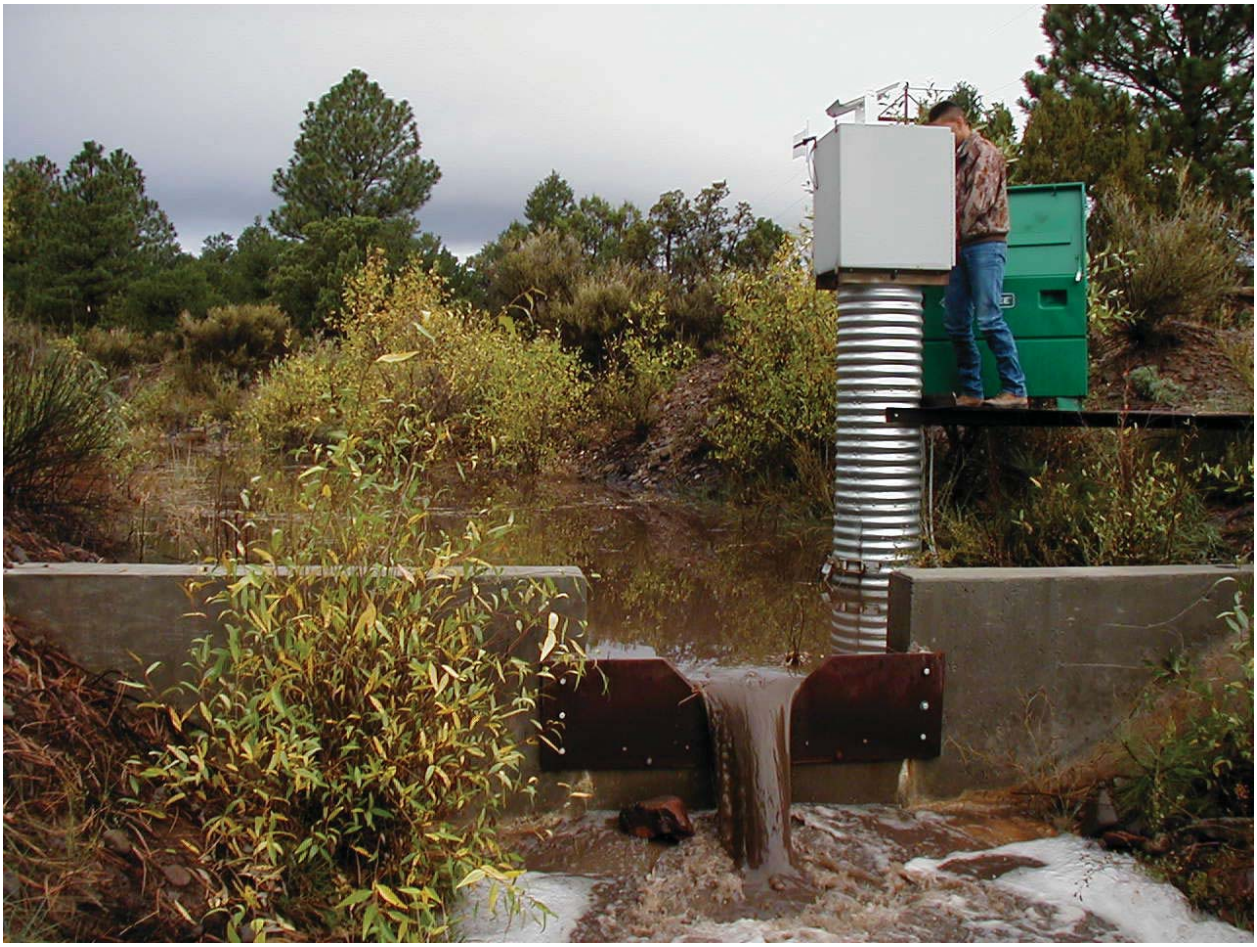
5. Surface Water, Groundwater, and Sediments



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Abstract

Record volumes of snowmelt and storm runoff crossed the Laboratory in 2001, reflecting the increased yield of surface water from the Jemez Mountains following the Cerro Grande fire. Snowmelt was present in the larger canyon systems for two months and provided a potential sustained source of water for wildlife. None of the snowmelt or base flow samples contained radioactivity greater than Department of Energy (DOE) Derived Concentration Guides (DCGs) values for public exposure. Measurements of alpha radiation in excess of 15 pCi/L occurred at locations with current or former radioactive liquid waste discharges: Acid/Pueblo, DP/Los Alamos, and Mortandad Canyons. For the second consecutive year, americium-241, plutonium-238, and plutonium-239, -240 in effluent from the Technical Area (TA)-50 Radioactive Liquid Waste Treatment Facility (RLWTF) outfall did not exceed DCGs. The average TA-50 RLWTF effluent nitrate and fluoride concentrations were below the New Mexico groundwater standards. Four snowmelt or base flow samples in Los Alamos Canyon contained lead concentrations greater than drinking water standards. Low levels of high-explosives compounds were detected in snowmelt in the Water Canyon drainage, consistent with earlier results.

Storm runoff in otherwise dry drainages results from summer thunderstorms. Record peak flows from fire-impacted areas occurred in three canyons. The amount of sediment carried by storm runoff continues to be 100 to 1000 times greater than pre-fire levels. Largely because of the sediment load and associated background concentrations, we measured record levels of many metals and several radionuclides in the storm runoff. Plutonium-239, -240 activities exceeded DOE DCGs in runoff in lower Pueblo Canyon and were partly attributable to mobilization of Laboratory legacy materials. We estimate that storm runoff transported approximately 20 to 40 mCi of plutonium-239, -240 downstream in lower Pueblo Canyon in 2001. This amount represents an estimated increase of more than 40 times the levels measured since automated runoff measurements started in 1997. Gross alpha activities were greater than public exposure DCGs in about three-fourths of the storm runoff samples. While high alpha activities were measured at stations both above and below the Laboratory, Laboratory contributions are indicated at several locations, most pronounced in Pueblo and Los Alamos Canyons and around Material Disposal Area (MDA) G. Selenium exceeded the New Mexico wildlife habitat standard in nearly half of the samples and appears to be of natural origin.

In 2000, because of the Cerro Grande fire, many sediment samples contained cesium-137 at much higher values than previously noted. Values in 2001 continued to show high cesium-137 at some stations. The sediment sampling again shows that plutonium occurs above fallout levels in Pueblo and Los Alamos Canyons and extends off-site from the Laboratory. Cesium-137 and plutonium-239, -240 activities in lower Pueblo Canyon have risen over the past few years, a result that may be due in part to mobilization of sediments by increased flows and of fallout cesium-137 in ash from vegetation burned in the Cerro Grande fire. Within Mortandad Canyon, the greatest radionuclide levels in sediments are found between the point where the TA-50 RLWTF effluent enters the drainage and the sediment traps, approximately a 3-km distance. Sampling after relocation of stations below the sediment traps in 2001 indicates that relatively high values of sediment radioactivity extend closer to the Laboratory boundary than previously described. Sediment samples below the TA-50 RLWTF outfall again showed cesium-137 concentrations that were up to five times greater than the screening action level (SAL) value. In 2001, sediment samples near the Laboratory boundary had cesium-137 activity of 1.3 to 5.6 times background. The latter sample, a few feet on the San Ildefonso Pueblo side of the boundary, had a value 60% of the SAL. A number of sediment samples near and downstream of the TA-54 Solid Waste Operations at MDA

G contained plutonium-238 and plutonium-239, -240 above background. We also found above-background levels of plutonium and americium in sediments downstream of MDA AB, TA-49.

Continued testing of water supply wells in 2001 showed that high-explosives constituents are not present in Los Alamos County and Santa Fe drinking water. Perchlorate (no drinking water standard) and tritium (at 1/500 of the drinking water standard) continued to be found in water supply well O-1 in Pueblo Canyon during 2001. Nitrate is higher than background in O-1. Other groundwater samples from the regional aquifer were consistent with previous results. Trace levels of tritium are present in the regional aquifer in a few areas where past liquid waste discharges occurred, notably beneath Los Alamos, Pueblo, and Mortandad Canyons. The highest tritium level found in a regional aquifer test well (near water supply well O-1) is about 1/50 of the drinking water standard. The nitrate concentration in a test well beneath Pueblo Canyon remains elevated but, in 2001, was only about half the drinking water standard. Except for above-background tritium in O-1, we detected no radionuclides other than naturally occurring uranium in Los Alamos County, San Ildefonso Pueblo, or Santa Fe water supply wells.

In 2000 and 2001, it appeared that perchlorate had been discovered in a spring issuing along the Rio Grande below the Laboratory and, in 2001, in numerous surface water samples. Evaluation of analytical laboratory methods and reanalysis of samples show that these apparent detections were the result of matrix interference in the analysis rather than the presence of perchlorate.

Analytical results for perched alluvial and intermediate-depth groundwater are similar to those of past years. Waters near former or present effluent discharge points show the effects of these discharges. A gross alpha sample from a test well in Cañada del Buey had a value about 65% of the DOE DCGs for public exposure. No values exceeded the DOE DCGs. Radioactivity measurements in perched alluvial groundwater that exceeded DOE DCGs for a DOE-operated drinking water system or EPA drinking water standards occurred at locations with current or former radioactive liquid waste discharges: gross beta, americium-241, and strontium-90 values from Mortandad and Los Alamos Canyons (these waters are not used as drinking water). Monitoring of fluoride and nitrate in Mortandad Canyon perched alluvial groundwater shows that levels of these substances have for the most part dropped below NM groundwater standards during 2001 as a result of their reduction in the TA-50 RLWTF effluent.

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A. Description of Monitoring Program

Studies related to development of groundwater supplies began at Los Alamos in 1945 under the direction of the US Geological Survey (USGS). In about 1949, the Atomic Energy Commission, the Los Alamos Scientific Laboratory, and the USGS jointly initiated studies aimed specifically at environmental monitoring and protecting groundwater quality. These initial efforts focused on Pueblo and DP/Los Alamos Canyons, which received radioactive industrial waste discharges in the early days of the Laboratory.

The current network of annual sampling stations for surface water and sediment surveillance includes a set of regional (or background) stations and a group of stations near or within the Los Alamos National Laboratory (LANL or the Laboratory) boundary. The regional stations establish the background quantities of radionuclides and radioactivity derived from natural minerals and from fallout affecting northern New Mexico and southern Colorado.

The Water Quality and Hydrology Group (ESH-18) collects groundwater samples from wells and springs within or adjacent to the Laboratory and from the nearby San Ildefonso Pueblo. The on-site stations, for the most part, focus on areas of present or former radioactive waste disposal operations, such as canyons (Figure 1-3). To provide a context for discussion of monitoring results, the setting and operational history of currently monitored canyons that have received radioactive or other liquid discharges are briefly summarized below.

For a discussion of sampling procedures, analytical procedures, data management, and quality assurance, see Section F. below.

1. Acid Canyon, Pueblo Canyon, and Lower Los Alamos Canyon

Acid Canyon, a small tributary of Pueblo Canyon, was the original disposal site for liquid wastes generated by research on nuclear materials for the World War II Manhattan Engineer District atomic bomb project. Acid Canyon received untreated radioactive industrial effluent from 1943 to 1951. The Technical Area (TA) 45 treatment plant was completed in 1951, and from 1951 to 1964 the plant discharged treated effluents that contained residual radionuclides into nearby Acid Canyon. Several decontamination projects have removed contamination from the area, but remaining residual radioactivity from these releases is now associated with the sediments in Pueblo Canyon (ESP 1981).

The inventory of radioactivity remaining in the Pueblo Canyon system is only approximately known. Several studies (ESP 1981; Ferenbaugh et al., 1994) have concluded that the plutonium in this canyon system does not present a health risk to the public. Based on analysis of radiological sediment survey data, the estimated total plutonium inventory in Acid Canyon, Pueblo Canyon, and Lower Los Alamos Canyon ranges from 246 mCi to 630 ± 300 mCi (ESP 1981). The estimated plutonium releases were about 177 mCi, in satisfactory agreement with the measured inventory considering uncertainties in sampling and release estimates. About two-thirds of this total is in the Department of Energy (DOE)-owned portion of lower Pueblo Canyon, which is planned to be transferred to Los Alamos County in 2007.

Pueblo Canyon currently receives treated sanitary effluent from the Los Alamos County Bayo Sewage Treatment Plant in the middle reach of Pueblo Canyon. Perched groundwater occurs seasonally in the alluvium, depending on the volume of surface flow from snowmelt, thunderstorm runoff, and sanitary effluents. Tritium, nitrate, and chloride, apparently derived from these Laboratory and municipal disposal operations, have infiltrated to the intermediate perched groundwater (at depths of 37 to 58 m [120 to 190 ft]) and to the regional aquifer (at a depth of 180 m [590 ft]) beneath the lower reach of Pueblo Canyon. Except for occasional nitrate values, levels of these constituents are a small fraction of the Environmental Protection Agency (EPA) drinking water standards.

Starting in 1990, increased discharge of sanitary effluent from the county treatment plant resulted in nearly continual flow during most except summer months in the lower reach of Pueblo Canyon, across DOE land into the lower reach of Los Alamos Canyon on San Ildefonso Pueblo land. From mid-June through early August, higher evapotranspiration and the diversion of sanitary effluent for golf course irrigation eliminate flow from Pueblo Canyon into Los Alamos Canyon. Hamilton Bend Spring, which in the past discharged from alluvium in the lower reach of Pueblo Canyon, has been dry since 1990, probably because there was no upstream discharge from the older, abandoned Pueblo Sewage Treatment Plant. Farther east, the alluvium is continuously saturated, mainly because of infiltration of effluent from the Bayo Sewage Treatment Plant. Effluent flow from Pueblo

Canyon into Los Alamos Canyon generally extends to somewhere between the DOE/San Ildefonso Pueblo boundary and the confluence of Guaje and Los Alamos Canyons.

2. DP Canyon and Los Alamos Canyon

In the past, Los Alamos Canyon received treated and untreated industrial effluents containing some radionuclides. The upper reach of Los Alamos Canyon experienced releases of treated and untreated radioactive effluents during the earliest Manhattan Project operations at TA-1 (1942–1945) and some release of water and radionuclides from the research reactors at TA-2. An industrial liquid waste treatment plant that served the old plutonium processing facility at TA-21 discharged effluent containing radionuclides into DP Canyon, a tributary to Los Alamos Canyon, from 1952 to 1986. Los Alamos Canyon also received discharges containing radionuclides from the sanitary sewage lagoon system at the Los Alamos Neutron Science Center (LANSCE) at TA-53. The low-level radioactive waste stream was separated from the sanitary system at TA-53 in 1989 and directed into a total retention evaporation lagoon.

The reach of Los Alamos Canyon within the Laboratory boundary presently carries flow from the Los Alamos Reservoir (west of the Laboratory) as well as National Pollutant Discharge Elimination System (NPDES)-permitted effluents from TA-53 and TA-21. Infiltration of effluents and natural runoff from the stream channel maintain a shallow body of perched groundwater in the alluvium of Los Alamos Canyon within the Laboratory boundary west of State Road (SR) 4. Groundwater levels are highest in late spring from snowmelt runoff and in late summer from thundershowers. Water levels decline during the winter and early summer when runoff is at a minimum. Perched groundwater also occurs within alluvium in the lower portion of Los Alamos Canyon on San Ildefonso Pueblo lands. Intermediate-depth perched groundwater occurs in the lower part of the Bandelier tuff and the underlying Puye Formation and Cerros del Rio basalt at depths of a few hundred feet below the canyon bottom. This intermediate groundwater also shows some evidence of contamination from Laboratory sources.

3. Sandia Canyon

Sandia Canyon has a small drainage area that heads at TA-3. The canyon receives water from the cooling tower at the TA-3 power plant. Treated effluents from the TA-46 Sanitary Wastewater Systems (SWS) Facility are rerouted to Sandia Canyon. These effluents support a continuous flow in a short reach of the upper part of the canyon. Only during summer thundershowers does stream flow approach the Laboratory boundary at SR-4, and only during periods of heavy thunderstorms or snowmelt does surface flow extend beyond the Laboratory boundary.

4. Mortandad Canyon

Mortandad Canyon has a small drainage area that heads at TA-3. Its drainage area receives inflow from natural precipitation and a number of NPDES outfalls, including one from the Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50. The TA-50 facility began operations in 1963. The effluents infiltrate into the stream channel and maintain a saturated zone in the alluvium extending about 3.5 km (2.2 mi) downstream from the outfall. The easternmost extent of saturation remains on-site, ending about 1.6 km (1 mi) west of the Laboratory boundary with San Ildefonso Pueblo. Over the period of operation, the radionuclides in the RLWTF effluent have often exceeded the DOE Derived Concentration Guides (DCGs) for public dose from drinking water (although this water is not used as drinking water). The effluent also contains nitrate that has caused perched alluvial groundwater concentrations to exceed the New Mexico groundwater standard of 10 mg/L (nitrate as nitrogen). In April 1999, the new reverse osmosis and ultrafiltration system at the RLWTF began operation. This system removes additional radionuclides and nitrate from the effluent, and discharges from the plant now meet the DOE public dose DCGs and the New Mexico groundwater standard for nitrate. The RLWTF effluent has met DOE DCGs continuously since December 10, 1999.

Perchlorate is a nonradioactive chemical compound containing a chlorine atom bound to four oxygen atoms and is used in a variety of industrial processes. At the Laboratory, perchlorate is a byproduct of the perchloric acid used in nuclear chemistry research. Perchlorate is on the EPA's contaminant candidate list, which under the Safe Drinking Water Act (SDWA) requires background investigations to determine a Maximum Contaminant Level (MCL). Perchlorate is present in the influent to the RLWTF at concentrations up to several thousand parts per billion (ppb). Perchlorate affects hormone production in the human thyroid

and is a suspected, but not proven, carcinogen. The California Department of Health Services has issued a health advisory limit of 18 ppb for perchlorate in drinking water. California revised its perchlorate action level down to 4 µg/L on January 18, 2002. (California DHS, EPA 2002) The Laboratory is conducting pilot tests to remove perchlorate from the RLWTF effluent.

The RLWTF is working on a system, which should be operational by March 31, 2002, for removing perchlorate from the plant effluent.

Continuous surface flow across the drainage has not reached the San Ildefonso Pueblo boundary since observations began in the early 1960s (Stoker et al., 1991). Three sediment traps located about 3 km (2 mi) downstream from the effluent discharge in Mortandad Canyon dissipate the energy of major thunderstorm runoff events and settle out transported sediments. From the sediment traps, it is approximately 2.3 km (1.4 mi) downstream to the Laboratory boundary with San Ildefonso Pueblo.

The alluvium is less than 1.5 m thick in the upper reach of Mortandad Canyon and thickens to about 23 m at the easternmost extent of saturation. The saturated portion of the alluvium is perched on weathered and unweathered tuff, generally with no more than 3 m of saturation. There is considerable seasonal variation in saturated thickness, depending on the amount of runoff experienced in any given year (Stoker et al., 1991). Velocity of water movement in the alluvium ranges from 18 m/day in the upper reach to about 2 m/day in the lower reach of the canyon (Purtymun 1974; Purtymun et al., 1983). The high turnover rate for water in the alluvial groundwater prevents accumulation of chemicals from the RLWTF effluent (Purtymun et al., 1977). The top of the regional aquifer is about 290 m below the alluvial groundwater.

5. Pajarito Canyon

In Pajarito Canyon, water perched in the alluvium is perched on the underlying tuff and is recharged mainly through snowmelt and thunderstorm runoff. Saturated alluvium does not extend beyond the facility boundary. Three shallow observation wells were constructed in 1985 as part of a compliance agreement with the State of New Mexico to determine whether technical areas in the canyon or solid waste disposal activities on the adjacent mesa were affecting the quality of shallow groundwater. No effects were observed; the alluvial groundwater is contained in the canyon bottom and does not extend under the mesa (Devaurs 1985).

6. Cañada del Buey

Cañada del Buey contains a shallow perched alluvial groundwater system of limited extent. The thickness of the alluvium ranges from 1.2 to 5 m, but the underlying weathered tuff ranges in thickness from 3.7 to 12 m. In 1992, saturation was found within only a 0.8-km-long segment, and only two observation wells have ever contained water (ESP 1994). Because treated effluent from the Laboratory's SWS Facility may at some time be discharged into the Cañada del Buey drainage system, a network of five shallow groundwater monitoring wells and two moisture monitoring holes was installed during the early summer of 1992 within the upper and middle reaches of the drainage (ESP 1994).

7. Water Canyon and Cañon de Valle

Water Canyon and Cañon de Valle (a tributary) pass through the southern portion of LANL where explosives development and testing occurs. The canyons contain thin alluvium near the mountains, but it thickens considerably across the Laboratory. West of the Laboratory, Upper Cañon de Valle contains perennial reaches, and the upper portions of both canyons have several springs (both on the flanks of the Sierra de los Valles and on the Pajarito Plateau) that discharge from perched layers in the Bandelier Tuff. Cañon de Valle has shallow alluvial groundwater of limited extent on Laboratory property. Surface flow in Cañon de Valle and Water Canyon is mainly ephemeral within the Laboratory, though short perennial reaches may exist in each canyon. The flow in Water Canyon below the western Laboratory boundary is due in part to flow from the Water Canyon Gallery. In the past, the Laboratory released wastewater from several high-explosives (HE) processing sites in TA-16 and TA-9 into both canyons. Consolidation of these individual NPDES outfalls to the High Explosives Wastewater Treatment Facility was completed in 1997 (reducing the number of outfalls from 21 to one). In the process, the Laboratory reduced the 12 million gallons of water per year used for high-explosives processing by 99%. The remaining water discharged is treated to comply with environmental regulations. Solid HE is captured in filters, and an activated carbon adsorption system removes dissolved HE.

B. Surface Water Sampling

1. Introduction

The Laboratory monitors surface water from regional and Pajarito Plateau stations to evaluate the potential environmental effects of Laboratory operations. No perennial surface water extends completely across the Laboratory in any canyon. Regional surface water samples are collected from rivers or reservoirs. Within and near the Laboratory, we collect base flow samples where effluent discharges or spring discharges maintain stream flow persistently for several weeks or months during the year. Periodic natural runoff occurs in two modes: (1) spring snowmelt that occurs over days to weeks at a low discharge rate and sediment load and (2) summer storm runoff from thunderstorms that occurs over hours, usually at a high discharge rate and sediment load.

To aid in water quality interpretation, we divide stream flow into three types or matrices. Each of the three flow types might be collected at a single location within a time span of as little as a week, depending on weather conditions. At times, the flow might represent a combination of several of these components. The three types are

- base flow—persistent stream flow, but not necessarily perennial water. This stream flow is present for periods of weeks or longer. The water source may be effluent discharge or shallow groundwater that discharges in canyons.
- snowmelt—flowing water that is present as a result of melting snow. This type of water often may be present for a week or more and in some years may not be present at all.
- storm runoff—flowing water that is present in response to rainfall. These flow events are generally very short-lived, with flows lasting from less than an hour to several days.

Because snowmelt and base flow are present for extended periods of time, they pose similar potentially longer-term exposure concerns, such as for wildlife watering. We thus discuss snowmelt and base flow together, separate from storm runoff. Although storm runoff may provide a short-term source of water for wildlife, it is of primary concern as a principal agent for moving Laboratory-derived constituents off-site and possibly into the Rio Grande.

The surface water within the Laboratory is not a source of municipal, industrial, or irrigation water, though wildlife does use the waters. Activities of radionuclides in surface water samples are compared with either the DOE DCGs or the New Mexico Water Quality Control Commission (NMWQCC 2000) stream standards, which in turn reference the New Mexico Environment Department's (NMED's) New Mexico Radiation Protection Regulations (Part 4, Appendix A). However, New Mexico radiation protection activity levels are in general two orders of magnitude greater than the DOE DCGs for public dose, so we discuss only the DCGs here. The concentrations of nonradioactive constituents may be compared with the NMWQCC General, Livestock Watering, and Wildlife Habitat Standards. The NMWQCC (NMWQCC 2000) groundwater standards can also be applied in cases where groundwater outflow may affect stream water quality. Appendix A presents these standards.

2. Runoff in 2001

Environmental surveillance monitoring focuses on describing the levels of specific chemical constituents in the environment. To understand the post-fire base flow monitoring results, however, it is also important to recognize the general hydrologic conditions that prevailed during the sampling period(s). In this section, we briefly discuss the magnitude of runoff in 2001. Table 5-1 presents a summary of flow data from Water Year 2001. Gaging stations with discharge data published in the report, "Surface Water Data at Los Alamos National Laboratory: 2001 Water Year" (Shaull et al., 2001), show higher peak flows than ever recorded. The annual water data report contains LANL flow data. LANL personnel collected and published surface water discharge data from approximately 36 stream-gaging stations that cover most of the Laboratory. The Laboratory operates and maintains this network of 85 stations, which seeks to characterize runoff from all watersheds at the Laboratory. (The Laboratory publishes station data only for gages that have developed stage and discharge relationships.)

The snowmelt in 2001 was significantly higher than observed during the previous six years of record (Shaull et al., 1996a, 1996b, 1998, 1999, 2000, 2001, and 2002). Figure 5-1 shows the total annual snowmelt at gages that are upstream and downstream of the Laboratory (excluding Pueblo Canyon). The November through May seasonal precipitation at TA-6 for

each year is also shown. The snowmelt in 2001 is about 1.5 times higher than previously observed at upstream gages and about 2 times higher than recently observed at downstream gages, although the seasonal precipitation in 2001 (9.1 in.) was about 10% less than that received in 1995 (10.1 in.). The increased snowmelt in 2001 was likely due in part to the effects of the Cerro Grande fire, which increased runoff by removing vegetation and soils from upper watersheds.

One of the notable effects of the Cerro Grande fire was increased storm runoff from precipitation events during the summer of 2000 and again in 2001. When thunderstorms occurred over the higher elevations of the Sierra de los Valles, runoff from burned slopes was significantly higher in canyons downstream of the precipitation than before the fire. Studies by Shaull et al. (2001), Koch et al. (2001), Johansen et al. (2001), and Gallaher et al. (2002) described storm runoff in 2000 after the Cerro Grande fire. Generally, most storm runoff events at LANL in 2001 were less intense than in 2000, partially because of below normal amounts of precipitation during the summer thunderstorm season and possibly because of partial recovery of fire-impacted areas in the watersheds. In 2001, however, record peak flows from fire-impacted areas occurred in Pueblo, Los Alamos, and Rendija Canyons, and the total volume of storm runoff was higher than in 2000.

The major storm runoff event of 2001 occurred in Pueblo Canyon on July 2, 2001, when a flood event totaling about 90 ac-ft rushed through the canyon. This record high runoff event resulted from a 60-minute thunderstorm that occurred west of Los Alamos town site on the afternoon of July 2, 2001.

Figure 5-2 shows the seasonal storm runoff measured at the gages downstream of the Laboratory (including Pueblo Canyon with base flow removed) for the period 1995 through 2001. The yearly seasonal storm runoff is the sum of runoff at each downstream gage from June 1 through October 31 of each year. Figure 5-2 also shows the seasonal precipitation received at the TA-6 meteorological station each year from June 1 through October 31.

The total downstream storm runoff in 2001 was 1.5 times higher than the storm runoff in 2000 after the Cerro Grande fire and about 3.6 times higher than the pre-fire average annual runoff (106 ac-ft), even though the seasonal precipitation in 2001 (6.94 in.) was less than the amount received in 2000 and less than the pre-fire average seasonal precipitation (12.4 in.).

3. Base Flow and Snowmelt Monitoring Networks

We collect snowmelt at upstream and downstream gaging stations at the Laboratory and base flow samples from Pajarito Plateau stations near the Laboratory and from regional stations. We collect base flow grab samples annually from locations where effluent discharges or natural runoff maintains persistent stream flow, and we collect regional base flow samples from monitoring stations on the Rio Grande, Rio Chama, and Jemez River (Figure 5-3.) These samples provide background data from areas beyond the Laboratory boundary.

Figure 5-4 shows the locations of gaging stations where storm runoff and some snowmelt samples were collected in 2001. Figure 5-5 shows base flow and snowmelt monitoring stations located on the Pajarito Plateau. In 2001, we took a total of 44 snowmelt samples from 18 collection sites and a total of 29 base flow samples from 21 monitoring sites at and near the Laboratory. The following sections describe the results of the analyses of these snowmelt and base flow samples.

4. Radiochemical Analytical Results for Base Flow and Snowmelt

Table 5-2 lists the results of radiochemical analyses for snowmelt and base flow samples for 2001. The table also lists the total propagated one-sigma analytical uncertainty and the analysis-specific minimum detectable activity where available. Uranium was analyzed by isotopic methods and as total uranium for most samples in 2001. We submitted a total of 53 filtered and 75 unfiltered samples of base flow and snowmelt for radiochemical analysis.

To emphasize values that are detections, Table 5-3 lists radionuclides detected in snowmelt and base flow samples. Detections are defined as values exceeding both the analytical method detection limit (where available) and three times the individual measurement uncertainty. The table shows two categories of qualifier codes: those from the analytical laboratory and from secondary validation. See Table 5-4 for an explanation of the qualifier codes. We show qualifier codes because some analytical results meet the detection criteria but are not really detections because of analytical problems. For example, in some cases, the analyte was found in the lab blank. Because uranium, gross alpha, and gross beta are usually detected, we indicate in Table 5-3 only occurrences of

these measurements above specific values. The specific values are 5 µg/L for total uranium, 5 pCi/L for gross alpha, and 20 pCi/L for gross beta and are lower than the EPA MCLs or screening levels.

The right-hand columns of Table 5-3 indicate radiochemical detections that are greater than one-half of the DOE DCGs for public dose for ingestion of environmental water or the standards shown. Bear in mind that surface waters on the Laboratory are not used for drinking water.

None of the base flow or snowmelt samples analyzed contained radiochemical activities greater than the DOE DCGs for public exposure. Three gross alpha measurements in Los Alamos Canyon were 60 to 90% of this value; one was from a sample collected upstream of the Laboratory near the ice rink. Three samples contained radionuclide activities greater than the 4-mrem-dose in the DOE drinking water DCGs.

Four samples of snowmelt contained radiochemical activities greater than New Mexico or EPA water quality standards. All of these samples came from areas below historical Laboratory effluent discharges. A sample from Acid Weir station collected on April 11, 2001, contained 14.9 pCi/L dissolved strontium-90; this concentration is 1.9 times the EPA primary drinking water standard. A sample from DPS-1 in DP Canyon collected on March 28 contained 139 pCi/L dissolved gross beta activity, 2.8 times the EPA secondary drinking water level, and 76.6 pCi/L dissolved strontium-90, nearly 10 times the EPA primary drinking water standard. Two unfiltered snowmelt samples collected on March 15 from Los Alamos Canyon above SR-4 and below the Los Alamos Canyon weir contained up to 26.8 pCi/L gross alpha activity, at 1.5 to 1.8 times the NM livestock watering standard. This weir sample also contained an americium-241 activity approaching (75%) the DOE drinking water DCG.

A base flow sample collected from Mortandad Canyon at GS-1 on April 18, 2001, contained total activity of 12.1 pCi/L strontium-90 and 92.9 pCi/L gross beta activity, which were above the EPA primary drinking water standard and the EPA secondary drinking water DCG, respectively. The amercium-241 activity in the sample was 5.5 times the DOE drinking water standard, and the plutonium-238 and plutonium-239, -240 levels were near the DOE drinking water DCG.

An unfiltered base flow sample collected along the Laboratory's western boundary contained gross alpha activity greater than the EPA primary drinking water standard and the New Mexico livestock watering standard of 15 pCi/L in 2001. This sample, collected from the Los Alamos Canyon below Ice Rink station on August 2, 2001, contained 16.7 pCi/L gross alpha activity, 1.1 times the standard. The base flow at this location on August 1 was the result of dredging operations by Los Alamos County that discharged water from the Los Alamos Reservoir. The sample contained an abnormally high concentration (for base flow) of 2890 mg/L total suspended solids (TSS), about 5 times the TSS concentration of other base flow samples in 2001.

Two base flow samples collected from regional locations contained detections greater than half the minimum standard. An unfiltered sample collected from the Rio Chama at Chamita (bank) station contained 7.7 pCi/L gross alpha activity, about 52% of the EPA primary drinking water standard and the New Mexico livestock watering standard of 15 pCi/L. A sample from the Jemez River contained americium-241 activity nearly double the DOE drinking water DCG. However, repeat analysis of the same sample did not confirm the americium-241 detection.

5. Nonradiochemical Analytical Results for Base Flow and Snowmelt

a. Major Chemical Constituents. Table 5-5 lists the results of analyses for major chemical constituents in snowmelt and base flow samples collected in 2001.

The chemical quality of base flow and snowmelt samples in 2001 is generally consistent with the quality of samples observed in pre-fire years. These waters commonly contain relatively low levels of both dissolved and suspended solids. Median total dissolved solids (TDS) concentrations at gages upstream of the Laboratory are comparable to downstream values in Los Alamos and Water Canyons. In Pajarito Canyon, however, median TDS concentrations in snowmelt increase by nearly 3 times at the downstream stations. In past monitoring, we have noted elevated levels of dissolved solutes in the alluvial groundwater in lower Pajarito Canyon. Possible causes of the TDS increase in Pajarito Canyon include evaporation, road salt, or residual effects of the Cerro Grande fire.

The measurements of base flow collected from areas receiving effluents often show the effect of these effluents. The TDS concentrations of base flow samples collected in Sandia Canyon at SCS-2 and SCS-3 on May 17 were 707 and 719 mg/L, respec-

tively, which were above the EPA secondary drinking water standard for TDS. The nitrate (as nitrogen) value for base flow from station lower Pueblo Canyon at SR-502 was 11.8 mg/L, above the EPA drinking water standard of 10 mg/L. The nitrate measurement probably included effluent from the Los Alamos County sewage treatment plant in lower Pueblo Canyon. The nitrate (as nitrogen) concentration reported for base flow from station Guaje Canyon was 130 mg/L; however, Guaje Canyon upstream of this location has no known source of nitrate, and the unusually high value reported by the analytical laboratory is considered an analytical laboratory or sampling error.

Five base flow samples and nine snowmelt samples contained more than 20 mg/L sodium, the EPA drinking water health advisory level. The highest sodium concentration in snowmelt was 160 mg/L in a sample collected from upper DP Canyon March 28, 2001. The same sample contained 632 mg/L TDS, which was also above the EPA secondary drinking water standard (500 mg/L) for TDS. The source is probably road salt runoff from urban road deicing operations.

The TSS concentration in base flow and snowmelt samples collected in 2001 was usually less than 400 mg/L. The TSS concentrations often reflect the landscape stability in the various canyons. Median TSS concentrations increase nearly 10 times between upstream and downstream gages in Los Alamos and Water Canyons. These data indicate a net removal of sediment from these canyons. In contrast, TSS concentrations in Pajarito Canyon decline downstream and indicate net deposition of sediment. The average TSS in snowmelt samples collected at all canyon upstream sites was 47 mg/L, and the average TSS in samples collected at downstream sites was 161 mg/L. The highest TSS in snowmelt was 652 mg/L in a sample from lower Los Alamos Canyon above SR-4. The highest TSS in base flow was recorded on August 1 in Los Alamos Canyon as the reservoir was being drained for maintenance operations. Using these average TSS concentrations and the total upstream and downstream snowmelt volumes (Section B.2., Runoff in 2001, in this chapter), we estimated the transport of suspended sediment in snowmelt at upstream locations as about 33,000 kg and at downstream locations as about 105,000 kg.

The results of the analyses of perchlorate in base flow appear in Table 5-6. Samples that were analyzed with the ion chromatography method before April 25, 2001, yielded many false positives because of matrix interferences (see Section F). Based on analytical laboratory qualifiers and validation of perchlorate data, only three base flow samples in 2001 contained detections of perchlorate. Samples collected in Sandia Canyon at locations SCS-1 and SCS-3 on November 29, 2001, contained estimated concentrations of 1.2µg/L and 0.52 µg/L, respectively. We obtained these measurements using the new liquid chromatography/mass spectrometry/mass spectrometry (LC/MS/MS) method (see QA, Section F). A base flow sample collected from Mortandad Canyon at GS-1 on April 18, 2001, contained perchlorate in a concentration of 99.5 µg/L; the base flow at this location reflects effluent discharges from the TA-50 RLWTF.

b. Trace Metals. Table 5-7 lists the results of trace metal analyses on snowmelt and base flow samples for 2001. We filtered samples collected for trace metal analysis so that we could compare them with the NMWQCC standards that apply to dissolved constituents. We left samples collected for mercury and selenium analysis unfiltered, because the NMWQCC standards for these analytes apply to total metal content. With some exceptions, the levels of trace metals in samples for 2001 were generally consistent with previous observations.

Only one sample contained a metal concentration greater than NMWQCC standards for livestock watering or wildlife habitat. The analysis detected selenium in an off-site base flow sample from station Frijoles at Monument Headquarters in a concentration of 5.6 µg/L, slightly above the wildlife habitat standard.

In 2001, the EPA lowered its primary drinking water standard and the tap water MCL for arsenic from 50 µg/L to 10 µg/L. No snowmelt samples contained dissolved arsenic in concentrations greater than the new standard. One base flow sample collected from station Los Alamos Canyon below Ice Rink on August 1 contained arsenic in a concentration of 11.4 µg/L, slightly above the new standard. This sample also contained barium at levels approaching (90%) the NM groundwater standard and lead above the EPA drinking water guideline. The water contained unusually high TSS from dredging operations conducted by Los Alamos County at the Los Alamos reservoir in the upper part of the Los Alamos Canyon watershed.

We also found lead concentrations approaching or slightly greater than the EPA drinking water guideline in three snowmelt and one base flow sample collected in lower Los Alamos Canyon. The snowmelt sample collected March 15 also contained antimony, cadmium, and thallium at levels greater than the EPA primary drinking water standards. A duplicate analysis of the sample, however, did not support the antimony, cadmium, or thallium detections.

Aluminum, iron, and manganese concentrations in filtered snowmelt and base flow were greater than EPA secondary drinking water standards at many locations in 2001, consistent with historical results. These metals are naturally occurring constituents in silt and clay minerals in base flow and runoff.

c. Organic Constituents in Snowmelt and Base Flow. Table 5-8 summarizes the locations where we collected organic samples in 2001. (See Section 5.F.2.c. later in this chapter for analytical methods and analytes.) We analyzed samples for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs). Some samples were also analyzed for high-explosive (HE) constituents. Table 5-9 shows organic compounds detected above the analytical laboratory's quantification level in 2001, as well as results from blanks.

The analysis detected the HE compounds RDX and HMX in 3 snowmelt samples in 2001. One sample collected from station Water Canyon at Beta contained 1.9 µg/L HMX and 0.49 µg/L RDX, and two samples collected from Water Canyon below SR-4 contained detections of HMX of 0.99 and 3.8 µg/L and RDX of 0.26 and 0.9 µg/L, respectively. These RDX values are below EPA's drinking water health advisory limit of 2 µg/L. Earlier monitoring had detected both of these compounds in a variety of water sampling locations within the Water Canyon drainage system.

The analysis detected SVOCs in base flow samples from 4 locations in 2001, including two regional locations. The most common compound detected was bis(2-ethylhexyl)phthalate, which was reported in a concentration of 1080 µg/L in a sample from the station Rio Chama at Chamita. Other detections of bis(2-ethylhexyl)phthalate included 6.4 µg/L from Pueblo 3 and 2 µg/L from station Pueblo Canyon at SR-502 in samples collected on April 3, 2001. The compound bis(2-ethylhexyl)phthalate is a plasticizer and a common artifact in analytical laboratory analyses of organic compounds, although this level is unusually high for such artifacts. The sample was collected upstream of the Laboratory at a location with little industrial activity.

The base flow sample collected from the station Rio Chama at Chamita also contained 20.4 µg/L pyrene and 21.5 µg/L of fluoranthene. The EPA has no standards for these compounds.

A snowmelt sample from upper Pueblo Canyon, at station Pueblo 1R located above Laboratory operations, contained 5.2 µg/L chloroform and 1.4 µg/L of bromodichloromethane. Both are common byproducts from chlorination. The specific source is unknown at present.

Polychlorinated biphenyls (PCBs) or dioxins/furans were not detected in snowmelt or base flow samples in 2001.

6. Long-Term Trends

Long-term trends for base flow are discussed in Section 5.D with groundwater trends.

7. Storm Runoff Monitoring Network

Storm runoff samples were historically collected as grab samples from usually dry portions of drainages during or shortly after runoff events. As of 1996, we have collected storm runoff samples using stream gaging stations, most with automated samplers (Shaull et al., 2000). The stream gaging stations collect samples when a significant rainfall event causes flow in a monitored portion of a drainage. Many gaging stations are located where drainages cross the Laboratory's boundaries. For the larger drainages, we sample where they exit the Laboratory and at upstream locations. In contrast, we sample storm runoff at several mesa-top sites (for example, MDA G [Figure 5-4], MDA L, TA-55) from locations that target specific industrial activities, with negligible run-on from other sources. We collected one sample (Los Alamos Canyon Weir) manually (grab sample) to supplement the automated samplers. Figure 5-4 shows gaging stations on the Pajarito Plateau. We use samples from the stations to monitor water quality effects of potential contaminant sources such as industrial outfalls or soil contamination sites.

In 2000, a large storm runoff event after the Cerro Grande fire destroyed most samplers located along the Laboratory's western boundary (background stations). Those stations were all rebuilt and operable through the 2001 season. Storm runoff samples were collected on 30 days during the 2001 season. We collected over

100 storm runoff samples from April through October, the majority (59%) from watercourses. Thirty-nine samples came from mesa-top stations.

8. Transport of Sediment by Storm Runoff

The levels of many chemical constituents in Los Alamos storm runoff are related to the TSS concentrations (Gallaher et al., 2002). We use TSS as a proxy measurement for the quantity of sediment carried in storm runoff. Generally, the most sediment-laden samples contain the highest total radioactivity and metals content. Thus, it is important to recognize the general trends in TSS concentrations. Higher levels of total radioactivity may be due to increased sediment erosion and transport in canyons, rather than to a new contaminant source.

We estimate changes in TSS concentrations with an averaging technique (flow weighting) that accounts for the variations in sediment associated with a changing streamflow regime (Belillas and Roda 1993; Brown and Krygier 1971). To calculate the mass of sediment (load) carried in each storm runoff event, we multiplied the appropriate TSS concentrations by the runoff volumes entering or leaving the Laboratory during a specific storm event. Then we estimated the average sediment load in runoff by dividing the total mass of sediment by the total volume of water in all the sampled storm events. This technique normalizes the effect of abnormal flow events, such as were observed at LANL after the Cerro Grande fire, allowing for comparison with pre-fire conditions.

After the Cerro Grande fire in 2000, the load of TSS per liter of water at most of the upstream monitoring stations increased by 100 to 1000 times (Figure 5-6). This trend continued in 2001 with higher average TSS concentrations at all upstream locations in 2001 except for the upstream location in Los Alamos Canyon. The reservoir in upper Los Alamos Canyon likely helps to reduce TSS concentrations in storm runoff. At the downstream stations in Pueblo, Los Alamos, Pajarito, and Water Canyons, the average TSS concentrations increased further in 2001, likely an effect of the Cerro Grande fire.

The largest downstream changes in 2001 occurred in Pueblo Canyon, with TSS concentrations increasing more than 100 times in 2000 after the fire and 10 times further in 2001, primarily as the result of the large flood event on July 2, 2001. The hydrologic and sediment transport regimes were not appreciably altered in the lesser-burned canyons of Cañada del Buey, Potrillo, and Ancho, where TSS concentrations in storm runoff do not show significant changes.

The 2001 TSS data indicate that about 1.3 million kg suspended sediment entered LANL at upstream locations (excluding Pueblo Canyon where upstream data are not available) and about 1.6 million kg suspended sediment was carried in storm runoff downstream of LANL. About 10 million kg suspended sediment was carried downstream in lower Pueblo Canyon in 2001; over half of this amount was during the large July 2 runoff event. Although the Laboratory's automated sampler did not collect sufficient water to analyze the July 2 flood for radioisotopes, a sample collected by NMED provides some basis for evaluating the load of plutonium-239, -240 carried by the event. The NMED grab sample contained 250 pCi/L plutonium-239, -240. Combining this measurement with other Laboratory results and flow measurements allows us to calculate the transported inventory. We estimate that storm runoff transported approximately 20 to 40 mCi of plutonium-239, -240 downstream in lower Pueblo Canyon in 2001. This amount represents an estimated increase of more than 40 times the levels measured since 1997 (Gallaher et al., 2002). About two-thirds of the plutonium transport in Pueblo Canyon occurred on July 2. The largest contributions to the Rio Grande occurred in the 1950s and 1960s, with relatively small contributions in the 70s, 80s, or 90s. The recent floods seen since the Cerro Grande fire contribute pulses of plutonium into the Rio Grande, likely not seen since the 1960s.

9. Radiochemical Analytical Results for Storm Runoff

Table 5-10 presents radiochemical analytical results for storm runoff in 2001. We commonly detected radionuclides in the unfiltered storm runoff samples, as expected with samples containing abundant sediment and associated natural or fallout radioactivity. Except for cesium-137 and uranium-235, the analysis detected each of the radionuclides in more than 50% of the samples. The levels of radionuclides we measured in our samples were quite variable by location and through time.

a. Comparison to Historical Levels. We evaluate the data by comparing results with historical levels and relevant standards and by looking for spatial and temporal trends. The benchmarks for comparing with historical levels are the analytical

results obtained since 1995 from storm runoff samples collected across and near the Laboratory. We use the post-1995 data set for comparison because, although storm runoff data were collected before 1995, the post-1995 data sampling methods were similar to those used for the current data. The pre-fire data set mainly includes 1995–1999 results from Los Alamos Canyon and Cañada del Buey. For other drainages, pre-fire storm runoff was limited.

The year 2001 activities were the highest ever recorded for plutonium-239, -240; uranium-234, -235, -238; gross alpha; and gross beta. In most cases, the enhanced radioactivity is attributable to increased storm runoff after the Cerro Grande fire. The plutonium-239, -240 maximums were seen in lower Pueblo Canyon and reflect a significantly increased mobilization of legacy LANL contamination in the canyon sediments. In contrast, the high total uranium activities were seen mainly in Guaje and Rendija Canyons, north of the Laboratory, and are related to increased natural sediment load in the large post-fire runoff events.

The largest overall changes from historical levels were recorded for gross alpha and gross beta activities. For both activities, 17 of the largest 20 historical values occurred during 2001. The elevated gross alpha and gross beta activities were seen roughly equally at on-site locations and at locations upstream or north of the Laboratory. A major factor of the elevated readings can simply be the larger sediment loads carried in the larger-magnitude post-Cerro Grande fire storm runoff events. To evaluate whether the increased gross alpha and beta activities were due mainly to the enhanced sediment load or whether LANL-derived constituents were mobilized, we performed the following screening analysis to remove the effect of the sediment load.

We compared calculated alpha activities in the suspended sediment for on-site locations against background sites located upstream and north of the Laboratory and with historical results. We calculated suspended sediment activities by dividing the unfiltered water alpha activities with the associated TSS concentrations. Results of the calculations appear in Figure 5-7, which compares alpha activities for background sites with on-site locations by time. As a group, activities for on-site locations are larger than those at background stations. For 2001, the median alpha activity calculated in suspended sediment was 26 pCi/g for on-site samples versus 10 pCi/g for the background samples. Residual sediment from the Cerro Grande fire, deposited in 2000 floods, could be the source of a fraction of the larger on-site alpha activities. Background values drop from 2000 to 2001, possibly because the flows flushed ash out of the burned areas, depositing some it on LANL.

This analysis indicates that most of the larger alpha activity values were LANL-related. Los Alamos and Pueblo Canyons and the area around MDA G (Figure 5-8) produced the largest alpha activities in suspended sediment in 2001. The gross beta activities follow the same general pattern described for gross alpha. It is likely that the post-fire stream flows are mobilizing higher-activity sediments that were previously stored in historic flood plain deposits along the active channels. The larger flows are probably encroaching upon the flood plains and scouring a broader segment of the canyon floor sediments.

b. Fire Impacts on Storm Runoff Quality. The largest residual effect from the Cerro Grande fire on radioactivity in storm runoff probably is increased scour and transport of sediment because of the heightened storm water flows. Los Alamos and Pueblo Canyons in particular show evidence of increased mobilization of Laboratory-impacted stream sediments. In addition to increased bulk movement of sediment, results also indicate an increase in the gross radioactivity of the suspended sediment carried by the on-site runoff since the fire, as discussed above. We have insufficient pre-fire storm runoff results, however, to do a direct site-by-site comparison.

Residual impacts from the dispersal of ash appear to be minimal. In 2000, we observed heightened levels of fallout-derived cesium-137 in ash-laden storm runoff after the fire. In 2001, peak concentrations of cesium-137 in runoff were markedly lower throughout the Pajarito Plateau, indicating a general flushing of the ash. The flows in Guaje Canyon display the most striking difference. Peak cesium-137 activity observed in several large Guaje Canyon 2001 storm runoff events was about 1/10th those observed in 2000 runoff events. These findings are consistent with data collected in the latter part of the 2000 season.

c. Comparison of Radioactivity in Storm Runoff with Standards and Screening Levels. Water quality standards have not been established specific to most radionuclides in runoff. We compare the results for unfiltered water samples with DOE DCGs for public exposure and NMWQCC general, livestock watering, and wildlife habitat standards (Table 5-3).

We further compare the results for filtered waters with appropriate EPA drinking water standards or DOE DCGs for drinking water (Table 5-3). Keep in mind that the storm runoff water is not used for drinking purposes because of its short-lived nature. Also keep in mind that the NMWQCC standards for gross alpha require the subtraction of activity from radon and uranium, as well as activity from source, special nuclear, and byproduct material. Our reported values do not reflect these subtractions. We make the comparison with drinking water standards to provide context to measured values. Lastly, we screen for significant concentrations in the suspended sediment by comparing them with radioactive Screening Action Levels (SALs) for sediments (ER 2001).

In unfiltered samples, gross alpha activities were greater than public exposure DCG levels (30 pCi/L) and State of New Mexico livestock watering standards (15 pCi/L) in about three-fourths of all samples collected. The gross alpha DCG is based on the most restrictive anthropogenic alpha emitters (plutonium-239, -240 and americium-241) and is commonly exceeded by storm runoff laden with naturally derived alpha emitters (such as from the uranium decay series). To illustrate, all of the background samples collected upstream or north of the Laboratory contain gross alpha activity greater than these reference standards. The gross beta activity DCG for public exposure was exceeded in five samples, three of which were collected on-site.

The plutonium-239, -240 DCG for public exposure was exceeded in 3 samples, all collected in lower Pueblo Canyon (station Pueblo above SR-502). The median plutonium-239, -240 activity for station Pueblo above SR-502 also was greater than the public exposure DCG, as shown in Figure 5-9. The calculated plutonium-239, -240 activities for the suspended sediment carried by these storm runoff events are 4.4, 1.6, and 1.2 pCi/g. A background storm runoff station for upper Pueblo Canyon was not yet operable during these events, and thus we cannot directly distinguish Laboratory-derived plutonium from fallout plutonium. However, the calculated activities in the Pueblo Canyon samples are one order of magnitude larger than calculated values (0.1 pCi/g or less) for storm runoff samples collected at other background stations north and upstream of the Laboratory. This comparison suggests that the exceedances of the DCGs are partly due to mobilization of Laboratory-derived plutonium and not solely due to the high sediment loads. The calculated suspended sediment plutonium-239, -240 activities in the Pueblo Canyon storm runoff samples are 10% or less the SAL of 44 pCi/g (ER 2001).

The analysis detected elevated levels of tritium in several storm runoff samples collected in DP/Los Alamos Canyons, upper Pajarito Canyon, and around MDA G. The maximum activity recorded (890 pCi/L at MDA G-3) was less than 5% of the reference standards.

All filtered samples contained radionuclide levels below the EPA and DOE drinking water standards, with one exception. A single sample from lower DP Canyon contained dissolved strontium-90 at 1.1 times greater than the EPA standard. The source of the strontium-90 in that sample is likely from past Laboratory operations at TA-21, and the result is consistent with previous monitoring data.

Suspended sediment in storm runoff samples collected at MDA G-4 is calculated to contain cesium-137 activities greater than the SAL, by 5 times. Because of further downstream mixing, the activities in sediment found in deposits after the runoff events will likely be substantially lower than those found in the runoff samples. The results indicate, nonetheless, elevated levels in storm runoff at MDA G. Levels of cesium-137 in sediments deposited around the perimeter of MDA G remain within background ranges, possibly because of the limited runoff volumes from the facility. We will continue to monitor to confirm this initial indication.

10. Nonradiochemical Analytical Results for Storm Runoff

a. Major Chemical Constituents. Table 5-11 lists the results of analyses for major chemical constituents in storm runoff samples for 2001. The concentrations of most constituents were comparable to pre-Cerro Grande fire levels. In 2000, we noted increases resulting from the fire for total alkalinity, calcium, magnesium, potassium, total phosphorous, and cyanide concentrations. In 2001, concentrations of these constituents were substantially lower than the previous year, indicating a general recovery after the fire.

TSS concentrations in storm runoff samples collected in 2001 were highly variable, depending on location and runoff magnitude. The average TSS concentration for sites upstream of the Laboratory was 23,000 mg/L, compared with 17,000 mg/L at LANL

sites. The largest TSS concentrations were consistently recorded in Guaje and Rendija Canyons, to the north of the Laboratory. TSS concentrations in those canyons averaged 78,000 mg/L, with a maximum of 144,000 mg/L. Storm runoff from mesa-top sites carried much less sediment, averaging 1,000 mg/L.

Samples from middle Los Alamos Canyon (above DP Canyon) and from around MDA G (G-3) both contained TDS concentrations greater than the EPA secondary drinking water standard. The MDA G-3 sample also contained chloride at a concentration greater than the NMWQCC groundwater standard, along with elevated levels of several other solutes.

We detected trace levels of total cyanide and amenable cyanide in several drainages crossing the Laboratory and in Guaje Canyon. All values were below the NMWQCC general, livestock watering, and wildlife habitat standards. In 2000, storm runoff derived from the Cerro Grande fire contained much higher total cyanide concentrations.

b. Trace Metals. Table 5-12 presents trace metals (for 23 metals) analytical results for year 2001 storm runoff in both filtered and unfiltered samples. With filtered samples, we can compare results with the NMWQCC standards for protection of livestock watering and wildlife habitat that apply to dissolved constituents. Samples analyzed for mercury and selenium were typically unfiltered, as the NMWQCC standards for these analytes apply to total metal content. In general, metals concentrations in filtered samples were lower than concentrations in unfiltered samples. This relationship indicates that the metals are generally associated with the particulate and sediment carried by the storm runoff rather than dissolved in the water.

For nearly every metal, the levels in both filtered and unfiltered storm runoff samples for 2001 were significantly higher than in prior years. As with the radionuclides, the increase in total metals concentrations is largely due to the increased sediment load in runoff after the Cerro Grande fire. It is uncertain what the source(s) of the larger dissolved metals concentrations might be. One possible cause is simply the mechanical limitations in the filtration process. Many of the samples contained large quantities (more than 50,000 mg/L) of suspended sediment, and even a small percentage of leakage passing the filter could affect the measured constituent concentrations in the filtered sample. The analytical laboratory reported that some filtered sample aliquots contained visible sediments.

With one exception, background metals concentrations in 2001 storm runoff samples were substantial and probably represent a major portion of the metals load. Silver appears to be the only metal readily attributable to Laboratory sources. At background sites, we rarely detect silver in storm runoff. In years 2000 and 2001, the 20 largest silver concentrations were all from on-site samples, and 18 of those came from Water and Pajarito Canyons. The Laboratory discharged silver with spent photographic solutions into a tributary of Cañon de Valle for more than 40 years, resulting in silver concentrations of up to 25,000 ppm in sediment in the tributary (Kasunic et al., 1985). The large runoff events following the Cerro Grande fire have accelerated the downstream movement of silver.

Comparison with Standards and Screening Levels. Selenium exceeded the New Mexico wildlife habitat standard of 5 µg/L in nearly half (50/109) of the unfiltered storm runoff samples collected from locations both on and above the Laboratory. The high percentage of values greater than the standard largely reflects the sediment load in the unfiltered samples. Three of the four largest values were from samples collected from background sites, in Guaje and in Pajarito Canyons.

Mercury was detected at levels greater the New Mexico wildlife habitat standard of 0.77 µg/L at one location, at station Los Alamos above SR-4. The mercury level at this site was twice the standard, and two additional samples from this and another station in Los Alamos Canyon had detectable levels of mercury at about 25% of the standard. These results are consistent with pre-fire results obtained in lower Los Alamos Canyon, and the persistence of the results suggests a LANL source. The analysis also detected mercury at low levels in a runoff sample from MDA G and in a background sample from Guaje Canyon north of the Laboratory.

Aluminum and vanadium concentrations were greater than NMWQCC livestock watering standards in 4 and 2 samples, respectively. Half of the samples containing values above the standard came from background sites, where these metals are probably derived from natural sources.

In 2001, the EPA primary drinking water standard for arsenic was lowered from 50 µg/L to 10 µg/L. Two filtered storm runoff samples from stations Guaje

Canyon above Rendija Canyon (46 µg/L) and Water Canyon at SR-4 (55 µg/L) contained arsenic greater than the new standard. Several other samples from these drainages contained arsenic values lower than the standard.

Because the suspended solids compose such a large portion of the total metals load in the runoff samples, we examined the suspended sediment for significant levels of the individual metals. Only concentrations for iron, a natural component of soils, were greater than residential EPA soil screening levels for metals (EPA 2000).

c. Organic Constituents in Storm Runoff. Table 5-8 summarizes the locations where we collected organic samples in 2001. (See Section F. in this chapter for analytical methods and analytes.) We analyzed storm runoff samples from TA-54 for SVOCs, HE compounds, PCBs, and dioxins/furans. Table 5-9 shows organic compounds detected above the analytical laboratory's quantification level in 2001.

We detected SVOCs in storm runoff samples collected from TA-54 at MDA L and MDA G. A runoff sample collected from TA-54 below MDA L contained the SVOC di-n-octylphthalate at a concentration of 23.6 µg/L. Storm runoff samples collected July 2, 2001, from MDA G-3 contained up to 27.4 µg/L phenol, 351µg/L 4-methylphenol, and 5.9 µg/L bis(2-ethylhexyl)phthalate. Levels of the latter two compounds are slightly greater than the EPA tap water guidelines by 1.9 and 1.2 times, respectively. Runoff samples collected from MDA G-4 contained 2.9 µg/L bis(2-ethylhexyl)phthalate. We know of no definitive environmental source for the SVOC bis(2-ethylhexyl)phthalate, but this compound is recognized as commonly introduced in analytical laboratory analyses.

The analysis detected dioxin compound OCDD in a storm runoff sample collected from TA-54 below MDA L on July 17, 2001, at a concentration of 0.0346 µg/L. Two other dioxin-like compounds, OCDF and 1,2,3,4,6,7,8-HpCDD, were also detected in the sample at levels below the quantification limit (J-flagged laboratory qualifier).

We analyzed eight storm runoff samples from TA-54 for PCB compounds in 2001. The analysis did not find PCB compounds in storm runoff samples above analytical detection limits. Five storm runoff samples from TA-54 below MDA L, MDA G-3, and MDA G-4 were analyzed for HE compounds; the analysis did not find HE compounds above analytical detection limits in storm runoff in 2001.

11. Technical Area 50 Discharges

The cumulative discharge of radionuclides from the RLWTF into Mortandad Canyon between 1963 and 1977 and yearly discharge data for 1998 through 2001 appear in Table 5-13. In addition to total annual activity released for 1998 through 2000, Table 5-13 also shows mean annual activities in effluent for each radionuclide and the ratio of this activity to the DOE DCG for public dose. Figure 5-10 shows the relationship of RLWTF average annual radionuclide activities and mineral concentrations in discharges to DOE DCGs or New Mexico groundwater standards since 1996. Americium-241, plutonium-238, and plutonium-239, -240 in the discharge did not exceed the DCG in 2000 or 2001. As mentioned above, the new reverse osmosis and ultrafiltration system began operating at the RLWTF in 2000. This system is designed to remove additional radionuclides from the effluent and to ensure that the discharges meet the DOE public dose DCGs.

In response to a letter of noncompliance from the NMED, in March 2000 the RLWTF instituted a program to restrict the discharge of nitrogenous wastes into facility's collection system. Therefore, the nitrate (nitrate as nitrogen) concentration of all effluent discharge from the RLWTF during 2001 was less than 10 mg/L. The average 2001 effluent nitrate concentration (value of 3.9 mg/L, nitrate as nitrogen) was below the New Mexico groundwater standard of 10 mg/L and was much lower than the values for previous years. The nitrate concentration in Mortandad Canyon base flow at station GS-1 in 2001 was 2.14 mg/L.

The fluoride concentration in the discharge also has declined over the last few years. The 2001 effluent fluoride concentration (average value of 0.73 mg/L) was below the New Mexico groundwater standard of 1.6 mg/L. The fluoride concentration in Mortandad Canyon at station GS-1 in 2001 was 0.3 mg/L.

In 2000, the RLWTF discharged 4.74 kg of perchlorate, for an average concentration of 254 µg/L in the effluent. This amount compares with values in 2001 of 2.29 kg of perchlorate, for an average concentration of 169 µg/L. The RLWTF is working on a system for removing perchlorate from the plant effluent. In 2001, they conducted pilot scale tests using ion exchange resins selective for perchlorate,

which confirmed that treatment to below 4 ppb is achievable. The ion exchange treatment system is expected to be operational by March 31, 2002.

C. Sediment Sampling

1. Introduction

Sediment transport associated with surface water runoff is a significant mechanism for contaminant movement. Contaminants originating from airborne deposition, effluent discharges, or unplanned releases can become attached to soils or sediments by adsorption or ion exchange.

There are no federal or state regulatory standards for soil or sediment contaminants that we can use for comparison with the Laboratory's environmental surveillance data. Instead, contaminant levels in sediments may be interpreted in terms of toxicity because of ingestion, inhalation, or direct exposure. The Laboratory's Environmental Restoration (ER) Project uses SALs to identify contaminants at concentrations or activities of concern. SALs are screening levels selected to be less than levels that would constitute a human health risk. SAL values are derived from toxicity values and exposure parameters using data from the EPA. The ER Project reevaluated radionuclides SALs in 2001 (ER 2001). Contaminant levels in sediments may also be compared with residential soil screening levels developed by EPA Region 6 (EPA 2000). These screening levels are derived from toxicity data and are currently used as SALs by the ER Project.

We can also compare the sediment data with background levels of metals or background activities of radionuclides resulting from atmospheric fallout or naturally occurring radionuclides. The ER Project determined background levels of metals and radionuclides in soils, rock, and sediments around the Pajarito Plateau (Ryti et al., 1998). Purtymun et al. (1987) used radionuclide analyses of sediment samples collected from regional stations for the period 1974 to 1986 to establish background activities from atmospheric fallout of radionuclides and to determine the background concentrations of naturally occurring uranium. McLin and Lyons (2002) developed background levels for data from the period 1974 to 1996. In this latter study, the authors determined separate values for reservoir sediments and river sediments. Differences in grain size and depositional setting lead to different levels of accumulation for fallout-derived radionuclides in these two environments. McLin and Lyons (2002) use the 0.95-quantile activity of each of the radionuclides in the regional station samples as an estimate of the upper limit of background values. If the activity of an individual sediment sample is greater than the estimated background value, we consider the Laboratory as a possible source of contamination. Tables summarizing analytical results list the background and SAL values for sediments.

2. Monitoring Network

Sediments are sampled in all major canyons that cross the Laboratory, including those with either perennial or ephemeral flows. We also sample sediments from regional reservoirs and stream channels annually.

Regional sediment sampling stations (Figure 5-3) are located within northern New Mexico and southern Colorado at distances up to 200 km from the Laboratory. Samples from regional stations provide a basis for estimating background activities of radionuclides resulting from atmospheric fallout or from naturally occurring radionuclides. We obtained regional sediment samples from reservoirs on the Rio Grande and the Rio Chama and at stations on the Rio Grande and Jemez River.

Stations on the Pajarito Plateau (Figure 5-11) are located within about 4 km of the Laboratory boundary, with the majority located within the Laboratory boundary. The information gathered from these stations documents conditions in areas potentially affected by Laboratory operations. Many of the sediment sampling stations on the Pajarito Plateau are located within canyons to monitor sediment contamination related to past and/or present effluent release sites. We sampled three major canyons (Pueblo, Los Alamos, and Mortandad Canyons) that have experienced past or present liquid radioactive releases, from upstream of the Laboratory to their confluence with the Rio Grande.

We also collected sediments from drainages downstream of two material disposal areas. MDA G at TA-54 is an active waste storage and disposal area. Nine sampling stations were established outside its perimeter fence in 1982 (Figure 5-12) to monitor possible transport of radionuclides from the area.

MDA AB at TA-49 was the site of underground nuclear weapons testing from 1959 to 1961 (Purtymun and Stoker 1987; ESP 1988). The tests involved high

explosives and fissionable material insufficient to produce a nuclear reaction. We established 11 stations in 1972 to monitor surface sediments in drainages adjacent to MDA AB (Figure 5-13).

3. Radiochemical Analytical Results for Sediments

Table 5-14 shows the results of radiochemical analysis of sediment samples collected in 2001. The table also lists the total propagated one-sigma analytical uncertainty and the analysis-specific minimum detectable activity where available. Uranium was analyzed by isotopic methods rather than as total uranium for most samples in 2001; we calculated total uranium from these values using specific activities for each isotope. The sample size for most sediment samples is 100 g.

To emphasize values that are detections, Tables 5-15 and 5-16 list radiochemical detections for values that are higher than river or reservoir background levels and identify values that are near or above SALs. Table 5-15 shows all tritium detections regardless of screening levels. Detections are defined as values exceeding both the analytical method detection limit (where available) and three times the individual measurement uncertainty. The table shows two categories of qualifier codes: those from the analytical laboratory and from secondary validation. See Table 5-4 for the qualifier codes. Qualifier codes are shown because some analytical results that meet the detection criteria are not really detections because of problems in the analytical laboratory. For example, in some cases the analyte was found in the lab blank.

In 1999, strontium-90 was found above fallout levels in all 105 sediment samples where it was detected in samples from the Pajarito Plateau and at regional stations. These high values resulted from problems with a new strontium-90 laboratory technique. Strontium-90 was previously detected infrequently at most stations. In 2000, strontium-90 was found above background only at Acid Weir below the former TA-45 outfall (a duplicate laboratory analysis detected strontium-90 below background in the sample). In 2001, strontium-90 was detected in sediment samples at DPS-1 and Mortandad Canyon stations GS-1, MCO-7, and MCO-9.

In 2000, the analysis found cesium-137 in many samples at much higher values than previously noted because of the Cerro Grande fire. Several studies (Bitner et al., 2001) have shown that fires concentrate fallout-derived cesium-137 from vegetation into the soil where it is available for redistribution by runoff. Storm runoff samples taken in 2000 from upstream of the Laboratory after the fire found cesium-137 levels much above normal (Johansen et al., 2001; ESP 2001). Cesium-137 in the suspended sediment portion of the storm runoff samples discussed in Johansen et al. (2001) was above the sediment SAL. Post-fire sediment samples from several canyons or at stations without previous evidence of radioactive contamination showed high cesium-137 values, some above SALs. In 2001, cesium-137 at some stations, including Pueblo 3, Pueblo at SR-502, Los Alamos at SR-4, and Water at SR-4, continued to be higher than previous values.

For 2000, samples from several reservoirs, including Cochiti Reservoir and reservoirs upstream from Laboratory influence, showed radionuclides above background. These values may reflect a change in analytical laboratory from previous years because of changes in analytical methods. For 2001, samples from Cochiti and Abiquiu Reservoirs had americium-241 two to three times above background levels. Rio Grande and Cochiti Reservoirs had plutonium-239, -240 values 60% to 170% above background. Several regional stations had gross beta measurements slightly above background. Station Guaje Canyon at SR-502 showed plutonium-239, -240 values at about twice background.

Many 2001 sediment samples from the known radioactive effluent release areas in Acid/Pueblo, DP/Los Alamos, and Mortandad Canyons exceeded background levels for tritium, cesium-137, plutonium-238, plutonium-239, -240, americium-241, gross alpha, gross beta, and gross gamma activities. These levels are consistent with historical data.

In sediments of both Los Alamos and Pueblo Canyons, above-background levels of plutonium and cesium-137 are evident for distances greater than 16 km downstream from the sources in Acid and DP Canyons (Figure 5-14). The contamination extends off-site across San Ildefonso Pueblo lands and reaches the Rio Grande near the Otowi Bridge. Plutonium-238 and plutonium-239, -240 activities downstream of historical release sites in those canyons have remained relatively constant during the past. These patterns have been documented for several decades in Laboratory reports (ESP 1981).

In 2001, the analysis found americium-241 at five times background in Pueblo Canyon, above Acid

Canyon at Pueblo 1R; this value is the highest observed at this station. At Acid Weir (at the confluence of Acid and Pueblo Canyons), plutonium-239, -240 activity was about 400 times background, consistent with historical data. At Pueblo 2, plutonium-239, -240 activity was 300 to 500 times background. Levels above background decrease to 105 times background at Hamilton Bend Spring, 150 times background at Pueblo 3, and 175 times background at Pueblo at SR-502. Plutonium-239, -240 activities at stations downstream of Acid Canyon have risen over the last three years (Figure 5-14). Cesium-137 in Pueblo Canyon sediments was generally below background during the late 80s and early 90s. Higher cesium-137 values were observed at Pueblo 3 in 1998, at Pueblo 1 and Acid Weir in 2000, and at Acid Weir, Pueblo 3, and Pueblo at SR-502 in 2001. Values found after the Cerro Grande fire may reflect mobilization of fallout cesium-137 in ash from burned vegetation.

Plutonium-239, -240 activities in Los Alamos Canyon are higher above DP Canyon, at stations Los Alamos at LAO-1 and Los Alamos at Upper Gaging Station, in the range of 40 times background. In DP Canyon, plutonium-239, -240 activities are 1.5 to 7 times background, having fallen by two orders of magnitude since the mid-80s. In Los Alamos Canyon, below the confluence with DP Canyon, plutonium-239, -240 activities are about 15 to 20 times background at stations Los Alamos at LAO-3, LAO-4.5, and SR-4. Below the confluence of Los Alamos and Pueblo Canyons, plutonium-239, -240 activities are about 40 times background at Los Alamos at Totavi. These findings indicate a larger contribution of plutonium-239, -240 by Pueblo Canyon in Los Alamos Canyon east of the Pueblo Canyon confluence.

Cesium-137 in Los Alamos Canyon both in DP Canyon (DPS-1) and above the confluence with DP Canyon (Los Alamos at Upper Gaging station) show similar histories. Values at these stations have decreased nearly two orders of magnitude to near background since the late 70s (Figure 5-14). Cesium-137 activity at station Los Alamos at SR-4 has decreased to near background and at station Los Alamos at Otowi has fluctuated around background.

Within Mortandad Canyon, the greatest radionuclide levels in sediments are found between the point where the TA-50 RLWTF effluent enters the drainage (above station Mortandad at GS-1) and the sediment traps (MCO-7), approximately a 3-km distance. Radionuclide levels decrease in the downstream direction from TA-50 to the sediment traps. Before 2001, radionuclide levels near, or slightly exceeding, background levels were found downstream of the sediment traps, extending to the Laboratory/San Ildefonso Pueblo boundary station A-6. Based on mass spectrometry analysis, Gallaher concluded that off-site plutonium contamination at levels near fallout values might extend two miles beyond the Laboratory boundary (Gallaher et al., 1997).

Below the sediment traps, the channel in Mortandad Canyon seldom has flow and is ill defined. In 2001, we evaluated the location of sediment station Mortandad at MCO-9 and moved it south to a more recently active channel. A station Mortandad at MCO-8.5 was added a short distance upstream. Results from these two stations are higher than prior values (Figure 5-15) from these stations in Environmental Surveillance Reports. In sediment radioactivity surveys during 1978 and 1981, Purtymun (1994) found cesium-137 values near station MCO-9 ranging from 0.7 to 6.9 pCi/g, which encompass the 2001 values of 3.1 to 5.7 pCi/g. For plutonium-239, -240, he found values of 0.1 and 1.3 pCi/g, compared with 2001 values of 0.9 to 2.7 pCi/g. Comparison of the Purtymun (1994) data with the 2001 data indicates no recent movement of cesium into the vicinity.

In 2001, sediment samples from GS-1, MCO-5, MCO-7, MCO-8.5, and MCO-9 stations in Mortandad Canyon showed cesium-137 concentrations that ranged from 0.5 up to 5 times the SAL value. Median values since 1980 for cesium-137 at the first three of these stations range up to six times greater than the SAL value. Overall, cesium-137 levels at these three stations have declined by factors of 5 to 35 since the early 1980s because of lower cesium-137 discharges from the RLWTF. In 2001, sediment samples near the Laboratory boundary had cesium-137 activity of 1.3 to 5.6 times background. The latter sample, a few feet on the San Ildefonso Pueblo side of the boundary, had 3.2 pCi/g and was 60% of the SAL. A sample collected in 1997 at this location had 2.2 pCi/g.

The americium-241 values range from 170 times background at GS-1 to below background at the Laboratory boundary. Plutonium-238 activity was 800 times background at GS-1 and not detected at the Laboratory boundary. Plutonium-239, -240 activity ranges from about 1000 times background at GS-1 and MCO-5 to about 10 times background (0.12 pCi/g) at and across the Laboratory boundary. A 1997 sample

just across the Laboratory boundary had 0.09 pCi/g. Trends in sediment radioactivity are discussed in detail in section C.5 of this chapter.

A number of sediment samples in the vicinity and downstream of MDA G contained americium-241, plutonium-238, and plutonium-239, -240 at activities greater than background. Both plutonium isotopes were about 20 times background at G-7. A second sample collected west of G-7 had plutonium-238 at 150 times background and plutonium-239, -240 at 30 times background. G-6R had a plutonium-239, -240 activity more than 13 times background. Americium-241 was 6 times background at G-6 R. Tritium was again found at G-4 R-1 and G-4 R-2 at significant activities and was also seen at G-5.

We found plutonium-238 and plutonium-239, -240 at activities greater than background in a number of sediment samples collected at MDA AB. Station AB-3 is located immediately downstream of a known surface-contamination area dating to 1960 (Purtymun and Stoker 1987). At AB-3, plutonium-239, -240 was about 30 times background. Because erosion control activities have altered this station, we collected an additional sample about 150 ft down slope. The plutonium-239, -240 activity at this location was 55 times background. These values are consistent with past results.

At station Ancho at SR-4, tritium was again detected. The station Above Ancho Spring had tritium above the SAL in 2000 but a very low value of 189 pCi/L in 2001.

Station Chaquehui at Rio Grande again had a detection of cesium-137 (just above background) and showed tritium. Sandia at SR-4 had 1270 pCi/L of tritium. Sandia at Rio Grande had 650 pCi/L of tritium and plutonium-238 at five times background.

Radioactivity in the remainder of sediment samples collected at locations at the Laboratory in 2001 was near background levels.

4. Nonradiochemical Analytical Results

a. Trace Metals. Beginning in 1990, we have analyzed sediments for trace metals. Table 5-17 presents trace metal results for the sediment samples collected in 2001.

Since 1990, trace metals analysis has indicated the presence of mercury at near detection limit concentrations (0.025 mg/kg) in nearly 200 sediment samples. The largest numbers of those historic samples containing mercury (from 1990–1998) were from Los Alamos Canyon (22 samples), followed by Mortandad Canyon (21 samples since 1992), MDA AB (19 samples), and MDA G (15 samples since 1994). In 2001, a sample from one station in Pueblo Canyon contained mercury above the background value of 0.1 mg/kg.

Barium and manganese are two metals that may be mobilized by forest fires. For 2000, we reported that many stations had manganese above SALs, including around MDA G and MDA AB and in samples from Bayo, Guaje, Water, and Los Alamos Canyons. The EPA residential soil screening level for manganese (3239 mg/kg) is an order of magnitude larger than the SAL (390 mg/kg), and no 2001 measurements are near the EPA level. For 2001, manganese was somewhat above background at stations Mortandad at MCO-5 and A-6, Pueblo at SR-502, Cañon de Valle at SR-501, and Los Alamos at Bridge. The latter two stations are upstream of Laboratory influence. Barium was more than twice background in samples from below the Laboratory at Rio Grande at Chaquehui and Pajarito.

Lead was above background at stations Acid Weir and Mortandad at A-6. Selenium was above background in samples from stations Mortandad at MCO-5 and Mortandad at A-6, Pueblo 3, and Pueblo at SR-502, and Frijoles at Monument Headquarters.

A sample from Pueblo 3 had above-background silver, copper, mercury, and selenium. Mercury and selenium were above background in a sample at station Pueblo at SR-502. Station Mortandad at MCO-5 had above-background iron, selenium, and zinc. This iron value exceeded the EPA residential screening level and is higher than most prior measurements by a factor of 10. Station Mortandad at A-6 had above-background cadmium, copper, lead, barium, and selenium.

b. Organic Analysis. Beginning in 1993, we have analyzed sediments for PCBs and SVOCs. Some sediment samples have been analyzed for HE constituents since 1995. Generally, we analyze samples from only a portion of the sediment stations each year, but in 2001 a larger number of samples was analyzed to evaluate Cerro Grande fire effects. This sampling was particularly concentrated along the Rio Grande and in Pueblo, Los Alamos, Pajarito, and Water Canyons. Table 5-18 lists these samples. With exceptions shown in Table 5-19, the analytical results showed no PCBs, SVOCs, or HE constituents detected above the analytical laboratory's reporting limit in any of the sediment samples collected during 2001.

Of the compounds listed in Table 5-19, most were at levels far below EPA residential soil screening levels (which are not available for all compounds). Three SVOCs, (benzo(a)pyrene, benzo(b)fluoranthene, and benzo(a)anthracene), were found at several stations at levels above the EPA Region 6 residential soil screening levels. These compounds are polycyclic aromatic hydrocarbon (PAH) compounds that are formed by burning of gasoline, garbage, or animal or plant material and are usually found in smoke and soot.

PAHs are also commonly found in urban or highway runoff (Lopes and Dionne 1998). These authors report that sediment organic content increases PAH retention and that in some studies EPA sediment PAH health-screening levels were exceeded in up to 70% of roadside and urban stream sediments. Another study by Walker (1999) notes that much of the PAHs may come from atmospheric fallout originating from fossil fuel burning and forest fires. It seems likely that the unusual detection of PAHs in sediments during 2001 may be the result of the Cerro Grande fire.

Locations where we found these PAHs in 2001 include Pueblo, Los Alamos, and Sandia Canyons. The highest values were in Los Alamos Canyon, which had relatively little runoff after the Cerro Grande fire. The lower runoff might have retained more ash from the Cerro Grande fire in that canyon.

Samples from at least four locations in Los Alamos Canyon showed PCBs at a few percent of EPA screening levels. Some PCB analyses were rejected in validation because of analytical deficiencies. In prior years, we have not analyzed PCBs in samples from these locations, but we will analyze for them in the future.

In addition to Indio Canyon at SR-4, we found high explosives in sediment samples from three stations upstream of the Laboratory boundary: Cañon de Valle at SR-501, Water at SR-501, and Twomile at SR-501. We previously sampled the Indio Canyon at SR-4 station for high explosives in 1996 and 1998 with no detections. The other stations have not been sampled for high explosives before but will have follow-up sampling in 2002. False identification of high-explosives compounds could occur if samples contained large amounts of ash or other organic matter, perhaps resulting from the Cerro Grande fire. The RDX and HMX values for station Water at SR-501 were 131 and 94 µg/kg, just above the method detection limits of 80 µg/kg, and they were not detected in a duplicate sample. RDX was found at station Cañon de Valle at SR-501 at a similar value. Values for HMX and RDX at stations Twomile at SR-501 and Indio Canyon at SR-4 were in the 600 to 900 µg/kg range. These RDX values are 15 to 20 percent of the EPA residential soil screening levels. Samples from these two stations also showed 2,4,6-Trinitrotoluene above 100 µg/kg.

5. Long-Term Trends

For the plots discussed in this section, we show only detections of a particular radionuclide in sediments; samples without such detections are not included.

Figure 5-14 shows activities of plutonium-239, -240 and cesium-137 at selected stations in Los Alamos and Pueblo Canyons. Pueblo Canyon stations are below a former outfall that discharged radioactive effluent into Acid Canyon. The activity of plutonium-239, -240 has remained approximately constant at these stations over the past two decades, perhaps increasing slightly at Pueblo at SR-502. Cesium-137 has generally decreased, although an increase appears over the last few years. This increase may be due in part to cesium-137 mobilized by combustion of forest materials in the Cerro Grande fire.

Stations in Los Alamos Canyon above and including Los Alamos at SR-4 are downstream of former sites of reactors, the Manhattan Project, and radioactive effluent discharge in DP Canyon. Stations in lower Los Alamos Canyon (Los Alamos at Otowi) are below sources in both Pueblo and Los Alamos Canyons. Plutonium-239, -240 and cesium-137 activities in DP Canyon sediments have decreased by orders of magnitude over the past 25 years, to near background values. Cesium-137 activity in stations above Los Alamos at SR-4 has also fallen, whereas at Los Alamos at Otowi, it has remained approximately constant and near background. Plutonium-239, -240 activity at other stations in Los Alamos Canyon is above background and has changed little for two decades.

Figure 5-15a depicts plutonium-238 activities at five stations in Mortandad Canyon from 1976 to 2001. GS-1, MCO-5, and MCO-7 are located downstream of the RLWTF discharge point and upstream of the sediment traps. Plutonium-238 activity at GS-1 has decreased by a factor of about 10 during that time period and, except for a 1999 sample at MCO-5 (which was questionable as a duplicate analysis was in the usual range), has not exceeded the SAL since 1985. MCO-9 and MCO-13 are located downstream of the sediment traps. Before

2001, plutonium-238 was infrequently above background at those stations and not regularly detected. Values in 2001 at stations below the sediment traps are higher, in part because we relocated some stations as discussed earlier.

Figure 5-15b shows plutonium-239, -240 levels on Laboratory lands in Mortandad Canyon. Plutonium-239, -240 levels upstream of the sediment traps have declined by approximately a factor of 10 since the 1980s, presumably because of decreased radioactivity in the RLWTF discharges and the dispersal of previously contaminated sediments. Downstream of the sediment traps, plutonium activities remained relatively constant until stations were moved in 2001; the activities were two orders of magnitude less than upstream of the sediment traps and near background activities. Values in 2001 are less than one order of magnitude lower than near the sediment traps.

Figure 5-15c shows that cesium-137 has been present in Mortandad Canyon since the first data collected in the 1970s. Between TA-50 and the sediment traps, cesium-137 levels have often exceeded the SAL but have decreased over the last 25 years. Before 2001, data indicated that cesium-137 levels below the sediment traps had gradually declined to near background levels. Relocation of two stations in 2001 showed cesium-137 below the sediment traps at values near the SAL. A station just across the Laboratory boundary with San Ildefonso Pueblo (Mortandad at A-6) also showed cesium-137 near the SAL. A few prior samples at this station have shown similar values.

D. Groundwater Sampling

1. Introduction

Groundwater resource management and protection efforts at the Laboratory focus on the regional aquifer underlying the region (see Section 1.A.3) but also consider perched groundwater found within canyon alluvium and at intermediate depths above the regional aquifer. The Los Alamos public water supply comes from supply wells drawing water from the regional aquifer.

The early groundwater management efforts by the USGS evolved through the growth of the Laboratory's current Groundwater Protection Management Program, required by DOE Order 5400.1 (DOE 1988). This program addresses environmental monitoring, resource management, aquifer protection, and hydrogeologic investigations. The Laboratory issued formal documentation for the program, the "Groundwater Protection Management Program Plan," in April 1990 and revised it in 1995 (LANL 1996). During 1996, the Laboratory developed and submitted an extended groundwater characterization plan, known as the Hydrogeologic Workplan (LANL 1998), to the NMED. NMED approved the Hydrogeologic Workplan on March 25, 1998. See Chapter 2 for a description of investigations under the Hydrogeologic Workplan.

Concentrations of radionuclides in environmental water samples from the regional aquifer, the perched alluvial groundwater in the canyons, and the intermediate-depth perched systems may be evaluated by comparison with DCGs for ingested water calculated from DOE's public dose limit (see Appendix A for a discussion of standards). The NMWQCC has also established standards for groundwater quality (NMWQCC 1996). Concentrations of radioactivity in drinking water samples from the water supply wells, which draw water from the regional aquifer, are compared with New Mexico drinking water regulations and EPA MCLs or to the DOE DCGs applicable to drinking water, which are more restrictive in a few cases.

The concentrations of nonradioactive chemical quality parameters may be evaluated by comparing them with NMWQCC groundwater standards (NMWQCC 1996) and with the New Mexico drinking water regulations and EPA drinking water standards, although these latter standards are only directly applicable to the public water supply. Although it is not a source of municipal or industrial water, shallow alluvial groundwater is a source of return flow to surface water and springs used by livestock and wildlife and may be compared with the standards for groundwater or the NMWQCC's (NMWQCC 2000) livestock watering and wildlife habitat stream standards. However, it should be noted that these standards are for the most part based on dissolved concentrations. Many of the results reported here are total concentrations (that is, they include both dissolved and suspended solids concentrations), which may be higher than dissolved concentrations alone.

2. Monitoring Network

Groundwater sampling locations are divided into three principal groups, related to the three modes of

groundwater occurrence: the regional aquifer, perched alluvial groundwater in the bottom of some canyons, and localized intermediate-depth perched groundwater systems. Figure 5-16 shows the sampling locations for the regional aquifer and the intermediate-depth perched groundwater systems. Figure 5-17 presents the sampling locations for the canyon alluvial groundwater systems. Purtymun (1995) described the springs and wells.

Sampling locations for the regional aquifer include test wells, supply wells, and springs. New wells, constructed pursuant to implementation of the Hydrogeologic Workplan activities, are designed to evaluate the adequacy of LANL's current monitoring system. These wells are not yet part of LANL's Groundwater Monitoring Plan and the monitoring well network. In 2002, the first set of the regional aquifer (R) wells, installed pursuant to implementation of the Hydrogeologic Workplan, will be turned over to ESH-18 for custodianship and possible inclusion in the monitoring network. ESH-18 is working with the NMED and other Laboratory organizations to formulate a protocol for adding these wells to LANL's Groundwater Monitoring Plan to meet site-wide groundwater monitoring needs.

We routinely sample eight deep test wells, completed within the regional aquifer. The USGS drilled these test wells between 1949 and 1960 using the cable tool method. The Laboratory located these test wells where they might detect infiltration of contaminants from areas of effluent disposal or underground weapons testing operations. These wells penetrate only a few tens or hundreds of feet into the upper part of the regional aquifer. The casings are not cemented, which would seal off surface infiltration along the boreholes.

We collect samples from 12 deep water supply wells in three well fields that produce water for the Laboratory and community. The wells are part of the Los Alamos water supply system and are owned (as of September 2001) and operated by the County of Los Alamos. The well fields include the off-site Guaje well field and the on-site Pajarito and Otowi well fields. The Guaje well field, located northeast of the Laboratory, contains five producing wells. The five wells of the Pajarito well field are located in Sandia and Pajarito Canyons and on mesa tops between those canyons. Two wells make up the Otowi well field, located in Los Alamos and Pueblo Canyons. Additional regional aquifer samples come from wells located on San Ildefonso Pueblo and from the Buckman well field operated by the city of Santa Fe. The frequency of monitoring varies from annual to monthly depending on the analytes and sampling location.

We sample numerous springs near the Rio Grande because they represent natural discharge from the regional aquifer (Purtymun and Adams 1980). As such, the springs serve to detect possible discharge of contaminated groundwater from beneath the Laboratory into the Rio Grande. Based on their chemistry, the springs in White Rock Canyon are divided into four groups, three of which have similar, regional-aquifer-related chemical quality. The chemical quality of springs in a fourth group reflects local conditions in the aquifer, probably related to discharge through faults or from volcanics. Sacred Spring is west of the river in lower Los Alamos Canyon.

We sample approximately half of the White Rock Canyon springs each year. Larger springs and springs on San Ildefonso Pueblo lands are sampled annually, with the remainder scheduled for alternate years.

We sample the perched alluvial groundwater in five canyons (Pueblo, Los Alamos, Mortandad, and Pajarito Canyons and Cañada del Buey) with shallow observation wells to determine the impact of NPDES discharges and past industrial discharges on water quality. In any given year, some of these alluvial observation wells may be dry, and thus we cannot obtain water samples. Observation wells in Water, Fence, and Sandia Canyons have been dry since their installation in 1989. All but two of the wells in Cañada del Buey are generally dry.

Intermediate-depth perched groundwater of limited extent occurs in conglomerates and basalt at depths of several hundred feet beneath the alluvium in portions of Pueblo, Los Alamos, and Sandia Canyons. We obtain samples from two test wells and one spring. The well and spring locations allow us to monitor possible infiltration of effluents beneath Pueblo and Los Alamos Canyons.

Some perched water occurs in volcanics on the flanks of the Jemez Mountains to the west of the Laboratory. This water discharges at several springs (Armstead and American) and yields a significant flow from a gallery in Water Canyon, where this perched water is sampled. Additional perched water extends eastward from the Jemez Mountains beneath TA-16 in the southwestern portion of the Laboratory. The drilling of Hydrogeologic Workplan well R-25

confirmed the existence of this perched water, at a depth of about 750 ft below the mesa top, in 1998. The water was found to contain high-explosives compounds resulting from past Laboratory discharges. The Laboratory is conducting further work to characterize this perched zone.

3. Radiochemical Analytical Results for Groundwater

Table 5-20 lists the results of radiochemical analyses of groundwater samples for 2001. The table also lists the total propagated one-sigma analytical uncertainty and the analysis-specific minimum detectable activity where available. Uranium was analyzed by isotopic methods; total uranium was calculated from these values using specific activities for each isotope.

To emphasize values that are detections, Table 5-21 lists radionuclides detected in groundwater samples. Detections are defined as values exceeding both the analytical method detection limit (where available) and three times the individual measurement uncertainty. Qualifier codes are shown because some analytical results that meet the detection criteria are not detections: in some cases, the analyte was found in the laboratory blank or was below the method detection limit, but the analytical result was reported as the minimum detectable activity. Because gross alpha and gross beta are usually detected, we indicate in Table 5-21 only occurrences of these measurements above threshold values. The specific levels are 5 pCi/L for gross alpha and 20 pCi/L for gross beta and are lower than the EPA MCLs or screening levels.

The right-hand columns of Table 5-21 indicate radiochemical detections that are greater than one-half of the DOE DCGs for public dose for ingestion of environmental water or the standards shown. Several groundwater values exceeded half the DOE public dose DCG values in 2001. These were gross alpha values in two San Ildefonso Pueblo water wells and in Cañada del Buey well CDBO-6. The gross alpha in San Ildefonso Pueblo wells is due to naturally occurring uranium in the water. The EPA MCL for gross alpha does not include the contribution to gross alpha by uranium. CDBO-6 had a gross alpha of 19.3 pCi/L on November 7 and has shown higher values in 1993, 1994, 1997, and 1998. A sample collected on May 1 had a gross alpha of 3.7 pCi/L. Other radioactivity has not generally been detected in CDBO-6 or 7. These wells often are dry and produce turbid samples.

Discussion of results will address the regional aquifer, the perched canyon alluvial groundwater, and the intermediate-depth perched groundwater system.

a. Radiochemical Constituents in the Regional Aquifer. For samples from wells or springs in the regional aquifer, most of the results for radiochemical measurements were below the DOE drinking water DCGs or the EPA or New Mexico standards applicable to a drinking water system. In addition, most of the results were near or below the detection limits of the analytical methods used. The exceptions are discussed below.

The main radioactive element the analysis detected in the regional aquifer was uranium, found in springs and wells on San Ildefonso Pueblo land. See Section E in this chapter for a discussion of these values.

A number of regional aquifer springs and wells had apparent detections of americium-241, plutonium-238, or other isotopes. In many cases, the analysis of laboratory or field duplicate samples did not support the apparent detections. At values near the detection limit, it is technically difficult to determine whether an analyte has been detected in an individual sample. However, because these measurements are not repeatable, these apparent detections are more likely to be due to analytical outliers (that is, false positives) than to the presence of the particular isotope in groundwater. Important factors in monitoring for radioactivity in groundwater are using detection limits substantially below the drinking water MCL and drawing conclusions based on a large body of data rather than from an individual sample. By observing data trends over time and location, we identify likely false positives potentially associated with any errors arising from chemical analysis or sampling.

In 2000, numerous apparent detections of plutonium isotopes (most near the detection limit) occurred in regional aquifer well and spring waters. Analysis of laboratory or field duplicates, done for many of the samples, did not support any of the apparent detections (and contradicted many of them). As plutonium isotopes are not regularly found in these waters, it is likely that the results were analytical artifacts. We collected additional samples in 2001 to check for the possibility of plutonium occurrence at these stations; none of the stations had plutonium detected. Four analyses in Test Well 3 showed no detections of either plutonium-238 or plutonium-239, -240. Sandia Spring had one analysis, and Spring 2 had two. We sampled San Ildefonso wells on two different dates, and none

of the stations had plutonium detected. LA-5 had five separate analyses for plutonium, Pajarito Well Pump 1 had six, Don Juan Playhouse Well had four, Otowi House Well had five, and New Community Well had four.

Americium-241 was apparently found near the detection limit in Sandia Spring (but not in a field duplicate), Spring 4 (but not in a duplicate analysis), and Spring 9. Americium-241 was also detected at about these levels in two deionized water (DI) blanks during the year. It has not been regularly found at any of these locations, so it is likely that these results are false positives. Plutonium-238 was found in Spring 4A at a low level. Detection of tritium in Test Well (186 pCi/L) was at a level below that seen earlier in several samples (350 pCi/L). Ancho Spring had a detection of strontium-90, but this strontium-90 was not seen in a duplicate sample.

We sampled regional aquifer test wells either quarterly or semiannually for strontium-90 in 2001. See Table 5-22. No strontium-90 was detected in these wells. One sample collected from PM-4 showed a strontium-90 detection, which reanalysis did not confirm. A letter from the analytical laboratory (GEL) states that the strontium-90 detection at PM-4 was unequivocally a false positive result. Four analyses of three other samples collected in 2001 from PM-4 did not show strontium-90.

Table 5-23 compiles the water supply well tritium results for 2001. The University of Miami analyzed these samples at a low detection limit of about 1 pCi/L. Samples taken from the O-1 supply well contained tritium within an average concentration of 31.6 pCi/L during 2001. These concentrations are 500 times lower than the federal drinking water standard but are above background concentrations that can be found in regional aquifer groundwater around the Laboratory. Tritium was either not detected or was found at background levels in other water supply wells, including the Santa Fe Buckman field.

Concentrations of tritium in the regional aquifer in other parts of the Laboratory can be found ranging between 1 and 3 pCi/L; tritium concentrations in northern New Mexico surface water and rainwater range from 30 to 40 pCi/L. Tritium also has been seen in the deep aquifer in a test well several hundred yards downstream from the O-1 supply well. The concentration of tritium in Test Well 1 was 360 pCi/L in 1993. The test well just penetrates the top of the regional aquifer about 600 ft beneath the canyon floor. In contrast, the zone within the aquifer from which O-1 draws its water begins at just about 1,000 ft below the canyon floor (and about 400 ft lower than the top of the aquifer and Test Well 1) and continues down an additional 1,460 ft.

In 2001, we sampled seven wells in the city of Santa Fe's Buckman field for strontium-90, uranium isotopes, general inorganic chemistry constituents, perchlorate, and high explosives. One sample from Buckman No. 2 contained about 223 µg/L of uranium, a value in line with earlier values obtained by the Santa Fe water company for that well.

b. Radiochemical Constituents in Alluvial Groundwater. None of the radionuclide activities in perched alluvial groundwater are above the DOE DCGs for public dose for ingestion of environmental water. Except for americium-241 and strontium-90 values from Mortandad and Los Alamos Canyons, none of the radiochemical measurements exceed DOE DCGs applicable to drinking water (that is, exceed 4 mrem or 1/25th of the DOE DCGs for public dose for ingestion of environmental water). Levels of tritium; cesium-137; uranium; plutonium-238; plutonium-239, -240; and gross alpha, beta, and gamma are all within the range of values observed in recent years.

In Pueblo Canyon, samples from APCO-1 showed detections of strontium-90 and plutonium-239, -240. This well has had plutonium-239, -240 above the detection limit in most years since 1994. We have seen similar values in previous years in surface water and alluvial groundwater in Pueblo Canyon because of past Laboratory discharges. The samples of perched alluvial groundwater in Los Alamos and DP Canyons show residual contamination, as we have seen since the original installation of monitoring wells in the 1960s. Strontium-90 was found in LAO-1, DP Spring, LAO-2, and other wells downstream to LAO-6. In LAO-1, LAO-2, and LAO-3A, the activity of strontium-90 usually approaches or exceeds the EPA primary drinking water MCL of 8 pCi/L. DP Spring, LAO-2, and LAO-3A showed gross beta activities approaching or exceeding the drinking water screening level of 50 pCi/L.

Radioactivity results for several of the perched alluvial groundwater samples from Mortandad Canyon were not available for this report because of the analytical laboratory's record processing error; they will appear in the next report. The available data showed activities of radionuclides within the ranges

observed previously. Tritium; strontium-90; cesium-137; plutonium-238; plutonium-239, -240; americium-241; and gross alpha, beta, and gamma are usually detected in many of the wells. The radionuclide levels are in general highest nearest to the TA-50 RLWTF outfall at well MCO-3 and decrease down the canyon. The levels of tritium, strontium-90, and gross beta usually exceed EPA drinking water criteria in many of the wells. In some years, the levels (except for tritium) exceed the 4-mrem DOE drinking water DCGs, but the levels do not exceed the DOE DCGs for public dose for ingestion of environmental water.

In 2001, strontium-90 in MCO-3 and MCO-5 exceeded the EPA MCL. EPA has no drinking water criteria for plutonium-238, plutonium-239, -240, or americium-241. Except for americium-241 in MCO-3, the 4-mrem DOE drinking water DCGs for these latter radionuclides were not exceeded in Mortandad Canyon alluvial groundwater in samples taken in 2001.

CDBO-6 had a high gross alpha value as discussed earlier. PCO-3 had a detection of strontium-90 of 0.4 pCi/L, the first in that well.

c. Radiochemical Constituents in Intermediate-Depth Perched Groundwater. In the 1950s, based on measurements of water levels and major inorganic ions, the USGS established that contaminated surface water and perched alluvial groundwater in Pueblo Canyon recharge the intermediate-depth perched zone water that underlies the canyon floor (Weir et al., 1963; Abrahams 1966). Taken over time, the radionuclide activity measurements in samples from Test Well 1A, Test Well 2A, and Basalt Spring in Pueblo and Los Alamos Canyons confirm this connection. Test Well 2A, farthest upstream and closest to the historical discharge area in Acid Canyon, has shown the highest levels. In 2001, we sampled Test Well 2A, Basalt Spring, and POI-4 (an intermediate-depth well located near Test Well 1A). Strontium-90 was again detected in the Basalt Spring sample. Tritium was found at 1110 pCi/L in Test Well 2A, in line with previous values. The sample from the Water Canyon Gallery, which lies southwest of the Laboratory, was consistent with previous results, showing no evidence of radionuclides from Los Alamos operations.

4. Nonradiochemical Analytical Results

Table 5-24 lists the results of general chemical analyses of groundwater samples for 2001. Table 5-25 lists groundwater perchlorate results, and the results of trace metal analyses appear in Table 5-26.

a. Nonradiochemical Constituents in the Regional Aquifer. With the exceptions discussed here, values for all parameters measured for environmental surveillance sampling in the water supply wells are within drinking water limits. Separate samples collected from the public water supply system to determine regulatory compliance with the Safe Drinking Water Act were all in compliance for 2001 (see Section 2.B.9).

The test wells in the regional aquifer showed levels of several constituents that approach or exceed standards for drinking water distribution systems. However, it should be noted that the test wells are for monitoring purposes only and are not part of the water supply system. TW-1 had a nitrate value of 5.8 mg/L (nitrate as nitrogen), again below the EPA primary drinking water standard of 10 mg/L. This test well has shown nitrate levels in the range of about 5 to 20 mg/L (nitrate as nitrogen) since the early 1980s. The source of the nitrate might be infiltration from sewage treatment effluent released into Pueblo Canyon or residual nitrate from the now decommissioned TA-45 radioactive liquid waste treatment plant that discharged effluents into upper Pueblo Canyon until 1964. Nitrogen isotope analyses the ER Project made during 1998 indicate that the nitrate is from a sewage source (Nylander et al., 1999).

In the last few years, iron, manganese, cadmium, nickel, antimony, and zinc have been high in several of the regional aquifer test wells. These wells are due to be replaced by new wells drilled as part of the Hydrogeologic Work Plan. Levels of trace metals that approach water quality standards in some of the test wells are believed to be associated with turbidity of samples and with the more than 40-year-old steel casings and pump columns. The lead levels appear to result from flaking of piping installed in the test wells and do not represent lead in solution in the water (ESP 1996). In 2001, iron approached or exceeded the EPA secondary drinking water standard in Test Wells 1, 3, 4, and DT-10 and exceeded the New Mexico groundwater limit in Test Well 3. Manganese approached or exceeded the EPA secondary drinking water standard in Test Wells 3 and 4. Test Wells 1 and 4 had lead concentrations above the EPA action level, and Test Well 8 had an aluminum concentration above the EPA MCL.

Samples collected for metals analysis from most of the White Rock Canyon springs were filtered in 2001. Many of the springs have very low flow rates, and we collected samples in small pools in contact with the

surrounding soils. None of the springs showed trace metals at levels of concern in 2001.

In 2001, surface water and groundwater samples the Environmental Surveillance Program collected were analyzed for perchlorate. Our investigations of analytical method performance indicated that samples analyzed by the ion chromatography method probably have a detection limit in the neighborhood of 4 µg/L. Samples analyzed by one of our analytical laboratories before April 25, 2001, showed many false positives because the analytical laboratory did not perform all the anion removal steps possible in the EPA analytical method. Thus, many of the apparent detections indicated in Table 5-25 are not detections. A new method combining liquid chromatography and mass spectrometry shows promise. During 2001, the new method was in development, and performance using this method was poor. This new method used liquid chromatography and two mass spectrometry steps (LC/MS/MS) and claims a detection limit of 0.25 µg/L. See Section F later in this chapter for more information on this topic.

Perchlorate was detected in samples collected during 2001 from the O-1 water supply well at concentrations of 2 and 5 µg/L, depending on analytical method (Table 5-25). Two methods were used with detection limits of 4 µg/L or 0.25 µg/L as listed in the table. The analytical laboratory J-flagged many of the analytical results, meaning that the results are below the reporting limit and the quantities are estimated. For the ion chromatography method, the reporting limit is probably about 12 µg/L. Following the initial discovery, we have sampled O-1 monthly for perchlorate. The source of perchlorate may be effluent from the Manhattan Project and early cold-war-era radioactive liquid waste treatment facilities that discharged into Acid Canyon until 1964. Other water supply wells (including wells in Santa Fe's Buckman Field) are sampled on a semiannual basis, and none have shown perchlorate in samples.

Follow-up sampling for perchlorate at several springs near Spring 4 (which we reported as having perchlorate in 2000 at 8.5 ppb) does not confirm the presence of perchlorate in springs of this area. The original measurement is in doubt as the analytical laboratory did not include all anion removal steps in the analysis, and presence of sulfate (for example) can cause interference in perchlorate analysis.

b. Nonradiochemical Constituents in Alluvial Groundwater. The canyon bottom perched alluvial groundwater in Pueblo, Los Alamos, and Mortandad Canyons receives or has received Laboratory effluents. The groundwater shows the effects of those effluents in that values of some constituents are elevated above natural levels.

Many of the Mortandad Canyon alluvial groundwater samples in Table 5-24 had fluoride and nitrate concentrations greater than half the New Mexico groundwater standards. The nitrate source is nitric acid from plutonium processing at TA-55 that enters the TA-50 waste stream. In response to a letter of noncompliance from NMED, in March 1999 the RLWTF instituted a program to restrict the discharge of nitrogenous wastes into the facility's collection system. As shown in Figure 5-18, the nitrate (nitrate as nitrogen) concentration of effluent discharge from the RLWTF after March 1999 has been less than 10 mg/L. The concentration of fluoride in the RLWTF effluent after August 1999 has been less than the 1.6 mg/L standard. The value in October 2001 was 1.56 mg/L, just below the standard.

Under the Laboratory's groundwater discharge plan application for the RLWTF, we collected separate samples for nitrate, fluoride, and TDS approximately bimonthly from three alluvial monitoring wells in Mortandad Canyon during 2001: MCO-3, MCO-6, and MCO-7. We reported the analytical results quarterly to the NMED. During 2001, nitrate concentrations in alluvial groundwater except at well MCO-7 were below the New Mexico groundwater standard for nitrate of 10 mg/L (nitrate as nitrogen), as Figure 5-18 shows. Fluoride concentrations at MCO-7 and MCO-7.5 exceeded the NMWQCC groundwater standard for fluoride of 1.6 mg/L during 2001, as shown in Figure 5-18.

Perchlorate was detected in groundwater at every alluvial groundwater well sampled in Mortandad Canyon. Perchlorate concentrations ranged from 53 µg/L to 220 µg/L (see Table 5-25). The perchlorate source is discharges from the TA-50 RLWTF, which processes wastewater from analytical chemistry facilities that perform actinide chemistry. The RLWTF has a treatment system to remove perchlorate from the effluent that will be operational in March 2002.

LAO-2 and LAO-4 continued to show elevated levels of molybdenum, and LAO-3A had molybdenum at about 70% of the New Mexico groundwater limit of 1000 µg/L (Figure 5-19). The potential source of this molybdenum is sodium molybdate, a commonly used water treatment chemical in cooling towers. Historically, sodium molybdate was used as a tracer in managing water chemistry in the cooling towers at TA-53. Three cooling towers (NPDES Outfalls 03A047,

03A048, 03A049) discharged upstream of LAO-3A. These cooling towers have recently been replaced with two new cooling towers. Facility managers will replace sodium molybdate with a phosphate-based tracer in 2002.

The Cerro Grande fire caused high manganese, aluminum, and iron concentrations in many surface water and shallow alluvial perched groundwater samples. CDBO-6 had high aluminum and iron values, probably related to a high TSS of about 25 mg/L. This well also had high amounts of cobalt. Higher than usual manganese concentrations were found in APCO-1 (Pueblo Canyon) and PCO-3 (Pajarito Canyon). Both canyons were extensively burned in the Cerro Grande fire.

c. Nonradiochemical Constituents in Intermediate-Depth Perched Groundwater. In 2001, the nitrate value for Basalt Spring was only 12% of the NMWQCC groundwater and EPA drinking water standards. In the past, it has exceeded the standards. The source of the nitrate is infiltration of contaminated surface water and shallow groundwater from Pueblo Canyon. Test Well 2A had high values of iron, magnesium, and zinc related to well casing materials. Basalt Spring had a mercury value that was about 60% of the New Mexico wildlife habitat standard for surface water. The Water Canyon gallery had high aluminum and iron, probably related to high sample turbidity.

d. Organic Constituents in Groundwater. We performed analyses for organic constituents on selected springs and test wells in 2001. The stations sampled appear in Table 5-27. Some samples were analyzed for VOCs, SVOCs, and PCBs. We analyzed water supply wells, test wells, and most springs for HE constituents. No HE constituents were found above the analytical laboratory's reporting limit in the groundwater samples listed in Table 5-27. LANL rejected many of the possible organic detections the analytical laboratory reported because the compounds were either detected in method blanks (that is, they were introduced during laboratory analysis) or detected in trip blanks. Trip blanks go along during sampling to determine if organic constituents come from sample transportation and shipment. Table 5-28 shows organic compounds detected above the analytical laboratory's reporting level in 2001, as well as results from blanks. Organics detected in groundwater in 2001 include the finding of butanone [2-] in two field blanks, bis(2-ethylhexyl)phthalate in LAO-3A and PCO-3 samples, and trichloroethane[1,1,1-] at the Otowi House well. Bis(2-ethylhexyl)phthalate is a plastics component that is often found as a result of contamination during analytical laboratory organic analysis.

In 1998, drilling of characterization well R-25 at TA-16 in the southwest portion of the Laboratory revealed the presence of HE constituents at concentrations above the EPA Health Advisory guidance values for drinking water. Consequently, the Laboratory tested all nearby water supply wells for these compounds. None of the analytical laboratories detected any HE or their degradation products in any of the water samples from any of the supply wells sampled. We sample all water supply wells at least annually for HE compounds. The wells nearest to TA-16 are sampled quarterly. We also did not find HE in any of the water supply well samples (including wells in Santa Fe's Buckman Field) in 2001.

5. Long-Term Trends

a. Regional Aquifer. The long-term trends of water quality in the regional aquifer have shown limited impact resulting from Laboratory operations. As noted above, in 1998, drilling characterization well R-25 at TA-16 in the southwest portion of the Laboratory revealed the presence of HE constituents. No HE constituents have been found in water supply wells. The extent of high explosives in the regional aquifer is presently unknown. The Laboratory is working in cooperation with regulatory agencies to define the extent of the contamination and ensure that drinking water supplies are adequately protected.

