	250	250	250	0	0	0	1
Other	Sulfide Reactive	µg/L	1	2.01E+04	2.01E+04	2.01E+04	2.01E+04	0	0	0	1
Other	Anion Sum	µg/L	26	732	1087	3012	1226	595.2	0.4856	0	0
Other	Cation Sum	µg/L	26	855.5	1150	2973	1322	555	0.4199	0	0
Other	Balance	µg/L	26	-24.22	41.41	651.3	91.27	172.9	1.8941	0	0
Other	Alkalinity(Lab) $CaCO_3$	µg/L	31	2.77E+04	4.45E+04	5.31E+04	4.40E+04	6975	0.1585	0	0
Other	Ammonium	µg/L	31	10	40	160	40.14	31.35	0.7812	0	8
Other	Ammonium [as N]	µg/L	31	7.778	31.11	124.4	31.22	24.39	0.7812	0	8
Other	Bicarbonate	µg/L	31	3.38E+04	5.43E+04	6.48E+04	5.37E+04	8509	0.1585	0	0
Other	Carbonate	µg/L	31	0	0	0	0	0	—	0	0
Other	Chlorate (ClO_3)	µg/L	32	5	10	10	9.063	1.983	0.2188	0	32
Other	Conductivity (Field)	µS/cm	14	65	94.5	165	98	26.16	0.2669	0	0
Other	Dissolved Oxygen (Field)	µg/L	3	1.07E+04	1.38E+04	1.38E+04	1.28E+04	1824	0.143	0	0
Other	Hardness	µg/L	26	1.93E+04	3.11E+04	6.23E+04	3.49E+04	1.20E+04	0.3446	0	0
Other	Iodide	µg/L	31	5	5	5	5	0	0	0	31
Other	Nitrate	µg/L	31	5	1190	2400	1116	607.5	0.5442	0	1
Other	Nitrate [as N]	µg/L	31	1.129	268.7	541.9	252.1	137.2	0.5442	0	1
Other	Nitrite	µg/L	31	5	5	90	11.61	16.2	1.3947	0	23
Other	Nitrite [as N]	µg/L	31	0.8974	0.8974	16.15	2.084	2.907	1.3947	0	23
Other	pH (Field)	SU	25	6.68	7.33	8.04	7.37	0.3202	0.0434	0	0
Other	Phosphate	µg/L	31	3.26	25	142.9	37.18	37.92	1.0199	0	17
Other	Silicon	µg/L	26	1.41E+04	2.33E+04	3.24E+04	2.35E+04	6086	0.2588	0	0
Other	Sulfite	µg/L	31	5	5	25	6.29	4.995	0.794	0	31
Other	Total Suspended Solids	µg/L	11	50	3679	6.30E+04	2.30E+04	2.65E+04	1.1493	0	1
Other	Turbidity (Field)	NTU	14	0	2.45	27.2	7.3	9.114	1.2485	0	2
Other-ratio	Br/Cl by wt	ratio	26	0	0.003752	0.03774	0.008489	0.01094	1.2891	0	0
Other-ratio	B/Cl by wt	ratio	26	0	0.006723	0.01381	0.005884	0.003603	0.6124	0	0
Other-ratio	Cs/Cl by wt	ratio	26	0	0	0.001961	1.49E-04	5.25E-04	3.5331	0	0
Other-ratio	F/Cl by wt	ratio	26	0.00121	0.09217	0.1373	0.07945	0.0439	0.5526	0	0
Other-ratio	HCO_3/CL by wt	ratio	26	0.9399	40.91	93.02	41.72	25.15	0.6028	0	0
Other-ratio	K/Cl by wt	ratio	26	0.07925	2.438	6.696	2.682	2.012	0.7502	0	0
Other-ratio	Li/Cl by wt	ratio	26	0	0	0.01887	0.001241	0.004031	3.2472	0	0
Other-ratio	Na/Cl by wt	ratio	26	0.5463	4.607	11.09	6.087	3.767	0.6189	0	0
Other-ratio	SO_4/Cl by wt	ratio	26	0.1138	3.238	7.793	3.511	2.27	0.6467	0	0
Rad-iso	Americium-241	pCi/L	19	0	0.011	0.192	0.02306	0.0432	1.8738	0	16

Table F-2.2-3c (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Rad-iso	Plutonium-238	pCi/L	19	-0.004	0.007	0.109	0.01823	0.0292	1.6016	0	16
Rad-iso	Plutonium-239	pCi/L	19	-0.0045	0.0055	0.041	0.006	0.009669	1.6114	0	18
Rad-iso	Strontium-90	pCi/L	19	-0.115	0	0.275	0.007105	0.09271	13.048	0	19
Rad-iso	Tritium	pCi/L	11	1.053	22.47	60.33	26.84	22.77	0.8484	0	0
Rad-iso	Tritium	TU[f]	11	0.33	7.04	18.9	8.407	7.133	0.8484	0	0
Rad-iso	Uranium-234	pCi/L	19	0.029	0.182	0.601	0.241	0.1856	0.7702	0	2
Rad-iso	Uranium-235	pCi/L	19	-0.00245	0.0055	0.046	0.01051	0.01322	1.2577	0	16
Rad-iso	Uranium-238	pCi/L	19	0.008	0.101	0.595	0.1398	0.1364	0.9757	0	1
Rad-gross	Gross Alpha Radiation	pCi/L	12	-0.23	0.155	0.97	0.2508	0.4053	1.6159	0	0
Rad-gross	Gross Beta Radiation	pCi/L	12	0.45	2.175	5.9	2.604	2.054	0.7886	0	3
Rad-gross	Gross Gamma Radiation	pCi/L	10	139	163.5	311	179.4	50.8	0.2832	0	3
Rad-gscan[g]	Cesium-137	pCi/L	19	-1.135	-0.085	0.55	-0.1232	0.3995	-3.243	0	19

[a] The mean is calculated as the arithmetic average.

[b] Std. Dev. = Standard deviation.

[c] CV = Coefficient of variation = std. dev./mean.
NATU = Natural uranium.
TUICPMS = Total uranium inductively coupled plasma mass spectrometry.
TULIKPA = Total uranium kinetic phosphorimetric analysis.