Aside from naturally occurring uranium, the only radionuclide we consistently detected in water samples from production wells or test wells within the regional aquifer is tritium, which is found at trace levels. We have found tritium contamination at four locations in Los Alamos and Pueblo Canyons and one location in Mortandad Canyon. The tritium levels measured range from less than 2% to less than 0.01% of current drinking water standards, and all are below levels detectable by the EPA-specified analytical methods normally used to determine compliance with drinking water regulations. Tritium at about 40 pCi/L was found in water supply well O-1. Other measurements of radionuclides above detection limits in the regional aquifer reflect occasional analytical outliers not confirmed by analysis of subsequent samples.

Nitrate concentrations in TW-1 have been near the EPA MCL since 1980. The source of the nitrate might be infiltration of sewage-effluent-contaminated shallow groundwater and surface water in Pueblo Canyon or residual nitrate from the now decommissioned radioactive liquid waste treatment plants that discharged effluents into upper Pueblo Canyon until 1964. Perchlorate is present in water supply well O-1 at concentrations up to 5 ppb, compared with provisional drinking water limits of 18 ppb. The source of the perchlorate might be residual perchlorate from the now decommissioned radioactive liquid waste treatment plants that discharged effluents into upper Pueblo Canyon until 1964.

Sampling of wells of Santa Fe's Buckman field, across the Rio Grande from Los Alamos, shows no evidence of compounds that might be from Los Alamos (tritium, strontium-90, perchlorate, or high explosives). In addition, none of these compounds are found in springs that discharge from the regional aquifer along the Rio Grande below Los Alamos.

b. Surface Water and Alluvial Groundwater in Mortandad Canyon. Figure 5-20 depicts long-term trends of radionuclide concentrations in surface water and shallow perched alluvial groundwater in Mortandad Canyon downstream from the outfall for the RLWTF at TA-50. The figure only shows radionuclide detections. Because of strong adsorption to sediments, cesium-137 is not detected in groundwater samples. If more than one sample was collected in a year, the average value for the year is plotted. The surface water samples are from the station Mortandad at GS-1, a short distance downstream of the TA-50 effluent discharge. Radioactivity levels at this station vary daily depending on whether individual samples are collected shortly after a release from the RLWTF. These samples also vary in response to changes in amount of runoff from other sources in the drainage. The groundwater samples are from observation well MCO-5 in the middle reach of the canyon. Groundwater radioactivity at MCO-5 is more stable than at Mortandad at GS-1 because groundwater responds more slowly to variations in runoff water quality.

Chemical reactions such as adsorption do not delay tritium transport, and high tritium activities are found throughout the groundwater within the Mortandad Canyon alluvium. The tritium levels in MCO-5 and at Mortandad at GS-1 in 2001 were below the EPA MCL of 20,000 pCi/L. The surface water tritium activity at Mortandad at GS-1 reflects diluted values of effluent from TA-50 as the effluent mixes with other stream water. The tritium activity at MCO-5 has fluctuated almost in direct response (with a time lag of about one year) to the average annual activity of tritium in the TA-50 outfall effluent. Tritium values at both stations have decreased since the mid-1980s because of decreased tritium content of the TA-50 effluent.

For all but four years between 1973 and 1999, the americium-241 activity of RLWTF discharges exceeded the DOE DCG for public dose of 30 pCi/L. Americium-241 activity has not been measured regularly at monitoring stations in Mortandad Canyon. Under many environmental conditions, americium is less strongly adsorbed than cesium or strontium and moves more readily in groundwater. Americium-241 activity in the shallow alluvial groundwater in 2001 was well below the DOE drinking water DCG of 1.2 pCi/L, except at MCO-3, where it was 77% of this value. Americium-241 at Mortandad at GS-1 showed an increase in activity approaching the DOE DCG for public dose from 1995 to 1998, decreased in 1999 and 2000, and increased again in 2001. At MCO-5, the americium-241 activity showed only a slight increase from 1995 to 1998 and a general decline over the past few years.

In 2001, we detected strontium-90 in surface water at Mortandad at GS-1 and in shallow perched alluvial groundwater observation wells MCO-3 and MCO-5. The activities remain at values in the range of the EPA drinking water standard (8 pCi/L) and the DOE DCG for a DOE-maintained drinking water system (40 pCi/L). It appears that strontium-90 has been retained by adsorption or mineral precipitation within the upstream portion of the alluvium. The level of strontium-90 has risen gradually at downstream wells MCO-5 and MCO-6 over the last 20 years suggesting that the mass of the radionuclide is moving slowly downstream.

We detected plutonium isotopes at Mortandad at GS-1, MCO-3, and MCO-5 in 2001. Both isotopes have been detected at Mortandad at GS-1 and MCO-3 at levels near the DOE public dose DCGs (30 pCi/L for plutonium-239, -240 and 40 pCi/L for plutonium-238) over the past few years, but the levels have decreased recently. Values at other alluvial observation wells except for MCO-4 and MCO-7.5 have been near the detection limit in the 1990s. Plutonium has in general been detected in all alluvial observation wells in Mortandad Canyon but appears to be decreasing in activity at downstream locations.

E. Groundwater and Sediment Sampling at San Ildefonso Pueblo

To document the potential impact of Laboratory operations on lands belonging to San Ildefonso Pueblo, DOE entered into a Memorandum of Understanding (MOU) with the Pueblo and the Bureau of Indian Affairs in 1987 to conduct environmental sampling on pueblo land. This section deals with hydrologic and sediment sampling. Figures 5-21 and 5-22 show the groundwater, surface water, and sediment stations sampled on San Ildefonso Pueblo. Aside from stations shown on those figures, the MOU also specifies collection and analysis of additional water and sediment samples from sites that have long been included in the Laboratory's Environmental Surveillance Program, as well as sampling of storm runoff in Los Alamos Canyon. These locations appear in Figures 5-3, 5-4, 5-5, and 5-11. We discuss the results of these analyses in previous sections.

1. Groundwater

Table 5-20 lists the results of radiochemical analyses of groundwater samples for 2001. The table also lists the total propagated one-sigma analytical uncertainty and the analysis-specific minimum detectable activity where available. Uranium was analyzed by isotopic methods; total uranium was calculated from these values using specific activities for each isotope.

To emphasize values that are detections, Table 5-21 lists radionuclides detected in groundwater samples. Detections are defined as values exceeding both the analytical method detection limit (where available) and three times the individual measurement uncertainty. Qualifier codes are shown because some analytical results that meet the detection criteria are not detections: in some cases, the analyte was found in the lab blank or was below the method detection limit, but the analytical result was reported as the minimum detectable activity. Because gross alpha and gross beta are usually detected, we indicate in Table 5-21 only occurrences of these measurements above threshold values. The specific levels are 5 pCi/L for gross alpha and 20 pCi/L for gross beta and are lower than the EPA MCLs or screening levels.

The right-hand columns of Table 5-21 indicate radiochemical detections that are greater than one-half of the DOE DCGs for public dose for ingestion of environmental water or the standards shown. Several groundwater values (gross alpha values in two San Ildefonso Pueblo water wells) exceeded half the DOE public dose DCG values in 2001. This gross alpha is due to naturally occurring uranium in the water. The EPA MCL for gross alpha does not include the contribution to gross alpha by uranium.

See Section D in this chapter for a discussion of most of the groundwater stations (wells and springs) listed in the MOU. The present section focuses on the San Ildefonso Pueblo water supply wells.

In 2000, numerous apparent detections of plutonium isotopes (most near the detection limit) occurred in regional aquifer well and spring waters. Analysis of laboratory or field duplicates, done for many of the samples, did not support any of the apparent detections (and contradicted many of them). As plutonium isotopes are not regularly found in these waters, it is likely that the results were analytical artifacts. We collected additional samples in 2001 to check for the possibility of plutonium occurrence at these stations; none of the stations had plutonium detected. Four analyses in Test Well 3 showed no detections of either plutonium-238 or plutonium-239, -240. Sandia Spring had one analysis, and Spring 2 had two. We sampled San Ildefonso wells on two different dates, and none of the stations had plutonium detected. LA-5 had five separate analyses for plutonium, Pajarito Well Pump 1 had six, Don Juan Playhouse Well had four, Otowi House Well had five, and New Community Well had four.

As in previous years, the groundwater data for San Ildefonso Pueblo indicate the widespread presence of naturally occurring uranium at levels approaching the EPA drinking water limit. Naturally occurring uranium concentrations near the EPA MCL of 30 μg/L are prevalent in well water throughout the Pojoaque area and San Ildefonso Pueblo. The high gross alpha readings for these wells are related to uranium occurrence.

In 2001, New Community well had the highest total uranium, 21 μg/L. The uranium concentrations at Pajarito Well Pump 1 were about 33% of the standard. These measurements are consistent with the levels in previous samples and with the relatively high levels of naturally occurring uranium in other wells and springs in the area.

The usual gross alpha levels in these wells are attributable to the presence of uranium. The gross alpha values in some wells were above the EPA primary drinking water standard of 15 pCi/L but were not detections because of high analytical uncertainties. This standard applies to gross alpha from radionuclides other than radon and uranium.

During the 1999 sampling, analytical laboratory problems caused many apparent detections of strontium-90 where it had not been seen previously. The 2000 and 2001 data support the conclusion that much of the 1999 strontium-90 data were subject to analytical error; no strontium-90 was detected in any of these wells.

The chemical quality of the groundwater, shown in Table 5-24, is consistent with previous observations. The sample from the Pajarito Well Pump 1 exceeded the drinking water standard for total dissolved solids; this level is similar to those previously measured. This well also has a chloride concentration at 60% of the New Mexico groundwater limit.

In 2001, surface water and groundwater samples that the Environmental Surveillance Program collected were analyzed for perchlorate. No samples collected at San Ildefonso contained perchlorate. Our investigations of analytical method performance indicated that samples analyzed by the ion chromatography method probably have a detection limit in the neighborhood of 4 µg/L. Samples one of our analytical laboratories analyzed before April 25, 2001, showed many false positives because the analytical laboratory did not perform all the anion removal steps possible in the EPA analytical method. Thus, many of the apparent detections indicated in Table 5-25 are not detections. A new method combining ion chromatography and mass spectrometry shows promise, but, during 2001, it was in development, and performance using this method was poor. See Section F later in this chapter for more information on this topic.

The fluoride values for some wells (Eastside Artesian and Pajarito Pump 1) are about half the NMWQCC groundwater standard of 1.6 mg/L, similar to previous values. Several of the wells (Eastside Artesian and Don Juan Playhouse) have alkaline pH values above the EPA secondary standard range of 6.8 to 8.5; these values do not represent a change from those previously observed in the area.

Many of the wells have sodium values significantly above the EPA health advisory limit of 20 mg/L. The value from Pajarito Well Pump 1 is especially high.

Table 5-26 shows trace metal analyses. The boron value in Pajarito Well Pump 1 was 170% of the NMWQCC groundwater limit of 750 µg/L. This value was similar to those of past years. Otowi House Well had detectable selenium.

We performed analyses for organic constituents on selected springs and test wells in 2001. The stations sampled appear in Table 5-27. Some samples were analyzed for VOCs, SVOCs, and PCBs. LANL rejected many of the possible organic detections the analytical laboratory reported because the compounds were either detected in method blanks (that is, they were introduced during laboratory analysis) or detected in trip blanks. Trip blanks go along during sampling to determine if organic constituents come from sample transportation and shipment. Table 5-28 shows organic compounds detected above the analytical laboratory's reporting level in 2001, as well as results from blanks. Organics detected in groundwater in 2001 include trichloroethane[1,1,1-] at the Otowi House well.

2. Sediments

We collected sediments from San Ildefonso Pueblo lands in Mortandad Canyon in 2001 from several stations. The results of radiochemical analysis of sediment samples collected in 2001 appear in Table 5-14. The table also lists the total propagated one-sigma analytical uncertainty and the analysis-specific minimum detectable activity where available. Uranium was analyzed by isotopic methods rather than as total uranium for most samples in 2001; total uranium was calculated from these values using specific activities for each isotope.

To emphasize values that are detections, Tables 5-15 (river sediments) and 5-16 (reservoir sediments) list radiochemical detections for values that are higher than river or reservoir background levels and identify values that are near or above SALs. Table 5-15 shows all tritium detections regardless of screening levels. Detections are defined as values exceeding both the analytical method detection limit (where available) and three times the individual measurement uncertainty. Lab qualifier codes are shown because some analytical results that meet the detection criteria are not detections: in some cases, the analyte was found in the lab blank or was below the method detection limit, but the analytical result was reported as the minimum detectable activity. Results from the 2001 sediment sample analysis are generally consistent with historical data.

In Mortandad Canyon, the channel below the sediment traps seldom has flow and is ill defined. In 2001, we evaluated the location of sediment station Mortandad at MCO-9 and moved it south to a more recently active channel. A station Mortandad at MCO-8.5 was added a short distance upstream. These stations are on LANL property. Results from these two stations are much higher than prior values from these

stations (Figure 5-15) in Environmental Surveillance Reports. In sediment radioactivity surveys during 1978 and 1981, Purtymun (1994) found cesium-137 values near MCO-9 ranging from 0.7 to 6.9 pCi/g, bounding 2001 values of 3.1 to 5.7 pCi/g. For plutonium-239, -240, Purtymun found values of 0.1 and 1.3 pCi/g, compared with 2001 values of 0.9 to 2.7 pCi/g. Comparison of the Purtymun (1994) data with the 2001 data indicates no recent movement of cesium into this vicinity.

In 2001, sediment samples from GS-1, MCO-5, MCO-7, MCO-8.5, and MCO-9 in Mortandad Canyon showed cesium-137 concentrations that ranged from 0.5 up to 5 times the SAL value. Median values since 1980 for cesium-137 at the first three of these stations range up to six times greater than the SAL value. Overall, cesium-137 levels at these three stations have declined by factors of 5 to 35 since the early 1980s because of lower cesium-137 discharges from the RLWTF. In 2001, sediment samples near the Laboratory boundary had cesium-137 activity of 1.3 to 5.6 times background. The latter sample, a few feet on the San Ildefonso Pueblo side of the boundary, had 3.2 pCi/g and was 60% of the SAL. A sample collected in 1997 at this location had 2.2 pCi/g.

Sediments from the sampling station located on San Ildefonso Pueblo lands at Los Alamos at Otowi showed the activity of plutonium-239, -240 at 7 times background. Below the confluence of Los Alamos and Pueblo Canyons, plutonium-239, -240 activities are about 40 times background at Los Alamos at Totavi. These values are within the range of previous measurements at these stations. See Section C.3 in this chapter for a more detailed discussion.

F. Sampling Procedures, Analytical Procedures, Data Management, and Quality Assurance

1. Sampling

The Draft Quality Assurance Project Plan (ESH-18, as per the DOE-AL Model SOP for Data Validation 1996) is the basic document covering sampling procedures and quality assurance (QA). All sampling is conducted using strict chain-of-custody procedures, as described in Gallaher (1993). The completed chain-of-custody form serves as an analytical request form and includes the requester or owner, sample barcode number, program code, date and time of sample collection, total number of bottles, the list of analytes to be measured, and the bottle sizes and preservatives for each analysis required.

The “F/UF” column on the tables of analytical results shows a “UF” for nonfiltered samples and an “F” for samples that were filtered through a 0.45-micron filter. We field-filtered radionuclide and metals samples collected at the White Rock Canyon springs to minimize the effects of surface soils and to represent groundwater surfacing at the springs. We also field-filtered surface water samples that were collected for metals analysis. This procedure allows for comparison of analytical results with NMWQCC standards. These standards are mainly for dissolved concentrations, except the mercury and selenium standards that are based on total concentrations. Samples we submitted for analysis of mercury and selenium were not filtered in the field and were analyzed to determine total concentration.

Automated samplers located at gaging stations (Shaull et al., 2001) collected storm runoff. In 2001 homogenization, and filtering if requested, of runoff samples took place at the analytical laboratory. If the automated sampler collected an adequate volume of water, both unfiltered (for total analyte concentration analysis) and filtered (for dissolved analyte analysis) analysis of the samples were requested. If the volume was insufficient, we requested analysis of only the unfiltered samples.

In 2001, we sent samples to four commercial analytical laboratories and one university research laboratory: General Engineering Laboratories, Inc. (GEL), Acculabs, Inc. (Acculabs), Edward S. Babcock & Sons, Inc. (ESB), the New Mexico Scientific Laboratory Division (SLD), and the University of Miami Tritium Laboratory (UoM).

New contracts with GEL and Acculabs were let in 2001. The new contracts required those laboratories to follow the Model Statement of Work for Analytical Laboratories (DOE-AL SOW) that was prepared for the DOE Albuquerque Operations Office (AQA 2000). An addendum describing specific requirements and guidelines for analysis of storm runoff, industrial wastewater, base flow, snowmelt, groundwater, and sediment samples accompanied the DOE-AL SOW. GEL and Acculabs were audited against the DOE-AL SOW in 2001, using procedures that the DOE-AL Analytical Management Program developed (see AGRA [1998] for a description of the procedures). GEL and Acculabs were awarded contracts only after they demonstrated that they met the requirements described in the DOE-AL SOW.

2. Analytical Procedures

a. Metals and Major Chemical Constituents. Storm runoff samples, base flow, snowmelt, and fire-related storm runoff samples are analyzed by methods consistent with 40 CFR 136.3. Groundwater samples and sediments are analyzed using EPA SW-846 methods.

b. Radionuclides. Radiochemical analysis is performed using methods as updated in Gautier (1995) or described in the DOE-AL SOW. Radiological detection limits are calculated according to the equations in the DOE-AL SOW. Sources of uncertainty that are included in the total propagated uncertainty associated with radiological results include both counting uncertainties and sample preparation (measurement) contributors.

We preserve water samples in the field for radiochemical analyses with nitric acid to a pH of 2 or less. Before 1996, the analytical laboratories filtered the preserved water samples. Samples collected in 1996 and after were preserved in the field as before but were not filtered by the laboratories. We collect a separate, unpreserved sample for tritium analysis.

Sediment samples are screened through a number-12 US-standard testing sieve before digestion. The sieve meets ASTM E-11 specifications and screens out materials larger than 1.7 mm.

When trace-level tritium analyses are required, we ship samples to the University of Miami Tritium Laboratory. These samples are collected and analyzed according to procedures described in Tritium Laboratory (1996).

Negative values are sometimes reported in radiological measurements. Negative numbers occur because radiochemistry counting instrument backgrounds must be subtracted to obtain net counts. Because of slight background fluctuations, individual values for samples containing little or no activity can be positive or negative numbers. Although negative values do not represent a physical reality, we report them as they are received from the analytical laboratory. Valid long-term averages can be obtained only if negative values are included in the analytical results.

Infrequent situations exist where net counts are zero, or about zero, resulting in values with an associated uncertainty of zero. In both cases, the problem is not considered significant as the result will be considered a nondetect in either case.

The first case involves net counts of zero. In order to propagate uncertainties, the relative uncertainties, in quadrature, are summed (total propagated uncertainty [TPU]). The resulting relative uncertainty is then multiplied by the result to arrive at the actual uncertainty. If the result is zero, multiplying any number by zero will result in zero, and the uncertainty will thus also be zero. GEL's reporting policy in 2001 was to not report TPUs of zero when activities of samples were zero but instead to report a TPU of 1, as a default value, when activities of samples were zero.

The second case, where activities are close to zero, is a reporting issue involving significant digits. For these low activities, a large number of leading zeros may be reported to provide a result with the requisite number of significant digits. However, the situation is the same; these values should be considered to be zero, or nondetects.

c. Organic Compounds. See Table A-9 for organic methods and analytes of surface water, groundwater, and sediment analysis. Tables A-10–13 list the specific compounds that are analyzed in each suite. All samples we submit for organic chemistry analyses are collected in brown glass bottles, and the aqueous VOC samples are preserved with hydrochloric acid. A trip blank or field blank always accompanies the VOC samples. In addition, most analytical methods require the analysis of laboratory-prepared method blanks or instrument blanks with each batch of samples. Organic target analytes that are detected in these blanks indicate contamination from the sampling or analytical environments. Certain organic compounds used in analytical laboratories are frequently detected in blanks. That is, contamination introduced by the laboratories is common for these compounds. These compounds include acetone, methylene chloride, toluene, 2-butanone, di-n-butyl phthalate, di-n-octyl phthalate, and bis(2-ethylhexyl)phthalate (Fetter 1993).

3. Data Management and Quality Assurance

a. Data Management. GEL and Acculabs submitted Level 4 data packages (comprehensive data packages that include information about all quality control, chromatograms, etc.) to ESH-18 both electronically and in paper report form. We use an internal database to track the status of analyses submitted electronically, and final analytical results are also stored in that database. ESB, SLD, and UoM submitted Level 2 data packages (analytical results and

associated quality control summaries only) in paper report form. Analytical data are validated according to the specifications of the DOE-AL Model Data Validation Procedure (AQA 2001). Table 5-4 lists qualifier and validation flag codes that accompany 2001 sediments and water data. The ESH-18 sample management representative performs technical oversight of analytical laboratories, with the assistance of the DOE-AL Analytical Management Program.

b. Quality Assurance. The DOE-AL SOW for analytical chemistry gives detailed requirements for the content of subcontract laboratory QA plans. The DOE-AL SOW also describes the exact requirements for handling ESH-18 samples, from initial sample receipt to the final data report. All of the applicable requirements for batch quality control (QC), which may include method blanks, matrix spikes, laboratory control samples, calibration verifications, detection limit verifications, etc., are discussed in that document.

In addition to batch QC performed by laboratories, ESH-18 may submit blind field QC samples to test analytical laboratory proficiency and spot check for analytical problems. These performance evaluation (PE) samples include blanks, field duplicates, and occasionally samples spiked with known amounts of analyte.

Performance evaluation blanks (PEB) are blank water samples with deionized water from a known source. Field blanks (FB) aid in the detection of contamination encountered during sampling events. Field blanks are collected during sampling events. Sample containers are filled with DI water brought to the sampling site in a clean container. The field blanks are preserved and analyzed in the same manner as the samples collected for environmental surveillance. Analysis of field blanks can indicate the introduction of contaminants to samples by cross-contamination, materials suspended in air and water, and by physical contamination (e.g., any sediment introduced to the sample during sampling).

Tables 5-29, 5-30, and 5-31 present the analytical results for the blanks. Tables 5-32, 5-33, and 5-34 present detections of analytes in performance evaluation blanks and field blanks. The detections in the field blanks indicate contamination that may have been introduced to the samples at the time of sample collection. In many cases, however, the quality of the source of the DI water used in the blanks appears to be in question. Several PEBs and FBs contained small, but measurable, amounts of various analytes, including a number of metals (e.g., aluminum, copper, iron, and zinc) and general inorganic analytes (e.g., silica and sodium). The source of the DI water was upgraded at the end of the 2001 sampling season with a deionization filter that is designed to deliver high-purity DI water.

The analytical result tables present the analytical results for the field duplicates. We did not submit PE samples for sediment analyses because soil PE samples are easily recognized by analytical laboratories. Similarly, PE samples are easily distinguishable from storm runoff. Because of this, we do not send PE samples with storm runoff samples.

The analytical laboratories following the DOE-AL SOW are also required to participate in several independent national performance evaluation programs: the Environmental Measurement Laboratory Quality Assessment Program (QAP) and the Department of Energy Mixed Analyte Performance Evaluation Program (MAPEP) for radiochemistry analysis and the EPA Water Supply (WS), the EPA Water Pollution (WP), the EPA NPDES (DMRQA), and the MAPEP programs for organic and inorganic constituents.

The QAP is designed to test the quality of the environmental measurements that its contractor laboratories report to DOE. The Environmental Measurements Laboratory (EML) administers the QAP for the DOE Office of Environmental Management (EM). The QAP meets the requirements of DOE Order 414.1A, which requires DOE facilities to substantiate, by an external assessment, the quality of radiochemical analyses by their subcontract analytical laboratories. The QAP Web site describes the history and objectives of the program in detail, along with access to the QAP reports (*http://www.eml.doe.gov/qap*).

The Mixed Analyte Performance Evaluation Program (MAPEP) is another external, independent program that includes radionuclides and hazardous waste contaminants that are covered by the Resource Conservation and Recovery Act (RCRA). The Radiological and Environmental Sciences Laboratory (RESL), a government-owned and government-operated (GOGO) laboratory, administers MAPEP. RESL is located at the Central Facilities Area of the Idaho National Engineering and Environmental Laboratory (INEEL). The MAPEP Web site describes

the history and objectives of the program in detail and provides access to MAPEP reports (*http://www.inel.gov/resl/mapep/*).

The WS, WP, and DMRQA programs are EPA-required programs supporting ground water and wastewater compliance programs. Commercial National Environmental Laboratory Accreditation Conference (NELAC)-certified performance-testing organizations administer these programs. See the EPA and DMRQA Web sites (*http://www.epa.gov/waterscience/methods/wswpinfo.html* and *http://www.dmrqa.com*) for the history and objectives of these programs, along with performance data.

Categories of results from all of these PE programs are (1) acceptable (result within the two-sigma acceptance range), (2) acceptable with warning (result within the three-sigma acceptance range), and (3) not acceptable (result outside the three-sigma acceptance range). The laboratories initiate internal corrective actions when PE results are categorized as not acceptable, and those corrective actions are spot-checked during various laboratory oversight activities.

PE Sample Results Summaries for Analytical Laboratories

General Engineering Laboratories, Inc.

ESH-18 submitted field blank water samples to GEL. Results for all analytes except toluene and methylene chloride were generally below the detection limit, and when results were above the detection limit, they were generally attributable to laboratory contamination; that is, the analyte was also detected in the batch preparation blank. Blank results not attributable to laboratory contamination were random and did not repeat between sampling events. Toluene and methylene chloride (both common laboratory contaminants) were detected in a significant number of field blanks. An investigation by the laboratory found chronic random low-level laboratory contamination for these analytes and led to a corrective action for reduction of low-level false positives.

Analysis of the QAP samples in soil and water had "acceptable" or "acceptable with warning" scores for all radionuclides. The MAPEP-00-S7 strontium-90 in soil result and the MAPEP-00-W8 strontium-90 in water were scored as not acceptable, and the MAPEP-01-S8 americium-241 in soil was scored as not acceptable. The laboratory subsequently instituted corrective actions for these failures. A detection of americium-241 in a DI water blank submitted to the laboratory had a value less than three times the minimum detectable activity, and the value, as per the DOE-AL Model Data Validation Procedure, is deemed estimated. Uranium-234, plutonium-238, and amercium-241 were detected in various field blanks. The QC associated with all of these samples does not indicate problems with the analysis. Both of the samples indicating the presence of amercium-241 were submitted to GEL before the corrective action for americium-241 in soil. "Acceptable" or "acceptable with warning" scores were achieved for all other radionuclides, including americium-241 in water, analyzed in the MAPEP program.

Several organic and inorganic analytes in the MAPEP samples had scores of "not acceptable." All of the organic and inorganic analytes included in the MAPEP program are also included in the WS, WP, and DMRQA programs. All analytes in the MAPEP samples with "not acceptable" results were analyzed with "acceptable" results in these programs.

The QC associated with a high TDS value in one DI water blank did not indicate laboratory analysis problems. The sample also contained a small, but measurable, amount of nitrate. Another blank sample had a high specific conductance value. Other samples also had small, but measurable, concentrations of various ions. These detections indicate the known source of DI water used for blanks may have not been of sufficiently high quality, and, as mentioned above, we upgraded the source of the DI water at the end of the 2001 sampling season with a deionization filter that is designed to deliver high-purity DI water.

"Acceptable" or "acceptable with warning" scores were achieved for all organic and inorganic constituents in the DMRQA program. Several organic and inorganic analytes in the WS and WP programs were scored as "unacceptable." The laboratory re-ordered blind PE samples for all failed analytes and analyzed these samples as part of their corrective action. All reanalyses achieved "acceptable" scores. In all cases, no analyte had "unacceptable" results reported in two consecutive PE data sets.

We added perchlorate (ClO4-) as an analyte of concern following its placement on EPA's Contaminant Candidate List (EPA 1998). Results from initial sampling and analysis of "real" waters (i.e. groundwaters from Los Alamos) showed random low-level perchlorate detects in water samples that were not expected to have perchlorate. Investigations,

including several blind field spike sets, identified the following problems:

The EPA-recommended analytical method for perchlorate is *Method 314; Determination of Perchlorate in Drinking Water Using Ion Chromatography* (EPA 1999). This procedure recommends a three ionic-cartridge cleanup step that the analytical laboratory was not initially using. Because this cleanup was not being used, interferences from other anions, primarily sulfate, were producing random and highly variable noise in the baseline at the perchlorate retention time. In April, a corrective action was requested, and GEL implemented it. Although the implementation of the cleanup did improve the variation in the baseline, a significant background signal above zero was still seen in most of the "real" samples.

The method detection limit (MDL) given in Method 314 is 0.53 µg/L. The GEL-derived MDL, using the procedure described in 40CFR136 with clean spiked water, generally agrees with this value; however, MDL verification studies, as required by the DOE-AL SOW, show that, in "real" samples, spikes at the MDL cannot reliably be detected. In addition, using an MDL of about 1 µg/L has been shown to produce an unacceptable number of "false positives" in the range of 1 to 4 µg/L. From these studies and similar studies conducted at the DOE Pantex site in Texas, GEL has recommended to the DOE a 4-µg/L detection limit for Method 314 in "real" waters.

EPA and several state regulatory groups, including NMED, are considering lowering the MCL for perchlorate to below 4 µg/L. Given the problems we have encountered with using Method 314 to measure perchlorate at low concentrations, we are working with the DOE and the NMED to investigate alternative methods for determining perchlorate.

Acculabs, Inc.

Acculabs developed a method for determining perchlorate in water and soil matrices using liquid chromatography/mass spectrometry/mass spectrometry (LC/MS/MS) in 2001. The aqueous method detection limit was purported to be 0.25 µg/L. For this reason, Acculabs was contracted to conduct perchlorate analysis of groundwater samples.

The LC/MS/MS method was in the development stages in mid-2001, and samples ESH-18 submitted were the first attempt to analyze actual groundwater samples for perchlorate by the LC/MS/MS technique. An MDL study performed at the analytical laboratory indicated the average recovery at very low concentrations of perchlorate (~0.1 µg/L) was approximately 1.5 times greater than the known spiked values of the samples. The laboratory control samples (LCS) and matrix spikes and matrix spike duplicates (MS/MSD) samples all had recoveries that ranged from 2.5 to 5 times greater than the known spiked values of the LCSs and MS/MSDs.

Performance samples ESH-18 submitted in 2001 contained concentrations of perchlorate, in groundwater, that ranged from 1 µg/L to 5 µg/L. The values acquired by the LC/MS/MS methodology ranged from 2 to 5 times the known spiked values, with the highest errors occurring at the lowest spiked concentrations. The laboratory ran the performance samples again after subsequent development of the method, with results ranging from within 10% to 60% greater than the known spiked values.

Although the laboratory noted the high recoveries, it was decided to proceed with the analyses of the ESH-18 samples while they investigated the cause of the high recoveries. Acculabs considered the method still under development until February 2002.

Edward S. Babcock & Sons, Inc.

ESB analyzed perchlorate in groundwaters by Method 314 with a purported detection limit of 2.2 µg/L. The laboratory did not employ the three ionic-cartridge cleanup step as required by the procedure.

Performance samples ESH-18 submitted in 2001 contained concentrations of perchlorate in groundwater that ranged from 1 µg/L to 5 µg/L. The laboratory was not able to reliably detect perchlorate at less than 4 µg/L, with reported values 25% to 65% higher than the known concentrations in the samples spiked at 5 µg/L.

Only QC summaries were required to be included in the data packages ESB submitted to ESH-18 in 2001. Service with ESB was terminated in 2002 after the laboratory declined to enter into a new contract that required the three ionic-cartridge cleanup and following the DOE-AL SOW.

Analytical Detections

For low-level radiochemical results, data are qualified based upon total propagated uncertainties and the proximity to the detection limits.

Radiological detection limits are sample specific, are based on Currie's formula (Currie 1968), and are

reported in the tables. The laboratories have determined detection limits for each of the other analytical methods. In deriving the detection limits, the laboratories included the average uncertainties associated with the entire analytical method. Sources of error considered include average counting uncertainties, sample preparation effects, digestion, dilutions, gravimetric and pipetting uncertainties, and spike recoveries.

Although these MDLs determined by the analytical laboratories give an idea of the average limit of detection for a particular measurement technique, the detection limits do not apply to each individual sample measurement (except for radiological analysis). Instead, the question of whether or not an individual measurement is a detection is evaluated in light of its individual measurement uncertainty. For radiochemical analytical results, the analytical uncertainties are reported in the tables. These uncertainties represent a one standard deviation (one-sigma) propagated uncertainty. "It is virtually unanimously accepted that an analyte should be reported as present when it is measured at a concentration three-sigma or more above the corresponding method blank," (Keith 1991). We report radiochemical detections as values greater than three times the reported uncertainty. For sediments, the values reported as detections in the table are also above background levels determined for fallout (or natural background levels in the case of uranium).

The limit of quantification, or LOQ, is the level where the concentration of an analyte can be quantified with confidence. Again according to Keith (1991), "When the analyte signal is 10 or more times larger than the standard deviation of the measurements, there is a 99% probability that the true concentration of the analyte is ±30% of the calculated concentration." Thus, measured values near the detection limit or less than 10 times the analytical uncertainty do not provide a reliable indication of the amount present. The importance of this number is demonstrated when analytical results are compared against standards; the analytical result should be greater than 10 times the analytical uncertainty for the comparison to be meaningful.

G. Unplanned Releases

1. Radioactive Liquid Materials

One unplanned radioactive liquid release occurred in 2001 when less than 50 gallons of partially treated radioactive liquid wastewater were inadvertently released from Holding Tank 21-113 at TA-21.

2. Nonradioactive Liquid Materials

Three unplanned releases of nonradioactive liquid took place in 2001. The following is a summary of these discharges.

- Two unplanned releases of sanitary sewage:

  A plugged leach field line caused an unplanned release from a permitted septic tank (LA-45).

  A plugged sanitary collection system line caused a sanitary wastewater release from a manhole (MH 03-696).

- A broken air compressor line allowed approximately four gallons of oil to enter a floor drain that was connected to NPDES Outfall 03A028.

ESH-18 personnel investigated all unplanned releases of liquids. Facility operators have completed corrective actions, and ESH-18 has recommended closure of these releases. It is anticipated that these unplanned release investigations will be closed when personnel from the NMED's Surface Water Quality Bureau become available for inspections.

H. Tables

Table 5-1. Summary of Discharges from Stream-Monitoring Stations at Los Alamos National Laboratory for Water Year 2001 (October 1, 2000–September 30, 2001)

Canyon Sites	Days with Flow	Volume of Water (Acre Feet)	Instantaneous Max (ft^3/s)
E025 Los Alamos above Ice Rink	241	505	185
E026 Los Alamos below Ice Rink[a]	201	463	185
E030 Los Alamos above DP Canyon	162	510	60
E038 DP above TA-21	122	107	208
E039 DP below Meadow at TA-21	136	133	77
E040 DP above Los Alamos Canyon	52	18	33
E042 Los Alamos above SR-4[b]	137	537	146
E060 Pueblo above SR-502[b]	365	850	1,440
E089 Guaje above Rendija[a]	32	73	644
E090 Rendija above Guaje[a]	7	93	2,120
E123 Sandia below Wetlands	365	342	50
E125 Sandia above SR-4[b]	0	0	0
E200 Mortandad below Effluent Canyon	255	55	49
E202 Mortandad above Sediment Traps	4	0.6	0.23
E203 Mortandad below Sediment Traps	0	0	0
E204 Mortandad at LANL Boundary[b]	0	0	0
E218 Cañada del Buey near TA-46	67	11	20
E225 Cañada del Buey near MDA G	0	0	0
E230 Cañada del Buey above SR-4[b]	6	2.2	8.1
E240 Pajarito below SR-501[a]	60	88	154
E241 Pajarito above Starmers[a]	81	7.6	108
E242 Starmers above Pajarito	365	117	103
E245 Pajarito above TA-18	140	290	137
E246 Threemile above Pajarito	40	15.2	25
E250 Pajarito above SR-4[b]	81	104	22
E252 Water above SR-501[a]	193	157	255
E253 Cañon de Valle above SR-501[a]	50	34	19
E262 Cañon de Valle above Water	67	7.9	26
E262.5 Water below MDA AB[a]	22	14	50
E263 Water at SR-4	53	180	87
E265 Water below SR-4[b]	55	122	96
E267 Potrillo above SR-4[b]	4	1.4	6.8
E275 Ancho below SR-4[b]	5	0.9	34
E350 Rio de los Frijoles at Bandelier	365	950	14

[a] Based on partial year of record.
[b] Station at downstream Laboratory boundary.

Table 5-2. Radiochemical Analysis of Snowmelt and Base Flow for 2001 (pCi/L[a])

Station Name	Date	Codes[b]			^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
					Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Regional Stations																						
Rio Chama at Chamita (bank)	08/01	WS	UF	CS	-76	47	161	0.21	0.09	0.28	1.27	1.14	2.52	0.961	0.086	0.008	0.0463	0.0131	0.0227	0.614	0.061	0.023
Rio Grande at Embudo (bank)	08/01	WS	UF	CS	-99	45	158	0.18	0.12	0.39	1.41	0.82	3.04	1.160	0.098	0.020	0.0381	0.0105	0.0074	0.608	0.059	0.025
Rio Grande at Otowi Upper (bank)	07/17	WS	UF	CS	-52	48	166	0.33	0.13	0.30	-1.88	1.89	6.36	0.843	0.072	0.025	0.0491	0.0106	0.0056	0.541	0.050	0.015
Rio Grande at Otowi (bank)	07/17	WS	F	CS																		
Rio Grande at Otowi (bank)	07/17	WS	UF	CS	-105	47	168	0.01	0.07	0.20	-3.20	1.83	6.10	0.909	0.077	0.028	0.0235	0.0073	0.0058	0.538	0.051	0.020
Rio Grande at Frijoles (bank)	09/26	WS	UF	CS	-55	55	186	0.12	0.07	0.23	-0.64	0.82	2.74	0.834	0.084	0.050	0.0662	0.0200	0.0446	0.590	0.065	0.030
Rio Grande at Cochiti	09/26	WS	UF	CS	-82	54	184	0.13	0.09	0.28	-0.81	0.80	2.71	0.728	0.069	0.028	0.0838	0.0169	0.0081	0.433	0.047	0.028
Jemez River	04/18	WS	UF	CS	-169	50	185	0.17	0.11	0.35	1.19	1.23	3.27	0.668	0.076	0.072	0.0303	0.0134	0.0355	0.299	0.044	0.035
Jemez River	04/18	WS	UF	DUP				0.45	0.10	0.27												
Jemez River	04/18	WS	UF	RE																		
Pajarito Plateau Stations																						
Guaje Canyon:																						
Guaje above Rendija	04/18	WM	F	CS				0.21	0.07	0.22	0.44	0.63	2.30	0.087	0.022	0.041	0.0005	0.0100	0.0533	0.037	0.014	0.033
Guaje above Rendija	04/18	WM	UF	CS	-169	51	186	0.18	0.08	0.27	-1.82	1.07	3.43	0.185	0.037	0.073	0.0327	0.0145	0.0383	0.148	0.031	0.048
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons):																						
Los Alamos Reservoir	05/01	WS	F	CS				0.10	0.11	0.38	0.39	1.04	1.75	0.047	0.011	0.007	0.0246	0.0094	0.0229	0.030	0.010	0.023
Los Alamos Reservoir	05/01	WS	F	DUP				0.23	0.16	0.52												
Los Alamos Reservoir	05/01	WS	UF	CS	-57	55	189	0.21	0.11	0.36	1.66	1.37	3.67	0.077	0.015	0.018	0.0149	0.0062	0.0067	0.035	0.011	0.023
Los Alamos Reservoir	05/01	WS	UF	DUP																		
Los Alamos above Ice Rink	03/07	WM	UF	CS	-143	60	212	0.35	0.15	0.50	-0.95	0.78	2.65	0.061	0.026	0.087	-0.0075	0.0113	0.0977	0.041	0.018	0.022
Los Alamos above Ice Rink	03/07	WM	UF	DUP	-170	58	210				0.62	0.82	2.93	0.105	0.035	0.074	0.0205	0.0188	0.0934	0.085	0.031	0.074
Los Alamos above Ice Rink	03/07	WM	F	CS				0.56	0.12	0.35	0.09	0.75	2.61	0.025	0.022	0.107	0.0000	1.0000	0.0270	0.006	0.016	0.107
Los Alamos above Ice Rink	03/07	WM	F	DUP				0.17	0.14	0.47												
Los Alamos above Ice Rink	03/15	WM	F	CS				0.19	0.08	0.25	-0.66	0.65	2.21	0.051	0.024	0.069	0.0000	1.0000	0.0253	0.037	0.019	0.025
Los Alamos above Ice Rink	03/15	WM	F	DUP																		
Los Alamos above Ice Rink	03/15	WM	UF	CS	-29	53	179	0.40	0.09	0.27	0.71	0.87	3.10	0.090	0.038	0.128	-0.0033	0.0033	0.1020	0.083	0.035	0.037
Los Alamos above Ice Rink	03/20	WM	F	CS				0.41	0.09	0.24	0.83	0.61	2.32	0.042	0.022	0.069	-0.0041	0.0122	0.1010	0.029	0.020	0.087
Los Alamos above Ice Rink	03/20	WM	UF	CS	0	53	178	0.36	0.08	0.23	1.21	0.87	3.09	0.045	0.025	0.093	0.0110	0.0142	0.0657	0.044	0.020	0.052
Los Alamos above Ice Rink	03/20	WM	UF	DUP							0.34	0.80	2.84									
Los Alamos above Ice Rink	03/20	WM	F	CS				0.52	0.08	0.24	0.00	0.67	2.36	0.077	0.026	0.023	0.0258	0.0150	0.0233	0.043	0.020	0.023
Los Alamos above Ice Rink	03/20	WM	F	DUP																		
Los Alamos above Ice Rink	03/20	WM	UF	CS	0	53	179	0.41	0.09	0.24	1.89	0.89	3.18	0.044	0.028	0.125	0.0192	0.0136	0.0260	0.082	0.032	0.103
Los Alamos above Ice Rink	04/04	WM	F	CS				0.37	0.11	0.36	0.42	0.99	1.74	0.039	0.023	0.086	-0.0624	0.0231	0.1350	-0.033	0.025	0.132
Los Alamos above Ice Rink	04/04	WM	UF	CS	28	53	176	0.47	0.07	0.22	0.83	0.91	3.26	0.148	0.031	0.064	0.0209	0.0116	0.0359	0.147	0.029	0.036
Los Alamos above Ice Rink	04/04	WM	UF	DUP							0.45	0.96	3.40									
Los Alamos above Ice Rink	05/02	WM	F	CS				0.07	0.10	0.34	0.62	0.55	2.05	0.065	0.017	0.037	0.0103	0.0086	0.0368	0.015	0.010	0.041
Los Alamos above Ice Rink	05/02	WM	UF	CS	-58	55	191	0.38	0.16	0.49	-1.38	1.04	3.46	0.064	0.016	0.037	-0.0025	0.0065	0.0296	0.044	0.012	0.026
Los Alamos below Ice Rink	04/18	WM	F	CS				0.20	0.11	0.37	0.70	0.71	2.61	0.062	0.018	0.013	-0.0035	0.0035	0.0354	0.034	0.013	0.013
Los Alamos below Ice Rink	04/18	WM	F	DUP										0.017	0.012	0.045	0.0063	0.0078	0.0361	0.010	0.007	0.013
Los Alamos below Ice Rink	04/18	WM	UF	CS	-86	54	188	0.28	0.09	0.30	-0.39	1.03	3.52	0.092	0.022	0.041	0.0127	0.0115	0.0481	0.047	0.016	0.041
Los Alamos below Ice Rink	04/18	WM	UF	DUP							1.04	0.93	3.41									
Los Alamos below Ice Rink	08/01	WS	F	CS				1.13	0.19	0.26	0.44	0.95	3.55	0.444	0.046	0.019	0.0393	0.0117	0.0244	0.395	0.042	0.019
Los Alamos below Ice Rink	08/01	WS	F	DUP				1.07	0.18	0.19	-0.13	1.32	4.72	0.441	0.044	0.022	0.0442	0.0111	0.0171	0.348	0.038	0.025
Los Alamos below Ice Rink	08/01	WS	UF	CS	0	50	163	1.91	0.29	0.25	0.01	1.92	6.95	3.820	0.346	0.145	0.2610	0.0559	0.0937	3.910	0.351	0.024
Los Alamos below Ice Rink	08/01	WS	UF	DUP	25	49	158				3.21	3.43	8.39									
Los Alamos below Ice Rink	08/02	WS	F	CS				1.34	0.22	0.28	-0.12	0.98	3.42	0.388	0.045	0.037	0.0422	0.0128	0.0289	0.255	0.034	0.037
Los Alamos below Ice Rink	08/02	WS	F	DUP							1.64	0.87	3.42									
Los Alamos below Ice Rink	08/02	WS	UF	CS	235	53	152	1.28	0.21	0.20	3.46	1.92	7.62	0.957	0.087	0.024	0.0315	0.0116	0.0306	0.829	0.078	0.024
Los Alamos below Ice Rink	08/02	WS	UF	DUP	184	52	153				1.61	1.94	7.26	0.987	0.092	0.010	0.0798	0.0187	0.0276	0.882	0.085	0.040
Los Alamos at Upper GS	03/26	WM	F	CS				0.83	0.11	0.29	0.37	0.58	2.15	0.056	0.017	0.029	-0.0080	0.0057	0.0373	0.048	0.014	0.011
Los Alamos at Upper GS	03/26	WM	F	DUP										0.071	0.019	0.031	0.0209	0.0095	0.0113	0.033	0.015	0.039
Los Alamos at Upper GS	03/26	WM	UF	CS	85	55	175	0.83	0.08	0.23	0.24	0.89	3.02	0.206	0.032	0.011	0.0119	0.0120	0.0428	0.123	0.024	0.029
Los Alamos at Upper GS	03/26	WM	UF	DUP							0.39	1.27	4.53									

Table 5-2. Radiochemical Analysis of Snowmelt and Base Flow for 2001 (pCi/L[a]) (Cont.)

					^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
Station Name	**Date**	**Codes[b]**			**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Pajarito Plateau Stations (Cont.)																						
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)																						
DPS-1	03/28	WM	F	CS				76.60	9.86	0.23	0.00	0.70	2.65	1.210	0.111	0.045	0.0504	0.0172	0.0390	0.218	0.036	0.050
DPS-1	03/28	WM	UF	CS	197	57	174	95.20	6.70	0.25	1.89	0.86	3.16	1.130	0.112	0.085	0.0683	0.0297	0.0884	0.204	0.040	0.077
Los Alamos above SR-4	03/15	WM	F	CS				1.40	0.10	0.17	0.30	0.72	2.50	0.069	0.027	0.092	-0.0031	0.0136	0.1000	0.054	0.023	0.071
Los Alamos above SR-4	03/15	WM	F	DUP				1.59	0.10	0.20												
Los Alamos above SR-4	03/15	WM	UF	CS	116	57	180	1.48	0.23	0.39	1.79	0.91	3.21	0.209	0.059	0.134	-0.0035	0.0035	0.1060	0.086	0.036	0.039
Los Alamos above SR-4	03/15	WM	UF	DUP	58	55	179				2.06	1.27	4.66									
Los Alamos above SR-4	03/21	WM	F	CS				1.58	0.13	0.30	-0.73	0.66	2.21	0.071	0.019	0.044	0.0068	0.0083	0.0314	0.027	0.010	0.009
Los Alamos above SR-4	03/21	WM	F	DUP																		
Los Alamos above SR-4	03/21	WM	UF	CS	-28	51	174	1.48	0.12	0.21	-0.43	1.02	3.45	0.103	0.021	0.031	0.0234	0.0112	0.0310	0.040	0.018	0.053
Los Alamos above SR-4	04/04	WM	F	CS				0.85	0.09	0.23	0.00	0.63	2.36	0.124	0.026	0.034	0.0196	0.0108	0.0337	0.100	0.023	0.012
Los Alamos above SR-4	04/04	WM	F	DUP										0.096	0.025	0.048	0.0208	0.0105	0.0141	0.085	0.023	0.038
Los Alamos above SR-4	04/04	WM	UF	CS	28	53	177	0.92	0.09	0.21	1.31	0.85	3.08	0.281	0.044	0.047	0.0217	0.0120	0.0374	0.157	0.030	0.014
Los Alamos above SR-4	04/18	WM	F	CS				0.90	0.14	0.23	1.11	0.71	2.65	0.044	0.016	0.032	0.0220	0.0118	0.0324	0.026	0.013	0.032
Los Alamos above SR-4	04/18	WM	F	DUP				0.85	0.09	0.22												
Los Alamos above SR-4	04/18	WM	UF	CS	-29	55	188	1.21	0.12	0.31	0.55	0.81	2.91	0.134	0.028	0.045	0.0417	0.0165	0.0452	0.110	0.026	0.045
Los Alamos above SR-4	05/02	WM	F	CS				0.93	0.12	0.33	1.13	0.54	1.94	0.039	0.011	0.025	-0.0009	0.0037	0.0248	0.054	0.013	0.020
Los Alamos above SR-4	05/02	WM	UF	CS	-58	55	190	0.49	0.15	0.45	1.29	1.04	3.72	0.081	0.018	0.031	0.0176	0.0085	0.0243	0.053	0.014	0.009
Los Alamos above SR-4	06/15	WS	F	CS				1.05	0.22	0.38	2.29	0.95	3.83	0.068	0.014	0.022	0.0024	0.0062	0.0253	0.052	0.012	0.017
Los Alamos above SR-4	06/15	WS	UF	CS	54	51	166	1.00	0.17	0.36	1.41	1.95	7.16	0.207	0.031	0.053	0.0346	0.0106	0.0196	0.260	0.033	0.025
Los Alamos below LA Weir	03/15	WM	F	CS				1.28	0.14	0.31	0.62	0.71	2.60	0.202	0.031	0.010	0.0112	0.0065	0.0102	0.138	0.025	0.010
Los Alamos below LA Weir	03/15	WM	F	DUP										0.222	0.059	0.104	0.0215	0.0206	0.1310	0.127	0.044	0.038
Los Alamos below LA Weir	03/15	WM	UF	CS	87	56	181	1.12	0.11	0.27	1.64	0.96	3.48	0.263	0.067	0.109	0.0148	0.0149	0.0402	0.233	0.062	0.109
Los Alamos below LA Weir	03/21	WM	F	CS				1.35	0.11	0.21	-0.23	0.49	1.69	0.076	0.027	0.078	-0.0040	0.0184	0.0727	0.056	0.021	0.056
Los Alamos below LA Weir	03/21	WM	UF	CS	29	54	180	1.39	0.09	0.20	-0.23	1.02	3.54	0.070	0.019	0.030	0.0123	0.0123	0.0441	0.049	0.015	0.011
Los Alamos below LA Weir	04/04	WM	F	CS				1.00	0.08	0.21	0.93	0.67	2.37	0.030	0.019	0.073	0.0044	0.0111	0.0561	0.008	0.011	0.048
Los Alamos below LA Weir	04/04	WM	F	DUP																		
Los Alamos below LA Weir	04/04	WM	UF	CS	58	55	179	1.01	0.15	0.19	0.58	0.84	2.91	0.105	0.027	0.053	-0.0025	0.0081	0.0528	0.108	0.026	0.015
Los Alamos below LA Weir	04/18	WM	F	CS				0.92	0.15	0.24	0.18	0.88	3.00	0.057	0.016	0.034	0.0131	0.0091	0.0341	0.016	0.009	0.027
Los Alamos below LA Weir	04/18	WM	UF	CS	29	57	187	1.13	0.13	0.32	0.85	0.97	3.41	0.072	0.021	0.037	0.0130	0.0114	0.0470	0.022	0.012	0.037
Los Alamos below LA Weir	05/02	WM	F	CS				0.74	0.07	0.20	0.87	1.58	3.24	0.062	0.024	0.072	-0.0120	0.0070	0.0650	0.086	0.025	0.044
Los Alamos below LA Weir	05/02	WM	F	DUP																		
Los Alamos below LA Weir	05/02	WM	UF	CS	-85	53	187	0.83	0.18	0.54	1.00	1.11	3.86	0.096	0.019	0.009	0.0001	0.0062	0.0368	0.043	0.014	0.032
Los Alamos at SR-4	03/26	WM	F	CS				0.93	0.14	0.23	-0.70	0.78	2.64	0.091	0.027	0.063	0.0096	0.0068	0.0130	0.067	0.021	0.045
Los Alamos at SR-4	03/26	WM	UF	CS	0	52	175	1.02	0.19	0.29	15.60	2.08	2.83	0.495	0.056	0.035	0.0414	0.0139	0.0277	0.443	0.052	0.035
Los Alamos at Rio Grande	03/26	WM	F	CS				0.76	0.13	0.40	0.46	0.67	2.41	0.255	0.038	0.038	-0.0041	0.0041	0.0303	0.201	0.032	0.011
Los Alamos at Rio Grande	03/26	WM	UF	CS	28	53	176	0.79	0.13	0.23	0.00	0.84	2.91	0.126	0.024	0.011	0.0122	0.0108	0.0377	0.097	0.023	0.038
Pueblo 1 R	04/11	WM	F	CS				1.52	0.21	0.22	0.95	0.73	2.32	0.115	0.023	0.011	0.0131	0.0085	0.0293	0.136	0.026	0.029
Pueblo 1 R	04/11	WM	UF	CS	0	56	187	1.23	0.10	0.24	0.87	0.90	3.16	0.128	0.028	0.066	0.0237	0.0098	0.0107	0.130	0.025	0.011
Pueblo 1 R	04/11	WM	UF	DUP				1.10	0.09	0.22												
Acid Weir	04/11	WM	F	CS				14.90	0.91	0.21	-0.84	0.62	2.05	0.205	0.034	0.040	0.0240	0.0124	0.0401	0.097	0.023	0.040
Acid Weir	04/11	WM	UF	CS	-28	55	186	14.80	1.88	0.23	0.36	0.88	3.09	0.352	0.047	0.012	0.0272	0.0113	0.0123	0.108	0.024	0.012
Acid Weir	04/11	WM	UF	DUP	56	56	184							0.206	0.033	0.031	0.0252	0.0104	0.0114	0.109	0.023	0.011
Pueblo 2	04/03	WM	F	CS				2.40	0.12	0.19	-0.14	0.63	2.20	0.119	0.024	0.035	0.0112	0.0084	0.0275	0.082	0.020	0.035
Pueblo 2	04/03	WM	F	DUP										0.214	0.029	0.008	0.0058	0.0058	0.0214	0.084	0.017	0.008
Pueblo 2	04/03	WM	UF	CS	57	55	178	2.74	0.20	0.42	1.24	1.20	4.23	0.113	0.021	0.029	0.0157	0.0095	0.0292	0.063	0.016	0.029
Pueblo 3	04/03	WS	F	CS				0.36	0.09	0.28	0.81	0.66	2.41	0.328	0.041	0.024	0.0066	0.0047	0.0090	0.132	0.024	0.031
Pueblo 3	04/03	WS	UF	CS	-117	51	181	0.29	0.10	0.31	0.81	2.07	2.79	0.380	0.048	0.048	0.0185	0.0134	0.0444	0.284	0.040	0.048
Pueblo 3	04/03	WS	UF	DUP																		
Pueblo at SR-502	04/03	WS	F	CS				0.36	0.09	0.30	-0.97	0.67	2.16	0.206	0.030	0.034	0.0032	0.0071	0.0295	0.104	0.021	0.034
Pueblo at SR-502	04/03	WS	F	DUP				0.41	0.12	0.33												
Pueblo at SR-502	04/03	WS	F	CS				0.48	0.10	0.30	0.88	0.65	2.39	0.189	0.029	0.034	0.0063	0.0077	0.0293	0.113	0.021	0.009
Pueblo at SR-502	04/03	WS	UF	CS	-57	51	178	0.44	0.11	0.33	0.54	0.82	2.86	0.232	0.031	0.027	0.0177	0.0073	0.0080	0.179	0.027	0.027
Pueblo at SR-502	04/03	WS	UF	DUP							0.46	0.81	2.90									
Pueblo at SR-502	04/03	WS	UF	CS	-113	49	176	0.73	0.10	0.27	0.17	0.89	3.10	0.213	0.033	0.047	-0.0067	0.0067	0.0359	0.166	0.026	0.009

Table 5-2. Radiochemical Analysis of Snowmelt and Base Flow for 2001 (pCi/L[a]) (Cont.)

					^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
Station Name	**Date**	**Codes[b]**			**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Pajarito Plateau Stations (Cont.)																						
Sandia Canyon:																						
SCS-1	05/17	WS	UF	CS	98	49	160	0.08	0.08	0.27	3.66	1.41	2.89	0.153	0.023	0.030	0.0000	1.0000	0.0392	0.091	0.017	0.027
SCS-1	05/17	WS	UF	DUP										0.135	0.021	0.028	0.0070	0.0070	0.0251	0.046	0.014	0.033
SCS-2	05/17	WS	UF	CS	72	47	155	0.28	0.08	0.24	0.16	1.10	3.89	0.218	0.031	0.041	0.0081	0.0112	0.0406	0.140	0.024	0.041
SCS-2	05/17	WS	UF	DUP	0	0	0.161	0.33	0.09	0.23												
SCS-2	05/17	WS	UF	CS	95	47	154	0.11	0.07	0.26	-0.21	1.27	4.37	0.236	0.029	0.028	0.0275	0.0094	0.0227	0.143	0.022	0.035
SCS-3	05/17	WS	UF	CS	71	47	157	0.07	0.08	0.27	2.53	1.44	2.31	0.196	0.028	0.025	0.0082	0.0048	0.0074	0.136	0.022	0.007
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey):																						
Mortandad at GS-1	04/18	WS	UF	CS	3140	115	184	12.10	0.64	0.28	10.80	1.59	3.61	0.846	0.094	0.084	0.0497	0.0202	0.0605	0.502	0.066	0.079
Pajarito Canyon (includes Twomile, Threemile Canyons):																						
Pajarito below SR-501	03/20	WM	F	CS				0.36	0.08	0.26	-0.46	0.77	2.28	0.043	0.023	0.071	0.0432	0.0173	0.0397	0.043	0.017	0.040
Pajarito below SR-501	03/20	WM	F	DUP										0.087	0.032	0.089	0.0008	0.0165	0.1160	0.048	0.025	0.089
Pajarito below SR-501	03/20	WM	UF	CS	-29	52	179	0.56	0.14	0.45	1.11	0.91	3.06	0.152	0.036	0.076	0.0144	0.0119	0.0466	0.046	0.019	0.047
Pajarito below SR-501	04/04	WM	F	CS				0.45	0.11	0.33	0.18	0.75	2.31	0.051	0.018	0.045	0.0110	0.0091	0.0354	0.016	0.010	0.035
Pajarito below SR-501	04/04	WM	F	DUP				0.39	0.09	0.25												
Pajarito below SR-501	04/04	WM	UF	CS	0	53	177	0.29	0.07	0.18	1.58	1.40	3.18	0.061	0.019	0.036	0.0049	0.0050	0.0134	0.041	0.016	0.036
Pajarito below SR-501	04/18	WM	F	CS				0.24	0.11	0.36	0.15	1.33	1.96	0.045	0.017	0.043	-0.0054	0.0075	0.0505	0.009	0.007	0.013
Pajarito below SR-501	04/18	WM	UF	CS	-28	54	185	0.26	0.13	0.41	-0.32	0.97	3.31	0.069	0.022	0.057	0.0244	0.0143	0.0497	0.026	0.016	0.057
Pajarito below SR-501	05/02	WM	F	CS				0.25	0.07	0.22	-0.21	0.68	2.31	0.031	0.010	0.008	-0.0018	0.0019	0.0205	0.014	0.006	0.008
Pajarito below SR-501	05/02	WM	F	DUP				0.18	0.08	0.27												
Pajarito below SR-501	05/02	WM	UF	CS	-115	53	189	0.34	0.10	0.34	8.43	1.81	3.59	0.032	0.012	0.035	0.0081	0.0071	0.0243	0.012	0.005	0.006
Pajarito below SR-501	05/02	WM	UF	DUP																		
Pajarito Canyon	04/04	WM	F	CS				0.17	0.09	0.29	-0.58	0.63	2.08	0.043	0.012	0.008	-0.0031	0.0031	0.0227	0.043	0.013	0.029
Pajarito Canyon	04/04	WM	UF	CS	29	54	177	0.40	0.10	0.30	-0.19	0.87	2.95	0.064	0.021	0.056	0.0101	0.0076	0.0247	0.087	0.019	0.025
Pajarito above SR-4	03/21	WM	F	CS				2.46	0.21	0.19	-0.31	0.71	2.47	1.310	0.116	0.053	0.0677	0.0185	0.0384	1.620	0.137	0.038
Pajarito above SR-4	03/21	WM	F	DUP										1.260	0.114	0.011	0.0776	0.0182	0.0105	1.660	0.143	0.011
Pajarito above SR-4	03/21	WM	UF	CS	86	55	178	2.47	0.11	0.18	-0.69	1.25	4.27	1.230	0.113	0.056	0.0838	0.0200	0.0294	1.470	0.130	0.029
Pajarito above SR-4	03/21	WM	UF	DUP																		
Pajarito above SR-4	04/04	WM	F	CS				1.47	0.11	0.24	0.59	0.64	2.53	0.140	0.029	0.057	0.0229	0.0112	0.0319	0.193	0.033	0.040
Pajarito above SR-4	04/04	WM	UF	CS	88	56	181	1.31	0.18	0.20	-1.59	0.89	2.82	0.139	0.029	0.052	0.0062	0.0077	0.0356	0.227	0.038	0.058
Pajarito above SR-4	04/18	WM	F	CS				1.43	0.12	0.26	0.55	0.84	2.97	0.235	0.041	0.063	-0.0196	0.0130	0.0828	0.276	0.045	0.063
Pajarito above SR-4	04/18	WM	UF	CS	-56	53	185	1.40	0.10	0.24	1.07	1.04	3.64	0.262	0.041	0.055	0.0223	0.0136	0.0496	0.342	0.048	0.060
Pajarito above SR-4	05/02	WM	F	CS				1.84	0.16	0.22	0.00	0.68	2.59	0.422	0.051	0.011	0.0426	0.0141	0.0360	0.605	0.066	0.051
Pajarito above SR-4	05/02	WM	UF	CS	-29	56	191	2.17	0.19	0.38	0.53	1.11	3.94	0.548	0.058	0.023	0.0539	0.0136	0.0086	0.611	0.063	0.038
Pajarito at Rio Grande	09/25	WS	UF	CS	-82	54	186	-0.03	0.08	0.28	0.17	0.73	2.61	0.679	0.071	0.036	0.0236	0.0137	0.0424	0.298	0.041	0.029
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons):																						
Water above SR-501	03/15	WM	F	CS				0.08	0.09	0.31	0.12	0.71	2.50	0.120	0.035	0.101	0.0161	0.0172	0.0929	0.000	0.009	0.072
Water above SR-501	03/15	WM	UF	CS	-29	52	177	-0.03	0.12	0.42	0.66	1.04	3.24	0.021	0.025	0.140	0.0038	0.0127	0.0819	0.004	0.010	0.067
Water above SR-501	03/20	WM	F	CS				0.18	0.07	0.23	0.42	0.65	2.31	0.023	0.019	0.096	0.0000	1.0000	0.0241	0.027	0.016	0.024
Water above SR-501	03/20	WM	F	DUP				0.12	0.06	0.19												
Water above SR-501	03/20	WM	UF	CS	0	52	175	0.08	0.09	0.30	-0.65	0.87	2.98	0.131	0.029	0.050	0.0482	0.0164	0.0145	0.039	0.016	0.039
Water above SR-501	04/04	WM	F	CS				0.12	0.06	0.20	-0.47	0.75	2.55	0.052	0.017	0.042	0.0149	0.0097	0.0334	0.018	0.009	0.012
Water above SR-501	04/04	WM	UF	CS	-29	52	178	0.04	0.06	0.19	1.25	1.88	2.83	0.010	0.026	0.119	0.0099	0.0206	0.0954	0.026	0.019	0.077
Water above SR-501	04/18	WM	F	CS				0.18	0.09	0.30	-0.52	0.62	2.07	0.029	0.011	0.031	0.0017	0.0060	0.0314	0.024	0.010	0.025
Water above SR-501	04/18	WM	F	DUP										0.046	0.015	0.030	0.0133	0.0087	0.0298	0.025	0.011	0.030
Water above SR-501	04/18	WM	UF	CS	-56	53	183	0.02	0.07	0.24	-0.11	1.14	3.97	0.060	0.020	0.059	0.0095	0.0120	0.0540	0.015	0.010	0.033
Water above SR-501	05/02	WM	F	CS				0.11	0.07	0.22	0.29	0.79	2.76	0.022	0.009	0.025	0.0156	0.0080	0.0255	0.009	0.008	0.037
Water above SR-501	05/02	WM	F	DUP																		
Water above SR-501	05/02	WM	UF	CS	-87	55	191	0.16	0.14	0.47	1.36	1.04	3.78	0.034	0.011	0.009	0.0202	0.0084	0.0091	0.040	0.012	0.009
Cañon de Valle above SR-501	04/04	WM	F	CS				0.35	0.07	0.23	-0.70	0.63	2.13	0.079	0.021	0.034	0.0196	0.0109	0.0337	0.041	0.014	0.012
Cañon de Valle above SR-501	04/04	WM	UF	CS	57	54	176	0.34	0.08	0.19	1.27	0.98	2.64	0.133	0.030	0.050	0.0178	0.0116	0.0398	0.077	0.022	0.040
Cañon de Valle above SR-501	04/18	WM	F	CS				0.23	0.10	0.31	0.64	1.37	1.73	0.053	0.018	0.038	-0.0037	0.0037	0.0381	0.013	0.012	0.048

Table 5-2. Radiochemical Analysis of Snowmelt and Base Flow for 2001 (pCi/L[a]) (Cont.)

					^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
Station Name	**Date**	**Codes[b]**			**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Pajarito Plateau Stations (Cont.)																						
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons): (Cont.)																						
Cañon de Valle above SR-501	04/18	WM	UF	CS	-141	51	185	0.14	0.09	0.29	8.79	1.72	3.09	0.109	0.034	0.110	0.0241	0.0179	0.0718	0.027	0.020	0.082
Cañon de Valle above SR-501	05/02	WM	F	CS				0.12	0.07	0.22	-0.27	0.83	2.80	0.043	0.013	0.011	0.0000	1.0000	0.0106	0.033	0.012	0.029
Cañon de Valle above SR-501	05/02	WM	F	DUP										0.025	0.013	0.046	0.0027	0.0066	0.0317	0.016	0.007	0.007
Cañon de Valle above SR-501	05/02	WM	UF	CS	-116	54	192	0.26	0.16	0.52	-0.02	1.03	3.53	0.057	0.015	0.028	0.0061	0.0044	0.0083	0.031	0.010	0.008
Water at Beta	04/17	WM	UF	CS	-28	54	184	0.57	0.11	0.34	2.83	1.11	3.19	0.019	0.012	0.042	-0.0041	0.0041	0.0422	0.025	0.014	0.042
Water below SR-4	03/21	WM	F	CS				0.36	0.09	0.28	-0.92	0.63	2.08	0.071	0.021	0.049	-0.0074	0.0139	0.0590	0.059	0.015	0.010
Water below SR-4	03/21	WM	UF	CS	0	53	177	0.50	0.07	0.21	1.40	0.86	3.65	0.209	0.032	0.034	0.0037	0.0082	0.0341	0.209	0.032	0.034
Water below SR-4	04/04	WM	F	CS				0.21	0.06	0.20	-0.69	0.59	1.71	0.028	0.016	0.057	-0.0113	0.0083	0.0568	0.026	0.015	0.052
Water below SR-4	04/04	WM	UF	CS	57	54	177	0.32	0.08	0.25	0.00	1.19	4.37	0.099	0.024	0.036	0.0196	0.0099	0.0133	0.125	0.027	0.045
Ancho Canyon:																						
Ancho at Rio Grande	09/25	WS	UF	CS	0	57	187	0.01	0.08	0.26	0.86	1.33	2.74	0.151	0.025	0.009	0.0197	0.0105	0.0305	0.085	0.018	0.024
Frijoles Canyon:																						
Frijoles at Monument Headquarters	07/18	WS	UF	CS	-79	48	168	0.21	0.10	0.24	-1.72	1.95	6.82	0.090	0.018	0.032	0.0053	0.0076	0.0287	0.061	0.014	0.020
Frijoles at Monument Headquarters	07/18	WS	UF	DUP	-54	50	171				0.98	1.68	6.33	0.071	0.020	0.046	0.0098	0.0086	0.0302	0.088	0.019	0.024
Frijoles at Rio Grande	09/26	WS	UF	CS	-108	52	182	0.11	0.10	0.33	1.25	0.68	2.62	0.063	0.020	0.050	-0.0141	0.0123	0.0559	-0.007	0.013	0.056
Frijoles at Rio Grande	09/26	WS	UF	DUP				0.06	0.07	0.22				0.030	0.016	0.053	-0.0036	0.0036	0.0328	0.017	0.014	0.053
Frijoles at Rio Grande	09/26	WS	UF	CS	-137	53	186	0.26	0.09	0.26	1.22	1.15	4.17	0.072	0.018	0.028	0.0227	0.0108	0.0279	0.023	0.012	0.035
Water Quality Standards[d]																						
DOE DCG for Public Dose					2,000,000			1,000			3,000			500			600			600		
DOE Drinking Water System DCG					80,000			40			120			20			24			24		
EPA Primary Drinking Water Standard					20,000			8														
EPA Screening Level																						
NMWQCC Groundwater Limit																						
NMWQCC Livestock Watering					20,000																	

Table 5-2. Radiochemical Analysis of Snowmelt and Base Flow for 2001 (pCi/L[a]) (Cont.)

Station Name	Date	Codes[b]			U (µg/L)	^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
					Result	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Regional Stations																				
Rio Chama at Chamita (bank)	08/01	WS	UF	CS		-0.003	0.005	0.028	0.000	1.000	0.022	0.032	0.015	0.039	7.7	1.1	1.7	6.6	0.6	1.6
Rio Grande at Embudo (bank)	08/01	WS	UF	CS		0.000	1.000	0.028	0.009	0.007	0.022	0.021	0.010	0.025	0.8	0.7	2.4	3.5	0.6	2.1
Rio Grande at Otowi Upper (bank)	07/17	WS	UF	CS		0.002	0.004	0.018	0.008	0.006	0.021	0.014	0.007	0.017	3.7	1.0	1.6	6.1	0.9	2.6
Rio Grande at Otowi (bank)	07/17	WS	F	CS	1.63															
Rio Grande at Otowi (bank)	07/17	WS	UF	CS		0.000	0.003	0.018	0.000	0.003	0.018	0.014	0.008	0.022	3.1	0.8	1.4	7.1	0.9	2.8
Rio Grande at Frijoles (bank)	09/26	WS	UF	CS		0.000	1.000	0.024	0.006	0.006	0.024	-0.009	0.010	0.042	3.2	0.5	0.9	6.0	0.3	0.6
Rio Grande at Cochiti	09/26	WS	UF	CS		0.000	1.000	0.007	0.016	0.007	0.019	0.012	0.010	0.033	2.8	0.6	1.2	6.4	0.4	0.9
Jemez River	04/18	WS	UF	CS		0.015	0.011	0.020	0.011	0.011	0.040	2.100	0.185	0.022	1.9	0.6	1.5	1.5	0.8	2.7
Jemez River	04/18	WS	UF	DUP																
Jemez River	04/18	WS	UF	RE								0.047	0.021	0.025						
Pajarito Plateau Stations																				
Guaje Canyon:																				
Guaje above Rendija	04/18	WM	F	CS	<[c] 0.10	0.008	0.008	0.021	0.000	1.000	0.051	0.025	0.014	0.037	0.6	0.6	2.1	3.8	0.9	2.6
Guaje above Rendija	04/18	WM	UF	CS	0.64	0.000	1.000	0.015	-0.008	0.008	0.044	0.014	0.010	0.019	1.0	0.5	1.3	4.6	1.1	3.2
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons):																				
Los Alamos Reservoir	05/01	WS	F	CS		0.020	0.009	0.011	0.005	0.006	0.029	-0.003	0.005	0.027	2.1	0.8	2.0	6.7	1.2	3.2
Los Alamos Reservoir	05/01	WS	F	DUP																
Los Alamos Reservoir	05/01	WS	UF	CS		0.009	0.005	0.008	0.006	0.004	0.008	0.016	0.007	0.007	1.3	0.6	1.9	4.5	1.0	3.1
Los Alamos Reservoir	05/01	WS	UF	DUP								0.005	0.005	0.014	0.8	0.5	1.7	2.6	0.9	2.8
Los Alamos above Ice Rink	03/07	WM	UF	CS	< 0.10	0.013	0.009	0.017	0.000	1.000	0.012	0.038	0.011	0.009	0.8	0.3	0.7	4.8	0.8	2.1
Los Alamos above Ice Rink	03/07	WM	UF	DUP	< 0.08	0.012	0.012	0.046	0.000	1.000	0.041				0.1	0.5	1.7	4.2	0.9	2.6
Los Alamos above Ice Rink	03/07	WM	F	CS	< 0.09	0.059	0.024	0.026	0.049	0.019	0.019	0.032	0.011	0.010	0.3	0.3	1.2	3.4	0.7	2.2
Los Alamos above Ice Rink	03/07	WM	F	DUP								0.040	0.012	0.009						
Los Alamos above Ice Rink	03/15	WM	F	CS	< 0.07	0.000	1.000	0.027	0.033	0.011	0.010	0.065	0.020	0.016	0.4	0.4	1.5	2.3	0.8	2.5
Los Alamos above Ice Rink	03/15	WM	F	DUP											-0.5	0.4	1.4	4.1	0.8	2.2
Los Alamos above Ice Rink	03/15	WM	UF	CS	0.28	0.000	1.000	0.012	0.004	0.004	0.012	0.118	0.028	0.017	0.6	0.3	1.0	3.9	0.7	2.1
Los Alamos above Ice Rink	03/20	WM	F	CS	< 0.06	0.011	0.006	0.008	0.006	0.006	0.021	0.022	0.013	0.020	0.0	0.4	1.3	4.3	0.7	2.1
Los Alamos above Ice Rink	03/20	WM	UF	CS	< 0.14	0.000	1.000	0.008	0.000	1.000	0.028	0.042	0.013	0.011	7.1	1.4	1.1	4.4	1.0	3.1
Los Alamos above Ice Rink	03/20	WM	UF	DUP	< 0.13															
Los Alamos above Ice Rink	03/20	WM	F	CS	< 0.08	0.000	1.000	0.008	-0.006	0.007	0.036	0.037	0.013	0.013	0.2	0.2	0.8	4.1	0.7	2.0
Los Alamos above Ice Rink	03/20	WM	F	DUP								0.055	0.023	0.025						
Los Alamos above Ice Rink	03/20	WM	UF	CS	0.30	0.000	1.000	0.023	0.013	0.008	0.023	0.021	0.015	0.028	-1.1	0.5	2.0	4.9	0.9	2.5
Los Alamos above Ice Rink	04/04	WM	F	CS	< 0.06	0.015	0.011	0.021	0.006	0.012	0.052	0.018	0.013	0.043	0.6	0.3	0.9	3.2	0.7	2.2
Los Alamos above Ice Rink	04/04	WM	UF	CS	0.35	0.000	1.000	0.031	0.016	0.012	0.022	0.020	0.013	0.038	1.6	0.7	1.8	4.8	1.1	3.2
Los Alamos above Ice Rink	04/04	WM	UF	DUP	0.32															
Los Alamos above Ice Rink	05/02	WM	F	CS	< 0.07	0.003	0.003	0.007	0.003	0.003	0.007	0.001	0.005	0.031	0.1	0.7	2.7	4.8	1.0	2.8
Los Alamos above Ice Rink	05/02	WM	UF	CS	< 0.14	0.008	0.007	0.029	0.007	0.006	0.023	-0.005	0.008	0.035	2.2	1.0	2.6	4.2	0.9	2.8
Los Alamos below Ice Rink	04/18	WM	F	CS	< 0.05	-0.006	0.006	0.045	0.018	0.009	0.012	0.009	0.009	0.024	0.8	0.4	1.2	2.8	0.8	2.6
Los Alamos below Ice Rink	04/18	WM	F	DUP		0.000	1.000	0.012	0.003	0.006	0.024	0.014	0.010	0.019						
Los Alamos below Ice Rink	04/18	WM	UF	CS	0.23	0.000	1.000	0.014	0.008	0.005	0.010	0.014	0.010	0.020	0.5	0.6	2.2	5.1	1.3	3.9
Los Alamos below Ice Rink	04/18	WM	UF	DUP	< 0.16										3.1	1.0	2.5	4.0	1.2	3.7
Los Alamos below Ice Rink	08/01	WS	F	CS	1.16	-0.002	0.004	0.020	0.009	0.004	0.006	0.059	0.016	0.034	-0.1	0.6	2.2	6.2	0.6	1.7
Los Alamos below Ice Rink	08/01	WS	F	DUP	1.23															
Los Alamos below Ice Rink	08/01	WS	UF	CS	6.51	0.028	0.011	0.029	0.142	0.023	0.023	0.070	0.016	0.009	2.9	0.4	0.7	2.4	0.4	0.9
Los Alamos below Ice Rink	08/01	WS	UF	DUP	6.36															
Los Alamos below Ice Rink	08/02	WS	F	CS	0.79	-0.003	0.006	0.032	0.010	0.008	0.025	0.027	0.010	0.025	0.8	0.4	1.4	9.2	0.9	2.7
Los Alamos below Ice Rink	08/02	WS	F	DUP	0.86															
Los Alamos below Ice Rink	08/02	WS	UF	CS	1.76	0.025	0.009	0.020	0.019	0.010	0.029	0.016	0.008	0.024	8.1	2.0	4.2	23.1	2.5	6.5
Los Alamos below Ice Rink	08/02	WS	UF	DUP	1.74	0.005	0.003	0.006	0.048	0.013	0.030	0.039	0.011	0.023	16.7	3.0	4.1	28.8	2.8	6.7
Los Alamos at Upper GS	03/26	WM	F	CS		0.019	0.013	0.025	0.019	0.013	0.025	0.034	0.018	0.053	0.0	0.5	1.8	4.7	1.0	2.8
Los Alamos at Upper GS	03/26	WM	F	DUP		0.000	1.000	0.030	0.016	0.012	0.038	0.023	0.012	0.016	1.3	0.6	1.6	6.1	0.9	2.5
Los Alamos at Upper GS	03/26	WM	UF	CS		0.025	0.012	0.017	0.319	0.049	0.045	0.041	0.015	0.014	2.7	0.8	1.3	8.3	1.1	2.4
Los Alamos at Upper GS	03/26	WM	UF	DUP																

Table 5-2. Radiochemical Analysis of Snowmelt and Base Flow for 2001 (pCi/L[a]) (Cont.)

Station Name	Date	Codes[b]			U (µg/L) Result	^{238}Pu Result	^{238}Pu Uncert	^{238}Pu MDA	^{239,240}Pu Result	^{239,240}Pu Uncert	^{239,240}Pu MDA	^{241}Am Result	^{241}Am Uncert	^{241}Am MDA	Gross Alpha Result	Gross Alpha Uncert	Gross Alpha MDA	Gross Beta Result	Gross Beta Uncert	Gross Beta MDA
Pajarito Plateau Stations (Cont.)																				
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)																				
DPS-1	03/28	WM	F	CS		-0.005	0.005	0.038	0.005	0.005	0.014	0.051	0.019	0.042	2.2	0.9	2.2	139.0	7.3	2.6
DPS-1	03/28	WM	UF	CS		0.005	0.005	0.014	0.015	0.012	0.038	0.056	0.019	0.017	6.7	6.5	1.6	165.0	22.2	2.4
Los Alamos above SR-4	03/15	WM	F	CS	0.20	0.007	0.005	0.010	0.019	0.008	0.010	0.030	0.015	0.020	0.8	0.3	0.6	4.5	0.8	2.2
Los Alamos above SR-4	03/15	WM	F	DUP		0.003	0.006	0.025	0.010	0.006	0.009									
Los Alamos above SR-4	03/15	WM	UF	CS	0.59	0.016	0.008	0.011	0.061	0.017	0.030	0.189	0.030	0.011	22.7	4.1	1.9	39.3	5.2	4.1
Los Alamos above SR-4	03/15	WM	UF	DUP	111.00															
Los Alamos above SR-4	03/21	WM	F	CS	< 0.10	0.007	0.007	0.018	0.007	0.012	0.049	0.013	0.009	0.017	-0.2	0.4	1.5	4.9	0.8	2.2
Los Alamos above SR-4	03/21	WM	F	DUP								0.050	0.019	0.047						
Los Alamos above SR-4	03/21	WM	UF	CS	0.33	0.000	1.000	0.020	0.166	0.039	0.067	0.159	0.031	0.015	-0.1	0.8	2.8	9.2	1.9	4.4
Los Alamos above SR-4	04/04	WM	F	CS	< 0.13	0.098	0.032	0.027	0.035	0.016	0.019	0.008	0.008	0.031	0.2	0.6	2.1	4.9	1.1	3.4
Los Alamos above SR-4	04/04	WM	F	DUP		0.012	0.012	0.032	0.034	0.017	0.023	0.029	0.017	0.026						
Los Alamos above SR-4	04/04	WM	UF	CS	0.58	0.012	0.012	0.033	0.190	0.042	0.023	0.090	0.023	0.044	0.6	0.7	2.4	7.1	1.5	4.0
Los Alamos above SR-4	04/18	WM	F	CS	< 0.06	0.005	0.005	0.014	0.027	0.012	0.028	0.096	0.031	0.026	0.8	0.5	1.6	3.6	1.0	3.0
Los Alamos above SR-4	04/18	WM	F	DUP																
Los Alamos above SR-4	04/18	WM	UF	CS	0.50	0.021	0.011	0.014	0.142	0.027	0.046	0.088	0.026	0.020	1.3	0.7	2.1	8.0	1.1	2.6
Los Alamos above SR-4	05/02	WM	F	CS	< 0.10	0.003	0.003	0.008	0.007	0.006	0.022	0.013	0.007	0.009	2.7	1.8	1.3	5.5	1.2	2.7
Los Alamos above SR-4	05/02	WM	UF	CS	< 0.11	0.009	0.005	0.008	0.015	0.008	0.031	0.014	0.008	0.013	0.8	0.8	2.7	4.9	1.0	2.8
Los Alamos above SR-4	06/15	WS	F	CS	< 0.08	0.000	1.000	0.011	0.006	0.006	0.021	0.016	0.010	0.030	-0.1	0.2	0.8	5.4	0.7	2.0
Los Alamos above SR-4	06/15	WS	UF	CS	0.73	0.003	0.006	0.025	0.262	0.029	0.007	0.103	0.016	0.016	8.3	0.9	1.8	14.9	1.0	2.5
Los Alamos below LA Weir	03/15	WM	F	CS	0.38	0.006	0.005	0.009	0.010	0.006	0.009	0.014	0.008	0.013	1.1	0.3	0.6	6.8	0.9	2.0
Los Alamos below LA Weir	03/15	WM	F	DUP																
Los Alamos below LA Weir	03/15	WM	UF	CS	1.32	0.018	0.008	0.010	0.077	0.018	0.027	0.905	0.084	0.034	26.8	6.1	3.9	26.4	4.0	5.9
Los Alamos below LA Weir	03/21	WM	F	CS	< 0.17	0.006	0.010	0.041	0.000	1.000	0.015	0.043	0.015	0.014	0.5	0.3	1.1	4.4	0.7	2.1
Los Alamos below LA Weir	03/21	WM	UF	CS	< 0.18	0.005	0.005	0.015	0.053	0.017	0.015	0.038	0.016	0.017	1.9	0.7	1.7	12.7	1.6	2.8
Los Alamos below LA Weir	04/04	WM	F	CS	< 0.10	0.018	0.013	0.024	0.006	0.006	0.017	0.019	0.011	0.018	0.6	0.3	1.0	4.3	1.0	2.9
Los Alamos below LA Weir	04/04	WM	F	DUP											0.3	0.4	1.5	6.5	1.3	3.6
Los Alamos below LA Weir	04/04	WM	UF	CS	0.39	0.000	1.000	0.027	0.078	0.024	0.019	0.092	0.020	0.011	0.7	0.4	1.2	6.1	1.5	4.0
Los Alamos below LA Weir	04/18	WM	F	CS	< 0.07	0.000	1.000	0.018	0.024	0.011	0.013	0.019	0.010	0.013	0.2	0.3	1.1	5.4	1.0	2.7
Los Alamos below LA Weir	04/18	WM	UF	CS	< 0.11	0.000	1.000	0.014	0.015	0.010	0.034	0.054	0.019	0.018	-0.2	0.5	1.8	5.9	1.1	3.1
Los Alamos below LA Weir	05/02	WM	F	CS	< 0.08	0.011	0.008	0.015	0.002	0.007	0.041	0.044	0.025	0.040	0.9	0.6	1.5	4.1	1.1	2.9
Los Alamos below LA Weir	05/02	WM	F	DUP								0.015	0.025	0.107						
Los Alamos below LA Weir	05/02	WM	UF	CS	< 0.15	0.010	0.006	0.021	0.035	0.011	0.021	0.014	0.007	0.010	1.6	0.9	2.7	6.2	1.0	2.9
Los Alamos at SR-4	03/26	WM	F	CS		-0.005	0.008	0.042	0.009	0.007	0.012	0.039	0.018	0.047	0.3	0.3	1.2	4.3	0.8	2.2
Los Alamos at SR-4	03/26	WM	UF	CS		0.021	0.015	0.028	0.407	0.070	0.028	0.094	0.027	0.020	3.2	0.9	1.4	11.4	1.2	2.4
Los Alamos at Rio Grande	03/26	WM	F	CS		0.022	0.011	0.015	-0.006	0.009	0.051	0.007	0.012	0.052	1.1	0.5	1.3	7.0	0.9	2.4
Los Alamos at Rio Grande	03/26	WM	UF	CS		0.007	0.007	0.019	0.246	0.044	0.019	0.077	0.020	0.014	1.4	0.6	1.7	53.7	3.9	2.7
Pueblo 1 R	04/11	WM	F	CS		-0.004	0.004	0.031	0.006	0.004	0.008	0.022	0.013	0.019	0.7	0.5	1.3	5.5	1.1	2.9
Pueblo 1 R	04/11	WM	UF	CS		-0.005	0.005	0.035	0.010	0.008	0.025	0.041	0.018	0.022	-0.6	0.6	2.5	6.4	1.2	3.3
Pueblo 1 R	04/11	WM	UF	DUP																
Acid Weir	04/11	WM	F	CS		0.000	1.000	0.013	0.020	0.011	0.031	0.013	0.013	0.046	1.0	0.8	2.4	25.4	2.2	3.3
Acid Weir	04/11	WM	UF	CS	0.39	0.000	1.000	0.015	0.072	0.020	0.043	0.010	0.010	0.027	0.4	0.7	2.8	27.8	2.9	4.4
Acid Weir	04/11	WM	UF	DUP	0.35	-0.006	0.006	0.042	0.029	0.011	0.011	0.039	0.018	0.021	0.7	0.7	2.3	27.1	3.0	3.5
Pueblo 2	04/03	WM	F	CS		0.000	1.000	0.025	0.038	0.014	0.032	0.022	0.013	0.020	0.2	0.5	1.9	11.3	1.3	2.9
Pueblo 2	04/03	WM	F	DUP								0.029	0.012	0.013						
Pueblo 2	04/03	WM	UF	CS		0.171	0.027	0.043	0.131	0.022	0.024	0.052	0.019	0.043	-0.5	0.5	2.1	10.1	1.2	2.8
Pueblo 3	04/03	WS	F	CS		0.000	1.000	0.011	0.008	0.008	0.031	0.051	0.017	0.015	-0.4	0.6	2.7	12.2	1.5	3.4
Pueblo 3	04/03	WS	UF	CS		0.008	0.006	0.011	0.560	0.056	0.029	0.046	0.019	0.021	7.3	2.5	1.4	22.8	4.4	3.9
Pueblo 3	04/03	WS	UF	DUP		0.019	0.010	0.028	0.579	0.057	0.011									
Pueblo at SR-502	04/03	WS	F	CS		0.007	0.007	0.026	0.014	0.009	0.026	0.043	0.019	0.023	0.4	0.6	2.3	12.2	1.8	4.2
Pueblo at SR-502	04/03	WS	F	DUP																
Pueblo at SR-502	04/03	WS	F	CS		0.007	0.005	0.009	0.023	0.009	0.009	0.011	0.011	0.029	1.0	1.0	3.3	13.8	1.8	3.5
Pueblo at SR-502	04/03	WS	UF	CS		0.011	0.006	0.010	0.065	0.017	0.033	0.052	0.019	0.018	0.3	0.6	2.1	13.8	1.6	3.1
Pueblo at SR-502	04/03	WS	UF	DUP																
Pueblo at SR-502	04/03	WS	UF	CS		0.004	0.009	0.037	0.063	0.017	0.029	0.031	0.016	0.021	-0.1	0.9	3.4	15.3	2.2	5.0

Table 5-2. Radiochemical Analysis of Snowmelt and Base Flow for 2001 (pCi/L[a]) (Cont.)

Station Name	Date	Codes[b]			U (µg/L) Result	^{238}Pu Result	^{238}Pu Uncert	^{238}Pu MDA	^{239,240}Pu Result	^{239,240}Pu Uncert	^{239,240}Pu MDA	^{241}Am Result	^{241}Am Uncert	^{241}Am MDA	Gross Alpha Result	Gross Alpha Uncert	Gross Alpha MDA	Gross Beta Result	Gross Beta Uncert	Gross Beta MDA
Pajarito Plateau Stations (Cont.)																				
Sandia Canyon:																				
SCS-1	05/17	WS	UF	CS		0.000	1.000	0.037	0.005	0.005	0.018	0.009	0.005	0.008	-0.1	0.5	2.0	10.3	1.3	3.0
SCS-1	05/17	WS	UF	DUP		0.005	0.005	0.013	0.004	0.006	0.025	0.016	0.008	0.011	0.5	0.7	2.4	12.9	1.5	3.2
SCS-2	05/17	WS	UF	CS		0.000	1.000	0.012	0.003	0.005	0.023	0.015	0.008	0.010	1.5	0.7	1.8	7.9	1.2	3.0
SCS-2	05/17	WS	UF	DUP																
SCS-2	05/17	WS	UF	CS		0.000	1.000	0.014	0.007	0.005	0.010	0.017	0.011	0.032	0.6	0.7	2.3	10.7	1.3	3.0
SCS-3	05/17	WS	UF	CS		-0.004	0.004	0.032	0.009	0.008	0.029	0.019	0.009	0.010	0.7	0.6	2.0	4.8	1.1	3.1
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey):																				
Mortandad at GS-1	04/18	WS	UF	CS		1.520	0.119	0.035	1.780	0.122	0.025	6.540	0.451	0.046	26.5	9.4	2.8	92.9	4.5	2.7
Pajarito Canyon (includes Twomile, Threemile Canyons):																				
Pajarito below SR-501	03/20	WM	F	CS	< 0.20	0.005	0.004	0.007	0.024	0.008	0.007	0.018	0.013	0.024	0.6	0.3	1.0	3.5	0.7	2.1
Pajarito below SR-501	03/20	WM	F	DUP		0.000	0.004	0.022	0.003	0.005	0.022									
Pajarito below SR-501	03/20	WM	UF	CS	0.39	0.016	0.007	0.009	0.003	0.008	0.034	0.039	0.020	0.027	3.1	1.0	2.5	6.8	1.7	4.7
Pajarito below SR-501	04/04	WM	F	CS	< 0.06	0.043	0.019	0.023	0.012	0.009	0.017	0.015	0.009	0.027	0.7	0.3	1.0	3.2	0.8	2.4
Pajarito below SR-501	04/04	WM	F	DUP																
Pajarito below SR-501	04/04	WM	UF	CS	< 0.10	0.000	1.000	0.032	0.025	0.015	0.023	0.000	1.000	0.019	0.1	0.5	1.8	2.5	1.0	3.2
Pajarito below SR-501	04/18	WM	F	CS	< 0.04	0.031	0.013	0.014	0.008	0.008	0.028	0.010	0.007	0.013	0.6	0.5	1.8	2.6	0.8	2.5
Pajarito below SR-501	04/18	WM	UF	CS	< 0.11	0.011	0.008	0.014	0.012	0.009	0.028	0.034	0.014	0.015	1.5	0.6	1.6	4.3	1.0	3.1
Pajarito below SR-501	05/02	WM	F	CS	< 0.03	-0.002	0.002	0.019	0.005	0.005	0.025	0.006	0.008	0.036	0.9	0.7	2.2	3.4	0.9	2.8
Pajarito below SR-501	05/02	WM	F	DUP											-0.8	0.6	2.6	2.7	0.9	2.8
Pajarito below SR-501	05/02	WM	UF	CS	< 0.03	-0.001	0.005	0.032	0.017	0.008	0.009	0.009	0.008	0.027	0.9	0.7	2.2	4.3	1.0	2.9
Pajarito below SR-501	05/02	WM	UF	DUP	< 0.03															
Pajarito Canyon	04/04	WM	F	CS		0.004	0.004	0.010	0.000	1.000	0.028	0.018	0.013	0.025	-0.3	0.5	2.1	2.3	1.1	3.1
Pajarito Canyon	04/04	WM	UF	CS		0.009	0.007	0.023	0.003	0.003	0.008	0.008	0.008	0.022	0.2	0.6	2.1	5.6	1.2	3.6
Pajarito above SR-4	03/21	WM	F	CS	4.78	0.006	0.013	0.053	0.000	1.000	0.042	0.037	0.015	0.034	1.9	0.5	1.1	13.7	1.2	2.1
Pajarito above SR-4	03/21	WM	F	DUP		0.006	0.013	0.052	0.023	0.011	0.015	0.036	0.014	0.014	2.6	1.3	1.7	15.2	3.1	2.3
Pajarito above SR-4	03/21	WM	UF	CS	4.90	0.000	1.000	0.011	0.008	0.006	0.011	0.034	0.013	0.013	2.7	1.0	2.4	14.8	2.5	4.3
Pajarito above SR-4	03/21	WM	UF	DUP	4.83															
Pajarito above SR-4	04/04	WM	F	CS	0.71	0.000	1.000	0.024	0.025	0.013	0.017	0.000	1.000	0.018	0.6	0.4	1.0	7.2	1.2	3.0
Pajarito above SR-4	04/04	WM	UF	CS	0.76	0.000	1.000	0.028	0.015	0.011	0.020	0.000	1.000	0.053	0.8	0.4	1.0	7.7	1.1	2.7
Pajarito above SR-4	04/18	WM	F	CS	1.13	-0.005	0.005	0.039	0.012	0.009	0.028	0.012	0.007	0.011	1.7	1.1	2.5	7.5	1.1	2.9
Pajarito above SR-4	04/18	WM	UF	CS	1.15	0.000	0.007	0.038	0.007	0.005	0.010	0.039	0.016	0.018	1.1	0.7	1.9	8.5	1.1	2.6
Pajarito above SR-4	05/02	WM	F	CS	2.20	0.007	0.006	0.022	0.003	0.003	0.008	0.011	0.010	0.041	1.6	0.7	1.9	7.4	1.2	3.1
Pajarito above SR-4	05/02	WM	UF	CS	2.23	0.003	0.003	0.007	0.005	0.004	0.007	0.008	0.007	0.027	2.5	2.2	3.5	10.9	1.0	1.9
Pajarito at Rio Grande	09/25	WS	UF	CS		-0.007	0.005	0.032	0.028	0.016	0.049	0.030	0.012	0.028	1.4	0.4	1.1	0.9	0.4	1.2
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons):																				
Water above SR-501	03/15	WM	F	CS	< 0.05	0.004	0.004	0.009	0.007	0.007	0.026	0.046	0.021	0.025	0.3	0.3	0.9	2.9	0.7	2.1
Water above SR-501	03/15	WM	UF	CS	< 0.07	0.004	0.004	0.010	0.012	0.007	0.010	0.013	0.009	0.018	0.6	0.3	1.0	2.8	0.7	2.3
Water above SR-501	03/20	WM	F	CS	< 0.15	-0.003	0.003	0.020	0.006	0.004	0.008	0.016	0.012	0.022	-1.3	0.4	1.7	0.2	0.7	2.3
Water above SR-501	03/20	WM	F	DUP																
Water above SR-501	03/20	WM	UF	CS	< 0.07	0.006	0.004	0.008	0.003	0.003	0.008	0.008	0.008	0.021	1.8	0.7	1.8	5.6	1.5	4.2
Water above SR-501	04/04	WM	F	CS	< 0.07	0.000	1.000	0.032	0.000	1.000	0.023	0.023	0.011	0.030	-0.1	0.3	1.0	3.3	0.7	2.0
Water above SR-501	04/04	WM	UF	CS	< 0.10	0.012	0.012	0.031	0.017	0.012	0.022	0.000	0.010	0.054	-0.3	0.4	1.4	3.4	0.8	2.3
Water above SR-501	04/18	WM	F	CS	< 0.02	0.000	1.000	0.031	0.008	0.008	0.022	0.011	0.008	0.014	0.1	0.5	1.9	3.6	0.8	2.5
Water above SR-501	04/18	WM	F	DUP																
Water above SR-501	04/18	WM	UF	CS	< 0.02	0.000	1.000	0.015	0.004	0.007	0.028	0.043	0.019	0.045	0.3	0.3	0.9	4.6	1.0	2.4
Water above SR-501	05/02	WM	F	CS	< 0.03	0.001	0.003	0.018	0.002	0.002	0.007	0.001	0.009	0.047	1.2	0.6	1.8	4.1	1.1	3.2
Water above SR-501	05/02	WM	F	DUP		0.015	0.007	0.008	0.004	0.005	0.022									
Water above SR-501	05/02	WM	UF	CS	0.44	0.001	0.004	0.022	0.006	0.004	0.008	-0.002	0.005	0.035	-0.3	0.5	2.3	4.7	1.0	2.9
Cañon de Valle above SR-501	04/04	WM	F	CS	< 0.05	0.000	1.000	0.025	0.007	0.007	0.018	0.024	0.012	0.016	-0.4	0.4	1.8	-0.2	0.8	3.0
Cañon de Valle above SR-501	04/04	WM	UF	CS	0.22	0.000	1.000	0.042	0.011	0.011	0.030	0.022	0.011	0.015	1.1	0.3	0.6	3.9	0.7	2.0
Cañon de Valle above SR-501	04/18	WM	F	CS	< 0.05	0.000	1.000	0.015	0.004	0.004	0.011	0.006	0.006	0.017	0.2	0.3	1.2	1.2	0.7	2.5

Table 5-2. Radiochemical Analysis of Snowmelt and Base Flow for 2001 (pCi/L[a]) (Cont.)

Station Name	Date	Codes[b]			U (µg/L) Result	^{238}Pu Result	^{238}Pu Uncert	^{238}Pu MDA	^{239,240}Pu Result	^{239,240}Pu Uncert	^{239,240}Pu MDA	^{241}Am Result	^{241}Am Uncert	^{241}Am MDA	Gross Alpha Result	Gross Alpha Uncert	Gross Alpha MDA	Gross Beta Result	Gross Beta Uncert	Gross Beta MDA
Pajarito Plateau Stations (Cont.)																				
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons):																				
Cañon de Valle above SR-501	04/18	WM	UF	CS	< 0.08	-0.005	0.005	0.037	0.018	0.011	0.034	0.053	0.024	0.029	-0.1	0.4	1.6	2.2	0.8	2.4
Cañon de Valle above SR-501	05/02	WM	F	CS	< 0.05	0.007	0.005	0.020	0.015	0.007	0.020	0.030	0.011	0.010	0.6	0.3	0.9	2.1	0.5	1.7
Cañon de Valle above SR-501	05/02	WM	F	DUP																
Cañon de Valle above SR-501	05/02	WM	UF	CS	< 0.06	0.010	0.005	0.007	-0.002	0.004	0.028	0.004	0.004	0.010	1.1	0.7	2.2	2.8	0.9	2.8
Water at Beta	04/17	WM	UF	CS		0.019	0.012	0.035	0.014	0.009	0.026	0.018	0.011	0.016	0.0	0.5	2.0	5.8	0.9	2.5
Water below SR-4	03/21	WM	F	CS	< 0.16	0.012	0.008	0.016	0.000	1.000	0.016	0.037	0.017	0.045	0.5	0.4	1.2	3.4	0.9	2.6
Water below SR-4	03/21	WM	UF	CS	0.69	0.014	0.010	0.019	0.056	0.022	0.051	0.065	0.026	0.060	2.3	0.7	1.7	7.5	1.6	4.1
Water below SR-4	04/04	WM	F	CS	< 0.09	0.008	0.008	0.022	0.000	1.000	0.042	0.000	0.008	0.042	-1.8	0.5	1.8	-2.4	0.8	2.9
Water below SR-4	04/04	WM	UF	CS	0.39	0.023	0.017	0.032	0.025	0.015	0.023	0.000	1.000	0.042	-0.9	0.5	1.8	1.9	0.8	2.5
Ancho Canyon:																				
Ancho at Rio Grande	09/25	WS	UF	CS		-0.006	0.004	0.028	0.012	0.011	0.040	0.000	1.000	0.041	0.7	0.4	1.3	2.2	0.4	1.0
Frijoles Canyon:																				
Frijoles at Monument Headquarters	07/18	WS	UF	CS		0.006	0.006	0.020	0.000	1.000	0.020	0.021	0.007	0.006	0.8	0.4	1.5	2.5	0.7	2.7
Frijoles at Monument Headquarters	07/18	WS	UF	DUP		0.000	1.000	0.007	0.003	0.005	0.020	0.005	0.011	0.042	1.3	0.5	1.5	4.2	0.7	2.1
Frijoles at Rio Grande	09/26	WS	UF	CS		0.000	1.000	0.009	0.000	1.000	0.035	0.028	0.012	0.033	0.2	0.4	1.3	1.7	0.4	1.2
Frijoles at Rio Grande	09/26	WS	UF	DUP		-0.004	0.011	0.046	0.007	0.007	0.026	0.033	0.013	0.013						
Frijoles at Rio Grande	09/26	WS	UF	CS		0.018	0.008	0.010	0.011	0.006	0.010	0.030	0.011	0.011	0.0	0.3	1.5	2.6	0.4	1.0
Water Quality Standards[d]																				
DOE DCG for Public Dose					800	40			30			30			30			1,000		
DOE Drinking Water System DCG					30	1.6			1.2			1.2			1.2			40		
EPA Primary Drinking Water Standard					30										15					
EPA Screening Level																		50		
NMWQCC Groundwater Limit					5,000															
NMWQCC Livestock Watering															15					

[a]Except where noted. Three columns are listed: the first is the analytical result, the second is the radioactive counting uncertainty (1 standard deviation), and the third is the analytical laboratory measurement-specific minimum detectable activity.

[b]Codes: WM–snowmelt; WS–base flow; UF–unfiltered; F–filtered; CS–customer sample; DUP–laboratory duplicate; TRP–laboratory triplicate; RE–laboratory reanalysis; REDP–laboratory reanalysis duplicate.

[c]Less than symbol (<) means measurement was below the specified limit of detection of the analytical method.

[d]Standards given here for comparison only; see Appendix A.

Table 5-3. Detections of Radionuclides[a] and Comparison to Standards[b] in Snowmelt and Base Flow for 2001

Station Name	Date	Codes[c]			Analyte	Result	Uncertainty[d]	MDA[e]	Units	Lab Qualifier Code[f]	Validation Flag Code[f]	Result/ Minimum Standard	Minimum Standard	Minimum Standard Type	DOE DCG	Result/ DOE DCG
Regional Stations																
Rio Chama at Chamita (bank)	08/01	WS	UF	CS	Gross Alpha	7.73	1.08	1.69	pCi/L			0.52	15	EPA PRIM DW STD		
Jemez River	04/18	WS	UF	CS	^{241}Am	2.1	0.185	0.0215	pCi/L		J+	1.75	1.2	DOE DW DCG		
Jemez River	04/18	WS	UF	CS	^{238}Pu	0.091	0.0227	0.0145	pCi/L							
Jemez River	04/18	WS	UF	DUP	^{90}Sr	0.445	0.0952	0.273	pCi/L							
Pajarito Plateau Stations																
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons):																
DPS-1	03/28	WM	UF	CS	Gross Beta	165	22.2	2.44	pCi/L			3.30	50	EPA SEC DW LVL		
DPS-1	03/28	WM	F	CS	Gross Beta	139	7.3	2.59	pCi/L			2.78	50	EPA SEC DW LVL		
DPS-1	03/28	WM	UF	CS	^{3}H	197	57.3	174	pCi/L							
DPS-1	03/28	WM	UF	CS	^{90}Sr	95.2	6.7	0.245	pCi/L			11.90	8	EPA PRIM DW STD		
DPS-1	03/28	WM	F	CS	^{90}Sr	76.6	9.86	0.233	pCi/L			9.58	8	EPA PRIM DW STD		
Los Alamos above SR-4	03/15	WM	UF	CS	^{241}Am	0.189	0.0296	0.0109	pCi/L							
Los Alamos above SR-4	03/15	WM	UF	CS	Gross Alpha	22.7	4.05	1.94	pCi/L			1.51	15	EPA PRIM DW STD	30	0.76
Los Alamos above SR-4	03/15	WM	UF	CS	Gross Beta	39.3	5.22	4.07	pCi/L			0.79	50	EPA SEC DW LVL		
Los Alamos above SR-4	03/15	WM	UF	CS	^{239,240}Pu	0.0612	0.0171	0.03	pCi/L							
Los Alamos above SR-4	03/15	WM	F	DUP	^{90}Sr	1.59	0.0967	0.204	pCi/L							
Los Alamos above SR-4	03/15	WM	UF	CS	^{90}Sr	1.48	0.233	0.389	pCi/L							
Los Alamos above SR-4	03/15	WM	F	CS	^{90}Sr	1.4	0.0978	0.167	pCi/L							
Los Alamos above SR-4	03/21	WM	UF	CS	^{241}Am	0.159	0.031	0.0149	pCi/L							
Los Alamos above SR-4	03/21	WM	UF	CS	^{239,240}Pu	0.166	0.0387	0.067	pCi/L		J					
Los Alamos above SR-4	03/21	WM	F	CS	^{90}Sr	1.58	0.133	0.303	pCi/L							
Los Alamos above SR-4	03/21	WM	UF	CS	^{90}Sr	1.48	0.115	0.211	pCi/L							
Los Alamos above SR-4	04/04	WM	UF	CS	^{241}Am	0.0903	0.0234	0.0441	pCi/L		J					
Los Alamos above SR-4	04/04	WM	F	CS	^{238}Pu	0.0984	0.0317	0.0267	pCi/L		J					
Los Alamos above SR-4	04/04	WM	UF	CS	^{239,240}Pu	0.19	0.0422	0.0234	pCi/L		J+					
Los Alamos above SR-4	04/04	WM	UF	CS	^{90}Sr	0.92	0.0925	0.207	pCi/L							
Los Alamos above SR-4	04/04	WM	F	CS	^{90}Sr	0.852	0.0931	0.233	pCi/L		J					
Los Alamos above SR-4	04/18	WM	F	CS	^{241}Am	0.0956	0.0308	0.0259	pCi/L							
Los Alamos above SR-4	04/18	WM	UF	CS	^{241}Am	0.0882	0.0261	0.0199	pCi/L		J+					
Los Alamos above SR-4	04/18	WM	UF	CS	^{239,240}Pu	0.142	0.0268	0.0461	pCi/L							
Los Alamos above SR-4	04/18	WM	UF	CS	^{90}Sr	1.21	0.124	0.309	pCi/L							
Los Alamos above SR-4	04/18	WM	F	CS	^{90}Sr	0.896	0.143	0.227	pCi/L							
Los Alamos above SR-4	04/18	WM	F	DUP	^{90}Sr	0.847	0.0852	0.224	pCi/L							
Los Alamos above SR-4	05/02	WM	F	CS	^{90}Sr	0.933	0.119	0.33	pCi/L		J					
Los Alamos above SR-4	05/02	WM	UF	CS	^{90}Sr	0.485	0.154	0.454	pCi/L		J					
Los Alamos above SR-4	06/15	WS	UF	CS	^{241}Am	0.103	0.0164	0.0159	pCi/L							
Los Alamos above SR-4	06/15	WS	UF	CS	Gross Alpha	8.31	0.909	1.77	pCi/L			0.55	15	EPA PRIM DW STD		
Los Alamos above SR-4	06/15	WS	UF	CS	^{239,240}Pu	0.262	0.029	0.00664	pCi/L							
Los Alamos above SR-4	06/15	WS	F	CS	^{90}Sr	1.05	0.223	0.375	pCi/L							
Los Alamos above SR-4	06/15	WS	UF	CS	^{90}Sr	0.996	0.173	0.356	pCi/L							
Los Alamos below LA Weir	03/15	WM	UF	CS	^{241}Am	0.905	0.084	0.034	pCi/L			0.75	1.2	DOE DW DCG		
Los Alamos below LA Weir	03/15	WM	UF	CS	Gross Alpha	26.8	6.06	3.87	pCi/L			1.79	15	EPA PRIM DW STD	30	0.89
Los Alamos below LA Weir	03/15	WM	UF	CS	Gross Beta	26.4	4	5.88	pCi/L			0.53	50	EPA SEC DW LVL		

Table 5-3. Detections of Radionuclides[a] and Comparison to Standards[b] in Snowmelt and Base Flow for 2001 (Cont.)

Station Name	Date	Codes[c]			Analyte	Result	Uncertainty[d]	MDA[e]	Units	Lab Qualifier Code[f]	Validation Flag Code[f]	Result/ Minimum Standard	Minimum Standard	Minimum Standard Type	DOE DCG	Result/ DOE DCG
Pajarito Plateau Stations (Cont.)																
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)																
Los Alamos below LA Weir	03/15	WM	UF	CS	^{239,240}Pu	0.0769	0.018	0.0269	pCi/L							
Los Alamos below LA Weir	03/15	WM	F	CS	^{90}Sr	1.28	0.141	0.312	pCi/L							
Los Alamos below LA Weir	03/15	WM	UF	CS	^{90}Sr	1.12	0.108	0.27	pCi/L							
Los Alamos below LA Weir	03/21	WM	UF	CS	^{239,240}Pu	0.0534	0.0171	0.0145	pCi/L							
Los Alamos below LA Weir	03/21	WM	UF	CS	^{90}Sr	1.39	0.0855	0.195	pCi/L							
Los Alamos below LA Weir	03/21	WM	F	CS	^{90}Sr	1.35	0.109	0.213	pCi/L							
Los Alamos below LA Weir	04/04	WM	UF	CS	^{241}Am	0.0916	0.0198	0.0108	pCi/L							
Los Alamos below LA Weir	04/04	WM	UF	CS	^{239,240}Pu	0.0782	0.024	0.0193	pCi/L		J+					
Los Alamos below LA Weir	04/04	WM	UF	CS	^{90}Sr	1.01	0.147	0.187	pCi/L							
Los Alamos below LA Weir	04/04	WM	F	CS	^{90}Sr	0.996	0.0812	0.206	pCi/L							
Los Alamos below LA Weir	04/18	WM	UF	CS	^{90}Sr	1.13	0.129	0.315	pCi/L							
Los Alamos below LA Weir	04/18	WM	F	CS	^{90}Sr	0.917	0.146	0.235	pCi/L							
Los Alamos below LA Weir	05/02	WM	UF	CS	^{239,240}Pu	0.0352	0.0106	0.0209	pCi/L		J					
Los Alamos below LA Weir	05/02	WM	UF	CS	^{90}Sr	0.829	0.176	0.538	pCi/L		J					
Los Alamos below LA Weir	05/02	WM	F	CS	^{90}Sr	0.74	0.0732	0.197	pCi/L							
Los Alamos at SR-4	03/26	WM	UF	CS	^{241}Am	0.0937	0.0266	0.0195	pCi/L							
Los Alamos at SR-4	03/26	WM	UF	CS	^{137}Cs	15.6	2.08	2.83	pCi/L							
Los Alamos at SR-4	03/26	WM	UF	CS	^{239,240}Pu	0.407	0.0698	0.0283	pCi/L							
Los Alamos at SR-4	03/26	WM	UF	CS	^{90}Sr	1.02	0.192	0.286	pCi/L							
Los Alamos at SR-4	03/26	WM	F	CS	^{90}Sr	0.927	0.143	0.23	pCi/L							
Los Alamos at Rio Grande	03/26	WM	UF	CS	^{241}Am	0.0771	0.0204	0.0139	pCi/L							
Los Alamos at Rio Grande	03/26	WM	UF	CS	Gross Beta	53.7	3.93	2.65	pCi/L			1.07	50	EPA SEC DW LVL		
Los Alamos at Rio Grande	03/26	WM	UF	CS	^{239,240}Pu	0.246	0.0439	0.0191	pCi/L							
Los Alamos at Rio Grande	03/26	WM	UF	CS	^{90}Sr	0.79	0.127	0.228	pCi/L							
Los Alamos at Rio Grande	03/26	WM	F	CS	^{90}Sr	0.755	0.132	0.399	pCi/L							
Pueblo 1 R	04/11	WM	F	CS	^{90}Sr	1.52	0.212	0.22	pCi/L							
Pueblo 1 R	04/11	WM	UF	CS	^{90}Sr	1.23	0.0952	0.242	pCi/L							
Pueblo 1 R	04/11	WM	UF	DUP	^{90}Sr	1.1	0.0882	0.222	pCi/L							
Acid Weir	04/11	WM	UF	CS	Gross Beta	27.8	2.9	4.42	pCi/L		J	0.56	50	EPA SEC DW LVL		
Acid Weir	04/11	WM	UF	DUP	Gross Beta	27.1	2.95	3.5	pCi/L		J	0.54	50	EPA SEC DW LVL		
Acid Weir	04/11	WM	F	CS	Gross Beta	25.4	2.19	3.33	pCi/L		J	0.51	50	EPA SEC DW LVL		
Acid Weir	04/11	WM	UF	CS	^{239,240}Pu	0.0723	0.02	0.0432	pCi/L		J					
Acid Weir	04/11	WM	F	CS	^{90}Sr	14.9	0.908	0.205	pCi/L			1.86	8	EPA PRIM DW STD		
Acid Weir	04/11	WM	UF	CS	^{90}Sr	14.8	1.88	0.231	pCi/L			1.85	8	EPA PRIM DW STD		
Pueblo 2	04/03	WM	UF	CS	^{238}Pu	0.171	0.0274	0.0431	pCi/L							
Pueblo 2	04/03	WM	UF	CS	^{239,240}Pu	0.131	0.0224	0.0242	pCi/L							
Pueblo 2	04/03	WM	UF	CS	^{90}Sr	2.74	0.196	0.416	pCi/L		J+					
Pueblo 2	04/03	WM	F	CS	^{90}Sr	2.4	0.115	0.194	pCi/L							
Pueblo 3	04/03	WS	UF	CS	Gross Beta	22.8	4.42	3.9	pCi/L		J					
Pueblo 3	04/03	WS	UF	DUP	^{239,240}Pu	0.579	0.0565	0.0105	pCi/L		J					
Pueblo 3	04/03	WS	UF	CS	^{239,240}Pu	0.56	0.0559	0.0288	pCi/L		J					
Pueblo 3	04/03	WS	F	CS	^{90}Sr	0.361	0.0901	0.283	pCi/L		J					

Table 5-3. Detections of Radionuclides[a] and Comparison to Standards[b] in Snowmelt and Base Flow for 2001 (Cont.)

Station Name	Date	Codes[c]			Analyte	Result	Uncertainty[d]	MDA[e]	Units	Lab Qualifier Code[f]	Validation Flag Code[f]	Result/ Minimum Standard	Minimum Standard	Minimum Standard Type	DOE DCG	Result/ DOE DCG
Pajarito Plateau Stations (Cont.)																
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)																
Pueblo at SR-502	04/03	WS	UF	CS	^{239,240}Pu	0.0645	0.0171	0.0333	pCi/L		J					
Pueblo at SR-502	04/03	WS	UF	CS	^{239,240}Pu	0.0632	0.0171	0.0291	pCi/L		J					
Pueblo at SR-502	04/03	WS	UF	CS	^{90}Sr	0.731	0.0959	0.271	pCi/L		J					
Pueblo at SR-502	04/03	WS	F	CS	^{90}Sr	0.481	0.0975	0.303	pCi/L		J					
Pueblo at SR-502	04/03	WS	UF	CS	^{90}Sr	0.442	0.105	0.332	pCi/L		J					
Pueblo at SR-502	04/03	WS	F	DUP	^{90}Sr	0.408	0.121	0.327	pCi/L		J					
Pueblo at SR-502	04/03	WS	F	CS	^{90}Sr	0.355	0.0941	0.299	pCi/L		J					
Los Alamos above Ice Rink	03/07	WM	F	DUP	^{241}Am	0.0398	0.0117	0.00898	pCi/L							
Los Alamos above Ice Rink	03/07	WM	UF	CS	^{241}Am	0.0379	0.0112	0.00857	pCi/L							
Los Alamos above Ice Rink	03/07	WM	F	CS	^{90}Sr	0.56	0.116	0.353	pCi/L		J					
Los Alamos above Ice Rink	03/15	WM	UF	CS	^{241}Am	0.118	0.0281	0.0169	pCi/L							
Los Alamos above Ice Rink	03/15	WM	UF	CS	^{241}Am	0.0666	0.0189	0.0139	pCi/L							
Los Alamos above Ice Rink	03/15	WM	F	CS	^{241}Am	0.0648	0.0199	0.016	pCi/L							
Los Alamos above Ice Rink	03/15	WM	UF	CS	^{90}Sr	0.404	0.0873	0.273	pCi/L							
Los Alamos above Ice Rink	03/20	WM	UF	CS	^{241}Am	0.0418	0.0134	0.0113	pCi/L							
Los Alamos above Ice Rink	03/20	WM	UF	CS	Gross Alpha	7.09	1.39	1.08	pCi/L							
Los Alamos above Ice Rink	03/20	WM	F	CS	^{90}Sr	0.524	0.0815	0.236	pCi/L		J					
Los Alamos above Ice Rink	03/20	WM	F	CS	^{90}Sr	0.408	0.0926	0.241	pCi/L		J					
Los Alamos above Ice Rink	03/20	WM	UF	CS	^{90}Sr	0.405	0.0912	0.237	pCi/L		J					
Los Alamos above Ice Rink	03/20	WM	UF	CS	^{90}Sr	0.356	0.0761	0.232	pCi/L		J					
Los Alamos above Ice Rink	04/04	WM	UF	CS	^{90}Sr	0.469	0.0728	0.219	pCi/L		J					
Los Alamos above Ice Rink	04/04	WM	F	CS	^{90}Sr	0.371	0.111	0.359	pCi/L		J					
Los Alamos below Ice Rink	08/01	WS	UF	CS	^{241}Am	0.0697	0.0157	0.00899	pCi/L		J+					
Los Alamos below Ice Rink	08/01	WS	F	CS	^{241}Am	0.0591	0.0159	0.0335	pCi/L		J					
Los Alamos below Ice Rink	08/01	WS	UF	CS	^{239,240}Pu	0.142	0.0227	0.0227	pCi/L							
Los Alamos below Ice Rink	08/01	WS	UF	CS	^{90}Sr	1.91	0.293	0.247	pCi/L							
Los Alamos below Ice Rink	08/01	WS	F	CS	^{90}Sr	1.13	0.191	0.257	pCi/L							
Los Alamos below Ice Rink	08/01	WS	F	DUP	^{90}Sr	1.07	0.184	0.187	pCi/L							
Los Alamos below Ice Rink	08/02	WS	UF	DUP	^{241}Am	0.0389	0.0111	0.0226	pCi/L							
Los Alamos below Ice Rink	08/02	WS	UF	DUP	Gross Alpha	16.7	3	4.06	pCi/L			1.11	15	EPA PRIM DW STD	30	0.56
Los Alamos below Ice Rink	08/02	WS	UF	CS	Gross Alpha	8.07	1.96	4.21	pCi/L			0.54	15	EPA PRIM DW STD		
Los Alamos below Ice Rink	08/02	WS	UF	DUP	Gross Beta	28.8	2.81	6.68	pCi/L			0.58	50	EPA SEC DW LVL		
Los Alamos below Ice Rink	08/02	WS	UF	CS	Gross Beta	23.1	2.46	6.5	pCi/L							
Los Alamos below Ice Rink	08/02	WS	UF	CS	^{3}H	235	53	152	pCi/L							
Los Alamos below Ice Rink	08/02	WS	UF	DUP	^{3}H	184	52	153	pCi/L							
Los Alamos below Ice Rink	08/02	WS	UF	DUP	^{239,240}Pu	0.048	0.013	0.03	pCi/L							
Los Alamos below Ice Rink	08/02	WS	F	CS	^{90}Sr	1.34	0.215	0.275	pCi/L							
Los Alamos below Ice Rink	08/02	WS	UF	CS	^{90}Sr	1.28	0.209	0.195	pCi/L							
Los Alamos at Upper GS	03/26	WM	UF	CS	^{239,240}Pu	0.319	0.0485	0.0451	pCi/L							
Los Alamos at Upper GS	03/26	WM	UF	CS	^{90}Sr	0.833	0.0845	0.231	pCi/L							
Los Alamos at Upper GS	03/26	WM	F	CS	^{90}Sr	0.828	0.105	0.285	pCi/L							

Table 5-3. Detections of Radionuclides[a] and Comparison to Standards[b] in Snowmelt and Base Flow for 2001 (Cont.)

Station Name	Date	Codes[c]			Analyte	Result	Uncertainty[d]	MDA[e]	Units	Lab Qualifier Code[f]	Validation Flag Code[f]	Result/ Minimum Standard	Minimum Standard	Minimum Standard Type	DOE DCG	Result/ DOE DCG
Pajarito Plateau Stations (Cont.)																
Sandia Canyon:																
SCS-2	05/17	WS	UF	DUP	^{90}Sr	0.325	0.087	0.23	pCi/L		J					
SCS-2	05/17	WS	UF	DUP	^{90}Sr	0.325	0.087	0.23	pCi/L							
SCS-2	05/17	WS	UF	CS	^{90}Sr	0.281	0.0822	0.244	pCi/L		J					
SCS-2	05/17	WS	UF	CS	^{90}Sr	0.281	0.0822	0.244	pCi/L							
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey):																
Mortandad at GS-1	04/18	WS	UF	CS	^{241}Am	6.54	0.451	0.0463	pCi/L		J+	5.45	1.2	DOE DW DCG		
Mortandad at GS-1	04/18	WS	UF	CS	^{137}Cs	10.8	1.59	3.61	pCi/L		U					
Mortandad at GS-1	04/18	WS	UF	CS	Gross Beta	92.9	4.5	2.66	pCi/L		J	1.86	50	EPA SEC DW LVL		
Mortandad at GS-1	04/18	WS	UF	CS	^{3}H	3140	115	184	pCi/L							
Mortandad at GS-1	04/18	WS	UF	CS	^{238}Pu	1.52	0.119	0.0353	pCi/L			0.95	1.6	DOE DW DCG		
Mortandad at GS-1	04/18	WS	UF	CS	^{239,240}Pu	1.78	0.122	0.0254	pCi/L			1.48	1.2	DOE DW DCG		
Mortandad at GS-1	04/18	WS	UF	CS	^{90}Sr	12.1	0.64	0.276	pCi/L		J+	1.51	8	EPA PRIM DW STD		
Pajarito Canyon (includes Twomile, Threemile Canyons):																
Pajarito below SR-501	03/20	WM	UF	CS	^{90}Sr	0.56	0.143	0.452	pCi/L		J					
Pajarito below SR-501	03/20	WM	F	CS	^{90}Sr	0.36	0.0839	0.264	pCi/L		J					
Pajarito below SR-501	04/04	WM	F	CS	^{90}Sr	0.454	0.107	0.334	pCi/L		J					
Pajarito below SR-501	04/04	WM	F	DUP	^{90}Sr	0.392	0.0942	0.254	pCi/L							
Pajarito below SR-501	04/04	WM	UF	CS	^{90}Sr	0.292	0.0676	0.178	pCi/L		J					
Pajarito below SR-501	05/02	WM	UF	CS	^{137}Cs	8.43	1.81	3.59	pCi/L		J					
Pajarito below SR-501	05/02	WM	UF	CS	^{90}Sr	0.335	0.104	0.335	pCi/L							
Pajarito below SR-501	05/02	WM	F	CS	^{90}Sr	0.251	0.068	0.219	pCi/L		J					
Pajarito Canyon	04/04	WM	UF	CS	^{90}Sr	0.399	0.095	0.296	pCi/L		J					
Pajarito above SR-4	03/21	WM	UF	CS	^{90}Sr	2.47	0.109	0.18	pCi/L							
Pajarito above SR-4	03/21	WM	F	CS	^{90}Sr	2.46	0.206	0.188	pCi/L		J					
Pajarito above SR-4	04/04	WM	F	CS	^{90}Sr	1.47	0.114	0.235	pCi/L							
Pajarito above SR-4	04/04	WM	UF	CS	^{90}Sr	1.31	0.184	0.199	pCi/L							
Pajarito above SR-4	04/18	WM	F	CS	^{90}Sr	1.43	0.118	0.256	pCi/L							
Pajarito above SR-4	04/18	WM	UF	CS	^{90}Sr	1.4	0.103	0.235	pCi/L							
Pajarito above SR-4	05/02	WM	UF	CS	^{90}Sr	2.17	0.192	0.381	pCi/L							
Pajarito above SR-4	05/02	WM	F	CS	^{90}Sr	1.84	0.157	0.224	pCi/L		U					

Table 5-3. Detections of Radionuclides[a] and Comparison to Standards[b] in Snowmelt and Base Flow for 2001 (Cont.)

Station Name	Date	Codes[c]			Analyte	Result	Uncertainty[d]	MDA[e]	Units	Lab Qualifier Code[f]	Validation Flag Code[f]	Result/ Minimum Standard	Minimum Standard	Minimum Standard Type	DOE DCG	Result/ DOE DCG
Pajarito Plateau Stations (Cont.)																
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons):																
Canon de Valle above SR-501	04/04	WM	F	CS	^{90}Sr	0.346	0.0745	0.229	pCi/L		J					
Canon de Valle above SR-501	04/04	WM	UF	CS	^{90}Sr	0.336	0.0804	0.185	pCi/L		J					
Canon de Valle above SR-501	04/18	WM	UF	CS	^{137}Cs	8.79	1.72	3.09	pCi/L		J					
Water at Beta	04/17	WM	UF	CS	^{90}Sr	0.574	0.113	0.335	pCi/L		J					
Water below SR-4	03/21	WM	UF	CS	^{90}Sr	0.501	0.0696	0.207	pCi/L		J					
Water below SR-4	03/21	WM	F	CS	^{90}Sr	0.362	0.087	0.275	pCi/L		J					
Water below SR-4	04/04	WM	UF	CS	^{90}Sr	0.322	0.0781	0.247	pCi/L		J					
Water below SR-4	04/04	WM	F	CS	^{90}Sr	0.211	0.0617	0.199	pCi/L		J					
Frijoles Canyon:																
Frijoles at Monument Headquarters	07/18	WS	UF	CS	^{241}Am	0.0214	0.00686	0.00579	pCi/L							

[a]Detection defined as value ≥ 3× uncertainty and ≥ detection limit, except values shown for uranium isotopes ≥ DOE DW DCG/4, for gross alpha ≥ 5 pCi/L, and for gross beta ≥ 20 pCi/L.
Note that some results in this table were qualified as nondetections by the analytical laboratory or during validation.
[b]Values indicated by entries in right-hand columns are greater than half the minimum standard shown. The minimum standard is either a DOE 4-mrem drinking water DCG or an EPA drinking water standard.
[c]Codes: WM–snowmelt; WS–base flow; UF–unfiltered; F–filtered; CS–customer sample; DUP–analytical laboratory duplicate analysis.
[d]One standard deviation radioactivity counting uncertainty.
[e]MDA=minimum detectable activity.
[f]For Laboratory Qualifier Codes and Validation Flag Codes, see Table 5-4.

Table 5-4. Secondary Validation and Laboratory Qualifier Flag Codes

Code	Description
Secondary Validation Flags	
A	The contractually required supporting documentation for this datum is absent.
J	The analyte is classified as detected, but the reported concentration value is expected to be more uncertain than usual.
J+	The analyte is classified as detected, but the reported concentration value is expected to be more uncertain than usual with a potential positive bias.
J-	The analyte is classified as detected, but the reported concentration value is expected to be more uncertain than usual with a potential negative bias.
NJ	(Organic)—Analyte has been tentatively identified, and the associated numerical value is estimated based upon 1:1 response factor to the nearest eluting internal standard.
PM	Manual review of raw data is recommended to determine if the observed noncompliances with quality acceptance criteria adversely impact data use.
R	The sample results are rejected because of serious deficiencies in the ability to analyze the sample and meet quality-control criteria. Presence or absence cannot be verified.
RPM	The reported sample result is classified as rejected because of serious noncompliances in the quality control acceptance criteria. The presence or absence of the analyte cannot be verified based on routine validation alone.
U	The analyte is classified as not detected.
UJ	The analyte is classified as not detected, with an expectation that the reported result is more uncertain than usual.
Laboratory Qualifier Flags	
*	(Inorganic)—Duplicate analysis not within control limits. (Organic)—Spike recovery is equal to or outside the control criteria used.
**	(Inorganic) and (Organic) GEL—Laboratory Control Sample recovery outside of acceptance limit.
*+	(Inorganic)—Duplicate analysis not within control limits. (Organic)—Spike recovery is equal to or outside the control criteria used. (Inorganic) GEL—Correlation coefficient the Method of Standard Addition (MSA) is less than 0.095. Paragon—No meaning. (Organic)—Duplicate Analysis (relative percent difference) not within control limits.
+	(Inorganic) GEL—Correlation coefficient the Method of Standard Addition (MSA) is less than 0.095. Paragon—No meaning. (Organic)—Duplicate Analysis (relative percent difference) not within control limits.
B	(Inorganic)—Reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL). (Organic)—Analyte present in the blank and the sample.
B*	(Inorganic)—Reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL). (Inorganic)—Duplicate analysis not within control limits.
B*N	(Inorganic)—Reported value < CRDL and > IDL. Duplicate Analysis not within control limits. Spiked sample recovery not within control limits.

Table 5-4. Secondary Validation and Laboratory Qualifier Flag Codes (Cont.)

Code	Description
Laboratory Qualifier Flags (Cont.)	
BE	Low surrogate recovery; analyzed twice.
BE*	(Inorganic)—Concatination of B, E, and *.
BEN	(Inorganic)—Concatination of B, E, and N.
BN	Ignites but does not sustain ignition.
D	(Organic)—Analytes analyzed at a secondary dilution.
E	(Inorganic) Paragon—Reported value is estimated because of the presence of interference. GEL—Percent difference between the parent sample and its serial dilution concentration exceeds 10%. (Organic)—Analyte concentration exceeded the upper level of the calibration range of the instrument for that specific analysis.
E*	(Inorganic) Paragon—Reported value is estimated because of interference. GEL—Percent difference between the parent sample and its serial dilution concentration exceeds 10%. Duplicate analysis not within control limits. (Organic)—Analyte concentration exceeded the upper level of the calibration range of the instrument for that specific analysis, and spike recovery is equal to or outside the control criteria used.
EB	(Organic)—Analyte concentration exceeded the upper level of calibration range of the instrument. Analyte present in the blank and the sample.
EN	(Inorganic)—Concatination of E and N.
J	(Inorganic)—The associated numerical value is an estimated quantity. (Organic)—The associated numerical value is an estimated quantity.
J*	(Inorganic)—The associated numerical value is an estimated quantity. Duplicate analysis not within control limits.
J*+	(Inorganic)—The associated numerical value is an estimated quantity. Duplicate analysis not within control limits. (Inorganic) GEL—Correlation coefficient the Method of Standard Addition (MSA) is less than 0.095. Paragon—No meaning (Organic)—Duplicate analysis (relative percent difference) not within control limits.
JB	(Inorganic)—The associated numeric value is an estimated quantity. The reported value was obtained from a reading that was less than the Contract Required Detection Limit.
JD	(Organic)—Estimated value. Analytes analyzed at a secondary dilution.
JP	(Organic)—The associated numerical value is an estimated quantity. > 25% difference for detected concentrations between two columns.
N	(Inorganic)—Spiked sample recovery not within control limits. (Organic)—Presumptive evidence based on a mass spectral library search to make a tentative identification of the analyte.
N*	(Inorganic)—Spiked sample recovery not within control limits. Duplicate analysis not within control limits.
NJ	(Organic)—Analyte has been tentatively identified, and the associated numerical value is estimated based upon 1:1 response factor to the nearest eluting internal standard.
P	(Organic)— > 25% difference for detected concentrations between two columns.
R	(Inorganic)—The data are not usable. (Organic)—The data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

Table 5-4. Secondary Validation and Laboratory Qualifier Flag Codes (Cont.)

Code	Description
Laboratory Qualifier Flags (Cont.)	
U	(Inorganic)—The material was analyzed for but was not detected above the level of the associated numeric value. The associated numerical value is either the sample quantitation limit or the sample detection limit. (Organic)—The material was analyzed.
U*	(Inorganic)—Compound was analyzed for but was not detected. Duplicate analysis not within control limits.
UE	(Inorganic)—Compound was analyzed for but was not detected. Reported value is estimated because of the presence of interference.
UEN	(Inorganic)—Concatination of U, E, and N.
UJ	(Inorganic)—The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise. (Organic)—The material was analyzed for but was not detected. Quantitation limit is an estimated quantity.
UN	(Inorganic)—Compound was analyzed for but was not detected. Spiked sample recovery not within control limits.
UN*	(Inorganic)—Compound was analyzed for but was not detected. Spiked sample recovery not within control limits. Duplicate analysis not within control limits.
X	Reported concentration is a false positive.

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a])

Station Name	Date	Codes[b]			SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+NO_2-N
Regional Stations																
Rio Chama at Chamita (bank)	08/01	WS	F	CS	14.3	42.3	8.4	2.1	17.8	3.2	83.5	1.1	96	0.10	<[f] 0.02	0.07
Rio Chama at Chamita (bank)	08/01	WS	UF	CS												
Rio Grande at Embudo (bank)	08/01	WS	F	CS	25.8	29.6	6.1	3.1	18.2	5.0	37.2	4.8	97	0.37	< 0.02	< 0.01
Rio Grande at Embudo (bank)	08/01	WS	UF	CS												
Rio Grande at Otowi Upper (bank)	07/17	WS	F	CS	17.1	31.4	6.1	2.8	16.2	3.2	42.3	1.5	100	0.22	< 0.02	< 0.01
Rio Grande at Otowi Upper (bank)	07/17	WS	UF	CS												
Rio Grande at Otowi (bank)	07/17	WS	F	CS	17.1	32.5	6.3	2.7	15.8	3.4	42.3	1.2	88	0.22	< 0.02	< 0.01
Rio Grande at Otowi (bank)	07/17	WS	F	DUP										0.23		
Rio Grande at Otowi (bank)	07/17	WS	UF	CS												
Rio Grande at Frijoles (bank)	09/26	WS	F	CS	19.4	36.4	6.9	2.3	15.0	3.2	47.4	0.9	97	0.31	< 0.02	0.05
Rio Grande at Frijoles (bank)	09/26	WS	UF	CS												
Rio Grande at Cochiti	09/26	WS	F	CS	18.1	37.4	7.1	2.3	15.3	3.6	50.8	1.1	84	0.28	< 0.02	0.06
Rio Grande at Cochiti	09/26	WS	UF	CS												
Jemez River	04/18	WS	F	CS	14.2	27.6	2.5	1.4	5.6	2.9	5.0	< 1.5	109	0.15	0.02	< 0.01
Jemez River	04/18	WS	F	DUP												
Jemez River	04/18	WS	UF	CS												
Jemez River	04/18	WS	UF	DUP												
Jemez River	04/18	WS	UF	TRP												
Pajarito Plateau Stations																
Guaje Canyon:																
Guaje Canyon	10/12	WS	F	CS	52.6	17.4	5.2	5.0	7.5	1.5	2.1	< 0.7	66	0.17	0.08	130.00
Guaje Canyon	10/12	WS	F	DUP	52.6	17.4	5.2	5.0	7.5	1.5	2.1	< 0.7	69			
Guaje Canyon	10/12	WS	UF	CS												
Guaje Canyon	10/12	WS	UF	DUP												
Guaje above Rendija	04/18	WM	F	CS		12.1	3.9	3.9	7.1	2.1	13.8	< 1.5	45			
Guaje above Rendija	04/18	WM	F	DUP												
Guaje above Rendija	04/18	WM	UF	CS			4.9								0.25	0.62
Guaje above Rendija	04/18	WM	UF	DUP												
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons):																
Los Alamos Reservoir	05/01	WS	F	CS	30.6	10.0	2.9	2.8	6.9	7.4	8.9	< 1.5	30	0.07	0.04	0.71
Los Alamos Reservoir	05/01	WS	F	DUP	30.5	10.0	2.9	2.8	6.9			< 1.5	29		0.02	
Los Alamos Reservoir	05/01	WS	F	TRP												
Los Alamos Reservoir	05/01	WS	UF	CS	32.7											
Los Alamos Reservoir	05/01	WS	UF	DUP												
Los Alamos above Ice Rink	03/07	WM	UF	CS			5.1								0.05	0.53
Los Alamos above Ice Rink	03/07	WM	UF	DUP			5.0									0.54
Los Alamos above Ice Rink	03/07	WM	F	CS			5.0			5.4	14.1					
Los Alamos above Ice Rink	03/07	WM	F	DUP												
Los Alamos above Ice Rink	03/15	WM	F	CS			4.7			7.5	15.1	< 1.5	49			
Los Alamos above Ice Rink	03/15	WM	UF	CS			4.8								0.04	0.70
Los Alamos above Ice Rink	03/20	WM	F	CS			4.6			9.4	15.7	< 0.7	45			

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]			SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+NO_2-N
Pajarito Plateau Stations (Cont.)																
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)																
Los Alamos above Ice Rink	03/20	WM	F	DUP								< 0.7	44			
Los Alamos above Ice Rink	03/20	WM	UF	CS			4.8								0.05	0.80
Los Alamos above Ice Rink	03/20	WM	UF	DUP			4.7								0.04	0.80
Los Alamos above Ice Rink	03/20	WM	F	CS			4.6			9.3	15.5	< 0.7	46			
Los Alamos above Ice Rink	03/20	WM	UF	CS			4.7								< 0.02	0.79
Los Alamos above Ice Rink	04/04	WM	F	CS		15.2	4.2	3.4	8.0	10.9	14.4	< 1.5	36			
Los Alamos above Ice Rink	04/04	WM	F	DUP												
Los Alamos above Ice Rink	04/04	WM	UF	CS			5.1								0.24	1.39
Los Alamos above Ice Rink	04/04	WM	UF	DUP												
Los Alamos above Ice Rink	04/04	WM	UF	TRP												
Los Alamos above Ice Rink	05/02	WM	F	CS		11.9	3.4	3.2	7.6	7.9	9.4	< 0.7	34			
Los Alamos above Ice Rink	05/02	WM	F	DUP												
Los Alamos above Ice Rink	05/02	WM	UF	CS			3.4								0.06	0.64
Los Alamos above Ice Rink	05/02	WM	UF	DUP											0.05	
Los Alamos below Ice Rink	04/18	WM	F	CS		13.1	3.7	3.4	7.9	10.8	12.6	< 1.5	37			
Los Alamos below Ice Rink	04/18	WM	F	DUP						11.3	13.1	< 1.5	34			
Los Alamos below Ice Rink	04/18	WM	F	TRP												
Los Alamos below Ice Rink	04/18	WM	UF	CS			3.8								0.10	1.06
Los Alamos below Ice Rink	04/18	WM	UF	DUP		13.5	3.9	3.7	8.3						0.10	1.04
Los Alamos below Ice Rink	04/18	WM	UF	TRP												
Los Alamos below Ice Rink	08/01	WS	F	CS			7.2			4.8	5.3	0.9	133			
Los Alamos below Ice Rink	08/01	WS	F	DUP			7.4			4.4	5.4	1.0	135			
Los Alamos below Ice Rink	08/01	WS	F	TRP												
Los Alamos below Ice Rink	08/01	WS	UF	CS			17.9								1.10	0.05
Los Alamos below Ice Rink	08/01	WS	UF	DUP			18.0								1.07	0.05
Los Alamos below Ice Rink	08/01	WS	UF	TRP												
Los Alamos below Ice Rink	08/02	WS	F	CS			7.8			5.7	4.9	1.0	140			
Los Alamos below Ice Rink	08/02	WS	F	DUP			7.8			5.7	4.9	1.1	139			
Los Alamos below Ice Rink	08/02	WS	F	TRP												
Los Alamos below Ice Rink	08/02	WS	UF	CS			9.9								0.38	0.05
Los Alamos below Ice Rink	08/02	WS	UF	DUP			9.8								0.38	0.05
Los Alamos below Ice Rink	08/02	WS	UF	TRP												
Los Alamos at Upper GS	03/26	WM	F	CS	27.5	19.2	4.8	4.2	15.2	27.8	16.8	< 0.7	40	0.09	0.05	1.11
Los Alamos at Upper GS	03/26	WM	F	DUP	27.8	19.6	4.7	4.3	15.4					0.10		1.13
Los Alamos at Upper GS	03/26	WM	UF	CS												
Los Alamos at Upper GS	03/26	WM	UF	DUP												
DPS-1	03/28	WM	F	CS	14.2	65.9	4.5	8.4	160.0	246.0	18.0	< 0.7	113	0.29	< 0.02	0.71
DPS-1	03/28	WM	F	DUP											0.02	
DPS-1	03/28	WM	UF	CS												
Los Alamos above SR-4	03/15	WM	F	CS			5.6			56.4	14.0	< 1.5	56			
Los Alamos above SR-4	03/15	WM	F	DUP								< 1.5	57			
Los Alamos above SR-4	03/15	WM	UF	CS			7.0								0.08	0.43
Los Alamos above SR-4	03/15	WM	UF	DUP			7.1								0.09	0.44

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]			SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+NO_2-N
Pajarito Plateau Stations (Cont.)																
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)																
Los Alamos above SR-4	03/21	WM	F	CS			5.2			40.9	15.7	< 0.7	49			
Los Alamos above SR-4	03/21	WM	F	DUP												
Los Alamos above SR-4	03/21	WM	UF	CS			5.6								0.08	0.60
Los Alamos above SR-4	03/21	WM	UF	DUP												
Los Alamos above SR-4	04/04	WM	F	CS		17.7	4.9	3.8	15.1	22.9	14.6	< 1.5	50			
Los Alamos above SR-4	04/04	WM	F	DUP												
Los Alamos above SR-4	04/04	WM	UF	CS			5.8								0.23	1.19
Los Alamos above SR-4	04/04	WM	UF	DUP												
Los Alamos above SR-4	04/04	WM	UF	TRP												
Los Alamos above SR-4	04/18	WM	F	CS		14.0	3.8	3.4	16.3	22.4	13.1	< 1.5	43			
Los Alamos above SR-4	04/18	WM	F	DUP												
Los Alamos above SR-4	04/18	WM	UF	CS			4.3								0.13	0.83
Los Alamos above SR-4	04/18	WM	UF	DUP											0.13	
Los Alamos above SR-4	05/02	WM	F	CS		14.4	3.9	3.5	16.8	24.2	11.0	< 0.7	42			
Los Alamos above SR-4	05/02	WM	F	DUP												
Los Alamos above SR-4	05/02	WM	UF	CS			3.9								0.03	0.46
Los Alamos above SR-4	06/15	WS	F	CS			4.2			11.3	7.2	< 0.7	56			
Los Alamos above SR-4	06/15	WS	F	DUP												
Los Alamos above SR-4	06/15	WS	F	TRP												
Los Alamos above SR-4	06/15	WS	UF	CS			5.4								0.26	0.05
Los Alamos above SR-4	06/15	WS	UF	DUP			5.4									
Los Alamos above SR-4	06/15	WS	UF	TRP												
Los Alamos below LA Weir	03/15	WM	F	CS			5.6			49.1	13.3	< 1.5	66			
Los Alamos below LA Weir	03/15	WM	F	DUP						48.8	13.3					
Los Alamos below LA Weir	03/15	WM	UF	CS			7.4								0.15	0.43
Los Alamos below LA Weir	03/21	WM	F	CS			5.1			39.9	14.8	< 0.7	52			
Los Alamos below LA Weir	03/21	WM	F	DUP												
Los Alamos below LA Weir	03/21	WM	UF	CS			5.4								0.04	0.57
Los Alamos below LA Weir	03/21	WM	UF	DUP												
Los Alamos below LA Weir	04/04	WM	F	CS		17.0	4.5	3.7	14.2	21.1	16.1	< 1.5	40			
Los Alamos below LA Weir	04/04	WM	F	DUP												
Los Alamos below LA Weir	04/04	WM	UF	CS			5.3								0.17	1.24
Los Alamos below LA Weir	04/04	WM	UF	DUP												
Los Alamos below LA Weir	04/04	WM	UF	TRP												
Los Alamos below LA Weir	04/18	WM	F	CS		14.6	3.9	3.5	16.9	21.1	12.7	< 1.5	42			
Los Alamos below LA Weir	04/18	WM	F	DUP												
Los Alamos below LA Weir	04/18	WM	UF	CS			4.0								0.08	0.83
Los Alamos below LA Weir	04/18	WM	UF	DUP												
Los Alamos below LA Weir	05/02	WM	F	CS		14.0	3.8	3.4	16.4	24.5	11.1	< 0.7	41			
Los Alamos below LA Weir	05/02	WM	F	DUP												
Los Alamos below LA Weir	05/02	WM	UF	CS			4.0								0.03	0.47
Los Alamos below LA Weir	05/02	WM	UF	DUP												
Los Alamos at SR-4	03/26	WM	F	CS	28.4	19.4	4.9	4.3	15.4	27.8	16.7	< 0.7	42	0.11	0.03	1.06

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]			SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+NO_2-N
Pajarito Plateau Stations (Cont.)																
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)																
Los Alamos at SR-4	03/26	WM	UF	CS												
Los Alamos at Rio Grande	03/26	WM	F	CS	39.5	26.7	5.0	6.4	31.4	33.3	17.3	< 0.7	76	0.23	0.96	2.75
Los Alamos at Rio Grande	03/26	WM	UF	CS												
Pueblo 1 R	04/11	WM	F	CS	23.0	32.0	5.8	5.5	36.7	44.5	22.0	< 1.5	88	0.13	< 0.02	0.74
Pueblo 1 R	04/11	WM	UF	CS			5.7									
Acid Weir	04/11	WM	F	CS	17.1	30.0	3.0	6.1	88.4	174.0	9.8	< 1.5	50	0.20	0.04	0.51
Acid Weir	04/11	WM	F	DUP												
Acid Weir	04/11	WM	UF	CS		30.9	3.1	6.3	92.7							
Acid Weir	04/11	WM	UF	DUP	16.8	30.4	3.1	6.2	85.2							
Pueblo 2	04/03	WM	F	CS	25.8	28.8	4.8	6.8	30.9	42.8	24.7	< 1.5	68	0.22	0.24	0.72
Pueblo 2	04/03	WM	F	DUP												
Pueblo 2	04/03	WM	UF	CS												
Pueblo 2	04/03	WM	UF	DUP												
Pueblo 3	04/03	WS	F	CS	72.7	22.2	6.3	14.2	63.0	37.8	26.9	< 1.5	189	0.38	4.35	1.31
Pueblo 3	04/03	WS	F	DUP											4.30	1.32
Pueblo 3	04/03	WS	UF	CS												
Pueblo 3	04/03	WS	UF	DUP												
Pueblo 3	04/03	WS	UF	TRP												
Pueblo 3	11/27	WS	UF	CS												
Pueblo 3	11/27	WS	UF	CS												
Pueblo 3	11/27	WS	UF	DUP												
Pueblo at SR-502	04/03	WS	F	CS	74.9	25.7	6.9	13.7	66.2	37.1	22.7	< 1.5	117	0.39	4.25	11.80
Pueblo at SR-502	04/03	WS	F	DUP											4.45	11.10
Pueblo at SR-502	04/03	WS	F	CS	71.0	26.0	7.0	12.9	63.1	41.1	21.8	< 1.5	119	0.40	4.30	11.60
Pueblo at SR-502	04/03	WS	F	DUP												
Pueblo at SR-502	04/03	WS	UF	CS												
Pueblo at SR-502	04/03	WS	UF	DUP	68.7	26.8	7.2	13.2	65.5							
Pueblo at SR-502	04/03	WS	UF	CS												
Pueblo at SR-502	04/03	WS	UF	DUP												
Pueblo at SR-502	11/27	WS	UF	CS												
Pueblo at SR-502	11/27	WS	UF	CS												
Sandia Canyon:																
SCS-1	05/17	WS	F	CS	98.0	21.4	6.6	12.8	104.0	88.7	17.0	3.4	123	0.40	3.65	1.63
SCS-1	05/17	WS	F	DUP	96.6	21.0	6.5	12.3	99.4	87.8	16.7	3.1	125		3.70	
SCS-1	05/17	WS	UF	CS												
SCS-1	05/17	WS	UF	DUP												
SCS-1	11/29	WS	UF	CS												
SCS-1	11/29	WS	UF	CS												
SCS-1	11/29	WS	UF	CS												
SCS-2	05/17	WS	F	CS	89.6	23.3	6.1	15.3	173.0	105.0	102.0	4.0	157	0.51	4.20	0.57
SCS-2	05/17	WS	F	CS	89.7	21.9	5.7	15.0	167.0	106.0	102.0	3.4	154	0.52	4.40	0.59
SCS-2	05/17	WS	UF	CS												

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]			SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+NO_2-N
Pajarito Plateau Stations (Cont.)																
Sandia Canyon: (Cont.)																
SCS-2	05/17	WS	UF	CS												
SCS-2	11/29	WS	UF	CS												
SCS-2	11/29	WS	UF	CS												
SCS-3	05/17	WS	F	CS	104.0	23.6	6.1	16.7	181.0	117.0	107.0	3.8	153	0.53	4.25	0.64
SCS-3	05/17	WS	UF	CS												
SCS-3	11/27	WS	UF	CS												
SCS-3	11/29	WS	UF	CS												
SCS-3	11/29	WS	UF	CS												
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey):																
Mortandad at GS-1	04/18	WS	F	CS	40.3	28.9	3.7	4.2	44.8	20.6	40.7	< 1.5	76	0.35	0.08	2.14
Mortandad at GS-1	04/18	WS	F	DUP	41.2	29.4	3.7	4.3	46.5							
Mortandad at GS-1	04/18	WS	UF	CS												
Pajarito Canyon (includes Twomile, Threemile Canyons):																
Pajarito below SR-501	03/20	WM	F	CS			4.0			8.3	18.4	< 0.7	30			
Pajarito below SR-501	03/20	WM	UF	CS			4.7								0.09	0.98
Pajarito below SR-501	03/20	WM	UF	DUP												
Pajarito below SR-501	04/04	WM	F	CS		12.3	3.6	2.7	4.9	3.8	17.9	< 1.5	26			
Pajarito below SR-501	04/04	WM	F	DUP												
Pajarito below SR-501	04/04	WM	UF	CS			3.8								0.11	1.45
Pajarito below SR-501	04/04	WM	UF	DUP												
Pajarito below SR-501	04/18	WM	F	CS		9.1	2.7	2.6	3.9	1.9	11.3	< 1.5	27			
Pajarito below SR-501	04/18	WM	F	DUP												
Pajarito below SR-501	04/18	WM	UF	CS			2.9								0.13	0.76
Pajarito below SR-501	04/18	WM	UF	DUP												
Pajarito below SR-501	05/02	WM	F	CS		10.0	3.0	2.9	4.2	3.2	9.5	< 0.7	32			
Pajarito below SR-501	05/02	WM	F	DUP		10.1	3.1	2.8	4.3	3.3	9.6	< 0.7	32			
Pajarito below SR-501	05/02	WM	UF	CS			3.0		4.3						0.06	0.45
Pajarito below SR-501	05/02	WM	UF	DUP											0.06	
Pajarito Canyon	04/04	WM	F	CS	27.8	15.7	4.3	3.0	12.2	14.3	17.9	< 1.5	40	0.12	< 0.02	1.13
Pajarito Canyon	04/04	WM	F	DUP												
Pajarito Canyon	04/04	WM	F	TRP												
Pajarito Canyon	04/04	WM	UF	CS												
Pajarito Canyon	04/04	WM	UF	DUP												
Pajarito above SR-4	03/21	WM	F	CS			14.8			51.8	34.3	1.6	194			
Pajarito above SR-4	03/21	WM	F	DUP												
Pajarito above SR-4	03/21	WM	F	TRP												
Pajarito above SR-4	03/21	WM	UF	CS			14.7								0.10	0.01
Pajarito above SR-4	03/21	WM	UF	DUP			15.1								0.15	
Pajarito above SR-4	04/04	WM	F	CS		33.6	7.4	5.6	21.5	30.4	21.5	< 1.5	91			
Pajarito above SR-4	04/04	WM	F	DUP												

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]			SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+NO_2-N
Pajarito Plateau Stations (Cont.)																
Pajarito Canyon (includes Twomile, Threemile Canyons): (Cont.)																
Pajarito above SR-4	04/04	WM	F	TRP												
Pajarito above SR-4	04/04	WM	UF	CS			7.2								0.12	0.49
Pajarito above SR-4	04/04	WM	UF	DUP												
Pajarito above SR-4	04/18	WM	F	CS		40.3	9.0	6.4	28.7	42.9	18.5	< 1.5	118			
Pajarito above SR-4	04/18	WM	F	DUP												
Pajarito above SR-4	04/18	WM	UF	CS			9.4								0.09	0.05
Pajarito above SR-4	04/18	WM	UF	DUP												
Pajarito above SR-4	05/02	WM	F	CS		59.3	13.2	7.6	34.4	58.3	12.5	1.4	180			
Pajarito above SR-4	05/02	WM	F	DUP												
Pajarito above SR-4	05/02	WM	UF	CS			13.3								0.07	0.02
Pajarito above SR-4	05/02	WM	UF	DUP												
Pajarito at Rio Grande	09/25	WS	F	CS	73.7	21.8	4.8	2.6	13.0	4.5	5.1	0.8	104	0.47	< 0.02	0.69
Pajarito at Rio Grande	09/25	WS	UF	CS												
Pajarito at Rio Grande	09/25	WS	UF	DUP												
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons):																
Water above SR-501	03/15	WM	F	CS			4.1			10.3	9.0	< 1.5	39			
Water above SR-501	03/15	WM	F	DUP												
Water above SR-501	03/15	WM	UF	CS			4.2								0.03	0.77
Water above SR-501	03/20	WM	F	CS			4.3			10.2	10.4	< 0.7	37			
Water above SR-501	03/20	WM	UF	CS			4.2								< 0.02	0.75
Water above SR-501	04/04	WM	F	CS		15.9	5.3	3.7	8.3	12.6	17.1	< 1.5	36			
Water above SR-501	04/04	WM	F	DUP		16.1	5.4	3.8	8.4							
Water above SR-501	04/04	WM	UF	CS			5.3								0.04	1.50
Water above SR-501	04/04	WM	UF	DUP												
Water above SR-501	04/18	WM	F	CS		15.7	5.5	4.3	9.8	19.1	17.7	< 1.5	38			
Water above SR-501	04/18	WM	F	DUP												
Water above SR-501	04/18	WM	UF	CS			5.7								0.05	1.39
Water above SR-501	04/18	WM	UF	DUP												
Water above SR-501	05/02	WM	F	CS		15.6	5.5	4.4	10.9	20.0	18.0	< 0.7	37			
Water above SR-501	05/02	WM	F	DUP												
Water above SR-501	05/02	WM	UF	CS			6.2								< 0.02	1.27
Water above SR-501	05/02	WM	UF	DUP												
Cañon de Valle above SR-501	04/04	WM	F	CS		10.9	3.0	2.2	3.2	1.9	9.4	< 1.5	28			
Cañon de Valle above SR-501	04/04	WM	F	DUP												
Cañon de Valle above SR-501	04/04	WM	UF	CS			3.4								0.12	1.06
Cañon de Valle above SR-501	04/04	WM	UF	DUP												
Cañon de Valle above SR-501	04/18	WM	F	CS		8.7	2.5	2.0	3.3	1.3	7.7	< 1.5	28			
Cañon de Valle above SR-501	04/18	WM	F	DUP												
Cañon de Valle above SR-501	04/18	WM	UF	CS			2.5								0.08	0.58
Cañon de Valle above SR-501	04/18	WM	UF	DUP												
Cañon de Valle above SR-501	05/02	WM	F	CS		9.2	2.6	2.1	3.6	1.3	6.8	< 0.7	30			
Cañon de Valle above SR-501	05/02	WM	F	DUP												

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]			SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+NO_2-N
Pajarito Plateau Stations (Cont.)																
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons): (Cont.)																
Cañon de Valle above SR-501	05/02	WM	UF	CS			2.5								0.03	0.12
Cañon de Valle above SR-501	05/02	WM	UF	DUP												
Water at Beta	04/17	WM	F	CS	33.5	16.9	5.4	4.2	11.8	23.1	15.5	< 1.5	94	0.13	0.08	0.85
Water at Beta	04/17	WM	F	DUP								< 1.5	92			
Water at Beta	04/17	WM	F	TRP												
Water at Beta	04/17	WM	UF	CS												
Water at Beta	04/17	WM	UF	DUP												
Water below SR-4	03/21	WM	F	CS			4.3			14.2	9.8	< 0.7	43			
Water below SR-4	03/21	WM	UF	CS			5.3								0.10	0.67
Water below SR-4	03/21	WM	UF	DUP												
Water below SR-4	04/04	WM	F	CS		16.5	5.3	4.0	11.1	15.8	16.6	< 1.5	41			
Water below SR-4	04/04	WM	F	DUP												
Water below SR-4	04/04	WM	F	TRP												
Water below SR-4	04/04	WM	UF	CS			5.5								0.07	1.20
Water below SR-4	04/04	WM	UF	DUP												
Ancho Canyon:																
Ancho at Rio Grande	09/25	WS	F	CS	77.0	12.7	3.3	1.9	10.9	2.3	2.1	2.6	87	0.42	< 0.02	0.01
Ancho at Rio Grande	09/25	WS	F	DUP						2.3	2.1					
Ancho at Rio Grande	09/25	WS	UF	CS												
Frijoles Canyon:																
Frijoles at Monument Headquarters	07/18	WS	F	CS	68.5	8.9	2.9	2.0	10.3	4.0	1.8	< 0.7	30	0.12	0.02	0.02
Frijoles at Monument Headquarters	07/18	WS	F	DUP												0.02
Frijoles at Monument Headquarters	07/18	WS	UF	CS												
Frijoles at Monument Headquarters	07/18	WS	UF	DUP	60.8	8.9	3.0	2.2	10.2							
Frijoles at Rio Grande	09/26	WS	F	CS	70.7	10.3	3.5	2.2	11.2	3.3	1.6	< 0.7	51	0.23	< 0.02	< 0.01
Frijoles at Rio Grande	09/26	WS	F	DUP	70.8	10.4	3.5	2.1	11.1					0.22		< 0.01
Frijoles at Rio Grande	09/26	WS	F	CS	70.6	10.3	3.5	2.3	11.4	3.6	1.7	< 0.7	59	0.25	< 0.02	< 0.01
Frijoles at Rio Grande	09/26	WS	F	DUP												
Frijoles at Rio Grande	09/26	WS	UF	CS												
Frijoles at Rio Grande	09/26	WS	UF	CS												
Frijoles at Rio Grande	09/26	WS	UF	DUP												

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]	SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+NO_2-N
Water Quality Standards[g]														
EPA Primary Drinking Water Standard									500			4.00		10
EPA Secondary Drinking Water Standard								250	250					
EPA Health Advisory							20							
NMWQCC Groundwater Limit								250	600			1.60		10
NMWQCC Wildlife Habitat Standard														

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a])

Station Name	Date	Codes[b]			ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)[d]	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Regional Stations													
Rio Chama at Chamita (bank)	08/01	WS	F	CS				253			140	7.8	279
Rio Chama at Chamita (bank)	08/01	WS	UF	CS	< 0.958	< 0.0029	< 0.0029		352				
Rio Grande at Embudo (bank)	08/01	WS	F	CS				196			99.1	8.1	464
Rio Grande at Embudo (bank)	08/01	WS	UF	CS	< 0.958	< 0.0029	< 0.0029		29				
Rio Grande at Otowi Upper (bank)	07/17	WS	F	CS				190			103	8.3	181
Rio Grande at Otowi Upper (bank)	07/17	WS	UF	CS	< 0.958		< 0.0029		76				
Rio Grande at Otowi (bank)	07/17	WS	F	CS				187			107	8.3	2
Rio Grande at Otowi (bank)	07/17	WS	F	DUP				183					
Rio Grande at Otowi (bank)	07/17	WS	UF	CS	< 0.958		< 0.0029		111				
Rio Grande at Frijoles (bank)	09/26	WS	F	CS				197			120	8.1	290
Rio Grande at Frijoles (bank)	09/26	WS	UF	CS	< 0.958		< 0.0029		132				
Rio Grande at Cochiti	09/26	WS	F	CS				196			123	8.0	124
Rio Grande at Cochiti	09/26	WS	UF	CS	< 0.958		< 0.0029		116				
Jemez River	04/18	WS	F	CS				107			79.3	7.9	137
Jemez River	04/18	WS	F	DUP				90					
Jemez River	04/18	WS	UF	CS	< 0.801		0.0039		77				
Jemez River	04/18	WS	UF	DUP	< 0.801				84				
Jemez River	04/18	WS	UF	TRP					83				
Pajarito Plateau Stations													
Guaje Canyon:													
Guaje Canyon	10/12	WS	F	CS				142			64.9	7.4	151
Guaje Canyon	10/12	WS	F	DUP								7.4	151
Guaje Canyon	10/12	WS	UF	CS	< 0.958				1				
Guaje Canyon	10/12	WS	UF	DUP	< 0.958								
Guaje above Rendija	04/18	WM	F	CS				134			46.1	7.7	
Guaje above Rendija	04/18	WM	F	DUP				140					
Guaje above Rendija	04/18	WM	UF	CS	< 0.801	< 0.0028	0.0039		335				121
Guaje above Rendija	04/18	WM	UF	DUP					376				
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons):													
Los Alamos Reservoir	05/01	WS	F	CS				104			36.7	7.1	100
Los Alamos Reservoir	05/01	WS	F	DUP				99				7.1	
Los Alamos Reservoir	05/01	WS	F	TRP				102					
Los Alamos Reservoir	05/01	WS	UF	CS	1.970		< 0.0028		6				
Los Alamos Reservoir	05/01	WS	UF	DUP									
Los Alamos above Ice Rink	03/07	WM	UF	CS	< 0.958	< 0.0028	< 0.0028		11				121
Los Alamos above Ice Rink	03/07	WM	UF	DUP	< 0.958	< 0.0028	< 0.0028						121
Los Alamos above Ice Rink	03/07	WM	F	CS								7.7	
Los Alamos above Ice Rink	03/07	WM	F	DUP								7.7	
Los Alamos above Ice Rink	03/15	WM	F	CS				119				7.6	
Los Alamos above Ice Rink	03/15	WM	UF	CS	10	< 0.0028	< 0.0028		27				20
Los Alamos above Ice Rink	03/20	WM	F	CS				135				7.7	

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]			ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)[d]	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Pajarito Plateau Stations (Cont.)													
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)													
Los Alamos above Ice Rink	03/20	WM	F	DUP				135				7.7	
Los Alamos above Ice Rink	03/20	WM	UF	CS	3.930	< 0.0028	< 0.0028		32				130
Los Alamos above Ice Rink	03/20	WM	UF	DUP	< 0.958		< 0.0028						131
Los Alamos above Ice Rink	03/20	WM	F	CS				132				7.7	
Los Alamos above Ice Rink	03/20	WM	UF	CS	6.760	< 0.0028	< 0.0028		32				124
Los Alamos above Ice Rink	04/04	WM	F	CS				134			55.3	7.4	
Los Alamos above Ice Rink	04/04	WM	F	DUP				137					
Los Alamos above Ice Rink	04/04	WM	UF	CS	1.970	< 0.0028	< 0.0028		215				14
Los Alamos above Ice Rink	04/04	WM	UF	DUP	< 0.801	< 0.0028	< 0.0028		229				14
Los Alamos above Ice Rink	04/04	WM	UF	TRP					229				
Los Alamos above Ice Rink	05/02	WM	F	CS				112			43.7	7.6	
Los Alamos above Ice Rink	05/02	WM	F	DUP				115					
Los Alamos above Ice Rink	05/02	WM	UF	CS	< 0.958	< 0.0028	< 0.0028		20				102
Los Alamos above Ice Rink	05/02	WM	UF	DUP					19				
Los Alamos below Ice Rink	04/18	WM	F	CS				116			47.8	7.6	
Los Alamos below Ice Rink	04/18	WM	F	DUP				114				7.6	
Los Alamos below Ice Rink	04/18	WM	F	TRP				117					
Los Alamos below Ice Rink	04/18	WM	UF	CS	< 0.801	0.0032	0.0069		65				191
Los Alamos below Ice Rink	04/18	WM	UF	DUP	1.380	< 0.0028	0.0043		66				
Los Alamos below Ice Rink	04/18	WM	UF	TRP					70				
Los Alamos below Ice Rink	08/01	WS	F	CS				215					
Los Alamos below Ice Rink	08/01	WS	F	DUP				220					
Los Alamos below Ice Rink	08/01	WS	F	TRP				220					
Los Alamos below Ice Rink	08/01	WS	UF	CS	< 4.790	< 0.0029	< 0.0029		2,870			7.1	298
Los Alamos below Ice Rink	08/01	WS	UF	DUP	< 4.790	< 0.0029	< 0.0029		2,890	5,360		7.1	298
Los Alamos below Ice Rink	08/01	WS	UF	TRP					2,610	6,070			
Los Alamos below Ice Rink	08/02	WS	F	CS				224					
Los Alamos below Ice Rink	08/02	WS	F	DUP				225					
Los Alamos below Ice Rink	08/02	WS	F	TRP				220					
Los Alamos below Ice Rink	08/02	WS	UF	CS	< 0.958	< 0.0029	0.0038		484	509		8.0	186
Los Alamos below Ice Rink	08/02	WS	UF	DUP	< 0.958	< 0.0029	< 0.0029		498	510		8.0	186
Los Alamos below Ice Rink	08/02	WS	UF	TRP					524				
Los Alamos at Upper GS	03/26	WM	F	CS				166			67.5	7.8	192
Los Alamos at Upper GS	03/26	WM	F	DUP				170				7.8	193
Los Alamos at Upper GS	03/26	WM	UF	CS	< 0.801		< 0.0028		311				
Los Alamos at Upper GS	03/26	WM	UF	DUP	< 0.801		< 0.0028		341				
DPS-1	03/28	WM	F	CS				632			183	7.3	899
DPS-1	03/28	WM	F	DUP									
DPS-1	03/28	WM	UF	CS	< 0.801		< 0.0028		3				
Los Alamos above SR-4	03/15	WM	F	CS				218				7.9	
Los Alamos above SR-4	03/15	WM	F	DUP								7.9	
Los Alamos above SR-4	03/15	WM	UF	CS	< 0.958	< 0.0028	< 0.0028		613				22
Los Alamos above SR-4	03/15	WM	UF	DUP		< 0.0028	< 0.0028		652				23

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]			ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)[d]	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Pajarito Plateau Stations (Cont.)													
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)													
Los Alamos above SR-4	03/21	WM	F	CS				197				8.0	
Los Alamos above SR-4	03/21	WM	F	DUP				202					
Los Alamos above SR-4	03/21	WM	UF	CS	11.200	< 0.0028	< 0.0028		151				245
Los Alamos above SR-4	03/21	WM	UF	DUP					159				
Los Alamos above SR-4	04/04	WM	F	CS				154			64.5	7.9	
Los Alamos above SR-4	04/04	WM	F	DUP				157					
Los Alamos above SR-4	04/04	WM	UF	CS	< 0.801	< 0.0028	< 0.0028		339				1330
Los Alamos above SR-4	04/04	WM	UF	DUP					371				
Los Alamos above SR-4	04/04	WM	UF	TRP					385				
Los Alamos above SR-4	04/18	WM	F	CS				146			50.7	7.7	
Los Alamos above SR-4	04/18	WM	F	DUP				149					
Los Alamos above SR-4	04/18	WM	UF	CS	< 0.801	< 0.0028	0.0063		295				143
Los Alamos above SR-4	04/18	WM	UF	DUP			0.0042		314				
Los Alamos above SR-4	05/02	WM	F	CS				147			52	7.8	
Los Alamos above SR-4	05/02	WM	F	DUP				148					
Los Alamos above SR-4	05/02	WM	UF	CS	< 0.958	< 0.0028	< 0.0028		11				150
Los Alamos above SR-4	06/15	WS	F	CS				135				7.7	
Los Alamos above SR-4	06/15	WS	F	DUP				142					
Los Alamos above SR-4	06/15	WS	F	TRP				137					
Los Alamos above SR-4	06/15	WS	UF	CS	< 0.958	< 0.0028	< 0.0028		291			7.5	147
Los Alamos above SR-4	06/15	WS	UF	DUP		< 0.0028	< 0.0028		297			7.5	
Los Alamos above SR-4	06/15	WS	UF	TRP					330				
Los Alamos below LA Weir	03/15	WM	F	CS				213				7.9	
Los Alamos below LA Weir	03/15	WM	F	DUP									
Los Alamos below LA Weir	03/15	WM	UF	CS	11.600	< 0.0028	< 0.0028		306				24
Los Alamos below LA Weir	03/21	WM	F	CS				204				8.0	
Los Alamos below LA Weir	03/21	WM	F	DUP				205					
Los Alamos below LA Weir	03/21	WM	UF	CS	6.730	< 0.0028	< 0.0028		22				14
Los Alamos below LA Weir	03/21	WM	UF	DUP					23				
Los Alamos below LA Weir	04/04	WM	F	CS				152			61.3	7.8	
Los Alamos below LA Weir	04/04	WM	F	DUP				158					
Los Alamos below LA Weir	04/04	WM	UF	CS	< 0.801	< 0.0028	< 0.0028		187				149
Los Alamos below LA Weir	04/04	WM	UF	DUP					188				
Los Alamos below LA Weir	04/04	WM	UF	TRP					183				
Los Alamos below LA Weir	04/18	WM	F	CS				148			52.6	7.7	
Los Alamos below LA Weir	04/18	WM	F	DUP				151					
Los Alamos below LA Weir	04/18	WM	UF	CS	< 0.801	< 0.0028	0.0076		19				194
Los Alamos below LA Weir	04/18	WM	UF	DUP					20				
Los Alamos below LA Weir	05/02	WM	F	CS				141			50.5	7.8	
Los Alamos below LA Weir	05/02	WM	F	DUP				143					
Los Alamos below LA Weir	05/02	WM	UF	CS	3.420	< 0.0028	< 0.0028		53				147
Los Alamos below LA Weir	05/02	WM	UF	DUP					59				
Los Alamos at SR-4	03/26	WM	F	CS				173			68.6	7.8	189

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]			ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)[d]	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Pajarito Plateau Stations (Cont.)													
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)													
Los Alamos at SR-4	03/26	WM	UF	CS	< 0.801		< 0.0028		476				
Los Alamos at Rio Grande	03/26	WM	F	CS				237			87.1	8.0	265
Los Alamos at Rio Grande	03/26	WM	UF	CS	1.200		< 0.0028		181				
Pueblo 1 R	04/11	WM	F	CS				239			104	7.7	273
Pueblo 1 R	04/11	WM	UF	CS	< 0.801		< 0.0028		4				
Acid Weir	04/11	WM	F	CS				331			87.2	6.6	462
Acid Weir	04/11	WM	F	DUP				342				6.6	463
Acid Weir	04/11	WM	UF	CS	< 0.801		< 0.0028		< 1				
Acid Weir	04/11	WM	UF	DUP									
Pueblo 2	04/03	WM	F	CS				243			91.8	7.8	308
Pueblo 2	04/03	WM	F	DUP				247					
Pueblo 2	04/03	WM	UF	CS	1.030		< 0.0028		6				
Pueblo 2	04/03	WM	UF	DUP					7				
Pueblo 3	04/03	WS	F	CS				394			81.3	7.6	523
Pueblo 3	04/03	WS	F	DUP				395					
Pueblo 3	04/03	WS	UF	CS	3.700		0.0032		182				
Pueblo 3	04/03	WS	UF	DUP					191				
Pueblo 3	04/03	WS	UF	TRP					191				
Pueblo 3	11/27	WS	UF	CS	< 0.250								
Pueblo 3	11/27	WS	UF	CS	2.660								
Pueblo 3	11/27	WS	UF	DUP	3.890								
Pueblo at SR-502	04/03	WS	F	CS				400			92.6	7.5	446
Pueblo at SR-502	04/03	WS	F	DUP				408				7.5	447
Pueblo at SR-502	04/03	WS	F	CS				405			93.8	7.3	451
Pueblo at SR-502	04/03	WS	F	DUP				406					
Pueblo at SR-502	04/03	WS	UF	CS	< 0.801		< 0.0028		13				
Pueblo at SR-502	04/03	WS	UF	DUP	1.900		< 0.0028		13				
Pueblo at SR-502	04/03	WS	UF	CS	< 0.801		< 0.0028		11				
Pueblo at SR-502	04/03	WS	UF	DUP					12				
Pueblo at SR-502	11/27	WS	UF	CS	< 0.250								
Pueblo at SR-502	11/27	WS	UF	CS	2.320								
Sandia Canyon:													
SCS-1	05/17	WS	F	CS				492			80.5	8.7	608
SCS-1	05/17	WS	F	DUP				492				8.7	609
SCS-1	05/17	WS	UF	CS	9.990		< 0.0028		9				
SCS-1	05/17	WS	UF	DUP			< 0.0028						
SCS-1	11/29	WS	UF	CS	1.200								
SCS-1	11/29	WS	UF	CS	2.750								
SCS-1	11/29	WS	UF	CS	2.310								
SCS-2	05/17	WS	F	CS				705			83.2	8.7	904
SCS-2	05/17	WS	F	CS				719			78.1	8.7	930
SCS-2	05/17	WS	UF	CS	3.320		0.0036		6				

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]			ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)[d]	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Pajarito Plateau Stations (Cont.)													
Sandia Canyon: (Cont.)													
SCS-2	05/17	WS	UF	CS	2.810		< 0.0028		6				
SCS-2	11/29	WS	UF	CS	< 0.250								
SCS-2	11/29	WS	UF	CS	2.420								
SCS-3	05/17	WS	F	CS				707			83.9	8.8	930
SCS-3	05/17	WS	UF	CS	4.680		< 0.0028		5				
SCS-3	11/27	WS	UF	CS	< 0.250								
SCS-3	11/29	WS	UF	CS	0.520								
SCS-3	11/29	WS	UF	CS	2.380								
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey):													
Mortandad at GS-1	04/18	WS	F	CS				282			87.2	7.7	303
Mortandad at GS-1	04/18	WS	F	DUP				287					
Mortandad at GS-1	04/18	WS	UF	CS	99.500		0.0037		< 1				
Pajarito Canyon (includes Twomile, Threemile Canyons):													
Pajarito below SR-501	03/20	WM	F	CS				128				7.6	
Pajarito below SR-501	03/20	WM	UF	CS	< 0.958	< 0.0028	0.0093		56				114
Pajarito below SR-501	03/20	WM	UF	DUP					56				
Pajarito below SR-501	04/04	WM	F	CS				120			45.4	7.7	
Pajarito below SR-501	04/04	WM	F	DUP				123					
Pajarito below SR-501	04/04	WM	UF	CS	< 0.801	< 0.0028	0.0031		24				84
Pajarito below SR-501	04/04	WM	UF	DUP					25				
Pajarito below SR-501	04/18	WM	F	CS				102			33.8	7.6	
Pajarito below SR-501	04/18	WM	F	DUP				99					
Pajarito below SR-501	04/18	WM	UF	CS	< 0.801	< 0.0028	0.0037		62				95
Pajarito below SR-501	04/18	WM	UF	DUP					54				
Pajarito below SR-501	05/02	WM	F	CS				98			37.5	7.3	
Pajarito below SR-501	05/02	WM	F	DUP				100				7.3	
Pajarito below SR-501	05/02	WM	UF	CS	0.958	< 0.0028	< 0.0028		< 1				82
Pajarito below SR-501	05/02	WM	UF	DUP		< 0.0028	< 0.0028		1				
Pajarito Canyon	04/04	WM	F	CS				158			56.8	7.7	161
Pajarito Canyon	04/04	WM	F	DUP				162					
Pajarito Canyon	04/04	WM	F	TRP				161					
Pajarito Canyon	04/04	WM	UF	CS	< 0.801		0.0030		87				
Pajarito Canyon	04/04	WM	UF	DUP					94				
Pajarito above SR-4	03/21	WM	F	CS				416				7.8	
Pajarito above SR-4	03/21	WM	F	DUP				418				7.8	
Pajarito above SR-4	03/21	WM	F	TRP				418					
Pajarito above SR-4	03/21	WM	UF	CS	< 0.958	< 0.0028	< 0.0028		19				416
Pajarito above SR-4	03/21	WM	UF	DUP			< 0.0028		22				415
Pajarito above SR-4	04/04	WM	F	CS				220			114	7.7	
Pajarito above SR-4	04/04	WM	F	DUP				218					

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]			ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)[d]	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Pajarito Plateau Stations (Cont.)													
Pajarito Canyon (includes Twomile, Threemile Canyons): (Cont.)													
Pajarito above SR-4	04/04	WM	F	TRP				223					
Pajarito above SR-4	04/04	WM	UF	CS	< 0.801	< 0.0028	< 0.0028		2				221
Pajarito above SR-4	04/04	WM	UF	DUP					3				
Pajarito above SR-4	04/18	WM	F	CS				261			138	7.7	
Pajarito above SR-4	04/18	WM	F	DUP				266					
Pajarito above SR-4	04/18	WM	UF	CS	< 0.801	< 0.0028	0.0046		< 1				392
Pajarito above SR-4	04/18	WM	UF	DUP					1				
Pajarito above SR-4	05/02	WM	F	CS				358			202	7.6	
Pajarito above SR-4	05/02	WM	F	DUP				362					
Pajarito above SR-4	05/02	WM	UF	CS	< 0.958	< 0.0028	< 0.0028		1				429
Pajarito above SR-4	05/02	WM	UF	DUP					2				
Pajarito at Rio Grande	09/25	WS	F	CS				184			74.1	7.9	126
Pajarito at Rio Grande	09/25	WS	UF	CS	< 0.958		< 0.0029		1				
Pajarito at Rio Grande	09/25	WS	UF	DUP			< 0.0029						
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons):													
Water above SR-501	03/15	WM	F	CS				118				7.2	
Water above SR-501	03/15	WM	F	DUP				118					
Water above SR-501	03/15	WM	UF	CS	3.530	< 0.0028	< 0.0028		5				19
Water above SR-501	03/20	WM	F	CS				121				7.2	
Water above SR-501	03/20	WM	UF	CS	3.060	< 0.0028	< 0.0028		11				109
Water above SR-501	04/04	WM	F	CS				149			61.4	7.5	
Water above SR-501	04/04	WM	F	DUP				150					
Water above SR-501	04/04	WM	UF	CS	< 0.801	< 0.0028	< 0.0028		15				158
Water above SR-501	04/04	WM	UF	DUP					17				
Water above SR-501	04/18	WM	F	CS				150			61.8	7.1	
Water above SR-501	04/18	WM	F	DUP				152					
Water above SR-501	04/18	WM	UF	CS	< 0.801	0.0035	0.0054		2				175
Water above SR-501	04/18	WM	UF	DUP					2				
Water above SR-501	05/02	WM	F	CS				156			61.8	6.9	
Water above SR-501	05/02	WM	F	DUP				159					
Water above SR-501	05/02	WM	UF	CS	< 0.958	< 0.0028	< 0.0028		34				7560
Water above SR-501	05/02	WM	UF	DUP					37				
Cañon de Valle above SR-501	04/04	WM	F	CS				90			39.6	7.7	
Cañon de Valle above SR-501	04/04	WM	F	DUP				95					
Cañon de Valle above SR-501	04/04	WM	UF	CS	< 0.801	< 0.0028	< 0.0028		110				66
Cañon de Valle above SR-501	04/04	WM	UF	DUP					111				
Cañon de Valle above SR-501	04/18	WM	F	CS				83			32	7.5	
Cañon de Valle above SR-501	04/18	WM	F	DUP				91					
Cañon de Valle above SR-501	04/18	WM	UF	CS	< 0.801	< 0.0028	0.0054		20				69
Cañon de Valle above SR-501	04/18	WM	UF	DUP					22				69
Cañon de Valle above SR-501	05/02	WM	F	CS				81			33.4	7.8	
Cañon de Valle above SR-501	05/02	WM	F	DUP				87					

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]			ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)[d]	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Pajarito Plateau Stations (Cont.)													
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons): (Cont.)													
Cañon de Valle above SR-501	05/02	WM	UF	CS	2.370	< 0.0028	< 0.0028		8				6930
Cañon de Valle above SR-501	05/02	WM	UF	DUP					10				
Water at Beta	04/17	WM	F	CS				151			64.3	7.4	135
Water at Beta	04/17	WM	F	DUP				156				7.4	
Water at Beta	04/17	WM	F	TRP				158					
Water at Beta	04/17	WM	UF	CS	< 0.801		< 0.0028		3				
Water at Beta	04/17	WM	UF	DUP	< 0.801								
Water below SR-4	03/21	WM	F	CS				150				7.9	
Water below SR-4	03/21	WM	UF	CS	11.300	< 0.0028	< 0.0028		181				120
Water below SR-4	03/21	WM	UF	DUP					189				
Water below SR-4	04/04	WM	F	CS				154			63.2	7.8	
Water below SR-4	04/04	WM	F	DUP				156					
Water below SR-4	04/04	WM	F	TRP				157					
Water below SR-4	04/04	WM	UF	CS	< 0.801	< 0.0028	< 0.0028		104				1360
Water below SR-4	04/04	WM	UF	DUP					108				
Ancho Canyon:													
Ancho at Rio Grande	09/25	WS	F	CS				135			45.1	8.6	282
Ancho at Rio Grande	09/25	WS	F	DUP									
Ancho at Rio Grande	09/25	WS	UF	CS	< 0.958		< 0.0029		< 1				
Frijoles Canyon:													
Frijoles at Monument Headquarters	07/18	WS	F	CS				128			34.3	7.9	123
Frijoles at Monument Headquarters	07/18	WS	F	DUP									
Frijoles at Monument Headquarters	07/18	WS	UF	CS	< 0.958		< 0.0029		24				
Frijoles at Monument Headquarters	07/18	WS	UF	DUP	< 0.958		< 0.0029		26				
Frijoles at Rio Grande	09/26	WS	F	CS				131			40	7.4	198
Frijoles at Rio Grande	09/26	WS	F	DUP									197
Frijoles at Rio Grande	09/26	WS	F	CS				136			40	8.0	122
Frijoles at Rio Grande	09/26	WS	F	DUP				134					
Frijoles at Rio Grande	09/26	WS	UF	CS	< 0.958		< 0.0029		1				
Frijoles at Rio Grande	09/26	WS	UF	CS	< 0.958		< 0.0029		< 1				
Frijoles at Rio Grande	09/26	WS	UF	DUP					2				

Table 5-5. Chemical Quality of Snowmelt and Base Flow for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]	ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)[d]	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Water Quality Standards[g]											
EPA Primary Drinking Water Standard					0.20						
EPA Secondary Drinking Water Standard						500				6.8–8.5	
EPA Health Advisory											
NMWQCC Groundwater Limit					0.20	1,000				6–9	
NMWQCC Wildlife Habitat Standard				0.0052							

[a]Except where noted.
[b]Codes: WM–Snowmelt; WS–Base flow; UF–unfiltered; F–filtered; CS–customer sample; DUP–laboratory duplicate; TRP–laboratory triplicate; QUD–laboratory quadruplicate.
[c]Total dissolved solids.
[d]Total suspended solids.
[e]Standard units.
[f]Less than symbol (<) means measurement was below the specified limit of detection of the analytical method.
[g]Standards given here for comparison only; see Appendix A.

Table 5-6. Perchlorate in Surface Water during 2001 (µg/L)[a]

Location Name	Sample Date	Analysis Date	Codes[b]	Field QC Type Code[c]	Result	MDL	Lab Qualifier Code[d]	Valid Flag Code[d]	Lab[e]
Regional Stations									
Rio Chama at Chamita (bank)	08/01	08/07	WS UF CS		<0.958	0.958	U		GELC
Rio Grande at Embudo (bank)	08/01	08/07	WS UF CS		<0.958	0.958	U		GELC
Rio Grande at Otowi Upper (bank)	07/17	08/06	WS UF CS		<0.958	0.958	U		GELC
Rio Grande at Otowi (bank)	07/17	08/06	WS UF CS		<0.958	0.958	U		GELC
Rio Grande at Frijoles (bank)	09/26	10/09	WS UF CS		<0.958	0.958	U		GELC
Rio Grande at Cochiti	09/26	10/09	WS UF CS		<0.958	0.958	U		GELC
Jemez River	04/18	05/04	WS UF DUP		<0.801	0.801	U		GELC
Jemez River	04/18	05/04	WS UF CS		<0.801	0.801	U		GELC
Jemez River	04/18	05/05	WS UF CS	FB	<0.801	0.801	U		GELC
Pajarito Plateau Stations									
Guaje Canyon:									
Guaje Canyon	10/12	10/18	WS UF CS		<0.958	0.958	U		GELC
Guaje Canyon	10/12	10/18	WS UF DUP		<0.958	0.958	U		GELC
Guaje above Rendija	04/18	05/04	WM UF CS		<0.801	0.801	U		GELC
Guaje above Rendija	08/11	09/06	WT UF CS		<4.79	4.79	U		GELC
Guaje above Rendija	08/14	09/06	WT UF CS		<4.79	4.79	U		GELC
Guaje above Rendija	08/14	09/06	WT UF DUP		<4.79	4.79	U		GELC
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons):									
Los Alamos Reservoir	05/01	05/08	WS UF CS		1.97	0.958	J		GELC
Los Alamos above Ice Rink	03/07	03/19	WM UF CS		<0.958	0.958	U		GELC
Los Alamos above Ice Rink	03/07	03/19	WM UF DUP		<0.958	0.958	U		GELC
Los Alamos above Ice Rink	03/15	03/28	WM UF CS		10	0.958			GELC
Los Alamos above Ice Rink	03/15	03/28	WM UF CS	FB	7.83	0.958			GELC
Los Alamos above Ice Rink	03/20	03/28	WM UF DUP		<0.958	0.958	U		GELC
Los Alamos above Ice Rink	03/20	03/28	WM UF CS		6.76	0.958			GELC
Los Alamos above Ice Rink	03/20	03/28	WM UF CS		3.93	0.958	J		GELC
Los Alamos above Ice Rink	04/04	04/28	WM UF DUP		<0.801	0.801	U		GELC
Los Alamos above Ice Rink	04/04	04/28	WM UF CS		1.97	0.801	J	U	GELC
Los Alamos above Ice Rink	05/02	05/18	WM UF CS		<0.958	0.958	U		GELC

Table 5-6. Perchlorate in Surface Water during 2001 (µg/L)[a] (Cont.)

Location Name	Sample Date	Analysis Date	Codes[b]	Field QC Type Code[c]	Result	MDL	Lab Qualifier Code[d]	Valid Flag Code[d]	Lab[e]
Pajarito Plateau Stations (Cont.)									
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)									
Los Alamos below Ice Rink	04/18	05/04	WM UF CS		<0.801	0.801	U		GELC
Los Alamos below Ice Rink	04/18	05/04	WM UF DUP		1.38	0.801	J		GELC
Los Alamos below Ice Rink	07/02	07/19	WT UF CS		<9.58	9.58	U		GELC
Los Alamos below Ice Rink	07/02	07/19	WT UF DUP		<9.58	9.58	U		GELC
Los Alamos below Ice Rink	07/13	08/06	WT UF CS		<4.79	4.79	U		GELC
Los Alamos below Ice Rink	07/13	08/06	WT UF DUP		<4.79	4.79	U		GELC
Los Alamos below Ice Rink	08/01	08/07	WS UF CS		<4.79	4.79	U		GELC
Los Alamos below Ice Rink	08/01	08/07	WS UF DUP		<4.79	4.79	U		GELC
Los Alamos below Ice Rink	08/02	08/28	WS UF CS		<0.958	0.958	U		GELC
Los Alamos below Ice Rink	08/02	08/28	WS UF DUP		<0.958	0.958	U		GELC
Los Alamos below Ice Rink	08/09	08/30	WT UF CS		<1.92	1.92	U		GELC
Los Alamos above DP Canyon	07/26	08/07	WT UF DUP		<4.79	4.79	U		GELC
Los Alamos above DP Canyon	07/26	08/07	WT UF CS		<4.79	4.79	U		GELC
Los Alamos above DP Canyon	08/09	08/30	WT UF DUP		<3.83	3.83	U		GELC
Los Alamos above DP Canyon	08/09	08/30	WT UF CS		<3.83	3.83	U		GELC
Los Alamos above DP Canyon	08/16	09/06	WT UF CS		<0.958	0.958	U		GELC
Los Alamos above DP Canyon	08/16	09/06	WT UF DUP		<0.958	0.958	U		GELC
Los Alamos at Upper GS	03/26	04/25	WM UF CS		<0.801	0.801	U		GELC
Los Alamos at Upper GS	03/26	04/25	WM UF DUP		<0.801	0.801	U		GELC
DPS-1	03/28	04/25	WM UF CS		<0.801	0.801	U		GELC
DP above Los Alamos Canyon	06/27	07/19	WT UF CS		<0.958	0.958	U		GELC
DP above Los Alamos Canyon	06/27	07/19	WT UF CS		<0.958	0.958	U		GELC
Los Alamos above SR-4	03/15	03/19	WM UF CS		<0.958	0.958	U		GELC
Los Alamos above SR-4	03/21	03/28	WM UF CS		11.2	0.958			GELC
Los Alamos above SR-4	04/04	04/28	WM UF CS		<0.801	0.801	U		GELC
Los Alamos above SR-4	04/18	05/04	WM UF CS		<0.801	0.801	U		GELC
Los Alamos above SR-4	05/02	05/18	WM UF CS		<0.958	0.958	U		GELC
Los Alamos above SR-4	06/15	07/09	WS UF CS		<0.958	0.958	U		GELC
Los Alamos above SR-4	08/16	09/06	WT UF CS		<0.958	0.958	U		GELC
Pueblo above SR-502	8/11	9/6	WT UF CS		<4.79	4.79	U		GELC

Table 5-6. Perchlorate in Surface Water during 2001 (µg/L)[a] (Cont.)

Location Name	Sample Date	Analysis Date	Codes[b]	Field QC Type Code[c]	Result	MDL	Lab Qualifier Code[d]	Valid Flag Code[d]	Lab[e]
Pajarito Plateau Stations (Cont.)									
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)									
Los Alamos below LA Weir	03/15	03/28	WM UF CS		11.6	0.958			GELC
Los Alamos below LA Weir	03/21	03/28	WM UF CS		6.73	0.958			GELC
Los Alamos below LA Weir	04/04	04/28	WM UF CS		<0.801	0.801	U		GELC
Los Alamos below LA Weir	04/18	05/04	WM UF CS		<0.801	0.801	U		GELC
Los Alamos below LA Weir	05/02	05/25	WM UF CS		3.42	0.958	J	U	GELC
Los Alamos at SR-4	03/26	04/25	WM UF CS		<0.801	0.801	U		GELC
Los Alamos at Rio Grande	03/26	04/25	WM UF CS		1.2	0.801	J		GELC
Pueblo 1 R	04/11	05/02	WM UF CS		<0.801	0.801	U		GELC
Acid Weir	04/11	05/02	WM UF CS		<0.801	0.801	U		GELC
Pueblo 2	04/03	04/27	WM UF CS		1.03	0.801	J	U	GELC
Pueblo 3	04/03	04/27	WS UF CS		3.7	0.801	J	U	GELC
Pueblo 3	11/27	01/21	WS UF CS		<0.25	0.25	U		ACCU
Pueblo 3	11/27	12/17	WS UF DUP		3.89	0.801	J		GELC
Pueblo 3	11/27	12/17	WS UF CS		2.66	0.801	J	U	GELC
Pueblo at SR-502	04/03	04/27	WS UF CS	FD	<0.801	0.801	U		GELC
Pueblo at SR-502	04/03	04/27	WS UF CS		<0.801	0.801	U		GELC
Pueblo at SR-502	04/03	04/27	WS UF DUP		1.9	0.801	J		GELC
Pueblo at SR-502	11/27	01/21	WS UF CS		<0.25	0.25	U		ACCU
Pueblo at SR-502	11/27	12/17	WS UF CS		2.32	0.801	J	U	GELC
Pueblo above SR-502	08/9	08/31	WT UF CS		<3.83	3.83	U		GELC
Sandia Canyon:									
SCS-1	5/17	6/8	WS UF CS		9.99	0.958		U	GELC
SCS-1	11/27	12/17	WS UF CS	FB	<0.801	0.801	U		GELC
SCS-1	11/29	1/21/02	WS UF CS		1.2	0.25			ACCU
SCS-1	11/29	12/17	WS UF CS		2.75	0.801	J	U	GELC
SCS-1	11/29	12/17	WS UF CS	FD	2.31	0.801	J	U	GELC
SCS-2	5/17	6/8	WS UF CS		3.32	0.958	J	U	GELC
SCS-2	5/17	6/7	WS UF CS	FD	2.81	0.958	J	U	GELC
SCS-2	11/29	01/22	WS UF CS		<0.25	0.25	U		ACCU

Table 5-6. Perchlorate in Surface Water during 2001 (µg/L)[a] (Cont.)

Location Name	Sample Date	Analysis Date	Codes[b]	Field QC Type Code[c]	Result	MDL	Lab Qualifier Code[d]	Valid Flag Code[d]	Lab[e]
Pajarito Plateau Stations (Cont.)									
Sandia Canyon: (Cont.)									
SCS-2	11/29	12/17	WS UF CS		2.42	0.801	J	U	GELC
SCS-3	05/17	06/08	WS UF CS		4.68	0.958		U	GELC
SCS-3	11/27	01/22	WS UF CS	FD	<0.25	0.25	U		ACCU
SCS-3	11/29	01/22	WS UF CS		0.52	0.25			ACCU
SCS-3	11/29	12/17	WS UF CS		2.38	0.801	J	U	GELC
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey):									
Mortandad Tributary NE Drainage at TA-55	07/19	08/07	WT UF CS		1.17	0.958	J		GELC
Mortandad at GS-1	04/18	05/08	WS UF CS		99.5	1.6			GELC
MDA L	05/28	06/08	WT UF CS		<1.92	1.92	U		GELC
MDA L	06/07	06/19	WT UF CS		<0.958	0.958	U		GELC
Pajarito Canyon (includes Twomile, Threemile Canyons):									
Pajarito below SR-501	03/20	03/28	WM UF CS		<0.958	0.958	U		GELC
Pajarito below SR-501	04/04	04/28	WM UF CS		<0.801	0.801	U		GELC
Pajarito below SR-501	04/18	05/04	WM UF CS		<0.801	0.801	U		GELC
Pajarito below SR-501	05/02	05/18	WM UF CS		0.958	0.958			GELC
Pajarito above Starmers	08/05	08/30	WT UF CS		<4.79	4.79	U		GELC
Pajarito Canyon	04/04	04/27	WM UF CS		<0.801	0.801	U		GELC
MDA G-3	06/07	06/26	WT UF CS		<3.83	3.83	U		GELC
MDA G-3	07/02	07/19	WT UF CS		<9.58	9.58	U		GELC
Pajarito above SR-4	03/21	03/28	WM UF CS		<0.958	0.958	U		GELC
Pajarito above SR-4	04/04	04/28	WM UF CS		<0.801	0.801	U		GELC
Pajarito above SR-4	04/18	05/04	WM UF CS		<0.801	0.801	U		GELC
Pajarito above SR-4	05/02	05/25	WM UF CS		<0.958	0.958	U		GELC
Pajarito above SR-4	05/02	05/25	WM UF CS	FB	1.27	0.958	J	U	GELC
Pajarito above SR-4	06/27	07/20	WT UF CS		<9.58	9.58	U		GELC
Pajarito above SR-4	08/06	08/30	WT UF DUP		<4.79	4.79	U		GELC
Pajarito above SR-4	08/06	08/30	WT UF CS		<4.79	4.79	U		GELC

Table 5-6. Perchlorate in Surface Water during 2001 (µg/L)[a] (Cont.)

Location Name	Sample Date	Analysis Date	Codes[b]	Field QC Type Code[c]	Result	MDL	Lab Qualifier Code[d]	Valid Flag Code[d]	Lab[e]
Pajarito Plateau Stations (Cont.)									
Pajarito Canyon (includes Twomile, Threemile Canyons) (Cont.)									
Pajarito above SR-4	08/09	09/06	WT UF CS		<1.92	1.92	U		GELC
Pajarito above SR-4	08/09	09/06	WT UF DUP		<1.92	1.92	U		GELC
Pajarito above SR-4	08/16	09/06	WT UF CS		<0.958	0.958	U		GELC
Pajarito at Rio Grande	09/25	10/09	WS UF CS		<0.958	0.958	U		GELC
Pajarito at Rio Grande	09/25	10/09	WS UF CS	FB	<0.958	0.958	U		GELC
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons):									
Water above SR-501	03/15	03/28	WM UF CS		3.53	0.958	J		GELC
Water above SR-501	03/20	03/28	WM UF CS		3.06	0.958	J		GELC
Water above SR-501	04/04	04/28	WM UF CS		<0.801	0.801	U		GELC
Water above SR-501	04/18	05/04	WM UF CS		<0.801	0.801	U		GELC
Water above SR-501	05/02	05/25	WM UF CS		<0.958	0.958	U		GELC
Cañon de Valle above SR-501	04/04	04/28	WM UF CS		<0.801	0.801	U		GELC
Cañon de Valle above SR-501	04/18	05/04	WM UF CS		<0.801	0.801	U		GELC
Cañon de Valle above SR-501	05/02	05/25	WM UF CS		2.37	0.958	J	U	GELC
Cañon de Valle above Water	08/09	09/06	WT UF CS		<4.79	4.79	U		GELC
Water at Beta	04/17	05/02	WM UF DUP		<0.801	0.801	U		GELC
Water at Beta	04/17	05/02	WM UF CS		<0.801	0.801	U		GELC
Water below MDA AB	08/08	08/30	WT UF CS		<3.83	3.83	U		GELC
Water below SR-4	03/21	3/28	WM UF CS		11.3	0.958			GELC
Water below SR-4	04/04	4/28	WM UF CS		<0.801	0.801	U		GELC
Water below SR-4	08/03	8/30	WT UF CS		<4.79	4.79	U		GELC
Potrillo Tributary Study Area	8/30	9/13	WT UF CS		<0.958	0.958	U		GELC

Table 5-6. Perchlorate in Surface Water during 2001 (µg/L)[a] (Cont.)

Location Name	Sample Date	Analysis Date	Codes[b]	Field QC Type Code[c]	Result	MDL	Lab Qualifier Code[d]	Valid Flag Code[d]	Lab[e]
Pajarito Plateau Stations (Cont.)									
Frijoles Canyon:									
Frijoles at Monument Headquarters	7/18	08/06	WS UF CS		<0.958	0.958	U		GELC
Frijoles at Monument Headquarters	7/18	08/06	WS UF DUP		<0.958	0.958	U		GELC
Frijoles at Rio Grande	09/26	10/09	WS UF CS	FTB	<0.958	0.958	U		GELC
Frijoles at Rio Grande	09/26	10/09	WS UF CS	FD	<0.958	0.958	U		GELC
Quality Assurance:									
DI Blank	04/04	04/28	WM UF CS	PEB	<0.801	0.801	U		GELC
DI Blank	07/17	08/06	WS UF CS	PEB	<0.958	0.958	U		GELC

[a]Detections are shaded.
[b] Codes: WM-snowmelt; WT-storm runoff; WS-base flow; UF-unfiltered; F-filtered; CS-customer sample; DUP-laboratory duplicate; TRP-laboratory triplicate; QUD-laboratory quadruplicate.
[c]FTB-trip blank; FD-field duplicate; FB-field blank; PEB-performance evaluation blank.
[d]For Lab Qualifier Codes and Valid Flag Codes, see Table 5-4.
[e]GEL-General Engineering Labs; ACCU-Acculabs.

Table 5-7. Trace Metals in Snowmelt and Base Flow for 2001 (µg/L)

Station Name	Date	Codes[a]			Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Regional Stations																
Rio Chama at Chamita (bank)	08/01	WS	F	CS	<[b] 0.3	62.5	< 2.6	< 33.3	91.5	< 0.25	< 0.1	< 1.0	< 1.5	< 1.9	< 26.0	< 0.07
Rio Chama at Chamita (bank)	08/01	WS	UF	CS												< 0.07
Rio Grande at Embudo (bank)	08/01	WS	F	CS	< 0.3	< 33.9	< 2.6	< 42.0	35.7	< 0.25	< 0.1	< 1.0	< 1.5	< 1.2	< 4.6	< 0.07
Rio Grande at Embudo (bank)	08/01	WS	UF	CS												< 0.07
Rio Grande at Otowi Upper (bank)	07/17	WS	F	CS	< 0.7	< 14.9	< 2.6	< 43.9	56.9	< 0.21	< 0.4	< 0.7	< 0.6	< 1.8	< 10.5	< 0.06
Rio Grande at Otowi Upper (bank)	07/17	WS	UF	CS												< 0.06
Rio Grande at Otowi (bank)	07/17	WS	F	CS	< 0.7	< 16.5	< 2.6	< 45.6	58.2	< 0.21	< 0.4	< 0.7	< 0.6	< 1.7	< 11.9	< 0.06
Rio Grande at Otowi (bank)	07/17	WS	F	DUP												
Rio Grande at Otowi (bank)	07/17	WS	UF	CS												< 0.06
Rio Grande at Frijoles (bank)	09/26	WS	F	CS	< 0.3	< 17.1	< 2.6	< 21.6	66.4	< 0.25	< 0.5	< 1.0	< 1.5	< 1.1	< 6.0	< 0.07
Rio Grande at Frijoles (bank)	09/26	WS	UF	CS												< 0.07
Rio Grande at Cochiti	09/26	WS	F	CS	< 0.3	< 39.1	< 2.6	< 40.1	71.4	< 0.25	< 0.5	< 1.2	< 1.5	< 1.3	< 6.5	< 0.07
Rio Grande at Cochiti	09/26	WS	UF	CS												< 0.07
Jemez River	04/18	WS	F	CS	< 0.9	340.0	< 2.3	< 38.6	61.6	< 0.16	< 0.1	< 3.3	< 0.6	< 1.5	220.0	< 0.06
Jemez River	04/18	WS	UF	CS												< 0.06
Jemez River	04/18	WS	UF	DUP												
Jemez River	04/18	WS	UF	TRP												
Pajarito Plateau Stations																
Guaje Canyon:																
Guaje Canyon	10/12	WS	F	CS	< 0.3	< 23.4	< 2.6	< 29.0	31.3	< 0.25	< 0.5	< 1.0	< 1.5	< 1.9	137.0	< 0.07
Guaje Canyon	10/12	WS	F	DUP	< 0.3	< 18.9	< 3.9	< 28.5	31.4	< 0.25	< 0.5	< 1.0	< 1.5	< 1.9	145.0	
Guaje Canyon	10/12	WS	UF	CS												< 0.07
Guaje above Rendija	04/18	WM	F	CS	< 0.9	486.0	< 2.3	< 17.0	31.7	< 0.16	< 0.1	< 2.7	< 0.6	< 1.0	234.0	< 0.06
Guaje above Rendija	04/18	WM	UF	CS	< 0.9	6570.0	< 2.3	< 12.0	117.0	0.65	< 0.4	< 1.9	< 2.3	< 4.3	3,810.0	< 0.06
Guaje above Rendija	04/18	WM	UF	DUP												
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons):																
Los Alamos Reservoir	05/01	WS	F	CS	< 0.9	1140.0	< 4.1	< 25.3	33.6	< 0.19	< 0.1	< 0.8	< 0.7	< 1.2	434.0	< 0.06
Los Alamos Reservoir	05/01	WS	F	DUP	< 0.9	1080.0	< 4.1	< 24.3	32.9	< 0.19		< 0.8	< 0.9	< 1.2	418.0	
Los Alamos Reservoir	05/01	WS	UF	CS	< 0.9	1820.0	< 4.1	< 29.9	38.5	< 0.19	< 0.1	< 0.8	< 1.1	< 1.2	732.0	< 0.06
Los Alamos above Ice Rink	03/07	WM	UF	CS	< 1.0	500.0	< 2.6	< 27.6	41.6	< 0.25	< 0.1	< 1.0	< 1.0	< 0.7	319.0	< 0.07
Los Alamos above Ice Rink	03/07	WM	UF	DUP	< 1.0	492.0	< 2.6	< 26.5	41.5	< 0.25	< 0.1	< 1.0	< 1.2	< 0.9	291.0	< 0.07
Los Alamos above Ice Rink	03/07	WM	F	CS	< 0.3	188.0	< 2.6	< 23.6	38.0	< 0.25	< 0.1	< 1.0	< 0.6	< 1.9	114.0	
Los Alamos above Ice Rink	03/15	WM	F	CS	< 0.3	125.0	< 2.6	< 11.4	34.9	< 0.25	< 0.1	7.9	< 1.5	< 1.1	65.4	
Los Alamos above Ice Rink	03/15	WM	UF	CS	< 0.3	933.0	< 2.6	< 7.4	44.4	< 0.25	< 0.1	< 1.0	< 1.5	< 1.1	536.0	< 0.07
Los Alamos above Ice Rink	03/20	WM	F	CS	< 0.3	74.9	< 2.6	< 14.2	35.5	< 0.25	< 0.1	< 1.0	< 1.5	< 1.9	< 39.1	< 0.07
Los Alamos above Ice Rink	03/20	WM	UF	CS	< 0.3	1080.0	< 2.6	< 10.1	49.0	< 0.25	< 0.1	< 1.0	< 1.5	< 1.4	609.0	< 0.07
Los Alamos above Ice Rink	03/20	WM	UF	DUP	< 0.3	1060.0	< 2.6	< 10.2	48.9	< 0.25	< 0.1	< 1.0	< 0.6	< 1.2	602.0	< 0.07
Los Alamos above Ice Rink	03/20	WM	F	CS	< 0.3	123.0	< 2.6	< 15.9	36.3	< 0.25	< 0.1	< 1.0	< 1.5	< 0.7	67.0	< 0.07
Los Alamos above Ice Rink	03/20	WM	UF	CS	< 0.3	1030.0	< 2.6	< 18.1	47.9	< 0.25	< 0.1	< 1.0	< 1.5	< 1.4	576.0	< 0.07
Los Alamos above Ice Rink	04/04	WM	F	CS	< 0.9	84.9	< 2.3	< 17.9	29.5	< 0.16	< 0.1	< 0.4	< 0.6	< 0.6	81.0	< 0.06
Los Alamos above Ice Rink	04/04	WM	UF	CS	< 0.9	7180.0	< 2.3	< 16.8	109.0	< 0.35	< 0.1	< 1.5	< 3.3	< 3.5	3,780.0	< 0.06
Los Alamos above Ice Rink	04/04	WM	UF	DUP							< 0.1					
Los Alamos above Ice Rink	04/04	WM	UF	TRP												
Los Alamos above Ice Rink	05/02	WM	F	CS	< 0.9	1090.0	< 4.1	< 32.5	37.8	< 0.19	< 0.1	< 1.1	< 1.0	< 1.7	454.0	< 0.06
Los Alamos above Ice Rink	05/02	WM	UF	CS	< 0.9	1910.0	< 4.1	< 31.9	43.9	< 0.19	< 0.1	< 0.8	< 0.8	< 1.2	850.0	< 0.06
Los Alamos above Ice Rink	05/02	WM	UF	DUP												
Los Alamos below Ice Rink	04/18	WM	F	CS	< 0.9	266.0	< 2.3	< 15.6	31.3	< 0.16	< 0.2	< 0.4	< 0.6	< 1.0	130.0	< 0.06

Table 5-7. Trace Metals in Snowmelt and Base Flow for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]			Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Pajarito Plateau Stations (Cont.)																
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)																
Los Alamos below Ice Rink	04/18	WM	UF	CS	< 0.9	2010.0	< 2.3	< 8.8	55.0	< 0.16	< 0.3	< 0.4	< 0.9	< 2.4	1,270.0	< 0.06
Los Alamos below Ice Rink	04/18	WM	UF	DUP	< 0.9	2030.0	< 2.3	< 8.9	53.3	< 0.16	< 0.3	< 0.4	< 0.6	< 1.9	1,040.0	< 0.06
Los Alamos below Ice Rink	04/18	WM	UF	TRP												
Los Alamos below Ice Rink	08/01	WS	F	CS	< 0.3	101.0	< 2.6	< 25.0	83.8	< 0.25	0.1	< 1.0	< 1.5	< 1.7	70.5	< 0.07
Los Alamos below Ice Rink	08/01	WS	F	DUP	< 0.3	95.2	< 2.6	< 24.8	84.9	< 0.25	< 0.1	< 1.0	< 1.5	< 1.5	65.1	< 0.07
Los Alamos below Ice Rink	08/01	WS	UF	CS	< 0.3	57600.0	11.2	< 13.8	851.0	< 4.46	1.6	15.1	30.1	47.8	38,400.0	< 0.07
Los Alamos below Ice Rink	08/01	WS	UF	DUP	< 0.3	58800.0	11.4	< 14.9	844.0	< 4.44	1.6	15.4	30.8	47.4	39,400.0	< 0.07
Los Alamos below Ice Rink	08/01	WS	UF	TRP												
Los Alamos below Ice Rink	08/02	WS	F	CS	< 0.3	103.0	< 2.8	< 26.7	77.8	< 0.25	< 0.3	< 1.0	< 1.5	< 1.4	72.0	< 0.07
Los Alamos below Ice Rink	08/02	WS	F	DUP	< 0.3	88.1	< 2.6	< 26.8	78.3	< 0.25	< 0.3	< 1.0	< 1.5	< 1.5	64.6	< 0.07
Los Alamos below Ice Rink	08/02	WS	UF	CS	< 0.3	11900.0	< 2.6	< 22.7	236.0	< 0.95	< 0.8	< 2.7	5.6	11.0	7,090.0	< 0.07
Los Alamos below Ice Rink	08/02	WS	UF	DUP	< 0.3	12000.0	< 4.6	< 21.6	236.0	< 0.82	< 0.7	< 2.4	5.2	10.3	7,080.0	< 0.07
Los Alamos below Ice Rink	08/02	WS	UF	TRP												
Los Alamos at Upper GS	03/26	WM	F	CS	< 0.3	< 37.2	< 2.6	< 24.9	42.0	< 0.25	< 0.1	< 1.0	< 1.5	< 1.9	< 13.8	< 0.07
Los Alamos at Upper GS	03/26	WM	F	DUP	< 0.3	< 30.2	< 2.6	< 24.6	43.0	< 0.25	< 0.1	< 1.0	< 0.6	< 1.2	< 4.9	
Los Alamos at Upper GS	03/26	WM	UF	CS												< 0.07
Los Alamos at Upper GS	03/26	WM	UF	DUP												< 0.07
DPS-1	03/28	WM	F	CS	< 0.3	< 18.7	< 2.6	< 27.7	215.0	< 0.36	< 0.1	< 0.7	< 0.9	< 2.5	< 37.0	< 0.18
DPS-1	03/28	WM	UF	CS												< 0.07
Los Alamos above SR-4	03/15	WM	F	CS	< 0.3	113.0	< 2.6	< 12.8	48.1	< 0.25	< 0.1	< 3.5	< 1.2	< 1.0	50.7	
Los Alamos above SR-4	03/15	WM	UF	CS	< 1.6	8750.0	5.5	< 13.9	121.0	< 0.80	< 0.2	8.6	6.0	5.2	4,940.0	< 0.07
Los Alamos above SR-4	03/15	WM	UF	DUP	< 0.3	8160.0	< 3.9	< 10.1	123.0	< 0.81	108.0	8.4	< 4.9	6.4	4,640.0	< 0.07
Los Alamos above SR-4	03/21	WM	F	CS	< 0.3	240.0	< 2.6	< 25.6	53.7	< 0.25	< 0.1	< 1.0	< 0.6	< 0.7	122.0	< 0.07
Los Alamos above SR-4	03/21	WM	UF	CS	< 0.3	3610.0	< 2.6	< 22.2	86.8	< 0.26	< 0.1	< 1.3	< 3.3	< 3.3	2,390.0	< 0.07
Los Alamos above SR-4	03/21	WM	UF	DUP												
Los Alamos above SR-4	04/04	WM	F	CS	< 0.9	< 27.1	< 2.3	< 20.0	36.3	< 0.16	< 0.1	< 0.4	< 0.8	< 0.6	< 3.3	< 0.06
Los Alamos above SR-4	04/04	WM	UF	CS	< 0.9	9120.0	< 2.3	< 20.2	142.0	< 0.56	< 0.1	< 2.0	< 4.7	5.7	5,490.0	< 0.06
Los Alamos above SR-4	04/04	WM	UF	DUP												
Los Alamos above SR-4	04/04	WM	UF	TRP												
Los Alamos above SR-4	04/18	WM	F	CS	< 0.9	501.0	< 2.3	< 18.0	37.0	< 0.16	< 0.3	< 0.4	< 0.6	< 4.4	207.0	< 0.06
Los Alamos above SR-4	04/18	WM	UF	CS	< 0.9	4210.0	< 2.3	< 17.7	85.7	< 0.22	< 0.4	< 0.6	< 2.0	< 3.8	2,520.0	< 0.06
Los Alamos above SR-4	04/18	WM	UF	DUP												
Los Alamos above SR-4	05/02	WM	F	CS	< 0.9	1040.0	< 4.1	< 32.3	43.7	< 0.19	< 0.1	< 0.8	< 3.8	< 1.2	501.0	< 0.06
Los Alamos above SR-4	05/02	WM	UF	CS	< 0.9	1450.0	< 4.1	< 39.5	46.1	< 0.19	< 0.1	8.0	< 1.2	< 1.2	642.0	< 0.06
Los Alamos above SR-4	06/15	WS	F	CS	< 0.9	118.0	< 4.1	< 16.8	40.8	< 0.19	< 0.1	< 0.8	< 0.7	< 1.2	70.0	< 0.06
Los Alamos above SR-4	06/15	WS	UF	CS	< 0.9	8500.0	< 4.1	< 21.8	136.0	< 0.73	< 0.2	< 2.0	< 4.8	7.4	5,120.0	< 0.06
Los Alamos above SR-4	06/15	WS	UF	DUP	< 0.9	8390.0	< 4.1	< 20.2	136.0	< 0.62		< 2.0	< 4.5	5.6	5,030.0	< 0.06
Los Alamos above SR-4	06/15	WS	UF	TRP												
Los Alamos below LA Weir	03/15	WM	F	CS	< 0.3	68.5	< 2.6	< 17.5	49.3	< 0.25	< 0.1	< 4.9	< 1.3	< 1.9	< 18.3	
Los Alamos below LA Weir	03/15	WM	UF	CS	< 0.3	11900.0	6.4	< 13.7	130.0	< 1.12	< 0.4	6.3	5.6	6.7	5,930.0	< 0.07
Los Alamos below LA Weir	03/21	WM	F	CS	< 0.3	98.5	< 2.6	< 28.2	50.8	< 0.25	< 0.1	< 1.0	< 1.1	< 1.1	60.7	< 0.07
Los Alamos below LA Weir	03/21	WM	UF	CS	< 0.3	1680.0	< 2.6	< 25.2	63.7	< 0.25	< 0.1	< 1.0	< 1.3	< 1.6	964.0	< 0.07
Los Alamos below LA Weir	03/21	WM	UF	DUP												
Los Alamos below LA Weir	04/04	WM	F	CS	< 0.9	208.0	< 2.3	< 16.2	38.0	< 0.16	< 0.1	< 0.4	< 0.6	< 0.6	107.0	< 0.06
Los Alamos below LA Weir	04/04	WM	UF	CS	< 0.9	7230.0	< 2.3	< 19.1	106.0	< 0.36	< 0.1	< 2.1	< 3.9	< 3.4	3,880.0	< 0.06
Los Alamos below LA Weir	04/04	WM	UF	DUP												
Los Alamos below LA Weir	04/04	WM	UF	TRP												
Los Alamos below LA Weir	04/18	WM	F	CS	< 0.9	311.0	< 2.3	< 16.0	37.8	< 0.16	< 0.3	< 2.2	< 0.6	< 1.0	136.0	< 0.06