[d] n/a = Not applicable.

[e] — = No summary information, no samples analyzed.

[f] TU = tritium unit, 1 TU=3.193 pCi/kg or 3.193 pCi/L tritium.

[g] Rad-gscan = gamma spectroscopy.

Table F-2.2-3d
Perched Intermediate Groundwater Nonfiltered Samples at One-Half Detection Limit for All Years, R-Qualifiers Not Included

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean[a]	Std. Dev.[b]	CV[c]	Rejected	Nondetects
Metals	Aluminum	µg/L	30	49.35	1088	4953	1439	1361	0.946	0	4
Metals	Antimony	µg/L	30	0.05	0.075	1.7	0.5567	0.6829	1.2267	0	30
Metals	Arsenic	µg/L	30	0.1	0.65	4.7	0.92	0.9307	1.0116	0	9
Metals	Barium	µg/L	30	13	21.7	124.8	33.02	26.68	0.8079	0	0
Metals	Beryllium	µg/L	30	0.1	1	1	0.7463	0.3702	0.496	0	30
Metals	Boron	µg/L	24	1	8	12	7.631	2.952	0.3869	0	5
Metals	Cadmium	µg/L	30	0.1	0.5	0.5	0.375	0.1804	0.4811	0	30
Metals	Calcium	µg/L	30	6240	8175	15150	9548	2998	0.314	0	0
Metals	Cesium	µg/L	20	1	1	2	1.05	0.2236	0.213	0	19
Metals	Chromium	µg/L	30	0.15	1	5	1.436	1.303	0.9072	0	20
Metals	Cobalt	µg/L	30	0.25	1	1	0.777	0.3235	0.4163	0	30
Metals	Copper	µg/L	27	0.15	3	10	3.778	3.113	0.824	0	11
Metals	Iron	µg/L	30	33.25	427.3	2052	565.1	536.9	0.9502	0	5
Metals	Lead	µg/L	29	0.5	1	4	1.328	0.8724	0.6571	0	20
Metals	Lithium	µg/L	20	5	5	10	5.25	1.118	0.213	0	19
Metals	Magnesium	µg/L	30	1540	2950	5906	2914	1253	0.43	0	0
Metals	Manganese	µg/L	28	0.44	4.7	15.25	5.116	3.728	0.7288	0	6
Metals	Mercury	µg/L	25	0.005	0.01	0.13	0.032	0.03657	1.1429	0	13
Metals	Molybdenum	µg/L	24	1	1	13	2.34	2.746	1.1735	0	16
Metals	Nickel	µg/L	30	0.55	1	3	1.03	0.4085	0.3967	0	26
Metals	Potassium	µg/L	30	1420	2460	7280	3503	1978	0.5647	0	0
Metals	Rubidium	µg/L	20	4	9.5	42	14.1	11.14	0.7904	0	0
Metals	Selenium	µg/L	30	0.05	0.25	1.55	0.64	0.6553	1.0239	0	24
Metals	Silver	µg/L	30	0.3	0.5	4	0.645	0.7023	1.0888	0	27
Metals	Sodium	µg/L	30	4130	6575	34940	8719	6311	0.7238	0	0
Metals	Strontium	µg/L	25	47.6	71	168.6	78.12	25.38	0.3249	0	0
Metals	Thallium	µg/L	30	1	1	4.5	1.333	0.7151	0.5364	0	30
Metals	Thorium	µg/L	0	—[d]	—	—	—	—	—	—	—
Metals	Tin	µg/L	25	2.5	2.5	14	3.872	2.807	0.7251	0	24
Metals	Titanium	µg/L	24	2.2	16.73	82.65	24.59	23.06	0.9378	0	0
Metals	Uranium	µg/L	5	0.15	0.25	0.82	0.422	0.3018	0.7151	0	0
Metals	Uranium by NATU	µg/L	0	—	—	—	—	—	—	—	—
Metals	Uranium by TUICPMS	µg/L	0	—	—	—	—	—	—	—	—
Metals	Uranium by TULIKPA	µg/L	0	—	—	—	—	—	—	—	—

Table F-2.2-3d (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Metals	Vanadium	µg/L	30	0.25	2.5	6	2.646	1.736	0.6561	0	10
Metals	Zinc	µg/L	30	0.3	5	20	6.831	6.341	0.9282	0	19
Other	Ammonia	µg/L	0	—	—	—	—	—	—	—	—
Other	Alkalinity Total	µg/L	0	—	—	—	—	—	—	—	—
Other	Bicarbonate as Calcium Carbonate	µg/L	5	3.56E+04	4.30E+04	5.60E+04	4.51E+04	7973	0.1767	0	0
Other	Bromide	µg/L	25	5	10.63	100	24.11	26.49	1.0985	0	10
Other	Chloride	µg/L	25	540	1370	6.43E+04	5974	1.37E+04	2.2936	0	0
Other-iso	Delta deuterium versus Std. Mean Ocean Water	n/a[e]	12	-99	-88	-81	-88.17	4.988	-0.057	0	0
Other	Fluoride	µg/L	25	25	90	210	102.4	46.62	0.4555	0	1
Other	Nitrogen Ammonia (as N)	µg/L	0	—	—	—	—	—	—	—	—
Other	Nitrogen Nitrate + Nitrite (as N)	µg/L	0	—	—	—	—	—	—	—	—
Other	Nitrogen Nitrate (as NO_3)	µg/L	0	—	—	—	—	—	—	—	—
Other	Nitrogen Nitrite (as NO_2)	µg/L	0	—	—	—	—	—	—	—	—
Other	Nitrogen Total Kjeldahl (as N)	µg/L	0	—	—	—	—	—	—	—	—
Other	Oxalate	µg/L	5	10	10	10	10	0	0	0	5
Other	Phosphorus Orthophosphate (as PO_4)	µg/L	5	100	100	200	140	54.77	0.3912	0	3
Other	Silica	µg/L	20	3.19E+04	4.86E+04	8.37E+04	5.37E+04	1.62E+04	0.3015	0	0
Other	Sulfate	µg/L	25	960	4530	1.03E+04	4842	2278	0.4704	0	0
Other	Total Dissolved Solids	µg/L	25	8.60E+04	1.24E+05	2.68E+05	1.45E+05	4.11E+04	0.2845	0	0
Other	Carbon Dissolved Organic	µg/L	0	—	—	—	—	—	—	—	—
Other	Carbon Total Organic	µg/L	1	3000	3000	3000	3000	0	0	0	0
Other	Conductivity	µS/cm	20	79.3	111.5	334	123.7	60.06	0.4855	0	0
Other	Humic Substances Hydrophilic Acids	µg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophilic Bases	µg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophilic Neutrals	µg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophilic Total	µg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophobic Acids	µg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophobic Neutrals	µg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophobic Total	µg/L	0	—	—	—	—	—	—	—	—
Other	pH	SU	20	6.91	7.35	7.58	7.318	0.1534	0.021	0	0
Other-iso	Nitrogen-15/Nitrogen-14 Ratio	ratio	5	-6	-1.4	0.2	-2.46	2.443	-0.993	0	0
Other-iso	Deuterium Hydrogen Ratio	ratio	15	-95	-76	-67	-78.4	7.385	-0.094	0	0
Other-iso	Oxygen-18/Oxygen-16 Ratio	ratio	27	-13.8	-12	-10.5	-12.19	0.756	-0.062	0	0
Other	Cyanide Reactive	µg/L	0	—	—	—	—	—	—	—	—
Other	Sulfide Reactive	µg/L	0	—	—	—	—	—	—	—	—