Table 5-7. Trace Metals in Snowmelt and Base Flow for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]			Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Pajarito Plateau Stations (Cont.)																
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)																
Los Alamos below LA Weir	04/18	WM	UF	CS	< 0.9	1280.0	< 2.3	< 7.9	45.8	< 0.16	< 0.3	< 0.4	< 0.8	< 1.5	681.0	< 0.06
Los Alamos below LA Weir	04/18	WM	UF	DUP												
Los Alamos below LA Weir	05/02	WM	F	CS	< 0.9	991.0	< 4.1	< 30.6	42.0	< 0.19	< 0.1	7.0	< 0.7	< 1.2	401.0	< 0.06
Los Alamos below LA Weir	05/02	WM	UF	CS	< 1.0	2060.0	< 4.1	< 23.8	54.8	< 0.19	< 0.1	8.6	< 1.8	< 1.2	1,000.0	< 0.06
Los Alamos below LA Weir	05/02	WM	UF	DUP												
Los Alamos at SR-4	03/26	WM	F	CS	< 0.3	188.0	< 2.6	< 22.8	43.2	< 0.25	< 0.1	< 1.0	< 1.1	< 1.0	90.9	< 0.07
Los Alamos at SR-4	03/26	WM	F	DUP												< 0.07
Los Alamos at SR-4	03/26	WM	UF	CS												< 0.07
Los Alamos at Rio Grande	03/26	WM	F	CS	< 0.3	< 25.3	< 2.6	88.4	59.3	< 0.25	< 0.1	< 1.0	< 1.5	< 1.8	< 15.4	< 0.07
Los Alamos at Rio Grande	03/26	WM	UF	CS												< 0.07
Pueblo 1 R	04/11	WM	F	CS	< 1.5	65.6	< 2.6	< 29.9	69.3	< 0.27	< 0.2	< 1.0	< 1.5	< 1.9	89.9	< 0.07
Pueblo 1 R	04/11	WM	UF	CS	< 1.7	432.0	< 4.5	< 24.8	72.7	< 0.52	< 0.2	< 1.0	< 1.5	< 1.9	400.0	< 0.07
Acid Weir	04/11	WM	F	CS	< 1.5	< 27.4	< 2.6	< 21.2	53.8	< 0.25	< 0.2	< 1.0	< 1.5	< 1.9	< 15.9	< 0.07
Acid Weir	04/11	WM	UF	CS	< 1.7	< 28.7	< 2.6	< 21.0	53.2	< 0.31	< 0.3	< 1.0	< 1.5	< 1.6	< 25.9	< 0.07
Acid Weir	04/11	WM	UF	DUP	< 1.6	< 39.1	< 2.6	< 19.8	54.8	< 0.32	< 0.3	< 1.0	< 1.5	< 1.9	< 13.6	< 0.07
Acid Weir	04/11	WM	UF	TRP			< 4.1					< 0.8	< 0.7	< 1.2		< 0.06
Pueblo 2	04/03	WM	F	CS	< 0.9	77.4	< 2.3	< 31.5	53.6	< 0.16	< 0.1	< 1.1	< 0.6	< 0.6	< 34.4	< 0.06
Pueblo 2	04/03	WM	UF	CS	< 0.9	534.0	< 2.3	< 38.1	58.2	< 0.16	< 0.1	< 0.4	< 0.6	< 1.5	305.0	< 0.06
Pueblo 2	04/03	WM	UF	DUP												
Pueblo 3	04/03	WS	F	CS	< 0.9	126.0	< 2.3	347.0	19.7	< 0.16	< 0.1	< 0.4	< 1.0	36.2	280.0	< 0.06
Pueblo 3	04/03	WS	UF	CS	< 2.3	3210.0	< 3.3	347.0	73.2	< 0.16	< 0.2	< 0.9	< 4.8	43.5	2,810.0	< 0.06
Pueblo 3	04/03	WS	UF	DUP												
Pueblo 3	04/03	WS	UF	TRP												
Pueblo at SR-502	04/03	WS	F	CS	< 0.9	< 29.8	< 2.3	334.0	17.0	< 0.16	< 0.1	< 1.0	< 0.6	7.5	139.0	< 0.06
Pueblo at SR-502	04/03	WS	F	CS	< 0.9	< 28.9	< 2.3	331.0	17.1	< 0.16	< 0.1	5.1	< 0.6	9.4	95.5	< 0.06
Pueblo at SR-502	04/03	WS	UF	CS	< 0.9	268.0	< 2.3	341.0	22.4	< 0.16	< 0.1	< 1.0	< 0.6	9.1	330.0	< 0.06
Pueblo at SR-502	04/03	WS	UF	DUP	< 0.9	284.0	< 2.3	345.0	22.6	< 0.16	< 0.1	< 1.0	< 0.7	9.6	339.0	< 0.06
Pueblo at SR-502	04/03	WS	UF	CS	< 0.9	265.0	< 2.3	320.0	21.7	< 0.16	< 0.1	< 4.7	< 0.6	9.0	331.0	< 0.06
Pueblo at SR-502	04/03	WS	UF	DUP												
Sandia Canyon:																
SCS-1	05/17	WS	F	CS	< 0.9	< 15.7	< 3.9	53.7	28.2	< 0.16	< 0.1	< 0.4	< 3.3	< 3.8	< 48.5	< 0.06
SCS-1	05/17	WS	F	DUP	< 0.9	< 7.6	5.3	50.9	27.6	< 0.16		< 0.4	< 3.5	< 4.3	< 3.3	
SCS-1	05/17	WS	UF	CS												< 0.06
SCS-2	05/17	WS	F	CS	< 0.9	170.0	5.2	73.6	32.6	< 0.16	< 0.3	< 0.4	9.4	8.0	298.0	< 0.06
SCS-2	05/17	WS	F	CS	< 0.9	137.0	< 3.7	65.5	30.3	< 0.16	< 0.2	< 0.4	8.6	6.8	254.0	< 0.06
SCS-2	05/17	WS	UF	CS												< 0.06
SCS-2	05/17	WS	UF	DUP												< 0.06
SCS-2	05/17	WS	UF	CS												< 0.06
SCS-3	05/17	WS	F	CS	< 0.9	187.0	6.3	78.4	33.0	< 0.16	< 0.1	< 0.4	9.7	7.6	297.0	< 0.06
SCS-3	05/17	WS	UF	CS												< 0.06
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey):																
Mortandad at GS-1	04/18	WS	F	CS	< 0.9	933.0	< 2.3	< 43.4	31.4	< 0.16	1.0	< 0.5	< 2.2	30.3	584.0	< 0.06
Mortandad at GS-1	04/18	WS	F	DUP	< 0.9	973.0	< 2.3	< 44.4	31.7	< 0.16		< 0.4	< 2.2	30.5	601.0	
Mortandad at GS-1	04/18	WS	UF	CS												< 0.06

Table 5-7. Trace Metals in Snowmelt and Base Flow for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]			Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Pajarito Plateau Stations (Cont.)																
Pajarito Canyon (includes Twomile, Threemile Canyons):																
Pajarito below SR-501	03/20	WM	F	CS	< 0.3	324.0	< 2.6	< 13.0	42.2	< 0.25	< 0.1	< 4.4	< 1.5	< 0.7	167.0	< 0.07
Pajarito below SR-501	03/20	WM	UF	CS	< 0.3	4510.0	< 2.6	< 12.6	131.0	< 0.30	< 0.1	< 4.7	< 2.1	< 3.7	2,620.0	< 0.07
Pajarito below SR-501	03/20	WM	UF	DUP												
Pajarito below SR-501	04/04	WM	F	CS	< 0.9	660.0	< 2.3	< 7.5	39.0	< 0.16	< 0.1	< 0.4	< 0.6	< 0.6	267.0	< 0.06
Pajarito below SR-501	04/04	WM	UF	CS	< 0.9	1610.0	< 2.3	< 17.1	52.2	< 0.16	< 0.1	< 1.3	< 0.8	< 0.6	737.0	< 0.06
Pajarito below SR-501	04/04	WM	UF	DUP												
Pajarito below SR-501	04/18	WM	F	CS	< 0.9	1180.0	< 2.3	< 7.6	37.2	< 0.16	< 0.1	< 0.4	< 0.6	< 1.1	421.0	< 0.06
Pajarito below SR-501	04/18	WM	UF	CS	< 0.9	1820.0	< 2.3	< 13.3	51.6	< 0.16	< 0.3	< 2.5	< 0.7	< 1.7	834.0	< 0.06
Pajarito below SR-501	04/18	WM	UF	DUP												
Pajarito below SR-501	05/02	WM	F	CS	< 0.9	683.0	< 4.1	< 10.6	37.7	< 0.19	< 0.1	< 0.8	< 0.7	< 1.2	286.0	< 0.06
Pajarito below SR-501	05/02	WM	F	DUP	< 0.9	683.0	< 4.1	< 10.7	38.5	< 0.19		< 0.8	< 0.7	< 1.2	288.0	
Pajarito below SR-501	05/02	WM	UF	CS	< 0.9	742.0	< 4.1	< 33.9	39.1	< 0.19	< 0.1	< 3.2	< 0.7	< 1.2	310.0	< 0.06
Pajarito below SR-501	05/02	WM	UF	DUP							< 0.1					
Pajarito Canyon	04/04	WM	F	CS	< 0.9	336.0	< 2.3	< 12.5	52.8	< 0.16	< 0.1	< 0.4	< 0.6	< 0.6	160.0	< 0.06
Pajarito Canyon	04/04	WM	UF	CS	< 0.9	3250.0	< 2.3	< 9.1	87.8	< 0.16	< 0.1	< 0.6	< 1.8	< 2.7	1,910.0	< 0.06
Pajarito Canyon	04/04	WM	UF	DUP												
Pajarito above SR-4	03/21	WM	F	CS	< 0.3	< 45.1	< 3.2	< 48.2	154.0	< 0.25	< 0.1	< 1.5	< 1.5	< 1.5	< 37.1	< 0.07
Pajarito above SR-4	03/21	WM	UF	CS	< 0.3	577.0	< 2.6	55.7	161.0	< 0.25	< 0.1	< 1.0	< 1.5	< 1.9	401.0	< 0.07
Pajarito above SR-4	03/21	WM	UF	DUP	< 0.3	604.0	< 2.6	56.8	165.0	< 0.25	< 0.1	< 1.0	< 1.5	< 1.6	412.0	< 0.07
Pajarito above SR-4	04/04	WM	F	CS	< 0.9	89.1	< 2.3	< 41.3	88.7	< 0.16	< 0.1	< 0.4	< 0.6	< 0.6	63.6	< 0.06
Pajarito above SR-4	04/04	WM	UF	CS	< 0.9	394.0	< 2.3	< 34.6	90.7	< 0.16	< 0.1	< 0.4	< 0.6	< 0.6	300.0	< 0.06
Pajarito above SR-4	04/04	WM	UF	DUP												
Pajarito above SR-4	04/18	WM	F	CS	< 0.9	< 16.0	< 2.3	< 45.4	113.0	< 0.16	< 0.1	< 0.4	< 0.6	< 2.2	59.3	< 0.06
Pajarito above SR-4	04/18	WM	UF	CS	< 0.9	< 32.9	< 2.3	< 40.4	118.0	< 0.16	< 0.3	< 0.4	< 0.6	< 1.7	87.3	< 0.06
Pajarito above SR-4	04/18	WM	UF	DUP												
Pajarito above SR-4	05/02	WM	F	CS	< 0.9	72.9	< 4.1	56.2	153.0	< 0.19	< 0.1	< 4.5	< 0.7	< 1.2	77.1	< 0.06
Pajarito above SR-4	05/02	WM	UF	CS	< 0.9	65.7	< 4.1	< 47.6	157.0	< 0.19	< 0.1	< 3.7	< 0.7	< 1.2	107.0	< 0.06
Pajarito above SR-4	05/02	WM	UF	DUP												
Pajarito at Rio Grande	09/25	WS	F	CS	< 0.3	< 34.3	< 2.6	< 29.2	40.9	< 0.25	< 0.5	< 2.5	< 3.8	< 1.9	< 4.6	< 0.07
Pajarito at Rio Grande	09/25	WS	UF	CS												< 0.07
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons):																
Water above SR-501	03/15	WM	F	CS	< 0.3	453.0	< 2.6	< 15.2	32.1	< 0.25	< 0.1	< 1.0	< 1.5	< 1.1	192.0	
Water above SR-501	03/15	WM	UF	CS	< 0.3	643.0	< 2.6	< 13.9	35.0	< 0.25	< 0.1	< 1.0	< 1.5	< 1.1	301.0	< 0.07
Water above SR-501	03/20	WM	F	CS	< 0.3	484.0	< 2.6	< 8.0	33.6	< 0.25	< 0.1	< 4.9	< 1.5	< 3.1	231.0	< 0.07
Water above SR-501	03/20	WM	UF	CS	< 0.3	575.0	< 2.6	< 8.5	36.1	< 0.25	< 0.1	9.9	< 1.5	< 0.9	289.0	< 0.07
Water above SR-501	04/04	WM	F	CS	< 0.9	373.0	< 2.3	< 14.4	43.5	< 0.16	< 0.1	< 0.4	< 0.6	< 0.6	149.0	< 0.06
Water above SR-501	04/04	WM	F	DUP	< 0.9	399.0	< 2.3	< 13.4	44.2	< 0.16		< 0.4	< 0.6	< 0.6	176.0	< 0.06
Water above SR-501	04/04	WM	UF	CS	< 0.9	813.0	< 2.3	< 12.4	48.8	< 0.16	< 0.1	< 0.4	< 0.6	< 0.6	383.0	< 0.06
Water above SR-501	04/04	WM	UF	DUP												
Water above SR-501	04/18	WM	F	CS	< 0.9	52.1	< 2.3	< 3.6	40.7	< 0.16	< 0.1	< 0.4	< 0.6	< 0.6	< 33.0	< 0.06
Water above SR-501	04/18	WM	UF	CS	< 0.9	108.0	< 2.3	< 17.0	42.3	< 0.16	< 0.3	< 0.4	< 0.6	< 0.9	91.0	< 0.06
Water above SR-501	04/18	WM	UF	DUP												
Water above SR-501	05/02	WM	F	CS	< 0.9	162.0	< 4.1	< 20.4	42.7	< 0.19	< 0.1	< 0.8	< 0.7	< 1.2	67.5	< 0.06
Water above SR-501	05/02	WM	UF	CS	< 0.9	4000.0	< 4.1	< 19.2	99.0	< 0.19	< 0.1	< 0.8	< 2.3	< 1.5	2,250.0	< 0.06
Water above SR-501	05/02	WM	UF	DUP												
Cañon de Valle above SR-501	04/04	WM	F	CS	< 0.9	243.0	< 2.3	< 7.0	24.5	< 0.16	< 0.1	< 0.4	< 0.6	< 0.6	89.8	< 0.06
Cañon de Valle above SR-501	04/04	WM	UF	CS	< 0.9	4750.0	< 2.3	< 3.7	69.8	< 0.16	< 0.1	< 0.9	< 2.1	< 1.1	2,300.0	< 0.06

Table 5-7. Trace Metals in Snowmelt and Base Flow for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]			Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Pajarito Plateau Stations (Cont.)																
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons): (Cont.)																
Cañon de Valle above SR-501	04/04	WM	UF	DUP												
Cañon de Valle above SR-501	04/18	WM	F	CS	< 0.9	1550.0	< 2.3	< 14.9	30.7	< 0.16	< 0.1	< 0.5	< 0.6	< 1.2	522.0	< 0.06
Cañon de Valle above SR-501	04/18	WM	UF	CS	< 0.9	1950.0	< 2.3	< 14.0	36.6	< 0.16	< 0.3	< 2.5	< 0.7	< 1.3	741.0	< 0.06
Cañon de Valle above SR-501	04/18	WM	UF	DUP												
Cañon de Valle above SR-501	05/02	WM	F	CS	< 0.9	1030.0	< 4.1	< 9.1	30.3	< 0.19	< 0.1	< 0.8	< 0.7	< 1.2	379.0	< 0.06
Cañon de Valle above SR-501	05/02	WM	UF	CS	< 0.9	1310.0	< 4.1	< 27.9	34.9	< 0.19	< 0.1	< 3.7	< 0.8	< 1.2	504.0	< 0.06
Cañon de Valle above SR-501	05/02	WM	UF	DUP												
Water at Beta	04/17	WM	F	CS	< 0.9	132.0	< 2.3	< 24.2	142.0	< 0.16	< 0.1	< 2.4	< 0.6	< 1.1	68.6	< 0.06
Water at Beta	04/17	WM	F	DUP							< 0.1					
Water at Beta	04/17	WM	UF	CS												< 0.06
Water at Beta	04/17	WM	UF	DUP												< 0.06
Water below SR-4	03/21	WM	F	CS	< 0.3	341.0	< 2.6	< 47.3	136.0	< 0.25	< 0.1	< 1.0	< 1.5	< 1.9	187.0	< 0.07
Water below SR-4	03/21	WM	UF	CS	< 0.3	8410.0	< 2.6	< 42.8	269.0	< 0.48	< 0.1	< 1.1	< 4.0	5.3	5,010.0	< 0.07
Water below SR-4	03/21	WM	UF	DUP												
Water below SR-4	04/04	WM	F	CS	< 0.9	212.0	< 2.3	< 17.3	106.0	< 0.16	< 0.1	< 0.4	< 0.6	< 0.6	95.7	< 0.06
Water below SR-4	04/04	WM	UF	CS	< 0.9	2980.0	< 2.3	< 15.9	149.0	< 0.16	< 0.1	< 0.9	< 1.4	< 0.7	1,690.0	< 0.06
Water below SR-4	04/04	WM	UF	DUP												
Ancho Canyon:																
Ancho at Rio Grande	09/25	WS	F	CS	< 0.3	< 34.3	< 2.6	< 20.6	26.3	< 0.25	< 0.5	< 0.7	< 1.5	< 1.9	< 4.6	< 0.07
Ancho at Rio Grande	09/25	WS	UF	CS												< 0.07
Frijoles Canyon:																
Frijoles at Monument Headquarters	07/18	WS	F	CS	< 0.7	< 29.8	< 2.6	< 12.7	16.3	< 0.21	< 0.4	< 0.7	< 0.6	< 1.0	68.2	< 0.06
Frijoles at Monument Headquarters	07/18	WS	UF	CS												< 0.06
Frijoles at Monument Headquarters	07/18	WS	UF	DUP	< 0.7	708.0	< 2.6	< 7.1	22.6	< 0.21	< 0.4	< 0.7	< 0.6	< 1.5	483.0	< 0.06
Frijoles at Rio Grande	09/26	WS	F	CS	< 0.3	< 48.5	< 2.6	< 14.6	17.1	< 0.25	< 0.4	< 1.0	< 1.5	< 1.9	73.6	< 0.07
Frijoles at Rio Grande	09/26	WS	F	DUP	< 0.3	52.8	< 2.6	< 12.6	17.7	< 0.25	< 0.5	< 1.0	< 1.5	< 1.9	71.6	< 0.07
Frijoles at Rio Grande	09/26	WS	F	CS	< 0.3	52.3	< 2.6	< 10.1	16.6	< 0.25	< 0.5	< 3.8	< 1.5	< 1.9	66.2	< 0.07
Frijoles at Rio Grande	09/26	WS	UF	CS												< 0.07
Frijoles at Rio Grande	09/26	WS	UF	CS												< 0.07
Frijoles at Rio Grande	09/26	WS	UF	DUP												
Water Quality Standards[c]																
EPA Primary Drinking Water Standard							10		2,000	4	5		100			2
EPA Secondary Drinking Water Standard						50-200									300	
EPA Action Level														1,300		
EPA Health Advisory																
NMWQCC Livestock Watering Standard						5,000	200	5,000			50	1,000	1,000	500		10
NMWQCC Groundwater Limit					50	5,000	100	750	1,000		10	50	50	1,000	1,000	2
NMWQCC Wildlife Habitat Standard																0.77

Table 5-7. Trace Metals in Snowmelt and Base Flow for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]			Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Regional Stations															
Rio Chama at Chamita (bank)	08/01	WS	F	CS	< 6.4	< 1.7	< 1.3	< 0.03	0.34	< 2.4	< 3.5	395.0	< 0.01	< 2.5	< 3.3
Rio Chama at Chamita (bank)	08/01	WS	UF	CS						< 2.4					
Rio Grande at Embudo (bank)	08/01	WS	F	CS	< 4.3	< 7.7	< 1.2	< 0.10	0.26	< 2.4	< 3.5	234.0	< 0.01	5.3	< 3.3
Rio Grande at Embudo (bank)	08/01	WS	UF	CS						< 2.4					
Rio Grande at Otowi Upper (bank)	07/17	WS	F	CS	< 3.0	< 4.2	< 1.3	< 2.43	< 0.41	< 3.5	< 1.9	262.0	< 0.31	< 4.0	< 1.3
Rio Grande at Otowi Upper (bank)	07/17	WS	UF	CS						< 3.5					
Rio Grande at Otowi (bank)	07/17	WS	F	CS	20.3	< 7.4	< 1.3	< 2.43	< 0.20	< 3.5	< 1.9	261.0	1.03	< 4.3	< 1.4
Rio Grande at Otowi (bank)	07/17	WS	F	DUP					< 0.13				< 0.31		
Rio Grande at Otowi (bank)	07/17	WS	UF	CS						< 3.5					
Rio Grande at Frijoles (bank)	09/26	WS	F	CS	< 4.4	< 3.8	< 1.2	< 2.57	0.15		< 3.5	294.0	< 0.01	< 3.2	< 1.3
Rio Grande at Frijoles (bank)	09/26	WS	UF	CS						< 2.4					
Rio Grande at Cochiti	09/26	WS	F	CS	21.2	< 2.8	< 1.2	< 2.57	0.11		< 3.5	303.0	< 0.01	< 3.5	< 1.1
Rio Grande at Cochiti	09/26	WS	UF	CS						< 2.4					
Jemez River	04/18	WS	F	CS	< 8.8	< 1.3	< 0.9	< 0.16	< 0.15		< 2.3	88.0	0.55	< 1.2	< 0.7
Jemez River	04/18	WS	UF	CS						< 2.9					
Jemez River	04/18	WS	UF	DUP											
Jemez River	04/18	WS	UF	TRP											
Pajarito Plateau Stations															
Guaje Canyon:															
Guaje Canyon	10/12	WS	F	CS	318.0	< 2.4	< 1.3	< 2.57	< 0.20	< 2.4	< 3.5	93.2	< 0.01	< 1.5	< 3.4
Guaje Canyon	10/12	WS	F	DUP	319.0	< 1.7	< 1.2	< 2.57	< 0.17	< 2.4	< 3.5	93.2	< 0.01	< 1.4	6.4
Guaje Canyon	10/12	WS	UF	CS						< 2.4					
Guaje above Rendija	04/18	WM	F	CS	< 9.0	< 1.3	< 1.8	< 0.13	< 0.15	< 2.9	< 2.3	68.9	< 0.08	< 2.3	< 2.8
Guaje above Rendija	04/18	WM	UF	CS	368.0	< 1.3	< 4.4	6.40	< 0.15	< 2.9	< 2.3	95.6	< 0.24	7.9	21.2
Guaje above Rendija	04/18	WM	UF	DUP											
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons):															
Los Alamos Reservoir	05/01	WS	F	CS	41.6	< 1.5	< 1.7	0.27	< 0.15		< 3.0	78.8	< 0.13	< 1.5	< 3.3
Los Alamos Reservoir	05/01	WS	F	DUP	41.5	< 1.5	< 1.6			< 2.8	< 3.0	78.7		< 1.7	< 2.0
Los Alamos Reservoir	05/01	WS	UF	CS	58.4	< 1.5	< 1.4	0.71	< 0.15	< 2.8	< 3.0	79.9	< 0.48	< 1.9	< 3.2
Los Alamos above Ice Rink	03/07	WM	UF	CS	41.7	< 2.1	< 1.2	< 0.48	< 0.11	< 4.7	< 3.5	111.0	0.58	< 1.7	22.0
Los Alamos above Ice Rink	03/07	WM	UF	DUP	41.0	< 1.7	< 1.2	< 0.47	< 0.11	< 2.4	< 2.6	111.0	< 0.01	< 1.9	< 2.9
Los Alamos above Ice Rink	03/07	WM	F	CS	11.7	< 1.6	< 1.2	< 0.08	< 0.11		< 2.6	112.0	1.22	< 1.3	13.5
Los Alamos above Ice Rink	03/15	WM	F	CS	19.1	< 1.7	< 1.0	0.22	< 0.11	< 2.4	< 3.5	101.0	< 0.01	< 1.0	3.7
Los Alamos above Ice Rink	03/15	WM	UF	CS	83.0	< 1.5	< 1.2	1.46	< 0.11	< 2.4	< 3.5	102.0	< 0.27	< 1.7	7.4
Los Alamos above Ice Rink	03/20	WM	F	CS	15.7	< 1.7	< 1.2	< 0.08	< 0.11	< 2.4	< 3.5	105.0	< 0.01	< 0.7	< 1.3
Los Alamos above Ice Rink	03/20	WM	UF	CS	93.9	< 3.6	< 1.2	< 1.38	< 0.11	< 2.4	< 3.5	109.0	< 0.43	< 1.5	5.4
Los Alamos above Ice Rink	03/20	WM	UF	DUP	92.9	< 1.7	< 1.2	< 1.33	< 0.11	< 2.4	< 3.5	108.0	< 0.01	< 1.5	5.9
Los Alamos above Ice Rink	03/20	WM	F	CS	16.1	< 1.7	< 1.2	< 0.08	< 0.11	< 2.4	< 3.5	106.0	< 0.01	< 1.0	< 1.7
Los Alamos above Ice Rink	03/20	WM	UF	CS	86.5	< 1.4	< 1.0	< 1.33	< 0.11	< 2.4	< 3.5	109.0	< 0.01	< 1.5	5.5
Los Alamos above Ice Rink	04/04	WM	F	CS	< 9.1	< 1.3	< 0.8	< 0.04	< 0.15	< 2.9	< 2.3	94.6	< 0.08	< 0.6	< 2.1
Los Alamos above Ice Rink	04/04	WM	UF	CS	385.0	< 1.3	< 4.5	5.98	< 0.15	< 2.9	< 2.3	118.0	< 0.24	6.1	20.9
Los Alamos above Ice Rink	04/04	WM	UF	DUP				5.75	< 0.15				< 0.08		
Los Alamos above Ice Rink	04/04	WM	UF	TRP											
Los Alamos above Ice Rink	05/02	WM	F	CS	14.6	< 1.5	< 1.9	< 0.04	< 0.15	< 2.8	< 3.0	88.0	< 0.08	< 1.9	< 3.0
Los Alamos above Ice Rink	05/02	WM	UF	CS	57.4	< 1.5	< 1.4	< 0.67	< 0.15	< 2.8	< 3.0	90.0	< 0.08	< 2.0	5.1
Los Alamos above Ice Rink	05/02	WM	UF	DUP											
Los Alamos below Ice Rink	04/18	WM	F	CS	< 8.8	< 1.3	< 0.9	< 0.29	< 0.15	< 2.9	< 2.3	91.5	< 0.16	< 1.3	< 1.4

Table 5-7. Trace Metals in Snowmelt and Base Flow for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]			Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Pajarito Plateau Stations (Cont.)															
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)															
Los Alamos below Ice Rink	04/18	WM	UF	CS	135.0	< 1.3	< 2.5	2.44	< 0.15	< 2.9	< 2.3	94.5	0.68	< 2.4	17.3
Los Alamos below Ice Rink	04/18	WM	UF	DUP	140.0	< 1.3	< 2.2	2.27	< 0.15	< 2.9	< 2.3	95.6	< 0.24	< 2.2	7.4
Los Alamos below Ice Rink	04/18	WM	UF	TRP											
Los Alamos below Ice Rink	08/01	WS	F	CS	21.1	< 3.5	< 1.2	< 0.08	0.13	< 2.4	< 3.5	216.0	< 0.01	< 2.2	< 3.3
Los Alamos below Ice Rink	08/01	WS	F	DUP	21.3	< 3.4	< 1.2	< 0.01	< 0.13	< 2.4	< 3.5	221.0	< 0.01	< 2.1	< 3.3
Los Alamos below Ice Rink	08/01	WS	UF	CS	3,830.0	< 3.4	34.4	93.30	0.64	< 2.4	< 3.5	419.0	0.90	62.5	277.0
Los Alamos below Ice Rink	08/01	WS	UF	DUP	3,810.0	< 4.1	34.6	93.50	< 0.43	< 3.7	< 2.1	415.0	0.89	64.5	278.0
Los Alamos below Ice Rink	08/01	WS	UF	TRP											
Los Alamos below Ice Rink	08/02	WS	F	CS	< 1.9	< 2.8	< 1.2	< 0.12	< 0.19	< 2.4	< 3.5	226.0	< 0.05	< 2.1	< 2.6
Los Alamos below Ice Rink	08/02	WS	F	DUP	< 1.7	< 2.9	< 1.2	< 0.19	< 0.19	< 2.4	< 3.5	227.0	< 0.09	< 2.0	< 1.8
Los Alamos below Ice Rink	08/02	WS	UF	CS	862.0	< 3.6	6.9	19.00	< 0.48	< 2.4	< 3.5	271.0	0.74	12.3	57.3
Los Alamos below Ice Rink	08/02	WS	UF	DUP	859.0	< 2.5	6.6	19.20	< 0.49	< 2.4	< 3.5	271.0	< 0.45	12.4	55.0
Los Alamos below Ice Rink	08/02	WS	UF	TRP											
Los Alamos at Upper GS	03/26	WM	F	CS	< 5.7	< 1.7	< 1.2	< 0.08	< 0.11	< 2.4	< 3.5	117.0	< 0.45	< 1.2	< 1.8
Los Alamos at Upper GS	03/26	WM	F	DUP	< 5.6	< 1.7	< 0.8	< 0.08	< 0.11	< 2.4	< 3.5	118.0	< 0.01	< 1.5	< 1.9
Los Alamos at Upper GS	03/26	WM	UF	CS						< 2.4					
Los Alamos at Upper GS	03/26	WM	UF	DUP											
DPS-1	03/28	WM	F	CS	119.0	< 3.4	< 2.7	< 0.20	< 0.62	< 2.4	< 3.5	283.0	0.51	< 2.2	18.1
DPS-1	03/28	WM	UF	CS						< 2.4					
Los Alamos above SR-4	03/15	WM	F	CS	< 4.6	39.7	< 1.2	0.26	< 0.11	< 2.4	< 3.5	126.0	< 0.01	< 2.0	3.9
Los Alamos above SR-4	03/15	WM	UF	CS	302.0	39.5	< 3.4	10.70	< 0.22	< 4.0	< 3.1	143.0	0.53	10.6	45.6
Los Alamos above SR-4	03/15	WM	UF	DUP	305.0	39.3	< 4.1	112.00	118.00	< 2.4	< 3.5	148.0	104.00	8.8	42.6
Los Alamos above SR-4	03/21	WM	F	CS	< 8.5	27.7	< 1.2	< 0.19	< 0.11	< 2.4	< 3.5	131.0	< 0.01	< 1.1	< 4.4
Los Alamos above SR-4	03/21	WM	UF	CS	159.0	27.2	< 2.0	6.49	< 0.27	< 2.4	< 3.5	136.0	< 0.01	< 4.4	26.1
Los Alamos above SR-4	03/21	WM	UF	DUP											
Los Alamos above SR-4	04/04	WM	F	CS	< 1.7	10.3	< 0.8	< 0.04	< 0.15	< 2.9	< 2.3	108.0	< 0.08	< 2.0	< 1.1
Los Alamos above SR-4	04/04	WM	UF	CS	538.0	10.3	5.8	12.00	< 0.15	< 2.9	< 2.3	130.0	< 0.08	8.8	40.8
Los Alamos above SR-4	04/04	WM	UF	DUP											
Los Alamos above SR-4	04/04	WM	UF	TRP											
Los Alamos above SR-4	04/18	WM	F	CS	< 5.9	14.9	< 1.0	< 0.50	< 0.39	< 2.9	< 2.3	95.4	< 0.18	< 1.2	27.7
Los Alamos above SR-4	04/18	WM	UF	CS	266.0	14.8	< 2.6	8.47	< 0.15	< 2.9	< 2.3	108.0	0.68	< 4.9	27.1
Los Alamos above SR-4	04/18	WM	UF	DUP											
Los Alamos above SR-4	05/02	WM	F	CS	18.0	13.3	< 1.4	< 0.04	< 0.15	< 2.8	< 3.0	104.0	< 0.08	< 2.2	15.3
Los Alamos above SR-4	05/02	WM	UF	CS	32.3	12.5	< 2.3	< 0.41	< 0.15	< 2.8	< 3.0	102.0	< 0.08	< 2.2	19.0
Los Alamos above SR-4	06/15	WS	F	CS	< 2.8	< 4.7	< 1.4	< 0.04	< 0.15	< 2.8	< 3.0	110.0	< 0.08	< 1.0	< 2.1
Los Alamos above SR-4	06/15	WS	UF	CS	646.0	< 4.3	< 3.7	15.80	< 0.18	< 2.8	< 3.0	134.0	< 0.08	8.3	50.3
Los Alamos above SR-4	06/15	WS	UF	DUP	647.0	< 5.1	< 3.5			< 2.8	< 3.0	134.0		8.4	49.9
Los Alamos above SR-4	06/15	WS	UF	TRP											
Los Alamos below LA Weir	03/15	WM	F	CS	< 9.3	36.2	< 1.2	0.16	< 0.11	< 2.4	< 3.5	128.0	< 0.01	< 3.0	6.4
Los Alamos below LA Weir	03/15	WM	UF	CS	304.0	35.3	< 4.4	18.60	< 0.30	< 2.4	< 3.5	148.0	0.84	11.2	67.1
Los Alamos below LA Weir	03/21	WM	F	CS	< 7.3	27.2	< 1.0	< 0.14	< 0.11	< 2.4	< 3.5	128.0	< 0.01	< 1.3	12.0
Los Alamos below LA Weir	03/21	WM	UF	CS	50.3	27.8	< 1.2	2.06	< 0.16	< 2.4	< 3.5	132.0	< 0.01	< 2.3	25.7
Los Alamos below LA Weir	03/21	WM	UF	DUP											
Los Alamos below LA Weir	04/04	WM	F	CS	< 5.6	< 9.7	< 0.8	0.28	< 0.15	< 2.9	< 2.3	103.0	< 0.08	< 1.2	< 4.5
Los Alamos below LA Weir	04/04	WM	UF	CS	309.0	< 9.5	< 4.6	7.68	< 0.15	< 2.9	< 2.3	121.0	< 0.08	6.6	29.6
Los Alamos below LA Weir	04/04	WM	UF	DUP											
Los Alamos below LA Weir	04/04	WM	UF	TRP											
Los Alamos below LA Weir	04/18	WM	F	CS	< 6.8	15.9	< 1.4	< 0.34	< 0.15	< 2.9	< 2.3	98.3	< 0.17	< 1.2	8.7

Table 5-7. Trace Metals in Snowmelt and Base Flow for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]			Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Pajarito Plateau Stations (Cont.)															
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)															
Los Alamos below LA Weir	04/18	WM	UF	CS	44.7	14.8	< 1.7	< 1.42	< 0.15	< 2.9	< 2.3	99.7	< 0.33	< 1.9	17.9
Los Alamos below LA Weir	04/18	WM	UF	DUP											
Los Alamos below LA Weir	05/02	WM	F	CS	< 10.0	12.9	< 1.7	< 0.04	< 0.15	< 2.8	< 3.0	101.0	< 0.08	< 1.7	5.4
Los Alamos below LA Weir	05/02	WM	UF	CS	75.7	12.4	< 3.0	< 1.68	< 0.15	< 2.8	< 3.0	105.0	< 0.08	< 2.9	10.7
Los Alamos below LA Weir	05/02	WM	UF	DUP											
Los Alamos at SR-4	03/26	WM	F	CS	10.3	11.2	< 1.2	< 0.17	< 0.11	< 3.4	< 3.5	116.0	< 0.13	< 1.3	< 3.6
Los Alamos at SR-4	03/26	WM	F	DUP											
Los Alamos at SR-4	03/26	WM	UF	CS						< 2.4					
Los Alamos at Rio Grande	03/26	WM	F	CS	11.3	< 7.2	< 2.0	< 0.04	< 0.11	< 2.4	< 3.5	157.0	< 0.01	< 4.9	< 4.2
Los Alamos at Rio Grande	03/26	WM	UF	CS						< 3.7					
Pueblo 1 R	04/11	WM	F	CS	153.0	< 1.7	< 1.2	< 0.37	< 0.17	< 2.4	< 3.5	173.0	< 0.29	< 0.8	< 2.3
Pueblo 1 R	04/11	WM	UF	CS	157.0	< 1.7	< 1.2	< 0.78	< 0.23	< 2.4	< 3.5	173.0	< 0.49	< 1.2	< 4.1
Acid Weir	04/11	WM	F	CS	< 1.6	< 1.7	< 1.2	< 0.28	< 0.24	< 2.4	< 3.5	173.0	< 0.32	< 1.0	5.2
Acid Weir	04/11	WM	UF	CS	< 1.5	< 1.7	< 1.2	< 0.38	< 0.29	< 2.4	< 3.5	177.0	0.80	< 1.3	< 3.3
Acid Weir	04/11	WM	UF	DUP	< 1.5	< 1.7	< 1.2	< 0.36	< 0.27	< 2.4	< 3.5	178.0	0.84	< 1.1	< 3.9
Acid Weir	04/11	WM	UF	TRP		< 7.7	< 1.4			< 2.8	< 3.0				
Pueblo 2	04/03	WM	F	CS	< 6.0	< 1.3	< 0.8	< 0.17	< 0.23	< 2.9	< 2.3	146.0	< 0.10	< 3.1	8.7
Pueblo 2	04/03	WM	UF	CS	15.9	< 1.6	< 0.8	< 0.95	< 0.40	< 2.9	< 2.3	149.0	< 0.20	< 3.6	< 3.6
Pueblo 2	04/03	WM	UF	DUP											
Pueblo 3	04/03	WS	F	CS	345.0	< 5.0	< 1.4	< 0.80	< 0.24	< 2.9	< 2.3	95.1	< 0.08	12.2	42.9
Pueblo 3	04/03	WS	UF	CS	452.0	< 6.7	< 3.1	7.76	< 0.35	< 2.9	< 2.3	114.0	< 0.20	17.4	74.0
Pueblo 3	04/03	WS	UF	DUP											
Pueblo 3	04/03	WS	UF	TRP											
Pueblo at SR-502	04/03	WS	F	CS	135.0	< 4.2	< 2.6	< 0.68	< 0.15	< 2.9	< 2.3	110.0	< 0.11	6.2	18.6
Pueblo at SR-502	04/03	WS	F	CS	137.0	< 4.4	< 3.3	< 0.71	< 0.15	< 2.9	< 2.3	112.0	< 0.10	6.2	20.6
Pueblo at SR-502	04/03	WS	UF	CS	174.0	< 5.4	< 2.9	< 1.41	< 0.15	< 2.9	< 2.3	113.0	0.53	6.8	21.7
Pueblo at SR-502	04/03	WS	UF	DUP	175.0	< 5.1	< 3.3	< 1.34	< 0.15	< 2.9	< 2.3	114.0	< 0.15	7.0	21.5
Pueblo at SR-502	04/03	WS	UF	CS	169.0	< 4.0	< 3.6	< 1.42	< 0.15	< 2.9	< 2.3	111.0	< 0.13	6.9	21.3
Pueblo at SR-502	04/03	WS	UF	DUP											
Sandia Canyon:															
SCS-1	05/17	WS	F	CS	< 9.6	< 8.6	< 0.8	< 0.04	< 0.58	< 2.9	< 2.3	106.0	< 0.08	12.0	420.0
SCS-1	05/17	WS	F	DUP	< 9.1	< 8.6	< 0.8			< 2.9	< 2.3	104.0		11.9	413.0
SCS-1	05/17	WS	UF	CS						< 2.9					
SCS-2	05/17	WS	F	CS	10.2	41.4	< 1.4	< 0.22	< 0.44	< 2.9	< 2.3	112.0	< 0.08	12.3	69.7
SCS-2	05/17	WS	F	CS	< 8.9	38.4	< 0.8	< 0.21	< 0.46	< 2.9	< 2.3	105.0	< 0.08	11.5	72.7
SCS-2	05/17	WS	UF	CS						< 2.9					
SCS-2	05/17	WS	UF	DUP											
SCS-2	05/17	WS	UF	CS						< 2.9					
SCS-3	05/17	WS	F	CS	< 8.1	43.0	< 1.0	< 0.19	< 0.45	< 2.9	< 2.3	113.0	< 0.08	12.9	58.5
SCS-3	05/17	WS	UF	CS						< 2.9					
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey):															
Mortandad at GS-1	04/18	WS	F	CS	< 5.5	36.7	5.4	< 1.47	< 0.48		< 2.3	74.3	< 0.27	< 2.3	265.0
Mortandad at GS-1	04/18	WS	F	DUP	< 5.6	36.6	5.3				< 2.3	75.1		< 2.3	268.0
Mortandad at GS-1	04/18	WS	UF	CS						< 2.9					

Table 5-7. Trace Metals in Snowmelt and Base Flow for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]			Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Pajarito Plateau Stations (Cont.)															
Pajarito Canyon (includes Twomile, Threemile Canyons):															
Pajarito below SR-501	03/20	WM	F	CS	< 9.8	< 1.7	< 1.2	< 0.07	< 0.11	< 2.4	< 3.5	99.9	< 0.01	< 1.6	< 4.1
Pajarito below SR-501	03/20	WM	UF	CS	247.0	< 1.7	< 2.5	5.94	< 0.16	< 2.4	< 3.5	120.0	< 0.01	6.8	25.8
Pajarito below SR-501	03/20	WM	UF	DUP											
Pajarito below SR-501	04/04	WM	F	CS	< 4.4	< 1.3	< 0.8	0.14	< 0.15	< 2.9	< 2.3	84.6	< 0.08	< 2.1	7.4
Pajarito below SR-501	04/04	WM	UF	CS	31.8	< 1.3	< 0.9	0.76	< 0.15	< 2.9	< 2.3	91.1	< 0.08	< 2.9	< 4.7
Pajarito below SR-501	04/04	WM	UF	DUP											
Pajarito below SR-501	04/18	WM	F	CS	< 5.1	< 1.3	< 1.4	< 0.34	< 0.15	< 2.9	< 2.3	68.7	< 0.08	< 2.9	< 4.1
Pajarito below SR-501	04/18	WM	UF	CS	37.4	< 1.3	< 1.9	< 1.39	< 0.15	< 2.9	< 2.3	74.9	< 0.23	< 3.7	6.5
Pajarito below SR-501	04/18	WM	UF	DUP											
Pajarito below SR-501	05/02	WM	F	CS	< 4.3	< 1.5	< 1.4	< 0.04	< 0.15	< 2.8	< 3.0	80.6	< 0.08	< 2.7	10.7
Pajarito below SR-501	05/02	WM	F	DUP	< 4.2	< 1.5	< 1.4			< 2.8	< 3.0	82.6		< 2.7	11.2
Pajarito below SR-501	05/02	WM	UF	CS	< 4.9	< 1.7	< 1.9	< 0.04	< 0.15	< 2.8	< 3.0	81.8	< 0.08	< 3.0	9.7
Pajarito below SR-501	05/02	WM	UF	DUP				< 0.04	< 0.15				< 0.08		
Pajarito Canyon	04/04	WM	F	CS	< 7.1	< 1.3	< 1.2	< 0.27	< 0.15	< 2.9	< 2.3	98.7	< 0.08	< 1.4	< 2.5
Pajarito Canyon	04/04	WM	UF	CS	116.0	< 1.3	< 2.9	4.11	< 0.15	< 2.9	< 2.3	106.0	< 0.18	< 4.4	12.3
Pajarito Canyon	04/04	WM	UF	DUP											
Pajarito above SR-4	03/21	WM	F	CS	50.8	< 4.6	< 1.8	< 0.08	< 0.20	< 2.4	< 3.5	400.0	< 0.01	< 1.1	< 1.8
Pajarito above SR-4	03/21	WM	UF	CS	86.7	< 6.1	< 1.7	< 0.68	< 0.20	< 2.4	< 3.5	398.0	< 0.18	< 1.6	< 2.7
Pajarito above SR-4	03/21	WM	UF	DUP	88.9	< 4.5	< 1.4	< 0.71	< 0.21	< 2.4	< 3.5	408.0	< 0.01	< 1.9	< 3.5
Pajarito above SR-4	04/04	WM	F	CS	21.8	< 1.9	< 1.4	< 0.04	< 0.15	< 2.9	< 2.3	189.0	< 0.08	< 1.1	< 2.9
Pajarito above SR-4	04/04	WM	UF	CS	27.6	< 1.9	< 2.2	0.34	< 0.15	< 2.9	< 2.3	187.0	< 0.08	< 1.3	< 2.9
Pajarito above SR-4	04/04	WM	UF	DUP											
Pajarito above SR-4	04/18	WM	F	CS	91.1	< 3.2	< 2.2	< 0.04	< 0.15	< 2.9	< 2.3	248.0	< 0.08	< 1.0	6.5
Pajarito above SR-4	04/18	WM	UF	CS	97.9	< 2.9	< 1.9	< 0.28	< 0.15	< 2.9	< 2.3	260.0	< 0.19	< 1.0	< 1.4
Pajarito above SR-4	04/18	WM	UF	DUP											
Pajarito above SR-4	05/02	WM	F	CS	223.0	< 1.5	< 3.7	< 0.04	< 0.15	< 2.8	< 3.0	388.0	< 0.08	< 1.0	< 1.9
Pajarito above SR-4	05/02	WM	UF	CS	231.0	< 1.5	< 3.6	< 0.04	< 0.15	< 2.8	< 3.0	392.0	< 0.08	< 0.8	< 1.9
Pajarito above SR-4	05/02	WM	UF	DUP											
Pajarito at Rio Grande	09/25	WS	F	CS	< 0.9	< 1.6	< 1.2	< 2.57	0.23		< 3.5	124.0	< 0.01	10.3	< 3.5
Pajarito at Rio Grande	09/25	WS	UF	CS						< 2.4					
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons):															
Water above SR-501	03/15	WM	F	CS	< 1.8	< 1.7	< 1.2	0.33	< 0.11	< 2.4	< 3.5	80.0	< 0.01	< 2.5	2.8
Water above SR-501	03/15	WM	UF	CS	< 9.2	< 1.4	< 1.2	0.89	< 0.11	< 2.4	< 3.5	80.5	< 0.08	< 3.1	3.9
Water above SR-501	03/20	WM	F	CS	< 2.0	< 1.7	< 1.2	< 0.10	< 0.11	< 2.4	< 3.5	86.8	< 0.01	< 3.0	< 3.9
Water above SR-501	03/20	WM	UF	CS	10.2	< 3.5	< 2.2	< 0.25	< 0.11	< 2.4	< 3.5	86.7	< 0.43	< 2.9	5.1
Water above SR-501	04/04	WM	F	CS	< 2.0	< 2.0	< 0.8	0.08	< 0.15	< 2.9	< 2.3	109.0	< 0.08	< 2.4	< 2.5
Water above SR-501	04/04	WM	F	DUP	< 2.2	< 1.3	< 0.8			< 2.9	< 2.3	111.0		< 2.2	< 3.3
Water above SR-501	04/04	WM	UF	CS	16.4	< 1.3	< 0.8	0.29	< 0.15	< 2.9	< 2.3	111.0	< 0.08	< 2.6	< 4.7
Water above SR-501	04/04	WM	UF	DUP											
Water above SR-501	04/18	WM	F	CS	< 0.3	< 1.3	< 0.8	< 0.04	< 0.15	< 2.9	< 2.3	114.0	< 0.08	< 2.1	< 2.5
Water above SR-501	04/18	WM	UF	CS	< 2.4	< 1.3	< 0.8	< 0.21	< 0.15	< 2.9	< 2.3	117.0	< 0.17	< 2.1	< 2.6
Water above SR-501	04/18	WM	UF	DUP											
Water above SR-501	05/02	WM	F	CS	< 1.4	< 1.5	< 1.4	< 0.04	< 0.15	< 2.8	< 3.0	119.0	< 0.08	< 2.4	< 2.7
Water above SR-501	05/02	WM	UF	CS	206.0	< 1.5	< 2.7	3.27	< 0.15	< 2.8	< 3.0	135.0	< 0.08	6.7	16.6
Water above SR-501	05/02	WM	UF	DUP											
Cañon de Valle above SR-501	04/04	WM	F	CS	< 6.7	< 1.3	< 0.8	< 0.04	< 0.15	< 2.9	< 2.3	74.6	< 0.08	< 0.6	< 2.1
Cañon de Valle above SR-501	04/04	WM	UF	CS	137.0	< 1.3	< 2.0	3.04	< 0.15	< 2.9	< 2.3	85.9	< 0.08	< 4.5	14.3

Table 5-7. Trace Metals in Snowmelt and Base Flow for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]			Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Pajarito Plateau Stations (Cont.)															
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons): (Cont.)															
Cañon de Valle above SR-501	04/04	WM	UF	DUP											
Cañon de Valle above SR-501	04/18	WM	F	CS	< 7.3	< 1.3	< 1.2	< 0.28	< 0.15	< 2.9	< 2.3	69.4	< 0.08	< 1.7	< 4.3
Cañon de Valle above SR-501	04/18	WM	UF	CS	29.0	< 1.3	< 1.5	< 1.05	< 0.15	< 2.9	< 2.3	69.5	< 0.17	< 2.2	6.8
Cañon de Valle above SR-501	04/18	WM	UF	DUP											
Cañon de Valle above SR-501	05/02	WM	F	CS	< 7.3	< 1.5	< 1.4	< 0.04	< 0.15	< 2.8	< 3.0	77.0	< 0.08	< 1.7	< 3.0
Cañon de Valle above SR-501	05/02	WM	UF	CS	21.4	< 1.5	< 1.5	< 0.04	< 0.15	< 2.8	< 3.0	78.2	< 0.08	< 1.8	12.2
Cañon de Valle above SR-501	05/02	WM	UF	DUP											
Water at Beta	04/17	WM	F	CS	< 1.4	< 1.3	< 0.8	< 0.10	< 0.15		< 2.3	109.0	< 0.50	< 1.7	< 0.7
Water at Beta	04/17	WM	F	DUP				< 0.16	< 0.15				< 0.08		
Water at Beta	04/17	WM	UF	CS						< 2.9					
Water at Beta	04/17	WM	UF	DUP											
Water below SR-4	03/21	WM	F	CS	< 7.0	< 2.0	< 1.2	< 0.13	< 0.11	< 2.4	< 3.5	95.9	< 0.01	< 1.7	< 2.5
Water below SR-4	03/21	WM	UF	CS	232.0	< 3.5	< 4.6	6.92	< 0.19	< 2.4	< 3.5	113.0	< 0.29	9.1	30.3
Water below SR-4	03/21	WM	UF	DUP											
Water below SR-4	04/04	WM	F	CS	< 1.7	< 1.3	< 0.8	< 0.04	< 0.15	< 2.9	< 2.3	107.0	< 0.08	< 1.6	< 3.7
Water below SR-4	04/04	WM	UF	CS	110.0	< 1.3	< 1.8	3.28	< 0.15	< 2.9	< 2.3	111.0	< 0.08	< 4.5	10.8
Water below SR-4	04/04	WM	UF	DUP											
Ancho Canyon:															
Ancho at Rio Grande	09/25	WS	F	CS	< 0.5	< 1.3	< 1.2	< 2.57	0.10		< 3.5	59.9	< 0.01	6.7	< 2.8
Ancho at Rio Grande	09/25	WS	UF	CS						< 2.4					
Frijoles Canyon:															
Frijoles at Monument Headquarters	07/18	WS	F	CS	< 9.8	< 1.6	< 1.3	< 2.43	< 0.25	< 3.5	< 1.9	55.1	< 0.28	< 3.8	< 1.7
Frijoles at Monument Headquarters	07/18	WS	UF	CS						5.6					
Frijoles at Monument Headquarters	07/18	WS	UF	DUP	47.2	< 1.2	< 1.3	< 2.43		< 3.5	< 1.9	56.6		< 4.7	< 3.8
Frijoles at Rio Grande	09/26	WS	F	CS	< 1.3	< 2.0	< 1.2	< 2.57	0.06	< 2.4	< 3.5	61.2	< 0.01	< 3.2	< 2.9
Frijoles at Rio Grande	09/26	WS	F	DUP	< 0.8	< 1.6	< 1.2	< 2.57	< 0.11	< 2.4	< 3.5	60.9	< 0.01	< 3.1	< 2.7
Frijoles at Rio Grande	09/26	WS	F	CS	< 0.6	< 1.9	< 1.2	< 2.57	< 0.11		< 3.5	60.2	< 0.01	< 3.0	< 2.8
Frijoles at Rio Grande	09/26	WS	UF	CS						< 2.4					
Frijoles at Rio Grande	09/26	WS	UF	CS						< 2.4					
Frijoles at Rio Grande	09/26	WS	UF	DUP											
Water Quality Standards[c]															
EPA Primary Drinking Water Standard							100		6	50			2		
EPA Secondary Drinking Water Standard					50										5,000
EPA Action Level								15							
EPA Health Advisory												25,000–90,000		80–110	
NMWQCC Livestock Watering Standard								100		50				100	25,000
NMWQCC Groundwater Limit					200	1,000	200	50		50					10,000
NMWQCC Wildlife Habitat Standard										5					

[a]Codes: WM–snowmelt runoff; WS–base flow; UF–unfiltered; F–filtered; CS–customer sample; DUP–laboratory duplicate.
[b]Less than symbol (<) means measurement was below the specified limit of detection of the analytical method.
[c]Standards given here for comparison only; see Appendix A. Note that New Mexico Livestock Watering and Groundwater limits are based on dissolved concentrations, whereas many of these analyses are of unfiltered samples; thus, concentration may include suspended sediment quantities.

Table 5-8. Number of Samples Collected for Each Suite of Organic Compounds in Surface Water Samples in 2001

			Organic Suite[b]				
Station Name	**Date**	**Matrix[a]**	**DIOX/FUR**	**HE**	**PCB**	**Semivolatile**	**Volatile**
Regional Stations							
Rio Chama at Chamita (bank)	08/01	WS			1	1	1
Rio Grande at Embudo (bank)	08/01	WS					1
Rio Grande at Embudo (bank)	08/01	WS			1	1	1
Rio Grande at Otowi Upper (bank)	07/17	WS		1	1	1	1
Rio Grande at Otowi (bank)	07/17	WS		1	1	1	1
Rio Grande at Frijoles (bank)	09/26	WS		1	1	1	1
Rio Grande at Cochiti	09/26	WS					1
Rio Grande at Cochiti	09/26	WS		1	1	1	1
Jemez River	04/18	WS			1	1	1
Jemez River	04/18	WS			1	1	1
Pajarito Plateau Stations							
Guaje Canyon:							
Guaje Canyon	10/12	WS					1
Guaje Canyon	10/12	WS			1	1	1
Guaje above Rendija	04/18	WM	1		1	1	1
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons):							
Los Alamos Reservoir	05/01	WS					1
Los Alamos Reservoir	05/01	WS			1	1	1
Los Alamos above Ice Rink	03/07	WM	1	1	1	1	1
Los Alamos above Ice Rink	03/15	WM	1	1	1	1	2
Los Alamos above Ice Rink	03/15	WM	1	1	1	1	1
Los Alamos above Ice Rink	03/20	WM	1	1	1	1	1
Los Alamos above Ice Rink	03/20	WM	1	1	1	1	1
Los Alamos above Ice Rink	04/04	WM	1	1	1	1	2
Los Alamos above Ice Rink	05/02	WM	1	1	1	1	1
Los Alamos below Ice Rink	04/18	WM	1	1	1	1	1
Los Alamos at Upper GS	03/26	WM			1	1	1
DPS-1	03/28	WM			1	1	1
Los Alamos above SR-4	03/15	WM	1	1	1	1	1
Los Alamos above SR-4	03/21	WM	1	1	1	1	1
Los Alamos above SR-4	04/04	WM	1	1	1	1	1
Los Alamos above SR-4	04/18	WM	1	1	1	1	1
Los Alamos above SR-4	05/02	WM	1	1	1	1	1
Los Alamos above SR-4	06/15	WS	1	1	1	1	
Los Alamos below LA Weir	03/15	WM	1	1	1	1	1
Los Alamos below LA Weir	03/21	WM	1	1	1	1	1
Los Alamos below LA Weir	04/04	WM	1	1	1	1	1
Los Alamos below LA Weir	04/18	WM	1	1	1	1	1
Los Alamos below LA Weir	05/02	WM	1	1	1	1	1
Los Alamos at SR-4	03/26	WM			1	1	1
Los Alamos at Rio Grande	03/26	WM			1	1	1
Pueblo 1 R	04/11	WM					1
Pueblo 1 R	04/11	WM			1	1	1
Acid Weir	04/11	WM			1	1	1
Pueblo 2	04/03	WM				1	1
Pueblo 3	04/03	WS			1	1	1
Pueblo at SR-502	04/03	WS			2	2	2

Table 5-8. Number of Samples Collected for Each Suite of Organic Compounds in Surface Water Samples in 2001 (Cont.)

			Organic Suite[b]				
Station Name	**Date**	**Matrix[a]**	**DIOX/FUR**	**HE**	**PCB**	**Semivolatile**	**Volatile**
Pajarito Plateau Stations (Cont.)							
Sandia Canyon:							
SCS-2	05/17	WS			2	2	3
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey):							
MDA L	04/06	WT			1		
MDA L	05/28	WT				1	
MDA L	06/07	WT			1		
MDA L	07/02	WT			1		
MDA L	07/17	WT	1	1	1	1	
MDA L	07/21	WT		1	1		
Pajarito Canyon (includes Twomile, Threemile Canyons):							
Pajarito below SR-501	03/20	WM	1	1	1	1	1
Pajarito below SR-501	04/04	WM	1	1	1	1	1
Pajarito below SR-501	04/18	WM	1	1	1	1	1
Pajarito below SR-501	05/02	WM	1	1	1	1	1
Pajarito Canyon	04/04	WM					1
Pajarito Canyon	04/04	WM			1	1	1
MDA G-3	06/07	WT			1		
MDA G-3	07/02	WT				1	
MDA G-3	07/13	WT		1			
MDA G-3	08/01	WT	1				
MDA G-3	08/30	WT				1	
MDA G-4	04/06	WT			1		
MDA G-4	07/02	WT			1		
MDA G-4	07/17	WT				1	
MDA G-4	08/01	WT		1			
Pajarito above SR-4	03/21	WM	1	1	1	1	1
Pajarito above SR-4	04/04	WM	1	1	1	1	1
Pajarito above SR-4	04/18	WM	1	1	1	1	1
Pajarito above SR-4	05/02	WM	2	2	2	2	3
Pajarito at Rio Grande	09/25	WS		1	1	1	2
Pajarito at Rio Grande	09/25	WS		1	1	1	1
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons):							
Water above SR-501	03/15	WM	1	1	1	1	1
Water above SR-501	03/20	WM	1	1	1	1	1
Water above SR-501	04/04	WM			1	1	1
Water above SR-501	04/18	WM	1	1	1	1	1
Water above SR-501	05/02	WM	1	1	1	1	1
Cañon de Valle above SR-501	04/04	WM	1	1	1	1	1
Cañon de Valle above SR-501	04/18	WM	1	1	1	1	1
Cañon de Valle above SR-501	05/02	WM	1	1	1	1	1
Water at Beta	04/17	WM		1	1	1	2
Water below SR-4	03/21	WM	1	1	1	1	1
Water below SR-4	04/04	WM	1	1	1	1	1
Ancho Canyon:							
Ancho at Rio Grande	09/25	WS					2

Table 5-8. Number of Samples Collected for Each Suite of Organic Compounds in Surface Water Samples in 2001 (Cont.)

			Organic Suite[b]				
Station Name	**Date**	**Matrix[a]**	**DIOX/FUR**	**HE**	**PCB**	**Semivolatile**	**Volatile**
Pajarito Plateau Stations (Cont.)							
Frijoles Canyon:							
Frijoles at Monument Headquarters	07/18	WS		1	1	1	1
Frijoles at Rio Grande	09/26	WS		2	2	2	2
Quality Assurance Samples:							
DI Blank	04/04	WM	1	1	1	1	1
DI Blank	07/17	WS		1	1	1	1
DI Blank	07/18	WS					1

[a]Matrix Codes: WM = snowmelt, WS = base flow, WT = storm runoff.
[b]Dioxins/Furans, high explosives, polychlorinated biphenyls, semivolatiles, and volatiles.

Table 5-9. Organic Compounds Detected in Surface Water in 2001 (μg/L)

Station Name	Date	Codes[a]				Dilution Factor	Suite[b]	Analyte	Result	Lab Qual Code[c]	Valid Flag Code	EPA Tap Screening Level	Result/ Screening Level)
Regional Stations													
Rio Chama at Chamita (bank)	08/01	WS	UF		CS	10	SVOA	Bis(2-ethylhexyl)phthalate	1,080	D		5	225.00
Rio Chama at Chamita (bank)	08/01	WS	UF		CS	1	SVOA	Bis(2-ethylhexyl)phthalate	584	E		5	121.67
Rio Chama at Chamita (bank)	08/01	WS	UF		CS	10	SVOA	Pyrene	20.4	D		183	0.11
Rio Chama at Chamita (bank)	08/01	WS	UF		CS	10	SVOA	Fluoranthene	21.5	D		1,460	0.01
Jemez River	04/18	WS	UF		CS	1	SVOA	Bis(2-ethylhexyl)phthalate	1.6		J	5	0.33
Pajarito Plateau Stations													
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons):													
Pueblo 1 R	04/11	WM	UF	FTB	CS	1	VOA	Chloroform	5.2			0	32.50
Pueblo 1 R	04/11	WM	UF	FTB	CS	1	VOA	Bromodichloromethane	1.4			0	7.78
Pueblo 3	04/03	WS	UF		CS	1	SVOA	Bis(2-ethylhexyl)phthalate	6.4			5	1.33
Pueblo at SR-502	04/03	WS	UF	FD	CS	1	SVOA	Bis(2-ethylhexyl)phthalate	2			5	0.42
Pueblo at SR-502	04/03	WS	UF		CS	1	SVOA	Bis(2-ethylhexyl)phthalate	1.5			5	0.31
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey):													
MDA L	07/17	WT	UF		CS	1	DIOX/FUR	OCDD	0.0346				
MDA L	07/17	WT	UF		CS	1	SVOA	Di-n-octylphthalate	23.6			730	0.03
Pajarito Canyon (includes Twomile, Threemile Canyons):													
MDA G-3	07/02	WT	UF		CS	10	SVOA	4-Methylphenol	351	D		183	1.92
MDA G-3	07/02	WT	UF		CS	1	SVOA	4-Methylphenol	238	E		183	1.30
MDA G-3	07/02	WT	UF		CS	1	SVOA	Phenol	20			21,900	0.00
MDA G-3	07/02	WT	UF		CS	1	SVOA	Bis(2-ethylhexyl)phthalate	5.9			5	1.23
MDA G-4	07/17	WT	UF		CS	1	SVOA	Bis(2-ethylhexyl)phthalate	2.9			5	0.60
Water Canyon (includes Canon del Valle, Potrillo, Fence, Indio Canyons):													
Water at Beta	04/17	WM	UF		CS	1	HEXP	RDX	0.49			1	0.80
Water at Beta	04/17	WM	UF		CS	1	HEXP	HMX	1.9			1,825	0.00
Water below SR-4	03/21	WM	UF		CS	1	HEXP	RDX	0.9			1	1.48
Water below SR-4	03/21	WM	UF		CS	1	HEXP	HMX	3.8			1,825	0.00
Water below SR-4	04/04	WM	UF		CS	1	HEXP	RDX	0.26			1	0.43
Water below SR-4	04/04	WM	UF		CS	1	HEXP	HMX	0.99			1,825	0.00

Table 5-9. Organic Compounds Detected in Surface Water in 2001 (μg/L) (Cont.)

Station Name	Date	Codes[a]	Dilution Factor	Suite[b]	Analyte	Result	Lab Qual Code[c]	Valid Flag Code	EPA Tap Screening Level	Result/ Screening Level)
Quality Assurance										
DI Blank	07/17	WS UF PEB CS	1	VOA	Chloroform	53.9			0	336.88
DI Blank	07/17	WS UF PEB CS	1	VOA	Bromodichloromethane	2.7			0	15.00

[a]Codes: WM–snowmelt; WS–base flow; WT–storm runoff; UF–unfiltered sample; F–filtered sample; FD–field blank sample; FTB–field trip blank; PEB–performance evaluation blank; CS–customer sample.
[b]HEXP–high-explosive compounds; SVOA–semivolatile organics; VOA–volatile organics; DIOX/FUR–dioxins/furans.
[c]For Lab Qualifier Codes and Valid Flag Codes, see Table 5-4.

Table 5-10. Radiochemical Analysis of Storm Runoff for 2001 (pCi/L[a])

				^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
Station Name	**Date**		**Codes[b]**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Guaje Canyon:																					
Guaje above Rendija	08/08	F	CS																		
Guaje above Rendija	08/08	UF	CS				22.40	3.37	0.55	2.86	3.08	7.23	55.700	5.230	1.780	2.490	0.669	0.449	55.200	5.190	1.530
Guaje above Rendija	08/09	F	CS				1.09	0.16	0.25	8.55	3.64	8.51	0.373	0.040	0.018	0.014	0.006	0.007	0.301	0.034	0.007
Guaje above Rendija	08/09	UF	CS	-27	45	149	22.00	3.81	2.24	1.92	1.69	4.94	354.000	48.600	5.260	15.200	3.460	3.610	334.000	45.900	4.540
Guaje above Rendija	08/11	F	CS				1.45	0.21	0.18	0.00	1.80	3.10	0.098	0.019	0.032	0.000	1.000	0.007	0.080	0.017	0.032
Guaje above Rendija	08/11	UF	CS	134	48	148	23.60	3.63	1.11	10.10	2.84	9.17	100.000	60.900	1.820	6.490	4.080	0.533	92.000	55.800	2.110
Guaje above Rendija	08/14	F	CS				0.87	0.15	0.20	0.78	1.90	7.16	0.106	0.026	0.055	0.022	0.012	0.039	0.067	0.018	0.031
Guaje above Rendija	08/14	F	DUP																		
Guaje above Rendija	08/14	UF	CS	26	44	143	12.20	1.82	1.29	4.66	1.92	7.59	33.000	20.000	1.300	1.970	1.310	1.030	27.800	16.900	1.030
Guaje above Rendija	08/14	UF	DUP	54	46	148	13.50	1.90	1.14	4.66	3.15	8.81	51.500	31.200	1.690	4.110	2.620	1.160	48.400	29.300	1.460
Guaje above Rendija	08/16	F	CS				0.88	0.14	0.16	1.82	1.70	3.31	0.066	0.014	0.019	0.015	0.008	0.024	0.054	0.013	0.024
Guaje above Rendija	08/16	F	DUP																		
Guaje above Rendija	08/16	UF	CS				23.80	3.85	1.41	9.75	4.59	6.71	84.600	51.200	1.920	4.850	3.050	1.080	72.900	44.200	1.080
Rendija above Guaje	07/02	F	CS																		
Rendija above Guaje	07/02	UF	CS																		
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons):																					
Los Alamos below Ice Rink	07/02	F	CS																		
Los Alamos below Ice Rink	07/02	UF	CS																		
Los Alamos below Ice Rink	07/02	UF	DUP	108	51	162							14.200	1.410	0.188	0.534	0.117	0.150	17.000	1.670	0.149
Los Alamos below Ice Rink	07/13	F	CS				1.88	0.33	0.41	0.66	1.36	4.96	0.869	0.080	0.044	0.063	0.015	0.032	0.736	0.070	0.028
Los Alamos below Ice Rink	07/13	F	DUP				1.98	0.37	0.40	0.87	0.80	3.15	0.920	0.084	0.028	0.047	0.013	0.022	0.866	0.080	0.028
Los Alamos below Ice Rink	07/13	UF	CS	-54	50	172	5.22	0.88	0.47	5.94	3.22	6.16	8.810	0.705	0.111	0.481	0.074	0.079	8.560	0.687	0.023
Los Alamos below Ice Rink	07/13	UF	DUP	-80	49	171	4.98	0.77	0.46	6.77	2.79	6.33	8.220	0.699	0.126	0.392	0.075	0.086	8.280	0.703	0.032
Los Alamos below Ice Rink	08/09	F	CS				1.70	0.29	0.26	-0.17	2.68	9.54	0.774	0.069	0.030	0.030	0.009	0.018	0.621	0.058	0.026
Los Alamos below Ice Rink	08/09	UF	CS	-27	45	149	3.62	0.60	0.30	6.18	2.40	5.96	9.180	1.340	1.670	0.512	0.316	0.942	5.990	0.999	0.939
Los Alamos above DP Canyon	07/02	F	CS																		
Los Alamos above DP Canyon	07/02	UF	CS																		
Los Alamos above DP Canyon	07/02	UF	DUP																		
Los Alamos above DP Canyon	07/14	F	CS				1.80	0.30	0.40	4.37	3.40	5.42	1.240	0.105	0.020	0.067	0.015	0.020	1.100	0.095	0.033
Los Alamos above DP Canyon	07/14	UF	CS	-81	49	173	7.57	1.29	0.68	8.32	3.13	5.94	34.400	3.410	0.474	1.420	0.266	0.442	35.600	3.520	0.403
Los Alamos above DP Canyon	07/26	F	CS				2.52	0.36	0.34	-1.18	0.81	2.67	0.498	0.056	0.044	0.030	0.015	0.044	0.468	0.053	0.034
Los Alamos above DP Canyon	07/26	F	DUP				1.98	0.25	0.23	4.49	2.30	3.20									
Los Alamos above DP Canyon	07/26	UF	CS	80	53	170	4.42	0.70	0.22	-0.91	1.34	4.73	6.040	1.390	0.745	0.404	0.264	0.814	5.680	1.310	0.586
Los Alamos above DP Canyon	07/26	UF	DUP	27	52	171				0.00	1.35	5.10									
Los Alamos above DP Canyon	08/05	F	CS				0.53	0.10	0.24	0.32	0.99	3.18	0.075	0.016	0.037	-0.002	0.008	0.039	0.082	0.016	0.031
Los Alamos above DP Canyon	08/05	F	RE																		
Los Alamos above DP Canyon	08/05	UF	CS	26	50	163	2.96	0.46	0.27	0.00	3.60	11.40	10.700	1.260	0.338	0.607	0.153	0.262	12.600	1.470	0.262
Los Alamos above DP Canyon	08/09	F	CS				1.24	0.21	0.23	1.04	0.91	3.45	0.319	0.039	0.036	0.036	0.014	0.036	0.245	0.033	0.032
Los Alamos above DP Canyon	08/09	F	DUP				1.21	0.17	0.27				0.321	0.042	0.011	0.032	0.013	0.030	0.281	0.039	0.030
Los Alamos above DP Canyon	08/09	UF	CS	27	46	150	14.70	2.43	0.53	10.00	2.96	6.00	149.000	12.000	1.360	6.040	1.060	1.080	147.000	11.900	1.080
Los Alamos above DP Canyon	08/09	UF	DUP	54	47	151				2.78	2.54	6.29									
Los Alamos above DP Canyon	08/16	F	CS				0.66	0.12	0.27	1.30	1.64	6.10	0.109	0.020	0.031	-0.008	0.008	0.036	0.074	0.016	0.031
Los Alamos above DP Canyon	08/16	F	DUP																		
Los Alamos above DP Canyon	08/16	UF	CS	373	59	160	3.09	0.49	0.34	3.78	2.02	7.78	12.600	1.840	0.218	0.504	0.164	0.356	12.600	1.850	0.355
Los Alamos above DP Canyon	08/16	UF	DUP	211	54	159	3.19	0.51	0.29	3.12	1.94	7.66	12.100	1.840	0.498	0.908	0.252	0.431	12.800	1.940	0.341
DP above TA-21	05/13	UF	CS				0.33	0.12	0.35	0.36	1.44	5.18	3.880	0.298	0.031	0.228	0.031	0.034	3.900	0.300	0.021
DP above TA-21	05/13	UF	DUP							-0.38	2.25	8.02									
DP above TA-21	05/28	F	CS																		
DP above TA-21	05/28	UF	CS																		
DP above TA-21	05/28	UF	DUP																		
DP above TA-21	06/27	F	CS																		
DP above TA-21	06/27	UF	CS																		
DP above TA-21	07/02	F	CS																		
DP above TA-21	07/02	F	DUP																		
DP above TA-21	07/02	UF	CS																		

Table 5-10. Radiochemical Analysis of Storm Runoff for 2001 (pCi/L[a]) (Cont.)

				^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
Station Name	**Date**		**Codes[b]**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)																					
DP above TA-21	08/01	F	CS																		
DP above TA-21	08/01	UF	CS																		
DP above TA-21	08/04	F	CS																		
DP above TA-21	08/04	UF	CS	400	58	155															
DP above TA-21	08/16	F	CS																		
DP above TA-21	08/16	UF	CS	238	55	159															
DP below Meadow at TA-21	06/27	F	CS																		
DP below Meadow at TA-21	06/27	UF	CS																		
DP below Meadow at TA-21	07/02	F	CS																		
DP below Meadow at TA-21	07/02	UF	CS																		
DP above Los Alamos Canyon	05/13	UF	CS				28.30	3.67	0.25	10.60	2.68	6.71	26.900	2.340	0.261	1.180	0.190	0.161	25.800	2.250	0.160
DP above Los Alamos Canyon	05/13	UF	DUP																		
DP above Los Alamos Canyon	05/28	F	CS																		
DP above Los Alamos Canyon	05/28	UF	CS																		
DP above Los Alamos Canyon	06/27	F	CS				8.77	1.66	0.79	2.48	1.39	5.30	0.062	0.014	0.027	0.004	0.006	0.021	0.041	0.010	0.021
DP above Los Alamos Canyon	06/27	UF	CS	218	55	164	21.80	6.01	1.01	19.90	3.54	6.07	11.100	0.978	0.143	0.639	0.100	0.118	9.620	0.856	0.030
DP above Los Alamos Canyon	08/04	F	CS																		
DP above Los Alamos Canyon	08/04	UF	CS																		
Los Alamos above SR-4	07/02	F	CS																		
Los Alamos above SR-4	07/02	UF	CS																		
Los Alamos above SR-4	07/14	F	CS																		
Los Alamos above SR-4	07/14	UF	CS	0	51	172	9.90	1.72	0.52	16.40	3.92	5.76	24.600	2.460	0.408	0.993	0.204	0.290	24.600	2.460	0.084
Los Alamos above SR-4	07/26	UF	CS																		
Los Alamos above SR-4	08/01	F	CS																		
Los Alamos above SR-4	08/01	UF	CS																		
Los Alamos above SR-4	08/04	F	CS				4.26	0.63	0.28	0.38	0.88	3.16	0.059	0.013	0.025	0.017	0.007	0.017	0.060	0.014	0.028
Los Alamos above SR-4	08/04	F	RE																		
Los Alamos above SR-4	08/04	UF	CS	123	51	158	13.50	1.91	0.24	4.92	7.58	9.48	14.400	1.660	0.283	0.946	0.210	0.367	13.700	1.590	0.328
Los Alamos above SR-4	08/08	F	CS																		
Los Alamos above SR-4	08/09	UF	CS																		
Los Alamos above SR-4	08/16	F	CS																		
Los Alamos above SR-4	08/16	UF	CS																		
Los Alamos above SR-4	08/16	F	CS				1.30	0.23	0.49	1.59	3.33	6.07	0.094	0.020	0.035	0.012	0.013	0.044	0.056	0.018	0.049
Los Alamos above SR-4	08/16	UF	CS	288	56	157	6.34	0.89	0.28	2.41	2.85	5.97	23.300	3.380	0.439	1.350	0.311	0.380	25.300	3.650	0.300
Los Alamos below LA Weir	07/26	F	CS																		
Los Alamos below LA Weir	07/26	UF	CS																		
Los Alamos below LA Weir	08/09	F	CS																		
Los Alamos below LA Weir	08/09	UF	CS	-27	45	149															
Los Alamos below LA Weir	08/16	F	CS																		
Los Alamos below LA Weir	08/16	UF	CS																		
Acid above Pueblo	08/03	F	CS																		
Acid above Pueblo	08/03	UF	CS				4.13	0.59	0.25	1.18	2.06	7.54	4.420	0.498	0.218	0.729	0.145	0.064	4.410	0.500	0.352
Acid above Pueblo	08/13	UF	CS				7.87	1.16	0.34	-1.00	1.78	6.09	5.940	0.600	0.177	0.311	0.073	0.040	5.790	0.585	0.040
Pueblo above SR-502	07/02	F	CS																		
Pueblo above SR-502	07/26	F	CS				2.64	0.45	0.35	2.88	2.39	3.98	0.647	0.062	0.029	0.038	0.011	0.020	0.668	0.063	0.025
Pueblo above SR-502	07/26	UF	CS				19.80	3.02	0.79	3.31	1.90	5.38	14.300	5.900	0.248	1.010	0.542	0.851	13.100	5.420	0.673
Pueblo above SR-502	08/04	UF	CS	546	61	151	10.00	1.34	0.37	8.09	3.12	5.84	8.760	2.710	0.733	0.396	0.287	0.852	8.840	2.730	0.214
Pueblo above SR-502	08/09	F	CS				2.16	0.33	0.26	4.46	3.36	5.75	0.357	0.040	0.040	0.018	0.010	0.031	0.324	0.037	0.019
Pueblo above SR-502	08/09	UF	CS	54	47	149	15.70	2.31	0.47	17.70	3.06	5.57	88.900	7.240	1.110	4.700	0.843	0.886	91.900	7.460	0.883
Pueblo above SR-502	08/11	F	CS				1.77	0.24	0.20	1.30	1.83	6.68	0.711	0.066	0.035	0.044	0.011	0.007	0.615	0.058	0.026
Pueblo above SR-502	08/11	UF	CS	161	49	149	16.00	2.55	0.66	14.80	4.28	7.59	78.900	32.200	0.947	7.280	3.140	1.690	82.700	33.800	1.190
Pueblo above SR-502	08/16	F	CS				1.43	0.22	0.37	0.28	1.76	3.74	0.837	0.076	0.021	0.035	0.011	0.021	0.802	0.074	0.008
Pueblo above SR-502	08/16	UF	CS	74	47	149	9.67	1.59	0.65	0.00	3.31	6.37	70.600	18.000	1.070	3.200	1.070	1.070	65.300	16.700	1.350

Table 5-10. Radiochemical Analysis of Storm Runoff for 2001 (pCi/L[a]) (Cont.)

				^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
Station Name	**Date**		**Codes[b]**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Sandia Canyon:																					
Sandia tributary at Salvage Yard	06/27	F	CS																		
Sandia tributary at Salvage Yard	06/27	F	DUP																		
Sandia tributary at Salvage Yard	06/27	UF	CS																		
Sandia tributary at Salvage Yard	06/27	UF	DUP																		
Sandia tributary at Salvage Yard	07/26	F	CS																		
Sandia tributary at Salvage Yard	07/26	UF	CS	0	51	173															
Sandia tributary at Salvage Yard	08/01	F	CS																		
Sandia tributary at Salvage Yard	08/01	UF	CS																		
Sandia below Wetlands	08/05	F	CS																		
Sandia below Wetlands	08/05	UF	CS				0.09	0.07	0.22	-1.60	1.82	6.33	2.280	0.183	0.037	0.106	0.021	0.032	2.350	0.188	0.045
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey):																					
TA-55 NW above Effluent Canyon	04/07	UF	CS				0.42	0.10	0.26	2.46	1.84	7.00	0.059	0.019	0.049	0.020	0.011	0.035	0.049	0.014	0.024
TA-55 NW above Effluent Canyon	04/20	UF	CS				-0.11	0.12	0.44	0.22	1.69	3.11	0.172	0.031	0.033	0.001	0.006	0.033	0.202	0.033	0.012
TA-55 NW above Effluent Canyon	04/20	UF	DUP																		
TA-55 NW above Effluent Canyon	05/13	F	CS				0.44	0.11	0.28	0.66	0.78	2.83	0.040	0.011	0.023	0.004	0.007	0.028	0.036	0.011	0.027
TA-55 NW above Effluent Canyon	05/13	UF	CS	-35	46	155	0.05	0.09	0.31	4.16	2.02	7.89	0.211	0.028	0.023	0.032	0.010	0.018	0.260	0.032	0.018
TA-55 NW above Effluent Canyon	05/28	F	CS				-0.03	0.10	0.33	2.96	1.05	4.17	0.071	0.015	0.027	0.009	0.007	0.021	0.009	0.008	0.027
TA-55 NW above Effluent Canyon	05/28	UF	CS	53	48	154	0.08	0.14	0.50	1.25	1.94	6.84	0.252	0.028	0.005	0.013	0.006	0.014	0.191	0.023	0.005
TA-55 NW above Effluent Canyon	05/28	UF	DUP				0.09	0.12	0.41												
TA-55 NW above Effluent Canyon	06/27	F	CS				-0.16	0.10	0.41	0.00	1.42	3.09	0.003	0.009	0.053	0.011	0.007	0.010	0.015	0.008	0.010
TA-55 NW above Effluent Canyon	06/27	UF	CS				0.13	0.10	0.39	4.76	2.42	7.26	0.845	0.080	0.024	0.061	0.016	0.035	0.785	0.076	0.009
TA-55 NW above Effluent Canyon	07/02	F	CS																		
TA-55 NW above Effluent Canyon	07/02	UF	CS																		
TA-55 NW above Effluent Canyon	07/13	UF	CS	0	50	168	0.00	0.20	0.66	-0.91	2.22	7.87	0.119	0.041	0.123	0.012	0.021	0.111	0.158	0.043	0.075
TA-55 NW above Effluent Canyon	07/19	F	CS				0.00	0.08	0.21	-1.11	0.87	2.92	0.030	0.011	0.028	0.004	0.005	0.020	0.025	0.008	0.018
TA-55 NW above Effluent Canyon	07/19	UF	CS				-0.76	0.51	1.39	-0.83	1.82	6.34	0.237	0.032	0.043	0.018	0.009	0.028	0.252	0.032	0.036
TA-55 NW above Effluent Canyon	07/19	UF	DUP							1.42	1.88	7.19									
TA-55 NW above Effluent Canyon	08/01	F	CS				-0.07	0.08	0.27	2.66	1.20	4.58	0.041	0.013	0.027	0.003	0.008	0.032	0.026	0.012	0.032
TA-55 NW above Effluent Canyon	08/01	UF	CS				-0.09	0.07	0.22	2.61	2.02	6.99	0.079	0.017	0.028	0.000	1.000	0.033	0.054	0.015	0.033
MDA L	04/06	UF	CS	-115	53	189	-0.25	0.13	0.46	-0.06	1.14	3.94	0.076	0.025	0.021	-0.012	0.007	0.082	0.031	0.015	0.021
MDA L	04/27	UF	CS	28	56	187	0.19	0.13	0.41	1.14	1.08	3.89	0.185	0.042	0.023	0.034	0.024	0.078	0.177	0.043	0.062
MDA L	04/27	UF	DUP	-116	53	190				0.14	0.99	3.43									
MDA L	05/28	F	CS																		
MDA L	05/28	UF	CS				0.24	0.08	0.26	-3.31	2.12	6.95	0.108	0.019	0.029	0.012	0.006	0.018	0.060	0.013	0.007
MDA L	05/28	UF	DUP																		
MDA L	06/07	F	CS																		
MDA L	06/07	UF	CS	26	46	150				0.18	1.83	6.57	0.134	0.023	0.039	0.022	0.010	0.030	0.189	0.026	0.030
MDA L	06/07	UF	DUP										0.103	0.020	0.035	0.011	0.011	0.037	0.243	0.031	0.025
MDA L	07/02	UF	CS																		
MDA L	07/26	F	CS																		
MDA L	07/26	UF	CS				-0.11	0.08	0.22	2.73	1.86	7.03	0.069	0.013	0.020	0.004	0.004	0.014	0.061	0.012	0.005
Pajarito Canyon (includes Twomile, Threemile Canyons):																					
Pajarito below SR-501	07/26	UF	CS				17.90	2.70	0.74	1.43	2.76	4.77	9.290	5.770	2.650	0.424	0.570	1.850	9.430	5.820	1.310
Pajarito below SR-501	08/09	F	CS																		
Pajarito below SR-501	08/09	UF	CS																		
Pajarito above Starmers	07/26	F	CS				1.56	0.23	0.25	2.17	1.47	2.13	0.284	0.035	0.029	0.060	0.014	0.025	0.149	0.023	0.025
Pajarito above Starmers	07/26	UF	CS				4.40	0.75	0.35	1.48	1.46	5.45	7.740	1.260	0.302	0.718	0.193	0.240	7.550	1.240	0.350
Pajarito above Starmers	08/05	F	CS																		
Pajarito above Starmers	08/05	UF	CS	449	59	153	6.75	1.15	0.27	6.78	3.55	7.95	3.050	0.515	0.208	0.085	0.110	0.399	4.120	0.669	0.370
Pajarito above Starmers	08/11	F	CS																		
Pajarito above Starmers	08/11	UF	CS				2.04	0.31	0.24	-1.09	1.69	5.97	4.760	2.070	1.000	0.874	0.491	0.796	6.920	2.940	1.000
Pajarito above TA-18	07/02	F	CS																		
Pajarito above TA-18	07/02	UF	CS																		
Pajarito above TA-18	08/05	F	CS																		
Pajarito above TA-18	08/05	UF	CS																		

Table 5-10. Radiochemical Analysis of Storm Runoff for 2001 (pCi/L[a]) (Cont.)

				^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
Station Name	**Date**		**Codes[b]**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Pajarito Canyon (includes Twomile, Threemile Canyons): (Cont.)																					
MDA G-1	08/05	UF	CS				0.84	0.15	0.19	4.24	2.12	8.44	2.360	0.244	0.082	0.204	0.052	0.082	2.150	0.228	0.103
MDA G-2	08/30	F	CS				0.14	0.09	0.27	1.24	0.98	3.72	0.096	0.019	0.026	0.006	0.008	0.030	0.082	0.016	0.008
MDA G-2	08/30	F	DUP																		
MDA G-2	08/30	UF	CS				1.44	0.28	0.33	1.47	2.30	9.14	17.600	1.360	0.086	0.821	0.104	0.105	17.800	1.370	0.059
MDA G-3	06/07	F	CS							1.55	1.33	4.97	0.046	0.024	0.074	0.000	0.009	0.039	0.025	0.015	0.045
MDA G-3	06/07	UF	CS							2.19	2.15	8.20	1.070	0.098	0.035	0.043	0.025	0.082	1.020	0.095	0.055
MDA G-3	07/02	F	CS																		
MDA G-3	07/02	UF	CS																		
MDA G-3	07/13	F	CS				0.01	0.10	0.34	3.32	2.12	2.96	0.060	0.014	0.025	0.004	0.004	0.020	0.048	0.012	0.007
MDA G-3	07/13	UF	CS	324	60	173	0.41	0.12	0.34	3.84	1.84	7.47	0.369	0.045	0.033	0.029	0.011	0.033	0.319	0.041	0.033
MDA G-3	08/01	F	CS				0.10	0.06	0.19	0.32	0.92	3.44	0.068	0.016	0.022	0.006	0.008	0.032	0.030	0.012	0.032
MDA G-3	08/01	UF	CS	593	63	158	0.01	0.06	0.21	4.85	2.51	9.71	0.320	0.034	0.025	0.010	0.007	0.022	0.239	0.028	0.015
MDA G-3	08/04	F	CS				0.09	0.07	0.23	1.21	1.00	3.12	0.037	0.013	0.037	0.012	0.008	0.032	0.025	0.010	0.025
MDA G-3	08/04	UF	CS	368	57	153	0.02	0.06	0.21	0.00	4.56	16.90	2.280	0.181	0.035	0.155	0.025	0.024	2.400	0.189	0.024
MDA G-3	08/30	F	CS				0.29	0.16	0.48	-0.78	1.29	4.51	0.063	0.014	0.008	0.011	0.006	0.008	0.023	0.009	0.021
MDA G-3	08/30	F	DUP				-0.05	0.12	0.42												
MDA G-3	08/30	UF	CS	890	65	150	0.08	0.10	0.34	-0.97	2.10	7.72	0.589	0.057	0.032	0.029	0.011	0.025	0.576	0.056	0.019
MDA G-3	08/30	UF	DUP							2.67	2.71	9.65									
MDA G-4	04/06	F	CS				-0.05	0.06	0.22	0.29	0.73	2.56	0.057	0.021	0.019	0.011	0.011	0.052	0.036	0.016	0.019
MDA G-4	04/06	UF	CS	0	56	189	0.26	0.07	0.23	0.00	1.41	5.30	0.457	0.053	0.035	0.034	0.014	0.035	0.430	0.051	0.028
MDA G-4	04/06	UF	DUP										0.494	0.052	0.008	0.065	0.016	0.029	0.386	0.044	0.008
MDA G-4	06/07	F	CS				-0.02	0.06	0.21	11.20	2.70	4.18	0.018	0.014	0.045	-0.015	0.011	0.050	0.021	0.011	0.032
MDA G-4	06/07	UF	CS	129	48	149	0.14	0.07	0.22	46.80	4.95	7.07	0.897	0.085	0.047	0.080	0.018	0.025	0.934	0.087	0.025
MDA G-4	06/07	UF	DUP																		
MDA G-4	06/27	F	CS																		
MDA G-4	06/27	UF	CS				0.00	0.10	0.41	29.90	4.93	7.16	1.420	0.126	0.045	0.045	0.014	0.010	1.270	0.115	0.041
MDA G-4	06/27	UF	DUP							34.80	4.89	6.44									
MDA G-4	07/02	F	CS																		
MDA G-4	07/02	UF	CS																		
MDA G-4	07/13	F	CS				0.06	0.13	0.45	1.50	0.88	3.86	0.021	0.014	0.061	0.012	0.009	0.040	0.009	0.011	0.052
MDA G-4	07/13	UF	CS	214	57	171	0.22	0.14	0.43	0.41	1.84	6.72	0.212	0.030	0.038	0.022	0.010	0.035	0.223	0.031	0.044
MDA G-4	07/17	UF	CS	242	58	172	0.34	0.13	0.36	-0.17	1.92	6.72	0.221	0.030	0.032	0.013	0.007	0.022	0.225	0.031	0.028
MDA G-4	07/26	F	CS																		
MDA G-4	08/01	F	CS				0.05	0.10	0.34	8.65	3.25	5.56	0.030	0.014	0.040	-0.003	0.010	0.043	0.036	0.012	0.024
MDA G-4	08/01	UF	CS				0.12	0.09	0.27	0.18	1.85	6.87	0.230	0.027	0.028	0.012	0.009	0.032	0.230	0.028	0.036
MDA G-4	08/04	F	CS				0.09	0.07	0.22	0.77	1.34	4.91	0.058	0.019	0.058	0.010	0.006	0.009	0.072	0.017	0.031
MDA G-4	08/04	F	RE																		
MDA G-4	08/04	UF	CS				0.23	0.08	0.22	-1.94	1.79	5.99	2.870	0.230	0.067	0.182	0.032	0.053	2.640	0.213	0.056
Pajarito above SR-4	06/27	F	CS				1.63	0.29	0.55	2.57	3.46	5.16	0.946	0.079	0.029	0.066	0.013	0.015	1.270	0.102	0.025
Pajarito above SR-4	06/27	UF	CS	136	52	163	2.73	0.43	0.53	7.03	2.24	8.72	5.570	0.428	0.054	0.274	0.038	0.011	7.000	0.531	0.010
Pajarito above SR-4	08/06	F	CS				1.89	0.31	0.27	0.77	1.00	3.45	0.566	0.060	0.054	0.016	0.010	0.037	0.509	0.055	0.044
Pajarito above SR-4	08/06	F	DUP				1.70	0.25	0.25	1.34	1.01	3.40									
Pajarito above SR-4	08/06	F	RE																		
Pajarito above SR-4	08/06	UF	CS	0	48	157	4.45	0.77	0.36	1.37	1.96	7.29	9.790	1.480	0.391	0.363	0.151	0.437	9.910	1.500	0.098
Pajarito above SR-4	08/06	UF	DUP	-25	48	160							8.010	1.260	0.117	0.379	0.164	0.467	10.300	1.580	0.319
Pajarito above SR-4	08/09	F	CS				1.58	0.26	0.25	0.14	1.29	4.65	0.244	0.032	0.031	0.009	0.008	0.027	0.207	0.029	0.021
Pajarito above SR-4	08/09	F	DUP																		
Pajarito above SR-4	08/09	UF	CS	108	48	150	3.90	0.63	0.36	11.10	3.30	7.13	8.390	0.743	0.191	0.234	0.088	0.192	8.440	0.747	0.191
Pajarito above SR-4	08/09	UF	DUP	107	48	148				2.23	2.03	7.83									
Pajarito above SR-4	08/16	F	CS				0.93	0.14	0.25	0.00	2.26	8.68	0.155	0.022	0.007	0.000	0.006	0.027	0.210	0.027	0.007
Pajarito above SR-4	08/16	F	DUP																		
Pajarito above SR-4	08/16	UF	CS	186	54	160	1.65	0.25	0.28	0.76	1.83	6.77	6.260	1.460	0.548	0.296	0.279	0.940	5.490	1.310	0.833

Table 5-10. Radiochemical Analysis of Storm Runoff for 2001 (pCi/L[a]) (Cont.)

				^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
Station Name	**Date**		**Codes[b]**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons):																					
Water above SR-501	07/22	F	CS																		
Water above SR-501	07/22	UF	CS	-53	49	169															
Cañon de Valle above SR-501	07/22	F	CS							0.50	1.19	3.85	0.143	0.020	0.023	0.004	0.005	0.018	0.141	0.020	0.023
Cañon de Valle above SR-501	07/22	UF	CS				12.60	1.67	0.40	15.00	3.71	6.70	20.700	2.230	0.254	1.520	0.247	0.175	19.900	2.140	0.220
Cañon de Valle above SR-501	07/26	F	CS																		
Cañon de Valle above SR-501	07/26	UF	CS																		
S Site Canyon above Water	08/03	F	CS																		
S Site Canyon above Water	08/03	UF	CS																		
Cañon de Valle above Water	08/05	UF	CS				14.10	2.42	0.61	0.80	2.20	8.07	51.500	16.000	1.270	3.310	1.210	0.869	53.900	16.800	0.867
Cañon de Valle above Water	08/05	F	CS																		
Cañon de Valle above Water	08/09	F	CS				1.07	0.17	0.25	1.15	0.97	3.77	0.155	0.023	0.029	0.000	0.007	0.029	0.081	0.016	0.026
Cañon de Valle above Water	08/09	UF	CS	27	46	148	9.56	1.32	0.29	9.57	2.99	5.25	47.900	3.860	1.040	2.650	0.582	1.280	50.600	4.050	1.280
Water below MDA AB	07/26	F	CS				1.18	0.17	0.26	4.36	1.17	4.67	0.800	0.074	0.027	0.066	0.016	0.031	0.757	0.070	0.021
Water below MDA AB	07/26	UF	CS				16.90	2.49	1.58	3.25	1.51	5.86	33.900	29.300	2.650	4.860	4.340	2.380	30.600	26.500	3.110
Water below MDA AB	08/03	F	CS				0.68	0.15	0.32	-0.65	0.92	3.23	0.101	0.017	0.020	0.009	0.005	0.016	0.109	0.018	0.016
Water below MDA AB	08/03	F	RE																		
Water below MDA AB	08/03	UF	CS	-80	50	171	3.54	0.58	0.28	0.00	6.89	6.87	12.000	1.400	0.272	0.763	0.175	0.216	14.000	1.620	0.215
Water below MDA AB	08/08	F	CS				0.95	0.14	0.22	0.00	3.92	6.90	0.152	0.023	0.023	0.012	0.009	0.030	0.103	0.018	0.026
Water below MDA AB	08/08	UF	CS	54	47	150	8.13	1.30	0.30	12.40	3.35	5.70	47.800	3.800	0.727	4.810	0.703	0.956	46.600	3.720	0.628
Water at SR-4	07/26	F	CS																		
Water at SR-4	07/26	UF	CS																		
Water at SR-4	08/03	UF	CS				8.99	1.16	0.37	0.00	8.80	8.19	61.600	25.200	1.590	1.560	0.822	1.430	62.800	25.700	0.973
Water at SR-4	08/03	F	CS																		
Water at SR-4	08/03	UF	CS	-80	50	172															
Water at SR-4	08/09	F	CS				0.85	0.14	0.26	-0.02	0.85	3.11	0.229	0.029	0.034	0.023	0.010	0.028	0.215	0.027	0.017
Water at SR-4	08/09	UF	CS	54	47	149	11.80	1.68	0.87	6.63	4.14	7.00	16.500	2.040	1.780	1.490	0.568	1.380	16.900	2.050	1.090
Water below SR-4	08/03	F	CS				0.65	0.13	0.27	1.24	0.90	3.57	0.063	0.019	0.053	-0.004	0.009	0.050	0.049	0.015	0.036
Water below SR-4	08/03	F	RE																		
Water below SR-4	08/03	UF	CS	-105	48	169															
Water below SR-4	08/03	F	CS																		
Water below SR-4	08/03	UF	CS				2.56	0.38	0.21	0.89	3.50	7.13	10.900	1.010	0.288	0.615	0.145	0.308	11.700	1.070	0.307
Water below SR-4	08/09	F	CS																		
Water below SR-4	08/09	UF	CS				11.00	1.88	0.53	10.60	2.90	6.33	79.000	6.350	1.220	3.660	0.751	1.430	82.100	6.580	1.220
Potrillo tributary Study Area	08/05	F	CS				0.20	0.08	0.25	-0.33	0.78	2.74	0.161	0.030	0.055	0.000	0.022	0.101	0.095	0.025	0.068
Potrillo tributary Study Area	08/05	F	RE																		
Potrillo tributary Study Area	08/05	F	REDP																		
Potrillo tributary Study Area	08/05	UF	CS				1.92	0.28	0.24	0.00	2.25	9.24	18.400	4.700	0.604	0.619	0.255	0.414	18.900	4.830	0.521
Potrillo tributary Study Area	08/05	UF	RE																		
Potrillo tributary Study Area	08/11	F	CS				0.14	0.07	0.18	1.47	0.98	3.96	0.268	0.033	0.032	0.017	0.010	0.032	0.171	0.025	0.028
Potrillo tributary Study Area	08/11	UF	CS				1.88	0.35	0.39	1.53	1.67	6.23	25.700	5.580	0.935	1.860	0.516	0.414	27.300	5.920	0.413
Potrillo tributary Study Area	08/30	F	CS																		
Potrillo tributary Study Area	08/30	UF	CS	27	45	147	8.80	1.66	0.74	5.22	2.41	9.76	18.900	6.230	0.905	0.831	0.425	0.907	20.100	6.610	0.554
Potrillo tributary Study Area	08/30	UF	DUP	137	48	147							26.400	8.630	1.030	2.060	0.790	0.791	27.200	8.910	0.788

Table 5-10. Radiochemical Analysis of Storm Runoff for 2001 (pCi/L[a]) (Cont.)

				^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
Station Name	**Date**		**Codes[b]**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Ancho Canyon:																					
Ancho Canyon spring tributary below SR-4	08/12	F	CS																		
Ancho Canyon spring tributary below SR-4	08/12	UF	CS																		
Water Quality Standards[c]																					
DOE DCG for Public Dose				2,000,000			1,000			3,000			500			600			600		
DOE Drinking Water System DCG				80,000			40			120			20			24			24		
EPA Primary Drinking Water Standard				20,000			8														
EPA Screening Level																					
NMWQCC Groundwater Limit																					
NMWQCC Livestock Watering				20,000																	

Table 5-10. Radiochemical Analysis of Storm Runoff for 2001 (pCi/L[a]) (Cont.)

				U (µg/L)	^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
Station Name	Date	Codes[b]		Result	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Guaje Canyon:																			
Guaje above Rendija	08/08	F	CS	0.30															
Guaje above Rendija	08/08	UF	CS	16.10	0.063	0.128	0.460	3.320	0.348	0.155	1.010	0.180	0.072	77.1	7.1	2.5	132.0	2.3	2.2
Guaje above Rendija	08/09	F	CS		0.699	0.062	0.009	0.014	0.009	0.025	0.028	0.010	0.024	3.0	0.8	1.9	11.6	0.9	1.8
Guaje above Rendija	08/09	UF	CS	137.00	0.524	0.184	0.406	3.530	0.574	0.655	1.020	0.230	0.106	1,190.0	146.0	287.0	5,350.0	217.0	432.0
Guaje above Rendija	08/11	F	CS	0.30	-0.009	0.007	0.037	0.006	0.009	0.033	0.018	0.007	0.007	0.9	0.3	0.8	10.5	0.5	0.7
Guaje above Rendija	08/11	UF	CS	77.90	0.065	0.046	0.088	3.930	0.474	0.426	1.220	0.151	0.035	398.0	21.9	18.3	512.0	19.9	38.5
Guaje above Rendija	08/14	F	CS	0.14	0.005	0.007	0.027	-0.008	0.007	0.033	0.033	0.010	0.019	1.6	0.5	1.2	7.7	0.9	2.6
Guaje above Rendija	08/14	F	DUP	0.15															
Guaje above Rendija	08/14	UF	CS	75.50	0.263	0.100	0.257	2.840	0.329	0.065	0.863	0.128	0.104	531.0	29.3	25.8	691.0	22.7	34.5
Guaje above Rendija	08/14	UF	DUP	74.50	0.277	0.079	0.136	3.910	0.381	0.136	0.819	0.077	0.032						
Guaje above Rendija	08/16	F	CS		0.003	0.006	0.038	0.002	0.015	0.093	0.020	0.009	0.011	-0.1	0.4	1.8	6.6	0.6	1.3
Guaje above Rendija	08/16	F	DUP											0.4	0.5	1.9	6.9	0.6	1.5
Guaje above Rendija	08/16	UF	CS		0.291	0.144	0.436	2.930	0.364	0.079	1.410	0.252	0.098	608.0	25.6	37.0	760.0	15.3	22.4
Rendija above Guaje	07/02	F	CS	2.53															
Rendija above Guaje	07/02	UF	CS	7.54															
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons):																			
Los Alamos below Ice Rink	07/02	F	CS	1.46															
Los Alamos below Ice Rink	07/02	UF	CS	23.20															
Los Alamos below Ice Rink	07/02	UF	DUP	21.10	0.165	0.047	0.088	1.340	0.163	0.033	1.290	0.120	0.017	715.0	38.9	37.4	863.0	29.2	48.5
Los Alamos below Ice Rink	07/13	F	CS	2.85	0.001	0.010	0.047	0.002	0.006	0.030	0.025	0.009	0.023	2.3	0.5	1.4	14.1	0.9	2.4
Los Alamos below Ice Rink	07/13	F	DUP	2.79	0.003	0.010	0.043	0.010	0.005	0.007	0.029	0.015	0.042	3.2	0.5	1.2	15.5	1.0	2.5
Los Alamos below Ice Rink	07/13	UF	CS	12.10	0.023	0.011	0.030	0.413	0.041	0.008	0.127	0.021	0.030	767.0	80.9	69.2	995.0	30.1	59.2
Los Alamos below Ice Rink	07/13	UF	DUP	11.60	0.044	0.013	0.010	0.376	0.043	0.010	0.128	0.020	0.024	681.0	64.9	61.4	1,050.0	28.8	48.5
Los Alamos below Ice Rink	08/09	F	CS	2.16	0.790	0.062	0.019	0.036	0.012	0.031	0.030	0.010	0.020	2.4	0.8	2.2	9.4	0.6	1.5
Los Alamos below Ice Rink	08/09	UF	CS	9.31	0.065	0.020	0.016	0.576	0.068	0.055	0.300	0.065	0.088	61.6	3.1	3.1	78.4	1.5	2.1
Los Alamos above DP Canyon	07/02	F	CS	1.43															
Los Alamos above DP Canyon	07/02	UF	CS	6.66															
Los Alamos above DP Canyon	07/02	UF	DUP								0.830	0.134	0.133						
Los Alamos above DP Canyon	07/14	F	CS	3.87	-0.006	0.006	0.033	0.009	0.007	0.023	0.015	0.006	0.007	3.5	0.6	1.7	10.7	0.6	1.5
Los Alamos above DP Canyon	07/14	UF	CS	24.90	0.215	0.051	0.031	6.020	0.463	0.083	0.630	0.073	0.045	756.0	66.5	64.9	953.0	28.1	54.3
Los Alamos above DP Canyon	07/26	F	CS	1.06	0.000	0.007	0.031	0.024	0.009	0.009	0.029	0.012	0.029	2.8	0.6	1.3	11.1	1.0	2.6
Los Alamos above DP Canyon	07/26	F	DUP	0.99															
Los Alamos above DP Canyon	07/26	UF	CS	31.60	0.056	0.016	0.027	2.190	0.152	0.027	0.165	0.026	0.031	404.0	32.9	8.0	568.0	37.0	14.4
Los Alamos above DP Canyon	07/26	UF	DUP	33.50	0.076	0.021	0.043	2.320	0.163	0.011	0.366	0.038	0.020	364.0	13.3	10.2	557.0	10.2	13.4
Los Alamos above DP Canyon	08/05	F	CS	0.15	0.002	0.005	0.028	0.025	0.009	0.022	0.014	0.006	0.006	0.3	0.3	1.0	5.2	0.6	2.1
Los Alamos above DP Canyon	08/05	F	RE								0.000	1.000	0.026						
Los Alamos above DP Canyon	08/05	UF	CS	15.00	0.146	0.033	0.065	5.680	0.391	0.040	0.302	0.032	0.024	228.0	15.8	7.6	238.0	14.6	12.3
Los Alamos above DP Canyon	08/09	F	CS	0.83	0.173	0.030	0.054	-0.007	0.019	0.075	0.029	0.009	0.008	1.2	0.5	1.3	8.8	0.6	1.2
Los Alamos above DP Canyon	08/09	F	DUP	0.83															
Los Alamos above DP Canyon	08/09	UF	CS	11.10	0.545	0.133	0.255	6.480	0.638	0.751	2.610	0.374	0.505	96.3	8.6	3.4	144.0	2.3	2.2
Los Alamos above DP Canyon	08/09	UF	DUP	37.00	0.538	0.118	0.158	7.720	0.678	0.405	2.010	0.208	0.095						
Los Alamos above DP Canyon	08/16	F	CS	0.16	0.014	0.012	0.057	0.064	0.020	0.062	0.022	0.013	0.045	0.9	0.8	2.7	1.7	1.4	5.2
Los Alamos above DP Canyon	08/16	F	DUP	0.15															
Los Alamos above DP Canyon	08/16	UF	CS	16.10	0.069	0.015	0.009	3.630	0.223	0.038	0.165	0.042	0.026	374.0	18.1	22.0	500.0	19.1	39.4
Los Alamos above DP Canyon	08/16	UF	DUP	14.70	0.085	0.024	0.046	5.950	0.407	0.017	0.287	0.055	0.066	349.0	22.1	24.4	484.0	17.8	34.3
DP above TA-21	05/13	UF	CS		0.012	0.007	0.011	0.084	0.016	0.008	0.037	0.013	0.027	14.5	2.8	1.1	26.9	2.3	2.6
DP above TA-21	05/13	UF	DUP																
DP above TA-21	05/28	F	CS	0.08															
DP above TA-21	05/28	UF	CS	2.45															
DP above TA-21	05/28	UF	DUP	2.68															
DP above TA-21	06/27	F	CS	0.07															
DP above TA-21	06/27	UF	CS	4.91															
DP above TA-21	07/02	F	CS	0.04															
DP above TA-21	07/02	F	DUP	0.04															
DP above TA-21	07/02	UF	CS	2.07															

Table 5-10. Radiochemical Analysis of Storm Runoff for 2001 (pCi/L[a]) (Cont.)