Table F-2.2-3d (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Other	Anion Sum	µg/L	20	730.1	1091	2996	1191	527.3	0.4426	0	0
Other	Cation Sum	µg/L	20	875.5	1190	3017	1342	533.2	0.3974	0	0
Other	Balance	µg/L	20	-26.36	67.03	670.4	126.1	175.1	1.3885	0	0
Other	Alkalinity(Lab) $CaCO_3$	µg/L	20	2.77E+04	4.45E+04	5.34E+04	4.39E+04	7168	0.1634	0	0
Other	Ammonium	µg/L	20	10	33.2	48.58	31.07	10.94	0.3521	0	2
Other	Ammonium [as N]	µg/L	20	7.778	25.82	37.78	24.16	8.507	0.3521	0	2
Other	Bicarbonate	µg/L	20	3.38E+04	5.43E+04	6.52E+04	5.35E+04	8745	0.1634	0	0
Other	Carbonate	µg/L	20	0	0	0	0	0	—	0	0
Other	Chlorate (ClO_3)	µg/L	20	5	10	10	8.75	2.221	0.2539	0	20
Other	Conductivity (Field)	µS/cm	12	65	94.5	165	98.92	28.3	0.2861	0	0
Other	Dissolved Oxygen (Field)	µg/L	2	1.07E+04	1.22E+04	1.38E+04	1.22E+04	2234	0.1827	0	0
Other	Hardness	µg/L	20	2.28E+04	3.34E+04	6.22E+04	3.62E+04	1.07E+04	0.2956	0	0
Other	Iodide	µg/L	20	5	5	5	5	0	0	0	20
Other	Nitrate	µg/L	20	10	835.4	1940	899.8	466.3	0.5182	0	1
Other	Nitrate [as N]	µg/L	20	2.258	188.6	438.1	203.2	105.3	0.5182	0	1
Other	Nitrite	µg/L	20	5	5	30	8.75	6.859	0.7838	0	17
Other	Nitrite [as N]	µg/L	20	0.8974	0.8974	5.385	1.571	1.231	0.7838	0	17
Other	pH (Field)	SU	19	6.68	7.33	8.04	7.393	0.3325	0.045	0	0
Other	Phosphate	µg/L	20	10	25	120	43.05	35.9	0.8341	0	12
Other	Silicon	µg/L	20	1.49E+04	2.27E+04	3.91E+04	2.51E+04	7563	0.3015	0	0
Other	Sulfite	µg/L	20	5	5	5	5	0	0	0	20
Other	Total Suspended Solids	µg/L	16	50	5538	7.55E+04	1.95E+04	2.54E+04	1.3018	0	1
Other	Turbidity (Field)	NTU	12	0	2.45	27.2	7.117	9.486	1.333	0	1
Other-ratio	Br/Cl by wt	ratio	20	0	0.004023	0.02142	0.007288	0.008059	1.1057	0	0
Other-ratio	B/Cl by wt	ratio	20	0	0.007168	0.01462	0.006245	0.003992	0.6393	0	0
Other-ratio	Cs/Cl by wt	ratio	20	0	0	0.001961	9.80E-05	4.38E-04	4.4721	0	0
Other-ratio	F/Cl by wt	ratio	20	0.001259	0.09209	0.1373	0.08337	0.0446	0.5349	0	0
Other-ratio	HCO_3/CL by wt	ratio	20	0.9518	42.05	91.85	42.84	25.15	0.5871	0	0
Other-ratio	K/Cl by wt	ratio	20	0.08305	2.3	6.781	2.628	2.095	0.797	0	0
Other-ratio	Li/Cl by wt	ratio	20	0	0	0.01686	8.43E-04	0.003771	4.4721	0	0
Other-ratio	Na/Cl by wt	ratio	20	0.5434	4.67	12.09	5.9	3.834	0.6498	0	0
Other-ratio	SO_4/Cl by wt	ratio	20	0.114	3.331	8.127	3.517	2.314	0.6581	0	0
Rad-iso	Americium-241	pCi/L	15	0	0.016	0.136	0.02467	0.03321	1.3458	0	11
Rad-iso	Plutonium-238	pCi/L	15	-0.0065	0.0045	0.057	0.009867	0.01689	1.712	0	13
Rad-iso	Plutonium-239	pCi/L	15	-0.0055	0.00475	0.041	0.006563	0.01074	1.6366	0	14
Rad-iso	Strontium-90	pCi/L	15	-0.38	0.005	0.18	-0.02767	0.1286	-4.647	0	15
Rad-iso	Tritium	pCi/L	33	-3	20.59	50.43	20.67	17.17	0.831	0	0