				U (µg/L)	^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
Station Name	Date	Codes[b]		Result	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons): (Cont.)																			
DP above TA-21	08/01	F	CS	0.05															
DP above TA-21	08/01	UF	CS	1.24															
DP above TA-21	08/04	F	CS	0.03															
DP above TA-21	08/04	UF	CS	2.24															
DP above TA-21	08/16	F	CS	0.02															
DP above TA-21	08/16	UF	CS	0.95															
DP below Meadow at TA-21	06/27	F	CS	0.08															
DP below Meadow at TA-21	06/27	UF	CS	3.46															
DP below Meadow at TA-21	07/02	F	CS	0.07															
DP below Meadow at TA-21	07/02	UF	CS	2.88															
DP above Los Alamos Canyon	05/13	UF	CS	11.00	1.400	0.273	0.620	8.500	1.110	0.295	14.200	1.260	1.460	21.0	4.0	1.8	89.7	6.7	2.6
DP above Los Alamos Canyon	05/13	UF	DUP		0.945	0.152	0.047	5.700	0.587	0.272	16.100	1.440	1.660						
DP above Los Alamos Canyon	05/28	F	CS	0.11															
DP above Los Alamos Canyon	05/28	UF	CS	7.85															
DP above Los Alamos Canyon	06/27	F	CS	0.09	0.000	0.003	0.014	0.010	0.006	0.018	0.033	0.015	0.018	2.0	0.4	1.0	27.5	1.1	2.2
DP above Los Alamos Canyon	06/27	UF	CS	5.01	0.439	0.041	0.018	2.460	0.153	0.032	10.100	1.230	0.649	521.0	26.6	30.4	773.0	23.5	44.6
DP above Los Alamos Canyon	08/04	F	CS	0.08															
DP above Los Alamos Canyon	08/04	UF	CS	4.09															
Los Alamos above SR-4	07/02	F	CS	0.10															
Los Alamos above SR-4	07/02	UF	CS	6.00															
Los Alamos above SR-4	07/14	F	CS	4.00															
Los Alamos above SR-4	07/14	UF	CS	26.40	0.071	0.021	0.040	3.270	0.228	0.039	0.837	0.080	0.035	405.0	39.6	47.9	451.0	20.7	45.7
Los Alamos above SR-4	07/26	UF	CS	58.10															
Los Alamos above SR-4	08/01	F	CS	1.20															
Los Alamos above SR-4	08/01	UF	CS	4.74															
Los Alamos above SR-4	08/04	F	CS	0.11	0.017	0.010	0.030	0.038	0.013	0.030	0.034	0.009	0.007	0.4	0.4	1.5	11.9	0.8	2.4
Los Alamos above SR-4	08/04	F	RE								0.021	0.009	0.025						
Los Alamos above SR-4	08/04	UF	CS	7.70	0.374	0.041	0.045	6.320	0.364	0.008	5.560	0.336	0.016	76.0	6.9	4.3	121.0	9.3	6.6
Los Alamos above SR-4	08/08	F	CS	0.60															
Los Alamos above SR-4	08/09	UF	CS	8.97															
Los Alamos above SR-4	08/16	F	CS	0.54															
Los Alamos above SR-4	08/16	UF	CS	3.53															
Los Alamos above SR-4	08/16	F	CS	0.11	0.000	1.000	0.013	0.007	0.010	0.053	0.058	0.015	0.011	0.8	0.4	1.1	9.2	1.2	4.1
Los Alamos above SR-4	08/16	UF	CS	17.30	0.319	0.053	0.020	11.700	0.785	0.055	2.440	0.224	0.070	655.0	48.5	59.4	1,140.0	34.4	54.3
Los Alamos below LA Weir	07/26	F	CS	2.03															
Los Alamos below LA Weir	07/26	UF	CS	17.70															
Los Alamos below LA Weir	08/09	F	CS	0.98															
Los Alamos below LA Weir	08/09	UF	CS	52.80															
Los Alamos below LA Weir	08/16	F	CS	0.09															
Los Alamos below LA Weir	08/16	UF	CS	11.30															
Acid above Pueblo	08/03	F	CS	1.28															
Acid above Pueblo	08/03	UF	CS		0.004	0.006	0.027	0.304	0.039	0.045	0.057	0.014	0.021	84.4	5.2	5.0	117.0	4.1	7.4
Acid above Pueblo	08/13	UF	CS		0.012	0.007	0.018	0.800	0.061	0.007	0.106	0.050	0.143	211.0	15.4	15.6	369.0	15.7	35.3
Pueblo above SR-502	07/02	F	CS	2.01															
Pueblo above SR-502	07/26	F	CS		0.000	0.005	0.024	0.112	0.020	0.024	0.040	0.016	0.037	3.3	0.4	0.7	24.3	0.7	1.4
Pueblo above SR-502	07/26	UF	CS		0.097	0.044	0.053	13.800	1.220	0.143	1.180	0.171	0.146	1,240.0	105.0	32.1	1,890.0	132.0	45.2
Pueblo above SR-502	08/04	UF	CS		0.172	0.031	0.014	18.600	1.040	0.037	0.942	0.093	0.053						
Pueblo above SR-502	08/09	F	CS	1.12	0.029	0.014	0.044	0.037	0.013	0.035	0.030	0.010	0.019	1.0	0.5	1.4	16.9	1.1	2.0
Pueblo above SR-502	08/09	UF	CS	81.80	0.415	0.091	0.049	40.600	2.850	0.167	4.930	0.383	0.027	309.0	16.8	19.4	342.0	7.0	9.0
Pueblo above SR-502	08/11	F	CS	2.10	0.000	1.000	0.010	0.079	0.021	0.047	0.047	0.013	0.024	1.2	0.5	1.3	15.4	1.1	2.0
Pueblo above SR-502	08/11	UF	CS	60.50	0.412	0.123	0.093	49.900	4.260	0.449	4.070	0.305	0.020	1,090.0	110.0	191.0	3,010.0	129.0	248.0
Pueblo above SR-502	08/16	F	CS	1.91	0.003	0.007	0.043	0.638	0.072	0.043	0.052	0.013	0.008	5.8	0.8	1.6	13.3	1.4	4.2
Pueblo above SR-502	08/16	UF	CS	46.60	0.590	0.105	0.197	85.300	6.000	0.083	5.560	0.429	0.027	1,800.0	129.0	109.0	2,500.0	107.0	240.0

Table 5-10. Radiochemical Analysis of Storm Runoff for 2001 (pCi/L[a]) (Cont.)

Station Name	Date	Codes[b]		U (µg/L) Result	^{238}Pu Result	^{238}Pu Uncert	^{238}Pu MDA	^{239,240}Pu Result	^{239,240}Pu Uncert	^{239,240}Pu MDA	^{241}Am Result	^{241}Am Uncert	^{241}Am MDA	Gross Alpha Result	Gross Alpha Uncert	Gross Alpha MDA	Gross Beta Result	Gross Beta Uncert	Gross Beta MDA
Sandia Canyon:																			
Sandia tributary at Salvage Yard	06/27	F	CS	0.31															
Sandia tributary at Salvage Yard	06/27	F	DUP	0.26															
Sandia tributary at Salvage Yard	06/27	UF	CS	0.32															
Sandia tributary at Salvage Yard	06/27	UF	DUP	0.37															
Sandia tributary at Salvage Yard	07/26	F	CS	0.24															
Sandia tributary at Salvage Yard	07/26	UF	CS	1.39															
Sandia tributary at Salvage Yard	08/01	F	CS	0.11															
Sandia tributary at Salvage Yard	08/01	UF	CS	0.89															
Sandia below Wetlands	08/05	F	CS	0.16															
Sandia below Wetlands	08/05	UF	CS	3.26	0.042	0.011	0.008	0.064	0.014	0.008	0.064	0.023	0.022	15.0	1.0	1.3	19.5	0.6	0.9
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey):																			
TA-55 NW above Effluent Canyon	04/07	UF	CS		0.000	1.000	0.036	0.017	0.008	0.009	0.017	0.012	0.023						
TA-55 NW above Effluent Canyon	04/20	UF	CS		0.006	0.006	0.016	0.043	0.014	0.012	0.033	0.018	0.049	13.4	2.4	1.3	11.7	1.3	2.8
TA-55 NW above Effluent Canyon	04/20	UF	DUP											7.2	1.3	1.7	14.0	1.6	3.1
TA-55 NW above Effluent Canyon	05/13	F	CS		0.121	0.020	0.008	0.013	0.005	0.006	0.014	0.007	0.009	0.3	0.3	1.2	3.0	0.9	2.8
TA-55 NW above Effluent Canyon	05/13	UF	CS		0.025	0.010	0.010	0.031	0.011	0.028	0.174	0.022	0.006	3.9	0.9	1.4	21.6	1.9	3.3
TA-55 NW above Effluent Canyon	05/28	F	CS		0.026	0.009	0.008	0.002	0.006	0.022	0.028	0.013	0.037	0.1	0.2	1.1	1.3	0.6	2.6
TA-55 NW above Effluent Canyon	05/28	UF	CS		0.010	0.005	0.007	0.009	0.009	0.031	0.169	0.023	0.007						
TA-55 NW above Effluent Canyon	05/28	UF	DUP																
TA-55 NW above Effluent Canyon	06/27	F	CS	0.02	0.002	0.004	0.017	0.012	0.005	0.006	0.033	0.011	0.026	3.7	0.5	1.2	5.2	0.8	2.5
TA-55 NW above Effluent Canyon	06/27	UF	CS		0.020	0.007	0.007	0.027	0.009	0.018	0.087	0.017	0.031	28.9	1.6	1.1	49.8	1.7	2.8
TA-55 NW above Effluent Canyon	07/02	F	CS	0.02															
TA-55 NW above Effluent Canyon	07/02	UF	CS	0.38															
TA-55 NW above Effluent Canyon	07/13	UF	CS		0.034	0.012	0.025	0.017	0.010	0.031	0.088	0.018	0.010	2.4	0.6	1.6	6.7	0.6	1.7
TA-55 NW above Effluent Canyon	07/19	F	CS		0.008	0.004	0.005	0.000	1.000	0.018	0.016	0.006	0.005	0.0	0.2	1.2	1.6	0.6	2.2
TA-55 NW above Effluent Canyon	07/19	UF	CS		0.031	0.010	0.027	0.023	0.007	0.006	0.123	0.019	0.029	31.6	2.1	1.9	54.5	1.6	2.7
TA-55 NW above Effluent Canyon	07/19	UF	DUP																
TA-55 NW above Effluent Canyon	08/01	F	CS		0.012	0.012	0.041	0.007	0.007	0.026	0.014	0.009	0.026	0.1	0.3	1.3	0.7	0.4	1.5
TA-55 NW above Effluent Canyon	08/01	UF	CS	0.14	0.019	0.007	0.007	0.024	0.009	0.018	0.063	0.016	0.026	2.5	0.7	1.9	7.5	0.7	1.8
MDA L	04/06	UF	CS	0.14	0.000	1.000	0.018	0.024	0.011	0.013	0.053	0.022	0.024	1.3	0.8	0.9	12.0	1.8	2.4
MDA L	04/27	UF	CS	0.51	0.035	0.025	0.048	0.018	0.018	0.048	0.808	0.124	0.041	13.3	2.6	1.5	33.8	2.6	3.1
MDA L	04/27	UF	DUP	0.38															
MDA L	05/28	F	CS	0.06															
MDA L	05/28	UF	CS	0.19	0.003	0.003	0.009	0.032	0.015	0.046	0.025	0.013	0.041	1.5	0.5	1.0	5.5	0.9	2.4
MDA L	05/28	UF	DUP	0.17															
MDA L	06/07	F	CS	0.00										0.0	0.3	1.4	1.0	0.7	2.8
MDA L	06/07	UF	CS	0.76	0.000	0.005	0.025	-0.004	0.010	0.038	0.011	0.008	0.027	7.4	1.2	2.1	26.3	1.5	2.9
MDA L	06/07	UF	DUP	0.59	0.000	1.000	0.008	-0.004	0.007	0.030	0.013	0.007	0.019						
MDA L	07/02	UF	CS	0.08															
MDA L	07/26	F	CS	0.02															
MDA L	07/26	UF	CS	0.35	-0.005	0.003	0.019	0.000	0.003	0.013	0.004	0.009	0.035	0.4	0.3	1.1	12.2	1.2	2.2
Pajarito Canyon (includes Twomile, Threemile Canyons):																			
Pajarito below SR-501	07/26	UF	CS		0.061	0.033	0.090	2.680	0.246	0.033	0.864	0.123	0.098	626.0	34.4	25.7	1,490.0	32.9	42.5
Pajarito below SR-501	08/09	F	CS	0.30															
Pajarito below SR-501	08/09	UF	CS	27.20															
Pajarito above Starmers	07/26	F	CS		-0.007	0.007	0.038	0.007	0.007	0.026	0.035	0.013	0.032	1.4	0.5	1.4	8.1	0.9	2.7
Pajarito above Starmers	07/26	UF	CS		0.064	0.019	0.015	0.907	0.087	0.015	0.305	0.050	0.019	142.0	12.7	6.1	329.0	22.6	10.6
Pajarito above Starmers	08/05	F	CS	0.21															
Pajarito above Starmers	08/05	UF	CS	15.80	0.031	0.012	0.029	0.369	0.039	0.023	0.198	0.031	0.036	89.1	6.1	5.3	131.0	5.6	12.7
Pajarito above Starmers	08/11	F	CS	0.09															
Pajarito above Starmers	08/11	UF	CS	6.05	0.008	0.008	0.023	0.432	0.069	0.100	0.142	0.042	0.075	150.0	11.9	17.4	219.0	16.4	38.5
Pajarito above TA-18	07/02	F	CS	0.93															
Pajarito above TA-18	07/02	UF	CS	12.90															
Pajarito above TA-18	08/05	F	CS	0.44															
Pajarito above TA-18	08/05	UF	CS	36.80															

Table 5-10. Radiochemical Analysis of Storm Runoff for 2001 (pCi/L[a]) (Cont.)

				U (µg/L)	^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
Station Name	Date		Codes[b]	Result	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Pajarito Canyon (includes Twomile, Threemile Canyons): (Cont.)																			
MDA G-1	08/05	UF	CS	2.97	0.069	0.015	0.009	0.081	0.018	0.029	0.075	0.016	0.021	61.8	3.3	4.3	70.1	3.1	8.0
MDA G-2	08/30	F	CS	0.13	-0.003	0.006	0.029	0.006	0.008	0.029	0.013	0.008	0.024	1.0	0.3	0.9	3.2	0.3	0.6
MDA G-2	08/30	F	DUP		0.019	0.008	0.008	0.000	0.009	0.037	0.032	0.012	0.027						
MDA G-2	08/30	UF	CS	16.40	0.065	0.017	0.037	0.239	0.031	0.034	0.156	0.029	0.013	350.0	22.1	31.9	365.0	11.5	19.6
MDA G-3	06/07	F	CS	0.08	0.003	0.003	0.008	0.011	0.007	0.020	0.019	0.010	0.013	0.5	0.5	2.1	6.1	0.9	3.2
MDA G-3	06/07	UF	CS	1.61	0.048	0.012	0.008	0.230	0.026	0.033	0.143	0.020	0.006	51.5	3.5	2.7	63.0	3.0	6.0
MDA G-3	07/02	F	CS	0.13															
MDA G-3	07/02	UF	CS	0.58															
MDA G-3	07/13	F	CS	0.22	-0.002	0.007	0.033	0.019	0.007	0.017	0.008	0.006	0.019	0.1	0.5	1.9	4.5	0.6	1.9
MDA G-3	07/13	UF	CS	0.59	0.003	0.004	0.020	0.095	0.015	0.016	0.060	0.012	0.006	10.4	1.3	1.7	14.2	0.7	1.4
MDA G-3	08/01	F	CS	0.09	0.003	0.003	0.008	0.003	0.006	0.027	0.065	0.017	0.032	-0.4	0.6	2.3	2.2	0.6	1.9
MDA G-3	08/01	UF	CS	0.36	0.007	0.005	0.013	0.035	0.009	0.020	0.050	0.011	0.016	7.2	1.0	1.6	10.9	0.8	1.7
MDA G-3	08/04	F	CS	0.04	0.006	0.004	0.008	0.015	0.007	0.008	0.017	0.007	0.008	0.2	0.3	1.4	4.4	0.7	2.6
MDA G-3	08/04	UF	CS	2.42	0.059	0.018	0.047	0.779	0.062	0.030	0.435	0.043	0.008	85.6	3.5	3.0	87.7	2.8	4.4
MDA G-3	08/30	F	CS	0.02	0.019	0.009	0.011	0.004	0.007	0.029	0.023	0.008	0.008	0.5	0.2	0.6	1.7	0.2	0.6
MDA G-3	08/30	F	DUP																
MDA G-3	08/30	UF	CS	0.41	0.053	0.015	0.029	0.389	0.041	0.029	0.152	0.025	0.040	7.8	0.9	1.0	10.7	0.6	0.8
MDA G-3	08/30	UF	DUP	0.44															
MDA G-4	04/06	F	CS	0.17	0.000	1.000	0.015	0.025	0.012	0.030	0.027	0.014	0.018	0.1	0.3	1.3	9.3	1.3	2.8
MDA G-4	04/06	UF	CS	0.69	0.022	0.013	0.040	1.420	0.107	0.042	0.805	0.071	0.025	4.6	0.9	1.5	18.2	1.9	2.6
MDA G-4	04/06	UF	DUP								0.729	0.069	0.011						
MDA G-4	06/07	F	CS	0.04	0.007	0.007	0.020	0.005	0.005	0.014	0.091	0.023	0.015	0.7	0.5	2.2	5.3	0.9	3.0
MDA G-4	06/07	UF	CS	1.73	0.027	0.013	0.033	0.538	0.051	0.009	1.350	0.099	0.008	68.4	11.9	15.3	100.0	12.4	24.9
MDA G-4	06/07	UF	DUP	1.65															
MDA G-4	06/27	F	CS	0.08															
MDA G-4	06/27	UF	CS	1.15	0.037	0.009	0.017	0.385	0.033	0.005	1.020	0.076	0.035	37.1	1.9	2.1	54.9	1.8	2.7
MDA G-4	06/27	UF	DUP																
MDA G-4	07/02	F	CS	0.07															
MDA G-4	07/02	UF	CS	1.04															
MDA G-4	07/13	F	CS	0.05	0.018	0.011	0.040	0.023	0.009	0.021	0.037	0.009	0.014	-0.1	0.5	2.0	2.9	0.5	1.7
MDA G-4	07/13	UF	CS	0.44	0.024	0.007	0.006	0.142	0.021	0.036	0.309	0.031	0.016	4.8	0.9	1.9	14.3	0.7	1.5
MDA G-4	07/17	UF	CS	0.31	0.000	0.007	0.032	0.146	0.021	0.018	0.286	0.030	0.015	4.1	0.7	1.9	29.6	1.0	2.1
MDA G-4	07/26	F	CS	0.02															
MDA G-4	08/01	F	CS		0.004	0.003	0.006	0.027	0.008	0.015	0.054	0.014	0.028	0.1	0.4	1.6	1.5	0.4	1.5
MDA G-4	08/01	UF	CS		0.004	0.004	0.016	0.138	0.017	0.013	0.461	0.044	0.019	7.0	1.3	2.7	13.1	0.9	2.2
MDA G-4	08/04	F	CS		-0.003	0.003	0.033	0.023	0.011	0.033	0.089	0.017	0.008	0.4	0.4	1.0	3.0	0.5	1.3
MDA G-4	08/04	F	RE								0.131	0.021	0.021						
MDA G-4	08/04	UF	CS	2.23	0.084	0.015	0.022	1.020	0.071	0.017	3.220	0.223	0.037	69.9	5.7	2.8	64.6	1.4	2.0
Pajarito above SR-4	06/27	F	CS	4.44	0.000	1.000	0.006	0.006	0.004	0.006	0.048	0.018	0.019	4.7	0.7	1.7	15.5	1.0	2.4
Pajarito above SR-4	06/27	UF	CS	13.10	0.019	0.006	0.006	0.262	0.027	0.006	0.151	0.024	0.009	147.0	12.8	17.6	251.0	15.6	36.0
Pajarito above SR-4	08/06	F	CS	0.82	0.003	0.003	0.008	0.014	0.008	0.028	0.008	0.005	0.007	5.1	0.8	1.5	12.8	0.7	1.4
Pajarito above SR-4	08/06	F	DUP	0.81										3.1	0.7	1.9	10.8	0.6	1.3
Pajarito above SR-4	08/06	F	RE								0.012	0.006	0.008						
Pajarito above SR-4	08/06	UF	CS	11.60	0.016	0.008	0.011	0.379	0.046	0.048	0.202	0.031	0.011	137.0	11.6	5.0	148.0	3.4	4.5
Pajarito above SR-4	08/06	UF	DUP	12.10	0.034	0.012	0.012	0.327	0.043	0.040	0.191	0.028	0.024						
Pajarito above SR-4	08/09	F	CS	0.40	0.000	0.004	0.020	0.048	0.014	0.032	0.035	0.012	0.024	2.7	0.5	0.8	14.0	0.8	1.6
Pajarito above SR-4	08/09	F	DUP	0.41															
Pajarito above SR-4	08/09	UF	CS	12.90	0.310	0.059	0.098	0.879	0.115	0.200	0.897	0.121	0.086	42.9	2.7	3.8	67.9	1.5	2.2
Pajarito above SR-4	08/09	UF	DUP	12.90															
Pajarito above SR-4	08/16	F	CS	0.67	0.009	0.009	0.044	0.014	0.010	0.044	0.023	0.009	0.009	1.3	0.4	0.8	9.8	1.0	2.2
Pajarito above SR-4	08/16	F	DUP											1.3	0.5	1.3	13.4	1.1	2.3
Pajarito above SR-4	08/16	UF	CS	8.16	0.069	0.015	0.008	0.333	0.037	0.028	0.011	0.011	0.029	138.0	8.4	6.2	149.0	6.2	9.3

Table 5-10. Radiochemical Analysis of Storm Runoff for 2001 (pCi/L[a]) (Cont.)

				U (µg/L)	^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
Station Name	Date	Codes[b]		Result	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons):																			
Water above SR-501	07/22	F	CS	2.53															
Water above SR-501	07/22	UF	CS	20.90															
Cañon de Valle above SR-501	07/22	F	CS		0.000	0.003	0.015	0.012	0.006	0.018	0.005	0.003	0.006	0.0	0.4	1.8	11.4	1.0	2.6
Cañon de Valle above SR-501	07/22	UF	CS		0.100	0.036	0.090	2.090	0.182	0.023	0.550	0.070	0.049	462.0	26.8	26.0	944.0	25.6	41.5
Cañon de Valle above SR-501	07/26	F	CS	0.42															
Cañon de Valle above SR-501	07/26	UF	CS	26.50															
S Site Canyon above Water	08/03	F	CS	0.41															
S Site Canyon above Water	08/03	UF	CS	23.10															
Cañon de Valle above Water	08/05	UF	CS	28.90	0.260	0.060	0.087	3.150	0.275	0.032	1.180	0.119	0.021	337.0	17.2	16.1	539.0	12.9	17.3
Cañon de Valle above Water	08/05	F	CS	0.95															
Cañon de Valle above Water	08/09	F	CS	0.21	0.002	0.005	0.023	0.024	0.010	0.026	0.025	0.008	0.008	1.6	0.5	1.3	14.1	1.0	2.4
Cañon de Valle above Water	08/09	UF	CS	39.70	0.251	0.097	0.269	1.040	0.182	0.348	0.490	0.064	0.018	545.0	32.8	26.9	786.0	25.4	46.2
Water below MDA AB	07/26	F	CS	0.75	-0.002	0.003	0.018	0.023	0.007	0.014	0.039	0.011	0.025	9.6	0.8	1.0	23.5	0.9	2.1
Water below MDA AB	07/26	UF	CS	104.00	0.304	0.095	0.075	2.180	0.306	0.203	0.776	0.137	0.051	1,660.0	73.3	71.5	2,990.0	64.1	117.0
Water below MDA AB	08/03	F	CS	0.28	0.000	1.000	0.007	0.005	0.004	0.007	0.009	0.005	0.016	2.0	0.4	0.8	7.4	0.7	2.1
Water below MDA AB	08/03	F	RE								0.018	0.008	0.008						
Water below MDA AB	08/03	UF	CS	11.30	0.042	0.014	0.011	0.626	0.063	0.031	0.233	0.028	0.007	238.0	11.4	11.9	297.0	10.4	18.4
Water below MDA AB	08/08	F	CS	0.25	0.006	0.006	0.023	0.111	0.020	0.008	0.014	0.009	0.026	0.9	0.4	1.1	8.5	0.9	2.2
Water below MDA AB	08/08	UF	CS	43.90	0.066	0.030	0.036	1.070	0.144	0.159	0.501	0.066	0.049	948.0	83.9	121.0	2,260.0	97.2	202.0
Water at SR-4	07/26	F	CS	2.03															
Water at SR-4	07/26	UF	CS	76.60															
Water at SR-4	08/03	UF	CS	12.10	0.261	0.071	0.120	1.600	0.192	0.044	0.491	0.073	0.087	223.0	12.1	20.2	393.0	10.5	18.6
Water at SR-4	08/03	F	CS	0.19															
Water at SR-4	08/03	UF	CS	17.10															
Water at SR-4	08/09	F	CS	0.27	0.007	0.016	0.059	0.042	0.013	0.024	0.027	0.010	0.022	5.7	0.6	1.0	13.0	0.6	1.0
Water at SR-4	08/09	UF	CS	15.10	0.427	0.128	0.264	2.160	0.405	0.993	0.868	0.186	0.094	88.2	9.2	4.0	139.0	2.3	2.5
Water below SR-4	08/03	F	CS		0.000	0.003	0.013	0.011	0.005	0.013	0.020	0.008	0.019	1.3	0.5	1.7	9.2	0.8	2.5
Water below SR-4	08/03	F	RE								0.015	0.007	0.008						
Water below SR-4	08/03	UF	CS	15.60															
Water below SR-4	08/03	F	CS	0.18															
Water below SR-4	08/03	UF	CS	15.20	0.038	0.010	0.007	0.398	0.038	0.007	0.193	0.027	0.026	45.0	3.3	4.6	64.1	4.0	10.5
Water below SR-4	08/09	F	CS	0.59															
Water below SR-4	08/09	UF	CS	27.20	0.549	0.080	0.121	0.662	0.094	0.167	0.267	0.074	0.052	87.9	9.4	4.1	131.0	2.2	2.2
Potrillo tributary Study Area	08/05	F	CS		0.003	0.003	0.009	-0.002	0.002	0.023	0.023	0.007	0.006	1.0	0.2	0.6	5.8	0.6	2.0
Potrillo tributary Study Area	08/05	F	RE								0.006	0.004	0.008						
Potrillo tributary Study Area	08/05	F	REDP								0.008	0.005	0.008						
Potrillo tributary Study Area	08/05	UF	CS		0.025	0.011	0.013	0.029	0.014	0.036	0.042	0.014	0.013	503.0	29.3	37.7	823.0	25.3	41.3
Potrillo tributary Study Area	08/05	UF	RE								0.136	0.030	0.050						
Potrillo tributary Study Area	08/11	F	CS	0.61	0.000	1.000	0.009	0.000	0.005	0.025	0.013	0.008	0.024	0.7	0.4	1.2	4.1	0.7	2.1
Potrillo tributary Study Area	08/11	UF	CS	13.30	0.280	0.071	0.045	0.247	0.070	0.121	0.127	0.038	0.029	421.0	29.5	33.2	468.0	24.4	56.9
Potrillo tributary Study Area	08/30	F	CS	0.78															
Potrillo tributary Study Area	08/30	UF	CS	27.60	0.065	0.023	0.022	0.195	0.047	0.098	0.094	0.029	0.053	516.0	31.6	49.6	805.0	20.1	36.4
Potrillo tributary Study Area	08/30	UF	DUP																

Table 5-10. Radiochemical Analysis of Storm Runoff for 2001 (pCi/L[a]) (Cont.)

				U (µg/L)	^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
Station Name	**Date**	**Codes[b]**		**Result**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Ancho Canyon:																			
Ancho Canyon spring tributary below SR-4	08/12	F	CS	0.09															
Ancho Canyon spring tributary below SR-4	08/12	UF	CS	8.11															
Water Quality Standards[c]																			
DOE DCG for Public Dose				800	40			30			30			30			1,000		
DOE Drinking Water System DCG				30	1.6			1.2			1.2			1.2			40		
EPA Primary Drinking Water Standard				30										15					
EPA Screening Level																	50		
NMWQCC Groundwater Limit				5,000															
NMWQCC Livestock Watering														15					

[a]Except where noted. Three columns are listed: the first is the analytical result, the second is the radioactive counting uncertainty (1 standard deviation), and the third is the analytical laboratory measurement-specific minimum detectable activity.

[b]Codes: UF–unfiltered; F–filtered; CS–customer sample; DUP–laboratory duplicate; TRP–laboratory triplicate; RE–laboratory replicate sample; REDP–laboratory duplicate replicate sample.

[c]Standards given here for comparison only; see Appendix A.

Table 5-11. Chemical Quality of Storm Runoff for 2001 (mg/L[a])

Station Name	Date	Codes[b]		Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	PO_4-P	NO_3+ NO_2-N	ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Guaje Canyon																						
Guaje above Rendija	08/08	F	CS		4.0			1.8	6.8	< 1	59						180				7.4	
Guaje above Rendija	08/08	F	DUP														178					
Guaje above Rendija	08/08	UF	CS		43.0							4.89	1.01					41,900	42,300		7.0	184
Guaje above Rendija	08/08	UF	DUP															47,000	51,800			
Guaje above Rendija	08/09	UF	CS		154.0										< 0.0029	0.016		144,000	100,000		7.0	
Guaje above Rendija	08/09	UF	DUP															155,000	81,900			
Guaje above Rendija	08/11	F	CS		3.7			1.2	4.6	< 1	72											
Guaje above Rendija	08/11	UF	CS		55.6							2.85	0.46	< 4.79	< 0.0029	0.0237		57,200	7,780		7.1	201
Guaje above Rendija	08/11	UF	DUP															56,300	8,420			
Guaje above Rendija	08/11	UF	TRP															62,800				
Guaje above Rendija	08/14	F	CS		32.4			2.8	4.4	< 1	35						108				7.2	
Guaje above Rendija	08/14	F	DUP		32.9			2.8	4.4								120				7.2	
Guaje above Rendija	08/14	F	TRP														138					
Guaje above Rendija	08/14	UF	CS		2.4							3.75	1.19	< 4.79	0.0050	0.0181		50,900	51,600		7.1	8950
Guaje above Rendija	08/14	UF	DUP		2.3							3.70	1.20	< 4.79	0.0060	0.0183		59,400	54,600		7.2	8980
Guaje above Rendija	08/14	UF	TRP															66,600	53,400			
Guaje above Rendija	08/16	UF	CS															61,100	42,300		6.9	
Guaje above Rendija	08/16	UF	DUP															68,600	35,500		6.9	
Rendija above Guaje	07/02	F	CS		7.4																	
Rendija above Guaje	07/02	F	DUP		7.4																	
Rendija above Guaje	07/02	UF	CS		124.0													113,000	101,000		7.3	
Rendija above Guaje	07/02	UF	DUP															126,000	81,400		7.3	
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons)																						
Los Alamos below Ice Rink	07/02	F	CS		5.4			7.0	9.3	< 1	89						220					
Los Alamos below Ice Rink	07/02	F	DUP					6.8	9.1	< 1	90						221					
Los Alamos below Ice Rink	07/02	UF	CS		44.1							4.08	1.45	< 9.58	< 0.0028	0.0223		10,200	21,000		7.6	262
Los Alamos below Ice Rink	07/02	UF	DUP		42.9							4.11	1.45	< 9.58	0.0029	0.0066		10,600	22,700			
Los Alamos below Ice Rink	07/02	UF	TRP															10,200				
Los Alamos below Ice Rink	07/13	F	CS		7.6			5.3	7.8	< 1	150						131					
Los Alamos below Ice Rink	07/13	F	DUP		7.5			5.4	8.1	< 1	151						134					
Los Alamos below Ice Rink	07/13	F	TRP														133					
Los Alamos below Ice Rink	07/13	UF	CS		32.0							2.61	< 0.01	< 4.79	< 0.0029	0.0110		4,630	26,400		7.4	328
Los Alamos below Ice Rink	07/13	UF	DUP		33.1							2.61	< 0.01	< 4.79	< 0.0029	0.0109		4,780	30,300		7.4	329
Los Alamos below Ice Rink	07/13	UF	TRP															4,660	32,100			
Los Alamos below Ice Rink	08/09	F	CS		8.7			4.7	4.2	2	148						235				7.8	
Los Alamos below Ice Rink	08/09	F	DUP														236					
Los Alamos below Ice Rink	08/09	UF	CS		26.5							2.38	0.30	< 1.92	< 0.0029	0.0061		4,480	8,560		7.1	282
Los Alamos below Ice Rink	08/09	UF	DUP															4,490	9,220			
Los Alamos above DP Canyon	07/02	F	CS		4.8																	
Los Alamos above DP Canyon	07/02	UF	CS		36.9							5.55	0.83		< 0.0028	0.0091		8,990	17,900		7.7	265
Los Alamos above DP Canyon	07/02	UF	DUP															9,320	26,100			264
Los Alamos above DP Canyon	07/14	F	CS		7.4																	
Los Alamos above DP Canyon	07/14	UF	CS		52.1										< 0.0029	0.0030		18,100	19,000		7.5	
Los Alamos above DP Canyon	07/14	UF	DUP															18,800	19,100			
Los Alamos above DP Canyon	07/26	F	CS		9.8			6.1	6.1	< 1	29						573					
Los Alamos above DP Canyon	07/26	F	DUP		9.8			6.1	6.1	< 1	30						587					
Los Alamos above DP Canyon	07/26	F	TRP														531					
Los Alamos above DP Canyon	07/26	UF	CS		31.5							3.55	0.41	< 4.79	< 0.0029	0.0068		13,200	12,000		7.5	265
Los Alamos above DP Canyon	07/26	UF	DUP		35.3							3.65	0.45	< 4.79	< 0.0029	0.0070		13,700	14,700		7.6	266
Los Alamos above DP Canyon	07/26	UF	TRP															14,000				
Los Alamos above DP Canyon	08/05	F	CS		2.4			9.1	4.1	< 1	53						116				7.4	
Los Alamos above DP Canyon	08/05	F	DUP							< 1	60										7.4	
Los Alamos above DP Canyon	08/05	UF	CS		28.9							1.92	0.29		< 0.0029	0.0125		8,580	17,100		7.5	177
Los Alamos above DP Canyon	08/05	UF	DUP															8,700	21,200			
Los Alamos above DP Canyon	08/05	UF	TRP																18,800			

Table 5-11. Chemical Quality of Storm Runoff for 2001 (mg/L[a])

Station Name	Date	Codes[b]		Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	PO_4-P	NO_3+ NO_2-N	ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons) (Cont.)																						
Los Alamos above DP Canyon	08/09	F	CS		5.3			3.9	6.1	< 1	91						188				7.6	
Los Alamos above DP Canyon	08/09	F	DUP		5.3			3.8	6.0	< 1	92						190				7.6	
Los Alamos above DP Canyon	08/09	UF	CS		42.9							7.80	1.01	< 3.83	< 0.0029	0.0157		37,300	27,600		7.2	263
Los Alamos above DP Canyon	08/09	UF	DUP		69.9							8.00	0.99	< 3.83	< 0.0029	0.0135		41,500	35,800		7.2	263
Los Alamos above DP Canyon	08/09	UF	TRP															40,600	44,000			
Los Alamos above DP Canyon	08/16	F	CS		2.7			7.3	4.3	< 1	40						110				7.1	
Los Alamos above DP Canyon	08/16	F	DUP		2.7			7.3	4.3	< 1	40						116				7.2	
Los Alamos above DP Canyon	08/16	F	TRP														126					
Los Alamos above DP Canyon	08/16	UF	CS		27.0							1.66	0.43	< 0.96	< 0.0029	0.0114		7,970	14,900		7.5	160
Los Alamos above DP Canyon	08/16	UF	DUP		24.7							1.64	0.43	< 0.96	< 0.0029	0.0111		9,010	13,900		7.5	160
Los Alamos above DP Canyon	08/16	UF	TRP															8,650	16,900			
DP above TA-21	05/13	UF	CS															2,660			7.8	
DP above TA-21	05/13	UF	DUP															2,710			7.8	
DP above TA-21	05/28	F	CS		0.7																	
DP above TA-21	05/28	UF	CS		5.9													1,440	3,060		7.0	
DP above TA-21	05/28	UF	DUP		6.4													1,510	3,380			
DP above TA-21	05/28	UF	TRP																3,730			
DP above TA-21	06/27	F	CS		0.8																	
DP above TA-21	06/27	UF	CS		9.7							1.15	0.22		< 0.0029	< 0.0029		3,180	2,230		7.3	
DP above TA-21	06/27	UF	DUP															3,250	2,510			
DP above TA-21	07/02	F	CS		0.5																	
DP above TA-21	07/02	UF	CS		4.1													1,150	2,050		7.1	
DP above TA-21	07/02	UF	DUP															950	2,370			
DP above TA-21	08/01	F	CS		0.6			2.8	2.9	< 1	33						72					
DP above TA-21	08/01	F	DUP														77					
DP above TA-21	08/01	UF	CS		3.2							0.36	0.44					840	1,060		7.3	100
DP above TA-21	08/01	UF	DUP															853	1,500		7.3	
DP above TA-21	08/01	UF	TRP																1,280			
DP above TA-21	08/04	F	CS		0.5																	
DP above TA-21	08/04	UF	CS		5.0							0.44	0.17		< 0.0029	< 0.0029		1,450	1,800		7.5	
DP above TA-21	08/04	UF	DUP															1,540	2,060			
DP above TA-21	08/16	F	CS		0.4																	
DP above TA-21	08/16	UF	CS		2.2										< 0.0029	0.0058		895	1,140		6.9	
DP above TA-21	08/16	UF	DUP															645	889			
DP below Meadow at TA-21	06/27	F	CS		0.9																	
DP below Meadow at TA-21	06/27	UF	CS		7.7							0.66	0.36		< 0.0029	0.0052		2,550	3,430		7.2	
DP below Meadow at TA-21	06/27	UF	DUP															2,690	3,530		7.2	
DP below Meadow at TA-21	07/02	F	CS		0.9																	
DP below Meadow at TA-21	07/02	UF	CS		9.5													2,880	3,320		7.0	
DP below Meadow at TA-21	07/02	UF	DUP															3,000	3,670			
DP below Meadow at TA-21	07/02	UF	TRP																4,030			
DP below Meadow at TA-21	08/04	UF	CS									0.66	0.13					2,730	3,650		6.8	92
DP below Meadow at TA-21	08/04	UF	DUP															2,860	4,280			
DP above Los Alamos Canyon	05/13	UF	CS		24.4													8,250	12,100		7.8	
DP above Los Alamos Canyon	05/13	UF	DUP															8,540	13,500			
DP above Los Alamos Canyon	05/13	UF	TRP																14,400			
DP above Los Alamos Canyon	05/28	F	CS		1.4																	
DP above Los Alamos Canyon	05/28	UF	CS		16.1													5,140			7.2	
DP above Los Alamos Canyon	05/28	UF	DUP															5,960				
DP above Los Alamos Canyon	06/27	F	CS		1.1			6.3	3.2	< 1	44						100					
DP above Los Alamos Canyon	06/27	F	DUP														103					
DP above Los Alamos Canyon	06/27	UF	CS		7.9							1.17	0.35	< 0.96	< 0.0029	0.0033		5,480	11,800		7.4	103
DP above Los Alamos Canyon	06/27	UF	DUP															5,900	12,400			
DP above Los Alamos Canyon	08/04	F	CS		1.0																	
DP above Los Alamos Canyon	08/04	UF	CS		11.3													3,320	5,350		6.9	102
DP above Los Alamos Canyon	08/04	UF	DUP																5,840		6.9	

Table 5-11. Chemical Quality of Storm Runoff for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]		Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	PO_4-P	NO_3+ NO_2-N	ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons) (Cont.)																						
Los Alamos above SR-4	07/02	F	CS		1.7																	
Los Alamos above SR-4	07/02	UF	CS		17.2													7,300	12,500		7.2	
Los Alamos above SR-4	07/02	UF	DUP															8,020	14,000			
Los Alamos above SR-4	07/02	UF	TRP																11,700			
Los Alamos above SR-4	07/14	F	CS		7.2																	
Los Alamos above SR-4	07/14	UF	CS		53.6										< 0.0029	0.0075		15,900	16,400		7.3	
Los Alamos above SR-4	07/14	UF	DUP													0.0091		16,500	16,600		7.3	
Los Alamos above SR-4	07/26	UF	CS		117.0													26,000	37,600		7.3	
Los Alamos above SR-4	07/26	UF	DUP															28,900	39,600		7.3	
Los Alamos above SR-4	07/26	UF	TRP															26,800	38,600			
Los Alamos above SR-4	08/01	F	CS		6.6																	
Los Alamos above SR-4	08/01	UF	CS		13.7							0.81	0.01					2,730	1,200		8.2	358
Los Alamos above SR-4	08/01	UF	DUP															2,800	1,310			
Los Alamos above SR-4	08/01	UF	TRP															2,530				
Los Alamos above SR-4	08/04	F	CS		2.5			10.2	3.9	<	1	58					110				7.5	
Los Alamos above SR-4	08/04	F	DUP														112					
Los Alamos above SR-4	08/04	UF	CS		23.0							1.35	0.26		< 0.0029	0.0085		5,900	16,500		7.2	160
Los Alamos above SR-4	08/04	UF	DUP															6,750	20,400			
Los Alamos above SR-4	08/08	F	CS		3.7																	
Los Alamos above SR-4	08/09	UF	CS		23.3							2.29	0.21					8,630	12,300		7.3	225
Los Alamos above SR-4	08/09	UF	DUP															8,750	14,800			
Los Alamos above SR-4	08/16	F	CS		6.0																	
Los Alamos above SR-4	08/16	UF	CS		12.3													2,840	2,340		7.3	
Los Alamos above SR-4	08/16	UF	DUP																2,460		7.3	
Los Alamos above SR-4	08/16	F	CS		2.3			6.0	3.7	<	1	38					95				7.0	
Los Alamos above SR-4	08/16	F	DUP														98					
Los Alamos above SR-4	08/16	UF	CS		26.3							1.95	0.40	< 0.96	0.0096	0.0114		9,000	5,070		7.1	146
Los Alamos above SR-4	08/16	UF	DUP															9,050	5,340			
Los Alamos below LA Weir	07/26	F	CS		6.3																	
Los Alamos below LA Weir	07/26	UF	CS		44.1							3.36	0.43					9,720	10,400		7.6	273
Los Alamos below LA Weir	07/26	UF	DUP															9,900	9,720			
Los Alamos below LA Weir	08/09	F	CS		5.9																	
Los Alamos below LA Weir	08/09	UF	CS		85.3							6.90	1.02		< 0.0029	0.0153		26,600	42,600		6.7	211
Los Alamos below LA Weir	08/09	UF	DUP															31,500	42,800			
Los Alamos below LA Weir	08/09	UF	TRP																43,600			
Los Alamos below LA Weir	08/16	F	CS		2.6																	
Los Alamos below LA Weir	08/16	UF	CS		24.3							1.42	0.30					9,420	7,860		7.2	135
Los Alamos below LA Weir	08/16	UF	DUP															9,750	8,310			
Acid above Pueblo	08/03	F	CS		5.9																	
Acid above Pueblo	08/03	UF	CS															4,090	10,100		7.2	
Acid above Pueblo	08/03	UF	DUP																9,730			
Acid above Pueblo	08/03	UF	TRP																9,640			
Acid above Pueblo	08/13	UF	CS															4,460			7.5	
Pueblo above SR-502	07/02	F	CS		5.9																	
Pueblo above SR-502	07/02	UF	CS															49,500	44,000		7.3	
Pueblo above SR-502	07/02	UF	DUP															53,000	57,100			
Pueblo above SR-502	07/26	UF	CS									4.65	2.31					40,400	40,700		7.3	368
Pueblo above SR-502	07/26	UF	DUP															41,500	45,800			
Pueblo above SR-502	08/04	UF	CS															22,000	10,600		7.5	
Pueblo above SR-502	08/04	UF	DUP															23,300	12,100			
Pueblo above SR-502	08/09	F	CS		5.2			10.9	16.3	<	1	99					228				7.3	
Pueblo above SR-502	08/09	F	DUP														234					
Pueblo above SR-502	08/09	UF	CS		83.8							4.50	1.57	< 3.83	< 0.0029	0.0099		33,300	33,800		7.2	311
Pueblo above SR-502	08/09	UF	DUP															35,600	39,000			
Pueblo above SR-502	08/09	UF	TRP																40,000			
Pueblo above SR-502	08/11	F	CS		5.4			8.2	23.5	<	1	115					246				8.1	

Table 5-11. Chemical Quality of Storm Runoff for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]		Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	PO_4-P	NO_3+ NO_2-N	ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons) (Cont.)																						
Pueblo above SR-502	08/11	F	DUP														251				8.1	
Pueblo above SR-502	08/11	UF	CS		69.4							4.30	0.92	< 4.79	< 0.0029	0.0132		30,900	50,100		7.3	346
Pueblo above SR-502	08/11	UF	DUP															32,600	50,700			
Pueblo above SR-502	08/16	F	CS		4.3			8.2	24.9	<	1	85					203				8.0	
Pueblo above SR-502	08/16	F	DUP														208					
Pueblo above SR-502	08/16	UF	CS		76.1							4.50	0.88					19,300	36,400		7.5	
Pueblo above SR-502	08/16	UF	DUP									4.70	0.88					21,300	41,500			
Sandia Canyon																						
Sandia tributary at Salvage Yard	06/27	F	CS		1.4																	
Sandia tributary at Salvage Yard	06/27	F	DUP		1.4																	
Sandia tributary at Salvage Yard	06/27	UF	CS		1.7							0.03	1.40		< 0.0029	0.0041		72	2,540		9.0	
Sandia tributary at Salvage Yard	06/27	UF	DUP									0.02	1.36		< 0.0029	0.0039		80	2,630		9.0	
Sandia tributary at Salvage Yard	07/26	F	CS		0.5																	
Sandia tributary at Salvage Yard	07/26	UF	CS		3.8										< 0.0029	0.0038		923	1,320		6.9	
Sandia tributary at Salvage Yard	07/26	UF	DUP															943	1,350		6.9	
Sandia tributary at Salvage Yard	07/26	UF	TRP																1,330			
Sandia tributary at Salvage Yard	08/01	F	CS		0.7																	
Sandia tributary at Salvage Yard	08/01	UF	CS		2.7							0.09	0.24					378	1,260		7.5	285
Sandia tributary at Salvage Yard	08/01	UF	DUP															380	1,400			
Sandia below Wetlands	08/05	F	CS		2.7																	
Sandia below Wetlands	08/05	UF	CS		10.9													1,760	3,250		7.1	440
Sandia below Wetlands	08/05	UF	DUP															1,770	3,290			
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey)																						
TA-55 NW above Effluent Canyon	04/07	UF	CS															46			7.3	
TA-55 NW above Effluent Canyon	04/07	UF	DUP															47			7.3	
TA-55 NW above Effluent Canyon	05/13	UF	CS															472			7.6	
TA-55 NW above Effluent Canyon	05/13	UF	DUP															480				
TA-55 NW above Effluent Canyon	05/28	UF	CS															512			6.9	
TA-55 NW above Effluent Canyon	05/28	UF	DUP															548			6.9	
TA-55 NW above Effluent Canyon	06/27	F	CS		0.2																	
TA-55 NW above Effluent Canyon	06/27	UF	CS															1,060	1,150		7.1	
TA-55 NW above Effluent Canyon	06/27	UF	DUP															996	1,290			
TA-55 NW above Effluent Canyon	07/02	F	CS		0.3																	
TA-55 NW above Effluent Canyon	07/02	UF	CS		1.3													250	218		6.8	
TA-55 NW above Effluent Canyon	07/02	UF	DUP															292	248			
TA-55 NW above Effluent Canyon	07/13	F	CS					8.7	2.6	<	1	35					33					
TA-55 NW above Effluent Canyon	07/13	F	DUP														38					
TA-55 NW above Effluent Canyon	07/13	UF	CS															102	219		6.8	
TA-55 NW above Effluent Canyon	07/13	UF	DUP															113	224			
TA-55 NW above Effluent Canyon	07/19	F	CS					1.8	1.9	<	1	17					34					
TA-55 NW above Effluent Canyon	07/19	F	DUP							<	1	18					38					
TA-55 NW above Effluent Canyon	07/19	F	TRP														40					
TA-55 NW above Effluent Canyon	07/19	UF	CS										0.05	0.50	1.17	< 0.0029	0.0031		494			7.1	
TA-55 NW above Effluent Canyon	07/19	UF	DUP														0.0033		512			7.1	
TA-55 NW above Effluent Canyon	07/19	UF	TRP																418			
TA-55 NW above Effluent Canyon	08/01	UF	CS		0.5														100	112	6.9	
TA-55 NW above Effluent Canyon	08/01	UF	DUP																88	118		
MDA L	04/06	UF	CS		0.5														42			
MDA L	04/06	UF	CS																42			
MDA L	04/06	UF	DUP																43			
MDA L	04/27	UF	CS		1.1																	
MDA L	04/27	UF	QUD																320			

Table 5-11. Chemical Quality of Storm Runoff for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]		Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	PO_4-P	NO_3+ NO_2-N	ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Mortandad Canyon (includes Ten Site Canyon, Cañada del Buey) (Cont.)																						
MDA L	04/27	UF	TRP															310				
MDA L	05/28	F	CS		0.3					<	1	33					68				6.7	
MDA L	05/28	F	DUP														64					
MDA L	05/28	F	TRP														60					
MDA L	05/28	UF	CS		0.5							0.18	0.56	< 1.92		0.0037		106	151		6.6	44
MDA L	05/28	UF	DUP		0.5								0.55					139	156		6.6	44
MDA L	06/07	F	CS		0.2			0.9	1.9	<	1	9					37				7.6	
MDA L	06/07	F	DUP														37				7.6	
MDA L	06/07	UF	CS		1.1							0.23	0.45	< 0.96	< 0.0028	< 0.0028		253	588		6.5	32
MDA L	06/07	UF	DUP									0.22			< 0.0028	< 0.0028		273	595			
MDA L	07/02	UF	CS		0.3							0.08	0.49					52	153		6.6	
MDA L	07/02	UF	DUP															54	160		6.6	
MDA L	07/17	UF	CS															15			7.1	
MDA L	07/17	UF	DUP															18			7.1	
MDA L	07/21	UF	CS																24		6.9	
MDA L	07/21	UF	DUP																29		6.9	
MDA L	07/26	F	CS		0.4																	
MDA L	07/26	UF	CS		0.6													28	44		7.0	81
MDA L	07/26	UF	DUP															30	49		7.0	
MDA L	10/05	UF	CS		0.8											0.0048		22				
MDA L	10/05	UF	DUP													0.0048		23				
Pajarito Canyon (includes Twomile, Threemile Canyons)																						
Pajarito below SR-501	07/26	UF	CS															48,500	44,700		7.5	
Pajarito below SR-501	07/26	UF	DUP															49,100	51,800			
Pajarito below SR-501	08/09	F	CS		3.9																	
Pajarito below SR-501	08/09	UF	CS		81.0							7.55	1.00					42,500	17,300		7.1	210
Pajarito below SR-501	08/09	UF	DUP															46,000	20,200			
Pajarito above Starmers	07/26	UF	CS															11,300	27,100		7.3	
Pajarito above Starmers	07/26	UF	DUP															11,400	30,800			
Pajarito above Starmers	08/05	F	CS		3.5			1.7	5.0	<	1	70					153					
Pajarito above Starmers	08/05	F	DUP														165					
Pajarito above Starmers	08/05	UF	CS		35.6							3.95	1.29	< 4.79	< 0.0029	0.0100		11,100	29,100		7.4	553
Pajarito above Starmers	08/05	UF	DUP															11,600	31,800			
Pajarito above Starmers	08/05	UF	TRP																33,500			
Pajarito above Starmers	08/11	F	CS		3.3																	
Pajarito above Starmers	08/11	UF	CS		15.2							1.65	0.86		< 0.0029	0.0134		3,990	15,900		12.2	142
Pajarito above Starmers	08/11	UF	DUP															4,110	16,300			
Pajarito above Starmers	08/11	UF	TRP																16,100			
Pajarito above TA-18	07/02	F	CS		2.6																	
Pajarito above TA-18	07/02	UF	CS		10.4													3,000	7,170		7.1	
Pajarito above TA-18	07/02	UF	DUP															3,060	8,130			
Pajarito above TA-18	08/05	F	CS		2.3																	
Pajarito above TA-18	08/05	UF	CS		29.2													15,100	19,700		7.5	196
Pajarito above TA-18	08/05	UF	DUP															16,000	8,500			
MDA G-1	08/05	UF	CS		19.2													2,880	5,370		7.1	
MDA G-1	08/05	UF	DUP															2,920	5,840			
MDA G-2	08/30	F	CS		9.4			39.4	1.8	<	1	31					130				7.8	
MDA G-2	08/30	F	DUP														130					
MDA G-2	08/30	F	TRP														136					
MDA G-2	08/30	UF	CS		53.1							0.36	0.33					2,270	12,600		8.1	231
MDA G-2	08/30	UF	DUP															2,510	14,600			
MDA G-2	08/30	UF	TRP															2,320				
MDA G-3	06/07	F	CS		5.8			44.7	8.9		0	34					220				7.5	
MDA G-3	06/07	F	DUP							<	1	34					228					
MDA G-3	06/07	UF	CS		11.0							0.25	1.00	< 3.83	0.0045	0.0093		830	918		6.9	210

Table 5-11. Chemical Quality of Storm Runoff for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]		Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	PO_4-P	NO_3+ NO_2-N	ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Pajarito Canyon (includes Twomile, Threemile Canyons) (Cont.)																						
MDA G-3	06/07	UF	DUP															885	930			
MDA G-3	07/02	F	CS		347.0			957.0	6.3	< 1	27						2,060					
MDA G-3	07/02	F	DUP														2,140					
MDA G-3	07/02	F	TRP														2,000					
MDA G-3	07/02	UF	CS		340.0							0.12	0.22	< 9.58	< 0.0028	< 0.0028		399	763		7.2	3520
MDA G-3	07/02	UF	DUP												< 0.0028	< 0.0028		418	845			
MDA G-3	07/02	UF	TRP															428	866			
MDA G-3	07/13	F	CS		51.4			183.0	6.1	< 1	163						484					
MDA G-3	07/13	F	DUP														508					
MDA G-3	07/13	UF	CS		50.2							0.04	0.53		0.0031	0.0046		194	157		6.8	708
MDA G-3	07/13	UF	DUP															197	158			708
MDA G-3	08/01	F	CS		26.6			107.0	5.1	< 1	23						388					
MDA G-3	08/01	F	DUP							< 1	23						392					
MDA G-3	08/01	UF	CS		29.4							0.02	0.22		< 0.0029	< 0.0029		144	163		6.7	1030
MDA G-3	08/01	UF	DUP															154	165			
MDA G-3	08/01	UF	TRP																169			
MDA G-3	08/04	F	CS		35.7			149.0	3.0	< 1	76						373					
MDA G-3	08/04	F	DUP														397					
MDA G-3	08/04	UF	CS		42.1							0.18	0.32		< 0.0029	0.0041		1,290	2,020		7.3	490
MDA G-3	08/04	UF	DUP																2,120			
MDA G-3	08/30	F	CS		8.9																	
MDA G-3	08/30	UF	CS		10.1							0.05	0.41		< 0.0029	0.0034		183	141		7.1	187
MDA G-3	08/30	UF	DUP									0.05	0.40		< 0.0029	0.0032			156		7.2	187
MDA G-4	04/06	F	CS	8.7	0.9	6.2	9.4	11.2	2.5	< 1	36						62			25.3	7.9	
MDA G-4	04/06	F	DUP					11.5	2.5								78				7.9	
MDA G-4	04/06	F	TRP														73					
MDA G-4	04/06	UF	CS		3.0							0.11	0.42		< 0.0028	< 0.0028		377				
MDA G-4	04/06	UF	DUP										0.42			< 0.0028		385				
MDA G-4	04/06	UF	CS															578				
MDA G-4	04/06	UF	DUP															580				
MDA G-4	06/07	F	CS		0.9																	
MDA G-4	06/07	UF	CS		6.8													1,600	1,690		7.3	151
MDA G-4	06/07	UF	DUP		6.6													1,680	1,710		7.3	151
MDA G-4	06/07	UF	TRP															1,790	1,760			
MDA G-4	06/27	F	CS		0.7																	
MDA G-4	06/27	UF	CS		4.2										< 0.0029	< 0.0029		1,100	717		7.5	98
MDA G-4	06/27	UF	DUP															1,360	748			
MDA G-4	07/02	F	CS		8.8																	
MDA G-4	07/02	UF	CS		12.6													865	2,960		7.9	257
MDA G-4	07/02	UF	DUP															876	3,180			
MDA G-4	07/13	F	CS		2.3																	
MDA G-4	07/13	UF	CS		3.1							0.06	0.68		< 0.0029	< 0.0029		126	114		6.9	138
MDA G-4	07/13	UF	DUP															128	119			
MDA G-4	07/17	UF	CS																611			
MDA G-4	07/17	UF	DUP																706			
MDA G-4	07/17	UF	CS		2.3										< 0.0029	< 0.0029		245	221		7.2	
MDA G-4	07/17	UF	DUP															247	224		7.2	
MDA G-4	07/17	UF	QUD															154				
MDA G-4	07/17	UF	TRP															142	228		7.2	
MDA G-4	07/26	F	CS		1.6																	
MDA G-4	08/01	UF	CS															188	220		7.3	
MDA G-4	08/01	UF	DUP															203	227			
MDA G-4	08/04	UF	CS		6.2													1,490	1,960		7.6	80
MDA G-4	08/04	UF	DUP															1,700	2,080		7.6	
MDA G-4	10/05	UF	CS		2.3											0.0042		98				

Table 5-11. Chemical Quality of Storm Runoff for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]		Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	PO_4-P	NO_3+ NO_2-N	ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Pajarito Canyon (includes Twomile, Threemile Canyons) (Cont.)																						
Pajarito above SR-4	06/27	F	CS		7.7			34.4	20.6	< 1	82						267					
Pajarito above SR-4	06/27	F	DUP														286					
Pajarito above SR-4	06/27	F	TRP														286					
Pajarito above SR-4	06/27	UF	CS		17.3							1.61	0.90	< 9.58	< 0.0029	0.0104		1,700	2,980		7.5	315
Pajarito above SR-4	06/27	UF	DUP															1,720	3,080			315
Pajarito above SR-4	08/06	F	CS		6.0			16.2	11.6	< 1	94						200				7.7	
Pajarito above SR-4	08/06	F	DUP		5.9			16.1	11.6	< 1	94						200				7.7	
Pajarito above SR-4	08/06	UF	CS		38.9							3.66	1.04	< 4.79	< 0.0029	0.0076		11,000	7,600		7.3	200
Pajarito above SR-4	08/06	UF	DUP		38.0							3.75	1.02	< 4.79	< 0.0029	0.0076		11,200	8,610		7.3	201
Pajarito above SR-4	08/06	UF	TRP															12,100				
Pajarito above SR-4	08/09	F	CS		5.0			10.6	7.9	< 1	84						196				7.3	
Pajarito above SR-4	08/09	F	DUP		4.9			10.6	7.8								206				7.3	
Pajarito above SR-4	08/09	F	TRP														202					
Pajarito above SR-4	08/09	UF	CS		33.9							3.42	1.07	< 1.92	< 0.0029	0.0131		6,400	7,660		7.3	199
Pajarito above SR-4	08/09	UF	DUP		34.0							3.39	1.12	< 1.92	< 0.0029	0.0141		7,200			7.3	199
Pajarito above SR-4	08/09	UF	TRP															7,340				
Pajarito above SR-4	08/16	F	CS		3.2			7.7	4.8	< 1	49						121				7.1	
Pajarito above SR-4	08/16	F	DUP														125					
Pajarito above SR-4	08/16	UF	CS		12.2							0.77	0.42	< 0.96	< 0.0029	0.0073		1,540	2,960		7.3	160
Pajarito above SR-4	08/16	UF	DUP															1,580	3,100			159
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons)																						
Water above SR-501	07/22	F	CS		8.2																	
Water above SR-501	07/22	UF	CS		80.1										< 0.0029	0.0156		32,300	14,000		7.4	367
Water above SR-501	07/22	UF	DUP		102.0										< 0.0029	0.0187		33,000	26,800		7.4	367
Water above SR-501	07/22	UF	TRP															32,900				
Cañon de Valle above SR-501	07/22	UF	CS																16,300			
Cañon de Valle above SR-501	07/22	UF	DUP																22,100			
Cañon de Valle above SR-501	07/26	F	CS		20.5																	
Cañon de Valle above SR-501	07/26	UF	CS		40.2							9.00	1.63					21,400	26,500		7.6	325
Cañon de Valle above SR-501	07/26	UF	DUP															24,700	29,500			
Water above S Site Canyon	07/22	UF	CS																12,100		7.4	
Water above S Site Canyon	07/22	UF	DUP																38,400			
S Site Canyon above Water	08/03	F	CS		1.5																	
S Site Canyon above Water	08/03	UF	CS		13.3													3,510	6,300		6.5	78
S Site Canyon above Water	08/03	UF	DUP															3,800	7,040			
Cañon de Valle above Water	08/05	UF	CS		84.9							7.90	1.84					27,700			7.2	317
Cañon de Valle above Water	08/05	UF	DUP															27,200	27,100			
Cañon de Valle above Water	08/05	UF	TRP															27,100	30,800			
Cañon de Valle above Water	08/05	F	CS		7.4																	
Cañon de Valle above Water	08/09	F	CS		4.0			7.2	4.5	< 1	72						167				7.4	
Cañon de Valle above Water	08/09	F	DUP														169					
Cañon de Valle above Water	08/09	UF	CS		75.5							5.20	1.05	< 4.79	< 0.0029	0.0172		20,700	27,200		7.2	184
Cañon de Valle above Water	08/09	UF	DUP															20,100	29,700			
Water below MDA AB	07/26	F	CS		6.8																	
Water below MDA AB	07/26	UF	CS		172.0													81,100	107,000		7.3	362
Water below MDA AB	07/26	UF	DUP															88,100	127,000			
Water below MDA AB	08/03	F	CS		2.8			2.1	3.6	< 1	11						160				6.0	
Water below MDA AB	08/03	F	DUP														173					
Water below MDA AB	08/03	F	TRP														153					
Water below MDA AB	08/03	UF	CS		27.2							2.17	0.56		< 0.0029	0.0074		7,260	33,400		6.8	94
Water below MDA AB	08/03	UF	DUP															8,630	34,400			
Water below MDA AB	08/08	F	CS		4.7																	
Water below MDA AB	08/08	UF	CS		72.1							4.14	2.01	< 3.83	< 0.0029	0.0110		17,300	21,400		6.9	185
Water below MDA AB	08/08	UF	DUP															22,300	25,800			
Water below MDA AB	08/08	UF	TRP																26,300			

Table 5-11. Chemical Quality of Storm Runoff for 2001 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]		Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	PO_4-P	NO_3+ NO_2-N	ClO_4 (µg/L)	CN (Amenable)	CN (Total)	TDS[c]	TSS[d]	TSS (max)	Hardness (as $CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons)																						
Water at SR-4	07/26	F	CS		57.2																	
Water at SR-4	07/26	UF	CS		100.0							3.33	0.42					83,400	38,200		7.5	275
Water at SR-4	07/26	UF	DUP															95,100	43,200			
Water at SR-4	08/03	UF	CS		69.7													30,400	50,100		7.0	
Water at SR-4	08/03	UF	DUP															33,900	59,200			
Water at SR-4	08/03	F	CS		1.9																	
Water at SR-4	08/03	UF	CS		19.7							1.65	0.44		< 0.0029	0.0064		5,460	4,990		6.8	79
Water at SR-4	08/03	UF	DUP															5,520	5,620			
Water at SR-4	08/09	F	CS		3.7			10.7	5.2	< 1	57						164				7.4	
Water at SR-4	08/09	F	DUP														176					
Water at SR-4	08/09	UF	CS		37.3							7.05	0.73		< 0.0029	0.0062		64,900	33,600		7.0	904
Water at SR-4	08/09	UF	DUP															52,300	45,300			
Water below SR-4	08/03	UF	CS		70.9							4.80	0.64	< 4.79	< 0.0029	0.0088		30,100	8,680		6.9	
Water below SR-4	08/03	UF	DUP												< 0.0029	0.0088		33,200	9,280			
Water below SR-4	08/03	F	CS		2.1																	
Water below SR-4	08/03	UF	CS		19.8													4,990	6,230		6.9	92
Water below SR-4	08/03	UF	DUP															5,210	6,630		7.0	92
Water below SR-4	08/03	UF	TRP															5,070	6,310			
Water below SR-4	08/09	F	CS		4.4			11.7	4.6	< 1	82						168				7.6	
Water below SR-4	08/09	F	DUP														175					
Water below SR-4	08/09	UF	CS		64.5							6.15	0.63					34,200	26,900		7.1	194
Water below SR-4	08/09	UF	DUP															26,200	37,200			
Potrillo tributary Study Area	08/05	UF	CS															18,300	19,600		7.6	
Potrillo tributary Study Area	08/05	UF	DUP															19,300	23,100			
Potrillo tributary Study Area	08/11	F	CS		1.8																	
Potrillo tributary Study Area	08/11	UF	CS		80.0													18,500	33,400		7.4	253
Potrillo tributary Study Area	08/11	UF	DUP															18,800	33,900			
Potrillo tributary Study Area	08/30	F	CS		2.5			1.9	2.0	< 1	59						118					
Potrillo tributary Study Area	08/30	F	DUP					1.8	1.9	< 1	60						124					
Potrillo tributary Study Area	08/30	UF	CS		138.0							2.43	0.46	< 0.96	< 0.0029	< 0.0029		25,500	15,500		7.8	201
Potrillo tributary Study Area	08/30	UF	DUP		140.0													23,100	15,900			
Potrillo tributary Study Area	08/30	UF	TRP															26,300	15,900			
Ancho Canyon																						
Ancho Canyon spring tributary below SR-4	08/12	F	CS		1.2																	
Ancho Canyon spring tributary below SR-4	08/12	UF	CS		41.0							1.02	0.37					7,650	9,230		7.1	90
Ancho Canyon spring tributary below SR-4	08/12	UF	DUP															7,690	9,840			
Water Quality Standards[f]																						
EPA Primary Drinking Water Standard									500				10			0.2						
EPA Secondary Drinking Water Standard								250	250								500				6.8–8.5	
EPA Health Advisory							20															
NMWQCC Groundwater Limit								250	600				10			0.2	1,000				6–9	
NMWQCC Wildlife Habitat Standard															0.0052							

[a]Except where noted.
[b]Codes: UF–unfiltered; F–filtered; CS–customer sample; DUP–laboratory duplicate; TRP–laboratory triplicate; QUD–laboratory quadruplicate.
[c]Total dissolved solids.
[d]Total suspended solids.
[e]Standard units.
[f]Standards given here for comparison only; see Appendix A.
NOTE: Less than symbol (<) means measurement was below the specified limit of detection of the analytical method.

Table 5-12. Trace Metals in Storm Runoff for 2001 (µg/L)

Station Name	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe
Guaje Canyon														
Guaje above Rendija	08/14	UF	CS	< 2.9[b]	1,260	< 2.6	23.9	38.8	< 0.25	22.5	< 0.7	1.0	< 1.9	744
Guaje above Rendija	08/14	UF	DUP	< 2.7	1,190	< 2.6	< 22.5	37.1	< 0.25	22.9	< 0.7	< 0.8	< 1.9	714
Guaje above Rendija	08/14	F	CS	< 4.8	166,000	45.5	72.2	4150.0	31.70	< 0.1	95.0	81.3	117.0	125,000
Guaje above Rendija	08/14	F	DUP	5.1	171,000	49.9	71.0	4030.0	31.10	< 0.1	93.9	86.0	122.0	132,000
Guaje above Rendija	08/11	UF	CS	< 4.4	313,000	83.7	95.8	5540.0	45.40	24.1	139.0	170.0	246.0	373,000
Guaje above Rendija	08/11	F	CS	< 2.6	2,450	< 2.6	29.4	78.1	< 0.25	< 0.3	< 2.0	1.4	< 1.9	1,390
Guaje above Rendija	08/09	UF	CS	< 0.3	1,040,000	140.0	162.0	20000.0	123.00	24.5	386.0	487.0	793.0	637,000
Guaje above Rendija	08/08	UF	CS	< 0.3	188,000	57.9	< 47.2	5540.0	34.70	9.1	137.0	93.0	136.0	159,000
Guaje above Rendija	08/08	F	CS	< 0.3	2,100	5.0	< 23.5	72.4	< 0.25	< 0.3	< 1.3	< 0.9	< 1.3	1,220
Rendija above Guaje	07/02	UF	CS	< 0.9	535,000	115.0	141.0	14300.0	53.60	6.6	362.0	289.0	376.0	327,000
Rendija above Guaje	07/02	F	CS	< 0.9	3,500	< 2.3	< 41.3	141.0	< 0.16	< 0.2	< 2.1	< 3.7	< 4.8	1,940
Rendija above Guaje	07/02	F	DUP	< 0.9	3,580	< 3.5	< 37.9	142.0	< 0.16		< 2.4	< 2.1	5.1	1,910
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons)														
Los Alamos below Ice Rink	08/09	UF	CS	< 0.3	115,000	23.6	< 24.9	1670.0	8.57	3.1	34.3	64.3	97.5	78,200
Los Alamos below Ice Rink	08/09	F	CS	< 0.3	102	< 2.6	< 20.2	87.0	< 0.25	< 0.1	< 1.0	< 1.5	< 3.6	52.1
Los Alamos below Ice Rink	07/13	UF	DUP	< 0.7	181,000	33.0	58.0	1950.0	11.40	3.0	39.2	87.3	131.0	108,000
Los Alamos below Ice Rink	07/13	UF	CS	< 0.7	176,000	29.2	74.5	1930.0	11.40	3.2	39.6	85.3	125.0	107,000
Los Alamos below Ice Rink	07/13	F	CS	< 0.7	53	< 3.5	< 43.5	144.0	< 0.21	< 0.1	< 1.5	< 0.6	< 2.0	66.7
Los Alamos below Ice Rink	07/13	F	DUP	< 0.7	58	5.4	< 43.2	142.0	< 0.21	< 0.1	< 1.4	< 0.6	< 1.3	79.5
Los Alamos below Ice Rink	07/02	UF	DUP	< 0.9	179,000	50.1	75.9	3640.0	15.30	6.4	63.3	91.5	166.0	133,000
Los Alamos below Ice Rink	07/02	UF	CS	< 0.9	187,000	57.1	100.0	3720.0	16.10	6.9	65.8	96.7	173.0	140,000
Los Alamos below Ice Rink	07/02	F	CS	< 0.9	505	< 2.3	< 37.5	84.8	< 0.16	< 0.1	< 1.2	< 0.6	< 3.7	375
Los Alamos above DP Canyon	08/16	UF	DUP	< 0.3	136,000	31.9	< 26.4	1670.0	11.40	3.8	43.3	87.0	123.0	105,000
Los Alamos above DP Canyon	08/16	UF	CS	< 0.3	153,000	38.6	< 23.5	1760.0	12.00	4.0	44.6	99.9	137.0	118,000
Los Alamos above DP Canyon	08/16	F	CS	< 0.3	1,240	< 2.8	< 17.2	38.4	< 0.25	< 0.0	< 1.0	< 1.4	< 3.0	679
Los Alamos above DP Canyon	08/16	F	DUP	< 0.3	1,180	< 2.6	< 15.2	38.1	< 0.25	< 0.0	< 1.0	< 1.0	< 3.5	649
Los Alamos above DP Canyon	08/09	UF	DUP	< 0.3	414,000	91.4	126.0	7020.0	48.60	11.4	177.0	271.0	365.0	332,000
Los Alamos above DP Canyon	08/09	UF	CS	< 0.3	197,000	38.9	54.2	3970.0	22.20	5.1	91.6	112.0	151.0	143,000
Los Alamos above DP Canyon	08/09	F	CS	< 0.3	1,580	< 2.6	< 31.9	313.0	< 1.12	< 0.6	< 3.3	< 0.6	< 4.7	626
Los Alamos above DP Canyon	08/09	F	DUP	< 0.3	1,580	< 4.5	< 31.4	313.0	< 1.09	< 0.6	< 3.3	< 0.7	< 4.9	621
Los Alamos above DP Canyon	08/05	UF	CS	< 0.3	150,000	36.9	< 19.3	2010.0	12.70	5.6	47.6	100.0	154.0	113,000
Los Alamos above DP Canyon	08/05	F	CS	< 0.3	829	< 4.7	< 12.9	40.6	< 0.25	0.3	< 1.0	< 1.5	< 3.2	473
Los Alamos above DP Canyon	07/26	UF	DUP	< 0.3	140,000	28.1	59.4	3360.0	19.90	8.1	68.4	73.9	117.0	92,200
Los Alamos above DP Canyon	07/26	UF	CS	< 0.3	125,000	26.0	54.4	3280.0	18.50	7.8	63.7	62.2	105.0	77,800
Los Alamos above DP Canyon	07/26	F	CS	< 0.3	1,380	< 4.4	< 45.8	713.0	< 1.65	0.7	7.6	< 1.5	7.8	714
Los Alamos above DP Canyon	07/26	F	DUP	< 0.3	1,370	6.1	< 44.7	720.0	< 1.63	< 0.8	7.7	< 1.5	7.8	702
Los Alamos above DP Canyon	07/14	UF	CS	< 0.7	249,000	47.6	118.0	4150.0	24.10	7.4	89.3	134.0	217.0	173,000
Los Alamos above DP Canyon	07/14	F	CS	< 0.7	180	< 3.7	< 40.6	148.0	< 0.21	< 0.2	< 1.2	< 0.6	< 2.0	83.2
Los Alamos above DP Canyon	07/02	UF	CS	< 0.9	158,000	43.2	< 49.0	2790.0	14.00	4.5	51.5	94.9	162.0	120,000
Los Alamos above DP Canyon	07/02	F	CS	< 0.9	1,140	< 2.3	< 35.2	76.9	< 0.16	< 0.1	< 0.8	< 1.9	< 4.0	734
DP above TA-21	08/16	UF	CS	< 0.3	11,700	< 4.5	< 8.9	141.0	< 0.86	< 0.8	< 2.7	11.9	34.2	7,870
DP above TA-21	08/16	F	CS	< 0.3	270	6.3	< 11.9	15.9	< 0.25	< 0.1	< 1.0	< 1.4	< 3.1	151
DP above TA-21	08/04	UF	CS	< 0.3	27,900	9.0	< 1.8	273.0	< 2.11	1.6	7.7	25.4	67.9	20,600

Table 5-12. Trace Metals in Storm Runoff for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons) (Cont.)														
DP above TA-21	08/04	F	CS	< 0.3	648	< 2.6	< 7.6	19.8	< 0.25	< 0.2	< 1.0	< 1.4	< 2.6	366
DP above TA-21	08/01	UF	CS	< 0.3	16,100	5.7	< 3.5	197.0	< 0.98	0.9	< 4.0	16.7	61.6	11,400
DP above TA-21	08/01	F	CS	< 0.3	159	< 2.6	< 11.6	25.3	< 0.25	< 0.1	< 1.0	< 1.7	9.2	127
DP above TA-21	07/02	UF	CS	< 0.9	24,300	10.8	< 3.6	256.0	< 2.50	1.4	7.6	21.9	52.1	17,800
DP above TA-21	07/02	F	CS	< 0.9	679	< 2.3	< 11.8	14.4	< 0.16	< 0.1	< 0.4	< 3.1	< 4.7	426
DP above TA-21	07/02	F	DUP							< 0.1				
DP above TA-21	06/27	UF	CS	< 0.9	52,100	18.4	< 3.6	645.0	< 4.85	3.5	16.0	55.6	145.0	39,700
DP above TA-21	06/27	F	CS	< 0.9	698	< 2.3	< 14.0	29.4	< 0.16	< 0.1	< 1.0	< 1.3	< 3.8	407
DP above TA-21	05/28	UF	CS	< 0.9	29,000	8.7	< 21.9	352.0	< 2.60	1.9	10.3	32.6	85.4	22,100
DP above TA-21	05/28	UF	DUP	< 0.9	32,900	9.6	< 22.8	367.0	< 2.59	2.0	11.0	35.9	91.7	25,800
DP above TA-21	05/28	F	CS	< 0.9	384	< 4.1	< 12.4	26.3	< 0.26	< 0.2	< 1.3	< 2.1	10.1	261
DP below Meadow at TA-21	07/02	UF	CS	< 0.9	52,500	16.1	< 3.6	519.0	< 3.76	1.6	14.5	45.4	83.2	41,300
DP below Meadow at TA-21	07/02	F	CS	< 0.9	1,130	< 3.3	< 14.2	25.7	< 0.16	< 0.1	< 0.4	< 3.7	< 4.5	702
DP below Meadow at TA-21	06/27	UF	CS	< 0.9	44,500	12.1	< 3.6	479.0	< 3.40	1.9	12.1	37.6	86.6	32,600
DP below Meadow at TA-21	06/27	F	CS	< 0.9	1,670	< 2.7	< 12.5	34.0	< 0.16	< 0.1	< 0.4	< 3.1	< 4.6	907
DP above Los Alamos Canyon	08/04	UF	CS	< 0.3	66,100	17.2	< 1.8	640.0	5.51	2.5	17.6	53.4	115.0	49,900
DP above Los Alamos Canyon	08/04	F	CS	< 0.3	1,330	< 2.6	< 13.9	35.9	< 0.22	< 0.4	< 1.0	< 1.9	< 4.6	743
DP above Los Alamos Canyon	06/27	UF	CS	< 0.9	41,500	13.4	< 3.6	819.0	6.88	3.4	19.2	33.0	117.0	26,900
DP above Los Alamos Canyon	06/27	F	CS	< 0.9	2,200	< 2.9	< 12.8	41.0	< 0.16	< 0.1	< 0.6	< 2.5	< 4.8	1,200
DP above Los Alamos Canyon	05/28	UF	CS	< 0.9	88,500	25.1	< 48.1	893.0	8.73	4.5	28.7	82.8	170.0	72,200
DP above Los Alamos Canyon	05/28	F	CS	< 0.9	1,040	< 4.1	< 21.7	59.6	< 0.27	< 0.2	< 1.2	< 1.2	5.1	620
DP above Los Alamos Canyon	05/13	UF	CS	< 0.9	153,000	40.8	< 36.3	1170.0	12.40	4.8	35.2	130.0	222.0	148,000
Los Alamos above SR-4	08/16	UF	CS	< 0.3	147,000	35.2	< 27.1	1840.0	13.00	4.5	47.4	93.5	138.0	109,000
Los Alamos above SR-4	08/16	UF	CS	< 0.3	43,100	8.0	< 18.7	573.0	< 3.65	1.1	10.7	23.9	33.8	27,600
Los Alamos above SR-4	08/16	F	CS	< 0.3	211	< 2.6	< 29.8	59.4	< 0.25	< 0.1	< 1.0	< 1.0	< 1.4	108
Los Alamos above SR-4	08/16	F	CS	< 0.3	1,380	< 4.1	< 17.1	48.6	< 0.25	< 0.1	< 1.0	< 1.4	< 2.7	736
Los Alamos above SR-4	08/09	UF	CS	< 0.3	114,000	33.0	< 11.6	1720.0	10.80	4.4	40.2	79.4	147.0	99,200
Los Alamos above SR-4	08/08	F	CS	< 0.3	471	7.2	< 21.0	67.6	< 0.25	< 0.2	< 1.0	< 1.1	< 1.4	251
Los Alamos above SR-4	08/04	UF	CS	< 0.3	122,000	32.3	< 28.0	1430.0	10.60	4.2	36.6	88.8	156.0	92,000
Los Alamos above SR-4	08/04	F	CS	< 0.3	743	5.4	< 13.5	47.9	< 0.25	0.3	< 1.0	< 0.8	< 2.2	414
Los Alamos above SR-4	08/01	UF	CS	< 0.3	46,300	9.4	< 17.2	640.0	< 3.33	1.2	11.2	24.7	37.3	29,400
Los Alamos above SR-4	08/01	F	CS	< 0.3	189	< 2.6	< 25.7	69.2	< 0.25	< 0.1	< 1.0	< 1.5	< 2.1	102
Los Alamos above SR-4	07/26	UF	CS	< 0.3	600,000	104.0	210.0	8220.0	47.30	17.7	189.0	350.0	550.0	477,000
Los Alamos above SR-4	07/14	UF	CS	< 0.7	254,000	50.6	101.0	4120.0	24.20	7.4	87.4	138.0	240.0	173,000
Los Alamos above SR-4	07/14	F	CS	< 0.7	188	7.0	< 40.4	130.0	< 0.21	< 0.2	< 1.0	< 0.6	13.0	121
Los Alamos above SR-4	07/02	UF	CS	< 0.9	90,700	25.6	< 8.5	1020.0	9.50	3.2	27.9	68.9	133.0	70,300
Los Alamos above SR-4	07/02	F	CS	< 0.9	1,470	< 2.3	< 19.2	33.5	< 0.16	< 0.1	< 0.5	< 3.1	< 3.9	861
Los Alamos below LA Weir	08/16	UF	CS	< 0.3	147,000	29.4	< 13.3	1520.0	11.20	3.4	38.4	89.4	117.0	105,000
Los Alamos below LA Weir	08/16	F	CS	< 0.3	979	< 2.8	< 15.0	38.1	< 0.25	< 0.0	< 1.0	< 1.3	< 2.3	507
Los Alamos below LA Weir	08/09	UF	CS	< 0.3	493,000	89.6	129.0	7440.0	52.80	14.1	178.0	300.0	429.0	359,000
Los Alamos below LA Weir	08/09	F	CS	< 0.3	922	< 2.6	< 32.4	182.0	< 0.36	< 0.3	< 1.6	< 1.5	6.4	390
Los Alamos below LA Weir	07/26	UF	CS	< 0.3	221,000	36.2	97.1	2950.0	18.50	5.2	63.4	117.0	175.0	144,000
Los Alamos below LA Weir	07/26	F	CS	< 0.3	240	< 2.6	< 36.1	86.8	< 0.25	0.0	< 1.0	< 1.5	< 3.7	160
Acid above Pueblo	08/03	F	CS	< 0.3	421	< 2.6	< 42.8	105.0	< 0.25	< 0.3	< 1.0	< 1.5	< 2.5	267

Table 5-12. Trace Metals in Storm Runoff for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons) (Cont.)														
Pueblo above SR-502	08/16	UF	CS	< 3.6	360,000	88.4	134.0	4680.0	32.30	11.2	149.0	249.0	348.0	327,000
Pueblo above SR-502	08/16	F	CS	< 0.3	1,400	5.0	< 34.9	63.0	< 0.25	< 0.1	< 1.0	< 0.8	< 3.8	848
Pueblo above SR-502	08/11	UF	CS	7.2	398,000	90.6	117.0	5670.0	35.60	17.4	173.0	251.0	353.0	385,000
Pueblo above SR-502	08/11	F	CS	< 3.0	2,160	< 2.6	48.4	109.0	< 0.25	< 0.3	< 1.9	1.4	< 1.9	1,150
Pueblo above SR-502	08/09	UF	CS	< 0.3	471,000	122.0	137.0	7480.0	49.60	15.3	215.0	275.0	435.0	366,000
Pueblo above SR-502	08/09	F	CS	< 0.3	567	< 2.6	< 44.3	91.5	< 0.25	< 0.1	< 1.0	< 1.5	5.4	333
Pueblo above SR-502	07/02	F	CS	< 0.9	1,110	< 2.3	< 35.4	99.9	< 0.16	< 0.1	< 1.8	< 0.6	< 3.7	679
Sandia Canyon														
Sandia tributary at Salvage Yard	08/01	UF	CS	< 0.3	15,100	< 3.3	< 7.5	152.0	< 0.59	0.6	< 2.4	8.9	21.6	9,960
Sandia tributary at Salvage Yard	08/01	F	CS	< 0.3	1,110	< 2.6	< 14.8	27.0	< 0.25	0.1	< 1.0	< 0.7	7.8	608
Sandia tributary at Salvage Yard	07/26	UF	CS	< 2.1	19,700	< 4.6	< 3.9	238.0	< 0.86	1.8	5.4	16.6	35.0	13,800
Sandia tributary at Salvage Yard	07/26	F	CS	< 0.3	703	< 2.6	< 10.8	28.9	< 0.25	0.3	< 1.0	< 1.2	8.6	390
Sandia tributary at Salvage Yard	06/27	UF	CS	< 0.9	2,490	< 2.3	< 31.3	80.7	< 0.16	< 0.3	< 1.1	< 3.6	25.3	1,460
Sandia tributary at Salvage Yard	06/27	UF	DUP							< 0.4				
Sandia tributary at Salvage Yard	06/27	F	CS	< 0.9	417	< 4.2	< 34.9	63.3	< 0.16	< 0.3	< 0.8	< 2.1	20.8	232
Sandia tributary at Salvage Yard	06/27	F	DUP	< 0.9	430	< 2.3	< 32.8	64.5	< 0.16	< 0.3	< 0.8	< 1.9	20.8	237
Sandia below Wetlands	08/05	UF	CS	17.3	46,800	18.9	< 8.8	447.0	< 2.80	2.3	12.4	292.0	122.0	39,700
Sandia below Wetlands	08/05	F	CS	< 0.3	832	< 4.3	< 29.6	31.8	< 0.25	< 0.1	< 1.0	< 4.4	5.6	531
Mortandad Canyon (includes Ten-Site Canyon, Cañada del Buey)														
TA-55 NW above Effluent Canyon	08/01	UF	CS	< 0.3	2,030	< 2.6	< 5.5	27.2	< 0.25	0.1	< 1.0	< 1.8	37.4	1,360
TA-55 NW above Effluent Canyon	07/02	UF	CS	< 0.9	5,790	6.4	< 5.4	65.9	< 0.28	< 0.4	< 1.5	< 4.9	48.9	3,890
TA-55 NW above Effluent Canyon	07/02	F	CS	< 0.9	< 8	< 2.3	< 8.0	13.8	< 0.16	< 0.1	< 0.4	< 0.9	12.8	< 22.1
TA-55 NW above Effluent Canyon	06/27	F	CS	< 0.9	115	< 2.3	< 4.8	17.5	< 0.16	< 0.1	< 0.4	< 0.6	6.1	75.1
MDA L	10/05	UF	CS	< 0.3		< 2.6				< 0.6				781
MDA L	10/05	UF	DUP											
MDA L	07/26	UF	CS	< 0.3	867	< 2.6	< 46.7	51.8	< 0.25	< 0.5	< 0.9	< 1.8	15.0	644
MDA L	07/26	F	CS	< 0.3	< 24	< 2.6	< 46.1	39.0	< 0.25	< 0.3	< 1.1	< 1.0	12.0	< 26.3
MDA L	07/02	UF	CS	< 0.9	676	5.1	< 12.4	25.5	< 0.16	< 0.3	< 0.5	< 1.7	7.7	539
MDA L	06/07	UF	CS	< 0.9	3,380	< 2.3	< 7.7	86.7	< 0.21	1.1	< 2.9	< 4.7	20.4	2,960
MDA L	06/07	UF	DUP							< 0.9				
MDA L	06/07	F	CS	< 0.9	< 38	< 2.3	< 8.9	20.4	< 0.16	< 0.3	< 0.4	< 0.6	< 4.3	< 23.5
MDA L	05/28	UF	CS	< 3.0	941	< 4.1	< 23.6	43.2	< 0.19	< 0.5	< 1.2	< 1.8	12.9	719
MDA L	05/28	UF	DUP	< 2.4	1,180	< 4.1	< 24.1	47.4	< 0.19	< 0.5	< 1.1	< 2.3	12.6	935
MDA L	05/28	F	CS	< 2.6	64	< 4.1	< 24.4	30.2	< 0.19	< 0.3	< 0.9	< 1.1	7.7	< 14.9
MDA L	04/27	UF	CS	< 0.9	3,860	< 4.1	< 14.2	92.7	< 0.27	< 0.7	< 4.5	5.9	22.4	3,700
MDA L	04/27	UF	DUP							< 0.6				
MDA L	04/06	UF	CS	< 1.4	1,080	< 4.1	< 31.6	41.9	< 0.32	< 0.6	< 0.9	< 1.8	13.8	1,050
Pajarito Canyon (includes Twomile, Threemile Canyons)														
Pajarito below SR-501	08/09	UF	CS	< 0.3	498,000	98.4	161.0	11300.0	31.00	10.2	197.0	286.0	380.0	303,000
Pajarito below SR-501	08/09	F	CS	< 0.3	824	5.1	< 27.9	83.0	< 0.25	< 0.3	< 1.0	< 1.1	< 1.3	418
Pajarito above Starmers	08/11	UF	CS	< 3.0	97,900	17.0	44.9	1500.0	5.15	2.6	32.4	54.3	63.5	62,400

Table 5-12. Trace Metals in Storm Runoff for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe
Pajarito Canyon (includes Twomile, Threemile Canyons) (Cont.)														
Pajarito above Starmers	08/11	F	CS	< 3.0	998	< 2.6	21.1	70.0	< 0.25	< 0.1	< 1.0	1.0	< 1.9	662
Pajarito above Starmers	08/05	UF	CS	< 0.3	210,000	42.8	< 42.4	4780.0	11.50	7.0	78.0	106.0	148.0	133,000
Pajarito above Starmers	08/05	F	CS	< 0.3	879	< 2.9	< 23.7	79.8	< 0.25	< 0.3	< 1.0	< 0.8	< 2.6	481
Pajarito above TA-18	08/05	UF	CS	< 1.8	162,000	45.0	< 27.1	2620.0	12.40	6.4	51.8	89.9	155.0	125,000
Pajarito above TA-18	08/05	F	CS	< 0.3	620	< 2.6	< 25.5	54.9	< 0.25	< 0.4	< 1.0	< 0.7	< 2.7	398
Pajarito above TA-18	07/02	UF	CS	< 0.9	55,800	17.7	< 12.9	682.0	< 4.92	1.7	13.8	28.2	50.7	39,600
Pajarito above TA-18	07/02	F	CS	< 0.9	1,880	< 2.3	< 22.8	48.3	< 0.16	< 0.1	< 0.4	< 0.9	< 3.2	969
MDA G-1	08/05	UF	CS	< 0.3	93,300	15.7	< 1.8	787.0	5.88	1.3	21.1	55.0	45.9	61,300
MDA G-2	08/30	UF	CS	< 1.3	153,000	41.3	124.0	1220.0	12.60	3.9	38.4	99.2	123.0	155,000
MDA G-2	08/30	F	CS	< 0.3	129	< 3.4	66.4	48.0	< 0.25	< 0.1	< 1.0	< 1.5	< 2.5	80.6
MDA G-3	08/30	UF	CS	< 0.3	6,510	< 4.5	54.2	72.4	< 0.60	< 0.1	< 1.7	4.8	6.8	3,780
MDA G-3	08/30	UF	DUP							< 0.1				
MDA G-3	08/30	F	CS	< 0.3	< 45	< 2.8	55.5	36.1	< 0.25	< 0.1	< 1.0	1.1	< 2.0	< 34.6
MDA G-3	08/04	UF	CS	< 1.5	25,100	5.8	116.0	268.0	< 1.71	< 0.7	< 3.8	16.2	21.4	14,200
MDA G-3	08/04	F	CS	< 0.3	16	< 2.6	128.0	99.9	< 0.25	< 0.3	< 1.0	< 1.5	< 2.0	< 7.13
MDA G-3	08/01	UF	CS	< 0.3	5,200	< 2.6	103.0	103.0	< 0.32	0.1	< 1.0	< 4.0	7.2	2,850
MDA G-3	08/01	F	CS	< 0.3	< 18	< 2.6	98.6	69.0	< 0.25	0.1	< 1.0	< 1.3	< 3.8	< 18
MDA G-3	07/13	UF	CS	< 0.7	8,670	6.3	156.0	165.0	< 0.41	< 0.4	< 0.7	5.2	7.5	4,310
MDA G-3	07/13	F	CS	< 0.7	52	< 3.6	164.0	126.0	< 0.21	< 0.2	< 0.7	< 0.8	< 2.9	< 36.3
MDA G-3	07/02	UF	CS	< 0.9	10,400	< 2.3	804.0	359.0	< 0.58	< 0.6	< 0.4	8.4	7.8	5,560
MDA G-3	07/02	F	CS	< 0.9	< 8	< 2.3	816.0	297.0	< 0.16	< 0.4	< 0.4	< 1.9	< 2.6	< 3.27
MDA G-3	06/07	UF	CS	< 0.9	26,000	5.7	< 33.1	244.0	< 1.66	< 0.6	5.2	18.2	22.8	17,900
MDA G-3	06/07	F	CS	< 0.9	211	< 2.3	< 41.1	67.5	< 0.16	< 0.2	< 0.6	< 2.2	5.8	136
MDA G-4	10/05	UF	CS	< 0.3		< 2.6				< 0.5				2,510
MDA G-4	08/04	UF	CS	< 0.3	28,500	5.9	< 1.8	288.0	< 1.90	1.1	< 4.8	13.9	40.9	16,200
MDA G-4	07/26	F	CS	< 0.3	315	< 2.6	< 28.6	28.8	< 0.25	< 0.1	< 1.0	< 1.5	7.4	160
MDA G-4	07/17	UF	CS	< 0.3	5,320	< 2.7	< 25.2	62.9	< 0.26	< 0.1	< 1.1	< 3.3	18.6	2,970
MDA G-4	07/13	UF	CS	< 0.7	4,250	5.9	< 28.5	56.3	< 0.21	< 0.3	< 0.7	< 1.9	13.5	2,170
MDA G-4	07/13	F	CS	< 0.7	206	5.6	< 29.4	29.1	< 0.21	< 0.1	< 0.7	< 0.6	6.2	104
MDA G-4	07/02	UF	CS	< 0.9	15,900	7.9	< 23.5	191.0	< 0.89	< 0.5	< 3.8	8.9	28.4	9,930
MDA G-4	07/02	F	CS	< 0.9	< 41	< 2.3	< 34.2	39.7	< 0.16	< 0.1	< 0.4	< 0.7	5.9	< 41
MDA G-4	06/27	UF	CS	< 0.9	17,500	< 4.9	< 9.2	211.0	< 0.97	< 0.7	< 3.5	11.2	57.5	11,000
MDA G-4	06/27	F	CS	< 0.9	229	< 3.8	< 20.0	26.2	< 0.16	< 0.1	< 0.4	< 0.8	7.1	131
MDA G-4	06/07	UF	CS	< 0.9	28,400	7.0	< 13.4	303.0	< 1.70	1.3	7.2	21.7	83.5	23,600
MDA G-4	06/07	UF	DUP	< 0.9	28,200	7.3	< 10.9	307.0	< 1.70	1.2	6.7	20.6	84.7	22,800
MDA G-4	06/07	F	CS	< 0.9	225	< 2.3	< 18.6	37.5	< 0.16	< 0.1	< 0.4	< 1.1	6.1	143
MDA G-4	04/06	UF	CS	< 1.7	11,300	5.2	< 31.7	125.0	< 0.95	< 0.5	< 3.6	7.9	32.3	7,980
MDA G-4	04/06	F	CS	< 1.5	1,720	< 4.1	< 30.7	26.6	< 0.48	< 0.2	< 0.8	< 1.5	< 4.8	973
Pajarito above SR-4	08/16	UF	CS	< 1.8	60,800	14.3	< 11.5	644.0	< 3.82	1.4	11.2	29.8	40.9	40,700
Pajarito above SR-4	08/16	F	CS	< 0.3	1,770	< 2.9	< 25.1	55.5	< 0.25	< 0.0	< 1.0	< 1.1	< 3.4	969
Pajarito above SR-4	08/09	UF	CS	26.0	220,000	43.3	64.3	3020.0	12.80	5.8	59.9	120.0	141.0	157,000
Pajarito above SR-4	08/09	UF	DUP	25.9	217,000	40.6	50.2	3110.0	12.40	5.7	59.1	120.0	143.0	157,000
Pajarito above SR-4	08/09	F	CS	< 0.3	548	< 2.6	< 43.4	114.0	< 0.25	< 0.1	< 1.0	< 1.5	5.3	310

Table 5-12. Trace Metals in Storm Runoff for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe
Pajarito Canyon (includes Twomile, Threemile Canyons) (Cont.)														
Pajarito above SR-4	08/09	F	DUP	< 0.3	471	< 2.6	< 40.4	111.0	< 0.25	< 0.2	< 1.0	< 1.5	5.4	279
Pajarito above SR-4	08/06	UF	CS	46.5	265,000	48.0	83.0	3080.0	12.90	5.4	58.9	134.0	133.0	170,000
Pajarito above SR-4	08/06	UF	DUP	46.4	257,000	45.2	78.2	3040.0	12.60	5.8	57.8	130.0	130.0	164,000
Pajarito above SR-4	08/06	F	CS	< 0.3	1,490	6.0	< 44.8	130.0	< 0.25	0.2	< 0.8	< 0.9	< 3.7	823
Pajarito above SR-4	08/06	F	DUP	< 0.3	1,450	< 3.5	< 44.3	130.0	< 0.25	< 0.4	< 1.2	< 0.8	< 3.7	817
Pajarito above SR-4	06/27	UF	CS	< 1.0	76,400	19.4	< 33.4	1080.0	6.36	2.5	15.2	31.3	54.3	44,100
Pajarito above SR-4	06/27	F	CS	< 0.9	289	< 4.2	50.6	99.4	< 0.16	< 0.1	< 0.5	< 0.6	< 4.5	194
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons)														
Water above SR-501	07/22	UF	CS	< 0.7	453,000	71.7	190.0	11800.0	29.90	8.2	187.0	220.0	323.0	289,000
Water above SR-501	07/22	UF	DUP	< 0.3	617,000	97.8	213.0	13900.0	41.20		229.0	317.0	454.0	368,000
Water above SR-501	07/22	F	CS	< 0.3	576	< 3.8	50.5	223.0	< 0.25	< 0.1	< 2.9	< 1.5	< 2.1	803
Cañon de Valle above SR-501	07/26	UF	CS	< 0.3	187,000	29.4	115.0	8590.0	18.40	12.9	130.0	75.1	104.0	96,500
Cañon de Valle above SR-501	07/26	F	CS	< 0.3	19,900	9.9	104.0	5210.0	7.24	5.0	28.3	< 3.5	10.0	5,930
S Site Canyon above Water	08/03	UF	CS	< 0.3	83,200	24.6	55.4	1730.0	5.46	2.8	25.8	43.0	80.3	56,600
S Site Canyon above Water	08/03	F	CS	< 0.3	1,350	< 2.8	60.3	74.4	< 0.25	0.4	< 1.0	< 0.8	< 2.4	774
Cañon de Valle above Water	08/09	UF	CS	267.0	468,000	91.9	132.0	24300.0	33.20	12.1	172.0	265.0	403.0	360,000
Cañon de Valle above Water	08/09	F	CS	< 1.6	2,560	< 2.6	< 30.5	434.0	< 0.25	< 0.2	< 1.2	< 0.7	< 4.3	1,190
Cañon de Valle above Water	08/05	UF	CS	301.0	494,000	79.4	59.3	29800.0	36.30	13.3	199.0	259.0	380.0	300,000
Cañon de Valle above Water	08/05	F	CS	11.8	17,000	6.7	< 35.1	989.0	< 0.57	0.5	< 4.2	7.7	11.4	8,930
Water below MDA AB	08/08	UF	CS	267.0	430,000	82.2	108.0	13700.0	34.80	10.9	167.0	245.0	348.0	315,000
Water below MDA AB	08/08	F	CS	< 0.7	2,390	< 2.6	< 18.7	236.0	< 0.25	< 0.1	< 1.0	< 0.7	< 5.0	1,120
Water below MDA AB	08/03	UF	CS	< 2.4	192,000	37.3	< 48.0	3040.0	15.80	3.7	54.0	93.6	113.0	127,000
Water below MDA AB	08/03	F	CS	< 0.3	546	< 3.1	< 29.9	305.0	< 0.79	0.6	< 3.0	< 1.5	< 2.2	262
Water below MDA AB	07/26	UF	CS	< 1.5	1,030,000	67.4	< 45.9	22700.0	61.60	25.9	382.0	302.0	436.0	353,000
Water below MDA AB	07/26	F	CS	< 0.3	627	< 3.1	< 25.4	133.0	< 0.25	< 0.1	< 0.9	< 1.5	< 3.5	301
Water at SR-4	08/09	UF	CS	157.0	170,000	36.9	< 49.0	15100.0	21.60	9.3	121.0	78.8	123.0	114,000
Water at SR-4	08/09	F	CS	< 2.0	2,040	< 3.5	< 25.6	239.0	< 0.25	< 0.2	< 0.7	< 1.3	< 1.8	1,070
Water at SR-4	08/03	UF	CS	5.4	417,000	81.3	142.0	8450.0	41.30	8.8	160.0	214.0	289.0	275,000
Water at SR-4	08/03	UF	CS	< 1.6	136,000	29.0	< 29.5	2310.0	10.40	3.7	36.6	64.4	87.6	84,400
Water at SR-4	08/03	F	CS	< 0.3	1,240	< 4.2	< 35.0	68.8	< 0.25	0.3	< 1.0	< 1.1	< 2.7	668
Water at SR-4	07/26	UF	CS	< 0.3	484,000	64.6	177.0	12500.0	31.90	22.6	196.0	253.0	317.0	302,000
Water at SR-4	07/26	F	CS	< 1.2	431,000	54.9	111.0	6100.0	24.70	4.4	122.0	235.0	262.0	274,000
Water below SR-4	08/09	UF	CS	307.0	401,000	79.7	112.0	15500.0	33.70	9.8	172.0	214.0	304.0	252,000
Water below SR-4	08/09	F	CS	< 1.4	2,110	< 2.6	< 25.7	292.0	< 0.25	< 0.3	< 1.2	< 0.7	< 2.0	1,040
Water below SR-4	08/03	UF	CS	< 4.4	429,000	85.4	137.0	8850.0	42.10	10.4	165.0	219.0	306.0	278,000
Water below SR-4	08/03	UF	CS	< 1.7	134,000	29.2	< 30.7	2200.0	10.80	3.3	36.0	63.4	86.3	85,000
Water below SR-4	08/03	F	CS	< 0.3	2,000	< 3.7	< 31.2	67.2	< 0.25	0.3	< 1.0	< 1.2	< 2.5	1,060
Potrillo tributary Study Area	08/30	UF	CS	< 0.3	869,000	105.0	216.0	6430.0	48.30	< 8.4	184.0	457.0	432.0	615,000
Potrillo tributary Study Area	08/30	UF	DUP	< 0.3	878,000	110.0	210.0	6560.0	49.30		188.0	461.0	443.0	625,000
Potrillo tributary Study Area	08/30	F	CS	< 0.3	1,150	6.0	15.6	78.4	< 0.25	< 0.1	< 1.3	1.1	< 3.4	581
Potrillo tributary Study Area	08/11	UF	CS	< 3.5	419,000	59.3	92.7	5080.0	32.90	6.2	132.0	239.0	282.0	334,000
Potrillo tributary Study Area	08/11	F	CS	< 2.5	541	< 2.6	18.6	69.4	< 0.25	< 0.1	< 0.7	< 1.5	< 1.9	290

Table 5-12. Trace Metals in Storm Runoff for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe
Ancho Canyon														
Ancho Canyon spring tributary below SR-4	08/12	UF	CS	< 3.7	231,000	36.9	70.1	2240.0	16.90	3.4	61.7	126.0	124.0	163,000
Ancho Canyon spring tributary below SR-4	08/12	F	CS	< 2.8	1,280	< 2.6	15.5	44.9	< 0.25	< 0.1	< 0.7	1.1	< 1.9	646
Water Quality Standards[c]														
EPA Primary Drinking Water Standard						10		2,000	4	5		100		
EPA Secondary Drinking Water Standard					50-200									300
EPA Action Level													1,300	
EPA Health Advisory														
NMWQCC Livestock Watering Standard					5,000	200	5,000			50	1,000	1,000	500	
NMWQCC Groundwater Limit				50.0	5,000	100	750	1,000		10	50	50	1,000	1,000
NMWQCC Wildlife Habitat Standard														

Table 5-12. Trace Metals in Storm Runoff for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Hg	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Guaje Canyon															
Guaje above Rendija	08/14	UF	CS	0.26	217	2.2	1.82	765	0.794	< 2.38	< 3.5	62.4	6.3	2.6	5.18
Guaje above Rendija	08/14	UF	DUP	< 0.17	211	< 1.9	< 1.2	734	< 0.773	< 2.38	< 3.5	59.9	6.49	< 2.49	< 4.81
Guaje above Rendija	08/14	F	CS	< 0.07	28,500	3.4	132	0.461	0.805	16.9	< 3.5	1,080	< 0.014	163	946
Guaje above Rendija	08/14	F	DUP	< 0.07	25,800	< 2.9	134	< 0.422	< 0.806	16.1	< 3.5	1,040	< 0.014	169	958
Guaje above Rendija	08/11	UF	CS	< 0.07	43,700	3.1	222	804	0.752	17.6	< 3.5	1,350	7.57	264	1,510
Guaje above Rendija	08/11	F	CS	< 0.07	1,070	4.6	< 1.2	1.5	1.56	< 2.38	< 3.5	108	< 0.014	4.96	12.4
Guaje above Rendija	08/09	UF	CS	< 0.07	68,500	1.7	739	1270	0.785	34.5	< 9.25	4,200	9.99	631	3,170
Guaje above Rendija	08/08	UF	CS	< 0.07	37,300	3.8	173	249	0.519	17.3	8.29	1,480	2.57	203	1,140
Guaje above Rendija	08/08	F	CS	< 0.07	1,200	3.9	< 1.98	< 1.36	0.304	< 2.38	< 3.5	105	< 0.014	< 4.2	10.4
Rendija above Guaje	07/02	UF	CS	< 0.06	76,000	4.8	516	99.4	1.24	28.3	6.78	3,350	1.75	371	1,970
Rendija above Guaje	07/02	F	CS	< 0.06	824	< 7.0	6.53	< 1.91	< 1.67	< 2.93	< 2.97	214	< 0.077	5.71	13.5
Rendija above Guaje	07/02	F	DUP	< 0.06	824	< 4.8	6.26			< 2.93	< 2.48	215		5.11	13.4
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons)															
Los Alamos below Ice Rink	08/09	UF	CS	< 0.07	7,560	3.4	83.5	83.1	0.202	7.54	46.4	592	2.33	99.8	469
Los Alamos below Ice Rink	08/09	F	CS	< 0.07	147	4.0	< 1.2	0.055	0.147	< 2.38	< 3.5	244	< 0.014	< 2.37	< 2.67
Los Alamos below Ice Rink	07/13	UF	DUP	< 0.06	8,030	< 5.7	101	171	< 0.328	< 4.8	< 7.48	635	2.38	147	680
Los Alamos below Ice Rink	07/13	UF	CS	< 0.06	7,950	< 6.2	101	170	1.91	< 3.49	7.22	633	2.81	147	671
Los Alamos below Ice Rink	07/13	F	CS	< 0.06	1,870	< 4.3	< 3.2	< 0.235	0.355	< 3.49	< 1.94	255	0.224	5.63	< 3.08
Los Alamos below Ice Rink	07/13	F	DUP	< 0.06	1,840	< 4.9	< 3.47	< 0.355	< 0.282	< 3.49	< 1.94	250	< 0.218	5.26	< 2.69
Los Alamos below Ice Rink	07/02	UF	DUP	< 0.06	19,600	< 4.8	113	353	< 0.371	7.77	< 7.13	954	3.21	171	1,180
Los Alamos below Ice Rink	07/02	UF	CS	< 0.06	19,800	4.5	120	384	0.435	6.36	7.97	974	3.34	177	1,270
Los Alamos below Ice Rink	07/02	F	CS	< 0.06	591	< 2.9	< 2.76	< 0.429	< 0.553	< 2.93	< 2.31	179	< 0.077	< 3.1	5.81
Los Alamos above DP Canyon	08/16	UF	DUP	< 0.19	8,000	< 3.8	87.8	327	< 0.305	9.04	< 2.65	434	2.26	149	771
Los Alamos above DP Canyon	08/16	UF	CS	0.20	8,040	< 3.5	94.5	351	0.395	< 2.38	5.36	457	2.37	163	824
Los Alamos above DP Canyon	08/16	F	CS	< 0.15	11.7	< 2.0	< 1.2	0.961	0.178	< 2.38	< 3.5	77.5	< 0.014	< 3.04	7.91
Los Alamos above DP Canyon	08/16	F	DUP	< 0.16	11.4	< 1.5	< 1.2	< 0.949	< 0.146	< 2.38	< 3.5	77.2	< 0.014	< 2.69	7.37
Los Alamos above DP Canyon	08/09	UF	DUP	< 0.07	33,300	< 4.9	371	646	< 0.533	26.9	13	1,790	7.42	381	2,040
Los Alamos above DP Canyon	08/09	UF	CS	< 0.07	25,600	3.3	167	204	0.364	8.81	4.03	1,380	2.77	181	968
Los Alamos above DP Canyon	08/09	F	CS	< 0.07	1,650	3.3	< 4.97	8.22	0.661	< 2.38	< 3.5	204	< 0.042	< 4.98	29.3
Los Alamos above DP Canyon	08/09	F	DUP	< 0.07	1,650	< 3.3	5.22	8.16	< 0.682	< 2.38	< 3.5	204	< 0.026	5.08	28.9
Los Alamos above DP Canyon	08/05	UF	CS	< 0.07	9,810	4.5	98.4	367	0.711	5.21	3.82	524	2.43	170	1,070
Los Alamos above DP Canyon	08/05	F	CS	< 0.07	172	3.0	< 1.2	0.736	0.356	< 2.38	< 3.5	77.1	0.022	< 3.23	6.76
Los Alamos above DP Canyon	07/26	UF	DUP	< 0.07	18,400	< 4.1	114	589	< 0.85	8.15	< 6.21	976	5.13	175	943
Los Alamos above DP Canyon	07/26	UF	CS	< 0.07	18,200	< 3.4	102	553	1.14	6.3	< 4.46	965	4.85	158	871
Los Alamos above DP Canyon	07/26	F	CS	< 0.07	4,320	< 1.6	8.07	18.5	0.639	< 2.38	< 3.5	415	0.158	6.23	88.2
Los Alamos above DP Canyon	07/26	F	DUP	< 0.07	4,340	< 1.7	8.02	18.1	< 0.591	< 2.38	< 3.5	419	< 0.132	6.5	89.4
Los Alamos above DP Canyon	07/14	UF	CS	< 0.06	22,800	< 7.0	173	410	0.507	8.41	13.3	1,150	4.57	250	1,300
Los Alamos above DP Canyon	07/14	F	CS	< 0.06	2,070	< 6.7	< 3.77	< 0.552	0.677	< 3.49	< 1.94	249	0.378	7.24	8.12
Los Alamos above DP Canyon	07/02	UF	CS	< 0.06	14,300	5.0	97.2	142	0.728	< 4.13	6.69	738	1.08	153	1,080
Los Alamos above DP Canyon	07/02	F	CS	< 0.06	419	< 5.0	< 2.23	< 1.1	< 0.669	< 3.89	< 2.31	148	< 0.077	< 4.28	9.68
DP above TA-21	08/16	UF	CS	< 0.17	335	< 1.7	7.03	57.4	0.767	< 2.38	< 3.5	50	0.133	15.9	280
DP above TA-21	08/16	F	CS	< 0.15	33.1	< 1.5	< 1.2	0.388	0.246	< 2.38	< 3.5	23.4	< 0.014	< 1.97	20.3
DP above TA-21	08/04	UF	CS	< 0.07	743	< 1.7	16.8	109	< 1.93	< 2.38	< 2.67	80.5	< 0.434	35.5	481