Table F-2.2-3d (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Rad-iso	Tritium	TU[f]	16	0.24	6.75	15.8	7.393	5.891	0.7969	0	0
Rad-iso	Uranium-234	pCi/L	15	0.049	0.209	0.655	0.2947	0.2099	0.7125	0	2
Rad-iso	Uranium-235	pCi/L	15	-4.50E-04	0.0075	0.039	0.01138	0.01045	0.918	0	12
Rad-iso	Uranium-238	pCi/L	15	0.019	0.099	0.465	0.1646	0.1305	0.7926	0	1
Rad-gross	Gross Alpha Radiation	pCi/L	10	-0.1	0.3475	0.7	0.375	0.2359	0.629	0	4
Rad-gross	Gross Beta Radiation	pCi/L	10	-0.02	2.4	7.5	3.019	2.841	0.9412	0	1
Rad-gross	Gross Gamma Radiation	pCi/L	9	103	164.5	313	172.6	62.97	0.3649	0	2
Rad-gscan[g]	Cesium-137	pCi/L	15	-1.35	0.157	0.7	0.02633	0.6289	23.881	0	15

[a] The mean is calculated as the arithmetic average.

[b] Std. Dev. = Standard deviation.

[c] CV = Coefficient of variation = std. dev./mean.
NATU = Natural uranium.
TUICPMS = Total uranium inductively coupled plasma mass spectrometry.
TULIKPA = Total uranium kinetic phosphorimetric analysis.

[d] n/a = Not applicable.

[e] — = No summary information, no samples analyzed.

[f] TU = tritium unit, 1 TU=3.193 pCi/kg or 3.193 pCi/L tritium.

[g] Rad-gscan = gamma spectroscopy.

Table F-2.2-3e
Regional Aquifer Filtered Samples at One-Half Detection Limit, Post-1997, R-Qualifiers Not Included

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean[a]	Std. Dev.[b]	CV[c]	Rejected	Nondetects
Metals	Aluminum	µg/L	54	1.6	10	115.1	20	20.12	1.0064	0	33
Metals	Antimony	µg/L	55	0.05	0.1	2.6	0.5289	0.7371	1.3938	0	51
Metals	Arsenic	µg/L	55	1	1.7	5.5	2.191	1.128	0.5148	0	13
Metals	Barium	µg/L	55	1.9	20.8	110	36.3	37.03	1.02	0	1
Metals	Beryllium	µg/L	55	0.005	1	1	0.6009	0.4297	0.7151	0	52
Metals	Boron	µg/L	48	4.6	18.2	51	23.16	13.93	0.6015	0	9
Metals	Cadmium	µg/L	55	0.065	0.5	0.5	0.3523	0.1923	0.5458	0	53
Metals	Calcium	µg/L	55	9090	15000	38100	15980	5850	0.366	0	0
Metals	Cesium	µg/L	33	0.5	1	1	0.9242	0.1821	0.197	0	33
Metals	Chromium	µg/L	55	0.15	3	44.7	4.083	5.948	1.457	0	14
Metals	Cobalt	µg/L	55	0.19	1	1	0.6686	0.3489	0.5218	0	54
Metals	Copper	µg/L	55	0.14	1	9	1.537	1.613	1.0492	0	31
Metals	Iron	µg/L	55	3.65	18.7	131.1	27.09	31.15	1.1501	0	39
Metals	Lead	µg/L	55	0.005	1	2	0.7172	0.4018	0.5603	0	52
Metals	Lithium	µg/L	33	20	30	40	29.97	7.808	0.2605	0	0
Metals	Magnesium	µg/L	55	230	2770	8430	2718	2378	0.8749	0	4
Metals	Manganese	µg/L	55	0.025	1	57.43	4.675	9.462	2.024	0	33
Metals	Mercury	µg/L	51	0.005	0.025	0.24	0.03107	0.03751	1.2074	0	44
Metals	Molybdenum	µg/L	38	1	1	3	1.334	0.6773	0.5077	0	30
Metals	Nickel	µg/L	55	0.25	1	19.8	1.426	2.736	1.9189	0	44
Metals	Potassium	µg/L	55	1370	2110	5070	2351	831	0.3534	0	0
Metals	Rubidium	µg/L	33	1	3	8	3.424	1.888	0.5514	0	1
Metals	Selenium	µg/L	55	0.05	0.1	3.6	0.7082	0.8498	1.1999	0	53
Metals	Silver	µg/L	55	0.12	0.5	1	0.4614	0.121	0.2622	0	54
Metals	Sodium	µg/L	55	9400	19300	30900	18080	7393	0.4089	0	0
Metals	Strontium	µg/L	38	42	114.7	510	192.5	165.2	0.8586	0	0
Metals	Thallium	µg/L	55	0.013	1	3.9	1.1	0.6445	0.586	0	49
Metals	Thorium	µg/L	5	0.5	0.5	0.5	0.5	0	0	0	5
Metals	Tin	µg/L	38	0.5	2.5	9.8	2.874	1.944	0.6764	0	38
Metals	Titanium	µg/L	38	0.65	1	5.874	1.439	1.332	0.9254	0	33
Metals	Uranium	µg/L	15	0.195	0.555	2.83	0.8827	0.8869	1.0047	0	0
Metals	Uranium by NATU	µg/L	0	—[d]	—	—	—	—	—	—	—
Metals	Uranium by TUICPMS	µg/L	9	0.195	0.519	2.61	0.8646	0.8971	1.0377	0	0
Metals	Uranium by TULIKPA	µg/L	9	0.23	0.47	2.56	0.8778	0.9284	1.0576	0	0