Table 5-12. Trace Metals in Storm Runoff for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Hg	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons) (Cont.)															
DP above TA-21	08/04	F	CS	< 0.07	< 3.29	< 1.7	< 1.42	< 0.689	< 0.467	< 2.38	< 3.5	29	< 0.084	< 2.24	16.4
DP above TA-21	08/01	UF	CS	< 0.07	462	< 1.9	11	60.1	1.32	< 2.38	< 3.5	75.8	< 0.047	23.7	413
DP above TA-21	08/01	F	CS	< 0.07	< 4.71	< 1.7	< 1.2	< 0.257	0.59	< 2.38	< 3.5	37.5	< 0.014	< 2.33	45.2
DP above TA-21	07/02	UF	CS	< 0.06	990	4.1	16.4	98.5	1.27	< 2.93	< 2.31	76.7	< 0.475	30.7	427
DP above TA-21	07/02	F	CS	< 0.06	< 5.52	< 1.7	< 1.25	< 0.715	< 0.638	< 2.93	< 2.31	24.7	< 0.077	< 2.82	15.7
DP above TA-21	07/02	F	DUP					< 1.68	< 0.558				< 0.077		
DP above TA-21	06/27	UF	CS	< 0.06	1,860	< 3.3	37.7	259	1.83	< 2.93	< 6.75	184	0.941	73.1	1,160
DP above TA-21	06/27	F	CS	< 0.06	271	< 2.7	< 1.68	0.523	0.474	< 2.93	< 2.76	44.8	< 0.077	< 2.71	19.5
DP above TA-21	05/28	UF	CS	< 0.06	833	< 3.0	22.3	130	1.32	< 2.8	< 2.95	118	0.7	39.7	657
DP above TA-21	05/28	UF	DUP	< 0.06	868	< 1.9	23.5	139	< 1.45	< 2.8	< 2.95	122	< 0.408	44.9	672
DP above TA-21	05/28	F	CS	< 0.06	116	< 1.5	< 1.96	< 1.1	0.58	< 2.8	< 2.95	44.2	< 0.096	< 2.98	44.3
DP below Meadow at TA-21	07/02	UF	CS	< 0.06	1,370	4.4	28.9	129	1.4	5.76	3.99	136	< 0.47	66.3	599
DP below Meadow at TA-21	07/02	F	CS	< 0.06	106	< 1.3	< 2.57	< 0.83	< 0.672	< 2.93	< 2.31	37	< 0.077	< 3.98	23.2
DP below Meadow at TA-21	06/27	UF	CS	< 0.06	1,220	< 1.5	28.6	150	1.43	< 2.93	< 3.77	129	0.709	58.8	626
DP below Meadow at TA-21	06/27	F	CS	< 0.06	< 8.55	< 1.6	< 2.23	0.877	0.354	< 2.93	< 2.31	44	< 0.077	< 3.6	21.3
DP above Los Alamos Canyon	08/04	UF	CS	< 0.07	1,930	< 3.5	38.1	189	2.06	< 4.68	< 4.4	171	0.751	84	784
DP above Los Alamos Canyon	08/04	F	CS	< 0.07	< 5.61	< 2.1	< 1.34	< 1.07	< 0.554	< 2.38	< 3.11	50.3	< 0.148	< 3.31	17.4
DP above Los Alamos Canyon	06/27	UF	CS	< 0.06	2,440	< 1.5	33.6	239	1.71	< 2.93	< 2.31	208	0.536	68.1	952
DP above Los Alamos Canyon	06/27	F	CS	< 0.06	158	< 2.1	< 1.17	1.35	0.359	< 2.93	< 2.31	53.4	< 0.077	< 4.34	21.2
DP above Los Alamos Canyon	05/28	UF	CS	< 0.06	2,600	< 4.6	57.8	354	1.27	< 2.8	< 7.18	252	1.58	115	1,110
DP above Los Alamos Canyon	05/28	F	CS	< 0.06	322	< 1.5	< 3.16	< 1.77	0.733	< 2.8	< 2.95	83.9	< 0.077	< 3.08	26.4
DP above Los Alamos Canyon	05/13	UF	CS	< 0.06	4,390	12.3	82.2	384	< 1.72	< 2.93	21.2	318	1.59	196	1,670
Los Alamos above SR-4	08/16	UF	CS	0.21	8,890	< 2.8	97	382	0.46	6.72	4.19	466	2.66	155	878
Los Alamos above SR-4	08/16	UF	CS	< 0.17	2,440	< 4.6	27.8	70.5	0.305	< 4.08	4.34	286	1.09	41	208
Los Alamos above SR-4	08/16	F	CS	< 0.18	10.2	< 3.7	< 1.2	0.133	0.132	< 2.38	2.28	166	0.121	< 2.98	< 3.95
Los Alamos above SR-4	08/16	F	CS	< 0.12	35.6	< 1.8	< 1.43	1.05	0.223	< 2.38	< 3.5	70.8	< 0.014	< 3.33	13.4
Los Alamos above SR-4	08/09	UF	CS	< 0.07	7,540	5.7	82.3	254	0.737	8.33	5.28	502	1.43	136	961
Los Alamos above SR-4	08/08	F	CS	< 0.07	283	4.6	< 1.2	< 0.541	0.447	< 2.38	< 3.5	128	< 0.014	< 4.38	5.66
Los Alamos above SR-4	08/04	UF	CS	< 0.07	6,650	4.7	78.4	256	0.709	< 4.81	4.95	385	1.47	144	1,050
Los Alamos above SR-4	08/04	F	CS	< 0.07	209	2.7	< 1.42	0.61	0.492	< 2.38	< 3.5	84.9	0.041	< 3.33	7.21
Los Alamos above SR-4	08/01	UF	CS	< 0.07	2,750	< 4.1	25.9	73.2	0.531	< 2.38	< 3.5	343	0.643	49.2	263
Los Alamos above SR-4	08/01	F	CS	< 0.07	< 4.47	< 2.7	< 1.2	< 0.379	0.446	< 2.38	< 3.5	204	< 0.014	< 2.62	33.9
Los Alamos above SR-4	07/26	UF	CS	1.69	40,300	18.1	402	1020	1.83	18.8	19.2	1,920	7.29	615	3,290
Los Alamos above SR-4	07/14	UF	CS	< 0.06	20,800	< 6.6	176	433	0.552	9.04	10.4	1,120	5.11	242	1,330
Los Alamos above SR-4	07/14	F	CS	< 0.06	1,500	< 8.6	< 3.87	< 0.427	0.928	< 3.49	< 1.94	232	0.421	5.8	8.63
Los Alamos above SR-4	07/02	UF	CS	< 0.06	3,890	9.0	53.4	231	1.34	5.1	9.19	283	0.817	112	993
Los Alamos above SR-4	07/02	F	CS	< 0.06	42.6	< 6.6	< 2.39	< 0.981	< 0.663	< 2.93	< 2.31	55.7	< 0.077	< 4.43	15.8
Los Alamos below LA Weir	08/16	UF	CS	< 0.17	6,160	< 4.0	91.5	286	0.223	< 4.24	4.17	379	2.26	142	756
Los Alamos below LA Weir	08/16	F	CS	< 0.07	27.4	< 2.0	< 1.2	0.622	0.189	< 2.38	< 3.5	76.3	< 0.014	< 3.11	7.14
Los Alamos below LA Weir	08/09	UF	CS	< 0.07	33,800	2.2	393	961	0.203	22.7	< 5.66	1,700	7.67	399	2,180
Los Alamos below LA Weir	08/09	F	CS	< 0.07	739	4.4	< 2.56	3.86	0.509	< 2.38	< 3.5	205	< 0.014	< 3.13	17.7
Los Alamos below LA Weir	07/26	UF	CS	< 0.07	12,900	< 6.5	134	348	0.271	< 4.96	< 9.05	829	3.33	218	1,040
Los Alamos below LA Weir	07/26	F	CS	< 0.07	44.6	< 6.2	< 1.49	0.414	0.341	< 2.38	< 3.5	198	0.096	< 2.65	8.87
Acid above Pueblo	08/03	F	CS	< 0.07	449	< 7.2	< 2.27	< 0.528	< 0.468	< 2.38	< 3.5	179	< 0.062	< 4.22	< 4.44

Table 5-12. Trace Metals in Storm Runoff for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Hg	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Los Alamos Canyon (includes Bayo, Acid, Pueblo, DP Canyons) (Cont.)															
Pueblo above SR-502	08/16	UF	CS	< 0.17	19,700	< 4.9	269	837	0.315	13.1	8.95	1,400	5.14	419	1,660
Pueblo above SR-502	08/16	F	CS	< 0.15	98.9	< 5.7	< 1.69	1.28	0.386	< 2.38	< 3.5	159	< 0.014	< 4.83	7.81
Pueblo above SR-502	08/11	UF	CS	< 0.07	24,600	2.4	325	857	0.5	15.1	< 3.5	1,370	6.25	376	1,460
Pueblo above SR-502	08/11	F	CS	< 0.07	536	5.0	2.39	1.87	0.506	< 2.38	< 3.5	193	< 0.014	5.19	7.21
Pueblo above SR-502	08/09	UF	CS	< 0.07	35,000	4.9	374	1150	0.341	26.8	< 5.34	1,770	6.68	485	1,860
Pueblo above SR-502	08/09	F	CS	< 0.07	219	6.1	< 1.85	0.397	0.6	< 3.66	< 3.5	181	< 0.014	< 3.26	< 4.83
Pueblo above SR-502	07/02	F	CS	< 0.06	656	< 4.5	< 3.11	< 0.841	< 0.809	< 2.93	< 2.31	178	< 0.077	< 2.62	18.5
Sandia Canyon															
Sandia tributary at Salvage Yard	08/01	UF	CS	< 0.07	230	< 2.6	8.51	15	1.18	< 2.38	< 3.5	59.2	< 0.014	19.1	523
Sandia tributary at Salvage Yard	08/01	F	CS	< 0.07	13.8	< 2.7	< 2.18	< 0.466	1.11	< 2.38	< 3.5	32.9	< 0.014	< 2.85	199
Sandia tributary at Salvage Yard	07/26	UF	CS	< 0.07	356	< 2.2	13.2	41.4	0.738	< 2.38	< 2.01	69.3	< 0.014	29	585
Sandia tributary at Salvage Yard	07/26	F	CS	< 0.07	25.3	< 1.7	< 2.35	3.88	0.348	< 2.38	< 3.5	25.9	< 0.014	< 2.04	133
Sandia tributary at Salvage Yard	06/27	UF	CS	< 0.06	137	< 4.0	10.2	3.91	1.72	< 2.93	< 2.31	92.3	< 0.077	6.86	2,770
Sandia tributary at Salvage Yard	06/27	UF	DUP					3.87	< 1.24				< 0.077		
Sandia tributary at Salvage Yard	06/27	F	CS	< 0.06	109	< 4.8	9.09	0.162	1.42	< 2.93	< 2.31	86	< 0.215	< 4.52	2,590
Sandia tributary at Salvage Yard	06/27	F	DUP	< 0.06	110	< 3.4	9.18	< 0.136	< 1.32	< 2.93	< 2.37	87.5	< 0.077	< 4.42	2,600
Sandia below Wetlands	08/05	UF	CS	< 0.07	1,700	80.8	32.7	96.9	1.04	< 2.38	6.24	135	1.45	63.8	960
Sandia below Wetlands	08/05	F	CS	< 0.07	40.8	82.6	< 1.96	< 0.906	0.685	< 2.38	< 3.5	58.6	< 0.286	9.09	42.2
Mortandad Canyon (includes Ten-Site Canyon, Cañada del Buey)															
TA-55 NW above Effluent Canyon	08/01	UF	CS	< 0.07	50.4	< 1.7	< 1.88	3.72	0.407	< 2.38	< 3.5	18.2	< 0.014	< 4.38	149
TA-55 NW above Effluent Canyon	07/02	UF	CS	< 0.06	117	1.8	< 2.23	9.15	0.381	< 2.93	< 2.31	26.1	< 0.143	7.42	318
TA-55 NW above Effluent Canyon	07/02	F	CS	< 0.06	< 4.07	< 1.3	< 1.5	< 0.037	< 0.153	< 2.93	< 2.31	14.1	< 0.077	< 1.48	60.3
TA-55 NW above Effluent Canyon	06/27	F	CS	< 0.06	< 2.13	< 1.3	< 0.82	< 0.037	< 0.153	< 2.93	< 2.39	17.9	< 0.077	< 1.39	21.3
MDA L	10/05	UF	CS	< 0.07				< 2.57		< 2.38					
MDA L	10/05	UF	DUP	< 0.07											
MDA L	07/26	UF	CS	< 0.07	99.4	< 1.7	< 2.92	< 1.24	0.896	< 2.38	< 3.5	36	< 0.063	< 3.94	727
MDA L	07/26	F	CS	< 0.07	80.3	< 1.7	< 1.46	< 0.077	0.596	< 2.38	< 3.5	32.7	< 0.014	< 3.04	662
MDA L	07/02	UF	CS	< 0.06	34.3	< 1.3	< 0.82	1.84	0.333	< 2.93	< 2.31	13	< 0.077	< 1.82	105
MDA L	06/07	UF	CS	< 0.04	125	< 1.3	< 4.05	12.3	< 1.31	< 2.93	< 2.31	29.2	< 0.284	6.18	254
MDA L	06/07	UF	DUP					12.6	< 1.31				< 0.077		
MDA L	06/07	F	CS	< 0.04	19.6	< 1.3	< 0.82	2.3	< 0.449	< 2.93	< 2.31	14.4	< 0.077	< 1.14	82.7
MDA L	05/28	UF	CS	< 0.06	64	< 3.1	< 2.87	< 1.73	< 0.595	< 2.8	< 2.95	27.6	< 0.077	< 3.39	212
MDA L	05/28	UF	DUP		69.8	< 1.5	< 2.33	< 1.69	< 0.574	< 2.8	< 2.95	29.8	< 0.077	< 3.43	215
MDA L	05/28	F	CS	< 0.06	41.7	< 2.2	< 1.37	< 0.037	< 0.568	< 2.8	< 2.95	24.9	< 0.077	< 1.67	149
MDA L	04/27	UF	CS	< 0.06	135	< 1.7	< 4.2	9.76	< 0.731	< 2.8	< 2.95	29.4	0.513	7.83	232
MDA L	04/27	UF	DUP	< 0.06				8.85	< 0.55				< 0.077		
MDA L	04/06	UF	CS	< 0.06	65.5	< 3.3	< 1.37	3.07	< 0.494	< 2.8	< 2.95	23.7	< 0.327	< 3.61	205
Pajarito Canyon (includes Twomile, Threemile Canyons)															
Pajarito below SR-501	08/09	UF	CS	< 0.73	35,300	4.2	286	482	0.564	29	9.42	2,690	4.28	468	1,600
Pajarito below SR-501	08/09	F	CS	< 0.07	201	2.8	< 1.36	< 0.296	0.384	< 2.38	2.38	153	< 0.014	< 2.78	5.31
Pajarito above Starmers	08/11	UF	CS	< 0.07	3,850	1.7	47	107	0.329	2.99	< 3.5	376	1.02	100	281

Table 5-12. Trace Metals in Storm Runoff for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Hg	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Pajarito Canyon (includes Twomile, Threemile Canyons) (Cont.)															
Pajarito above Starmers	08/11	F	CS	< 0.07	76.3	< 1.7	< 1.2	0.47	0.272	< 2.38	< 3.5	116	< 0.014	4.9	4.72
Pajarito above Starmers	08/05	UF	CS	< 0.07	15,800	< 1.7	111	318	< 1.46	8.98	< 2.29	990	2.53	199	728
Pajarito above Starmers	08/05	F	CS	< 0.07	102	< 1.7	< 1.2	< 0.471	< 0.353	< 2.38	< 3.5	135	< 0.046	< 3.16	7.49
Pajarito above TA-18	08/05	UF	CS	< 0.07	9,910	< 4.1	94	286	< 1.65	8.89	< 4.71	546	2.1	175	813
Pajarito above TA-18	08/05	F	CS	< 0.07	10.8	< 1.5	< 1.2	< 0.781	< 0.462	< 2.38	< 3.5	88.2	< 0.085	< 2.94	5.83
Pajarito above TA-18	07/02	UF	CS	< 0.06	2,600	3.8	26.9	84.5	0.944	< 2.93	3.51	193	0.741	56.2	306
Pajarito above TA-18	07/02	F	CS	< 0.06	132	< 2.3	< 2.26	< 1.01	< 0.654	< 2.93	< 2.31	76.4	< 0.077	< 3.8	7.46
MDA G-1	08/05	UF	CS	< 0.07	1,400	< 1.7	45.3	78.4	< 0.733	< 3.73	< 3.5	190	0.993	105	226
MDA G-2	08/30	UF	CS	< 0.07	4,990	8.1	86.4	132	< 1.8	7.04	12.2	463	0.98	206	866
MDA G-2	08/30	F	CS	< 0.07	< 6.54	< 1.7	< 1.2	< 0.077	< 0.69	< 2.38	< 3.5	120	< 0.014	< 3.63	25.7
MDA G-3	08/30	UF	CS	< 0.07	131	3.0	3.51	4.13	< 1.72	< 2.38	2.74	96.7	0.626	8.83	127
MDA G-3	08/30	UF	DUP	< 0.07				4.09	< 1.73				< 0.172		
MDA G-3	08/30	F	CS	< 0.07	< 1.22	2.3	< 1.2	< 0.077	< 1.7	< 2.38	2.28	86.3	< 0.014	< 2.02	43.2
MDA G-3	08/04	UF	CS	< 0.07	535	< 1.4	11.2	20.5	< 1.17	< 2.38	< 3.5	338	< 0.391	26.5	203
MDA G-3	08/04	F	CS	< 0.07	< 3	< 1.7	< 1.2	< 0.077	< 0.612	< 2.38	< 3.5	288	< 0.034	< 2.64	7.26
MDA G-3	08/01	UF	CS	< 0.07	172	< 3.8	< 2.91	3.15	2.13	< 2.38	< 3.5	247	< 0.265	7.42	116
MDA G-3	08/01	F	CS	< 0.07	80.8	< 2.1	< 1.39	< 0.077	2.12	< 2.38	< 3.5	229	< 0.014	< 2.31	41.8
MDA G-3	07/13	UF	CS	< 0.06	285	< 2.5	< 4.78	4.88	3.06	< 3.49	< 1.94	364	0.441	11.2	159
MDA G-3	07/13	F	CS	< 0.06	196	< 2.7	< 2.32	< 0.2	3.29	< 3.49	< 1.94	359	0.264	< 4.06	75.2
MDA G-3	07/02	UF	CS	< 0.06	992	3.1	< 4.07	5.86	1.61	< 2.93	< 2.31	1,750	< 0.185	15.2	125
MDA G-3	07/02	F	CS	< 0.06	861	< 2.7	< 1.76	< 0.037	< 1.36	< 2.93	< 2.31	1,680	< 0.077	< 4.68	47.9
MDA G-3	06/07	UF	CS	< 0.04	511	< 3.8	13.7	22	2.55	< 2.93	< 2.31	168	< 0.105	33.9	257
MDA G-3	06/07	F	CS	< 0.04	99.9	< 3.7	< 2.16	2.14	2.91	< 3.37	< 2.31	125	< 0.077	6	15.7
MDA G-4	10/05	UF	CS	< 0.07				< 3.36		< 2.38					
MDA G-4	08/04	UF	CS	< 0.07	591	< 1.7	13.3	25.3	3.94	< 2.38	< 2.3	128	0.543	28.5	260
MDA G-4	07/26	F	CS	< 0.07	25.4	< 1.7	< 1.32	< 0.077	7.44	< 2.38	< 3.5	58.8	< 0.014	< 4.31	18
MDA G-4	07/17	UF	CS	< 0.07	104	< 1.7	< 3.58	4.48	7.46	< 2.38	< 3.5	67.7	< 0.014	9.29	79.7
MDA G-4	07/13	UF	CS	< 0.06	79.8	< 1.2	< 3.42	3.35	7.86	< 3.49	< 1.94	70.4	0.336	7.04	57.8
MDA G-4	07/13	F	CS	< 0.06	< 5.45	< 1.2	< 1.78	< 0.188	7.71	< 3.49	< 1.94	58.1	0.187	< 3.42	17.4
MDA G-4	07/02	UF	CS	< 0.06	365	2.4	7.42	14.1	3.94	< 2.93	< 2.31	160	< 0.169	18.4	190
MDA G-4	07/02	F	CS	< 0.06	< 1.55	< 1.3	< 1.2	< 0.037	3.14	< 2.93	< 2.31	102	< 0.077	< 2.06	7.39
MDA G-4	06/27	UF	CS	< 0.06	362	< 1.3	9.45	18.1	8.53	< 2.93	< 2.31	111	< 0.087	22.1	259
MDA G-4	06/27	F	CS	< 0.06	10.5	< 1.3	< 1.2	< 0.037	9.01	< 2.93	< 2.93	52.3	< 0.077	< 3.12	10.7
MDA G-4	06/07	UF	CS	< 0.04	615	< 3.0	18.9	27.7	6.98	< 3.39	< 2.31	150	0.831	40.9	434
MDA G-4	06/07	UF	DUP	< 0.04	613	< 1.6	17.9	27.4	7.2	< 2.93	< 2.31	152	< 0.364	39.8	439
MDA G-4	06/07	F	CS	< 0.04	40.4	< 4.3	< 1.75	2.27	8.16	< 3.14	< 2.31	57.7	< 0.077	< 3.43	15.4
MDA G-4	04/06	UF	CS	< 0.06	221	< 1.9	6.83	10.6	3.69	< 2.8	< 2.95	74.2	< 0.419	15.5	114
MDA G-4	04/06	F	CS	0.20	26.8	< 2.8	< 1.37	< 1.31	4.49	< 2.8	< 2.95	44.2	< 0.369	< 4.08	14.4
Pajarito above SR-4	08/16	UF	CS	< 0.17	1,820	< 3.8	26.8	84.4	0.365	< 2.38	2.09	242	0.862	58.9	223
Pajarito above SR-4	08/16	F	CS	< 0.15	17.5	< 3.4	< 1.49	0.979	0.114	< 2.38	3.38	99.2	< 0.014	< 3.13	6.35
Pajarito above SR-4	08/09	UF	CS	< 0.07	8,380	4.0	127	271	0.209	16.9	< 2.74	635	2.94	210	632
Pajarito above SR-4	08/09	UF	DUP	< 0.07	8,290	< 3.3	125	274	< 0.057	14.8	29.5	637	2.46	212	624
Pajarito above SR-4	08/09	F	CS	< 0.07	158	3.1	< 2.64	1.51	0.443	< 5	< 3.5	185	< 0.014	< 4.1	5.47

Table 5-12. Trace Metals in Storm Runoff for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Hg	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Pajarito Canyon (includes Twomile, Threemile Canyons) (Cont.)															
Pajarito above SR-4	08/09	F	DUP	< 0.07	155	< 3.0	< 1.88	< 0.233	< 0.446	< 4.76	< 3.5	182	< 0.014	< 3.36	5.9
Pajarito above SR-4	08/06	UF	CS	< 0.07	8,140	3.9	132	225	0.291	11.1	2.86	660	2.54	243	734
Pajarito above SR-4	08/06	UF	DUP	< 0.07	7,880	< 3.4	129	235	< 0.325	6.85	< 2.56	648	2.74	235	720
Pajarito above SR-4	08/06	F	CS	< 0.07	592	3.0	< 2.72	0.495	0.464	< 2.38	< 3.5	208	0.022	< 3.55	7.65
Pajarito above SR-4	08/06	F	DUP	< 0.07	588	< 2.7	< 2.05	< 0.395	< 0.449	< 2.38	< 3.5	207	< 0.014	< 3.44	6.38
Pajarito above SR-4	06/27	UF	CS	< 0.06	3,150	< 3.6	32.7	83.1	0.55	< 2.93	< 3.69	438	0.696	66.1	817
Pajarito above SR-4	06/27	F	CS	< 0.06	184	< 3.5	< 1.91	< 0.037	0.352	< 2.93	< 2.31	234	< 0.077	< 2.48	6.36
Water Canyon (includes Cañon de Valle, Potrillo, Fence, Indio Canyons)															
Water above SR-501	07/22	UF	CS	< 0.07	38,500	3.6	246	312	< 0.598	9.55	7.12	3,040	3.3	338	1,540
Water above SR-501	07/22	UF	DUP		39,600	< 4.0	343			9.17	12	3,300		455	2,040
Water above SR-501	07/22	F	CS	< 0.07	2,270	4.3	< 2.68	< 1.24	< 0.752	< 2.38	< 3.5	351	< 0.274	12.5	9.49
Cañon de Valle above SR-501	07/26	UF	CS	< 0.07	35,200	< 2.6	115	615	0.482	10.6	< 5.47	2,170	5.12	177	907
Cañon de Valle above SR-501	07/26	F	CS	< 0.07	12,200	< 1.7	21.7	11.3	0.502	< 2.38	< 3.5	1,770	0.406	17.4	342
S Site Canyon above Water	08/03	UF	CS	< 0.07	3,170	3.0	40.2	145	0.454	5.79	2.33	226	1.46	94	266
S Site Canyon above Water	08/03	F	CS	< 0.07	278	1.3	< 1.2	0.598	0.35	< 2.38	< 3.5	40.5	< 0.014	< 3.2	8.09
Cañon de Valle above Water	08/09	UF	CS	< 0.07	29,600	3.3	318	684	0.219	24.4	< 9.48	1,670	5.14	420	1,690
Cañon de Valle above Water	08/09	F	CS	< 0.73	460	2.9	< 2.24	1.12	0.139	< 2.38	< 3.5	150	< 0.014	< 3.27	7.49
Cañon de Valle above Water	08/05	UF	CS	< 0.07	38,700	< 1.7	301	543	0.435	14.9	< 3.5	2,210	4.73	384	1,880
Cañon de Valle above Water	08/05	F	CS	< 0.07	1,290	2.9	7.36	8.92	0.41	< 2.38	< 3.5	246	0.067	15.6	43.4
Water below MDA AB	08/08	UF	CS	< 0.07	26,400	3.3	261	687	0.374	27.1	< 8.11	1,650	5.49	405	1,470
Water below MDA AB	08/08	F	CS	< 0.73	46.4	2.1	< 1.2	0.93	0.15	< 3.56	< 3.5	150	< 0.014	< 4.4	9.14
Water below MDA AB	08/03	UF	CS	< 0.07	8,350	5.0	86.8	121	0.369	8.43	5.76	561	1.29	197	608
Water below MDA AB	08/03	F	CS	< 0.07	1,060	< 1.7	< 1.41	1.16	0.29	< 2.38	< 3.5	111	0.054	< 3.1	22.6
Water below MDA AB	07/26	UF	CS	< 0.07	71,500	< 1.7	530	1110	1.31	8.52	< 5.83	6,040	8.98	253	3,370
Water below MDA AB	07/26	F	CS	< 0.07	593	< 4.2	< 1.2	0.261	0.424	< 3.81	< 3.5	256	< 0.014	< 2.65	7.18
Water at SR-4	08/09	UF	CS	< 0.07	26,500	2.3	135	228	0.398	9.1	3.08	1,610	2.56	165	915
Water at SR-4	08/09	F	CS	< 0.07	442	3.3	< 1.78	< 1.02	0.425	< 2.38	< 3.5	127	< 0.014	< 3.59	8.08
Water at SR-4	08/03	UF	CS	< 0.07	26,400	6.4	231	124	0.412	14.7	18.7	1,720	1.5	390	1,610
Water at SR-4	08/03	UF	CS	< 0.07	5,210	4.0	60.4	159	0.375	< 2.38	5.27	380	1.9	135	410
Water at SR-4	08/03	F	CS	< 0.07	118	2.6	< 1.2	0.433	0.276	< 2.38	< 3.5	55.7	0.028	< 4.17	< 3.59
Water at SR-4	07/26	UF	CS	< 0.07	47,100	< 4.4	251	797	0.937	11.5	11.8	4,290	5.73	415	1,350
Water at SR-4	07/26	F	CS	< 0.07	15,900	< 4.6	212	42.1	0.099	8.94	< 8.92	1,440	0.321	388	1,020
Water below SR-4	08/09	UF	CS	< 0.07	29,500	4.2	251	392	0.474	28.8	10.2	1,810	4.07	364	1,500
Water below SR-4	08/09	F	CS	< 0.07	1,170	4.1	< 2.78	< 1.17	0.416	< 2.38	< 3.5	157	< 0.014	7.01	8.84
Water below SR-4	08/03	UF	CS	< 0.07	26,800	5.3	243	185	0.412	16	16.2	1,720	1.82	408	1,620
Water below SR-4	08/03	UF	CS	< 0.07	4,970	3.7	61.2	154	0.52	5.55	3.21	373	1.82	127	418
Water below SR-4	08/03	F	CS	< 0.07	196	2.1	< 1.2	0.751	0.322	< 2.38	< 3.5	57.4	0.028	< 4.53	6.25
Potrillo tributary Study Area	08/30	UF	CS	< 0.07	11,800	7.4	383	510	< 1.9	17.6	22.2	1,160	8.89	794	1,590
Potrillo tributary Study Area	08/30	UF	DUP		12,100	< 7.1	390			12.7	24.1	1,180		797	1,610
Potrillo tributary Study Area	08/30	F	CS	< 0.07	137	1.5	2.45	< 0.21	< 0.48	< 2.38	< 3.5	104	< 0.014	9.74	28.8
Potrillo tributary Study Area	08/11	UF	CS	< 0.07	8,270	1.2	261	288	0.075	5.45	< 3.5	909	5.09	355	990
Potrillo tributary Study Area	08/11	F	CS	< 0.07	43	< 1.7	< 1.2	0.137	0.458	< 2.38	< 3.5	90.9	< 0.014	11.2	3.41

Table 5-12. Trace Metals in Storm Runoff for 2001 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Hg	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Ancho Canyon															
Ancho Canyon spring tributary below SR-4	08/12	UF	CS	< 0.07	3,140	1.3	123	179	0.121	2.19	< 3.5	440	2.93	219	468
Ancho Canyon spring tributary below SR-4	08/12	F	CS	< 0.07	17.7	< 1.7	< 1.2	0.342	0.252	< 2.38	< 3.5	51.7	< 0.014	7.92	12.4
Water Quality Standards[c]															
EPA Primary Drinking Water Standard				2			100		6	50			2		
EPA Secondary Drinking Water Standard					50										5,000
EPA Action Level								15							
EPA Health Advisory												25,000–90,000		80-110	
NMWQCC Livestock Watering Standard				10				100		50				100	25,000
NMWQCC Groundwater Limit				2	200	1,000	200	50		50					10,000
NMWQCC Wildlife Habitat Standard				0.77						5					

[a]Codes: UF–unfiltered; F–filtered; CS–customer sample; DUP–laboratory duplicate.
[b]Less than symbol (<) means measurement was below the specified limit of detection of the analytical method.
[c]Standards given here for comparison only; see Appendix A. Note that New Mexico Livestock Watering and Groundwater limits mostly are based on dissolved concentrations, whereas many of these analyses are of unfiltered samples; thus, concentration may include suspended sediment quantities.

Table 5-13. Summary of TA-50 Radionuclide, Nitrate, Fluoride, and Perchlorate Discharges[a]

	1963–1977	1999			2000			2001		
Radionuclide	Total Activity Released (mCi)[b]	Total Annual Activity (mCi)	Mean Activity (pCi/L)	Ratio of Activity to DCG[c]	Total Annual Activity (mCi)	Mean Activity (pCi/L)	Ratio of Activity to DCG[c]	Total Annual Activity (mCi)	Mean Activity (pCi/L)	Ratio of Activity to DCG[c]
^{3}H	25,150	485	24,252	0.01	907	48,713	0.024	126	9,297	0.0046
^{241}Am	7	1.1	55.0	1.83	0.041	2.25	0.075	0.056	4.11	0.1370
^{137}Cs	848	1.5	76.9	0.026	3.1	166.7	0.056	0.213	15.7	0.0052
^{238}Pu	51	2.4	121.3	3.03	0.063	3.39	0.085	0.074	5.46	0.1365
$^{239,240}Pu$	39	1.40	70.0	2.33	0.035	1.86	0.062	0.024	1.79	0.0597
^{89}Sr	<1	0.36	18.2	0.0009	0.332	17.8	0.0009	0.039	2.91	0.0001
^{90}Sr	295	0.52	26.0	0.026	0.170	9.1	0.009	0.029	2.14	0.0021
^{234}U	NA	0.17	8.6	0.017	0.037	1.98	0.004	0.027	2.03	0.0041
^{235}U	2	0.0047	0.24	0.0004	0.016	0.86	0.0014	0.0016	0.12	0.0002

Constituent	Total Annual Mass (kg)	Mean Concentration (mg/L)	Ratio of Concentration to MCL[d]	Total Annual Mass (kg)	Mean Concentration (mg/L)	Ratio of Concentration to MCL[d]	Total Annual Mass (kg)	Mean Concentration (mg/L)	Ratio of Concentration to MCL[d]
NO_4-N	486	24.2	2.4	46.6	2.50	0.25	52.5	3.86	0.39
F	22.6	1.12	0.7	5.29	0.28	0.17	9.96	0.73	0.46
ClO_4	No data			4.74	0.254	No standard	2.29	0.169	No standard
Total annual effluent volume ($\times 10^7$ liters)	2.00			1.86			1.36		

[a]Compiled from Radioactive Liquid Waste Group (FWO-RLW) Annual Reports. Data for 2001 are preliminary.
[b]DOE 1979; decay corrected through 12/77.
[c]Public dose limit.
[d]New Mexico Groundwater Limit.

Table 5-14. Radiochemical Analysis of Sediments for 2001 (pCi/g[a])

			^{3}H (pCi/L)			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
Station	**Date**	**Code**	**Result**	**Uncert**	**MDA[b]**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Regional Stations																				
Rio Chama at Chamita	06/20	CS	–27	42.5	151	0.0455	0.0287	0.123	0.0549	0.0399	0.0564	0.344	0.0331	0.0136	0.024	0.0064	0.0108	0.34	0.0327	0.0108
Rio Chama at Chamita	06/20	DUP	26.2	42.6	147															
Rio Grande at Embudo	06/20	CS	54.7	45.1	153	0.0265	0.0284	0.129	0.109	0.0176	0.0349	0.545	0.0489	0.0178	0.126	0.0171	0.0122	0.508	0.0461	0.0122
Rio Grande at Otowi (bank)	07/11	CS	–64.7	59.8	216	–0.0855	0.0617	0.319	0.0379	0.014	0.0348	0.567	0.0677	0.0584	0.0342	0.0132	0.0132	0.515	0.0631	0.0452
Rio Grande at Frijoles (bank)	09/26	CS	–138	56	204	–0.0668	0.053	0.252	0.111	0.0172	0.0316	0.533	0.0613	0.0316	0.0564	0.0171	0.0317	0.585	0.0656	0.0399
Rio Grande at Cochiti	09/26	CS	–164	54.8	203	0.0079	0.0603	0.271	0.114	0.0181	0.0309	0.325	0.0401	0.043	0.0132	0.0094	0.0329	0.373	0.0428	0.0225
Rio Grande at Bernalillo	06/06	CS	80.6	48.9	164	0.0597	0.0396	0.163	0.062	0.0133	0.0345	0.606	0.0651	0.0413	0.0351	0.0146	0.0462	0.594	0.0642	0.0413
Jemez River	06/06	CS	80.3	61.5	209	–0.0304	0.0481	0.232	0.032	0.0108	0.024	0.392	0.0488	0.068	0.0238	0.011	0.0337	0.41	0.0484	0.0266
Jemez River	06/06	DUP	–27.2	58.6	212															
Reservoirs on Rio Chama (New Mexico)																				
Heron Upper	08/30	CS				0.208	0.0928	0.36	0.299	0.044	0.0585	0.792	0.0862	0.0676	0.0362	0.0139	0.014	0.856	0.0909	0.0479
Heron Upper	08/30	CS				0.0366	0.0699	0.32	0.225	0.0219	0.0351	0.837	0.0874	0.0444	0.0575	0.0181	0.0446	0.71	0.0775	0.0352
Heron Upper	08/30	DUP				0.0097	0.0687	0.323	0.252	0.0366	0.0504	0.818	0.089	0.0902	0.096	0.0247	0.0559	0.725	0.0805	0.014
Heron Middle	08/30	CS				–0.0342	0.0808	0.386	0.255	0.0325	0.0578	0.974	0.103	0.106	0.0652	0.0216	0.0654	1.18	0.117	0.0504
Heron Lower	08/30	CS				–0.0709	0.0584	0.295	0.251	0.0302	0.0584	1.28	0.127	0.0431	0.109	0.027	0.0432	1.65	0.155	0.0159
El Vado Lower	08/30	CS				0.187	0.103	0.414	0.245	0.0291	0.0493	1.17	0.116	0.0637	0.0904	0.0247	0.0639	1.53	0.143	0.0493
El Vado Middle	08/30	CS				0.0999	0.0903	0.392	0.218	0.0212	0.034	1.09	0.11	0.0714	0.0078	0.0196	0.113	1.1	0.112	0.0586
El Vado Upper	08/30	CS				–0.0368	0.0715	0.347	0.224	0.0309	0.0565	0.98	0.104	0.0804	0.0686	0.0216	0.0531	0.935	0.0999	0.0529
Abiquiu Upper	08/20	CS				0.0131	0.0229	0.0766	0.0886	0.0236	0.0499	0.968	0.0844	0.0244	0.0449	0.015	0.0396	0.9	0.0799	0.0371
Abiquiu Middle	08/20	CS				0.0581	0.0263	0.0821	0.328	0.0322	0.0487	0.94	0.0984	0.0395	0.0385	0.0161	0.0396	1.03	0.105	0.0145
Abiquiu Lower	08/20	CS				–0.0086	0.0241	0.0817	0.208	0.0211	0.0348	1.15	0.107	0.0475	0.06	0.0206	0.0596	1.06	0.1	0.0659
Reservoirs on Rio Grande (Colorado)																				
Rio Grande Upper	10/16	CS				0.029	0.064	0.293	0.669	0.0618	0.0696	1.35	0.117	0.0405	0.044	0.0224	0.0701	1.1	0.0994	0.0507
Rio Grande Upper	10/16	DUP																		
Rio Grande Middle	10/16	CS				0.0966	0.0733	0.316	1.06	0.0753	0.0407	1.13	0.0997	0.0498	0.101	0.0216	0.0413	0.888	0.0818	0.0231
Rio Grande Lower	10/16	CS				–0.0167	0.0612	0.293	0.306	0.0279	0.0445	1.03	0.0926	0.0089	0.108	0.0208	0.0241	0.996	0.0904	0.024
Reservoirs on Rio Grande (New Mexico)																				
Cochiti Upper	08/22	CS				0.0646	0.028	0.0863	0.507	0.0403	0.0456	1.06	0.0982	0.0441	0.0848	0.0187	0.01	1.03	0.0952	0.01
Cochiti Upper	08/22	DUP				0.0583	0.0261	0.0793				1.06	0.0964	0.0257	0.0642	0.0168	0.0325	1.09	0.099	0.0324
Cochiti Middle	08/22	CS				0.0969	0.0222	0.061	0.739	0.0466	0.0391	1.16	0.102	0.0296	0.0473	0.0155	0.0419	1.16	0.102	0.0234
Cochiti Middle	08/22	CS				0.0775	0.0224	0.0659	0.66	0.0348	0.0384	1.16	0.101	0.0227	0.0701	0.0173	0.0372	1.31	0.112	0.0371
Cochiti Lower	08/22	CS				0.0583	0.0279	0.0873	1.09	0.0694	0.0313	0.993	0.0873	0.0364	0.0896	0.0173	0.0205	1.04	0.0902	0.0204
Perimeter Stations																				
Rio Grande at Sandia	09/24	CS	–135	54.9	200	0.118	0.0589	0.236	0.23	0.0192	0.0237	0.582	0.0592	0.0398	0.0369	0.0116	0.0224	0.748	0.0713	0.0365
Rio Grande at Mortandad	09/24	CS	–135	54.7	200	0.0993	0.0613	0.25	0.143	0.0229	0.0384	0.332	0.0407	0.0432	0.0344	0.012	0.0285	0.322	0.0391	0.0284
Rio Grande at Pajarito	09/25	CS	–218	52.9	202	0.0644	0.0651	0.279	0.119	0.0188	0.0297	0.409	0.0444	0.0256	0.0258	0.0107	0.0298	0.354	0.04	0.0203
Rio Grande at Water	09/25	CS	–136	55.2	202	–0.0379	0.0397	0.187	0.0603	0.0196	0.0354	0.48	0.0522	0.0299	0.0484	0.0152	0.0348	0.364	0.0429	0.0237
Rio Grande at Ancho	09/25	CS	–110	56.4	203	–0.0766	0.0434	0.208	0.0302	0.0112	0.025	0.385	0.0457	0.0396	0.0396	0.0143	0.0356	0.313	0.0392	0.0242
Rio Grande at Chaquehui	09/25	CS	–137	55.6	203	0.0546	0.0533	0.229	0.269	0.0271	0.0398	0.711	0.0659	0.0194	0.0533	0.0129	0.0195	0.74	0.0681	0.0245
Pajarito Plateau Stations																				
Guaje Canyon:																				
Guaje Reservoir	10/12	CS				0.16	0.0716	0.28	0.509	0.0477	0.0564	1.24	0.11	0.0534	0.0642	0.0166	0.0263	1.32	0.116	0.0262
Guaje Reservoir	10/12	DUP				0.0504	0.0637	0.285				1.16	0.106	0.0619	0.175	0.0307	0.0488	1.02	0.0962	0.0557
Guaje Canyon at SR-502	07/11	CS	–64.5	59.6	216	0.396	0.104	0.299	0.0863	0.0238	0.0696	0.563	0.0738	0.0679	0.0481	0.0217	0.076	0.623	0.0787	0.0586
Guaje Canyon at SR-502	07/11	CS	53.7	104	359	0.0831	0.061	0.266	0.601	0.0551	0.0603	0.891	0.0949	0.0385	0.0472	0.0161	0.0142	1.05	0.107	0.0142
Bayo Canyon:																				
Bayo at SR-502	07/11	CS	139	92	310	0.0573	0.0651	0.296	0	0.019	0.0546	0.625	0.0776	0.0559	0.0387	0.0166	0.0445	0.597	0.0755	0.0648
Acid/Pueblo Canyons:																				
Acid Weir	06/12	CS	267	53.9	163	0.243	0.0781	0.218	0.795	0.0691	0.0761	0.829	0.132	0.141	0.0305	0.0217	0.0413	1.03	0.151	0.112
Acid Weir	06/12	DUP										0.828	0.12	0.129	0.0393	0.0247	0.129	0.802	0.117	0.144

Table 5-14. Radiochemical Analysis of Sediments for 2001 (pCi/g[a]) (Cont.)

			^{3}H (pCi/L)			^{90}Sr			^{137}Cs			^{234}U			^{235,236}U			^{238}U		
Station	**Date**	**Code**	**Result**	**Uncert**	**MDA[b]**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Pajarito Plateau Stations (Cont.)																				
Acid/Pueblo Canyons (Cont.):																				
Pueblo 1 R	06/12	CS	179	98.2	328	0.0281	0.0336	0.153	0.433	0.0241	0.0401	0.436	0.0446	0.0254	0.0118	0.0072	0.022	0.406	0.0423	0.0254
Pueblo 2	06/12	CS	399	148	487	0.076	0.032	0.125	0.278	0.0538	0.0727	0.67	0.0644	0.0264	0.0512	0.0132	0.021	0.71	0.0673	0.0264
Pueblo 2	06/12	CS	398	148	486	0.0875	0.0449	0.173	0.349	0.0293	0.0394	0.912	0.134	0.0374	0.0626	0.0317	0.129	0.884	0.131	0.0374
Hamilton Bend Spring	06/12	CS	544	298	996	0.119	0.0415	0.154	0.483	0.0365	0.0481	0.98	0.135	0.149	0.0343	0.0219	0.0915	0.874	0.125	0.115
Pueblo 3	06/12	CS	53.8	48.2	164	0.386	0.0746	0.142	2.05	0.122	0.0572	1.26	0.157	0.108	0.0669	0.0291	0.0855	1.32	0.162	0.0852
Pueblo 3	06/12	DUP							2.11	0.134	0.0708									
Pueblo at SR-502	06/12	CS	160	50.9	163	0.222	0.0541	0.131	1.26	0.0782	0.0564	1.39	0.124	0.0728	0.09	0.0202	0.0276	1.21	0.109	0.0347
DP/Los Alamos Canyons:																				
Los Alamos at Bridge	06/26	CS	137	54.4	178	0.0408	0.0755	0.344	0.891	0.0583	0.0317	0.69	0.0689	0.0569	0.0566	0.0208	0.0592	0.684	0.068	0.0498
Los Alamos at Bridge	06/26	DUP	222	64.6	206	–0.014	0.0622	0.298	0.839	0.0569	0.0334									
Los Alamos at Bridge	06/26	CS	125	61.4	204	0.0945	0.0771	0.332	0.901	0.0539	0.0361	0.8	0.0747	0.0557	0.0639	0.0141	0.0075	0.811	0.0744	0.0333
Los Alamos at LAO-1	06/26	CS	2,470	110	203	0.135	0.0793	0.326	0.346	0.0352	0.0512	0.683	0.0662	0.0222	0.0394	0.0113	0.0082	0.692	0.0667	0.0082
Los Alamos at Upper GS	06/26	CS	1,160	85.4	203	0.0879	0.0718	0.31	0.47	0.0428	0.0586	1.24	0.133	0.0535	0.051	0.0285	0.0876	1.13	0.126	0.0873
DPS-1	06/26	CS	3,030	118	201	1.82	0.322	0.235	0.145	0.0213	0.0383	0.555	0.0599	0.042	0.0526	0.0238	0.0726	0.458	0.0529	0.0493
DPS-4	06/26	CS	676	74	200	0.561	0.122	0.292	1.36	0.0863	0.0302	1.09	0.0983	0.0519	0.0394	0.0126	0.0242	1.09	0.0977	0.0304
Los Alamos at LAO-3	06/26	CS	188	63	203	–0.0163	0.064	0.307	1.07	0.0708	0.0338	1.12	0.0983	0.0224	0.0335	0.012	0.0283	1.03	0.0914	0.0082
Los Alamos at LAO-4.5	06/27	CS	340	66.4	201	0.126	0.0678	0.271	0.885	0.0598	0.0435	0.787	0.0732	0.0344	0.0344	0.0117	0.0267	0.778	0.0724	0.0266
Los Alamos at SR-4	06/26	CS	827	175	538	0.083	0.0655	0.279	1.35	0.0969	0.0576	0.936	0.0901	0.0359	0.031	0.0214	0.0703	0.878	0.0861	0.0464
Los Alamos at Totavi	07/11	CS	64.9	63.6	217	0.196	0.0706	0.26	0.539	0.0472	0.0556	1.39	0.138	0.101	0.0718	0.0222	0.0521	1.48	0.143	0.0602
Los Alamos at Totavi	07/11	CS	200	69	223	0.194	0.0736	0.278	0.585	0.0459	0.0618	1.21	0.122	0.0516	0.0546	0.0195	0.0517	0.971	0.103	0.0516
Los Alamos at Otowi	07/11	CS	40.2	77.7	269	–0.0112	0.0688	0.333	0.259	0.0318	0.0442	0.768	0.0867	0.0586	0.0513	0.018	0.0402	0.92	0.099	0.0713
Los Alamos at Otowi	07/11	DUP	64.1	62.8	215	0.0483	0.0523	0.238	0.274	0.0299	0.0578	1.18	0.114	0.0347	0.0689	0.0202	0.044	1.01	0.101	0.0128
Sandia Canyon:																				
Sandia at SR-4	07/11	CS	1,270	335	1,060	0.0223	0.0491	0.233	0	0.0371	0.0463	0.98	0.11	0.104	0.0877	0.0357	0.14	0.688	0.0941	0.212
Sandia at Rio Grande	09/24	CS	659	119	265	0.0512	0.0554	0.239	–0.0004	0.0093	0.0317	0.484	0.0559	0.0416	0.012	0.0085	0.0285	0.398	0.0483	0.0105
Sandia at Rio Grande	09/24	DUP				0.0394	0.0419	0.18	0.0161	0.0085	0.0207	0.449	0.0498	0.0434	0.0101	0.014	0.0514	0.532	0.0558	0.0403
Mortandad Canyon:																				
Mortandad near CMR Building	06/19	CS				0.0199	0.0244	0.112	0.0597	0.0192	0.0425	0.518	0.0495	0.0056	0.0234	0.0075	0.0152	0.475	0.0463	0.0056
Mortandad near CMR Building	06/19	DUP										0.511	0.0474	0.0212	0.0532	0.0113	0.0191	0.439	0.0418	0.013
Mortandad west of GS-1	06/19	CS	543	448	1,520	0.0687	0.034	0.138	0.0855	0.0167	0.0371	0.354	0.0406	0.0248	0.021	0.0092	0.0289	0.394	0.0441	0.035
Mortandad west of GS-1	06/19	DUP																		
Mortandad at GS-1	06/19	CS	5,940	132	152	0.86	0.129	0.143	27.9	0.17	0.0693	0.598	0.054	0.0311	0.037	0.0112	0.0349	0.559	0.0511	0.0283
Mortandad at GS-1	06/19	DUP				1.09	0.172	0.147												
Mortandad at MCO-5	06/19	CS	3,220	505	1,500	0.694	0.105	0.125	15.6	0.749	0.0566	0.45	0.042	0.0177	0.033	0.0077	0.0045	0.387	0.0373	0.0121
Mortandad at MCO-7	06/19	CS	794	443	1,480	1.25	0.196	0.129	8.22	0.476	0.0516	0.869	0.0761	0.0058	0.0488	0.0123	0.0303	0.762	0.0686	0.034
Mortandad at MCO-8.5	06/19	CS	2,890	581	1,790	0.542	0.0841	0.115	4.46	0.236	0.0314	0.54	0.0512	0.0219	0.0487	0.0113	0.022	0.522	0.0497	0.0055
Mortandad at MCO-8.5	06/19	DUP																		
Mortandad at MCO-8.5	06/19	CS	2,690	493	1,500	0.381	0.0668	0.136	3.11	0.0614	0.0505	0.537	0.0517	0.0302	0.0662	0.0135	0.0231	0.443	0.0445	0.023
Mortandad at MCO-9	06/19	CS	1,970	151	380	1.57	0.249	0.149	5.69	0.291	0.0492	1.07	0.0939	0.0067	0.0754	0.0152	0.0229	1.15	0.0996	0.0181
Mortandad at MCO-13 (A-5)	06/19	CS	945	239	756	0.38	0.0658	0.119	0.714	0.0466	0.0358	1.26	0.106	0.0269	0.0654	0.0139	0.027	1.21	0.102	0.0165
Mortandad A-6	07/11	CS	281	74.3	235	0.759	0.137	0.245	3.16	0.201	0.0719	1.82	0.167	0.0397	0.0693	0.0214	0.0503	1.96	0.178	0.0502
Mortandad A-7	07/11	CS	1,900	655	2,120	–0.0155	0.0548	0.268	0.103	0.0434	0.063	1.25	0.125	0.0733	0.128	0.0294	0.0521	1.16	0.118	0.0602
Mortandad at SR-4 (A-9)	07/11	CS	1,760	352	1,070	0.013	0.0533	0.256	0.18	0.0417	0.0826	1.2	0.124	0.0738	0.0702	0.0223	0.0453	1.35	0.136	0.0166
Mortandad at Rio Grande (A-11)	09/24	CS	–82.6	57.3	204	–0.0291	0.0558	0.257	0.0112	0.0101	0.0366	0.388	0.0496	0.0493	0.0416	0.0145	0.0303	0.333	0.0438	0.0111
Mortandad at Rio Grande (A-11)	09/24	DUP	–55.9	58.9	207															
TA-54 Area G:																				
MDA G-0	05/30	CS	1660	132	358	0.0966	0.0554	0.226	0.0904	0.0287	0.0498	0.816	0.0755	0.0311	0.0319	0.0122	0.0312	0.822	0.0758	0.0269
MDA G-1	05/31	CS	393	111	360	0.144	0.066	0.257	0.0724	0.014	0.0259	0.471	0.0485	0.0281	0.0288	0.0104	0.0244	0.468	0.0482	0.0243
MDA G-1	05/31	CS	197	108	361	0.0344	0.0601	0.273	0.0448	0.0132	0.0245	0.706	0.0721	0.0348	0.0536	0.0153	0.0276	0.659	0.0683	0.0101
MDA G-2	05/31	CS	147	158	538	0.0431	0.0337	0.145	0.0632	0.0194	0.0369	0.556	0.0635	0.0846	0.0276	0.0136	0.0466	0.58	0.0634	0.0464
MDA G-2	05/31	DUP	730	168	535															
MDA G-3	05/31	CS	1,280	126	360	0.0374	0.053	0.238	0.118	0.0125	0.021	0.614	0.0661	0.06	0.0464	0.0182	0.0602	0.73	0.0744	0.0454

Table 5-14. Radiochemical Analysis of Sediments for 2001 (pCi/g[a]) (Cont.)

			^{3}H (pCi/L)			^{90}Sr			^{137}Cs			^{234}U			^{235,236}U			^{238}U		
Station	**Date**	**Code**	**Result**	**Uncert**	**MDA[b]**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Pajarito Plateau Stations (Cont.)																				
TA-54 Area G (Cont.):																				
MDA G-4 R-1	05/31	CS	19,200	302	271	–0.0157	0.041	0.201	0.227	0.0338	0.0509	1.06	0.107	0.0668	0.0577	0.0186	0.0376	0.949	0.098	0.0375
MDA G-4 R-1	05/31	DUP				0.0739	0.0504	0.212	0.221	0.0174	0.0261									
MDA G-4 R-2	05/31	CS	9,930	207	270	0.204	0.0616	0.19	0.419	0.0339	0.036	1.17	0.116	0.0998	0.0711	0.0221	0.0553	1.13	0.113	0.0769
MDA G-5	05/31	CS	3,570	217	545	0.048	0.0448	0.196	0.0732	0.0163	0.0384	1.05	0.102	0.0961	0.0457	0.0225	0.0837	1.01	0.0981	0.0461
MDA G-6 R	05/31	CS	1,770	187	539	0.0479	0.0393	0.17	0.0955	0.0213	0.0315	1.06	0.102	0.0632	0.0167	0.015	0.0634	1.12	0.106	0.0391
MDA G-7	05/31	CS	2,350	143	358	0.107	0.0438	0.165	0.325	0.031	0.0331	0.796	0.0811	0.0604	0.0697	0.0181	0.0297	0.792	0.0802	0.0433
MDA G-7	05/31	DUP										0.818	0.0826	0.0803	0.0221	0.0139	0.0442	0.811	0.08	0.0441
MDA G-7 West	05/31	CS	1,060	179	554	0.0754	0.0373	0.15	0.486	0.0369	0.0307	1.18	0.114	0.0789	0.0325	0.0156	0.0511	1.86	0.164	0.0349
MDA G-8	05/31	CS	492	113	360	0.0086	0.024	0.112	0.157	0.0207	0.0337	0.782	0.0796	0.0561	0.0289	0.0166	0.0633	0.769	0.0785	0.0521
MDA-G-9	05/31	CS	876	325	1,070	–0.0105	0.0433	0.208	0.164	0.0311	0.0624	0.77	0.0801	0.077	0.0251	0.0138	0.0493	0.73	0.0758	0.038
MDA-G-9	05/31	CS				0.023	0.0387	0.176	0.122	0.0235	0.0478	0.805	0.0785	0.0264	0.0108	0.0063	0.0098	0.802	0.0784	0.0333
Cañada del Buey:																				
Cañada del Buey at SR-4	06/05	CS	943	160	494	0.0234	0.0479	0.22	0.0796	0.0135	0.0262	0.956	0.0991	0.0479	0.0273	0.0133	0.038	0.839	0.0902	0.0555
Cañada del Buey at SR-4	06/05	DUP				0.0203	0.0544	0.25	0.0824	0.0291	0.0496									
Pajarito Canyon:																				
Two-Mile at SR-501	06/05	CS				0.227	0.0689	0.192	0.638	0.0304	0.0421	0.532	0.0647	0.0745	0.0134	0.0121	0.0507	0.513	0.0617	0.0346
Pajarito at SR-501	06/05	CS	134	145	492	0.133	0.0571	0.205	0.148	0.0191	0.0332	0.441	0.0559	0.0551	0.0322	0.0124	0.0125	0.442	0.0553	0.0338
Pajarito at SR-4	06/05	CS	242	53.5	164	0.035	0.0478	0.215	0.213	0.0203	0.0243	0.805	0.0931	0.0903	0.0617	0.0274	0.0956	0.863	0.0981	0.1
Pajarito at SR-4	06/05	DUP	240	53	163															
Pajarito at SR-4	06/05	CS	241	53.2	163	0.108	0.0596	0.237	0.309	0.0277	0.0341	1.28	0.123	0.0815	0.0377	0.0193	0.0692	1.11	0.11	0.0587
Pajarito at Rio Grande	09/25	CS	–221	53.7	204	0.0161	0.0639	0.286	0.0605	0.0232	0.0414	0.473	0.0549	0.0523	0.0365	0.0182	0.059	0.315	0.043	0.0588
Potrillo Canyon:																				
Potrillo at SR-4	06/05	CS				0.116	0.0528	0.196	0.207	0.02	0.0312	1.09	0.11	0.0633	0.0793	0.0213	0.0143	1.1	0.11	0.0388
Fence Canyon:																				
Fence at SR-4	06/05	CS				0.163	0.0666	0.238	0.303	0.027	0.0347	1.07	0.107	0.0369	0.0553	0.0171	0.0136	1.08	0.108	0.0369
Cañon de Valle:																				
Cañon de Valle at SR-501	06/05	CS	277	54	169	0.168	0.061	0.204	0.586	0.0455	0.039	0.737	0.0739	0.0338	0.0687	0.018	0.0393	0.746	0.0743	0.0099
Water Canyon:																				
Water at SR-501	06/05	CS	357	101	327	–0.0299	0.0461	0.222	0.296	0.0314	0.0317	0.965	0.11	0.13	0.0125	0.0285	0.131	0.925	0.106	0.113
Water at SR-501	06/05	CS	134	144	491	0.0978	0.0513	0.199	0.219	0.0207	0.0346	0.894	0.0935	0.0866	0.118	0.0263	0.0445	0.789	0.0844	0.0574
Water Canyon at SR-4	06/05	CS	268	147	492	0.285	0.0881	0.246	1.14	0.0398	0.044	0.767	0.0804	0.0523	0.0493	0.0158	0.0321	0.824	0.0843	0.032
Water Canyon at SR-4	06/05	DUP										0.824	0.0906	0.0704	0.0399	0.0201	0.0706	1.06	0.108	0.0578
Water at Rio Grande	09/25	CS	178	185	430	0.0819	0.0624	0.261	0.104	0.0141	0.0276	0.351	0.042	0.0423	0.018	0.0142	0.0477	0.288	0.0376	0.0476
Water at Rio Grande	09/25	CS	283	149	342	0.0599	0.0428	0.179	0.364	0.0283	0.0332	0.744	0.0815	0.046	0.124	0.0264	0.0135	0.679	0.0765	0.046
Indio Canyon:																				
Indio Canyon at SR-4	06/05	CS				0.18	0.0717	0.257	0.182	0.0257	0.0447	0.701	0.0751	0.0516	0.0455	0.0159	0.0401	0.754	0.0796	0.0682
Ancho Canyon:																				
Ancho at SR-4	06/05	CS	1,610	314	984	0.064	0.0496	0.21	0.138	0.0245	0.0459	1.27	0.115	0.0478	0.0639	0.0166	0.0108	1.6	0.139	0.037
Ancho at SR-4	06/05	DUP																		
Above Ancho Spring	10/24	CS	541	180	575	0.174	0.0783	0.31	0.159	0.0361	0.0586	0.666	0.0719	0.0441	0.0555	0.0168	0.0443	0.943	0.0935	0.0493
Above Ancho Spring	10/24	DUP	261	169	555	0.0051	0.0556	0.262				0.885	0.0878	0.0792	0.0613	0.0173	0.0461	1.04	0.0987	0.0412
Above Ancho Spring	10/24	CS	189	54.6	172	0.048	0.0584	0.262	0.102	0.0344	0.0701	1.09	0.103	0.0641	0.0617	0.0174	0.0464	1.03	0.0988	0.0798
Ancho at Rio Grande	09/25	CS	–167	55.5	206	–0.009	0.0412	0.191	0.03	0.01	0.0273	0.281	0.0335	0.0072	0.008	0.007	0.0246	0.225	0.0292	0.0195
TA-49 Area AB:																				
MDA AB-1	05/22	CS	468	111	344	0.0952	0.0249	0.0714	0.173	0.0175	0.0274	0.605	0.0966	0.0825	0.045	0.0278	0.0828	0.605	0.0966	0.0825
MDA AB-1	05/22	CS	242	51.9	158	0.127	0.0301	0.0805	0.265	0.0245	0.0361	0.54	0.0908	0.135	0.0169	0.017	0.083	0.602	0.0953	0.0828
MDA AB-2	05/22	CS	189	50.7	159	0.0206	0.0206	0.0906	0.2	0.0302	0.0566	0.84	0.125	0.12	0.0713	0.0329	0.0954	0.976	0.137	0.0952

Table 5-14. Radiochemical Analysis of Sediments for 2001 (pCi/g[a]) (Cont.)

			^{3}H (pCi/L)			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
Station	**Date**	**Code**	**Result**	**Uncert**	**MDA[b]**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**	**Result**	**Uncert**	**MDA**
Pajarito Plateau Stations (Cont.)																				
TA-49 Area AB (Cont.):																				
MDA AB-2	05/22	DUP																		
MDA AB-3	05/22	CS	541	102	319	0.0607	0.0224	0.0817	0.0632	0.0243	0.0376	0.565	0.0864	0.102	0.0045	0.0197	0.125	0.527	0.0836	0.125
MDA AB-3 Alternate	05/23	CS	420	115	371	0.178	0.0367	0.0784	0.367	0.0322	0.0399	1.31	0.18	0.143	0.0352	0.028	0.143	1.74	0.218	0.113
MDA AB-4	05/22	CS	314	51.6	159	0.0879	0.0246	0.0791	0.207	0.0465	0.0739	0.931	0.117	0.133	0.0309	0.0214	0.0953	0.94	0.117	0.065
MDA AB-4A	05/22	CS	268	44	135	0.148	0.0327	0.0812	0.337	0.0673	0.0959	0.822	0.0893	0.0486	0.0577	0.022	0.0565	0.942	0.0989	0.0563
MDA AB-5	05/22	CS	324	54.4	159	0.0586	0.0255	0.101	0.408	0.0346	0.0475	0.977	0.123	0.145	0.134	0.0485	0.133	1.29	0.149	0.157
MDA AB-5	05/22	CS	294	53.2	158	0.0138	0.0219	0.0993	0.333	0.0338	0.053	1	0.114	0.122	0.0714	0.024	0.0477	0.893	0.102	0.0601
MDA AB-6	05/22	CS	302	56.1	170	–0.0114	0.0202	0.0978	0.122	0.0227	0.0399	0.664	0.117	0.255	0.0387	0.0261	0.108	0.652	0.113	0.176
MDA AB-7	05/22	CS	529	69.7	208	0.0824	0.0262	0.0846	0.414	0.0359	0.0565	0.372	0.0584	0.0617	0.0333	0.0151	0.0181	0.406	0.0607	0.0489
MDA AB-8	05/22	CS	478	63	188	–0.003	0.0186	0.0895	0.0933	0.0264	0.0665	0.519	0.0663	0.0155	0.0286	0.013	0.0155	0.547	0.0692	0.042
MDA AB-9	05/22	CS	400	107	337	0.163	0.032	0.0781	0.454	0.0389	0.0418	1.31	0.14	0.11	0.0555	0.0281	0.0833	1.61	0.161	0.0831
MDA AB-10	05/22	CS	525	141	442	0.0335	0.0182	0.075	0.214	0.0247	0.0462	0.48	0.0667	0.0587	0.0444	0.0193	0.0467	0.493	0.0683	0.068
MDA AB-11	05/23	CS	209	49.9	154	0.151	0.0377	0.0883	0.339	0.0284	0.0362	0.745	0.115	0.136	0.0634	0.0288	0.0344	0.771	0.116	0.0343
MDA AB-11	05/23	DUP	183	49.2	154															
Chaquehui Canyon:																				
Chaquehui at Rio Grande	09/25	CS	2,300	168	406	0.272	0.0711	0.227	0.746	0.0518	0.0471	1.36	0.115	0.0292	0.0637	0.016	0.0293	1.34	0.115	0.0472
Frijoles Canyon:																				
Frijoles at Monument Headquarters	06/27	CS	92.3	59.5	200	0.0073	0.0732	0.342	0.204	0.0305	0.0509	1.09	0.102	0.0727	0.0487	0.0167	0.0403	0.852	0.0832	0.0402
Frijoles at Monument Headquarters	06/27	CS	–92.1	54	200	0.0867	0.0655	0.279	0.174	0.017	0.0252	1.15	0.111	0.0546	0.0456	0.0185	0.049	0.949	0.0947	0.0123
Frijoles at Rio Grande	06/27	CS	–61.9	55.4	201	–0.0051	0.0621	0.293	0.301	0.0336	0.0634	1.64	0.138	0.0361	0.114	0.0223	0.0313	1.63	0.137	0.0403
Frijoles at Rio Grande	06/27	DUP										1.78	0.149	0.0262	0.0927	0.02	0.0262	1.65	0.14	0.0096
Frijoles at Rio Grande	09/26	CS	–163	54.4	201	0.137	0.066	0.259	0.104	0.0159	0.026	0.589	0.0602	0.0237	0.0197	0.0091	0.0238	0.58	0.0597	0.0299
TA-55 below E169	05/18	CS	484	58.4	158	0.0455	0.0261	0.106	0.202	0.0286	0.0439	0.845	0.123	0.133	0.0121	0.0248	0.149	1.17	0.152	0.0908
TA-55 below E169	05/18	DUP				0.0427	0.0203	0.0797	0.25	0.0258	0.0297	0.893	0.0981	0.0542	0.041	0.0213	0.063	0.905	0.0987	0.043
River Background[c]			3600			1.02			0.56											
Reservoir Background[c]			500			1.19			0.98											
Former Background[d]						0.87			0.44											
ER Canyon Sediments Background[e]						1.04			0.90			2.59			0.20			2.29		
SAL[f]			20,000			5.7			5.3			63			17			93		

Table 5-14. Radiochemical Analysis of Sediments for 2001 (pCi/g[a]) (Cont.)

					^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
Station	Date	Code	U (mg/kg, calc)		Result	Uncert	MDA[b]	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Regional Stations																			
Rio Chama at Chamita	06/20	CS	1.02	0.10	0.001	0.0017	0.0072	0.0058	0.0028	0.0072	0.0062	0.0041	0.0133	5.71	1.03	2.3	22.4	1.46	3.12
Rio Chama at Chamita	06/20	DUP																	
Rio Grande at Embudo	06/20	CS	1.57	0.14	0.0073	0.0026	0.0025	0.0091	0.0029	0.0025	0.116	0.0411	0.0851	6.81	1.16	2.26	23.7	1.49	3.23
Rio Grande at Otowi (bank)	07/11	CS	1.55	0.19	0	0.0015	0.0079	0.0011	0.0019	0.0079	0.0105	0.0073	0.0275	5.4	1.18	2.07	18.2	1.08	1.43
Rio Grande at Frijoles (bank)	09/26	CS	1.77	0.20	0.0013	0.0013	0.0036	0.0067	0.0036	0.0098	0.0187	0.0079	0.0213	10.2	1.18	2.14	27.2	1.21	2.4
Rio Grande at Cochiti	09/26	CS	1.12	0.13	0.0026	0.0018	0.0035	0.0103	0.0037	0.0035	0.0199	0.0082	0.009	7.57	1.07	2.26	19.1	0.925	1.67
Rio Grande at Bernalillo	06/06	CS	1.78	0.19	0	1	0.0082	0.009	0.0052	0.0082	0.005	0.0044	0.0182	8.75	1.5	2.22	21.7	1.65	2.3
Jemez River	06/06	CS	1.23	0.14	0	1	0.0076	0	1	0.0076	0.0025	0.0031	0.0145	5.43	1.08	2.55	25.3	1.45	2.82
Jemez River	06/06	DUP																	
Reservoirs on Rio Chama (New Mexico)																			
Heron Upper	08/30	CS	2.56	0.27	0	1	0.0036	0.008	0.0063	0.0212	0.0021	0.0021	0.0076	6.94	0.768	1.47	17.9	1.2	3.04
Heron Upper	08/30	CS	2.14	0.23	0.0016	0.0016	0.0042	0.0047	0.0035	0.0114	0.0078	0.0026	0.0023	6.69	0.796	1.26	16.6	1.08	2.53
Heron Upper	08/30	DUP	2.20	0.24	–0.0096	0.0089	0.047	0.0151	0.0076	0.0268	0.0046	0.0022	0.0057	10.1	0.957	1.66	18.2	1.04	2.49
Heron Middle	08/30	CS	3.54	0.35	0.0033	0.0024	0.0045	0	1	0.0275	0.0102	0.0031	0.0025	16.4	1.24	1.51	28.4	1.29	2.58
Heron Lower	08/30	CS	4.96	0.46	0.0069	0.0042	0.0126	–0.0462	0.0104	0.049	0.0066	0.0024	0.0022	16.9	1.27	1.42	28.9	1.31	2.62
El Vado Lower	08/30	CS	4.60	0.43	0.0017	0.0029	0.0124	0.0203	0.006	0.0046	0.0032	0.0016	0.0022	11.3	1.06	1.67	21.6	1.27	2.98
El Vado Middle	08/30	CS	3.28	0.33	–0.0034	0.0042	0.0206	0.0309	0.0075	0.0047	0.0061	0.0027	0.0071	9.23	1.55	1.13	19.1	1.43	2.56
El Vado Upper	08/30	CS	2.81	0.30	0	1	0.0152	0	1	0.0388	0.0053	0.002	0.0021	9.25	1.27	1.58	17.4	1.32	2.39
Abiquiu Upper	08/20	CS	2.70	0.24	0.0008	0.0019	0.0122	0.0058	0.0034	0.0122	0.0109	0.0064	0.0229	16.6	1.71	1.77	24.1	0.736	1
Abiquiu Middle	08/20	CS	3.08	0.31	0.001	0.0022	0.0144	0.0049	0.0035	0.0144	0.0066	0.0062	0.0307	20.9	1.39	0.951	29.9	0.723	0.78
Abiquiu Lower	08/20	CS	3.18	0.30	0.0011	0.0024	0.0159	0.0043	0.0031	0.0059	0.0324	0.0104	0.0088	16.9	1.65	0.951	20.7	0.699	0.909
Reservoirs on Rio Grande (Colorado)																			
Rio Grande Upper	10/16	CS	3.29	0.30	0.0155	0.0102	0.0336	0.0293	0.0103	0.0287	0.0066	0.0139	0.0489	17	2.49	3.06	27.7	1.36	1.57
Rio Grande Upper	10/16	DUP												11.8	1.55	2.28	23.8	1.2	1.99
Rio Grande Middle	10/16	CS	2.69	0.24	0.012	0.0107	0.0364	0.0546	0.0117	0.0241	0.0364	0.0132	0.0389	17	2.27	3.98	36.7	1.57	1.98
Rio Grande Lower	10/16	CS	3.01	0.27	–0.0033	0.0058	0.0249	0.0116	0.006	0.0179	0.0188	0.01	0.0315	19.1	2.11	2.53	36.3	1.45	1.64
Reservoirs on Rio Grande (New Mexico)																			
Cochiti Upper	08/22	CS	3.10	0.28	0.0025	0.0032	0.0179	0.044	0.0091	0.0122	0.0251	0.0104	0.0113	19.1	1.53	1.21	26.9	0.752	1.06
Cochiti Upper	08/22	DUP	3.27	0.29	–0.0015	0.0011	0.0139	0.0509	0.0094	0.0139	0.0284	0.0104	0.0293						
Cochiti Middle	08/22	CS	3.47	0.30	0.0031	0.0022	0.0042	0.0358	0.0078	0.0042	0.0321	0.0099	0.0079	23.1	2.02	1.06	27.1	0.624	0.696
Cochiti Middle	08/22	CS	3.93	0.33	0.0039	0.0028	0.0053	0.0194	0.0062	0.0053	0.0103	0.0073	0.032	22.6	2.02	1.28	25.5	0.747	1.06
Cochiti Lower	08/22	CS	3.14	0.27	0.0038	0.0027	0.0051	0.0313	0.0081	0.014	0.0263	0.0085	0.0071	21.2	2.28	1.67	26.2	0.801	1.26
Perimeter Stations																			
Rio Grande at Sandia	09/24	CS	2.24	0.21	0	0.0022	0.0113	0.0154	0.0058	0.0143	0.006	0.0044	0.0179	17.7	1.09	1.38	29.3	0.86	1.53
Rio Grande at Mortandad	09/24	CS	0.97	0.12	–0.0014	0.0031	0.0151	0.0112	0.0057	0.0169	0.0127	0.0064	0.0086	8.43	1.44	2.55	24.9	1.17	2.3
Rio Grande at Pajarito	09/25	CS	1.07	0.12	0	1	0.0109	0.0134	0.005	0.0109	0.0226	0.0078	0.0176	9.12	1.29	1.41	22.4	1.03	1.5
Rio Grande at Water	09/25	CS	1.11	0.13	0.0059	0.003	0.004	0.003	0.0042	0.016	0.0027	0.0027	0.0073	9.99	1.16	1.77	24.1	1.03	1.72
Rio Grande at Ancho	09/25	CS	0.95	0.12	0.0028	0.002	0.0038	0.0014	0.0025	0.0104	0.0035	0.0063	0.0353	4.94	0.867	2.05	20.5	1	1.92
Rio Grande at Chaquehui	09/25	CS	2.23	0.20	0.0012	0.002	0.0086	0.0093	0.0037	0.0086	0.0174	0.0081	0.0235	14.4	1.27	1.84	27.6	1.1	1.71
Pajarito Plateau Stations																			
Guaje Canyon:																			
Guaje Reservoir	10/12	CS	3.96	0.35	–0.0038	0.0068	0.0269	0.0227	0.0063	0.0136	–0.005	0.0132	0.049	20.5	2.19	2.11	34.1	1.45	1.38
Guaje Reservoir	10/12	DUP	3.12	0.29	0.0015	0.0083	0.0309	0.0154	0.0066	0.0185	0.0114	0.0078	0.0257						
Guaje Canyon at SR-502	07/11	CS	1.88	0.23	–0.0023	0.0023	0.0123	0.0046	0.0028	0.0084	0.0115	0.0044	0.0129	8.21	1.67	2.79	24.1	1.23	1.55
Guaje Canyon at SR-502	07/11	CS	3.15	0.32	0.0053	0.0024	0.0029	0.0265	0.0057	0.0078	0.0076	0.0033	0.0096	13.3	2	2.51	27.5	1.31	1.63
Bayo Canyon:																			
Bayo at SR-502	07/11	CS	1.79	0.22	0	1	0.0033	0.0012	0.0021	0.0088	0.007	0.0029	0.0032	5.78	1.35	3	23	1.19	1.85
Acid/Pueblo Canyons:																			
Acid Weir	06/12	CS	3.08	0.45	0.0229	0.0074	0.0163	5.5	0.309	0.0189	0.0171	0.0079	0.0284	12.5	1.58	2.78	30.4	1.63	3.06
Acid Weir	06/12	DUP	2.41	0.35															

Table 5-14. Radiochemical Analysis of Sediments for 2001 (pCi/g[a]) (Cont.)

					^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
Station	Date	Code	U (mg/kg, calc)		Result	Uncert	MDA[b]	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Pajarito Plateau Stations (Cont.)																			
Acid/Pueblo Canyons (Cont.):																			
Pueblo 1 R	06/12	CS	1.21	0.13	0.0054	0.0032	0.0049	0.0145	0.0052	0.0049	0.405	0.0401	0.0184	3.13	0.678	1.16	23.7	1.26	2.48
Pueblo 2	06/12	CS	2.14	0.20	0.024	0.0074	0.0159	4.08	0.234	0.0126	0.146	0.0193	0.0055	3.44	0.77	1.64	26.9	1.43	2.83
Pueblo 2	06/12	CS	2.66	0.39	0.0321	0.0055	0.0023	6.53	0.349	0.0062	0.122	0.0183	0.0207	5.39	0.972	1.62	25.5	1.49	2.74
Hamilton Bend Spring	06/12	CS	2.62	0.37	0.0078	0.0047	0.0145	1.37	0.0855	0.0234	0.0726	0.0132	0.0058	14.8	1.65	2.36	38.4	1.88	2.71
Pueblo 3	06/12	CS	3.96	0.48	0.0171	0.005	0.0039	1.96	0.115	0.0132	0.102	0.0161	0.0059	24.7	2.16	1.53	36.9	1.76	2.65
Pueblo 3	06/12	DUP			0.0066	0.0041	0.0122	1.94	0.118	0.0154	0.114	0.0195	0.0296	28.1	2.22	2.22	43	1.99	3.18
Pueblo at SR-502	06/12	CS	3.64	0.32	0.0145	0.0054	0.0119	2.3	0.136	0.0044	0.111	0.0163	0.0055	23.6	2.23	2.72	42.9	2.06	3.5
DP/Los Alamos Canyons:																			
Los Alamos at Bridge	06/26	CS	2.06	0.20	–0.0138	0.0097	0.0374	0.0196	0.0056	0.0124	0.0103	0.0075	0.0251	17.8	1.96	1.84	36.5	1.85	2.7
Los Alamos at Bridge	06/26	DUP			0.003	0.0041	0.0149	0.0129	0.0044	0.0107	0.0157	0.0075	0.0232	11.1	1.43	2.25	38.4	1.79	2.77
Los Alamos at Bridge	06/26	CS	2.44	0.22	–0.0092	0.0105	0.0392	0.0172	0.0053	0.0123	–0.0035	0.0077	0.0294	6.79	1.02	1.86	16.9	1.25	2.95
Los Alamos at LAO-1	06/26	CS	2.08	0.20	–0.0027	0.0121	0.0439	0.523	0.0391	0.0164	0.0134	0.0084	0.0272	13.9	2.55	1.65	38.4	2.54	2.53
Los Alamos at Upper GS	06/26	CS	3.39	0.38	0.0024	0.0034	0.0128	0.561	0.0396	0.0168	0.0189	0.0072	0.0206	27.9	2.54	2.45	44.8	2.18	2.84
DPS-1	06/26	CS	1.39	0.16	0.0179	0.0068	0.0198	0.0211	0.0057	0.0126	0.0097	0.0058	0.0187	6.64	1.1	2.23	31	1.42	2.24
DPS-4	06/26	CS	3.26	0.29	0.0011	0.0102	0.0363	0.0929	0.0116	0.0119	0.157	0.0181	0.0308	9.27	1.28	1.25	33	1.57	2.26
Los Alamos at LAO-3	06/26	CS	3.08	0.27	0.0215	0.0098	0.0307	0.276	0.0226	0.0116	0.143	0.0158	0.0181	15.7	1.76	2	41.8	1.94	3.13
Los Alamos at LAO-4.5	06/27	CS	2.33	0.22	0.0028	0.0116	0.0415	0.18	0.0194	0.0211	0.218	0.0217	0.0277	14.8	1.74	1.99	43.4	2	2.8
Los Alamos at SR-4	06/26	CS	2.63	0.26	0.0271	0.0114	0.0352	0.204	0.0198	0.0185	0.201	0.019	0.0142	10.7	1.44	1.54	35.7	1.74	2.83
Los Alamos at Totavi	07/11	CS	4.44	0.43	0.0058	0.0024	0.0026	0.579	0.0381	0.0071	0.0639	0.0093	0.0082	17	2.54	3.29	33	1.51	2.18
Los Alamos at Totavi	07/11	CS	2.92	0.31	0.0117	0.0036	0.0029	0.571	0.0386	0.0029	0.0666	0.0102	0.0165	13.4	2.1	2.93	34.8	1.49	1.75
Los Alamos at Otowi	07/11	CS	2.76	0.29	0	1	0.0087	0.0997	0.0121	0.0032	0.0141	0.0039	0.0068	5.55	1.31	2.61	26.6	1.28	1.66
Los Alamos at Otowi	07/11	DUP	3.04	0.30	0.002	0.0014	0.0027	0.0961	0.0109	0.0027	0.0195	0.006	0.0169	5.69	1.32	2.6	26.3	1.26	1.63
Sandia Canyon:																			
Sandia at SR-4	07/11	CS	2.09	0.28	0.0023	0.0024	0.0086	0.0023	0.0029	0.0109	0.015	0.0046	0.0091	8.85	1.52	2.06	30.5	1.38	1.46
Sandia at Rio Grande	09/24	CS	1.19	0.14	0.0435	0.0112	0.0074	0.0408	0.0148	0.0408	0.0149	0.0061	0.0067	6.68	0.679	1.33	28.5	0.82	1.22
Sandia at Rio Grande	09/24	DUP	1.59	0.17	0	1	0.0042	0.0047	0.0041	0.0144	0.0147	0.0079	0.0241						
Mortandad Canyon:																			
Mortandad near CMR Building	06/19	CS	1.42	0.14	0.0372	0.0069	0.0081	0.0153	0.0042	0.003	0.0114	0.0051	0.0149	6.77	1.19	2.52	31.5	1.72	3.33
Mortandad near CMR Building	06/19	DUP	1.33	0.12															
Mortandad west of GS-1	06/19	CS	1.18	0.13	0.0083	0.0036	0.0087	0.0236	0.0057	0.0087	0.0117	0.0044	0.0096	2.18	0.704	1.7	28.7	1.6	2.75
Mortandad west of GS-1	06/19	DUP			0.0038	0.002	0.0056	0.0107	0.0033	0.0071	0.0139	0.0041	0.0031						
Mortandad at GS-1	06/19	CS	1.68	0.15	7.26	0.384	0.0028	12.7	0.66	0.0112	13.2	0.914	0.057	32.9	2.68	1.68	56.1	2.24	2.76
Mortandad at GS-1	06/19	DUP																	
Mortandad at MCO-5	06/19	CS	1.17	0.11	5.3	0.329	0.017	13.4	0.799	0.017	8.13	0.606	0.0261	9.85	1.32	1.62	32	1.67	2.87
Mortandad at MCO-7	06/19	CS	2.29	0.20	2.74	0.156	0.0127	5.99	0.326	0.0087	10.6	0.749	0.0726	14	1.67	1.81	35.4	1.84	2.78
Mortandad at MCO-8.5	06/19	CS	1.58	0.15	0.35	0.0257	0.0026	1.13	0.0666	0.0071	1.96	0.221	0.0421	4.77	1.11	2.24	25.8	1.89	2.6
Mortandad at MCO-8.5	06/19	DUP									2.79	0.265	0.034						
Mortandad at MCO-8.5	06/19	CS	1.35	0.13	0.278	0.0241	0.0035	0.934	0.0608	0.0096	1.17	0.141	0.032	2.3	0.852	1.63	30.1	2.17	2.83
Mortandad at MCO-9	06/19	CS	3.46	0.30	0.525	0.0368	0.0083	2.67	0.15	0.0082	1.97	0.166	0.0165	12.8	1.56	2.69	35.7	1.85	3.23
Mortandad at MCO-13 (A-5)	06/19	CS	3.63	0.30	0.0071	0.0031	0.0074	0.099	0.0114	0.0094	0.0211	0.0054	0.0036	18.9	1.94	2.03	47.2	2.13	3.09
Mortandad A-6	07/11	CS	5.87	0.53	0.0056	0.0031	0.0096	0.125	0.0123	0.0127	0.0474	0.0116	0.0329	38.2	3.12	2.69	53.1	1.82	1.6
Mortandad A-7	07/11	CS	3.51	0.35	–0.001	0.0029	0.0126	–0.0019	0.0054	0.021	0.0106	0.0075	0.0282	10.6	1.83	2.75	56.7	1.88	2.25
Mortandad at SR-4 (A-9)	07/11	CS	4.05	0.40	0.0019	0.0014	0.0026	0.0106	0.0038	0.009	0.0084	0.0053	0.0194	17.3	1.91	2.41	35.2	1.5	1.86
Mortandad at Rio Grande (A-11)	09/24	CS	1.01	0.13	0.0016	0.0016	0.0043	–0.0079	0.0057	0.0262	0.0204	0.0073	0.0069	4.28	0.716	1.58	24.2	0.683	1.01
Mortandad at Rio Grande (A-11)	09/24	DUP																	
TA-54 Area G:																			
MDA G-0	05/30	CS	2.46	0.23	0.0072	0.0051	0.0097	0.0258	0.0083	0.007	0.0136	0.0062	0.0074	26	1.74	1.62	52.3	1.78	2.48
MDA G-1	05/31	CS	1.41	0.14	0.0028	0.0028	0.0076	0.006	0.0035	0.0055	0.009	0.0047	0.0168	15.6	1.45	1.28	45.9	1.83	2.7
MDA G-1	05/31	CS	1.99	0.20	–0.0037	0.0027	0.0343	–0.0013	0.0013	0.0196	0.0094	0.0048	0.0154	9.33	1.01	1.72	36.8	1.58	2.97
MDA G-2	05/31	CS	1.74	0.19	0.0033	0.0033	0.0089	0.0189	0.0068	0.0064	0.0134	0.0057	0.0178	9.57	1.73	1.39	38	2.37	2.79
MDA G-2	05/31	DUP																	
MDA G-3	05/31	CS	2.19	0.22	0.0241	0.0092	0.0093	0.0099	0.005	0.0067	0.0131	0.005	0.0051	8.32	1.37	2.25	41.7	2.55	2.73

Table 5-14. Radiochemical Analysis of Sediments for 2001 (pCi/g[a]) (Cont.)

					^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
Station	Date	Code	U (mg/kg, calc)		Result	Uncert	MDA[b]	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Pajarito Plateau Stations (Cont.)																			
TA-54 Area G (Cont.):																			
MDA G-4 R-1	05/31	CS	2.85	0.29	0.0145	0.0066	0.0079	0.0115	0.0059	0.0225	0.0149	0.0062	0.0169	22.1	4.24	5.19	40.2	4.18	8.63
MDA G-4 R-1	05/31	DUP			0.0101	0.0051	0.0068	0.0226	0.0071	0.0195	0.0236	0.0098	0.0107	15.7	1.31	2.14	40.2	1.62	3.41
MDA G-4 R-2	05/31	CS	3.40	0.34	0.0057	0.0041	0.0077	0.035	0.0087	0.0056	0.0148	0.0076	0.0275	17.5	1.38	1.89	41.6	1.56	2.61
MDA G-5	05/31	CS	3.03	0.29	0.0141	0.0071	0.0096	0.0178	0.0075	0.0236	0.0159	0.0058	0.0138	18.3	1.35	1.75	39.8	1.7	3.03
MDA G-6 R	05/31	CS	3.34	0.32	0.0105	0.0053	0.0071	0.169	0.0203	0.0139	0.506	0.0434	0.0174	12.7	1.25	2.18	40.7	1.73	3.33
MDA G-7	05/31	CS	2.39	0.24	0.26	0.0327	0.0232	0.248	0.0285	0.0378	0.0745	0.0139	0.0063	24.7	1.92	1.45	47.5	2.94	2.26
MDA G-7	05/31	DUP	2.42	0.24															
MDA G-7 West	05/31	CS	5.55	0.49	1.31	0.102	0.0084	0.392	0.0375	0.006	0.102	0.0188	0.0218	31.9	2.2	2.03	50.2	1.79	2.94
MDA G-8	05/31	CS	2.30	0.23	0.0425	0.0113	0.0202	0.0385	0.0095	0.0213	0.0304	0.0099	0.0213	12.4	1.2	1.79	39.3	1.64	3.11
MDA-G-9	05/31	CS	2.18	0.23	0.0493	0.0127	0.0084	0.0644	0.0125	0.006	0.0168	0.0092	0.0397	19.8	1.62	1.71	48	1.87	2.83
MDA-G-9	05/31	CS	2.39	0.23	0.0351	0.01	0.0073	0.0292	0.0077	0.0053	0.0168	0.0065	0.0065	11	1.16	1.94	37.7	1.65	2.41
Cañada del Buey:																			
Cañada del Buey at SR-4	06/05	CS	2.51	0.27	–0.0003	0.004	0.023	0.0076	0.0053	0.0199	0.0102	0.0079	0.0267	16.2	1.83	2.03	34.3	1.79	3.41
Cañada del Buey at SR-4	06/05	DUP												14.4	1.64	2.46	36.5	1.72	2.64
Pajarito Canyon:																			
Two-Mile at SR-501	06/05	CS	1.53	0.18	0	1	0.0075	0.029	0.0095	0.0204	0.011	0.007	0.0268	15.5	1.7	2.55	40.7	1.95	3.25
Pajarito at SR-501	06/05	CS	1.33	0.16	0.007	0.005	0.0095	0.007	0.005	0.0095	0.0108	0.0055	0.018	2.64	0.839	2.56	32.5	1.63	2.67
Pajarito at SR-4	06/05	CS	2.60	0.29	–0.0004	0.0045	0.0325	0.033	0.0114	0.0258	0.0105	0.0054	0.0175	10.6	1.41	1.21	33.1	1.69	2.54
Pajarito at SR-4	06/05	DUP																	
Pajarito at SR-4	06/05	CS	3.32	0.33	0.0055	0.0039	0.0075	0.0221	0.0079	0.0075	0.0158	0.0081	0.029	11.9	1.48	1.55	33.5	1.64	2.44
Pajarito at Rio Grande	09/25	CS	0.95	0.13	–0.0017	0.0017	0.0126	–0.0034	0.0048	0.0224	0.0182	0.0084	0.0246	6.09	1.15	1.9	30.8	1.22	1.86
Potrillo Canyon:																			
Potrillo at SR-4	06/05	CS	3.31	0.33	0.0012	0.0038	0.0202	0.0033	0.01	0.0464	0.0119	0.0057	0.0157	16.3	1.89	2.19	38.9	1.9	2.89
Fence Canyon:																			
Fence at SR-4	06/05	CS	3.24	0.32	–0.001	0.004	0.0224	0.0303	0.0087	0.0241	0.0178	0.006	0.0054	13.1	1.69	2.83	36.8	2	3.14
Cañon de Valle:																			
Cañon de Valle at SR-501	06/05	CS	2.25	0.22	0.0032	0.0032	0.0087	0.027	0.0099	0.0235	0.0194	0.0082	0.0238	15.3	1.89	1.88	40.4	1.97	2.8
Water Canyon:																			
Water at SR-501	06/05	CS	2.76	0.32	0.0086	0.005	0.0078	0.0058	0.0041	0.0078	0.011	0.0049	0.0059	12.8	1.6	2.37	38.2	1.87	3.03
Water at SR-501	06/05	CS	2.40	0.25	0	1	0.0089	0.0033	0.0033	0.0089	0.0073	0.0042	0.0066	17.2	3.13	1.86	50.5	3.19	2.55
Water Canyon at SR-4	06/05	CS	2.48	0.25	0.003	0.003	0.008	0.0266	0.009	0.008	0.0184	0.0056	0.0045	17.1	1.97	1.99	40.5	1.93	2.85
Water Canyon at SR-4	06/05	DUP	3.17	0.32															
Water at Rio Grande	09/25	CS	0.87	0.11	0.0046	0.0027	0.0042	0.0092	0.0049	0.0143	0.0101	0.0051	0.0068	5.15	1.11	2.15	24.9	1.08	1.71
Water at Rio Grande	09/25	CS	2.08	0.23	0.003	0.0036	0.0138	0.0193	0.0058	0.0109	0.0081	0.0047	0.0073	10.7	1.49	1.4	32.4	1.18	1.35
Indio Canyon:																			
Indio Canyon at SR-4	06/05	CS	2.27	0.24	–0.0035	0.0025	0.0287	0.0124	0.0062	0.0084	0.0268	0.0082	0.016	18.5	2.05	2.49	43.2	1.91	2.89
Ancho Canyon:																			
Ancho at SR-4	06/05	CS	4.79	0.41	–0.0018	0.0018	0.024	–0.0022	0.0045	0.035	0.0166	0.0085	0.0305	8.84	1.32	2.57	38.3	1.77	3.25
Ancho at SR-4	06/05	DUP			0.0012	0.0031	0.0201	0.0036	0.0054	0.0294	0.0114	0.0085	0.0344						
Above Ancho Spring	10/24	CS	2.83	0.28	0.0056	0.0032	0.005	0.0112	0.0059	0.0173	0.0043	0.0043	0.0117	6.87	1.44	3.32	31.4	1.43	1.59
Above Ancho Spring	10/24	DUP	3.12	0.29	0	0.0043	0.0189	0.007	0.0082	0.0293	0.004	0.0105	0.0428						
Above Ancho Spring	10/24	CS	3.09	0.29	0.0022	0.0022	0.0059	–0.0044	0.0069	0.0307	0.0194	0.0117	0.036	13.4	1.65	2.65	33.8	1.44	2.01
Ancho at Rio Grande	09/25	CS	0.67	0.09	0.0014	0.0014	0.0038	0.0056	0.0028	0.0038	0	1	0.0087	4.32	0.899	2.23	20.7	0.952	1.58
TA-49 Area AB:																			
MDA AB-1	05/22	CS	1.82	0.29	0	1	0.0026	0.0176	0.0042	0.0026	0.0133	0.0043	0.0036	7.77	0.811	1.42	31.4	1.31	2.67
MDA AB-1	05/22	CS	1.80	0.28	0.0012	0.003	0.0149	0.0166	0.0049	0.0038	0.0172	0.0049	0.0036	14	1.16	0.977	36.3	1.44	2.44
MDA AB-2	05/22	CS	2.94	0.41	0.0082	0.0031	0.0067	0.0593	0.008	0.0025	0.0121	0.0057	0.0162	22.7	1.65	1.71	33.2	1.58	3.44

Table 5-14. Radiochemical Analysis of Sediments for 2001 (pCi/g[a]) (Cont.)

					^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
Station	Date	Code	U (mg/kg, calc)		Result	Uncert	MDA[b]	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Pajarito Plateau Stations (Cont.)																			
TA-49 Area AB (Cont.):																			
MDA AB-2	05/22	DUP									0.027	0.0069	0.0046						
MDA AB-3	05/22	CS	1.57	0.25	0.0107	0.0043	0.0117	0.402	0.0286	0.0071	0.113	0.0141	0.0037	15.8	1.33	1.44	33	1.49	2.81
MDA AB-3 Alternate	05/23	CS	5.20	0.65	0.0141	0.0043	0.0035	0.721	0.0496	0.0095	0.155	0.0157	0.0029	25.2	1.9	2.78	38.6	1.9	3.24
MDA AB-4	05/22	CS	2.81	0.35	0.0027	0.0019	0.0037	0.0059	0.0031	0.0091	0.0064	0.0032	0.0043	19.6	1.63	1.76	32.1	1.69	3.26
MDA AB-4A	05/22	CS	2.83	0.29	0.0004	0.0017	0.0102	0.0156	0.005	0.0102	0.0153	0.0045	0.0035	22.5	1.54	1.1	31.6	1.26	2.34
MDA AB-5	05/22	CS	3.90	0.44	0.0062	0.0028	0.0034	0.0187	0.0049	0.0034	0.0196	0.0056	0.0041	19.2	1.46	1.51	39.3	1.68	3.26
MDA AB-5	05/22	CS	2.69	0.30	0.0013	0.0013	0.0034	0.0147	0.0048	0.0118	0.0117	0.0044	0.0109	16.8	1.36	1.39	39.5	1.63	2.84
MDA AB-6	05/22	CS	1.96	0.34	0.0028	0.002	0.0038	0.0125	0.0042	0.0038	0.0083	0.0034	0.0037	9.31	1.08	2.01	30.4	1.56	2.94
MDA AB-7	05/22	CS	1.22	0.18	–0.0002	0.0027	0.0156	0.013	0.0044	0.0039	0.0087	0.0036	0.0039	9.09	0.968	1.25	33.5	1.4	2.63
MDA AB-8	05/22	CS	1.64	0.21	–0.0011	0.0019	0.0103	0.0067	0.0027	0.003	0.0125	0.004	0.0034	8.9	1.02	1.62	35.1	1.49	2.72
MDA AB-9	05/22	CS	4.82	0.48	0.0011	0.0011	0.003	0.0412	0.0076	0.012	0.0223	0.0061	0.0122	22.6	1.22	0.857	44.3	1.16	1.38
MDA AB-10	05/22	CS	1.49	0.20	0	0.0022	0.0096	0.017	0.004	0.0024	0.0067	0.0028	0.003	7.6	0.751	1.35	37.8	1.36	2.14
MDA AB-11	05/23	CS	2.32	0.35	0.0009	0.0016	0.0068	0.0157	0.0045	0.0099	0.0162	0.0052	0.0044	21.2	1.6	1.78	36.8	1.55	2.67
MDA AB-11	05/23	DUP																	
Chaquehui Canyon:																			
Chaquehui at Rio Grande	09/25	CS	4.02	0.34	0.0028	0.0028	0.0103	0.0195	0.0072	0.0197	0.0026	0.0026	0.0072	24	1.77	2.06	42.9	1.41	2.16
Frijoles Canyon:																			
Frijoles at Monument Headquarters	06/27	CS	2.56	0.25	0	0.0087	0.0312	0.0132	0.0045	0.011	0.0156	0.0091	0.0295	21.1	2.03	1.61	39.7	1.8	2.43
Frijoles at Monument Headquarters	06/27	CS	2.85	0.28	–0.0047	0.005	0.0213	0.0223	0.0057	0.0109	0.0234	0.0079	0.0226	11	1.48	2.77	30.9	1.69	2.99
Frijoles at Rio Grande	06/27	CS	4.90	0.41	–0.0054	0.0074	0.0284	0.0225	0.0061	0.0141	0.0172	0.0057	0.0152	21.7	2.03	1.62	34.7	1.69	2.71
Frijoles at Rio Grande	06/27	DUP	4.95	0.42															
Frijoles at Rio Grande	09/26	CS	1.74	0.18	0	1	0.005	0.0019	0.0067	0.0262	0.0158	0.0065	0.0072	9.44	1.35	1.84	34.1	1.24	1.6
TA-55 below E169	05/18	CS	3.49	0.45	0.0155	0.0047	0.0038	0.0842	0.0118	0.0038	0.0511	0.0083	0.0032	15.1	1.33	0.997	41	1.63	2.55
TA-55 below E169	05/18	DUP	2.71	0.29	0.0099	0.0046	0.0132	0.0558	0.0085	0.0081	0.0503	0.0087	0.0036	15.5	1.48	1.63	44.2	2.88	2.62
River Background[c]			4.49		0.0087			0.0130			0.0760			15.7			17.6		
Reservoir Background[c]			4.58		0.0012			0.0201			0.0100			15.9			9.7		
Former Background[d]			4.40		0.0060			0.0230											
ER Canyon Sediments Background[e]			2.22		0.0060			0.0680			0.0400								
SAL[f]			29		49			44			39								

[a]Except where noted. Three columns are listed: the first is the analytical result, the second is the radioactive counting uncertainty (1 standard deviation), and the third is the analytical laboratory measurement-specific minimum detectable activity.

[b]MDA=minimum detectable activity.

[c]Upper limit for background values (McLin and Lyons 2002).

[d]Purtymun et al. (1987a).

[e]Ryti (1998).

[f]Screening Action Level, LANL Environmental Restoration Project, 2001; see text for details.

Table 5-15. Detections of Greater-Than-Background Radionuclides in River and Stream Sediments for 2001[a]

Station Name	Date	Code[b]	Analyte	Result	Uncertainty[c]	MDA[d]	Units	Lab Qual Code[e]	Valid Flag Code[e]	ER Canyon Sediment Background[f]	Result/ ER Canyon Sediment Background	River Background[g]	Result/ River Background	SAL[h]	Result/ SAL
Regional Stations															
Rio Grande at Otowi (bank)	07/11	CS	Gross Beta	18.2	1.08	1.43	pCi/g		J-			17.6	1.03		
Rio Grande at Frijoles (bank)	09/26	CS	Gross Beta	27.2	1.21	2.4	pCi/g					17.6	1.55		
Rio Grande at Cochiti	09/26	CS	Gross Beta	19.1	0.925	1.67	pCi/g					17.6	1.09		
Rio Grande at Bernalillo	06/06	CS	Gross Beta	21.7	1.65	2.3	pCi/g					17.6	1.23		
Jemez River	06/06	CS	Gross Beta		25.3	1.45	2.82	pCi/g					17.6	1.44	
Pajarito Plateau Stations															
Guaje Canyon:															
Guaje Reservoir	10/12	CS	Gross Alpha	20.5	2.19	2.11	pCi/g					15.7	1.31		
Guaje Reservoir	10/12	CS	Gross Beta	34.1	1.45	1.38	pCi/g					17.6	1.94		
Guaje Reservoir	10/12	CS	^{239,240}Pu	0.0227	0.00629	0.0136	pCi/g			0.068	0.33	0.013	1.75		
Guaje Canyon at SR-502	07/11	CS	^{137}Cs	0.601	0.0551	0.0603	pCi/g			0.9	0.67	0.56	1.07		
Guaje Canyon at SR-502	07/11	CS	Gross Beta	27.5	1.31	1.63	pCi/g		J-			17.6	1.56		
Guaje Canyon at SR-502	07/11	CS	Gross Beta	24.1	1.23	1.55	pCi/g		J-			17.6	1.37		
Guaje Canyon at SR-502	07/11	CS	^{239,240}Pu	0.0265	0.00567	0.00779	pCi/g			0.068	0.39	0.013	2.04		
Bayo Canyon:															
Bayo at SR-502	07/11	CS	Gross Beta	23	1.19	1.85	pCi/g		J-			17.6	1.31		
Acid/Pueblo Canyons:															
Acid Weir	06/12	CS	^{137}Cs	0.795	0.0691	0.0761	pCi/g			0.9	0.88	0.56	1.42		
Acid Weir	06/12	CS	Gross Beta	30.4	1.63	3.06	pCi/g					17.6	1.73		
Acid Weir	06/12	CS	^{3}H	267	53.9	163	pCi/L					3,600	0.07		
Acid Weir	06/12	CS	^{238}Pu	0.0229	0.00735	0.0163	pCi/g			0.006	3.82	0.009	2.63		
Acid Weir	06/12	CS	^{239,240}Pu	5.5	0.309	0.0189	pCi/g			0.068	80.88	0.013	423.08		
Pueblo 1 R	06/12	CS	^{241}Am	0.405	0.0401	0.0184	pCi/g			0.04	10.13	0.076	5.33		
Pueblo 1 R	06/12	CS	Gross Beta	23.7	1.26	2.48	pCi/g					17.6	1.35		
Pueblo 2	06/12	CS	^{241}Am	0.146	0.0193	0.00551	pCi/g			0.04	3.65	0.076	1.92		
Pueblo 2	06/12	CS	^{241}Am	0.122	0.0183	0.0207	pCi/g			0.04	3.05	0.076	1.61		
Pueblo 2	06/12	CS	Gross Beta	26.9	1.43	2.83	pCi/g					17.6	1.53		
Pueblo 2	06/12	CS	Gross Beta	25.5	1.49	2.74	pCi/g					17.6	1.45		
Pueblo 2	06/12	CS	^{238}Pu	0.0321	0.00548	0.00229	pCi/g			0.006	5.35	0.009	3.69		
Pueblo 2	06/12	CS	^{238}Pu	0.024	0.00738	0.0159	pCi/g			0.006	4.00	0.009	2.76		
Pueblo 2	06/12	CS	^{239,240}Pu	6.53	0.349	0.00622	pCi/g			0.068	96.03	0.013	502.31		
Pueblo 2	06/12	CS	^{239,240}Pu	4.08	0.234	0.0126	pCi/g			0.068	60.00	0.013	313.85		
Hamilton Bend Spring	06/12	CS	^{241}Am	0.0726	0.0132	0.00579	pCi/g			0.04	1.82	0.076	0.96		
Hamilton Bend Spring	06/12	CS	Gross Beta	38.4	1.88	2.71	pCi/g					17.6	2.18		

Table 5-15. Detections of Greater-Than-Background Radionuclides in River and Stream Sediments for 2001[a] (Cont.)

Station Name	Date	Code[b]	Analyte	Result	Uncertainty[c]	MDA[d]	Units	Lab Qual Code[e]	Valid Flag Code[e]	ER Canyon Sediment Background[f]	Result/ ER Canyon Sediment Background	River Background[g]	Result/ River Background	SAL[h]	Result/ SAL
Pajarito Plateau Stations (Cont.)															
Acid/Pueblo Canyons (Cont.):															
Hamilton Bend Spring	06/12	CS	^{239,240}Pu	1.37	0.0855	0.0234	pCi/g			0.068	20.15	0.013	105.38		
Pueblo 3	06/12	DUP	^{241}Am	0.114	0.0195	0.0296	pCi/g			0.04	2.85	0.076	1.50		
Pueblo 3	06/12	CS	^{241}Am	0.102	0.0161	0.0059	pCi/g			0.04	2.55	0.076	1.34		
Pueblo 3	06/12	DUP	^{137}Cs	2.11	0.134	0.0708	pCi/g			0.9	2.34	0.56	3.77		
Pueblo 3	06/12	CS	^{137}Cs	2.05	0.122	0.0572	pCi/g			0.9	2.28	0.56	3.66		
Pueblo 3	06/12	DUP	Gross Alpha	28.1	2.22	2.22	pCi/g					15.7	1.79		
Pueblo 3	06/12	CS	Gross Alpha	24.7	2.16	1.53	pCi/g					15.7	1.57		
Pueblo 3	06/12	DUP	Gross Beta	43	1.99	3.18	pCi/g					17.6	2.44		
Pueblo 3	06/12	CS	Gross Beta	36.9	1.76	2.65	pCi/g					17.6	2.10		
Pueblo 3	06/12	CS	^{238}Pu	0.0171	0.005	0.00385	pCi/g			0.006	2.85	0.009	1.97		
Pueblo 3	06/12	CS	^{239,240}Pu	1.96	0.115	0.0132	pCi/g			0.068	28.82	0.013	150.77		
Pueblo 3	06/12	DUP	^{239,240}Pu	1.94	0.118	0.0154	pCi/g			0.068	28.53	0.013	149.23		
Pueblo at SR-502	06/12	CS	^{241}Am	0.111	0.0163	0.00546	pCi/g			0.04	2.78	0.076	1.46		
Pueblo at SR-502	06/12	CS	^{137}Cs	1.26	0.0782	0.0564	pCi/g			0.9	1.40	0.56	2.25		
Pueblo at SR-502	06/12	CS	Gross Alpha	23.6	2.23	2.72	pCi/g					15.7	1.50		
Pueblo at SR-502	06/12	CS	Gross Beta	42.9	2.06	3.5	pCi/g					17.6	2.44		
Pueblo at SR-502	06/12	CS	^{239,240}Pu	2.3	0.136	0.00436	pCi/g			0.068	33.82	0.013	176.92		
DP/Los Alamos Canyons:															
Los Alamos at Bridge	06/26	CS	^{137}Cs	0.901	0.0539	0.0361	pCi/g			0.9	1.00	0.56	1.61		
Los Alamos at Bridge	06/26	CS	^{137}Cs	0.891	0.0583	0.0317	pCi/g			0.9	0.99	0.56	1.59		
Los Alamos at Bridge	06/26	DUP	^{137}Cs	0.839	0.0569	0.0334	pCi/g			0.9	0.93	0.56	1.50		
Los Alamos at Bridge	06/26	CS	Gross Alpha	17.8	1.96	1.84	pCi/g		J-			15.7	1.13		
Los Alamos at Bridge	06/26	DUP	Gross Beta	38.4	1.79	2.77	pCi/g		J			17.6	2.18		
Los Alamos at Bridge	06/26	CS	Gross Beta	36.5	1.85	2.7	pCi/g		J			17.6	2.07		
Los Alamos at Bridge	06/26	DUP	^{3}H	222	64.6	206	pCi/L		U			3,600	0.06		
Los Alamos at Bridge	06/26	CS	^{239,240}Pu	0.0196	0.00561	0.0124	pCi/g		J	0.068	0.29	0.013	1.51		
Los Alamos at Bridge	06/26	CS	^{239,240}Pu	0.0172	0.00533	0.0123	pCi/g		J	0.068	0.25	0.013	1.32		
Los Alamos at LAO-1	06/26	CS	Gross Beta	38.4	2.54	2.53	pCi/g		J			17.6	2.18		
Los Alamos at LAO-1	06/26	CS	^{3}H	2,470	110	203	pCi/L					3,600	0.69		
Los Alamos at LAO-1	06/26	CS	^{239,240}Pu	0.523	0.0391	0.0164	pCi/g			0.068	7.69	0.013	40.23		
Los Alamos at Upper GS	06/26	CS	Gross Alpha	27.9	2.54	2.45	pCi/g		J-			15.7	1.78		
Los Alamos at Upper GS	06/26	CS	Gross Beta	44.8	2.18	2.84	pCi/g		J			17.6	2.55		
Los Alamos at Upper GS	06/26	CS	^{3}H	1,160	85.4	203	pCi/L					3,600	0.32		
Los Alamos at Upper GS	06/26	CS	^{239,240}Pu	0.561	0.0396	0.0168	pCi/g			0.068	8.25	0.013	43.15		
DPS-1	06/26	CS	Gross Beta	31	1.42	2.24	pCi/g		J			17.6	1.76		

Table 5-15. Detections of Greater-Than-Background Radionuclides in River and Stream Sediments for 2001[a] (Cont.)