Table F-2.2-3e (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Metals	Vanadium	µg/L	55	1	11	17.1	10.47	4.681	0.4472	0	4
Metals	Zinc	µg/L	50	0.255	5	80	13.26	22.77	1.7176	0	35
Other	Ammonia	µg/L	0	—	—	—	—	—	—	—	—
Other	Alkalinity Total	µg/L	3	9.40E+04	9.50E+04	9.90E+04	9.60E+04	2646	0.0276	0	0
Other	Bicarbonate as Calcium Carbonate	µg/L	1	1.20E+05	1.20E+05	1.20E+05	1.20E+05	0	0	0	0
Other	Bromide	µg/L	48	0.025	37.21	100	44.27	31.85	0.7196	0	16
Other	Chloride	µg/L	48	1740	2300	9140	3195	2095	0.6559	0	0
Other-iso	Delta deuterium versus Std. Mean Ocean Water	n/a[e]	0	—	—	—	—	—	—	—	—
Other	Fluoride	µg/L	48	200	465	580	432.7	103.8	0.2398	0	0
Other	Nitrogen Ammonia (as N)	µg/L	9	250	250	1100	345.6	282.9	0.8188	0	8
Other	Nitrogen Nitrate + Nitrite (as N)	µg/L	9	25	300	910	324.4	259.3	0.7991	0	2
Other	Nitrogen Nitrate (as NO_3)	µg/L	6	100	155	400	211.7	137.8	0.6508	0	3
Other	Nitrogen Nitrite (as NO_2)	µg/L	6	50	50	50	50	0	0	0	6
Other	Nitrogen Total Kjeldahl (as N)	µg/L	9	50	190	350	195.6	107.4	0.549	0	2
Other	Oxalate	µg/L	17	0.3	10	10	9.429	2.353	0.2495	0	17
Other	Phosphorus Orthophosphate (as PO_4)	µg/L	15	25	25	250	79.33	75.92	0.957	0	13
Other	Silica	µg/L	42	1.86E+04	6.78E+04	1.00E+05	5.81E+04	2.38E+04	0.4095	0	0
Other	Sulfate	µg/L	48	1770	4973	1.72E+04	4659	2781	0.5968	0	0
Other	Total Dissolved Solids	µg/L	37	1.40E+05	2.04E+05	3.22E+05	2.09E+05	4.76E+04	0.2278	0	0
Other	Carbon Dissolved Organic	µg/L	8	290	1300	8100	2278	2554	1.1214	0	0
Other	Carbon Total Organic	µg/L	5	270	370	600	416	155.3	0.3734	0	0
Other	Conductivity	µS/cm	37	100	196	292	185.9	53.18	0.2861	0	0
Other	Humic Substances Hydrophilic Acids	µg/L	6	300	900	4300	1400	1501	1.0719	0	0
Other	Humic Substances Hydrophilic Bases	µg/L	5	100	100	400	180	130.4	0.7244	0	0
Other	Humic Substances Hydrophilic Neutrals	µg/L	4	200	200	500	275	150	0.5455	0	0
Other	Humic Substances Hydrophilic Total	µg/L	6	400	1200	5200	1717	1787	1.041	0	0
Other	Humic Substances Hydrophobic Acids	µg/L	6	100	350	1500	516.7	511.5	0.9901	0	0
Other	Humic Substances Hydrophobic Neutrals	µg/L	6	300	600	1300	666.7	403.3	0.605	0	0
Other	Humic Substances Hydrophobic Total	µg/L	6	400	1050	2900	1217	879.6	0.7229	0	0
Other	pH	SU	33	6.8	7.85	8.17	7.735	0.3463	0.0448	0	0
Other-iso	Nitrogen-15/Nitrogen-14 Ratio	ratio	1	0	0	0	0	0	0	0	0
Other-iso	Deuterium Hydrogen Ratio	ratio	10	-80	-72	-70	-73.5	3.064	-0.042	0	0
Other-iso	Oxygen-18/Oxygen-16 Ratio	ratio	10	-11.9	-11.3	-11.2	-11.39	0.2378	-0.021	0	0
Other	Cyanide Reactive	µg/L	0	—	—	—	—	—	—	—	—
Other	Sulfide Reactive	µg/L	0	—	—	—	—	—	—	—	—
Other	Anion Sum	µg/L	28	1198	2162	3220	2010	602.2	0.2996	0	0

Table F-2.2-3e (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Other	Cation Sum	µg/L	28	1245	2184	3101	2017	568.3	0.2817	0	0
Other	Balance	µg/L	28	-55.67	11.41	66.09	9.211	30.94	3.3594	0	0
Other	Alkalinity(Lab) $CaCO_3$	µg/L	33	5.37E+04	9.59E+04	1.28E+05	8.55E+04	2.49E+04	0.2915	0	0
Other	Ammonium	µg/L	33	10	30	74.04	28.95	19.01	0.6565	0	13
Other	Ammonium [as N]	µg/L	33	7.778	23.33	57.59	22.52	14.78	0.6565	0	13
Other	Bicarbonate	µg/L	33	6.55E+04	1.10E+05	1.50E+05	1.03E+05	2.93E+04	0.2845	0	0
Other	Carbonate	µg/L	33	0	0	7100	590.9	1688	2.8567	0	0
Other	Chlorate (ClO_3)	µg/L	33	5	10	10	9.545	1.46	0.1529	0	33
Other	Conductivity (Field)	µS/cm	16	51	190	290	196.8	58.62	0.2978	0	0
Other	Dissolved Oxygen (Field)	µg/L	0	—	—	—	—	—	—	—	—
Other	Hardness	µg/L	28	3.55E+04	5.54E+04	1.04E+05	5.61E+04	1.94E+04	0.3459	0	0
Other	Iodide	µg/L	33	5	5	5	5	0	0	0	33
Other	Nitrate	µg/L	33	5	1470	3250	1298	876.3	0.675	0	2
Other	Nitrate [as N]	µg/L	33	1.129	331.9	733.9	293.2	197.9	0.675	0	2
Other	Nitrite	µg/L	33	5	5	30	8.333	5.951	0.7141	0	28
Other	Nitrite [as N]	µg/L	33	0.8974	0.8974	5.385	1.496	1.068	0.7141	0	28
Other	pH (Field)	SU	28	6.5	7.645	8.27	7.571	0.4449	0.0588	0	0
Other	Phosphate	µg/L	33	3.26	25	80	21.79	16.45	0.7547	0	26
Other	Silicon	µg/L	28	8700	3.01E+04	4.68E+04	2.77E+04	1.20E+04	0.4333	0	0
Other	Sulfite	µg/L	33	5	5	5	5	0	0	0	33
Other	Total Suspended Solids	µg/L	10	50	223	8.26E+04	1.31E+04	2.79E+04	2.1282	0	2
Other	Turbidity (Field)	NTU	13	0	2.2	5.4	2.046	1.821	0.89	0	0
Other-ratio	Br/Cl by wt	ratio	28	0	0.009741	0.02151	0.01066	0.005016	0.4704	0	0
Other-ratio	B/Cl by wt	ratio	28	0.001091	0.005868	0.01844	0.008365	0.004693	0.5611	0	0
Other-ratio	Cs/Cl by wt	ratio	28	0	0	0	0	0	—	0	0
Other-ratio	F/Cl by wt	ratio	28	0.02845	0.173	0.2905	0.156	0.07999	0.5128	0	0
Other-ratio	HCO_3/CL by wt	ratio	28	15.75	35.24	69.83	35.98	13.32	0.3702	0	0
Other-ratio	K/Cl by wt	ratio	28	0.406	0.7119	2.355	0.8173	0.4064	0.4973	0	0
Other-ratio	Li/Cl by wt	ratio	28	0.004091	0.01055	0.01786	0.01048	0.004196	0.4004	0	0
Other-ratio	Na/Cl by wt	ratio	28	2.436	5.884	12.79	6.574	3.148	0.4789	0	0
Other-ratio	SO_4/Cl by wt	ratio	28	0.6357	1.183	4.226	1.637	0.9223	0.5635	0	0
Rad-iso	Americium-241	pCi/L	19	-0.00235	0.011	0.24	0.0243	0.05347	2.2005	0	17
Rad-iso	Plutonium-238	pCi/L	19	-0.0203	0.003	0.049	0.00545	0.01352	2.4813	0	18
Rad-iso	Plutonium-239	pCi/L	19	-0.0056	0.0042	0.048	0.008461	0.0139	1.6429	0	17
Rad-iso	Strontium-90	pCi/L	19	-0.15	0.005	0.23	0.02679	0.09705	3.6226	0	19
Rad-iso	Tritium	pCi/L	10	0.1277	0.5107	3.798	0.8906	1.128	1.2666	0	0

Table F-2.2-3e (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Rad-iso	Tritium	TU[f]	10	0.04	0.16	1.19	0.279	0.3534	1.2666	0	0
Rad-iso	Uranium-234	pCi/L	19	0.1	0.475	1.56	0.5773	0.4417	0.765	0	0
Rad-iso	Uranium-235	pCi/L	19	0.00275	0.01	0.065	0.0138	0.0166	1.2034	0	16
Rad-iso	Uranium-238	pCi/L	19	0.055	0.216	0.822	0.2852	0.2348	0.8235	0	0
Rad-gross	Gross Alpha Radiation	pCi/L	13	-0.53	0.085	1.75	0.2921	0.6996	2.3948	0	4
Rad-gross	Gross Beta Radiation	pCi/L	13	0.18	0.99	2.5	1.079	0.7223	0.6693	0	8
Rad-gross	Gross Gamma Radiation	pCi/L	13	117	177	318	196.9	61	0.3098	0	2
Rad-gscan[g]	Cesium-137	pCi/L	19	-1.25	-0.125	1.1	-0.156	0.6153	-3.945	0	19

[a] The mean is calculated as the arithmetic average.

[b] Std. Dev. = Standard deviation.

[c] CV = Coefficient of variation = std. dev./mean.
NATU = Natural uranium.
TUICPMS = Total uranium inductively coupled plasma mass spectrometry.
TULIKPA = Total uranium kinetic phosphorimetric analysis.

[d] n/a = Not applicable.

[e] — = No summary information, no samples analyzed.

[f] TU = Tritium unit, 1 TU=3.193 pCi/kg or 3.193 pCi/L tritium.

[g] Rad-gscan = Gamma spectroscopy.

Table F-2.2-3f
Regional Aquifer Nonfiltered Samples at One-Half Detection Limit, Post-1997, R-Qualifiers Not Included

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean[a]	Std. Dev.[b]	CV[c]	Rejected	Nondetects
Metals	Aluminum	µg/L	33	5.5	60	3696	370.1	742.1	2.0051	0	11
Metals	Antimony	µg/L	34	0.05	0.1	2.6	0.5574	0.7837	1.406	0	30
Metals	Arsenic	µg/L	34	1	2.2	6.7	2.496	1.32	0.5291	0	4
Metals	Barium	µg/L	34	3.6	24.6	112	39.33	36.98	0.9401	0	0
Metals	Beryllium	µg/L	34	0.1	1	1	0.7571	0.3846	0.5081	0	34
Metals	Boron	µg/L	29	5.2	20	52	23.61	14.42	0.611	0	5
Metals	Cadmium	µg/L	34	0.1	0.5	0.5	0.3897	0.174	0.4464	0	34
Metals	Calcium	µg/L	34	9050	17070	37300	16850	6205	0.3683	0	0
Metals	Cesium	µg/L	24	1	1	1	1	0	0	0	24
Metals	Chromium	µg/L	34	0.15	4	16	4.737	3.311	0.6991	0	6
Metals	Cobalt	µg/L	34	0.25	1	1	0.8268	0.2929	0.3542	0	32
Metals	Copper	µg/L	34	0.44	2	23	3.815	4.642	1.2167	0	10
Metals	Iron	µg/L	34	5	41.68	2024	270	454.7	1.6843	0	11
Metals	Lead	µg/L	34	0.5	1	4	1.09	0.7853	0.7206	0	31
Metals	Lithium	µg/L	24	10	30	50	28.33	9.168	0.3236	0	0
Metals	Magnesium	µg/L	34	246	2886	8430	3187	2542	0.7977	0	1
Metals	Manganese	µg/L	34	0.1	2.1	142.8	14.2	27.02	1.9022	0	17
Metals	Mercury	µg/L	31	0.005	0.01	0.12	0.0229	0.02479	1.0825	0	20
Metals	Molybdenum	µg/L	28	1	1.225	8	1.895	1.5	0.7919	0	17
Metals	Nickel	µg/L	34	0.46	1	17	1.453	2.758	1.8978	0	29
Metals	Potassium	µg/L	34	1470	2155	5010	2374	879.9	0.3706	0	0
Metals	Rubidium	µg/L	24	2	3	9	3.875	2.05	0.5289	0	0
Metals	Selenium	µg/L	34	0.05	0.1	3.3	0.6162	0.7797	1.2654	0	25
Metals	Silver	µg/L	34	0.3	0.5	1	0.4926	0.1122	0.2278	0	33
Metals	Sodium	µg/L	34	9500	19300	30300	17810	6925	0.3889	0	0
Metals	Strontium	µg/L	28	47.8	111.5	500	185	161.1	0.8709	0	0
Metals	Thallium	µg/L	34	1	1	4.3	1.306	0.683	0.523	0	33
Metals	Thorium	µg/L	0	—[d]	—	—	—	—	—	—	—
Metals	Tin	µg/L	28	2.5	2.5	14.6	3.396	2.586	0.7613	0	27
Metals	Titanium	µg/L	28	0.65	4.216	78.94	11.28	18.15	1.6086	0	11
Metals	Uranium	µg/L	6	0.25	0.63	2.92	0.955	0.9786	1.0247	0	0
Metals	Uranium by NATU	µg/L	0	—	—	—	—	—	—	—	—
Metals	Uranium by TUICPMS	µg/L	0	—	—	—	—	—	—	—	—
Metals	Uranium by TULIKPA	µg/L	0	—	—	—	—	—	—	—	—