Station Name	Date	Code[b]	Analyte	Result	Uncertainty[c]	MDA[d]	Units	Lab Qual Code[e]	Valid Flag Code[e]	ER Canyon Sediment Background[f]	Result/ ER Canyon Sediment Background	River Background[g]	Result/ River Background	SAL[h]	Result/ SAL
Pajarito Plateau Stations (Cont.)															
DP/Los Alamos Canyons (Cont.):															
DPS-1	06/26	CS	^{3}H	3,030	118	201	pCi/L					3,600	0.84		
DPS-1	06/26	CS	^{239,240}Pu	0.0211	0.00568	0.0126	pCi/g		J	0.068	0.31	0.013	1.62		
DPS-1	06/26	CS	^{90}Sr	1.82	0.322	0.235	pCi/g			1.04	1.75	1.02	1.78		
DPS-4	06/26	CS	^{241}Am	0.157	0.0181	0.0308	pCi/g			0.04	3.93	0.076	2.07		
DPS-4	06/26	CS	^{137}Cs	1.36	0.0863	0.0302	pCi/g			0.9	1.51	0.56	2.43		
DPS-4	06/26	CS	Gross Beta	33	1.57	2.26	pCi/g		J			17.6	1.88		
DPS-4	06/26	CS	^{3}H	676	74	200	pCi/L					3,600	0.19		
DPS-4	06/26	CS	^{239,240}Pu	0.0929	0.0116	0.0119	pCi/g			0.068	1.37	0.013	7.15		
Los Alamos at LAO-3	06/26	CS	^{241}Am	0.143	0.0158	0.0181	pCi/g			0.04	3.58	0.076	1.88		
Los Alamos at LAO-3	06/26	CS	^{137}Cs	1.07	0.0708	0.0338	pCi/g			0.9	1.19	0.56	1.91		
Los Alamos at LAO-3	06/26	CS	Gross Alpha	15.7	1.76	2	pCi/g		J-			15.7	1.00		
Los Alamos at LAO-3	06/26	CS	Gross Beta	41.8	1.94	3.13	pCi/g		J			17.6	2.38		
Los Alamos at LAO-3	06/26	CS	^{239,240}Pu	0.276	0.0226	0.0116	pCi/g			0.068	4.06	0.013	21.23		
Los Alamos at LAO-4.5	06/27	CS	^{241}Am	0.218	0.0217	0.0277	pCi/g			0.04	5.45	0.076	2.87		
Los Alamos at LAO-4.5	06/27	CS	^{137}Cs	0.885	0.0598	0.0435	pCi/g			0.9	0.98	0.56	1.58		
Los Alamos at LAO-4.5	06/27	CS	Gross Beta	43.4	2	2.8	pCi/g		J			17.6	2.47		
Los Alamos at LAO-4.5	06/27	CS	^{3}H	340	66.4	201	pCi/L		J			3,600	0.09		
Los Alamos at LAO-4.5	06/27	CS	^{239,240}Pu	0.18	0.0194	0.0211	pCi/g			0.068	2.65	0.013	13.85		
Los Alamos at SR-4	06/26	CS	^{241}Am	0.201	0.019	0.0142	pCi/g			0.04	5.03	0.076	2.64		
Los Alamos at SR-4	06/26	CS	^{137}Cs	1.35	0.0969	0.0576	pCi/g			0.9	1.50	0.56	2.41		
Los Alamos at SR-4	06/26	CS	Gross Beta	35.7	1.74	2.83	pCi/g		J			17.6	2.03		
Los Alamos at SR-4	06/26	CS	^{3}H	827	175	538	pCi/L		J			3,600	0.23		
Los Alamos at SR-4	06/26	CS	^{239,240}Pu	0.204	0.0198	0.0185	pCi/g			0.068	3.00	0.013	15.69		
Los Alamos at Totavi	07/11	CS	^{241}Am	0.0666	0.0102	0.0165	pCi/g			0.04	1.67	0.076	0.88		
Los Alamos at Totavi	07/11	CS	^{241}Am	0.0639	0.0093	0.00823	pCi/g			0.04	1.60	0.076	0.84		
Los Alamos at Totavi	07/11	CS	^{137}Cs	0.585	0.0459	0.0618	pCi/g			0.9	0.65	0.56	1.04		
Los Alamos at Totavi	07/11	CS	Gross Alpha	17	2.54	3.29	pCi/g		J-			15.7	1.08		
Los Alamos at Totavi	07/11	CS	Gross Beta	34.8	1.49	1.75	pCi/g		J-			17.6	1.98		
Los Alamos at Totavi	07/11	CS	Gross Beta	33	1.51	2.18	pCi/g		J-			17.6	1.88		
Los Alamos at Totavi	07/11	CS	^{238}Pu	0.0117	0.00357	0.00287	pCi/g			0.006	1.95	0.009	1.34		
Los Alamos at Totavi	07/11	CS	^{239,240}Pu	0.579	0.0381	0.00706	pCi/g			0.068	8.51	0.013	44.54		
Los Alamos at Totavi	07/11	CS	^{239,240}Pu	0.571	0.0386	0.00287	pCi/g			0.068	8.40	0.013	43.92		
Los Alamos at Otowi	07/11	CS	Gross Beta	26.6	1.28	1.66	pCi/g		J-			17.6	1.51		
Los Alamos at Otowi	07/11	DUP	Gross Beta	26.3	1.26	1.63	pCi/g		J-			17.6	1.49		
Los Alamos at Otowi	07/11	CS	^{239,240}Pu	0.0997	0.0121	0.00322	pCi/g			0.068	1.47	0.013	7.67		
Los Alamos at Otowi	07/11	DUP	^{239,240}Pu	0.0961	0.0109	0.00266	pCi/g			0.068	1.41	0.013	7.39		

Table 5-15. Detections of Greater-Than-Background Radionuclides in River and Stream Sediments for 2001[a] (Cont.)

Station Name	Date	Code[b]	Analyte	Result	Uncertainty[c]	MDA[d]	Units	Lab Qual Code[e]	Valid Flag Code[e]	ER Canyon Sediment Background[f]	Result/ ER Canyon Sediment Background	River Background[g]	Result/ River Background	SAL[h]	Result/ SAL
Pajarito Plateau Stations (Cont.)															
Sandia Canyon:															
Sandia at SR-4	07/11	CS	Gross Beta	30.5	1.38	1.46	pCi/g		J-			17.6	1.73		
Sandia at SR-4	07/11	CS	^{3}H	1,270	335	1,060	pCi/L		J			3,600	0.35		
Sandia at Rio Grande	09/24	CS	Gross Beta	28.5	0.82	1.22	pCi/g					17.6	1.62		
Sandia at Rio Grande	09/24	CS	^{3}H	659	119	265	pCi/L					3,600	0.18		
Sandia at Rio Grande	09/24	CS	^{238}Pu	0.0435	0.0112	0.00737	pCi/g			0.006	7.25	0.009	5.00		
Mortandad Canyon:															
Mortandad near CMR Building	06/19	CS	Gross Beta	31.5	1.72	3.33	pCi/g		J			17.6	1.79		
Mortandad near CMR Building	06/19	CS	^{238}Pu	0.0372	0.00685	0.00806	pCi/g			0.006	6.20	0.009	4.28		
Mortandad near CMR Building	06/19	CS	^{239,240}Pu	0.0153	0.00417	0.00297	pCi/g			0.068	0.23	0.013	1.18		
Mortandad west of GS-1	06/19	CS	Gross Beta	28.7	1.6	2.75	pCi/g		J			17.6	1.63		
Mortandad west of GS-1	06/19	CS	^{239,240}Pu	0.0236	0.00566	0.00867	pCi/g		J	0.068	0.35	0.013	1.82		
Mortandad at GS-1	06/19	CS	^{241}Am	13.2	0.914	0.057	pCi/g			0.04	330.00	0.076	173.68		
Mortandad at GS-1	06/19	CS	^{137}Cs	27.9	0.17	0.0693	pCi/g			0.9	31.00	0.56	49.82	5.3	5.26
Mortandad at GS-1	06/19	CS	Gross Alpha	32.9	2.68	1.68	pCi/g					15.7	2.10		
Mortandad at GS-1	06/19	CS	Gross Beta	56.1	2.24	2.76	pCi/g		J			17.6	3.19		
Mortandad at GS-1	06/19	CS	^{3}H	5,940	132	152	pCi/L					3,600	1.65		
Mortandad at GS-1	06/19	CS	^{238}Pu	7.26	0.384	0.00283	pCi/g			0.006	1,210.00	0.009	834.48		
Mortandad at GS-1	06/19	CS	^{239,240}Pu	12.7	0.66	0.0112	pCi/g			0.068	186.76	0.013	976.92		
Mortandad at GS-1	06/19	DUP	^{90}Sr	1.09	0.172	0.147	pCi/g			1.04	1.05	1.02	1.07		
Mortandad at MCO-5	06/19	CS	^{241}Am	8.13	0.606	0.0261	pCi/g			0.04	203.25	0.076	106.97		
Mortandad at MCO-5	06/19	CS	^{137}Cs	15.6	0.749	0.0566	pCi/g			0.9	17.33	0.56	27.86	5.3	2.94
Mortandad at MCO-5	06/19	CS	Gross Beta	32	1.67	2.87	pCi/g		J			17.6	1.82		
Mortandad at MCO-5	06/19	CS	^{3}H	3,220	505	1,500	pCi/L		J			3,600	0.89		
Mortandad at MCO-5	06/19	CS	^{238}Pu	5.3	0.329	0.017	pCi/g			0.006	883.33	0.009	609.20		
Mortandad at MCO-5	06/19	CS	^{239,240}Pu	13.4	0.799	0.017	pCi/g			0.068	197.06	0.013	1,030.77		
Mortandad at MCO-7	06/19	CS	^{241}Am	10.6	0.749	0.0726	pCi/g			0.04	265.00	0.076	139.47		
Mortandad at MCO-7	06/19	CS	^{137}Cs	8.22	0.476	0.0516	pCi/g			0.9	9.13	0.56	14.68	5.3	1.55
Mortandad at MCO-7	06/19	CS	Gross Beta	35.4	1.84	2.78	pCi/g		J			17.6	2.01		
Mortandad at MCO-7	06/19	CS	^{238}Pu	2.74	0.156	0.0127	pCi/g			0.006	456.67	0.009	314.94		
Mortandad at MCO-7	06/19	CS	^{239,240}Pu	5.99	0.326	0.00868	pCi/g			0.068	88.09	0.013	460.77		
Mortandad at MCO-7	06/19	CS	^{90}Sr	1.25	0.196	0.129	pCi/g			1.04	1.20	1.02	1.23		
Mortandad at MCO-8.5	06/19	DUP	^{241}Am	2.79	0.265	0.034	pCi/g			0.04	69.75	0.076	36.71		
Mortandad at MCO-8.5	06/19	CS	^{241}Am	1.96	0.221	0.0421	pCi/g			0.04	49.00	0.076	25.79		
Mortandad at MCO-8.5	06/19	CS	^{241}Am	1.17	0.141	0.032	pCi/g			0.04	29.25	0.076	15.39		
Mortandad at MCO-8.5	06/19	CS	^{137}Cs	4.46	0.236	0.0314	pCi/g			0.9	4.96	0.56	7.96	5.3	0.84

Table 5-15. Detections of Greater-Than-Background Radionuclides in River and Stream Sediments for 2001[a] (Cont.)

Station Name	Date	Code[b]	Analyte	Result	Uncertainty[c]	MDA[d]	Units	Lab Qual Code[e]	Valid Flag Code[e]	ER Canyon Sediment Background[f]	Result/ ER Canyon Sediment Background	River Background[g]	Result/ River Background	SAL[h]	Result/ SAL
Pajarito Plateau Stations (Cont.)															
Mortandad Canyon (Cont.):															
Mortandad at MCO-8.5	06/19	CS	^{137}Cs	3.11	0.0614	0.0505	pCi/g			0.9	3.46	0.56	5.55	5.3	0.59
Mortandad at MCO-8.5	06/19	CS	Gross Beta	30.1	2.17	2.83	pCi/g		J			17.6	1.71		
Mortandad at MCO-8.5	06/19	CS	Gross Beta	25.8	1.89	2.6	pCi/g		J			17.6	1.47		
Mortandad at MCO-8.5	06/19	CS	^{3}H	2,890	581	1,790	pCi/L		J			3,600	0.80		
Mortandad at MCO-8.5	06/19	CS	^{3}H	2,690	493	1,500	pCi/L		J			3,600	0.75		
Mortandad at MCO-8.5	06/19	CS	^{238}Pu	0.35	0.0257	0.0026	pCi/g			0.006	58.33	0.009	40.23		
Mortandad at MCO-8.5	06/19	CS	^{238}Pu	0.278	0.0241	0.00352	pCi/g			0.006	46.33	0.009	31.95		
Mortandad at MCO-8.5	06/19	CS	^{239,240}Pu	1.13	0.0666	0.00705	pCi/g			0.068	16.62	0.013	86.92		
Mortandad at MCO-8.5	06/19	CS	^{239,240}Pu	0.934	0.0608	0.00955	pCi/g			0.068	13.74	0.013	71.85		
Mortandad at MCO-9	06/19	CS	^{241}Am	1.97	0.166	0.0165	pCi/g			0.04	49.25	0.076	25.92		
Mortandad at MCO-9	06/19	CS	^{137}Cs	5.69	0.291	0.0492	pCi/g			0.9	6.32	0.56	10.16	5.3	1.07
Mortandad at MCO-9	06/19	CS	Gross Beta	35.7	1.85	3.23	pCi/g		J			17.6	2.03		
Mortandad at MCO-9	06/19	CS	^{3}H	1,970	151	380	pCi/L					3,600	0.55		
Mortandad at MCO-9	06/19	CS	^{238}Pu	0.525	0.0368	0.00825	pCi/g			0.006	87.50	0.009	60.34		
Mortandad at MCO-9	06/19	CS	^{239,240}Pu	2.67	0.15	0.00824	pCi/g			0.068	39.26	0.013	205.38		
Mortandad at MCO-9	06/19	CS	^{90}Sr	1.57	0.249	0.149	pCi/g			1.04	1.51	1.02	1.54		
Mortandad at MCO-13 (A-5)	06/19	CS	^{137}Cs	0.714	0.0466	0.0358	pCi/g			0.9	0.79	0.56	1.28		
Mortandad at MCO-13 (A-5)	06/19	CS	Gross Alpha	18.9	1.94	2.03	pCi/g					15.7	1.20		
Mortandad at MCO-13 (A-5)	06/19	CS	Gross Beta	47.2	2.13	3.09	pCi/g		J			17.6	2.68		
Mortandad at MCO-13 (A-5)	06/19	CS	^{3}H	945	239	756	pCi/L		J			3,600	0.26		
Mortandad at MCO-13 (A-5)	06/19	CS	^{239,240}Pu	0.099	0.0114	0.00938	pCi/g			0.068	1.46	0.013	7.62		
Mortandad A-6	07/11	CS	^{241}Am	0.0474	0.0116	0.0329	pCi/g		J	0.04	1.19	0.076	0.62		
Mortandad A-6	07/11	CS	^{137}Cs	3.16	0.201	0.0719	pCi/g			0.9	3.51	0.56	5.64	5.3	0.60
Mortandad A-6	07/11	CS	Gross Alpha	38.2	3.12	2.69	pCi/g		J-			15.7	2.43		
Mortandad A-6	07/11	CS	Gross Beta	53.1	1.82	1.6	pCi/g		J-			17.6	3.02		
Mortandad A-6	07/11	CS	^{3}H	281	74.3	235	pCi/L		J			3,600	0.08		
Mortandad A-6	07/11	CS	^{239,240}Pu	0.125	0.0123	0.0127	pCi/g		J-	0.068	1.84	0.013	9.62		
Mortandad A-7	07/11	CS	Gross Beta	56.7	1.88	2.25	pCi/g		J-			17.6	3.22		
Mortandad at SR-4 (A-9)	07/11	CS	Gross Alpha	17.3	1.91	2.41	pCi/g		J-			15.7	1.10		
Mortandad at SR-4 (A-9)	07/11	CS	Gross Beta	35.2	1.5	1.86	pCi/g		J-			17.6	2.00		
Mortandad at SR-4 (A-9)	07/11	CS	^{3}H	1,760	352	1,070	pCi/L		J			3,600	0.49		
Mortandad at Rio Grande (A-11)	09/24	CS	Gross Beta	24.2	0.683	1.01	pCi/g					17.6	1.38		
TA-54 Area G:															
MDA G-0	05/30	CS	Gross Alpha	26	1.74	1.62	pCi/g		J-			15.7	1.66		
MDA G-0	05/30	CS	Gross Beta	52.3	1.78	2.48	pCi/g		J-			17.6	2.97		

Table 5-15. Detections of Greater-Than-Background Radionuclides in River and Stream Sediments for 2001[a] (Cont.)

Station Name	Date	Code[b]	Analyte	Result	Uncertainty[c]	MDA[d]	Units	Lab Qual Code[e]	Valid Flag Code[e]	ER Canyon Sediment Background[f]	Result/ ER Canyon Sediment Background	River Background[g]	Result/ River Background	SAL[h]	Result/ SAL
Pajarito Plateau Stations (Cont.)															
TA-54 Area G (Cont.):															
MDA G-0	05/30	CS	^{3}H	1,660	132	358	pCi/L					3,600	0.46		
MDA G-0	05/30	CS	$^{239,240}Pu$	0.0258	0.0083	0.00699	pCi/g			0.068	0.38	0.013	1.98		
MDA G-1	05/31	CS	Gross Beta	45.9	1.83	2.7	pCi/g		J-			17.6	2.61		
MDA G-1	05/31	CS	Gross Beta	36.8	1.58	2.97	pCi/g		J-			17.6	2.09		
MDA G-1	05/31	CS	^{3}H	393	111	360	pCi/L		J			3,600	0.11		
MDA G-2	05/31	CS	Gross Beta	38	2.37	2.79	pCi/g		J-			17.6	2.16		
MDA G-2	05/31	DUP	^{3}H	730	168	535	pCi/L		U			3,600	0.20		
MDA G-3	05/31	CS	Gross Beta	41.7	2.55	2.73	pCi/g		J-			17.6	2.37		
MDA G-3	05/31	CS	^{3}H	1,280	126	360	pCi/L					3,600	0.36		
MDA G-4 R-1	05/31	CS	Gross Alpha	22.1	4.24	5.19	pCi/g		J-			15.7	1.41		
MDA G-4 R-1	05/31	DUP	Gross Alpha	15.7	1.31	2.14	pCi/g		J-			15.7	1.00		
MDA G-4 R-1	05/31	CS	Gross Beta	40.2	4.18	8.63	pCi/g		J-			17.6	2.28		
MDA G-4 R-1	05/31	DUP	Gross Beta	40.2	1.62	3.41	pCi/g		J-			17.6	2.28		
MDA G-4 R-1	05/31	CS	^{3}H	19,200	302	271	pCi/L					3,600	5.33		
MDA G-4 R-1	05/31	DUP	$^{239,240}Pu$	0.0226	0.00708	0.0195	pCi/g		U	0.068	0.33	0.013	1.74		
MDA G-4 R-2	05/31	CS	Gross Alpha	17.5	1.38	1.89	pCi/g		J-			15.7	1.11		
MDA G-4 R-2	05/31	CS	Gross Beta	41.6	1.56	2.61	pCi/g		J-			17.6	2.36		
MDA G-4 R-2	05/31	CS	^{3}H	9,930	207	270	pCi/L					3,600	2.76		
MDA G-4 R-2	05/31	CS	$^{239,240}Pu$	0.035	0.00872	0.00558	pCi/g			0.068	0.51	0.013	2.69		
MDA G-5	05/31	CS	Gross Alpha	18.3	1.35	1.75	pCi/g		J-			15.7	1.17		
MDA G-5	05/31	CS	Gross Beta	39.8	1.7	3.03	pCi/g		J-			17.6	2.26		
MDA G-5	05/31	CS	^{3}H	3,570	217	545	pCi/L					3,600	0.99		
MDA G-6 R	05/31	CS	^{241}Am	0.506	0.0434	0.0174	pCi/g			0.04	12.65	0.076	6.66		
MDA G-6 R	05/31	CS	Gross Beta	40.7	1.73	3.33	pCi/g		J-			17.6	2.31		
MDA G-6 R	05/31	CS	^{3}H	1,770	187	539	pCi/L					3,600	0.49		
MDA G-6 R	05/31	CS	$^{239,240}Pu$	0.169	0.0203	0.0139	pCi/g			0.068	2.49	0.013	13.00		
MDA G-7	05/31	CS	^{241}Am	0.0745	0.0139	0.00631	pCi/g			0.04	1.86	0.076	0.98		
MDA G-7	05/31	CS	Gross Alpha	24.7	1.92	1.45	pCi/g		J-			15.7	1.57		
MDA G-7	05/31	CS	Gross Beta	47.5	2.94	2.26	pCi/g		J-			17.6	2.70		
MDA G-7	05/31	CS	^{3}H	2,350	143	358	pCi/L					3,600	0.65		
MDA G-7	05/31	CS	^{238}Pu	0.26	0.0327	0.0232	pCi/g			0.006	43.33	0.009	29.89		
MDA G-7	05/31	CS	$^{239,240}Pu$	0.248	0.0285	0.0378	pCi/g			0.068	3.65	0.013	19.08		
MDA G-7 West	05/31	CS	^{241}Am	0.102	0.0188	0.0218	pCi/g			0.04	2.55	0.076	1.34		
MDA G-7 West	05/31	CS	Gross Alpha	31.9	2.2	2.03	pCi/g		J-			15.7	2.03		
MDA G-7 West	05/31	CS	Gross Beta	50.2	1.79	2.94	pCi/g		J-			17.6	2.85		
MDA G-7 West	05/31	CS	^{3}H	1,060	179	554	pCi/L		J			3,600	0.29		

Table 5-15. Detections of Greater-Than-Background Radionuclides in River and Stream Sediments for 2001[a] (Cont.)

Station Name	Date	Code[b]	Analyte	Result	Uncertainty[c]	MDA[d]	Units	Lab Qual Code[e]	Valid Flag Code[e]	ER Canyon Sediment Background[f]	Result/ ER Canyon Sediment Background	River Background[g]	Result/ River Background	SAL[h]	Result/ SAL
Pajarito Plateau Stations (Cont.)															
TA-54 Area G (Cont.):															
MDA G-7 West	05/31	CS	^{238}Pu	1.31	0.102	0.00837	pCi/g			0.006	218.33	0.009	150.57		
MDA G-7 West	05/31	CS	^{239,240}Pu	0.392	0.0375	0.00603	pCi/g			0.068	5.76	0.013	30.15		
MDA G-8	05/31	CS	Gross Beta	39.3	1.64	3.11	pCi/g		J-			17.6	2.23		
MDA G-8	05/31	CS	^{3}H	492	113	360	pCi/L		J			3,600	0.14		
MDA G-8	05/31	CS	^{238}Pu	0.0425	0.0113	0.0202	pCi/g		J	0.006	7.08	0.009	4.89		
MDA G-8	05/31	CS	^{239,240}Pu	0.0385	0.00949	0.0213	pCi/g		J	0.068	0.57	0.013	2.96		
MDA-G-9	05/31	CS	Gross Alpha	19.8	1.62	1.71	pCi/g		J-			15.7	1.26		
MDA-G-9	05/31	CS	Gross Beta	48	1.87	2.83	pCi/g		J-			17.6	2.73		
MDA-G-9	05/31	CS	Gross Beta	37.7	1.65	2.41	pCi/g		J-			17.6	2.14		
MDA-G-9	05/31	CS	^{238}Pu	0.0493	0.0127	0.00836	pCi/g			0.006	8.22	0.009	5.67		
MDA-G-9	05/31	CS	^{238}Pu	0.0351	0.00996	0.00732	pCi/g			0.006	5.85	0.009	4.03		
MDA-G-9	05/31	CS	^{239,240}Pu	0.0644	0.0125	0.00602	pCi/g			0.068	0.95	0.013	4.95		
MDA-G-9	05/31	CS	^{239,240}Pu	0.0292	0.00773	0.00527	pCi/g			0.068	0.43	0.013	2.25		
Cañada del Buey:															
Cañada del Buey at SR-4	06/05	CS	Gross Alpha	16.2	1.83	2.03	pCi/g					15.7	1.03		
Cañada del Buey at SR-4	06/05	DUP	Gross Beta	36.5	1.72	2.64	pCi/g					17.6	2.07		
Cañada del Buey at SR-4	06/05	CS	Gross Beta	34.3	1.79	3.41	pCi/g					17.6	1.95		
Cañada del Buey at SR-4	06/05	CS	^{3}H	943	160	494	pCi/L					3,600	0.26		
Pajarito Canyon:															
Two-Mile at SR-501	06/05	CS	^{137}Cs	0.638	0.0304	0.0421	pCi/g			0.9	0.71	0.56	1.14		
Two-Mile at SR-501	06/05	CS	Gross Beta	40.7	1.95	3.25	pCi/g					17.6	2.31		
Two-Mile at SR-501	06/05	CS	^{239,240}Pu	0.029	0.00948	0.0204	pCi/g			0.068	0.43	0.013	2.23		
Pajarito at SR-501	06/05	CS	Gross Beta	32.5	1.63	2.67	pCi/g					17.6	1.85		
Pajarito at SR-4	06/05	CS	Gross Beta	33.5	1.64	2.44	pCi/g					17.6	1.90		
Pajarito at SR-4	06/05	CS	Gross Beta	33.1	1.69	2.54	pCi/g					17.6	1.88		
Pajarito at SR-4	06/05	CS	^{3}H	242	53.5	164	pCi/L					3,600	0.07		
Pajarito at SR-4	06/05	CS	^{3}H	241	53.2	163	pCi/L					3,600	0.07		
Pajarito at SR-4	06/05	DUP	^{3}H	240	53	163	pCi/L					3,600	0.07		
Pajarito at Rio Grande	09/25	CS	Gross Beta	30.8	1.22	1.86	pCi/g					17.6	1.75		
Potrillo Canyon:															
Potrillo at SR-4	06/05	CS	Gross Alpha	16.3	1.89	2.19	pCi/g					15.7	1.04		
Potrillo at SR-4	06/05	CS	Gross Beta	38.9	1.9	2.89	pCi/g					17.6	2.21		

Table 5-15. Detections of Greater-Than-Background Radionuclides in River and Stream Sediments for 2001[a] (Cont.)

Station Name	Date	Code[b]	Analyte	Result	Uncertainty[c]	MDA[d]	Units	Lab Qual Code[e]	Valid Flag Code[e]	ER Canyon Sediment Background[f]	Result/ ER Canyon Sediment Background	River Background[g]	Result/ River Background	SAL[h]	Result/ SAL
Pajarito Plateau Stations (Cont.)															
Fence Canyon:															
Fence at SR-4	06/05	CS	Gross Beta	36.8	2	3.14	pCi/g					17.6	2.09		
Fence at SR-4	06/05	CS	^{239,240}Pu	0.0303	0.00872	0.0241	pCi/g			0.068	0.45	0.013	2.33		
Cañon de Valle:															
Cañon de Valle at SR-501	06/05	CS	^{137}Cs	0.586	0.0455	0.039	pCi/g			0.9	0.65	0.56	1.05		
Cañon de Valle at SR-501	06/05	CS	Gross Beta	40.4	1.97	2.8	pCi/g					17.6	2.30		
Cañon de Valle at SR-501	06/05	CS	^{3}H	277	54	169	pCi/L					3,600	0.08		
Water Canyon:															
Water at SR-501	06/05	CS	Gross Alpha	17.2	3.13	1.86	pCi/g					15.7	1.10		
Water at SR-501	06/05	CS	Gross Beta	50.5	3.19	2.55	pCi/g					17.6	2.87		
Water at SR-501	06/05	CS	Gross Beta	38.2	1.87	3.03	pCi/g					17.6	2.17		
Water at SR-501	06/05	CS	^{3}H	357	101	327	pCi/L					3,600	0.10		
Water Canyon at SR-4	06/05	CS	^{137}Cs	1.14	0.0398	0.044	pCi/g			0.9	1.27	0.56	2.04		
Water Canyon at SR-4	06/05	CS	Gross Alpha	17.1	1.97	1.99	pCi/g					15.7	1.09		
Water Canyon at SR-4	06/05	CS	Gross Beta	40.5	1.93	2.85	pCi/g					17.6	2.30		
Water at Rio Grande	09/25	CS	Gross Beta	32.4	1.18	1.35	pCi/g					17.6	1.84		
Water at Rio Grande	09/25	CS	Gross Beta	24.9	1.08	1.71	pCi/g					17.6	1.41		
Water at Rio Grande	09/25	CS	^{239,240}Pu	0.0193	0.00583	0.0109	pCi/g			0.068	0.28	0.013	1.48		
Indio Canyon:															
Indio Canyon at SR-4	06/05	CS	Gross Alpha	18.5	2.05	2.49	pCi/g					15.7	1.18		
Indio Canyon at SR-4	06/05	CS	Gross Beta	43.2	1.91	2.89	pCi/g					17.6	2.45		
Ancho Canyon:															
Ancho at SR-4	06/05	CS	Gross Beta	38.3	1.77	3.25	pCi/g					17.6	2.18		
Ancho at SR-4	06/05	CS	^{3}H	1,610	314	984	pCi/L					3,600	0.45		
Above Ancho Spring	10/24	CS	Gross Beta	33.8	1.44	2.01	pCi/g					17.6	1.92		
Above Ancho Spring	10/24	CS	Gross Beta	31.4	1.43	1.59	pCi/g					17.6	1.78		
Above Ancho Spring	10/24	CS	^{3}H	189	54.6	172	pCi/L					3,600	0.05		
Ancho at Rio Grande	09/25	CS	Gross Beta	20.7	0.952	1.58	pCi/g					17.6	1.18		
TA-49 Area AB:															
MDA AB-1	05/22	CS	Gross Beta	36.3	1.44	2.44	pCi/g		J			17.6	2.06		
MDA AB-1	05/22	CS	Gross Beta	31.4	1.31	2.67	pCi/g		J			17.6	1.78		
MDA AB-1	05/22	CS	^{3}H	468	111	344	pCi/L					3,600	0.13		

Table 5-15. Detections of Greater-Than-Background Radionuclides in River and Stream Sediments for 2001[a] (Cont.)

Station Name	Date	Code[b]	Analyte	Result	Uncertainty[c]	MDA[d]	Units	Lab Qual Code[e]	Valid Flag Code[e]	ER Canyon Sediment Background[f]	Result/ ER Canyon Sediment Background	River Background[g]	Result/ River Background	SAL[h]	Result/ SAL
Pajarito Plateau Stations (Cont.)															
TA-49 Area AB (Cont.):															
MDA AB-1	05/22	CS	^{3}H	242	51.9	158	pCi/L		J			3,600	0.07		
MDA AB-1	05/22	CS	$^{239,240}Pu$	0.0176	0.00424	0.00264	pCi/g			0.068	0.26	0.013	1.35		
MDA AB-1	05/22	CS	$^{239,240}Pu$	0.0166	0.00489	0.00376	pCi/g			0.068	0.24	0.013	1.28		
MDA AB-2	05/22	CS	Gross Alpha	22.7	1.65	1.71	pCi/g					15.7	1.45		
MDA AB-2	05/22	CS	Gross Beta	33.2	1.58	3.44	pCi/g		J			17.6	1.89		
MDA AB-2	05/22	CS	^{3}H	189	50.7	159	pCi/L		J			3,600	0.05		
MDA AB-2	05/22	CS	$^{239,240}Pu$	0.0593	0.00798	0.00247	pCi/g			0.068	0.87	0.013	4.56		
MDA AB-3	05/22	CS	^{241}Am	0.113	0.0141	0.0037	pCi/g			0.04	2.83	0.076	1.49		
MDA AB-3	05/22	CS	Gross Alpha	15.8	1.33	1.44	pCi/g					15.7	1.01		
MDA AB-3	05/22	CS	Gross Beta	33	1.49	2.81	pCi/g		J			17.6	1.88		
MDA AB-3	05/22	CS	^{3}H	541	102	319	pCi/L		J			3,600	0.15		
MDA AB-3	05/22	CS	$^{239,240}Pu$	0.402	0.0286	0.00714	pCi/g			0.068	5.91	0.013	30.92		
MDA AB-3 Alternate	05/23	CS	^{241}Am	0.155	0.0157	0.00291	pCi/g			0.04	3.88	0.076	2.04		
MDA AB-3 Alternate	05/23	CS	Gross Alpha	25.2	1.9	2.78	pCi/g					15.7	1.61		
MDA AB-3 Alternate	05/23	CS	Gross Beta	38.6	1.9	3.24	pCi/g		J			17.6	2.19		
MDA AB-3 Alternate	05/23	CS	^{3}H	420	115	371	pCi/L		J			3,600	0.12		
MDA AB-3 Alternate	05/23	CS	^{238}Pu	0.0141	0.00434	0.00349	pCi/g			0.006	2.35	0.009	1.62		
MDA AB-3 Alternate	05/23	CS	$^{239,240}Pu$	0.721	0.0496	0.00946	pCi/g			0.068	10.60	0.013	55.46		
MDA AB-4	05/22	CS	Gross Alpha	19.6	1.63	1.76	pCi/g					15.7	1.25		
MDA AB-4	05/22	CS	Gross Beta	32.1	1.69	3.26	pCi/g		J			17.6	1.82		
MDA AB-4	05/22	CS	^{3}H	314	51.6	159	pCi/L		J			3,600	0.09		
MDA AB-4A	05/22	CS	Gross Alpha	22.5	1.54	1.1	pCi/g					15.7	1.43		
MDA AB-4A	05/22	CS	Gross Beta	31.6	1.26	2.34	pCi/g		J			17.6	1.80		
MDA AB-4A	05/22	CS	^{3}H	268	44	135	pCi/L		J			3,600	0.07		
MDA AB-4A	05/22	CS	$^{239,240}Pu$	0.0156	0.00496	0.0102	pCi/g		J	0.068	0.23	0.013	1.20		
MDA AB-5	05/22	CS	Gross Alpha	19.2	1.46	1.51	pCi/g					15.7	1.22		
MDA AB-5	05/22	CS	Gross Alpha	16.8	1.36	1.39	pCi/g					15.7	1.07		
MDA AB-5	05/22	CS	Gross Beta	39.5	1.63	2.84	pCi/g		J			17.6	2.24		
MDA AB-5	05/22	CS	Gross Beta	39.3	1.68	3.26	pCi/g		J			17.6	2.23		
MDA AB-5	05/22	CS	^{3}H	324	54.4	159	pCi/L		J			3,600	0.09		
MDA AB-5	05/22	CS	^{3}H	294	53.2	158	pCi/L		J			3,600	0.08		
MDA AB-5	05/22	CS	$^{239,240}Pu$	0.0187	0.00494	0.00338	pCi/g			0.068	0.28	0.013	1.44		
MDA AB-5	05/22	CS	$^{239,240}Pu$	0.0147	0.00482	0.0118	pCi/g		J	0.068	0.22	0.013	1.13		
MDA AB-6	05/22	CS	Gross Beta	30.4	1.56	2.94	pCi/g		J			17.6	1.73		
MDA AB-6	05/22	CS	^{3}H	302	56.1	170	pCi/L		J			3,600	0.08		
MDA AB-7	05/22	CS	Gross Beta	33.5	1.4	2.63	pCi/g		J			17.6	1.90		

Table 5-15. Detections of Greater-Than-Background Radionuclides in River and Stream Sediments for 2001[a] (Cont.)

Station Name	Date	Code[b]	Analyte	Result	Uncertainty[c]	MDA[d]	Units	Lab Qual Code[e]	Valid Flag Code[e]	ER Canyon Sediment Background[f]	Result/ ER Canyon Sediment Background	River Background[g]	Result/ River Background	SAL[h]	Result/ SAL
Pajarito Plateau Stations (Cont.)															
TA-49 Area AB (Cont.):															
MDA AB-7	05/22	CS	^{3}H	529	69.7	208	pCi/L		J			3,600	0.15		
MDA AB-8	05/22	CS	Gross Beta	35.1	1.49	2.72	pCi/g		J			17.6	1.99		
MDA AB-8	05/22	CS	^{3}H	478	63	188	pCi/L		J			3,600	0.13		
MDA AB-9	05/22	CS	Gross Alpha	22.6	1.22	0.857	pCi/g					15.7	1.44		
MDA AB-9	05/22	CS	Gross Beta	44.3	1.16	1.38	pCi/g		J			17.6	2.52		
MDA AB-9	05/22	CS	^{3}H	400	107	337	pCi/L		J			3,600	0.11		
MDA AB-9	05/22	CS	^{239,240}Pu	0.0412	0.00762	0.012	pCi/g			0.068	0.61	0.013	3.17		
MDA AB-10	05/22	CS	Gross Beta	37.8	1.36	2.14	pCi/g		J			17.6	2.15		
MDA AB-10	05/22	CS	^{3}H	525	141	442	pCi/L					3,600	0.15		
MDA AB-10	05/22	CS	^{239,240}Pu	0.017	0.004	0.00243	pCi/g			0.068	0.25	0.013	1.31		
MDA AB-11	05/23	CS	Gross Alpha	21.2	1.6	1.78	pCi/g					15.7	1.35		
MDA AB-11	05/23	CS	Gross Beta	36.8	1.55	2.67	pCi/g		J			17.6	2.09		
MDA AB-11	05/23	CS	^{3}H	209	49.9	154	pCi/L					3,600	0.06		
MDA AB-11	05/23	DUP	^{3}H	49.2	154	pCi/L					3,600	0.05			
MDA AB-11	05/23	CS	^{239,240}Pu	0.0157	0.00449	0.00991	pCi/g		J	0.068	0.23	0.013	1.21		
Chaquehui Canyon:															
Chaquehui at Rio Grande	09/25	CS	^{137}Cs	0.746	0.0518	0.0471	pCi/g			0.9	0.83	0.56	1.33		
Chaquehui at Rio Grande	09/25	CS	Gross Alpha	24	1.77	2.06	pCi/g					15.7	1.53		
Chaquehui at Rio Grande	09/25	CS	Gross Beta	42.9	1.41	2.16	pCi/g					17.6	2.44		
Chaquehui at Rio Grande	09/25	CS	^{3}H	2,300	168	406	pCi/L					3,600	0.64		
Frijoles Canyon:															
Frijoles at Monument Headquarters	06/27	CS	Gross Alpha	21.1	2.03	1.61	pCi/g		J-			15.7	1.34		
Frijoles at Monument Headquarters	06/27	CS	Gross Beta	39.7	1.8	2.43	pCi/g		J			17.6	2.26		
Frijoles at Monument Headquarters	06/27	CS	Gross Beta	30.9	1.69	2.99	pCi/g		J			17.6	1.76		
Frijoles at Monument Headquarters	06/27	CS	^{239,240}Pu	0.0223	0.00574	0.0109	pCi/g		J	0.068	0.33	0.013	1.72		
Frijoles at Rio Grande	06/27	CS	Gross Alpha	21.7	2.03	1.62	pCi/g		J-			15.7	1.38		
Frijoles at Rio Grande	06/27	CS	Gross Beta	34.7	1.69	2.71	pCi/g		J			17.6	1.97		
Frijoles at Rio Grande	09/26	CS	Gross Beta	34.1	1.24	1.6	pCi/g					17.6	1.94		
Frijoles at Rio Grande	06/27	CS	^{239,240}Pu	0.0225	0.00609	0.0141	pCi/g		J	0.068	0.33	0.013	1.73		

[a]Above-background detection defined value as ≥ 3 × uncertainty and ≥ detection limit and ≥ background. Values indicated by entries in SAL column are greater than half of the SAL. Note that some results in this table were qualified as nondetections by the analytical laboratory. All tritium detections are shown.
[b]Codes: CS–customer sample; DUP–duplicate; TRP–triplicate; RE–reanalysis.
[c]One standard deviation radioactivity counting uncertainty.
[d]MDA=Minimum detectable activity.
[e]For Laboratory Qualifier Codes and Validation Flag Codes, see Table 5-4.
[f]Ryti (1998).
[g]Upper limit for background values (McLin and Lyons 2002).
[h]Screening Action Level, LANL Environmental Restoration Project, 2001; see text for details.

Table 5-16. Detections of Greater-Than-Background Radionuclides in Reservoir Sediments for 2001[a]

Station Name	Date	Code[b]	Analyte	Result	Uncertainty[c]	MDA[d]	Units	Lab Qualifier Code[e]	Valid Flag Code[e]	Reservoir Background[f]	Result/ Background
Reservoirs on Rio Chama (New Mexico)											
Heron Upper	08/30	CS	Gross Beta	17.9	1.2	3.04	pCi/g		J-	9.7	1.85
Heron Upper	08/30	CS	Gross Beta	16.6	1.08	2.53	pCi/g		J-	9.7	1.71
Heron Upper	08/30	DUP	Gross Beta	18.2	1.04	2.49	pCi/g			9.7	1.88
Heron Middle	08/30	CS	^{241}Am	0.0102	0.00312	0.00251	pCi/g			0.01	1.02
Heron Middle	08/30	CS	Gross Alpha	16.4	1.24	1.51	pCi/g		J-	15.9	1.03
Heron Middle	08/30	CS	Gross Beta	28.4	1.29	2.58	pCi/g		J-	9.7	2.93
Heron Lower	08/30	CS	Gross Alpha	16.9	1.27	1.42	pCi/g		J-	15.9	1.06
Heron Lower	08/30	CS	Gross Beta	28.9	1.31	2.62	pCi/g		J-	9.7	2.98
El Vado Lower	08/30	CS	Gross Beta	21.6	1.27	2.98	pCi/g		J-	9.7	2.23
El Vado Lower	08/30	CS	^{239,240}Pu	0.0203	0.00595	0.00457	pCi/g			0.02	1.02
El Vado Middle	08/30	CS	Gross Beta	19.1	1.43	2.56	pCi/g		J-	9.7	1.97
El Vado Middle	08/30	CS	^{239,240}Pu	0.0309	0.00748	0.00466	pCi/g			0.02	1.55
El Vado Upper	08/30	CS	Gross Beta	17.4	1.32	2.39	pCi/g		J-	9.7	1.79
Abiquiu Upper	08/20	CS	Gross Alpha	16.6	1.71	1.77	pCi/g			15.9	1.04
Abiquiu Upper	08/20	CS	Gross Beta	24.1	0.736	1	pCi/g			9.7	2.48
Abiquiu Middle	08/20	CS	Gross Beta	20.9	1.39	0.951	pCi/g			15.9	1.31
Abiquiu Middle	08/20	CS	GrossB	29.9	0.723	0.78	pCi/g			9.7	3.08
Abiquiu Lower	08/20	CS	^{241}Am	0.0324	0.0104	0.00879	pCi/g			0.01	3.24
Abiquiu Lower	08/20	CS	Gross Alpha	16.9	1.65	0.951	pCi/g			15.9	1.06
Abiquiu Lower	08/20	CS	Gross Beta	20.7	0.699	0.909	pCi/g			9.7	2.13
Reservoirs on Rio Grande (Colorado)											
Rio Grande Upper	10/16	CS	Gross Alpha	17	2.49	3.06	pCi/g			15.9	1.07
Rio Grande Upper	10/16	CS	Gross Beta	27.7	1.36	1.57	pCi/g			9.7	2.86
Rio Grande Upper	10/16	DUP	Gross Beta	23.8	1.2	1.99	pCi/g			9.7	2.45
Rio Grande Middle	10/16	CS	^{137}Cs	1.06	0.0753	0.0407	pCi/g			0.98	1.08
Rio Grande Middle	10/16	CS	Gross Alpha	17	2.27	3.98	pCi/g			15.9	1.07
Rio Grande Middle	10/16	CS	Gross Beta	36.7	1.57	1.98	pCi/g			9.7	3.78
Rio Grande Middle	10/16	CS	^{239,240}Pu	0.0546	0.0117	0.0241	pCi/g			0.02	2.73
Rio Grande Lower	10/16	CS	Gross Alpha	19.1	2.11	2.53	pCi/g			15.9	1.2
Rio Grande Lower	10/16	CS	Gross Beta	36.3	1.45	1.64	pCi/g			9.7	3.74

Table 5-16. Detections of Greater-Than-Background Radionuclides in Reservoir Sediments for 2001[a] (Cont.)

Station Name	Date	Code[b]	Analyte	Result	Uncertainty[c]	MDA[d]	Units	Lab Qualifier Code[e]	Valid Flag Code[e]	Reservoir Background[f]	Result/ Background
Reservoirs on Rio Grande (New Mexico)											
Cochiti Upper	08/22	CS	Gross Alpha	19.1	1.53	1.21	pCi/g			15.9	1.2
Cochiti Upper	08/22	CS	Gross Beta	26.9	0.752	1.06	pCi/g			9.7	2.77
Cochiti Upper	08/22	CS	^{239,240}Pu	0.044	0.00905	0.0122	pCi/g			0.02	2.2
Cochiti Upper	08/22	DUP	^{239,240}Pu	0.0509	0.00939	0.0139	pCi/g			0.02	2.55
Cochiti Middle	08/22	CS	^{241}Am	0.0321	0.00986	0.0079	pCi/g			0.01	3.21
Cochiti Middle	08/22	CS	Gross Alpha	23.1	2.02	1.06	pCi/g			15.9	1.45
Cochiti Middle	08/22	CS	Gross Beta	27.1	0.624	0.696	pCi/g			9.7	2.79
Cochiti Middle	08/22	CS	^{239,240}Pu	0.0358	0.00775	0.00422	pCi/g			0.02	1.79
Cochiti Middle	08/22	CS	Gross Alpha	22.6	2.02	1.28	pCi/g			15.9	1.42
Cochiti Middle	08/22	CS	Gross Beta	25.5	0.747	1.06	pCi/g			9.7	2.63
Cochiti Lower	08/22	CS	^{241}Am	0.0263	0.00847	0.00713	pCi/g			0.01	2.63
Cochiti Lower	08/22	CS	^{137}Cs	1.09	0.0694	0.0313	pCi/g			0.98	1.11
Cochiti Lower	08/22	CS	Gross Alpha	21.2	2.28	1.67	pCi/g			15.9	1.33
Cochiti Lower	08/22	CS	Gross Beta	26.2	0.801	1.26	pCi/g			9.7	2.7
Cochiti Lower	08/22	CS	^{239,240}Pu	0.0313	0.00812	0.014	pCi/g			0.02	1.57

[a]Above-background detection defined as value ≥ 3 × uncertainty and ≥ detection limit and ≥ background. Values indicated by entries in SAL column are greater than half of the SAL. Note that some results in this table were qualified as nondetections by the analytical laboratory. All tritium detections are shown.
[b]Codes: CS-customer sample; DUP-duplicate; TRP-triplicate; RE-reanalysis.
[c]One standard deviation radioactivity counting uncertainty.
[d]MDA=minimum detectable activity.
[e]For Lab Qualifier and Validation Flag Codes, see Table 5-4.
[f]Upper limit for background values (McLin and Lyons 2002).

Table 5-17. Total Recoverable Trace Metals in Sediments for 2001 (mg/kg)

Station	Date	Code[a]	Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe
Regional Stations													
Rio Chama at Chamita	06/20	CS	<[b] 0.097	4,120	1.87	< 2.68	85.3	< 0.252	0.086	1.68	4.84	1.97	4,950
Rio Grande at Embudo	06/20	CS	< 0.097	4,420	2.37	< 1.43	107	< 0.275	0.151	4.17	10.7	5.76	11,800
Rio Grande at Otowi (bank)	07/11	CS	< 0.083	2,460	2.02	< 1.39	174	< 0.225	< 0.14	2.76	9.71	3.06	11,700
Rio Grande at Frijoles (bank)	09/26	CS	< 0.142	8,460	2.24	< 3.41	174	< 0.453	< 0.142	3.52	8.52	5.83	8,670
Rio Grande at Cochiti	09/26	CS	< 0.152	3,910	1.01	< 1.8	64.7	< 0.238	< 0.101	1.85	4.06	2.74	4,410
Rio Grande at Bernalillo	06/06	CS	< 0.12	7,690	3.05	< 4.28	178	< 0.43	< 0.227	4.04	8.62	6.83	9,880
Jemez River	06/06	CS	< 0.12	2,280	1.21	< 1.53	105	< 0.21	< 0.208	1.47	3.54	1.92	4,280
Reservoirs on Rio Chama (New Mexico)													
Heron Upper	08/30	CS	< 0.21	21,900	5.51	< 8.13	150	< 0.803	0.52	9.56	13.1	22.4	25,400
Heron Upper	08/30	CS	< 0.198	21,900	5.81	9.88	151	0.871	0.402	9.56	14.1	23.2	25,500
Heron Upper	08/30	DUP	< 0.208	21,700	6.11	< 8.18	152	< 0.81		9.69	13.3	22.9	25,700
Heron Middle	08/30	CS	< 0.365	30,100	10.9	16.7	175	< 1.22	< 0.476	10.8	23.2	27	28,300
Heron Lower	08/30	CS	< 0.429	32,200	8.49	19	188	< 1.36	< 0.507	10.1	27.1	26.4	27,200
El Vado Lower	08/30	CS	< 0.339	25,700	10.6	15.3	187	< 1.28	0.758	10.6	25.1	22.3	25,400
El Vado Middle	08/30	CS	< 0.271	22,300	9.94	< 10.9	171	< 1.14	0.677	10.5	24.5	23.4	24,500
El Vado Upper	08/30	CS	< 0.218	17,600	7.49	< 7.23	153	< 0.903	0.768	9.54	21.6	21.8	21,100
Abiquiu Upper	08/20	CS	< 1.02	23,300	5.93	16	178	< 1.11	0.547	8.5	20.7	19.3	20,600
Abiquiu Middle	08/20	CS	< 1.49	33,300	6.91	22.1	330	< 1.53	< 0.368	12.1	29.3	25.6	29,200
Abiquiu Lower	08/20	CS	1.96	25,200	4.37	15.5	292	< 1.2	< 0.348	10.6	25.7	22.4	25,700
Reservoirs on Rio Grande (Colorado)													
Rio Grande Upper	10/16	CS	< 0.191	16,900	4.35	< 0.891	216	0.869	< 0.27	7.98	6.67	15.5	22,100
Rio Grande Middle	10/16	CS	< 0.198	13,600	4.43	< 1.37	165	< 0.707	< 0.28	6.77	4.98	11.6	19,600
Rio Grande Lower	10/16	CS	< 0.185	10,200	3.57	< 0.986	167	< 0.522	< 0.248	6.75	5.02	9.25	20,600
Reservoirs on Rio Grande (New Mexico)													
Cochiti Upper	08/22	CS	< 0.83	17,900	3.3	< 8.7	366	< 0.99	< 0.387	7.67	12.9	13.7	15,000
Cochiti Upper	08/22	DUP	< 0.62	16,200	2.71	< 6.92	348	< 0.93	< 0.331	7.1	11.7	13.3	14,100
Cochiti Middle	08/22	CS	< 1.05	37,600	4.91	< 16.3	317	1.81	0.752	11.7	23.5	24.9	26,500
Cochiti Middle	08/22	CS	< 1.33	35,400	4.81	< 14.7	306	1.67	< 0.522	10.6	21.1	23.1	23,900
Cochiti Lower	08/22	CS	< 1.55	36,100	4.15	< 15.2	275	< 1.74	< 0.608	9.98	20.8	22.1	23,500
Perimeter Stations													
Rio Grande at Sandia	09/24	CS	< 0.137	7,170	1.7	< 2.95	177	< 0.38	< 0.154	3.03	6.45	4.58	7,140
Rio Grande at Mortandad	09/24	CS	< 0.158	7,100	1.8	< 3.03	131	< 0.367	< 0.08	2.65	6.26	4.27	6,800
Rio Grande at Pajarito	09/25	CS	< 0.15	13,000	2.67	< 4.87	353	0.679	< 0.167	4.92	9.41	9.16	9,800
Rio Grande at Water	09/25	CS	< 0.144	7,580	1.91	< 2.94	158	< 0.416	< 0.081	3.11	7.48	5.02	7,700
Rio Grande at Ancho	09/25	CS	< 0.142	8,020	1.74	< 2.65	119	< 0.398	< 0.149	4.41	8.2	5.91	8,880
Rio Grande at Chaquehui	09/25	CS	< 0.151	11,500	2.19	< 4.41	256	< 0.572	< 0.185	4.3	9.99	7.83	9,870
Pajarito Plateau Stations													
Guaje Canyon:													
Guaje Reservoir	10/12	CS	< 0.166	8,520	1.25	< 3.19	137	< 0.665	< 0.117	3.77	8.32	8.14	8,460
Guaje Reservoir	10/12	DUP	< 0.157	7,810	1.41	< 2.71	126	< 0.58	< 0.125	3.54	7.76	7.39	8,000
Guaje Canyon at SR-502	07/11	CS	< 0.093	7,430	2	< 2.79	202	< 0.502	< 0.263	3.9	8.15	7.28	9,550
Guaje Canyon at SR-502	07/11	CS	< 0.066	4,500	1.46	< 1.78	81	< 0.383	< 0.175	2.48	4.28	4.96	6,170

Table 5-17. Total Recoverable Trace Metals in Sediments for 2001 (mg/kg) (Cont.)

Station	Date	Code[a]	Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe
Pajarito Plateau Stations (cont.)													
Bayo Canyon:													
Bayo at SR-502	07/11	CS	< 0.064	4,390	1.06	< 1.41	98.9	< 0.303	< 0.129	2.91	5.94	5.35	8,320
Acid/Pueblo Canyons:													
Acid Weir	06/12	CS	< 0.093	5,950	2.32	< 2.91	90.4	< 0.469	0.391	2.6	5.93	7.84	6,610
Pueblo 1 R	06/12	CS	< 0.086	3,550	1.19	< 0.86	38.3	< 0.253	< 0.142	1.45	3.01	2.33	5,790
Pueblo 2	06/12	CS	< 0.087	3,010	1.05	< 0.717	50.2	< 0.261	< 0.167	1.12	3.34	2.17	4,900
Pueblo 2	06/12	CS	< 0.085	2,650	1.08	< 0.671	31.4	< 0.249	< 0.151	0.96	2.4	1.78	5,020
Hamilton Bend Spring	06/12	CS	< 0.082	5,050	1.39	< 1.56	56.4	< 0.424	0.202	1.68	3.63	3.94	5,420
Pueblo 3	06/12	CS	2.34	11,300	2.94	< 6.44	147	< 0.752	0.443	2.77	10.3	44.4	10,300
Pueblo 3	06/12	DUP	2.73	11,100	2.7	< 5.76	153	< 0.739	0.438	2.59	10.6	51.6	9,840
Pueblo at SR-502	06/12	CS	1.13	9,850	2.69	12.1	116	0.754	0.317	3.12	8.04	15.9	9,080
DP/Los Alamos Canyons:													
Los Alamos at Bridge	06/26	CS	< 0.112	6,810	1.48	< 2.48	90.1	< 0.478	< 0.175	2.5	6.21	5.52	8,350
Los Alamos at Bridge	06/26	DUP	< 0.107	7,730	1.67	< 2.63	100	< 0.526	< 0.218	2.68	6.67	6.45	9,150
Los Alamos at Bridge	06/26	CS	< 0.114	7,080	1.22	< 2.43	95.3	< 0.469	< 0.175	2.5	6.27	5.76	8,560
Los Alamos at LAO-1	06/26	CS	< 0.11	4,860	1.34	< 1.31	56.1	< 0.519	< 0.147	3.62	6.09	4.75	6,330
Los Alamos at Upper GS	06/26	CS	< 0.099	7,990	1.95	< 2.38	83.1	0.69	< 0.218	2.48	7.11	6.48	8,440
DPS-1	06/26	CS	< 0.098	2,460	1.36	< 0.483	33.8	< 0.259	< 0.13	1.7	2.29	2.87	6,220
DPS-4	06/26	CS	< 0.101	2,980	1.03	< 0.561	27.7	< 0.415	< 0.112	1.03	1.98	2.21	5,410
Los Alamos at LAO-3	06/26	CS	< 0.127	5,380	1.77	< 1.38	46.8	< 0.504	< 0.147	1.65	4.79	3.93	8,580
Los Alamos at LAO-4.5	06/27	CS	< 0.097	2,950	0.819	< 0.649	28.4	< 0.3	< 0.1	1.01	2.61	2.55	4,740
Los Alamos at SR-4	06/26	CS	< 0.092	7,210	1.57	< 1.87	63.8	0.565	0.217	2.94	8.28	4.79	17,900
Los Alamos at Totavi	07/11	CS	< 0.066	3,820	1.1	< 1.59	53.8	< 0.364	< 0.189	2.12	3.51	4.6	6,800
Los Alamos at Totavi	07/11	CS	< 0.064	4,570	1.39	< 1.72	62.4	< 0.433	0.205	2.3	3.87	5.4	7,250
Los Alamos at Otowi	07/11	CS	< 0.062	2,670	0.941	< 1.1	39.1	< 0.227	< 0.141	1.74	3.58	3.24	5,940
Los Alamos at Otowi	07/11	DUP	< 0.067	3,110	1.22	< 1.14	51	< 0.255	< 0.111	1.9	4.64	3.63	6,990
Sandia Canyon:													
Sandia at SR-4	07/11	CS	< 0.062	3,160	1.02	< 0.878	39.1	< 0.428	< 0.115	1.52	2.1	2.12	4,830
Sandia at Rio Grande	09/24	CS	< 0.113	5,430	0.872	< 1.22	71	< 0.308	< 0.101	2.98	5.05	4.13	6,550
Sandia at Rio Grande	09/24	DUP	< 0.109	5,360	0.839	< 1.12	67.1	< 0.31	< 0.076	2.82	4.8	3.94	6,340
Mortandad Canyon:													
Mortandad near CMR Building	06/19	CS	< 0.12	4,570	1.85	< 1.58	40.3	< 0.421	0.185	1.74	4.71	4.11	7,750
Mortandad west of GS-1	06/19	CS	< 0.087	3,130	1.44	< 1.07	24.5	< 0.299	0.132	0.966	3.08	1.61	5,040
Mortandad west of GS-1	06/19	DUP	< 0.086	3,920	2.2	< 1.11	33.9	< 0.362	< 0.087	1.31	4.25	2.01	6,130
Mortandad at GS-1	06/19	CS	< 0.094	5,910	1.89	< 1.8	36.6	0.569	0.173	1.6	7.3	9.86	7,800
Mortandad at MCO-5	06/19	CS	< 0.082	3,000	2.64	< 0.717	23.4	< 0.397	0.169	2.93	6.52	1.38	48,900
Mortandad at MCO-7	06/19	CS	< 0.087	6,330	2.1	< 2.03	50.4	0.549	0.179	1.8	4.66	4.71	7,120
Mortandad at MCO-8.5	06/19	CS	< 0.084	4,670	1.74	< 2.03	43.1	< 0.388	0.153	1.43	3.28	3.58	6,460
Mortandad at MCO-8.5	06/19	CS	< 0.079	5,920	1.92	< 2.81	53.3	< 0.449	0.214	1.78	4.33	4.19	7,690
Mortandad at MCO-9	06/19	CS	< 0.087	7,790	2.36	< 2.97	73	0.662	0.294	2.28	5.4	6.08	8,760
Mortandad at MCO-13 (A-5)	06/19	CS	< 0.087	13,000	3.42	6.39	134	1.08	0.344	4.12	8.71	8.16	13,100
Mortandad A-6	07/11	CS	< 0.065	11,000	3.93	7.08	216	1.33	0.87	5.3	7.64	20	12,300

Table 5-17. Total Recoverable Trace Metals in Sediments for 2001 (mg/kg) (Cont.)

Station	Date	Code[a]	Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe
Pajarito Plateau Stations (cont.)													
Mortandad Canyon: (Cont.)													
Mortandad A-7	07/11	CS	< 0.066	5,800	1.98	< 1.17	81	0.742	0.223	2.64	3.89	4.12	8,020
Mortandad at SR-4 (A-9)	07/11	CS	< 0.067	4,720	1.8	< 1.22	61.4	0.514	< 0.185	2.14	4.24	3.73	6,630
Mortandad at Rio Grande (A-11)	09/24	CS	< 0.121	3,520	1.04	< 1.17	55.7	< 0.268	< 0.062	4.19	5.96	10.7	9,940
TA-54 Area G:													
MDA G-0	05/30	CS	< 0.085	4,420	1.31	< 2.15	37	< 0.341	0.2	1.5	4.21	3	5,770
MDA G-0	05/30	DUP	< 0.084	4,130	1.21	< 1.67	34.2	< 0.32	< 0.16	1.4	3.84	2.88	5,490
MDA G-1	05/31	CS	< 0.087	5,220	1.64	< 1.58	50.8	< 0.394	< 0.176	1.98	4.22	2.68	6,620
MDA G-1	05/31	CS	< 0.088	5,450	1.64	< 1.57	56.4	< 0.409	< 0.189	1.94	4.17	2.73	6,130
MDA G-2	05/31	CS	< 0.087	5,670	1.74	< 1.95	46.1	< 0.436	0.218	1.71	3.89	3.3	5,970
MDA G-3	05/31	CS	< 0.243	3,600	1.25	< 1.05	29.6	< 0.324	< 0.192	1.23	3.69	2.33	5,520
MDA G-4 R-1	05/31	CS	0.479	6,420	1.76	< 2.1	47.1	0.503	0.334	1.75	5.18	3.93	6,330
MDA G-4 R-2	05/31	CS	< 0.145	7,530	2.31	< 2.41	58.7	0.691	0.334	1.82	5.04	4.43	8,180
MDA G-5	05/31	CS	0.508	7,510	2.22	< 2.19	66.8	0.565	0.258	2.31	6.3	4.65	7,330
MDA G-6 R	05/31	CS	< 0.088	4,410	1.47	< 1.5	52.3	< 0.369	0.295	1.53	3.7	7.02	5,470
MDA G-7	05/31	CS	< 0.082	5,160	1.28	< 1.16	38.2	< 0.32	0.243	1.65	3.12	3.71	4,900
MDA G-8	05/31	CS	< 0.082	6,480	1.78	< 1.42	65.1	0.536	0.23	3.6	7.06	2.47	13,900
MDA-G-9	05/31	CS	< 0.086	3,800	1.4	< 0.889	36.4	< 0.389	< 0.182	1.5	2.61	2.12	5,020
MDA-G-9	05/31	CS	< 0.086	5,210	1.26	< 1.36	51	< 0.446	0.245	2.05	3.86	2.77	6,090
Cañada del Buey:													
Cañada del Buey at SR-4	06/05	CS	< 0.22	9,790	2.26	< 2.51	105	0.69	0.26	4.52	7.12	4.63	9,420
Cañada del Buey at SR-4	06/05	DUP	< 0.19	9,910	2.65	< 2.48	108	0.7	0.233	4.56	7.43	4.92	9,780
Pajarito Canyon:													
Twomile at SR-501	06/05	CS	< 0.08	4,870	1.94	< 2.06	98.9	< 0.32	0.227	2.53	4.35	4	6,670
Pajarito at SR-501	06/05	CS	< 0.09	8,200	1.65	< 2.44	126	< 0.39	0.262	3.43	8.1	5.58	8,130
Pajarito at SR-4	06/05	CS	< 0.29	8,340	2.65	< 2.8	83.3	0.73	0.332	3.16	7.35	4.48	10,200
Pajarito at SR-4	06/05	CS	< 0.19	7,270	2.52	< 2.21	71.5	< 0.53	0.411	2.9	5.67	3.88	8,200
Pajarito at Rio Grande	09/25	CS	< 0.157	2,530	0.982	< 0.263	18.7	< 0.143	< 0.038	1.33	5.34	1.56	5,320
Potrillo Canyon:													
Potrillo at SR-4	06/05	CS	< 0.09	7,850	2.19	< 2.22	78.8	0.66	0.293	3.28	6.18	3.88	8,520
Potrillo at SR-4	06/05	DUP	< 0.09	7,730	1.92	< 2.11	74.5	0.63		3.04	5.95	3.81	8,120
Fence Canyon:													
Fence at SR-4	06/05	CS	< 0.09	8,980	2.59	< 2.42	95.2	0.72	0.296	3.55	6.59	5.25	9,440
Cañon de Valle:													
Canon de Valle at SR-501	06/05	CS	< 0.09	7,750	2.21	< 2.72	130	0.52	0.247	3.24	5.69	5.89	8,150
Water Canyon:													
Water at SR-501	06/05	CS	< 0.09	6,300	1.49	< 1.5	76.7	< 0.43	0.21	2.27	5.02	3.35	6,340
Water at SR-501	06/05	CS	< 0.09	4,590	1.09	< 0.87	49.2	< 0.3	< 0.148	1.9	5.69	2.03	7,040
Water Canyon at SR-4	06/05	CS	< 0.09	7,000	1.74	< 1.8	63.9	0.52	0.22	2.96	5.92	3.56	7,710

Table 5-17. Total Recoverable Trace Metals in Sediments for 2001 (mg/kg) (Cont.)

Station	Date	Code[a]	Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe
Pajarito Plateau Stations (cont.)													
Water Canyon:													
Water at Rio Grande	09/25	CS	< 0.112	2,530	0.488	< 0.561	38.1	< 0.192	< 0.052	1.03	2.03	1.37	3,500
Water at Rio Grande	09/25	CS	< 0.153	3,090	0.792	< 0.603	48.9	< 0.233	< 0.026	1.1	2.29	1.65	3,820
Indio Canyon:													
Indio Canyon at SR-4	06/05	CS	< 0.08	4,090	1.59	< 1.16	32.5	< 0.43	< 0.172	2.05	4.54	2.06	9,680
Ancho Canyon:													
Ancho at SR-4	06/05	CS	< 0.1	6,380	1.45	< 1.89	106	< 0.47	0.235	2.2	4.97	3.25	6,760
Above Ancho Spring	10/24	CS	< 0.116	4,690	1.64	< 1.24	45	< 0.386	< 0.049	2.23	5.4	3.44	9,580
Above Ancho Spring	10/24	CS	< 0.116	5,760	1.65	< 1.58	53.6	< 0.457	< 0.086	2.12	4.96	4.35	8,260
Ancho at Rio Grande	09/25	CS	< 0.153	7,470	1.19	< 1.89	53	< 0.466	< 0.082	1.81	8.33	3.98	5,830
TA-49 Area AB:													
MDA AB-1	05/22	CS	< 0.082	8,910	2.69	< 1.6	95.3	0.671	0.317	4.08	6.96	5.48	9,460
MDA AB-1	05/22	CS	< 0.088	7,950	2.35	< 1.52	73.6	0.547	0.294	3.53	6.67	3.93	8,860
MDA AB-1	05/22	DUP	< 0.088	8,740	2.78	< 1.4	82.6	0.574	0.306	4.59	7.12	4.31	9,400
MDA AB-2	05/22	CS	< 0.087	14,800	3.49	< 1.55	196	0.979	0.392	6.54	10.9	8.52	12,600
MDA AB-3	05/22	CS	< 0.083	4,550	1.53	< 0.788	69.4	< 0.382	0.212	2.44	3.96	4.54	6,290
MDA AB-3 Alternate	05/23	CS	< 0.084	8,560	2.21	< 1.54	107	0.541	0.377	2.8	5.4	5.59	7,070
MDA AB-4	05/22	CS	< 0.083	10,400	2.64	< 1.64	160	0.786	0.324	4.66	7.2	6.19	8,770
MDA AB-4A	05/22	CS	< 0.086	13,400	2.45	< 2.82	199	0.868	0.39	3.98	7.2	6.57	8,810
MDA AB-5	05/22	CS	< 0.09	10,500	2.9	< 1.99	110	0.735	0.592	3.97	7.07	7.22	8,900
MDA AB-5	05/22	CS	< 0.093	10,300	2.77	< 1.6	108	0.704	0.442	3.88	7.11	6.47	9,160
MDA AB-6	05/22	CS	< 0.081	7,460	2.55	< 1.1	91	0.527	0.264	4.36	6.85	3.73	8,590
MDA AB-7	05/22	CS	< 0.081	7,250	2.43	< 1.23	62.4	0.543	0.273	2.24	6.08	3.47	9,300
MDA AB-8	05/22	CS	< 0.085	5,790	2.36	< 0.857	58.1	< 0.476	0.24	2.23	4.8	3.36	7,460
MDA AB-9	05/22	CS	< 0.082	5,210	2.02	< 0.734	70.7	0.481	0.345	3.31	4.12	3.63	7,390
MDA AB-10	05/22	CS	< 0.083	7,190	2.23	< 2.01	120	0.602	< 0.189	3.87	5.71	5.77	8,720
MDA AB-11	05/23	CS	< 0.12	17,400	3.4	< 1.77	186	1.32	0.401	5.53	9.57	10	11,800
Chaquehui Canyon:													
Chaquehui at Rio Grande	09/25	CS	< 0.117	13,100	2.75	< 4.1	128	0.977	0.349	4.67	9.45	12.4	12,200
Frijoles Canyon:													
Frijoles at Monument Headquarters	06/27	CS	< 0.164	6,330	< 0.875	< 1.27	46.3	< 0.677	< 0.149	1.15	3.36	2.42	6,170
Frijoles at Monument Headquarters	06/27	CS	< 0.151	4,990	< 0.655	< 0.849	35.7	< 0.481	< 0.15	0.878	3.41	1.9	4,980
Frijoles at Rio Grande	06/27	CS	< 0.233	10,700	1.87	< 3.27	96.5	< 0.877	< 0.31	3.1	8.24	7.51	10,500
Frijoles at Rio Grande	09/26	CS	< 0.196	5,310	1.13	< 1.33	40.6	< 0.451	< 0.029	1.49	3.67	3.7	5,060
EPA Residential Soil Screening Level[c]			391	76,188	22	5,497	5,375	154	39	3,354	211	2,905	23,464
ER Canyon Sediment Background[d]			1	15,400	3.98		127	1.31	0.4	4.73	10.5	11.2	13,800

Table 5-17. Total Recoverable Trace Metals in Sediments for 2001 (mg/kg) (Cont.)

Station	Date	Code[a]	Hg	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Regional Stations														
Rio Chama at Chamita	06/20	CS	< 0.006	99.7	< 0.142	3.31	2.62	< 0.036	< 0.326	< 0.258	38.1	0.023	13	11.9
Rio Grande at Embudo	06/20	CS	< 0.006	200	< 0.623	8.84	5.77	< 0.034	< 0.478	< 0.8	20.6	0.043	29.6	52.5
Rio Grande at Otowi (bank)	07/11	CS	< 0.004	112	< 0.144	4.41	4.27	< 0.038	< 0.432	< 1.22	16.9	< 0.037	32.6	18.7
Rio Grande at Frijoles (bank)	09/26	CS	< 0.011	188	< 0.155	6.81	6.22	< 0.0379	< 0.332	< 1.07	75.1	< 0.072	20.8	23.7
Rio Grande at Cochiti	09/26	CS	< 0.012	109	< 0.166	3.16	2.36	< 0.0412	< 0.355	< 1.19	21.7	< 0.022	10.1	13.1
Rio Grande at Bernalillo	06/06	CS	< 0.004	241	< 0.33	7.67	6.6	< 0.044	< 0.41	< 0.64	68.6	< 0.105	22.2	29
Jemez River	06/06	CS	< 0.004	284	< 0.23	2.79	2.56	< 0.04	< 0.4	< 0.35	36	< 0.054	8.92	15.4
Reservoirs on Rio Chama (New Mexico)														
Heron Upper	08/30	CS	0.019	580	< 0.876	13.3	12.7	< 0.027	< 0.765	1.76	91.9	0.307	49.5	71.3
Heron Upper	08/30	CS	0.037	571	< 1.27	14	10.8	< 0.0539	< 0.742	9.86	94.3	0.268	50.4	72.5
Heron Upper	08/30	DUP	0.035	572	< 0.781	13.5			1.38	1.74	94.1		49.9	72.4
Heron Middle	08/30	CS	< 0.018	804	< 2.41	23.8	15.7	< 0.1	< 1.43	2.64	80.1	0.672	62.2	90.1
Heron Lower	08/30	CS	0.037	618	< 2.59	27.4	17.3	< 0.114	< 1	3.52	72.6	0.819	66	95.4
El Vado Lower	08/30	CS	0.06	1000	< 1.92	26.3	18.5	< 0.047	< 1.18	3.07	65	0.641	63.2	91.1
El Vado Middle	08/30	CS	< 0.019	697	< 1.66	23.6	14.9	< 0.039	< 0.941	2.5	68	0.52	55.7	81.7
El Vado Upper	08/30	CS	0.022	568	< 1.29	18.8	13.3	< 0.076	1.05	1.63	76.8	0.394	49.9	64.8
Abiquiu Upper	08/20	CS	0.177	285	< 1.74	22.6	17	0.076	< 0.8	< 1.62	182	0.551	48.6	74.9
Abiquiu Middle	08/20	CS	0.225	710	< 1.38	27.4	19.3	0.052	< 1.28	< 3.57	102	0.38	57	83.1
Abiquiu Lower	08/20	CS	0.166	401	< 0.92	21.6	16.2	0.033	< 0.656	< 1.13	93.6	0.279	46.4	58.9
Reservoirs on Rio Grande (Colorado)														
Rio Grande Upper	10/16	CS	0.021	435	< 0.449	5.38	10.6	< 0.0479	< 0.446	2.61	74.3	< 0.156	46.4	79.2
Rio Grande Middle	10/16	CS	0.02	431	< 0.293	4.18	9.5	< 0.0503	< 0.462	2.86	60.5	< 0.144	37.5	58.2
Rio Grande Lower	10/16	CS	0.02	351	< 0.363	3.94	7.51	< 0.0466	< 0.432	2.78	56.5	< 0.102	46.6	58.2
Reservoirs on Rio Grande (New Mexico)														
Cochiti Upper	08/22	CS	0.077	433	< 1.04	13.2	15.8	0.051	< 0.48	2.53	179	< 0.191	27.3	49.8
Cochiti Upper	08/22	DUP	0.114	421	< 0.5	12.6	15.8	< 0.045	< 0.58	< 1.68	172	< 0.179	25.1	47.1
Cochiti Middle	08/22	CS	0.199	732	< 0.74	22.6	27.3	0.038	< 1.03	< 2.44	188	0.35	45	84.7
Cochiti Middle	08/22	CS	0.173	674	< 0.75	20.3	21.1	< 0.0983	< 0.67	< 2.13	180	< 0.278	40.6	76.8
Cochiti Lower	08/22	CS	0.267	929	< 0.71	19.3	27.8	0.035	< 1.11	< 1.67	139	< 0.311	39.2	83.6
Perimeter Stations														
Rio Grande at Sandia	09/24	CS	< 0.0051	265	< 0.151	5.3	6.11	0.015	< 0.322	1.23	88.7	< 0.068	16	18.6
Rio Grande at Mortandad	09/24	CS	0.012	147	< 0.173	4.98	3.44	0.016	< 0.37	< 1.07	54.5	< 0.033	15.4	17.6
Rio Grande at Pajarito	09/25	CS	0.019	367	< 0.165	9.31	8.79	0.064	< 0.352	1.42	177	< 0.106	20.6	31.2
Rio Grande at Water	09/25	CS	0.011	169	< 0.157	5.96	4.57	0.017	< 0.336	< 1.03	65.6	< 0.044	18.3	21.3
Rio Grande at Ancho	09/25	CS	0.013	265	< 0.155	7.84	4.4	0.015	< 0.332	< 0.887	53.7	< 0.043	21	21.4
Rio Grande at Chaquehui	09/25	CS	< 0.012	266	< 0.165	8.61	7.56	0.017	< 0.353	< 1.27	133	< 0.091	21.5	29.4
Pajarito Plateau Stations														
Guaje Canyon:														
Guaje Reservoir	10/12	CS	0.021	529	< 0.376	8.85	9.03	0.106	< 0.389	2.52	28.5	< 0.135	16.1	31.5
Guaje Reservoir	10/12	DUP	0.017	454	< 0.222	8.11	8.93	< 0.027	< 0.368	2.94	24.6	< 0.134	15.4	29.5
Guaje Canyon at SR-502	07/11	CS	< 0.006	238	< 0.22	7.89	6.48	< 0.042	< 0.489	2.13	112	< 0.1	17.7	30
Guaje Canyon at SR-502	07/11	CS	0.01	336	< 0.292	5.17	9.74	< 0.031	< 0.344	1.41	18.9	0.116	10.2	20.1

Table 5-17. Total Recoverable Trace Metals in Sediments for 2001 (mg/kg) (Cont.)

Station	Date	Code[a]	Hg	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Pajarito Plateau Stations (cont.)														
Bayo Canyon:														
Bayo at SR-502	07/11	CS	< 0.005	226	< 0.25	6.38	5.13	< 0.03	< 0.392	1.48	21.5	< 0.072	17.2	21.5
Acid/Pueblo Canyons:														
Acid Weir	06/12	CS	0.022	468	< 0.73	5	33.5	0.099	< 0.312	< 0.81	23	< 0.109	11.5	63
Pueblo 1 R	06/12	CS	< 0.004	316	< 0.807	2.94	9.82	< 0.03	< 0.288	< 0.648	6.35	< 0.035	7.56	33.7
Pueblo 2	06/12	CS	0.015	217	< 0.576	2.72	7.91	0.058	< 0.293	< 0.827	7.02	< 0.041	6.05	31.1
Pueblo 2	06/12	CS	0.026	202	< 0.691	1.91	8.82	0.079	< 0.285	< 0.825	5.8	< 0.034	6.11	30.9
Hamilton Bend Spring	06/12	CS	0.009	295	< 0.462	3.23	12	0.046	< 0.348	1.15	11.6	< 0.066	7.61	34.9
Pueblo 3	06/12	CS	0.126	299	< 1.37	6.92	20.8	0.194	< 0.728	3.13	31.8	0.193	18.2	102
Pueblo 3	06/12	DUP	0.135	298	< 1.16	6.71	20.1	< 0.135	0.953	3.64	33.5	< 0.153	18	108
Pueblo at SR-502	06/12	CS	0.018	703	< 0.775	6.25	20.6	0.21	0.71	2.09	26.7	0.152	15.5	63.6
DP/Los Alamos Canyons:														
Los Alamos at Bridge	06/26	CS	< 0.01	614	< 0.679	5.81	12.4	0.05	< 0.376	1.4	18.6	< 0.128	13.2	47.1
Los Alamos at Bridge	06/26	DUP	< 0.006	667	< 0.516	5.69	11.2	< 0.076	< 0.358	1.54	21.9	< 0.116	14.6	52.6
Los Alamos at Bridge	06/26	CS	< 0.007	653	< 0.522	5.21	11.1	< 0.041	< 0.384	1.36	20.3	< 0.127	14.2	48.3
Los Alamos at LAO-1	06/26	CS	0.029	423	< 0.67	3.23	11.2	< 0.038	< 0.369	1.29	11.8	< 0.104	8.85	46.2
Los Alamos at Upper GS	06/26	CS	0.024	514	< 0.728	5.09	14.9	< 0.175	< 0.332	1.77	20	0.124	12.4	61.3
DPS-1	06/26	CS	< 0.003	290	< 0.51	2.12	9.83	0.312	< 0.33	< 1.01	5.04	< 0.021	6.6	46
DPS-4	06/26	CS	< 0.003	258	< 0.687	1.63	9.22	< 0.177	< 0.339	2.09	4.03	< 0.025	5	48.1
Los Alamos at LAO-3	06/26	CS	0.015	352	< 0.931	3.23	11.1	< 0.226	< 0.469	1.95	9.88	< 0.067	10.5	58.5
Los Alamos at LAO-4.5	06/27	CS	< 0.007	231	< 0.741	1.86	8.92	< 0.179	< 0.326	1.24	6.09	< 0.033	6.28	33.6
Los Alamos at SR-4	06/26	CS	< 0.008	582	2.77	5.75	16.8	< 0.163	< 0.309	1.84	14.1	< 0.086	20.1	116
Los Alamos at Totavi	07/11	CS	0.013	280	< 0.433	4.36	10.1	0.062	< 0.347	1.65	12.9	< 0.066	8.41	30.1
Los Alamos at Totavi	07/11	CS	0.013	308	< 0.457	4.6	11.7	< 0.031	< 0.387	1.74	15	< 0.068	10	31.2
Los Alamos at Otowi	07/11	CS	0.011	191	< 0.416	3.69	5.86	0.031	< 0.327	1.62	9.58	0.119	10.6	19.4
Los Alamos at Otowi	07/11	DUP	0.01	216	< 0.535	4.84	6.12	< 0.031	< 0.35	1.6	11.7	< 0.082	12.5	22.5
Sandia Canyon:														
Sandia at SR-4	07/11	CS	< 0.003	234	< 0.255	2.48	6.91	< 0.03	< 0.327	1.71	5.32	< 0.055	4.75	20.6
Sandia at Rio Grande	09/24	CS	< 0.0041	191	< 0.124	7.98	3.62	0.046	< 0.354	1.03	45.1	< 0.036	12.9	19.2
Sandia at Rio Grande	09/24	DUP	< 0.0043	182	< 0.119	6.66	3.66	< 0.014	< 0.255	< 0.903	44	< 0.016	12.9	18.8
Mortandad Canyon:														
Mortandad near CMR Building	06/19	CS	0.014	238	1.75	3.72	10.9	0.047	< 0.403	< 1.09	8.87	0.035	9.33	74.6
Mortandad west of GS-1	06/19	CS	< 0.009	219	< 0.929	1.86	5.05	0.051	< 0.301	< 0.343	4.5	0.107	5.79	29.3
Mortandad west of GS-1	06/19	DUP	< 0.007	294	< 0.824	2.52	5.36	< 0.03	< 0.287	< 0.47	5.77	< 0.019	7.91	34.1
Mortandad at GS-1	06/19	CS	0.04	293	1.48	5.13	7.5	0.036	< 0.317	1.27	7.98	0.069	8.43	111
Mortandad at MCO-5	06/19	CS	0.017	880	7.72	5.06	13.8	< 0.031	1.18	2.56	3.92	0.447	22.3	251
Mortandad at MCO-7	06/19	CS	0.027	272	< 0.686	3.57	8.28	< 0.031	< 0.407	< 0.621	9.18	0.082	9.04	37.4
Mortandad at MCO-8.5	06/19	CS	0.011	253	< 0.719	2.58	8.21	0.034	< 0.282	< 0.792	11	0.054	7.35	39.9
Mortandad at MCO-8.5	06/19	CS	0.013	295	< 0.741	3.15	13.1	0.04	< 0.304	< 0.845	13.6	0.072	9.25	45.4
Mortandad at MCO-9	06/19	CS	0.02	381	1.07	4.17	15	0.031	< 0.294	< 0.856	13.9	0.122	11	52.6
Mortandad at MCO-13 (A-5)	06/19	CS	0.016	564	< 0.828	7.06	15.6	0.09	< 0.337	1.61	32.2	0.131	18.2	63.8
Mortandad A-6	07/11	CS	0.026	802	< 0.497	8.44	36	0.036	0.861	2.31	63.8	0.234	16.5	79.7

Table 5-17. Total Recoverable Trace Metals in Sediments for 2001 (mg/kg) (Cont.)

Station	Date	Code[a]	Hg	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Pajarito Plateau Stations (cont.)														
Mortandad Canyon: (Cont.)														
Mortandad A-7	07/11	CS	< 0.004	331	< 0.383	3.98	10.6	< 0.03	< 0.356	1.96	13.7	0.105	9.5	30.2
Mortandad at SR-4 (A-9)	07/11	CS	< 0.007	255	< 0.248	3.4	12.5	< 0.03	< 0.426	1.93	9.64	< 0.061	8.24	32
Mortandad at Rio Grande (A-11)	09/24	CS	0.022	204	< 0.132	10.8	3.71	0.013	< 0.282	1.1	13.2	< 0.021	18.3	25
TA-54 Area G:														
MDA G-0	05/30	CS	< 0.003	169	< 0.599	3.06	4.53	0.044	< 0.286	< 0.781	7.89	< 0.078	9.6	32
MDA G-0	05/30	DUP	< 0.005	157	< 0.404	2.83	4.69	< 0.041	< 0.283	< 0.685	7.8	< 0.049	9.09	30
MDA G-1	05/31	CS	< 0.003	218	< 0.394	3.09	6.03	< 0.029	< 0.291	< 0.938	8.88	< 0.058	10.2	30.6
MDA G-1	05/31	CS	< 0.003	231	< 0.311	3.12	7.07	0.038	< 0.294	< 0.981	9.37	< 0.067	9.33	28.7
MDA G-2	05/31	CS	< 0.005	215	< 0.398	3.23	5.6	< 0.03	< 0.292	< 0.826	9.4	< 0.052	8.18	33.5
MDA G-3	05/31	CS	< 0.009	196	< 0.367	2.24	5.98	< 0.03	< 0.285	< 0.741	4.75	< 0.033	7.93	34.9
MDA G-4 R-1	05/31	CS	0.02	219	< 0.406	3.33	10	< 0.031	< 0.318	1.06	8.91	< 0.068	8.76	33.7
MDA G-4 R-2	05/31	CS	0.015	292	< 0.534	3.72	10.5	0.031	< 0.295	1.72	11.7	< 0.06	9.94	46.6
MDA G-5	05/31	CS	0.021	250	< 0.39	4.03	7.61	< 0.031	< 0.294	1.13	12.5	< 0.073	11.1	40.4
MDA G-6 R	05/31	CS	< 0.006	199	< 0.525	3.26	6.09	0.075	< 0.294	< 0.809	13.7	< 0.05	8.77	49.4
MDA G-7	05/31	CS	< 0.003	177	< 0.297	3.23	6.03	< 0.031	< 0.276	< 0.808	9.41	< 0.04	6.47	25.5
MDA G-8	05/31	CS	< 0.003	427	1.22	5.26	8.81	0.038	< 0.275	1.09	8.91	< 0.087	21.6	54.1
MDA-G-9	05/31	CS	< 0.004	206	< 0.321	2.17	5.68	< 0.029	< 0.288	< 0.672	5.06	< 0.044	6.96	24.8
MDA-G-9	05/31	CS	< 0.003	255	< 0.407	3.04	8.09	< 0.03	< 0.29	< 0.98	7.61	< 0.064	9.27	30.3
Cañada del Buey:														
Cañada del Buey at SR-4	06/05	CS	< 0.004	276	< 0.36	6.35	9.44	0.038	< 0.26	< 0.75	17.8	0.2	14.3	30.2
Cañada del Buey at SR-4	06/05	DUP	< 0.004	280	< 0.31	7	10.8	< 0.03	< 0.28	< 0.71	18.4	0.151	14.9	32.5
Pajarito Canyon:														
Twomile at SR-501	06/05	CS	0.01	470	< 0.75	3.79	16.4	< 0.029	< 0.27	< 0.57	19.4	< 0.08	10.7	30.7
Pajarito at SR-501	06/05	CS	< 0.003	441	< 0.41	6.26	10.1	< 0.031	< 0.29	< 0.53	21.9	0.101	16.4	30.8
Pajarito at SR-4	06/05	CS	0.023	322	< 1.05	5.54	9.49	0.161	< 0.35	1.37	19.1	0.162	14.7	43.6
Pajarito at SR-4	06/05	CS	0.021	286	< 0.9	4.9	11.1	0.048	< 0.35	< 1	16.2	0.163	12.4	38.2
Pajarito at Rio Grande	09/25	CS	0.014	95.1	< 0.37	2.29	2.86	< 0.0423	< 0.367	< 1.34	7.33	< 0.0098	7.78	23.3
Potrillo Canyon:														
Potrillo at SR-4	06/05	CS	< 0.006	296	< 0.48	5.25	11	< 0.029	< 0.29	1.19	13.6	0.127	13.4	34.7
Potrillo at SR-4	06/05	DUP		280	< 0.45	5.03			< 0.3	1.12	13.2		12.9	33.4
Fence Canyon:														
Fence at SR-4	06/05	CS	< 0.009	357	< 0.57	5.44	10.9	< 0.031	< 0.29	1.33	15	0.134	14.2	42.1
Cañon de Valle:														
Canon de Valle at SR-501	06/05	CS	0.012	698	< 0.81	4.97	10.5	< 0.03	< 0.3	< 0.87	33.3	0.111	12.6	51.5
Water Canyon:														
Water at SR-501	06/05	CS	< 0.003	373	< 0.54	3.7	7.61	< 0.029	< 0.3	< 0.78	15.2	0.11	10.6	26.7
Water at SR-501	06/05	CS	< 0.003	270	< 0.68	3.25	4.92	< 0.031	< 0.29	< 0.59	9.1	< 0.063	11.7	27.5
Water Canyon at SR-4	06/05	CS	< 0.009	243	< 0.48	4.82	9.03	< 0.031	< 0.29	0.99	12.1	0.117	12.8	28.8

Table 5-17. Total Recoverable Trace Metals in Sediments for 2001 (mg/kg) (Cont.)

Station	Date	Code[a]	Hg	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn
Pajarito Plateau Stations (cont.)														
Water Canyon:														
Water at Rio Grande	09/25	CS	0.01	176	< 0.157	1.71	4.01	0.014	< 0.263	1.16	5.09	< 0.022	4.77	19.9
Water at Rio Grande	09/25	CS	< 0.008	185	< 0.186	2.03	3.71	< 0.0292	< 0.265	1.28	6.59	< 0.024	5.44	18.1
Indio Canyon:														
Indio Canyon at SR-4	06/05	CS	< 0.003	316	1.13	3.4	6.4	< 0.031	< 0.27	1.31	5.83	< 0.064	12.3	46
Ancho Canyon:														
Ancho at SR-4	06/05	CS	0.011	345	< 0.48	3.66	11.1	< 0.03	< 0.3	< 0.97	14.7	0.137	10.3	30.3
Above Ancho Spring	10/24	CS	0.01	228	< 0.706	4.27	4.69	< 0.0291	< 0.271	2.16	9.28	< 0.022	14.6	35.4
Above Ancho Spring	10/24	CS	0.01	231	< 0.461	4.19	5.89	< 0.0294	< 0.271	2.17	12.1	< 0.032	11.7	29.3
Ancho at Rio Grande	09/25	CS	0.014	76.6	< 0.205	4.06	3.56	0.013	< 0.358	1.5	13.1	< 0.053	13.2	19.8
TA-49 Area AB:														
MDA AB-1	05/22	CS	< 0.009	358	< 0.39	5.47	11.6	0.037	< 0.277	1.19	18.9	0.148	16.6	29.4
MDA AB-1	05/22	CS	< 0.008	292	< 0.509	4.76	10.9	0.055	< 0.297	1.39	13.5	0.179	15.9	27.3
MDA AB-1	05/22	DUP	< 0.007	369	< 0.385	5.25	11.1	< 0.041	< 0.297	1.36	14.1	0.163	17	30.7
MDA AB-2	05/22	CS	0.02	423	< 0.472	9.54	14.6	< 0.03	< 0.291	< 0.838	37.3	0.242	27.2	46
MDA AB-3	05/22	CS	< 0.002	213	< 0.453	4.55	6.48	< 0.03	< 0.28	< 0.76	11.6	< 0.07	10.6	51.3
MDA AB-3 Alternate	05/23	CS	0.01	245	< 0.26	4.7	13	0.043	< 0.283	< 0.819	21	0.118	11.1	30.4
MDA AB-4	05/22	CS	< 0.008	344	< 0.27	6.29	11.9	< 0.031	< 0.28	< 0.743	27.7	0.173	17.7	24.3
MDA AB-4A	05/22	CS	0.018	222	< 0.227	6.56	12.1	< 0.029	< 0.289	< 0.965	35.2	0.178	16.9	24.5
MDA AB-5	05/22	CS	0.013	326	< 0.539	6.17	17.1	0.049	< 0.301	1.33	24.5	0.167	15.7	700
MDA AB-5	05/22	CS	0.015	331	< 0.638	6	13.7	0.041	< 0.313	1.22	22.1	0.137	16.2	468
MDA AB-6	05/22	CS	< 0.003	322	< 0.294	4.97	9.89	0.037	< 0.273	1.34	14.2	0.145	18.2	21.7
MDA AB-7	05/22	CS	< 0.005	197	< 0.546	4.48	9.8	0.036	< 0.273	1.34	12	0.129	11.7	29.8
MDA AB-8	05/22	CS	< 0.006	232	< 0.738	3.91	9.53	< 0.03	< 0.286	1.46	10	0.262	11.2	29.8
MDA AB-9	05/22	CS	< 0.008	275	< 0.568	3.94	11.9	0.037	< 0.276	1.02	11.5	0.131	11.3	26.8
MDA AB-10	05/22	CS	< 0.003	383	< 0.477	5.09	8.73	< 0.031	< 0.342	< 0.874	23.7	< 0.083	15.9	32.7
MDA AB-11	05/23	CS	0.017	292	< 0.4	9.36	12.5	< 0.045	< 0.404	< 1.35	29.8	0.226	21.3	34
Chaquehui Canyon:														
Chaquehui at Rio Grande	09/25	CS	0.021	346	< 0.399	9.91	12.8	0.022	< 0.273	1.8	31.3	0.154	18.4	45.9
Frijoles Canyon:														
Frijoles at Monument Headquarters	06/27	CS	< 0.005	356	< 0.48	2.07	8.86	< 0.299	1.01	2.69	11.2	< 0.059	6.83	35.9
Frijoles at Monument Headquarters	06/27	CS	< 0.005	271	< 0.284	1.6	6.5	< 0.284	< 0.508	2.37	9.57	< 0.061	6.03	31.8
Frijoles at Rio Grande	06/27	CS	< 0.007	348	< 0.44	7.22	11.9	< 0.419	< 1.05	3.04	30.9	< 0.123	17.9	51.3
Frijoles at Rio Grande	09/26	CS	0.021	143	< 0.254	3.79	5.78	< 0.0525	< 0.46	2	13.5	< 0.0121	8.92	24
EPA Residential Soil Screening Level[c]				3,239	391	1,564	400	31	391	46,929	46,929		548	23,464
ER Canyon Sediment Background[d]			0.1	543		9.38	19.7	0.83	0.3			0.73	19.7	60.2

[a]Codes: CS-customer sample; DUP.-duplicate; TRP-triplicate; RE-reanalysis.
[b]Less than symbol (<) means measurement was below the specified limit of detection of the analytical method.
[c]EPA Region VI values *http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm*.
[d]Ryti et al., 1998.

Table 5-18. Number of Samples Collected for Each Suite of Organic Compounds in Sediments for 2001

		Organic Suite[a]		
Station Name	**Date**	**HE**	**PCB**	**Semivolatile**
Regional Stations				
Rio Chama at Chamita	06/20		1	1
Rio Grande at Embudo	06/20		1	1
Rio Grande at Otowi (bank)	07/11	1	1	1
Rio Grande at Frijoles (bank)	09/26	1	1	1
Rio Grande at Cochiti	09/26	1	1	1
Rio Grande at Bernalillo	06/06	1	1	1
Jemez River	06/06		1	1
Reservoirs on Rio Chama (New Mexico)				
Heron Upper	08/30		2	2
Heron Middle	08/30		1	1
Heron Lower	08/30		1	1
El Vado Lower	08/30		1	1
El Vado Middle	08/30		1	1
El Vado Upper	08/30		1	1
Abiquiu Upper	08/20		1	1
Abiquiu Middle	08/20		1	1
Abiquiu Lower	08/20		1	
Reservoirs on Rio Grande (Colorado)				
Rio Grande Upper	10/16		1	1
Rio Grande Middle	10/16		1	1
Rio Grande Lower	10/16		1	1
Reservoirs on Rio Grande (New Mexico)				
Cochiti Upper	08/22	1	1	1
Cochiti Middle	08/22	2	2	2
Cochiti Lower	08/22	1	1	1
Perimeter Stations				
Rio Grande at Sandia	09/24		1	1
Rio Grande at Mortandad	09/24		1	1
Rio Grande at Pajarito	09/25	1	1	1
Rio Grande at Water	09/25	1	1	1
Rio Grande at Ancho	09/25	1	1	1
Rio Grande at Chaquehui	09/25	1	1	1
Pajarito Plateau Stations				
Guaje Canyon:				
Guaje Reservoir	10/12		1	1
Guaje Canyon at SR-502	07/11	1	1	1
Guaje Canyon at SR-502	07/11		1	1
Bayo Canyon:				
Bayo at SR-502	07/11		1	1

Table 5-18. Number of Samples Collected for Each Suite of Organic Compounds in Sediments for 2001 (Cont.)

		Organic Suite[a]		
Station Name	**Date**	**HE**	**PCB**	**Semivolatile**
Pajarito Plateau Stations (Cont.)				
Acid/Pueblo Canyons:				
Acid Weir	06/12		1	1
Pueblo 1 R	06/12		1	1
Pueblo 2	06/12		2	2
Hamilton Bend Spring	06/12		1	1
Pueblo 3	06/12		1	1
Pueblo at SR-502	06/12		1	1
DP/Los Alamos Canyons:				
Los Alamos at Bridge	06/26		2	2
Los Alamos at LAO-1	06/26		1	1
Los Alamos at Upper GS	06/26		1	
DPS-1	06/26		1	1
DPS-4	06/26		1	1
Los Alamos at LAO-3	06/26		1	1
Los Alamos at LAO-4.5	06/27		1	1
Los Alamos at SR-4	06/26		1	1
Los Alamos at Totavi	07/11		2	2
Los Alamos at Otowi	07/11		1	1
Sandia Canyon:				
Sandia at SR-4	07/11		1	1
Sandia at Rio Grande	09/24		1	1
Pajarito Canyon:				
Twomile at SR-501	06/05	1	1	1
Pajarito at SR-501	06/05	1	1	1
Pajarito at SR-4	06/05	2	2	2
Pajarito at Rio Grande	09/25	1	1	1
Potrillo Canyon:				
Potrillo at SR-4	06/05	1		
Fence Canyon:				
Fence at SR-4	06/05	1		
Cañon de Valle:				
Cañon de Valle at SR-501	06/05	1	1	1
Water Canyon:				
Water at SR-501	06/05	2	2	2
Water Canyon at SR-4	06/05	1	1	1
Water at Rio Grande	09/25	2	2	2

Table 5-18. Number of Samples Collected for Each Suite of Organic Compounds in Sediments for 2001 (Cont.)

		Organic Suite[a]		
Station Name	**Date**	**HE**	**PCB**	**Semivolatile**
Pajarito Plateau Stations (Cont.)				
Indio Canyon:				
Indio Canyon at SR-4	06/05	1		
Ancho Canyon:				
Ancho at SR-4	06/05	1	1	1
Above Ancho Spring	10/24	2	2	1
Ancho at Rio Grande	09/25	1	1	1
Chaquehui Canyon:				
Chaquehui at Rio Grande	09/25	1	1	1
Frijoles Canyon:				
Frijoles at Monument Headquarters	06/27	2	2	2
Frijoles at Rio Grande	06/27	1	1	1
Frijoles at Rio Grande	09/26	1	1	1

[a]High explosives, polychlorinated biphenyls, and semivolatiles.

Table 5-19. Organic Compounds Detected in Sediment in 2001 (µg/kg)

Name	Date	Code[a]	Factor	Suite[b]	Dilution Analyte	Result	Lab Qualifier Code[c]	Valid Flag Code[c]	EPA Residential Soil Screening Level[d]	Result/ Screening Level
Reservoirs on Rio Chama (New Mexico)										
Heron Upper	08/30	CS	1	SVOA	Fluoranthene	256		J	2,293,610	0
Abiquiu Upper	08/20	RE	1	SVOA	Bis(2-ethylhexyl)phthalate	213			34,750	0.01
Abiquiu Lower	08/20	CS	1	PEST/PCB	Aroclor-1260	12	P		220	0.05
Pajarito Plateau Stations										
Acid/Pueblo Canyons:										
Acid Weir	06/12	CS	1	SVOA	Chrysene	44.5			62,180	0
Acid Weir	06/12	CS	1	SVOA	Fluoranthene	63.6			2,293,610	0
Acid Weir	06/12	CS	1	SVOA	Pyrene	79.4			2,308,750	0
Acid Weir	06/12	CS	1	SVOA	Benzo(k)fluoranthene	46.5			6,210	0.01
Acid Weir	06/12	CS	1	SVOA	Phenanthrene	41.1				
Pueblo 1 R	06/12	CS	1	SVOA	Fluoranthene	120			2,293,610	0
Pueblo 1 R	06/12	CS	1	SVOA	Phenanthrene	95				
Pueblo 1 R	06/12	CS	1	SVOA	Chrysene	65.1			62,180	0
Pueblo 1 R	06/12	CS	1	SVOA	Pyrene	148			2,308,750	0
Hamilton Bend Spring	06/12	CS	1	SVOA	Fluoranthene	78.2			2,293,610	0
Hamilton Bend Spring	06/12	CS	1	SVOA	Phenanthrene	73.3				
Hamilton Bend Spring	06/12	CS	1	SVOA	Pyrene	101			2,308,750	0
Hamilton Bend Spring	06/12	CS	1	SVOA	Bis(2-ethylhexyl)phthalate	163			34,750	0
Pueblo 3	06/12	CS	1	SVOA	Bis(2-ethylhexyl)phthalate	56.1			34,750	0
Pueblo at SR-502	06/12	CS	10	SVOA	Bis(2-ethylhexyl)phthalate	1,120			34,750	0.03
DP/Los Alamos Canyons:										
Los Alamos at Bridge	06/26	CS	1	SVOA	Pyrene	382		J+	2,308,750	0
Los Alamos at Bridge	06/26	CS	1	SVOA	Fluoranthene	68			2,293,610	0
Los Alamos at Bridge	06/26	CS	1	SVOA	Chrysene	53.6			62,180	0
Los Alamos at Bridge	06/26	CS	1	SVOA	Pyrene	324			2,308,750	0
Los Alamos at Bridge	06/26	CS	1	SVOA	Benzo(a)anthracene	45.8			620	0.07
Los Alamos at LAO-1	06/26	CS	1	SVOA	Acenaphthene	370		J	3,683,390	0
Los Alamos at LAO-1	06/26	CS	1	PEST/PCB	Aroclor-1260	25.2	P	J-	220	0.11
Los Alamos at LAO-1	06/26	CS	1	PEST/PCB	Aroclor-1254	14.4	P	R	1,120	0.01
Los Alamos at LAO-1	06/26	CS	1	SVOA	Benzo(g,h,i)perylene	692		J+		
Los Alamos at LAO-1	06/26	CS	1	SVOA	Benzo(b)fluoranthene	758		J+	620	1.22
Los Alamos at LAO-1	06/26	CS	1	SVOA	Chrysene	1,010		J+	62,180	0.02

Table 5-19. Organic Compounds Detected in Sediment in 2001 (µg/kg) (Cont.)

Name	Date	Code[a]	Factor	Suite[b]	Dilution Analyte	Result	Lab Qualifier Code[c]	Valid Flag Code[c]	EPA Residential Soil Screening Level[d]	Result/ Screening Level
Pajarito Plateau Stations (Cont.)										
DP/Los Alamos Canyons: (Cont.)										
Los Alamos at LAO-1	06/26	CS	1	SVOA	Benzo(a)anthracene	785		J+	620	1.27
Los Alamos at LAO-1	06/26	CS	1	SVOA	Anthracene	152			21,899,670	0
Los Alamos at LAO-1	06/26	CS	1	SVOA	Phenanthrene	1,120				
Los Alamos at LAO-1	06/26	CS	1	SVOA	Fluorene	360			2,644,480	0
Los Alamos at LAO-1	06/26	CS	1	SVOA	Fluoranthene	1,310			2,293,610	0
Los Alamos at LAO-1	06/26	CS	1	SVOA	Benzo(a)pyrene	915		J+	60	15.25
Los Alamos at LAO-1	06/26	CS	1	SVOA	Benzo(k)fluoranthene	701		J+	6,210	0.11
Los Alamos at LAO-1	06/26	CS	1	SVOA	Indeno(1,2,3-cd)pyrene	507		J+	620	0.82
Los Alamos at LAO-1	06/26	CS	1	SVOA	Pyrene	2,410		J+	2,308,750	0
Los Alamos at Upper GS	06/26	CS	1	PEST/PCB	Aroclor-1254	13.2	P	J	1,120	0.01
Los Alamos at Upper GS	06/26	RE	1	SVOA	Benzo(g,h,i)perylene	422				
Los Alamos at Upper GS	06/26	RE	1	SVOA	Benzo(b)fluoranthene	1,670			620	2.69
Los Alamos at Upper GS	06/26	RE	1	SVOA	Anthracene	429			21,899,670	0
Los Alamos at Upper GS	06/26	RE	1	SVOA	Fluorene	186			2,644,480	0
Los Alamos at Upper GS	06/26	RE	1	VOA	Acenaphthene	120			3,683,390	0
Los Alamos at Upper GS	06/26	RE	1	SVOA	Phenanthrene	2,150				
Los Alamos at Upper GS	06/26	RE	1	SVOA	Benzo(a)anthracene	1,260			620	2.03
Los Alamos at Upper GS	06/26	RE	1	SVOA	Fluoranthene	2,810			2,293,610	0
Los Alamos at Upper GS	06/26	RE	1	SVOA	Indeno(1,2,3-cd)pyrene	400			620	0.65
Los Alamos at Upper GS	06/26	RE	1	SVOA	Chrysene	1,160			62,180	0.02
Los Alamos at Upper GS	06/26	CS	1	PEST/PCB	Aroclor-1260	12.7		J-	220	0.06
Los Alamos at Upper GS	06/26	RE	1	SVOA	Pyrene	2,340		J+	2,308,750	0
Los Alamos at Upper GS	06/26	RE	1	SVOA	Benzo(a)pyrene	938			60	15.63
DPS-1	06/26	CS	1	SVOA	Pyrene	408		J	2,308,750	0
DPS-1	06/26	CS	1	SVOA	Fluoranthene	138			2,293,610	0
DPS-1	06/26	CS	1	SVOA	Phenanthrene	49.8				
DPS-1	06/26	CS	1	SVOA	Chrysene	109			62,180	0
DPS-1	06/26	CS	1	SVOA	Benzo(a)anthracene	83.1			620	0.13
DPS-4	06/26	CS	1	SVOA	Pyrene	358		J	2,308,750	0
DPS-4	06/26	CS	1	SVOA	Phenanthrene	54.2				
DPS-4	06/26	CS	1	SVOA	Chrysene	77.2			62,180	0
DPS-4	06/26	CS	1	SVOA	Fluoranthene	121			2,293,610	0
DPS-4	06/26	CS	1	SVOA	Benzo(a)anthracene	63.9			620	0.1

Table 5-19. Organic Compounds Detected in Sediment in 2001 (µg/kg) (Cont.)

Name	Date	Code[a]	Factor	Suite[b]	Dilution Analyte	Result	Lab Qualifier Code[c]	Valid Flag Code[c]	EPA Residential Soil Screening Level[d]	Result/ Screening Level
Pajarito Plateau Stations (Cont.)										
DP/Los Alamos Canyons: (Cont.)										
Los Alamos at LAO-3	06/26	CS	1	SVOA	Chrysene	176		J	62,180	0
Los Alamos at LAO-3	06/26	CS	1	SVOA	Acenaphthene	406		J	3,683,390	0
Los Alamos at LAO-3	06/26	CS	1	SVOA	Anthracene	51.2			21,899,670	0
Los Alamos at LAO-3	06/26	CS	1	SVOA	Phenanthrene	226				
Los Alamos at LAO-3	06/26	CS	1	SVOA	Fluorene	401			2,644,480	0
Los Alamos at LAO-3	06/26	CS	1	SVOA	Fluoranthene	285			2,293,610	0
Los Alamos at LAO-3	06/26	CS	1	SVOA	Pyrene	658		J+	2,308,750	0
Los Alamos at LAO-3	06/26	CS	1	PEST/PCB	Aroclor-1254	5.5	P	R	1,120	0
Los Alamos at LAO-3	06/26	CS	1	SVOA	Benzo(a)pyrene	139		J+	60	2.32
Los Alamos at LAO-3	06/26	CS	1	SVOA	Benzo(a)anthracene	177		J+	620	0.29
Los Alamos at LAO-4.5	06/27	CS	1	PEST/PCB	Aroclor-1260	4.6	P	J	220	0.02
Los Alamos at LAO-4.5	06/27	CS	1	SVOA	Benzo(a)pyrene	92.2		J+	60	1.54
Los Alamos at LAO-4.5	06/27	CS	1	SVOA	Phenanthrene	66.5				
Los Alamos at LAO-4.5	06/27	CS	1	SVOA	Fluoranthene	130			2,293,610	0
Los Alamos at LAO-4.5	06/27	RE	1	SVOA	Benzo(b)fluoranthene	312		J+	620	0.5
Los Alamos at LAO-4.5	06/27	CS	1	SVOA	Benzo(a)anthracene	101		J+	620	0.16
Los Alamos at LAO-4.5	06/27	CS	1	SVOA	Chrysene	104		J+	62,180	0
Los Alamos at LAO-4.5	06/27	RE	1	SVOA	Pyrene	239		J+	2,308,750	0
Los Alamos at LAO-4.5	06/27	CS	1	SVOA	Pyrene	426		J+	2,308,750	0
Los Alamos at LAO-4.5	06/27	CS	1	SVOA	Benzo(b)fluoranthene	132		J+	620	0.21
Los Alamos at LAO-4.5	06/27	CS	1	SVOA	Benzo(k)fluoranthene	91		J+	6,210	0.01
Los Alamos at LAO-4.5	06/27	RE	1	SVOA	Phenanthrene	84				
Los Alamos at LAO-4.5	06/27	RE	1	SVOA	Fluoranthene	208			2,293,610	0
Los Alamos at LAO-4.5	06/27	RE	1	SVOA	Benzo(g,h,i)perylene	83.7				
Los Alamos at LAO-4.5	06/27	RE	1	SVOA	Indeno(1,2,3-cd)pyrene	72.8			620	0.12
Los Alamos at SR-4	06/26	CS	1	SVOA	Pyrene	358		J	2,308,750	0
Los Alamos at SR-4	06/26	CS	1	PEST/PCB	Aroclor-1260	5.3		J-	220	0.02
Los Alamos at SR-4	06/26	CS	1	SVOA	Phenanthrene	69.3				
Los Alamos at SR-4	06/26	CS	1	SVOA	Benzo(b)fluoranthene	83.5			620	0.13
Los Alamos at SR-4	06/26	CS	1	SVOA	Benzo(k)fluoranthene	84.1			6,210	0.01
Los Alamos at SR-4	06/26	CS	1	SVOA	Benzo(a)anthracene	74.4			620	0.12
Los Alamos at SR-4	06/26	CS	1	SVOA	Fluorene	281			2,644,480	0
Los Alamos at SR-4	06/26	CS	1	SVOA	Chrysene	82.7			62,180	0
Los Alamos at SR-4	06/26	CS	1	SVOA	Fluoranthene	129			2,293,610	0

Table 5-19. Organic Compounds Detected in Sediment in 2001 (µg/kg) (Cont.)