Table F-2.2-3f (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Metals	Vanadium	μg/L	34	2	11	19	10.82	4.596	0.4247	0	1
Metals	Zinc	μg/L	34	0.3	5	70	13.47	20.11	1.4938	0	25
Other	Ammonia	μg/L	0	—	—	—	—	—	—	—	—
Other	Alkalinity Total	μg/L	2	9.77E+04	9.89E+04	1.00E+05	9.89E+04	1626	0.0165	0	0
Other	Bicarbonate as Calcium Carbonate	μg/L	1	1.20E+05	1.20E+05	1.20E+05	1.20E+05	0	0	0	0
Other	Bromide	μg/L	28	10	40	100	41.83	23.84	0.5699	0	5
Other	Chloride	μg/L	28	1700	2574	9050	3482	2354	0.6761	0	0
Other-iso	Delta deuterium versus Std. Mean Ocean Water	n/a[e]	11	-87	-80	-78	-81.09	2.587	-0.0319	0	0
Other	Fluoride	μg/L	28	200	430	550	395.4	101.2	0.256	0	0
Other	Nitrogen Ammonia (as N)	μg/L	0	—	—	—	—	—	—	—	—
Other	Nitrogen Nitrate + Nitrite (as N)	μg/L	0	—	—	—	—	—	—	—	—
Other	Nitrogen Nitrate (as NO_3)	μg/L	3	100	100	400	200	173.2	0.866	0	2
Other	Nitrogen Nitrite (as NO_2)	μg/L	3	50	50	50	50	0	0	0	3
Other	Nitrogen Total Kjeldahl (as N)	μg/L	0	—	—	—	—	—	—	—	—
Other	Oxalate	μg/L	9	10	10	10	10	0	0	0	9
Other	Phosphorus Orthophosphate (as PO_4)	μg/L	4	100	100	100	100	0	0	0	4
Other	Silica	μg/L	24	2.65E+04	6.90E+04	9.97E+04	6.22E+04	2.30E+04	0.3697	0	0
Other	Sulfate	μg/L	28	1700	5559	1.74E+04	4954	3147	0.6353	0	0
Other	Total Dissolved Solids	μg/L	27	1.27E+05	2.01E+05	3.18E+05	2.12E+05	4.92E+04	0.232	0	0
Other	Carbon Dissolved Organic	μg/L	0	—	—	—	—	—	—	—	—
Other	Carbon Total Organic	μg/L	0	—	—	—	—	—	—	—	—
Other	Conductivity	μS/cm	24	120	201	296	189	56.45	0.2986	0	0
Other	Humic Substances Hydrophilic Acids	μg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophilic Bases	μg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophilic Neutrals	μg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophilic Total	μg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophobic Acids	μg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophobic Neutrals	μg/L	0	—	—	—	—	—	—	—	—
Other	Humic Substances Hydrophobic Total	μg/L	0	—	—	—	—	—	—	—	—
Other	pH	SU	24	7.17	7.77	8.17	7.703	0.3251	0.0422	0	0
Other-iso	Nitrogen-15/Nitrogen-14 Ratio	ratio	8	-7.6	-0.55	2.6	-1.337	3.672	-2.7453	0	0
Other-iso	Deuterium Hydrogen Ratio	ratio	18	-77	-73	-67	-72.78	2.962	-0.0407	0	0
Other-iso	Oxygen-18/Oxygen-16 Ratio	ratio	29	-11.9	-11.2	-10.1	-11.19	0.4232	-0.0378	0	0
Other	Cyanide Reactive	μg/L	0	—	—	—	—	—	—	—	—
Other	Sulfide Reactive	μg/L	0	—	—	—	—	—	—	—	—
Other	Anion Sum	μg/L	24	1227	2077	3085	1960	604.9	0.3086	0	0

Table F-2.2-3f (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Other	Cation Sum	μg/L	24	1238	2144	3015	1978	591.5	0.299	0	0
Other	Balance	μg/L	24	-33.56	4.13	87.33	11.5	32.71	2.8442	0	0
Other	Alkalinity(Lab) $CaCO_3$	μg/L	24	5.40E+04	9.22E+04	1.29E+05	8.59E+04	2.54E+04	0.2954	0	0
Other	Ammonium	μg/L	24	10	30	68.03	30.53	16.47	0.5396	0	6
Other	Ammonium [as N]	μg/L	24	7.778	23.33	52.91	23.74	12.81	0.5396	0	6
Other	Bicarbonate	μg/L	24	6.59E+04	1.13E+05	1.57E+05	1.04E+05	3.12E+04	0.2991	0	0
Other	Carbonate	μg/L	24	0	0	5300	220.8	1082	4.899	0	0
Other	Chlorate (ClO_3)	μg/L	24	5	10	10	9.375	1.689	0.1802	0	24
Other	Conductivity (Field)	μS/cm	14	51	202.5	290	198.5	62.74	0.3161	0	0
Other	Dissolved Oxygen (Field)	μg/L	0	—	—	—	—	—	—	—	—
Other	Hardness	μg/L	24	3.56E+04	5.31E+04	1.02E+05	5.55E+04	1.96E+04	0.3538	0	0
Other	Iodide	μg/L	24	5	5	5	5	0	0	0	24
Other	Nitrate	μg/L	24	5	1310	3220	1234	907.9	0.7356	0	3
Other	Nitrate [as N]	μg/L	24	1.129	295.8	727.1	278.7	205	0.7356	0	3
Other	Nitrite	μg/L	24	5	5	10	6.042	2.074	0.3433	0	24
Other	Nitrite [as N]	μg/L	24	0.8974	0.8974	1.795	1.084	0.3723	0.3433	0	24
Other	pH (Field)	SU	24	6.5	7.645	8.27	7.585	0.4535	0.0598	0	0
Other	Phosphate	μg/L	24	10	17.5	80	21.46	17.03	0.7938	0	21
Other	Silicon	μg/L	24	1.24E+04	3.23E+04	4.66E+04	2.91E+04	1.07E+04	0.3697	0	0
Other	Sulfite	μg/L	24	5	5	5	5	0	0	0	24
Other	Total Suspended Solids	μg/L	22	50	2140	8.26E+04	1.26E+04	2.09E+04	1.6607	0	4
Other	Turbidity (Field)	NTU	12	0	1.25	5.4	1.817	1.978	1.0885	0	0
Other-ratio	Br/Cl by wt	ratio	24	0	0.009952	0.02311	0.0121	0.006505	0.5376	0	0
Other-ratio	B/Cl by wt	ratio	24	0.001126	0.00652	0.01923	0.008441	0.004621	0.5475	0	0
Other-ratio	Cs/Cl by wt	ratio	24	0	0	0	0	0		0	0
Other-ratio	F/Cl by wt	ratio	24	0.02873	0.1756	0.2802	0.1606	0.07997	0.4978	0	0
Other-ratio	HCO_3/CL by wt	ratio	24	15.8	36.24	71.43	36.83	13.48	0.3661	0	0
Other-ratio	K/Cl by wt	ratio	24	0.3912	0.7468	2.343	0.8163	0.4245	0.52	0	0
Other-ratio	Li/Cl by wt	ratio	24	0.00351	0.01013	0.01765	0.01019	0.004199	0.4118	0	0
Other-ratio	Na/Cl by wt	ratio	24	2.381	5.7	12.47	6.43	2.998	0.4662	0	0
Other-ratio	SO_4/Cl by wt	ratio	24	0.6276	1.18	4.307	1.64	0.9466	0.5773	0	0
Rad-iso	Americium-241	pCi/L	16	5.00E-04	0.00665	0.193	0.02583	0.05007	1.9386	0	14
Rad-iso	Plutonium-238	pCi/L	16	-0.001	0.006	0.0225	0.006656	0.007043	1.0581	0	16
Rad-iso	Plutonium-239	pCi/L	16	-0.0022	0.0039	0.024	0.005069	0.006245	1.2321	0	16
Rad-iso	Strontium-90	pCi/L	16	-0.125	-0.0075	0.185	-0.00726	0.08091	-11.1463	0	16
Rad-iso	Tritium	pCi/L	37	-2.4	0.4789	48	2.589	8.142	3.1444	0	0

Table F-2.2-3f (continued)

Group	Analyte	Units	Count	Minimum	Median	Maximum	Mean	Std. Dev.	CV	Rejected	Nondetects
Rad-iso	Tritium	TU[f]	21	-0.08	0.08	4.04	0.4276	0.923	2.1586	0	0
Rad-iso	Uranium-234	pCi/L	16	0.152	0.5	1.64	0.5846	0.4171	0.7136	0	0
Rad-iso	Uranium-235	pCi/L	16	-9.50E-04	0.0244	0.063	0.02616	0.0202	0.7723	0	7
Rad-iso	Uranium-238	pCi/L	16	0.096	0.264	0.814	0.2913	0.1899	0.6519	0	0
Rad-gross	Gross Alpha Radiation	pCi/L	10	-0.5	0.2671	1.6	0.3709	0.7305	1.9693	0	3
Rad-gross	Gross Beta Radiation	pCi/L	10	-0.16	1.555	4	1.781	1.518	0.8525	0	3
Rad-gross	Gross Gamma Radiation	pCi/L	10	105	199.3	397	209.8	77.64	0.37	0	2
Rad-gscan[g]	Cesium-137	pCi/L	16	-1.045	-0.3053	1.05	-0.128	0.6428	-5.023	0	16

[a] The mean is calculated as the arithmetic average.

[b] Std. Dev. = Standard deviation.

[c] CV = Coefficient of variation = std. dev./mean.
NATU = Natural uranium.
TUICPMS = Total uranium inductively coupled plasma mass spectrometry.
TULIKPA = Total uranium kinetic phosphorimetric analysis.

[d] n/a = Not applicable.

[e] — = No summary information, no samples analyzed.

[f] TU = Tritium unit, 1 TU=3.193 pCi/kg or 3.193 pCi/L tritium.

[g] Rad-gscan = Gamma spectroscopy.

Table F-2.2-4
Background Perchlorate Concentration in the Pajarito Plateau Groundwaters
(NMED 2004, 88768)

Aquifer-prep	Units	Count	Minimum	Median	Maximum	Mean[a]	Std. Dev.[b]	CV[c]	Rejected	Nondetects
Regional-filtered	µg/L	36	0.025	0.26	0.46	0.2735	0.09198	0.3363	0	1
Volcanic-filtered	µg/L	20	0.17	0.2615	0.45	0.272	0.06831	0.2511	0	0
Combined	µg/L	56	0.025	0.26	0.46	0.2729	0.08364	0.3064	0	1

[a] The mean is calculated as the arithmetic average.

[b] Std. Dev. = Standard deviation.

[c] CV = Coefficient of variation = Std. Dev /Mean.