Name	Date	Code[a]	Factor	Suite[b]	Dilution Analyte	Result	Lab Qualifier Code[c]	Valid Flag Code[c]	EPA Residential Soil Screening Level[d]	Result/ Screening Level
Pajarito Plateau Stations (Cont.)										
DP/Los Alamos Canyons: (Cont.)										
Los Alamos at Totavi	07/11	CS	1	SVOA	Bis(2-ethylhexyl)phthalate	67.1			34,750	0
Los Alamos at Totavi	07/11	CS	1	SVOA	Benzo(b)fluoranthene	49.3			620	0.08
Los Alamos at Totavi	07/11	CS	1	SVOA	Benzo(a)pyrene	64.9			60	1.08
Los Alamos at Totavi	07/11	CS	1	SVOA	Indeno(1,2,3-cd)pyrene	144			620	0.23
Los Alamos at Totavi	07/11	CS	1	SVOA	Pyrene	123			2,308,750	0
Los Alamos at Totavi	07/11	CS	1	SVOA	Benzo(a)anthracene	58.2			620	0.09
Los Alamos at Totavi	07/11	CS	1	SVOA	Phenanthrene	70.7				
Los Alamos at Totavi	07/11	CS	1	SVOA	Benzo(k)fluoranthene	51.8			6,210	0.01
Los Alamos at Totavi	07/11	CS	1	SVOA	Chrysene	65.8			62,180	0
Los Alamos at Totavi	07/11	CS	1	SVOA	Fluoranthene	101			2,293,610	0
Sandia Canyon:										
Sandia at SR-4	07/11	CS	1	SVOA	Benzo(b)fluoranthene	54.7			620	0.09
Sandia at SR-4	07/11	CS	1	SVOA	Benzo(a)pyrene	50.4			60	0.84
Sandia at SR-4	07/11	CS	1	SVOA	Benzo(k)fluoranthene	61.8			6,210	0.01
Sandia at SR-4	07/11	CS	1	SVOA	Bis(2-ethylhexyl)phthalate	87.5			34,750	0
Sandia at SR-4	07/11	CS	1	SVOA	Benzo(g,h,i)perylene	123				
Pajarito Canyon:										
Twomile at SR-501	06/05	CS	1	HEXP	RDX	664			4,420	0.15
Twomile at SR-501	06/05	CS	1	SVOA	Aniline	509			85,370	0.01
Twomile at SR-501	06/05	CS	1	SVOA	Bis(2-ethylhexyl)phthalate	118			34,750	0
Twomile at SR-501	06/05	CS	1	HEXP	2,4,6-Trinitrotoluene	106			16,220	0.01
Twomile at SR-501	06/05	CS	1	HEXP	HMX	580			3,055,150	0
Cañon de Valle:										
Cañon de Valle at SR-501	06/05	CS	1	HEXP	RDX	115			4,420	0.03
Water Canyon:										
Water at SR-501	06/05	CS	1	HEXP	HMX	94.4			3,055,150	0
Water at SR-501	06/05	CS	1	SVOA	Bis(2-ethylhexyl)phthalate	37			34,750	0
Water at SR-501	06/05	CS	1	HEXP	RDX	131			4,420	0.03

Table 5-19. Organic Compounds Detected in Sediment in 2001 (µg/kg) (Cont.)

Name	Date	Code[a]	Factor	Suite[b]	Dilution Analyte	Result	Lab Qualifier Code[c]	Valid Flag Code[c]	EPA Residential Soil Screening Level[d]	Result/ Screening Level
Pajarito Plateau Stations (Cont.)										
Indio Canyon:										
Indio Canyon at SR-4	06/05	CS	1	HEXP	2,4,6-Trinitrotoluene	152			16,220	0.01
Indio Canyon at SR-4	06/05	CS	1	HEXP	HMX	699			3,055,150	0
Indio Canyon at SR-4	06/05	CS	1	HEXP	RDX	874			4,420	0.2
Frijoles Canyon:										
Frijoles at Rio Grande	06/27	CS	1	SVOA	4-Methylphenol	1,110			305,510	0

[a]Codes: CS-customer sample; DUP-duplicate; TRP-triplicate; RE-reanalysis.
[b]PEST/PCB-pesticides and polychlorinated biphenyls; SVOA-semivolatile organics; VOA-volatile organics; and HEXP-high-explosive compounds.
[c]For Lab Qualifier Codes and Validation Flag Codes, see Table 5-4.
[d]EPA Region VI values *http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm*.

Table 5-20. Radiochemical Analysis of Groundwater for 2001 (pCi/L[a])

Station	Date	Codes[b]		^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
				Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Regional Aquifer Wells																					
Test Wells:																					
Test Well 1	06/05	UF	CS	186	51.3		0.017	0.037		1.01	0.94	3.58	1.94	0.157	0.0499	0.0562	0.0159	0.0424	1.07	0.0946	0.036
Test Well 3	06/04	UF	CS	53.1	47.5		0.0571	0.0433		0.6	1.83	3.04	0.294	0.0356	0.0327	0.00819	0.00477	0.0074	0.11	0.0195	0.0253
Test Well 3	06/04	UF	DUP							-0.986	0.933	3.18									
Test Well 3	10/04	UF	CS	-133	50.8	179	0.0136	0.0451	0.151	0.33	0.681	2.51	0.408	0.0406	0.0153	0.0188	0.0087	0.0251	0.146	0.0209	0.025
Test Well 3	10/04	UF	DUP				0.0632	0.0502	0.162	-0.4	0.696	2.39	0.444	0.0435	0.0269	0.00412	0.00583	0.0222	0.162	0.0218	0.0191
Test Well 3	10/04	UF	TRP				-0.071	0.0491	0.165												
Test Well 3	10/04	UF	CS	-107	51.8	180	0.0272	0.0398	0.133	-0.405	0.762	2.58	0.439	0.0418	0.0052	0.00766	0.00608	0.0206	0.183	0.0229	0.0177
Test Well 4	06/04	UF	CS	53.4	47.8		0.0498	0.0361		0.371	0.963	3.6	0.0352	0.0117	0.0322	0.00883	0.00576	0.0198	0.0222	0.00843	0.0198
Test Well 4	06/04	UF	DUP				0.0473	0.0332													
Test Well 8	06/04	UF	CS	0	45.9		0.0037	0.044		2.3	1.8	3.47	0.388	0.0462	0.0516	0.0191	0.0102	0.0351	0.128	0.0226	0.024
Test Well DT-5A	06/06	UF	CS	0	45.1		0.0932	0.0484		0.149	1.39	4.98	0.192	0.0267	0.0311	0.0052	0.00369	0.00704	0.128	0.0205	0.0191
Test Well DT-9	06/07	UF	CS	0	45		0.0035	0.0414		1.48	0.939	3.58	0.283	0.035	0.0264	0.00811	0.00733	0.0307	0.142	0.0225	0.00771
Test Well DT-9	06/07	UF	DUP	26.3	46.2								0.252	0.0341	0.0434	0.0026	0.0066	0.0333	0.152	0.0244	0.0227
Test Well DT-10	06/06	UF	CS	0	44.6		0.0125	0.0456		-0.232	0.843	2.99	0.457	0.048	0.0293	0.0035	0.00434	0.0201	0.225	0.0297	0.0253
Water Supply Wells:																					
O-1	05/09	UF	CS	-142	53.2	192	0.0332	0.0783	0.262	0.15	0.647	2.25	0.862	0.0741	0.0404	0.0262	0.0168	0.055	0.45	0.0442	0.0302
O-1	05/09	UF	DUP	-121	57.6	205	0.0349	0.0588	0.196	0.723	0.807	2.93	0.823	0.076	0.0204	0.0313	0.0101	0.0205	0.442	0.0474	0.0204
O-1	05/09	UF	TRP				-0.0205	0.0464	0.158												
O-1	05/09	UF	CS	-84.2	54.3	190	-0.0353	0.0703	0.239	0.377	0.546	2	0.902	0.0792	0.0065	0.0387	0.0101	0.00655	0.511	0.0506	0.0177
O-1	05/09	UF	DUP				-0.0115	0.0422	0.143												
O-4	05/09	UF	CS	-116	55.1	196	-0.212	0.102	0.334	0.26	0.843	3.05	0.641	0.0582	0.0223	0.0271	0.00927	0.0224	0.243	0.0284	0.0153
O-4	05/09	UF	DUP				-0.0109	0.045	0.153												
PM-1	05/09	UF	CS	-144	54.1	195	0.0925	0.0731	0.238	0.0679	0.764	2.71	1.2	0.0981	0.0375	0.0311	0.0106	0.0272	0.592	0.0544	0.0152
PM-1	05/09	UF	DUP				-0.0041	0.041	0.139												
PM-2	05/09	UF	CS	-203	52.7	196	-0.0019	0.0694	0.235	0.164	0.688	2.5	0.257	0.0307	0.029	0.00888	0.00705	0.0239	0.106	0.0173	0.0163
PM-2	05/09	UF	DUP				0.0542	0.0443	0.145												
PM-3	05/09	UF	CS	-148	55.5	200	-0.0447	0.0701	0.239	0.322	1.51	2.34	0.797	0.0736	0.0463	0.0564	0.015	0.0336	0.345	0.0391	0.0275
PM-3	05/09	UF	DUP				0.0946	0.0473	0.15												
PM-4	05/09	UF	CS	-171	52.8	193	0.224	0.0938	0.28	0.0205	1.41	2.28	0.275	0.0302	0.0143	0.00777	0.00479	0.0143	0.136	0.0188	0.00525
PM-4	05/09	UF	DUP				0.0338	0.0531	0.176												
PM-5	05/09	UF	CS	-170	52.5	192	0.0387	0.0714	0.238	0.482	0.913	3.25	0.323	0.0335	0.0254	0.0127	0.00977	0.0328	0.144	0.0193	0.0167
G-1A	05/09	UF	CS	-142	53.3	192	0.0665	0.0614	0.201	-0.071	0.724	2.58	0.27	0.0308	0.0196	0.00847	0.00522	0.0156	0.135	0.0194	0.00572
G-1A	05/09	UF	DUP				-0.0025	0.0441	0.15												
G-1A	05/09	UF	TRP				0.0895	0.0575	0.15												
G-2A	05/09	UF	CS	-143	53.8	194	0.0065	0.0527	0.178	0.931	0.842	3.03	0.286	0.0364	0.0325	0.0234	0.0105	0.0326	0.161	0.0254	0.028
G-2A	05/09	UF	DUP				0.019	0.0432	0.118												
G-3A	05/09	UF	CS	-116	55.2	196	-0.002	0.0595	0.201	0.403	0.83	2.64	0.535	0.0497	0.0181	0.0235	0.00699	0.00531	0.268	0.0298	0.0181
G-3A	05/09	UF	DUP				-0.0179	0.0449	0.123												
G-4A	05/09	UF	CS	-225	50.4	190	0.0446	0.0572	0.189	-0.597	0.836	2.85	0.536	0.058	0.0489	0.0348	0.0166	0.0592	0.268	0.0364	0.0427
G-4A	05/09	UF	DUP				0.0687	0.0476	0.125												
Regional Aquifer Springs																					
White Rock Canyon Group I:																					
Sandia Spring	09/24	F	CS				0.0512	0.0709	0.272	-0.057	0.652	2.29	0.519	0.0708	0.0798	0.0567	0.0207	0.049	0.239	0.0435	0.018
Sandia Spring	09/24	F	CS				0.114	0.0656	0.242	-0.288	0.584	2.06	0.361	0.0538	0.0446	0.0335	0.0154	0.0447	0.23	0.0416	0.0562
Sandia Spring	09/24	UF	CS	-110	53.5	186															
Sandia Spring	09/24	UF	CS	-109	52.9	184															
Spring 3	09/24	F	CS				0.0084	0.0748	0.291	-0.929	0.643	2.17	1.02	0.108	0.0822	0.0762	0.0229	0.0543	0.513	0.0665	0.0541
Spring 3	09/24	UF	CS	-109	52.9	184															
Spring 4	09/24	UF	CS	-135	51.7	183															
Spring 4	09/24	UF	DUP	-108	52.6	183															
Spring 4	09/24	UF	CS				-0.0296	0.0658	0.259	0.374	0.727	2.26	0.462	0.0645	0.0685	0.0352	0.0161	0.047	0.286	0.0475	0.0172
Spring 4	09/24	UF	DUP				0.048	0.0714	0.273	0.699	0.731	2.73	0.67	0.0788	0.0423	0.00305	0.00637	0.0424	0.282	0.0456	0.0534
Spring 4A	09/25	F	CS				-0.0715	0.0826	0.324	-0.567	0.714	2.43	0.56	0.0675	0.0481	0.0341	0.0155	0.056	0.319	0.0469	0.0382
Spring 4A	09/25	UF	CS	-79.5	52.3	179															
Spring 5	09/25	F	CS				0.0176	0.0706	0.275	1.22	1.53	2	0.455	0.0592	0.0145	0.0378	0.0159	0.0499	0.196	0.0356	0.0394
Spring 5	09/25	UF	CS	-110	53.6	187															

Table 5-20. Radiochemical Analysis of Groundwater for 2001 (pCi/L[a]) (Cont.)

Station	Date	Codes[b]		^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
				Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Regional Aquifer Springs (Cont.)																					
White Rock Canyon Group I: (Cont.)																					
Ancho Spring	10/24	F	CS				0.3	0.0865	0.221	0.314	1.21	4.75	0.191	0.0245	0.016	0.0087	0.00618	0.0202	0.0802	0.015	0.0201
Ancho Spring	10/24	F	DUP				0.111	0.0606	0.191	0.724	1.21	4.7	0.178	0.029	0.0446	-0.00205	0.00808	0.0448	0.0778	0.0184	0.0367
Ancho Spring	10/24	UF	CS	-53.8	49.1	167															
Ancho Spring	10/24	UF	DUP	-26.6	49.3	165															
White Rock Canyon Group II:																					
Spring 6A	09/25	UF	CS	-27.4	55.5	185															
Spring 6A	09/25	F	CS				0.0883	0.0789	0.297	1.14	0.885	3.23	0.592	0.0747	0.0733	0.0279	0.016	0.0659	0.284	0.0467	0.0449
Spring 9	09/25	UF	CS	-136	52.2	184															
Spring 9	09/26	F	CS				-0.0454	0.0558	0.22	0.47	0.744	2.77	0.135	0.0295	0.0502	0.0325	0.0135	0.0147	0.0867	0.0234	0.0502
White Rock Canyon Group III:																					
Spring 1	09/24	UF	CS	-138	52.8	186															
Spring 1	09/24	F	CS				-0.0624	0.0721	0.285	0.0445	0.609	2.18	1.28	0.128	0.0984	0.0764	0.0319	0.139	0.584	0.0738	0.0936
Spring 1	09/24	F	DUP																		
Spring 2	09/24	UF	CS	-129	49.3	174															
Spring 2	09/24	F	CS				0.0253	0.0856	0.332	0.0061	0.628	2.19	0.67	0.0781	0.0412	0.031	0.0142	0.0414	0.37	0.0532	0.052
White Rock Canyon Group IV:																					
La Mesita Spring	10/23	UF	CS	-186	50.8	184															
La Mesita Spring	10/23	F	CS				0.174	0.1	0.367	-0.927	1.21	4.24	5.42	0.4	0.0365	0.241	0.0324	0.0452	3.54	0.267	0.019
Other Springs:																					
Sacred Spring	10/23	F	CS				0.144	0.0982	0.363	0	1.63	3.48	0.927	0.0811	0.0435	0.0241	0.0149	0.0484	0.528	0.0521	0.0339
Sacred Spring	10/23	F	DUP				0.198	0.0906	0.324	-2.64	3.05	10.4	1.16	0.106	0.0329	0.0269	0.0114	0.033	0.54	0.0586	0.0261
Sacred Spring	10/23	UF	CS	-54.1	52.5	178															
Sacred Spring	10/23	UF	DUP	-108	51.1	178															
Sacred Spring	10/23	F	CS				0.0657	0.0656	0.25	-2.31	1.47	4.67	0.984	0.0848	0.0181	0.0172	0.00895	0.0265	0.419	0.044	0.0264
Sacred Spring	10/23	UF	CS	-184	50.2	182															
Canyon Alluvial Groundwater Systems																					
Acid/Pueblo Canyons:																					
APCO-1	04/03	UF	CS	0	52.8	177	1.31	0.131	0.26	-0.356	0.666	2.31	0.407	0.0482	0.0265	0.0108	0.0096	0.0336	0.278	0.0372	0.00977
APCO-1	04/03	F	CS				1.27	0.123	0.306	0.461	0.804	2.39	0.355	0.043	0.0308	0.0133	0.00821	0.0245	0.199	0.0293	0.009
APCO-1	04/03	F	DUP				1.42	0.128	0.293												
DP/Los Alamos Canyons:																					
LAO-C	04/03	UF	CS	0	52.8	177	0.154	0.1	0.326	-0.16	0.523	1.83	0.0456	0.0174	0.0447	0.0166	0.0118	0.0386	0.0249	0.0156	0.0498
LAO-C	04/03	F	CS				0.264	0.0872	0.281	0.964	0.593	2.45	0.105	0.0211	0.0258	0.0351	0.0114	0.00951	0.063	0.0163	0.0258
LAO-C	04/03	F	DUP										0.0519	0.0155	0.0322	0.00695	0.00494	0.00941	0.0346	0.0112	0.00939
LAO-0.7	03/29	UF	CS	-27.9	50.7	173	0.0478	0.0696	0.237	-1.33	0.628	2.02	0.102	0.0218	0.0417	0.0415	0.0142	0.0343	0.0763	0.0177	0.0295
LAO-0.7	03/29	F	CS				0.0999	0.065	0.218	-0.731	0.926	2.73	0.0903	0.0209	0.0423	0.0194	0.00925	0.0238	0.0451	0.0148	0.0347
LAO-0.7	03/29	F	DUP				0.0461	0.0482	0.164												
LAO-1	04/05	UF	CS	225	58.2	175	8.28	1.07	0.372	0.362	0.679	2.38	0.0583	0.0223	0.0651	-0.00325	0.00563	0.0302	0.0292	0.0109	0.0238
LAO-1	04/05	UF	DUP										0.0044	0.0261	0.0967	-0.0133	0.0183	0.0772	0.00442	0.0159	0.0623
LAO-1	04/05	F	CS				9.61	0.401	0.408	-0.077	0.666	2.28	0.0386	0.0139	0.0326	-0.0176	0.0094	0.0497	0.0105	0.00932	0.0326
LAO-1	04/05	F	DUP							-0.47	0.638	2.19									
DP Spring	04/03	F	CS				115	5.57	0.205	-0.16	0.676	2.3	0.428	0.0493	0.0256	0.0245	0.0094	0.00947	0.0279	0.0122	0.0323
DP Spring	04/03	UF	CS	455	64.5	177	113	14.2	0.211	-0.423	0.509	1.68	0.378	0.0468	0.0468	0.0107	0.00625	0.0097	0.0285	0.0125	0.0331
LAO-2	03/29	UF	CS	197	57.4	175	29.1	0.904	0.21	0.307	0.623	2.19	0.0829	0.0194	0.0277	0.0189	0.0114	0.0351	0.0151	0.0131	0.0452
LAO-2	03/29	F	CS				26.3	1.13	0.217	-0.062	0.592	2.08	0.0873	0.0236	0.045	0.0243	0.013	0.0358	0.0339	0.0147	0.0357
LAO-3A	03/28	UF	CS	85.2	54.9	176	47.2	1.39	0.282	0.199	0.632	1.93	0.138	0.0248	0.0101	0.03	0.0132	0.0348	0.127	0.0236	0.0101
LAO-3A	03/28	F	CS				37	2.07	0.235	0	1.81	1.99	0.12	0.0232	0.0358	0.0134	0.00823	0.0246	0.0832	0.0183	0.0245
LAO-3A	03/28	F	DUP										0.137	0.0312	0.0663	0.0355	0.0156	0.0412	0.0795	0.0206	0.0325
LAO-3A	03/28	F	CS				52.1	1.44	0.209	-1.31	0.614	1.93	0.134	0.0258	0.0424	0.0177	0.00946	0.0261	0.0565	0.0147	0.00957
LAO-3A	03/28	UF	CS	171	57.3	177	46.1	3.25	0.186	-1.23	0.772	2.57	0.168	0.0285	0.0281	0.0307	0.0123	0.0282	0.0726	0.019	0.0355
LAO-3A	03/28	UF	DUP	195	55.4	168															
LAO-4	04/05	UF	CS	85.5	55.1	177	5.19	0.33	0.548	-0.708	0.67	2.21	0.0581	0.0176	0.041	0.00685	0.00841	0.0318	0.0444	0.0152	0.0368

Table 5-20. Radiochemical Analysis of Groundwater for 2001 (pCi/L[a]) (Cont.)

Station	Date	Codes[b]		^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
				Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Canyon Alluvial Groundwater Systems (Cont.)																					
DP/Los Alamos Canyons:																					
LAO-4	04/05	UF	DUP																		
LAO-4	04/05	F	CS				5.46	0.911	0.433	1.14	0.703	2.64	0.0632	0.016	0.0101	0.00745	0.00747	0.0274	0.026	0.0113	0.0273
LAO-4.5C	03/28	UF	CS	56.5	53.8	175	2.13	0.122	0.222	0.559	0.725	2.65	0.0875	0.0216	0.0495	0.0094	0.00547	0.00849	0.0406	0.0116	0.00847
LAO-4.5C	03/28	F	CS				2.13	0.151	0.246	-0.135	0.634	2.19	0.0521	0.017	0.0401	0.00373	0.00835	0.0347	0.0335	0.0126	0.0274
LAO-6A	03/28	UF	CS	112	55	174	1.71	0.104	0.219	1.31	1.28	2.16	0.126	0.0219	0.0087	0.00646	0.00914	0.0347	0.0483	0.0158	0.0387
LAO-6A	03/28	F	CS				1.37	0.094	0.228	-1.11	0.621	2.06	0.0715	0.0175	0.0263	0.00717	0.00509	0.00971	0.0286	0.0125	0.0332
Mortandad Canyon:																					
MCO-3	07/31	UF	CS	4,790	134	168	39.3	5.17	0.176	3.81	3.27	4.92	0.908	0.0892	0.0103	0.0825	0.0197	0.0355	0.333	0.0435	0.0281
MCO-5	08/02	UF	CS	6,820	159	166	38.1	5.23	0.178	0	1.01	4.07	0.887	0.0826	0.0224	0.0361	0.0123	0.0329	0.278	0.0355	0.0224
MCO-5	08/02	UF	DUP	6,690	154	158				-0.768	0.965	3.34	0.917	0.0835	0.0388	0.0442	0.0133	0.0297	0.292	0.0359	0.0297
MCO-7.5	08/07	UF	DUP				-0.082	0.0596	0.16												
Cañada del Buey:																					
CDBO-6	05/01	UF	CS	-29	56	191	0.154	0.13	0.438	0.429	0.658	2.17	0.202	0.0257	0.027	0.0124	0.00831	0.0271	0.161	0.0226	0.029
CDBO-6	11/07	UF	CS																		
Pajarito Canyon:																					
PCO-1	04/10	F	CS				0.142	0.116	0.393	0.942	0.677	2.47	0.0346	0.0179	0.0644	-0.0105	0.00613	0.0748	0.0277	0.014	0.0188
PCO-1	04/10	UF	CS	-57.6	54.9	190	0.21	0.0929	0.294	0.253	0.645	2.27	0.0137	0.0155	0.0831	-0.0142	0.014	0.11	-0.014	0.00707	0.0831
PCO-1	04/10	UF	DUP							0.106	0.669	2.32	0.0384	0.0174	0.0208	0.0115	0.0116	0.0568	0.00381	0.00862	0.0566
PCO-1	04/10	F	CS				0.197	0.11	0.357	-0.078	0.589	2.11	0.0219	0.018	0.0917	-0.003	0.00301	0.0919	0.0125	0.0125	0.0337
PCO-1	04/10	UF	CS	-85.5	53.5	188	0.107	0.129	0.439	0.188	0.64	2.26	0.0138	0.0138	0.0373	0	1	0.0374	0	1	0.0373
PCO-3	04/10	F	CS				0.393	0.121	0.351	-0.393	0.637	2.21	0.918	0.135	0.0371	0.0654	0.0314	0.101	0.655	0.109	0.101
PCO-3	04/10	UF	CS	28.6	56.8	188	0.366	0.138	0.449	0.0391	0.724	2.56	1.08	0.154	0.0394	0.0694	0.0333	0.107	0.869	0.134	0.107
Intermediate Perched Groundwater Systems																					
Pueblo/Los Alamos/Sandia Canyon Area Perched System in Conglomerates and Basalt:																					
POI-4	08/01	UF	CS	-80.7	49.9	172	0.0256	0.0383	0.124	-0.291	0.91	3.21	1.12	0.111	0.0538	0.0545	0.019	0.054	0.688	0.0763	0.0416
Test Well 2A	07/30	UF	CS	1,110	76.1	165	-0.0167	0.0422	0.139	6.58	3.19	4.93	0.0463	0.0129	0.0296	-0.00398	0.00283	0.0256	0.00154	0.0048	0.0256
Basalt Spring	10/23	F	CS				0.611	0.128	0.301	-0.173	1.42	5.08	0.673	0.0622	0.0309	0.113	0.0188	0.0219	0.424	0.0433	0.00638
Basalt Spring	10/23	UF	CS	-78.4	53	181															
Perched Groundwater System in Volcanics:																					
Water Canyon Gallery	11/29	F	CS				-0.0043	0.0628	0.171	-0.881	0.806	2.76				0.0293	0.00808	0.00567	0.0417	0.00976	0.00565
Water Canyon Gallery	11/29	F	DUP				0.134	0.0631	0.134	0.0624	0.919	3.3				0.0167	0.006	0.00564	0.0311	0.00832	0.00563
Water Canyon Gallery	11/29	UF	CS	-162	50.9	183															
Water Canyon Gallery	11/29	UF	DUP	-107	51.9	181															
San Ildefonso Pueblo																					
LA-5	06/19	UF	CS	-51.3	45.9	159	0.104	0.0931	0.355	0	1.72	6.08	0.508	0.0525	0.0306	0.0207	0.00844	0.021	0.259	0.0329	0.0209
LA-5	06/19	UF	CS																		
LA-5	10/03	UF	CS																		
LA-5	10/03	UF	DUP																		
LA-5	10/03	UF	CS																		
Eastside Artesian Well	06/20	UF	CS	-26.2	47.7	163	-0.033	0.0915	0.368	0.557	0.823	2.98	0.0218	0.0122	0.0447	0.00192	0.00597	0.0318	0.00533	0.00687	0.0317
Pajarito Well (Pump 1)	06/19	UF	CS	-52.3	46.8	162	0.249	0.115	0.402	-1.14	0.996	3.43	10.2	0.812	0.0468	0.163	0.036	0.0592	3.29	0.289	0.0172
Pajarito Well (Pump 1)	06/19	UF	DUP																		
Pajarito Well (Pump 1)	06/19	UF	CS																		
Pajarito Well (Pump 1)	06/19	UF	CS	-26.3	47.9	163	0.0753	0.0945	0.365	0.393	0.707	2.48	9.1	0.699	0.0658	0.847	0.0889	0.0504	2.99	0.249	0.0434
Pajarito Well (Pump 1)	06/19	UF	DUP				-0.0396	0.0884	0.372												
Pajarito Well (Pump 1)	06/19	UF	CS																		
Pajarito Well (Pump 1)	10/03	UF	CS																		
Pajarito Well (Pump 1)	10/03	UF	CS																		
Don Juan Playhouse Well	06/20	UF	CS	-51.9	46.4	161	0.25	0.147	0.527	0.575	1.12	2.07	4.07	0.31	0.0291	0.116	0.0208	0.00851	2.16	0.174	0.00848
Don Juan Playhouse Well	06/20	UF	CS																		
Don Juan Playhouse Well	10/03	UF	CS																		
Don Juan Playhouse Well	10/03	UF	CS																		

Table 5-20. Radiochemical Analysis of Groundwater for 2001 (pCi/L[a]) (Cont.)

Station	Date	Codes[b]		^{3}H			^{90}Sr			^{137}Cs			^{234}U			$^{235,236}U$			^{238}U		
				Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
San Ildefonso Pueblo (Cont.)																					
Martinez House Well	12/04	UF	CS	-134	51.3	181	0.0506	0.0226	0.0561	-0.625	0.65	2.23				0.166	0.0232	0.0175	1.89	0.147	0.0174
Martinez House Well	12/04	UF	DUP							-0.747	0.72	2.37									
Otowi House Well	06/19	UF	CS	0	49.2	165	0.165	0.0923	0.353	0	0.99	4.02	1.71	0.147	0.0632	0.0592	0.0167	0.0353	1.03	0.0974	0.0455
Otowi House Well	06/19	UF	DUP	-27	49.1	168							1.68	0.143	0.0427	0.0135	0.0144	0.062	0.934	0.0893	0.0644
Otowi House Well	06/19	UF	CS																		
Otowi House Well	10/03	UF	CS																		
Otowi House Well	10/03	UF	CS																		
New Community Well	06/19	UF	CS	0	47.2	158	0.0371	0.114	0.448	0.37	0.631	2.32	11.3	0.862	0.066	0.342	0.0501	0.0817	7.12	0.554	0.0702
New Community Well	06/19	UF	CS																		
New Community Well	10/03	UF	CS																		
New Community Well	10/03	UF	CS																		
Santa Fe Water Supply Wells																					
Buckman 1	08/16	UF	CS				-0.16	0.0819	0.215				3.49	0.269	0.0377	0.144	0.0251	0.0258	2.07	0.168	0.042
Buckman 1	08/16	UF	DUP										3.75	0.285	0.0092	0.108	0.0222	0.0364	2.09	0.169	0.0248
Buckman 1	10/31	UF	CS				-0.0834	0.0653	0.222							0.301	0.0346	0.0388	5.29	0.419	0.0341
Buckman 1	10/31	UF	DUP				-0.0861	0.0733	0.247							0.396	0.0417	0.0302	5.47	0.437	0.0325
Buckman 1	10/31	UF	TRP													0.786	0.0693	0.0162	5.91	0.461	0.0212
Buckman 2	08/16	UF	CS				0.133	0.0598	0.151				92.6	6.99	0.141	4.7	0.402	0.0221	73.7	5.57	0.0753
Buckman 2	08/16	UF	RE										91.6	6.98	0.14	4.09	0.386	0.14	74.5	5.69	0.14
Buckman 2	08/16	UF	REDP										87.4	6.6	0.154	3.74	0.35	0.0868	74	5.6	0.0866
Buckman 2	10/31	UF	CS				0.0293	0.0548	0.183							0.347	0.0365	0.00475	6.79	0.539	0.0129
Buckman 2	10/31	UF	DUP													1.12	0.0959	0.015	6.52	0.51	0.0118
Buckman 2	10/31	UF	TRP													0.211	0.0219	0.0115	2.79	0.213	0.00288
Buckman 3	10/31	UF	CS				-0.0205	0.0551	0.188							0.147	0.0184	0.0104	2.86	0.226	0.0104
Buckman 3	10/31	UF	DUP													0.539	0.0493	0.0202	2.59	0.205	0.0176
Buckman 3	10/31	UF	TRP													0.688	0.0586	0.00854	2.91	0.224	0.0125
Buckman 4	10/31	UF	CS				0.0109	0.0494	0.166							0.297	0.029	0.0139	3	0.229	0.0162
Buckman 4	10/31	UF	DUP													0.208	0.0219	0.00832	2.99	0.23	0.0121
Buckman 4	10/31	UF	TRP													0.266	0.028	0.0147	3.1	0.242	0.0192
Buckman 6	10/31	UF	CS				0.0053	0.0673	0.226							0.165	0.0194	0.0146	1.67	0.133	0.0131
Buckman 6	10/31	UF	DUP													0.324	0.0352	0.019	1.9	0.158	0.0231
Buckman 6	10/31	UF	TRP													0.136	0.0177	0.0108	1.87	0.151	0.00397
Buckman 7	08/16	UF	CS				-0.0114	0.0578	0.159				5.12	0.378	0.0232	0.113	0.019	0.0185	1.76	0.141	0.0232
Buckman 7	08/16	UF	DUP										5.01	0.369	0.0182	0.149	0.0225	0.0231	1.68	0.135	0.0349
Buckman 7	10/31	UF	CS				-0.0197	0.0674	0.228							0.11	0.0149	0.00989	1.9	0.152	0.0124
Buckman 7	10/31	UF	DUP													0.198	0.0226	0.0172	1.8	0.144	0.0121
Buckman 7	10/31	UF	TRP													0.12	0.0179	0.0208	1.83	0.151	0.0147
Buckman 8	10/31	UF	CS				0.146	0.0616	0.187							0.261	0.0285	0.0176	4.17	0.328	0.0206
Buckman 8	10/31	UF	DUP													0.24	0.0271	0.0118	4.6	0.364	0.0148
Buckman 8	10/31	UF	TRP													0.212	0.0256	0.016	4.68	0.373	0.0126
Buckman 8	10/31	UF	CS				0.125	0.0579	0.179							0.692	0.0605	0.0124	4.06	0.315	0.016
Buckman 8	10/31	UF	DUP													0.234	0.0257	0.0176	4.55	0.354	0.0161
Buckman 8	10/31	UF	TRP													0.275	0.0289	0.013	3.98	0.311	0.0129
Water Quality Standards[c]																					
DOE DCG for Public Dose				2,000,000			1,000			3,000			500			600			600		
DOE Drinking Water System DCG				80,000			40			120			20			24			24		
EPA Primary Drinking Water Standard				20,000			8														
EPA Screening Level																					
NMWQCC Groundwater Limit																					

Table 5-20. Radiochemical Analysis of Groundwater for 2001 (pCi/L[a]) (Cont.)

Station	Date	Codes[b]		U (µg/L, calc)		^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
				Result	Uncert	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Regional Aquifer Wells																				
Test Wells:																				
Test Well 1	06/05	UF	CS	3.21	0.28	0.00662	0.00664	0.018	0.00477	0.00478	0.0129	0.0398	0.0135	0.0308	1.99	0.698		4.2	0.917	
Test Well 3	06/04	UF	CS	0.33	0.06	0	1	0.0152	0.00807	0.00808	0.0297	0.0279	0.0107	0.0108	-0.52	0.364		3.12	0.735	
Test Well 3	06/04	UF	DUP																	
Test Well 3	10/04	UF	CS	0.44	0.06	0.00227	0.00393	0.0167	0.0272	0.00972	0.0244	0.0114	0.00606	0.0177	-0.333	0.474	2.22	2.33	0.418	1.33
Test Well 3	10/04	UF	DUP	0.48	0.06	0.0149	0.00613	0.00673	0.0124	0.00826	0.0267	0.00954	0.0043	0.00517	0.444	0.452	1.89	1.6	0.393	1.41
Test Well 3	10/04	UF	TRP																	
Test Well 3	10/04	UF	CS	0.55	0.07	0.00614	0.00459	0.0151	0.00614	0.00542	0.019	0.0115	0.00609	0.0178	0.715	0.469	1.74	1.66	0.364	1.21
Test Well 4	06/04	UF	CS	0.07	0.03	0	1	0.0205	0.00546	0.00946	0.0402	0.0256	0.0129	0.0173	0.429	0.391		2.87	0.748	
Test Well 4	06/04	UF	DUP												-0.444	0.31		2.64	0.812	
Test Well 8	06/04	UF	CS	0.39	0.07	0	1	0.0203	0.0108	0.0132	0.0501	0.0164	0.0136	0.0463	0.96	0.43		3.01	0.71	
Test Well DT-5A	06/06	UF	CS	0.38	0.06	0	1	0.017	0.00902	0.00904	0.0332	0.00609	0.0105	0.0399	0.242	0.437		1.33	0.667	
Test Well DT-9	06/07	UF	CS	0.43	0.07	0.00677	0.00678	0.0183	0.0135	0.00961	0.0183	0.00329	0.0033	0.00891	0.173	0.386		1.28	0.737	
Test Well DT-9	06/07	UF	DUP	0.45	0.07	0	1	0.0194	0.00515	0.00516	0.014	0.022	0.00743	0.00661						
Test Well DT-10	06/06	UF	CS	0.67	0.09	0	1	0.0196	-0.0104	0.00741	0.0485	0.0257	0.0116	0.0139	-0.257	0.408		0.8	0.764	
Water Supply Wells:																				
O-1	05/09	UF	CS	1.35	0.13	0.0183	0.00754	0.00826	0.00914	0.0053	0.00826	0.0221	0.00847	0.00857	0.209	0.534	2.02	4.06	1.02	3.02
O-1	05/09	UF	DUP	1.33	0.14	0.00497	0.00417	0.0162	0.0022	0.00221	0.00597	0.00542	0.00699	0.0323	0.691	0.448	1.44	3.63	0.9	2.68
O-1	05/09	UF	TRP																	
O-1	05/09	UF	CS	1.54	0.15	0.0124	0.00561	0.00674	0.00746	0.00433	0.00674	0.0312	0.0112	0.0106	1.72	1.08	2.82	6.1	0.866	2.38
O-1	05/09	UF	DUP																	
O-4	05/09	UF	CS	0.74	0.08	0.0165	0.00745	0.00896	0.000839	0.00412	0.0243	0.00107	0.00473	0.0282	1.49	0.893	2.68	4.94	0.793	2.24
O-4	05/09	UF	DUP																	
PM-1	05/09	UF	CS	1.78	0.16	0.0101	0.00602	0.0209	0	1	0.00609	0.00331	0.00332	0.00897	2.33	1.07	3	8.06	0.894	2.2
PM-1	05/09	UF	DUP																	
PM-2	05/09	UF	CS	0.32	0.05	0.00978	0.00692	0.0259	0.00279	0.00279	0.00756	0.0256	0.0106	0.0116	1.03	0.851	2.7	3.55	0.746	2.22
PM-2	05/09	UF	DUP																	
PM-3	05/09	UF	CS	1.05	0.12	0.00882	0.00624	0.0234	0.00315	0.00402	0.0185	0.0124	0.00683	0.0213	0.448	0.85	3.14	5.68	0.807	2.17
PM-3	05/09	UF	DUP																	
PM-4	05/09	UF	CS	0.41	0.06	0.0168	0.00693	0.0076	-0.000669	0.00537	0.0302	0.00534	0.00688	0.0318	0.721	0.691	2.33	6.03	0.836	2.27
PM-4	05/09	UF	DUP																	
PM-5	05/09	UF	CS	0.43	0.06	0.000766	0.00378	0.0223	0.000766	0.00377	0.0223	0.012	0.00602	0.0081	0.553	0.597	2.08	4.01	0.777	2.3
G-1A	05/09	UF	CS	0.41	0.06	0.008	0.00527	0.0181	0.00246	0.00246	0.00666	0.0152	0.00767	0.0103	0.667	0.706	2.53	6.25	0.819	2.16
G-1A	05/09	UF	DUP																	
G-1A	05/09	UF	TRP																	
G-2A	05/09	UF	CS	0.49	0.08	0.00401	0.00284	0.00544	0	1	0.0148	0.00609	0.00432	0.00825	0.116	0.406	1.57	1.32	0.785	2.62
G-2A	05/09	UF	DUP																	
G-3A	05/09	UF	CS	0.81	0.09	0.00868	0.00503	0.00784	0.0022	0.00625	0.0311	0.0317	0.0122	0.0123	0.639	0.406	1.27	-1.33	0.781	2.86
G-3A	05/09	UF	DUP																	
G-4A	05/09	UF	CS	0.81	0.11	0.00922	0.00379	0.00416	0.00615	0.00378	0.0113	0.0103	0.00715	0.0269	0.681	0.356	1.06	1.47	0.652	2.13
G-4A	05/09	UF	DUP																	
Regional Aquifer Springs																				
White Rock Canyon Group I:																				
Sandia Spring	09/24	F	CS	0.74	0.13	0.00245	0.00245	0.00663	-0.00734	0.00648	0.0321	0.0346	0.0106	0.00853	1	0.425	1.41	2.77	0.4	1.11
Sandia Spring	09/24	F	CS	0.70	0.12	0.00733	0.00425	0.00662	0.00977	0.00978	0.0344	0.00542	0.00543	0.0199	0.624	0.409	1.54	2.51	0.382	1.06
Sandia Spring	09/24	UF	CS																	
Sandia Spring	09/24	UF	CS																	
Spring 3	09/24	F	CS	1.56	0.20	0.00965	0.00765	0.026	0.00965	0.00485	0.00653	0.0112	0.00562	0.00757	0.601	0.517	1.98	2.68	0.399	1.09
Spring 3	09/24	UF	CS																	
Spring 4	09/24	UF	CS																	
Spring 4	09/24	UF	DUP																	
Spring 4	09/24	UF	CS	0.87	0.14	0.00626	0.00468	0.0154	-0.00208	0.00466	0.0224	0.0354	0.0118	0.0237	-0.251	0.313	1.68	2.62	0.407	1.18
Spring 4	09/24	UF	DUP	0.84	0.14	-0.0023	0.00399	0.0214	0.00461	0.00565	0.0214	0.015	0.00939	0.03	-0.372	0.376	1.99	1.92	0.41	1.42
Spring 4A	09/25	F	CS	0.97	0.14	0.074	0.015	0.0195	0.00264	0.00699	0.0284	0.0237	0.00849	0.00804	0.688	0.36	1.23	2.16	0.352	0.977
Spring 4A	09/25	UF	CS																	
Spring 5	09/25	F	CS	0.60	0.11	0	1	0.00677	0.00499	0.00612	0.0232	0.027	0.00912	0.00812	1.18	0.457	1.25	2.34	0.362	0.949
Spring 5	09/25	UF	CS																	

Table 5-20. Radiochemical Analysis of Groundwater for 2001 (pCi/L[a]) (Cont.)

Station	Date	Codes[b]		U (µg/L, calc)		^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
				Result	Uncert	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Regional Aquifer Springs (Cont.)																				
White Rock Canyon Group I: (Cont.)																				
Ancho Spring	10/24	F	CS	0.24	0.04	0.0114	0.00905	0.0307	6.8E-10	0.00699	0.0307	0.00586	0.00587	0.0216	0.9	0.4	1.45	2.87	0.711	2.8
Ancho Spring	10/24	F	DUP	0.23	0.05	0.00279	0.00623	0.0259	0.00279	0.00483	0.0205	0.0217	0.0126	0.039						
Ancho Spring	10/24	UF	CS																	
Ancho Spring	10/24	UF	DUP																	
White Rock Canyon Group II:																				
Spring 6A	09/25	UF	CS																	
Spring 6A	09/25	F	CS	0.86	0.14	0.00803	0.006	0.0197	-0.0134	0.0111	0.0485	0.0216	0.00827	0.00838	0.491	0.44	1.68	2.86	0.423	1.21
Spring 9	09/25	UF	CS																	
Spring 9	09/26	F	CS	0.27	0.07	0.00226	0.00392	0.0167	0.00226	0.0109	0.041	0.0316	0.0102	0.0226	0.0913	0.347	1.64	0.445	0.26	1.06
White Rock Canyon Group III:																				
Spring 1	09/24	UF	CS																	
Spring 1	09/24	F	CS	1.77	0.22	0.0053	0.00376	0.00718	0.00529	0.00375	0.00717	0.00881	0.00727	0.0284	1.59	0.626	2.16	2.3	0.432	1.44
Spring 1	09/24	F	DUP									0.0173	0.0087	0.0117						
Spring 2	09/24	UF	CS																	
Spring 2	09/24	F	CS	1.12	0.16	0.0049	0.0049	0.018	0.00978	0.00601	0.018	0.0239	0.00856	0.00809	1.1	0.542	1.92	1.26	0.398	1.52
White Rock Canyon Group IV:																				
La Mesita Spring	10/23	UF	CS																	
La Mesita Spring	10/23	F	CS	10.65	0.79	0.00538	0.00381	0.00728	0.00269	0.00891	0.0352	0.019	0.011	0.0341	11.3	1.24	1.31	7.4	0.827	2.53
Other Springs:																				
Sacred Spring	10/23	F	CS	1.58	0.16	0.00771	0.00928	0.0337	0.00257	0.00575	0.0239	-0.00342	0.0123	0.0513	2.24	0.604	1.65	4.3	0.691	2.34
Sacred Spring	10/23	F	DUP	1.62	0.17	-0.00456	0.00323	0.0212	0.00455	0.00789	0.0298	0.0371	0.0133	0.0126	2.28	0.566	1.5	3.44	0.695	2.48
Sacred Spring	10/23	UF	CS																	
Sacred Spring	10/23	UF	DUP																	
Sacred Spring	10/23	F	CS	1.26	0.13	0.00715	0.0086	0.0312	0.00477	0.00338	0.00646	-0.00272	0.0112	0.0453	2.17	0.577	1.7	4.97	0.786	2.84
Sacred Spring	10/23	UF	CS																	
Canyon Alluvial Groundwater Systems																				
Acid/Pueblo Canyons:																				
APCO-1	04/03	UF	CS	0.83	0.11	0.0134	0.00672	0.00906	0.157	0.0248	0.0246	0.00364	0.00962	0.0391	2.97	1.33	1.39	18.6	3.03	2.84
APCO-1	04/03	F	CS	0.60	0.09	0.00395	0.00396	0.0107	0.0948	0.02	0.0107	0.0398	0.0143	0.0135	1.03	0.64	2.02	18.7	1.64	2.98
APCO-1	04/03	F	DUP												1.89	0.999	2.98	17.6	1.64	3.32
DP/Los Alamos Canyons:																				
LAO-C	04/03	UF	CS	0.08	0.05	0.0104	0.00603	0.0094	0.0173	0.00922	0.0255	0.0155	0.00781	0.0105	-0.0845	0.613	2.42	4	1.05	3.22
LAO-C	04/03	F	CS	0.20	0.05	0.0151	0.00931	0.0279	0.00757	0.00537	0.0103	0.013	0.0115	0.0402	0.528	0.411	1.4	4.4	0.977	2.87
LAO-C	04/03	F	DUP	0.11	0.03	0.0105	0.00612	0.00953	0.00351	0.00786	0.0326	0.0223	0.0092	0.0101						
LAO-0.7	03/29	UF	CS	0.25	0.05	-4.55E-10	0.00539	0.0281	0.103	0.0212	0.0281	0.0258	0.0103	0.0238	1.72	0.607	1.66	3.37	0.937	2.92
LAO-0.7	03/29	F	CS	0.14	0.04	1.11E-09	0.00657	0.0342	0.0232	0.0124	0.0342	0.273	0.0362	0.0106	1.24	0.612	1.65	3.67	0.876	2.65
LAO-0.7	03/29	F	DUP																	
LAO-1	04/05	UF	CS	0.09	0.03	0	1	0.0179	0.0237	0.0107	0.0129	0.017	0.0105	0.0314	0.523	0.63	2.05	24.4	3.99	2.73
LAO-1	04/05	UF	DUP	0.01	0.05	0	1	0.015	0.0239	0.0113	0.0293	0.0421	0.0168	0.0388						
LAO-1	04/05	F	CS	0.02	0.03	0.00653	0.0113	0.0481	0.00941	0.0115	0.0437	0.0209	0.0086	0.00942	-0.0118	0.402	1.51	23.8	1.99	2.47
LAO-1	04/05	F	DUP												-0.705	0.407	1.68	23.6	1.95	2.66
DP Spring	04/03	F	CS	0.09	0.04	0.0179	0.00953	0.0264	0.00716	0.00508	0.00971	0.025	0.0103	0.0113	2.43	0.862	1.54	214	13.5	3.06
DP Spring	04/03	UF	CS	0.09	0.04	0.0131	0.00758	0.0118	0.00871	0.00618	0.0118	0.0293	0.0156	0.0454	-0.315	0.596	2.49	228	11.6	2.93
LAO-2	03/29	UF	CS	0.05	0.04	0.0191	0.0096	0.0129	0	1	0.0129	0.0237	0.00905	0.00916	1.89	0.798	1.97	92	6.27	2.53
LAO-2	03/29	F	CS	0.11	0.04	1.08E-09	0.00643	0.0335	0.00454	0.00455	0.0123	0.0313	0.0149	0.0384	2.6	0.818	0.89	51.5	3.6	2.34
LAO-3A	03/28	UF	CS	0.39	0.07	0.00449	0.0045	0.0122	-0.00449	0.0045	0.033	0.0245	0.00878	0.00831	3.08	0.727	1.33	93.4	5.26	2.32
LAO-3A	03/28	F	CS	0.25	0.05	0.00464	0.00464	0.0126	0.00463	0.00464	0.0126	0.0246	0.0101	0.0111	2.41	0.707	1.16	89.2	5.7	2.36
LAO-3A	03/28	F	DUP	0.25	0.06	0.0197	0.0114	0.0178	0	1	0.0178	0.0179	0.00807	0.0097						
LAO-3A	03/28	F	CS	0.18	0.04	0	1	0.0159	-0.00586	0.00587	0.0431	0	1	0.0124	1.55	0.474	1.1	7.05	0.885	2.2
LAO-3A	03/28	UF	CS	0.23	0.06	0	1	0.0158	0.00584	0.00585	0.0158	0.0312	0.0112	0.0106	2.86	1.2	1.77	97.4	14.2	2.53
LAO-3A	03/28	UF	DUP																	
LAO-4	04/05	UF	CS	0.14	0.05	0	1	0.0165	0.0131	0.00762	0.0119	0.0269	0.0111	0.0121	1.02	0.509	1.56	13.8	1.35	2.62

Table 5-20. Radiochemical Analysis of Groundwater for 2001 (pCi/L[a]) (Cont.)

Station	Date	Codes[b]		U (µg/L, calc)		^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
				Result	Uncert	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
Canyon Alluvial Groundwater Systems (Cont.)																				
DP/Los Alamos Canyons:																				
LAO-4	04/05	UF	DUP																	
LAO-4	04/05	F	CS	0.08	0.03	0.0241	0.0121	0.0163	-1.04E-09	0.00868	0.0403	0.053	0.0163	0.0131	1.08	0.616	1.29	19.7	3.95	2.59
LAO-4.5C	03/28	UF	CS	0.13	0.03	0.00551	0.00552	0.0149	-0.00551	0.00954	0.0511	0.0273	0.0128	0.0367	0.614	0.558	1.87	8.51	1.21	2.73
LAO-4.5C	03/28	F	CS	0.10	0.04	0	1	0.0202	0	1	0.0202	0.044	0.0125	0.00917	1.46	0.723	2.1	8.63	1.12	2.66
LAO-6A	03/28	UF	CS	0.15	0.05	0.0234	0.0136	0.0211	0.00778	0.00779	0.0211	0.0553	0.0171	0.0367	0.169	0.368	1.36	7.61	1.68	2.36
LAO-6A	03/28	F	CS	0.09	0.04	-0.00532	0.00532	0.0391	-0.00531	0.00532	0.0391	0.0245	0.0116	0.03	0.301	0.345	1.22	8	1.02	2.41
Mortandad Canyon:																				
MCO-3	07/31	UF	CS	1.03	0.13	0.315	0.0387	0.01	0.122	0.0224	0.01	0.927	0.0706	0.0169	2.99	0.911	2.7	161	2.41	1.88
MCO-5	08/02	UF	CS	0.84	0.11	0.0139	0.012	0.0417	0.0104	0.00778	0.0255	0.207	0.0238	0.0149	-0.372	0.896	2.36	120	2.17	2.13
MCO-5	08/02	UF	DUP	0.89	0.11	0.027	0.00969	0.00914	0.054	0.0139	0.00914	0.179	0.0223	0.0221	1.53	1.37	2.93	117	2.3	2.21
MCO-7.5	08/07	UF	DUP																	
Cañada del Buey:																				
CDBO-6	05/01	UF	CS	0.48	0.07	0.00553	0.00621	0.0296	0.00636	0.00451	0.00862	0.00247	0.00247	0.0067	3.73	1.08	2.2	6.72	1.27	3.6
CDBO-6	11/07	UF	CS												19.3	1.32	1.33	21.4	1.17	2.8
Pajarito Canyon:																				
PCO-1	04/10	F	CS	0.08	0.04	0	1	0.0175	0.00928	0.00658	0.0126	0.0345	0.0174	0.0233	-0.119	0.35	1.51	5.04	0.926	2.6
PCO-1	04/10	UF	CS	-0.05	0.02	0	1	0.014	0.00744	0.00528	0.0101	0.0536	0.0192	0.0181	0.807	0.569	1.6	8.34	1.56	2.63
PCO-1	04/10	UF	DUP	0.02	0.03	0	1	0.0248	0.0198	0.0115	0.0179	0.0221	0.0112	0.015	0.954	0.489	1.45	12.9	1.24	2.54
PCO-1	04/10	F	CS	0.04	0.04	0	1	0.0184	0.00488	0.00489	0.0132	0.00548	0.00549	0.0148	0.926	0.741	1.89	4.74	1.3	2.75
PCO-1	04/10	UF	CS	0.00	3.01	-0.00564	0.00565	0.0415	0.00813	0.0115	0.0438	0.0294	0.014	0.0361	-0.562	0.504	2.17	7.83	1.08	2.81
PCO-3	04/10	F	CS	1.98	0.32	0.0238	0.0107	0.0129	0.00685	0.00839	0.0318	0.0561	0.0232	0.0253	0.821	0.8	2.11	1.93	1.09	3.38
PCO-3	04/10	UF	CS	2.62	0.40	0	1	0.0134	0.0107	0.00619	0.00965	0.0576	0.0221	0.0223	1.83	1.05	2.05	2.31	0.988	3.01
Intermediate Perched Groundwater Systems																				
Pueblo/Los Alamos/Sandia Canyon Area Perched System in Conglon																				
POI-4	08/01	UF	CS	2.07	0.23	0	1	0.0306	0.0166	0.0132	0.0448	0.0154	0.00552	0.00522	0.631	0.747	2.64	12.6	0.995	2.85
Test Well 2A	07/30	UF	CS	0.00	0.01	0.00851	0.0121	0.0458	0.00425	0.00737	0.0313	0.00752	0.00596	0.0202	-0.682	0.703	2.8	1.45	0.539	1.89
Basalt Spring	10/23	F	CS	1.31	0.13	-0.00645	0.00646	0.0347	0.0161	0.0155	0.0537	0.0338	0.0142	0.0403	2.51	0.725	1.81	15.7	1.08	2.51
Basalt Spring	10/23	UF	CS																	
Perched Groundwater System in Volcanics:																				
Water Canyon Gallery	11/29	F	CS			0.00689	0.00515	0.0169	0.0138	0.00567	0.00622	0.0192	0.00984	0.0301	0.849	0.403	1.4	1.49	0.39	1.41
Water Canyon Gallery	11/29	F	DUP			-0.00216	0.00375	0.0201	0.0173	0.00971	0.0305	0.0127	0.00639	0.0086	0.882	0.459	1.66	2.54	0.421	1.25
Water Canyon Gallery	11/29	UF	CS																	
Water Canyon Gallery	11/29	UF	DUP																	
San Ildefonso Pueblo																				
LA-5	06/19	UF	CS	0.78	0.10	0	1	0.0214	0.00291	0.00291	0.00788	0.0143	0.00685	0.019	1.25	0.598	2.15	1.9	0.776	3.12
LA-5	06/19	UF	CS			0	1	0.0118	0	1	0.0118									
LA-5	10/03	UF	CS			-0.00671	0.00476	0.0312	0.0168	0.0121	0.0403									
LA-5	10/03	UF	DUP			0.00753	0.00534	0.0102	0	1	0.0405									
LA-5	10/03	UF	CS			0.000561	0.00549	0.0306	0.00943	0.00975	0.0386									
Eastside Artesian Well	06/20	UF	CS	0.02	0.02	0.00284	0.00285	0.00771	0.00284	0.00285	0.0077	0.0179	0.011	0.0329	-0.0089	0.385	1.88	-0.121	0.654	3
Pajarito Well (Pump 1)	06/19	UF	CS	9.87	0.86	0	1	0.0169	0	1	0.00623	0.0053	0.00376	0.00718	12.5	1.3	2.67	5.79	0.895	2.69
Pajarito Well (Pump 1)	06/19	UF	DUP												9.25	1.09	2.23	4.23	0.882	2.75
Pajarito Well (Pump 1)	06/19	UF	CS			0.00992	0.00499	0.00672	-0.00496	0.00352	0.023									
Pajarito Well (Pump 1)	06/19	UF	CS	9.29	0.74	0.00447	0.00447	0.0164	0.00223	0.00387	0.0164	0.0169	0.00645	0.00653	9.81	1.04	1.63	5.05	0.84	2.55
Pajarito Well (Pump 1)	06/19	UF	DUP																	
Pajarito Well (Pump 1)	06/19	UF	CS			0	1	0.00808	-0.00298	0.00298	0.0219									
Pajarito Well (Pump 1)	10/03	UF	CS			-0.0037	0.00642	0.0344	-0.0111	0.0111	0.0522									
Pajarito Well (Pump 1)	10/03	UF	CS			0	1	0.0118	0.000586	0.00574	0.032									
Don Juan Playhouse Well	06/20	UF	CS	6.48	0.52	0.00889	0.00664	0.0218	0.00296	0.00784	0.0319	0.0307	0.011	0.0259	6.44	1.09	1.91	2.23	0.743	2.88
Don Juan Playhouse Well	06/20	UF	CS			-0.00681	0.00483	0.0316	0.00681	0.00682	0.0251									
Don Juan Playhouse Well	10/03	UF	CS			0	1	0.0265	0.00359	0.00623	0.0264									
Don Juan Playhouse Well	10/03	UF	CS			-0.00384	0.00384	0.0283	-0.00384	0.00384	0.0282									

Table 5-20. Radiochemical Analysis of Groundwater for 2001 (pCi/L[a]) (Cont.)

Station	Date	Codes[b]		U (µg/L, calc)		^{238}Pu			^{239,240}Pu			^{241}Am			Gross Alpha			Gross Beta		
				Result	Uncert	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
San Ildefonso Pueblo (Cont.)																				
Martinez House Well	12/04	UF	CS			0.00482	0.00342	0.00653	0.0144	0.00685	0.0177	0.0144	0.00684	0.0177	6.81	1.28	2.69	3.52	0.56	1.83
Martinez House Well	12/04	UF	DUP																	
Otowi House Well	06/19	UF	CS	3.09	0.29	0.00241	0.00241	0.00652	0.0024	0.00538	0.0223	0.00309	0.00535	0.0227	0.539	0.556	2.43	4.17	0.894	3.27
Otowi House Well	06/19	UF	DUP	2.79	0.27	0.0148	0.0129	0.0444	0.00296	0.00296	0.00802	0.00838	0.00928	0.0336						
Otowi House Well	06/19	UF	CS			0	1	0.00981	0.00362	0.00362	0.0098									
Otowi House Well	10/03	UF	CS			0.00343	0.00595	0.0253	0	1	0.0369									
Otowi House Well	10/03	UF	CS			0	1	0.0248	0.00337	0.00338	0.00914									
New Community Well	06/19	UF	CS	21.35	1.65	-0.0127	0.00674	0.0357	0.00253	0.00567	0.0235	0.00572	0.00573	0.021	19.4	1.97	2.03	5.91	0.99	3.38
New Community Well	06/19	UF	CS			1.77E-10	0.00421	0.0219	0.00297	0.00298	0.00806									
New Community Well	10/03	UF	CS			0.00341	0.00341	0.00924	0	1	0.0447									
New Community Well	10/03	UF	CS			0	1	0.0268	0.00364	0.00631	0.0268									
Santa Fe Water Supply Wells																				
Buckman 1	08/16	UF	CS	6.23	0.50															
Buckman 1	08/16	UF	DUP	6.27	0.50															
Buckman 1	10/31	UF	CS																	
Buckman 1	10/31	UF	DUP																	
Buckman 1	10/31	UF	TRP																	
Buckman 2	08/16	UF	CS	221.54	16.58															
Buckman 2	08/16	UF	RE	223.63	16.94															
Buckman 2	08/16	UF	REDP	221.98	16.67															
Buckman 2	10/31	UF	CS																	
Buckman 2	10/31	UF	DUP																	
Buckman 2	10/31	UF	TRP																	
Buckman 3	10/31	UF	CS																	
Buckman 3	10/31	UF	DUP																	
Buckman 3	10/31	UF	TRP																	
Buckman 4	10/31	UF	CS																	
Buckman 4	10/31	UF	DUP																	
Buckman 4	10/31	UF	TRP																	
Buckman 6	10/31	UF	CS																	
Buckman 6	10/31	UF	DUP																	
Buckman 6	10/31	UF	TRP																	
Buckman 7	08/16	UF	CS	5.29	0.42															
Buckman 7	08/16	UF	DUP	5.07	0.40															
Buckman 7	10/31	UF	CS																	
Buckman 7	10/31	UF	DUP																	
Buckman 7	10/31	UF	TRP																	
Buckman 8	10/31	UF	CS																	
Buckman 8	10/31	UF	DUP																	
Buckman 8	10/31	UF	TRP																	
Buckman 8	10/31	UF	CS																	
Buckman 8	10/31	UF	DUP																	
Buckman 8	10/31	UF	TRP																	
Water Quality Standards[c]																				
DOE DCG for Public Dose				800		40			30			30			30			1,000		
DOE Drinking Water System DCG				30		1.6			1.2			1.2			1.2			40		
EPA Primary Drinking Water Standard				30											15					
EPA Screening Level																		50		
NMWQCC Groundwater Limit				5,000																

[a] Except where noted. Three columns are listed: the first is the analytical result, the second is the radioactive counting uncertainty (1 standard deviation), and the third is the analytical laboratory measurement-specific minimum detectable activity.
[b] Codes: UF–unfiltered; F–filtered; CS–customer sample; DUP–laboratory duplicate.
[c] Standards given here for comparison only; see Appendix A.

Table 5-21. Detections of Radionuclides[a] and Comparison to Standards[b] in Groundwater for 2001

Station	Date		Code[c]	Analyte	Result	Uncertainty[d]	MDA[e]	Units	Lab Qual Code[f]	Valid Flag Code[f]	Result/ Minimum Standard	Minimum Standard	Minimum Standard Type	DOE DCG	Result/ DOE DCG
Regional Aquifer Wells															
Test Wells:															
Test Well 1	06/05	UF	CS	^{3}H	186	51.3		pCi/L							
Water Supply Wells:															
PM-4	11/28	UF	CS	^{90}Sr	0.134	0.0373	0.0741	pCi/L							
Regional Aquifer Springs															
White Rock Canyon Group I:															
Sandia Spring	09/24	F	CS	^{241}Am	0.0346	0.0106	0.00853	pCi/L							
Spring 4	09/24	UF	CS	^{241}Am	0.0354	0.0118	0.0237	pCi/L							
Spring 4A	09/25	F	CS	^{238}Pu	0.074	0.015	0.0195	pCi/L							
Ancho Spring	10/24	F	CS	^{90}Sr	0.3	0.0865	0.221	pCi/L							
White Rock Canyon Group II:															
Spring 9	09/26	F	CS	^{241}Am	0.0316	0.0102	0.0226	pCi/L							
White Rock Canyon Group IV:															
La Mesita Spring	10/23	F	CS	Gross Alpha	11.3	1.24	1.31	pCi/L			0.75	15	EPA PRIM DW STD	30	0.38
La Mesita Spring	10/23	F	CS	^{234}U	5.42	0.4	0.0365	pCi/L							
Canyon Alluvial Groundwater Systems															
Acid/Pueblo Canyons:															
APCO-1	04/03	F	DUP	^{90}Sr	1.42	0.128	0.293	pCi/L							
APCO-1	04/03	UF	CS	^{90}Sr	1.31	0.131	0.26	pCi/L							
APCO-1	04/03	F	CS	^{90}Sr	1.27	0.123	0.306	pCi/L							
APCO-1	04/03	UF	CS	^{239,240}Pu	0.157	0.0248	0.0246	pCi/L							
APCO-1	04/03	F	CS	^{239,240}Pu	0.0948	0.02	0.0107	pCi/L							
DP/Los Alamos Canyons:															
LAO-0.7	03/29	F	CS	^{241}Am	0.273	0.0362	0.0106	pCi/L							
LAO-0.7	03/29	UF	CS	^{239,240}Pu	0.103	0.0212	0.0281	pCi/L							
LAO-1	04/05	F	CS	^{90}Sr	9.61	0.401	0.408	pCi/L			1.20	8	EPA PRIM DW STD		
LAO-1	04/05	UF	CS	^{90}Sr	8.28	1.07	0.372	pCi/L			1.04	8	EPA PRIM DW STD		
LAO-1	04/05	UF	CS	Gross Beta	24.4	3.99	2.73	pCi/L		J					
LAO-1	04/05	F	CS	Gross Beta	23.8	1.99	2.47	pCi/L		J					
LAO-1	04/05	F	DUP	Gross Beta	23.6	1.95	2.66	pCi/L		J					
LAO-1	04/05	UF	CS	^{3}H	225	58.2	175	pCi/L							
DP Spring	04/03	UF	CS	Gross Beta	228	11.6	2.93	pCi/L		J	4.56	50	EPA SEC DW LVL		
DP Spring	04/03	F	CS	Gross Beta	214	13.5	3.06	pCi/L		J	4.28	50	EPA SEC DW LVL		
DP Spring	04/03	F	CS	^{90}Sr	115	5.57	0.205	pCi/L			14.38	8	EPA PRIM DW STD		
DP Spring	04/03	UF	CS	^{90}Sr	113	14.2	0.211	pCi/L			14.13	8	EPA PRIM DW STD		
DP Spring	04/03	UF	CS	^{3}H	455	64.5	177	pCi/L		J					
LAO-2	03/29	UF	CS	Gross Beta	92	6.27	2.53	pCi/L		J	1.84	50	EPA SEC DW LVL		
LAO-2	03/29	F	CS	Gross Beta	51.5	3.6	2.34	pCi/L		J	1.03	50	EPA SEC DW LVL		
LAO-2	03/29	UF	CS	^{90}Sr	29.1	0.904	0.21	pCi/L			3.64	8	EPA PRIM DW STD		
LAO-2	03/29	F	CS	^{90}Sr	26.3	1.13	0.217	pCi/L			3.29	8	EPA PRIM DW STD		
LAO-2	03/29	UF	CS	^{3}H	197	57.4	175	pCi/L		J					
LAO-3A	03/28	UF	CS	Gross Beta	97.4	14.2	2.53	pCi/L		J	1.95	50	EPA SEC DW LVL		
LAO-3A	03/28	UF	CS	Gross Beta	93.4	5.26	2.32	pCi/L		J	1.87	50	EPA SEC DW LVL		
LAO-3A	03/28	F	CS	Gross Beta	89.2	5.7	2.36	pCi/L		J	1.78	50	EPA SEC DW LVL		
LAO-3A	03/28	F	CS	^{90}Sr	52.1	1.44	0.209	pCi/L			6.51	8	EPA PRIM DW STD		
LAO-3A	03/28	UF	CS	^{90}Sr	47.2	1.39	0.282	pCi/L			5.90	8	EPA PRIM DW STD		
LAO-3A	03/28	UF	CS	^{90}Sr	46.1	3.25	0.186	pCi/L			5.76	8	EPA PRIM DW STD		
LAO-3A	03/28	F	CS	^{90}Sr	37	2.07	0.235	pCi/L			4.63	8	EPA PRIM DW STD		
LAO-3A	03/28	UF	DUP	^{3}H	195	55.4	168	pCi/L		U					

Table 5-21. Detections of Radionuclides[a] and Comparison to Standards[b] in Groundwater for 2001 (Cont.)

Station	Date		Code[c]	Analyte	Result	Uncertainty[d]	MDA[e]	Units	Lab Qual Code[f]	Valid Flag Code[f]	Result/ Minimum Standard	Minimum Standard	Minimum Standard Type	DOE DCG	Result/ DOE DCG
Canyon Alluvial Groundwater Systems															
DP/Los Alamos Canyons:															
LAO-4	04/05	F	CS	^{90}Sr	5.46	0.911	0.433	pCi/L			0.68	8	EPA PRIM DW STD		
LAO-4	04/05	UF	CS	^{90}Sr	5.19	0.33	0.548	pCi/L			0.65	8	EPA PRIM DW STD		
LAO-4	04/05	F	CS	^{241}Am	0.053	0.0163	0.0131	pCi/L							
LAO-4.5C	03/28	F	CS	^{90}Sr	2.13	0.151	0.246	pCi/L							
LAO-4.5C	03/28	UF	CS	^{90}Sr	2.13	0.122	0.222	pCi/L							
LAO-4.5C	03/28	F	CS	^{241}Am	0.044	0.0125	0.00917	pCi/L							
LAO-6A	03/28	UF	CS	^{90}Sr	1.71	0.104	0.219	pCi/L							
LAO-6A	03/28	F	CS	^{90}Sr	1.37	0.094	0.228	pCi/L							
LAO-6A	03/28	UF	CS	^{241}Am	0.0553	0.0171	0.0367	pCi/L		J					
Mortandad Canyon:															
MCO-3	07/31	UF	CS	Gross Beta	161	2.41	1.88	pCi/L		J	3.22	50	EPA SEC DW LVL		
MCO-3	07/31	UF	CS	^{90}Sr	39.3	5.17	0.176	pCi/L			4.91	8	EPA PRIM DW STD		
MCO-3	07/31	UF	CS	^{241}Am	0.927	0.0706	0.0169	pCi/L			0.77	1.2	DOE DW DCG		
MCO-3	07/31	UF	CS	^{3}H	4790	134	168	pCi/L							
MCO-3	07/31	UF	CS	^{238}Pu	0.315	0.0387	0.01	pCi/L							
MCO-3	07/31	UF	CS	^{239,240}Pu	0.122	0.0224	0.01	pCi/L		J					
MCO-5	08/02	UF	CS	Gross Beta	120	2.17	2.13	pCi/L		J	2.40	50	EPA SEC DW LVL		
MCO-5	08/02	UF	DUP	Gross Beta	117	2.3	2.21	pCi/L			2.34	50	EPA SEC DW LVL		
MCO-5	08/02	UF	CS	^{90}Sr	38.1	5.23	0.178	pCi/L			4.76	8	EPA PRIM DW STD		
MCO-5	08/02	UF	CS	^{3}H	6820	159	166	pCi/L							
MCO-5	08/02	UF	DUP	^{3}H	6690	154	158	pCi/L							
MCO-5	08/02	UF	CS	^{241}Am	0.207	0.0238	0.0149	pCi/L							
MCO-5	08/02	UF	DUP	^{241}Am	0.179	0.0223	0.0221	pCi/L							
MCO-5	08/02	UF	DUP	^{239,240}Pu	0.054	0.0139	0.00914	pCi/L							
Cañada del Buey:															
CDBO-6	11/07	UF	CS	Gross Alpha	19.3	1.32	1.33	pCi/L			1.29	15	EPA PRIM DW STD	30	0.64
CDBO-6	11/07	UF	CS	Gross Beta	21.4	1.17	2.8	pCi/L							
Pajarito Canyon:															
PCO-3	04/10	F	CS	^{90}Sr	0.393	0.121	0.351	pCi/L							
Intermediate Perched Groundwater Systems															
Pueblo/Los Alamos/Sandia Canyon Area Perched System in Conglomerates and Basalt:															
Test Well 2A	07/30	UF	CS	^{3}H	1110	76.1	165	pCi/L							
Basalt Spring	10/23	F	CS	^{90}Sr	0.611	0.128	0.301	pCi/L							
San Ildefonso Pueblo															
Pajarito Well (Pump 1)	06/19	UF	CS	Gross Alpha	12.5	1.3	2.67	pCi/L			0.83	15	EPA PRIM DW STD	30	0.42
Pajarito Well (Pump 1)	06/19	UF	CS	Gross Alpha	9.81	1.04	1.63	pCi/L			0.65	15	EPA PRIM DW STD	30	0.33
Pajarito Well (Pump 1)	06/19	UF	DUP	Gross Alpha	9.25	1.09	2.23	pCi/L			0.62	15	EPA PRIM DW STD	30	0.31
Pajarito Well (Pump 1)	06/19	UF	CS	^{234}U	10.2	0.812	0.0468	pCi/L			0.51	20	DOE DW DCG		
Pajarito Well (Pump 1)	06/19	UF	CS	^{234}U	9.1	0.699	0.0658	pCi/L							
Martinez House Well	12/04	UF	CS	Gross Alpha	6.81	1.28	2.69	pCi/L							
Don Juan Playhouse Well	06/20	UF	CS	Gross Alpha	6.44	1.09	1.91	pCi/L							
New Community Well	06/19	UF	CS	Gross Alpha	19.4	1.97	2.03	pCi/L			1.29	15	EPA PRIM DW STD	30	0.65
New Community Well	06/19	UF	CS	^{234}U	11.3	0.862	0.066	pCi/L			0.57	20	DOE DW DCG		
New Community Well	06/19	UF	CS	^{238}U	7.12	0.554	0.0702	pCi/L							

Table 5-21. Detections of Radionuclides[a] and Comparison to Standards[b] in Groundwater for 2001 (Cont.)

Station	Date		Code[c]	Analyte	Result	Uncertainty[d]	MDA[e]	Units	Lab Qual Code[f]	Valid Flag Code[f]	Result/ Minimum Standard	Minimum Standard	Minimum Standard Type	DOE DCG	Result/ DOE DCG
Santa Fe Water Supply Wells															
Buckman 2	08/16	UF	CS	^{234}U	92.6	6.99	0.141	pCi/L		J+	4.63	20	DOE DW DCG		
Buckman 2	08/16	UF	RE	^{234}U	91.6	6.98	0.14	pCi/L			4.58	20	DOE DW DCG		
Buckman 2	08/16	UF	REDP	^{234}U	87.4	6.6	0.154	pCi/L			4.37	20	DOE DW DCG		
Buckman 2	08/16	UF	RE	^{238}U	74.5	5.69	0.14	pCi/L			3.10	24	DOE DW DCG		
Buckman 2	08/16	UF	REDP	^{238}U	74	5.6	0.0866	pCi/L			3.08	24	DOE DW DCG		
Buckman 2	08/16	UF	CS	^{238}U	73.7	5.57	0.0753	pCi/L		J+	3.07	24	DOE DW DCG		
Buckman 2	10/31	UF	CS	^{238}U	6.79	0.539	0.0129	pCi/L		R					
Buckman 2	10/31	UF	DUP	^{238}U	6.52	0.51	0.0118	pCi/L							
Buckman 7	08/16	UF	CS	^{234}U	5.12	0.378	0.0232	pCi/L		J-					
Buckman 7	08/16	UF	DUP	^{234}U	5.01	0.369	0.0182	pCi/L							

[a]Detection defined as value ≥ 3× uncertainty and ≥ detection limit, except values shown for uranium isotopes ≥ DOE DW DCG/4, for gross alpha ≥ 5 pCi/L, and for gross beta ≥ 20 pCi/L.
Note that some results in this table were qualified as nondetections by the analytical laboratory or during validation.
[b]Values indicated by entries in right-hand columns are greater than half the minimum standard shown. The minimum standard is either a DOE 4-mrem drinking water DCG or an EPA drinking water standard.
[c]Codes: UF-unfiltered, F-filtered; CS-customer sample; DUP.-duplicate; TRP-triplicate; RE-reanalysis.
[d]One standard deviation radioactivity counting uncertainty.
[e]MDA=mimimum detectable activity.
[f]For Lab Qualifier Codes and Validation Flag Codes, see Table 5-4.

Table 5-22. Special Regional Aquifer Sampling for Strontium-90 During 2001 (pCi/L)[a]

Station Name	Date	Codes[b]		Result	Uncertainty	MDA	Detect?[c]
Test Wells							
Test Well 1	03/22	UF	CS	0.101	0.0704	0.236	
Test Well 1	06/05	UF	CS	0.017	0.037		
Test Well 1	07/31	UF	CS	0.0982	0.0516	0.157	
Test Well 1	10/04	UF	CS	–0.0003	0.0457	0.154	
Test Well 3	03/22	UF	CS	–0.112	0.111	0.388	
Test Well 3	06/04	UF	CS	0.0571	0.0433		
Test Well 3	07/30	UF	CS	–0.0236	0.0473	0.155	
Test Well 3	10/04	UF	CS	0.0136	0.0451	0.151	
Test Well 3	10/04	UF	DUP	0.0632	0.0502	0.162	
Test Well 3	10/04	UF	TRP	–0.071	0.0491	0.165	
Test Well 3	10/04	UF	CS	0.0272	0.0398	0.133	
Test Well 4	03/22	UF	CS	–0.027	0.0878	0.304	
Test Well 4	03/22	UF	CS	–0.084	0.121	0.419	
Test Well 4	03/22	UF	DUP	0.0364	0.117	0.401	
Test Well 4	06/04	UF	CS	0.0498	0.0361		
Test Well 4	06/04	UF	DUP	0.0473	0.0332		
Test Well 4	07/30	UF	CS	0.0589	0.0374	0.117	
Test Well 4	10/04	UF	CS	0.0031	0.0463	0.156	
Test Well 8	03/22	UF	CS	0.0616	0.104	0.354	
Test Well 8	06/04	UF	CS	0.0037	0.044		
Test Well 8	07/30	UF	CS	–0.0553	0.0455	0.149	
Test Well 8	10/05	UF	CS	0.137	0.0539	0.157	
Test Well DT-5A	06/06	UF	CS	0.0932	0.0484		
Test Well DT-5A	11/14	UF	CS	–0.0352	346	0.0723	
Test Well DT-9	06/07	UF	CS	0.0035	0.0414		
Test Well DT-9	11/14	UF	CS	–0.0099	98.8	0.0532	
Test Well DT-9	11/14	UF	DUP	0.0075	76.2	0.0479	
Test Well DT-10	06/06	UF	CS	0.0125	0.0456		
Test Well DT-10	11/14	UF	CS	0.0113	98.1	0.0502	
Water Supply Wells							
O-1	02/14	UF	CS	0.229	0.123	0.41	
O-1	02/14	UF	CS	0.0067	0.129	0.448	
O-1	05/09	UF	CS	0.0332	0.0783	0.262	
O-1	05/09	UF	DUP	0.0349	0.0588	0.196	
O-1	05/09	UF	TRP	–0.0205	0.0464	0.158	
O-1	05/09	UF	CS	–0.0353	0.0703	0.239	
O-1	05/09	UF	DUP	–0.0115	0.0422	0.143	
O-1	08/08	UF	CS	0.007	0.0391	0.107	
O-1	08/08	UF	CS	0.0206	0.048	0.131	
O-1	11/28	UF	CS	–0.0089	0.0169	0.0465	
O-4	02/14	UF	CS	0.0449	0.076	0.26	
O-4	05/09	UF	CS	–0.212	0.102	0.334	
O-4	05/09	UF	DUP	–0.0109	0.045	0.153	
O-4	08/08	UF	CS	0.0628	0.0487	0.129	
O-4	11/28	UF	CS	0.0364	0.0213	0.0555	
PM-1	02/14	UF	CS	–0.384	0.124	0.462	

Table 5-22. Special Regional Aquifer Sampling for Strontium-90 During 2001 (pCi/L)[a] (Cont.)

Station Name	Date	Codes[b]		Result	Uncertainty	MDA	Detect?[c]
Water Supply Wells (Cont.)							
PM-1	05/09	UF	CS	0.0925	0.0731	0.238	
PM-1	05/09	UF	DUP	-0.0041	0.041	0.139	
PM-1	08/08	UF	CS	0.0934	0.0475	0.123	
PM-1	11/28	UF	CS	0.0076	0.0273	0.0743	
PM-2	02/14	UF	CS	–0.0317	0.104	0.368	
PM-2	05/09	UF	CS	–0.0019	0.0694	0.235	
PM-2	05/09	UF	DUP	0.0542	0.0443	0.145	
PM-2	08/08	UF	CS	–0.031	0.0455	0.125	
PM-2	11/28	UF	CS	0.0301	0.0273	0.0725	
PM-2	11/28	UF	CS	–0.0126	0.0348	0.0953	
PM-3	05/09	UF	CS	–0.0447	0.0701	0.239	
PM-3	05/09	UF	DUP	0.0946	0.0473	0.15	
PM-3	08/08	UF	CS	0.0137	0.0665	0.286	
PM-3	11/28	UF	CS	0.0707	0.0278	0.0681	
PM-4	02/14	UF	CS	0.0159	0.119	0.415	
PM-4	05/09	UF	CS	0.224	0.0938	0.28	
PM-4	05/09	UF	DUP	0.0338	0.0531	0.176	
PM-4	08/08	UF	CS	0.081	0.0455	0.118	
PM-4	11/28	UF	CS	0.134	0.0373	0.0741	Detect
PM-4	11/28	UF	RE	–0.0516	0.0203	0.0613	
PM-5	02/14	UF	CS	0.0441	0.111	0.386	
PM-5	05/09	UF	CS	0.0387	0.0714	0.238	
PM-5	05/09	UF	DUP	–0.0558	0.0518	0.175	
PM-5	08/08	UF	CS	–0.0765	0.0562	0.25	
PM-5	11/28	UF	CS	0.0141	0.0328	0.089	
G-1A	02/14	UF	CS	–0.0156	0.0939	0.325	
G-1A	02/14	UF	DUP	0.0279	0.0937	0.328	
G-1A	05/09	UF	CS	0.0665	0.0614	0.201	
G-1A	05/09	UF	DUP	–0.0025	0.0441	0.15	
G-1A	05/09	UF	TRP	0.0895	0.0575	0.15	
G-1A	08/08	UF	CS	0.0326	0.0502	0.136	
G-1A	11/28	UF	CS	–0.0059	0.029	0.0793	
G-2A	05/09	UF	CS	0.0065	0.0527	0.178	
G-2A	05/09	UF	DUP	0.019	0.0432	0.118	
G-2A	08/08	UF	CS	0.0909	0.0478	0.124	
G-2A	11/28	UF	CS	–0.011	0.0318	0.087	
G-3A	02/14	UF	CS	0.0625	0.0671	0.229	
G-3A	02/14	UF	DUP	–0.0643	0.0564	0.201	
G-3A	05/09	UF	CS	–0.002	0.0595	0.201	
G-3A	05/09	UF	DUP	–0.0179	0.0449	0.123	
G-3A	08/08	UF	CS	0.0026	0.0438	0.12	
G-3A	11/28	UF	CS	0.0113	0.0201	0.0544	
G-4A	02/14	UF	CS	–0.128	0.0829	0.293	
G-4A	05/09	UF	CS	0.0446	0.0572	0.189	
G-4A	05/09	UF	DUP	0.0687	0.0476	0.125	
G-4A	08/08	UF	CS	–0.0241	0.0504	0.138	
G-4A	11/28	UF	CS	–0.0088	0.026	0.0712	

Table 5-22. Special Regional Aquifer Sampling for Strontium-90 During 2001 (pCi/L)[a] (Cont.)

Station Name	Date	Codes[b]		Result	Uncertainty	MDA	Detect?[c]
G-5A	08/08	UF	CS	0.0484	0.0423	0.113	
G-5A	11/28	UF	CS	–0.0134	0.0307	0.0841	

Water Quality Standards[d]

DOE DCG for Public Dose	1,000
DOE Drinking Water System DCG	40
EPA Primary Drinking Water Standard	8

[a]Three columns are listed: the first is the analytical result, the second is the radioactive counting uncertainty (1 standard deviation), and the third is the analytical laboratory measurement-specific minimum detectable activity.

[b]Codes: UF-unfiltered; F-filtered; CS-customer sample; RE-reanalysis; DUP-laboratory duplicate; TRP-laboratory triplicate.

[c]Detection defined as value ≥ 3 × uncertainty and ≥ detection limit.

[d]Standards given here for comparison only; see Appendix A.

Table 5-23. Special Water Supply Sampling for Tritium during 2001 (pCi/L)[a]

Station Name	Date	Result	Uncertainty	Detect?[b]
Los Alamos Water Supply Wells				
PM-1	02/14	1.34	0.29	Detect
PM-2	02/14	–0.13	0.29	
PM-3	05/09	–0.19	0.29	
PM-4	02/14	0.00	0.29	
PM-5	02/14	0.00	0.29	
O-1	01/09	29.06	0.96	Detect
O-1	01/09	30.33	0.96	Detect
O-1	02/14	38.00	1.28	Detect
O-1	02/14	36.40	1.28	Detect
O-1	03/13	32.57	0.96	Detect
O-1	03/13	33.53	0.96	Detect
O-1	04/11	28.10	0.96	Detect
O-1	05/09	35.44	1.28	Detect
O-1	06/13	33.85	1.28	Detect
O-1	07/11	33.53	0.96	Detect
O-1	08/08	31.29	0.96	Detect
O-1	09/05	27.59	0.89	Detect
O-1	09/05	26.69	0.93	Detect
O-1	10/24	24.46	0.80	Detect
O-1	10/24	23.18	0.77	Detect
O-1	11/28	32.89	0.96	Detect
O-1	12/15	40.23	1.28	Detect
O-4	02/14	–0.10	0.29	
G-1A	02/14	0.26	0.29	
G-2A	05/09	0.06	0.35	
G-3A	02/14	0.10	0.29	
G-4A	02/14	0.00	0.29	
G-5A	08/08	–0.10	0.29	
G-5A	08/08	0.16	0.29	
Santa Fe Water Supply Wells				
Buckman 1	08/16	0.00	0.29	
Buckman 1	10/31	–0.03	0.29	
Buckman 2	08/16	–0.19	0.29	
Buckman 2	10/31	0.29	0.29	
Buckman 3	10/31	0.03	0.29	
Buckman 4	10/31	–0.10	0.29	
Buckman 6	10/31	0.03	0.29	
Buckman 7	08/16	0.22	0.29	
Buckman 7	10/31	–0.35	0.29	
Buckman 8	10/31	–0.06	0.29	

[a]Two columns are listed: the first is the analytical result, and the second is the radioactive counting uncertainty (1 standard deviation).
[b]Detection defined as value ≥ 3 × uncertainty and ≥ detection limit.

Table 5-24. Chemical Quality of Groundwater in 2001 (mg/L[a])

Station Name	Date	Code[b]	SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+N O_2-N	ClO_4 (µg/L)	CN (Total)	TDS[c]	TSS[d]	Hardness ($CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Regional Aquifer Wells																					
Test Wells:																					
Test Well 1	06/05	F CS															306				
Test Well 1	06/05	UF CS	44.9	48.5	9.44	3.93	19.3	32.9	21.5	<[f]	0.725	104	0.379	0.07	5.8	1.37	< 0.0028	1.8	160	7.95	170
Test Well 3	06/04	F CS															174				
Test Well 3	06/04	UF CS	68.1	15.2	4.71	2.32	12	2.75	2.62	<	0.725	71.4	0.454	0.05	0.53	< 0.958	< 0.0028	1.4	57.5	7.74	130
Test Well 4	06/04	F CS															108				
Test Well 4	06/04	UF CS	27.7	9.78	5.34	2.39	10.5	1.74	< 0.06	<	0.725	60.6	0.227	0.07	0.01	< 0.958	< 0.0028	2	46.4	8.05	109
Test Well 8	06/04	F CS															150				
Test Well 8	06/04	F DUP															150				
Test Well 8	06/04	UF CS	64.3	11	3.78	1.64	10.4	1.77	1.96	<	0.725	57.3	0.188	0.06	0.23	3.26	< 0.0028	< 0.699	43	7.59	131
Test Well 8	06/04	UF DUP												0.08						7.59	131
Test Well 8	11/06	UF CS														2.37					
Test Well 8	11/06	UF DUP														1.74					
Test Well 8	11/06	UF CS														< 0.958					
Test Well DT-5A	06/06	F CS															140				
Test Well DT-5A	06/06	UF CS	66.9	8.47	2.35	1.75	11.1	1.46	1.35	<	0.725	47.5	0.25	0.06	0.29	< 0.958	< 0.0028	< 0.699	30.8	7.95	3.28
Test Well DT-9	06/07	F CS															143				
Test Well DT-9	06/07	UF CS	66.2	9.61	2.56	0.973	10.7	1.69	1.59	<	0.725	49.4	0.315	0.05	0.31	< 0.958	< 0.0028	< 0.699	34.6	8.04	125
Test Well DT-10	06/06	F CS															146				
Test Well DT-10	06/06	UF CS	60.7	11.1	3.24	1.33	11	1.44	1.35	<	1.45	56.4	0.271	0.07	0.23	< 0.958	< 0.0028	< 0.699	41	8.19	114
Test Well DT-10	06/06	UF DUP	60.6	11.1	3.24	1.33	10.9			<	1.45	55.5	0.282		0.23	< 0.958	< 0.0028				
Water Supply Wells:																					
O-1	05/09	F CS															164				
O-1	05/09	F DUP															175				
O-1	05/09	F TRP															171				
O-1	05/09	UF CS	69.6	19.3	3.09	3.66	21.4	5.36	6.04		1.44	89.4	0.452	< 0.0194	1.3		< 0.0028	< 1.06	61	8.07	158
O-1	05/09	UF DUP		20	3.2		22.2	5.38	6.15		1.39	88.4	0.462		1.26		< 0.0028	< 1.06		8.09	
O-1	05/09	F CS															167				
O-1	05/09	F DUP															173				
O-1	05/09	UF CS	69.7	19.5	3.11	3.65	22.2	5.25	5.95		1.52	88.4	0.464	< 0.0194	1.26		< 0.0028	< 0.699	61.4	8.1	157
O-4	05/09	F CS															214				
O-4	05/09	F DUP															216				
O-4	05/09	UF CS	96.7	21.9	8.88	3.7	20.8	6.91	4.98	<	0.725	117	0.343	< 0.0194	0.39		< 0.0028	< 0.699	91.4	7.31	187
PM-1	05/09	F CS															199				
PM-1	05/09	F DUP															204				
PM-1	05/09	UF CS	80.4	25.6	6.69	3.7	20	5.23	4.57		1.44	118	0.297	< 0.0194	0.48		0.0038	< 0.699	91.4	7.91	189
PM-2	05/09	F CS															143				
PM-2	05/09	F DUP															146				
PM-2	05/09	UF CS	93.5	10.7	3.88	2.25	12.1	1.95	1.96	<	0.725	58.8	0.326	< 0.0194	0.29		< 0.0028	1.6	42.6	7.68	97
PM-2	05/09	UF DUP																2			
PM-3	05/09	F CS															207				
PM-3	05/09	F DUP															213				
PM-3	05/09	UF CS	91.4	24.5	8.41	3.69	18	6.28	5.06		1.08	113	0.347	< 0.0194	0.46	1.35	< 0.0028	3	95.7	7.7	185
PM-3	05/09	UF DUP																3.2			
PM-4	05/09	F CS															141				
PM-4	05/09	F DUP															143				
PM-4	05/09	UF CS	91.9	10.3	3.76	2.1	11.4	1.73	2	<	0.725	56.3	0.312	< 0.0194	0.28		< 0.0028	< 0.699	41.2	7.63	154
PM-5	05/09	F CS															147				
PM-5	05/09	F DUP															156				

Table 5-24. Chemical Quality of Groundwater in 2001 (mg/L[a]) (Cont.)

Station Name	Date	Code[b]	SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+N O_2-N	ClO_4 (µg/L)	CN (Total)	TDS[c]	TSS[d]	Hardness ($CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Regional Aquifer Wells (Cont.)																					
Water Supply Wells: (Cont.)																					
PM-5	05/09	UF CS	94.1	10.8	4.25	2.09	12.5	1.97	2.21	< 0.725	65.3	0.303	< 0.0194	0.27	< 0.958	< 0.0028		< 0.699	44.5	7.73	96
PM-5	05/09	UF DUP																			96
G-1A	05/09	F CS															177				
G-1A	05/09	F DUP															178				
G-1A	05/09	UF CS	74.1	10	0.47	2.63	33.2	2.9	3.86	1.71	82.9	0.629	< 0.0194	0.42		< 0.0028		< 0.699	26.9	8.17	143
G-1A	05/09	UF DUP	70.1	9.99	0.46	2.62	31.7	2.87	3.86					0.42						8.18	
G-2A	05/09	F CS															148				
G-2A	05/09	F DUP															149				
G-2A	05/09	UF CS	59.6	11	0.91	2.09	25.7	2.01	3.19	0.776	77.9	0.433	< 0.0194	0.41	< 0.958	< 0.0028		< 0.699	31.2	8.14	120
G-3A	05/09	F CS															136				
G-3A	05/09	F DUP															138				
G-3A	05/09	UF CS	52.6	16.3	3.02	1.88	14.9	2.29	3.13	0.907	75.9	0.344	< 0.0194	0.58		< 0.0028		< 0.699	53.2	8.05	116
G-4A	05/09	F CS															138				
G-4A	05/09	F DUP															143				
G-4A	05/09	UF CS	53.8	16	3.11	1.96	13.2	2.16	2.88	0.77	73.9	0.303	< 0.0194	0.51		< 0.0028		< 0.699	52.7	8.1	215
G-4A	05/09	UF DUP											< 0.0194								
Regional Aquifer Springs																					
White Rock Canyon Group I:																					
Sandia Spring	09/24	F CS	55.3	35.5	4.26	2.64	15	3.56	5.89	< 0.725	145	0.662	0.02	0.05			206		106	7.22	259
Sandia Spring	09/24	F CS	55.2	36.2	4.33	2.69	15.3	3.49	5.84	< 0.725	116	0.623	< 0.0194	0.04			198		108	7.22	258
Sandia Spring	09/24	UF CS													< 0.958	< 0.0029		< 0.699			
Sandia Spring	09/24	UF CS													< 0.958	< 0.0029		< 0.699			
Spring 3	09/24	F CS	51.3	22.8	1.9	2.97	16	4.35	5.31	0.735	131	0.457	< 0.0194	1.27			167		64.8	7.9	198
Spring 3	09/24	UF CS													< 0.958	< 0.0029		7.45			
Spring 4	09/24	UF CS													< 0.958	< 0.0029		6.54			
Spring 4	09/24	UF DUP													< 0.958	< 0.0029		8.46			
Spring 4	09/24	UF CS	57.3	23.4	4.66	2.73	13.8	5.72	8.54	< 0.725	72.5	0.511	0.02	1.23			173		77.5	7.48	206
Spring 4	09/24	UF DUP	59.2	23.3	4.65	2.72	13.7	5.7	8.72	< 0.725	73.1	0.519	0.02	1.25			165			7.5	206
Spring 4	11/01	UF CS													2.35						
Spring 4B	03/09	UF CS													6.62						
Spring 4B	03/09	UF RE													< 0.801						
Spring 4B	11/01	UF CS													1.4						
Spring 4C	11/01	UF CS													2.63						
Spring 4C	11/01	UF DUP													2.5						
Spring 4A	09/25	F CS	74	20.6	4.75	2.3	12.4	4.37	5.34	< 0.725	87	0.472	< 0.0194	0.86			171		71.1	7.94	181
Spring 4A	09/25	UF CS													< 0.958	< 0.0029		< 0.672			
Spring 4A	09/25	UF DUP													< 0.958						
Spring 4A	11/01	UF CS													1.71						
Spring 4AA	11/01	UF CS													1.57						
Spring 5	09/25	F CS	70.2	18.5	4.76	2.02	11.9	3.91	4.62	< 0.725	87	0.42	< 0.0194	0.7			163		65.8	7.97	176
Spring 5	09/25	UF CS													1.29	< 0.0029		3.27			
Ancho Spring	10/24	F CS	74.6	12.1	2.96	1.84	10.4	1.89	2.21	< 0.725	71.4	0.315	< 0.0194	0.34			144		42.4	7.45	118
Ancho Spring	10/24	F DUP	78.5	12.4	3.03	1.88	10.6	1.85	2.32	< 0.725	71.4	0.314	< 0.0194	0.34			147			7.47	118
Ancho Spring	10/24	UF CS													< 0.958	< 0.0029		8.2			
Ancho Spring	10/24	UF DUP													< 0.958	< 0.0029		7			

Table 5-24. Chemical Quality of Groundwater in 2001 (mg/L[a]) (Cont.)

Station Name	Date	Code[b]	SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+N O_2-N	ClO_4 (µg/L)	CN (Total)	TDS[c]	TSS[d]	Hardness ($CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Regional Aquifer Springs (Cont.)																					
White Rock Canyon Group II:																					
Spring 6A	09/25	UF CS													< 0.958	< 0.0029		117			
Spring 6A	09/25	F CS	78.9	11.7	2.58	1.89	11.4	2.15	2.72	< 0.725	81.2	0.39	< 0.0194	0.38			149		39.9	7.18	130
Spring 9	09/25	UF CS													< 0.958	< 0.0029		11.7			
Spring 9	09/26	F CS	77.9	11	3.09	1.6	11.4	1.91	2.14	< 0.725	59.2	0.425	< 0.0194	0.15			147		40.1	7.64	125
Spring 9	09/26	F DUP																		7.68	
White Rock Canyon Group III:																					
Spring 1	09/24	UF CS													< 0.958	< 0.0029		60.9			
Spring 1	09/24	F CS	36.1	18.8	1.21	2.29	32	2.7	6.18	0.835	110	0.565	0.03	0.23			167		51.8	7.86	224
Spring 2	09/24	UF CS													< 0.958	< 0.0029		10.7			
Spring 2	09/24	F CS	34.7	16.3	0.7	1.6	51.7	2.84	5.12	2.07	151	1.16	0.02	0.01			204		43.6	8.18	274
White Rock Canyon Group IV:																					
La Mesita Spring	10/23	UF CS													< 0.958	< 0.0029		715			
La Mesita Spring	10/23	F CS	29.7	36.1	1.19	4.92	34.6	6.44	13.4	0.969	125	0.234	0.02	2.41			207		94.9	7.94	279
Other Springs:																					
Sacred Spring	10/23	F CS	45	31.3	1.39	2.76	21.7	2.6	7.32	0.775	117	0.436	0.03	0.2			177		83.8	7.55	223
Sacred Spring	10/23	F DUP	44.4	30.8	1.37	2.74	21.4	2.67	7.46	0.81	120	0.446	< 0.0194	0.2			179			7.56	222
Sacred Spring	10/23	UF CS													< 0.958	< 0.0029		260			
Sacred Spring	10/23	UF DUP													1.95	< 0.0029		294			
Sacred Spring	10/23	F CS	44.2	30.8	1.37	2.65	21.3	2.51	7.17	0.741	110	0.446	0.04	0.19			177		82.5	7.78	226
Sacred Spring	10/23	UF CS													< 0.958	< 0.0029		3.2			
Canyon Alluvial Groundwater Systems																					
Acid/Pueblo Canyons:																					
APCO-1	04/03	UF CS	61.1		7.17										< 0.801	< 0.0028		3.2			
APCO-1	04/03	UF DUP	60.1	35.4	7.08	14.5	59.5									< 0.0028					
APCO-1	04/03	F CS	61.9	35.6	7.12	14.5	58.5	45.5	3.18	< 1.45	211	0.452	4.75	0.52			377		118	6.82	604
APCO-1	04/03	F DUP															385			6.81	605
DP/Los Alamos Canyons:																					
LAO-C	04/03	UF CS													< 0.801	< 0.0028		< 1.4			
LAO-C	04/03	F CS	37.7	16.7	3.93	3.54	42.8	50.5	17.6	< 1.45	52.3	0.131	< 0.0194	0.32			251		57.8	6.65	352
LAO-C	04/03	F DUP						50.5	17.6												
LAO-0.7	03/29	UF CS													< 0.801	< 0.0028		46.4			
LAO-0.7	03/29	UF DUP														0.0031		42.2			
LAO-0.7	03/29	F CS	28.7	20.2	4.15	3.27	42.6	61.3	14.3	< 0.725	56.4	0.15	0.07	0.55			232		67.6	7.13	276
LAO-0.7	03/29	F DUP	28.9	20.3	4.17	3.29	43.9	61.2	13.8	< 0.725	58.4						224			7.13	275
LAO-1	04/05	UF CS													< 0.801	< 0.0028		2.8			
LAO-1	04/05	UF DUP													< 0.801						
LAO-1	04/05	F CS	30.3	26	5.5	3.9	45.2	77.7	13.6	< 1.45	61.3	0.179	0.03	0.49			267		87.7	7.33	291
LAO-1	04/05	F DUP	30.6	26.3	5.54	3.9	43.4	77.5	13.8			0.17	0.02							7.34	292
DP Spring	04/03	F CS	12.4	30.7	3.2	10.8	56.1	106	11.4	< 1.45	53.3	0.7	0.03	0.49			321		89.9	7.5	555
DP Spring	04/03	UF CS													< 0.801	< 0.0028		1.6			
LAO-2	03/29	UF CS													< 0.801	< 0.0028		< 0.699			
LAO-2	03/29	F CS	37.4	28	6.48	8.33	36.5	69.6	12.1	< 0.725	63	0.514	0.06	0.58			270		96.5	6.81	316
LAO-3A	03/28	UF CS													1.17	< 0.0028		1.4			
LAO-3A	03/28	F CS	49.6	30	7.24	6.13	36.2	66.2	13.3	< 0.725	76.4	0.487	0.12	0.85			275		105	7.58	310
LAO-3A	03/28	F CS	49	29.5	7.13	6.08	35.6	65.7	13.8	< 0.725	74.8	0.495	0.11	0.84			272		103	7.2	304
LAO-3A	03/28	UF CS				5.99									1.28	< 0.0028		< 0.699			
LAO-4	04/05	UF CS													< 0.801	< 0.0028		< 1.4			

Table 5-24. Chemical Quality of Groundwater in 2001 (mg/L[a]) (Cont.)

Station Name	Date	Code[b]		SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+NO_2-N	ClO_4 (µg/L)	CN (Total)	TDS[c]	TSS[d]	Hardness ($CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Canyon Alluvial Groundwater Systems (Cont.)																						
DP/Los Alamos Canyons: (Cont.)																						
LAO-4	04/05	F	CS	35.2	21.2	5.72	5.3	29.1	42.6	14	< 1.45	67.3	0.491	< 0.0194	0.19			217		76.5	7.05	221
LAO-4.5C	03/28	UF	CS													< 0.801	< 0.0028		0.889			
LAO-4.5C	03/28	F	CS	34.4	16.6	4.92	4.74	32.8	46.9	12.7	< 0.725	56.4	0.577	< 0.0194	< 0.0069			201		61.7	7.26	231
LAO-6A	03/28	UF	CS													< 0.801	< 0.0028		< 0.699			
LAO-6A	03/28	F	CS	38	15.4	4.91	3.6	35	46.4	13.4	< 0.725	55.4	0.456	< 0.0194	0.13			199		58.8	7.14	227
Mortandad Canyon:																						
MCO-3	03/12	F	CS										0.793		1.46			259				
MCO-3	03/12	F	DUP										0.805					262				
MCO-3	03/12	UF	CS													140						
MCO-3	05/24	F	CS										0.705		2.72			338				
MCO-3	05/24	F	DUP										0.705		2.76			350				
MCO-3	05/24	F	TRP															346				
MCO-3	05/24	UF	CS													107						
MCO-3	07/31	UF	CS		46.4											114	< 0.0029		< 0.647			
MCO-3	07/31	F	CS	47.3	45.2	2.96	8.17	68.9	19.5	89.1	< 0.725	149	0.435	0.04	3.48			425		125	7.57	507
MCO-3	09/07	F	CS										0.667		3.06	53.6		347				
MCO-3	09/07	F	DUP										0.657		3.06	57.1		336				
MCO-3	11/16	F	CS										0.585		3.87	132		405				
MCO-4B	05/24	F	CS										1.07		4.22			311				
MCO-4B	05/24	F	DUP															312				
MCO-4B	05/24	UF	CS													157						
MCO-5	08/02	UF	CS		31.9											157	< 0.0029		0.943			
MCO-5	08/02	UF	DUP	32.9	31.7	3.05	13.6	53.1								156	< 0.0029					
MCO-5	08/02	F	CS	33.1	31.1	2.95	15	55	25.6	38	0.739	141	0.743	0.02	2.88			335		89.7	7.5	576
MCO-5	08/02	F	DUP																		7.49	
MCO-6	03/12	F	CS										1.43		4.77			289				
MCO-6	03/12	UF	CS													220						
MCO-6	05/24	F	CS										1.44		4.64			313				
MCO-6	05/24	F	DUP															313				
MCO-6	05/24	F	CS										1.51		4.46			312				
MCO-6	05/24	F	DUP															314				
MCO-6	05/24	UF	CS													145						
MCO-6	05/24	UF	CS													139						
MCO-6	08/06	F	CS	33.6	32.2	2.96	15.6	54	25.3	36.6	< 0.725	141	1.34	0.04	3.9			323		92.7	7.28	486
MCO-6	08/06	F	DUP						26	36.2			1.35					317			7.29	
MCO-6	09/10	F	CS										1.22		4.02	139		319				
MCO-6	11/16	F	CS										1.24		2.91	109		329				
MCO-6	11/16	F	DUP															326				
MCO-7	03/12	F	CS										1.56		9.2			330				
MCO-7	03/12	F	CS										1.61		9.05			331				
MCO-7	03/12	UF	CS													180						
MCO-7	05/24	F	CS										1.74		6.88			320				
MCO-7	05/24	F	DUP															326				
MCO-7	05/24	UF	CS													141						
MCO-7	08/07	F	CS	33.2	19	4.68	11.5	79.3	13.9	33.7	< 0.725	160	1.79	0.04	10.9			357		66.7	7.21	198
MCO-7	09/10	F	CS										1.61		5.37	148		308				
MCO-7.5	08/07	UF	DUP	33.6	18.8	4.64	11.5	80.6								204						
MCO-7.5	08/07	F	CS	35.7	18.1	4.38	16.6	61.4	19.8	31.6	1.44	139	1.72	0.29	5.75			318		63.2	8.06	256

Table 5-24. Chemical Quality of Groundwater in 2001 (mg/L[a]) (Cont.)

Station Name	Date	Code[b]	SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+N O_2-N	ClO_4 (µg/L)	CN (Total)	TDS[c]	TSS[d]	Hardness ($CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
Canyon Alluvial Groundwater Systems (Cont.)																					
Cañada del Buey:																					
CDBO-6	05/01	F CS	61	12.4	2.91	2.11	19.8	17.7	8.37	< 1.45	54.3	0.229	0.14	0.06			175		42.9	6.94	52.1
CDBO-6	05/01	F DUP	60.1	12.7	2.96	2.16	20.3					0.221		0.06			172			6.95	52
CDBO-6	05/01	F TRP															183				
CDBO-6	05/01	UF CS													2.38	0.0052		25.6			
CDBO-6	05/01	UF DUP																28			
CDBO-6	09/10	F CS						16.4						0.07			172				
CDBO-6	11/07	UF CS														< 0.0029					
CDBO-6	11/07	UF DUP														< 0.0029					
CDBO-6	11/07	F CS										0.148		9.1			165				
CDBO-6	11/07	F DUP						15.5	9.37			0.156		9.1			169				
Pajarito Canyon:																					
PCO-1	04/10	F CS	35.8	36	10.5	5.15	44.4	101	19.2	< 1.45	48.2	0.095	< 0.0194	2.27			326		133	1.25	335
PCO-1	04/10	F DUP										0.096					338			1.24	336
PCO-1	04/10	UF CS	37												< 0.801	< 0.0028		1.8			
PCO-1	04/10	UF DUP	38	37.2	10.9	5.29	48.7									< 0.0028					
PCO-1	04/10	F CS	36.9	36.3	10.6	5.23	43.1	99.7	18.7	< 1.45	50.3	0.093	< 0.0194	2.25			308		134	1.19	410
PCO-1	04/10	F DUP															330				
PCO-1	04/10	UF CS	37.4												< 0.801	< 0.0028		1			
PCO-1	04/10	UF DUP																1.2			
PCO-3	04/10	F CS	38.6	91.2	20.2	2.47	280	204	131	< 1.45	359	0.394	< 0.0194	< 0.0069			1020		311	1.22	1140
PCO-3	04/10	F DUP															984				
PCO-3	04/10	UF CS	39.1												< 3.2	0.0072		1.52			
PCO-3	04/10	UF DUP																1.82			
PCO-3	04/10	UF TRP																1.82			
Intermediate Perched Groundwater Systems																					
Pueblo/Los Alamos/Sandia Canyon Area Perched System in Conglomerates and Basalt:																					
POI-4	08/01	F CS															355				
POI-4	08/01	UF CS	53	42.1	10.7	8.01	41.1	38.9	21.6	2.52	164	0.217	1.1	2.23	1.73	< 0.0029		0.5	149	8.24	165
Test Well 2A	07/30	UF CS		34.8									< 0.0194	< 0.0069	< 0.958						
Basalt Spring	10/23	F CS	58.5	42.8	10.6	13	50.5	34.7	19.7	< 0.725	189	0.325	1.68	1.2			359		151	6.93	468
Basalt Spring	10/23	UF CS													1.3	< 0.0029		26			
Perched Groundwater System in Volcanics:																					
Water Canyon Gallery	11/29	F CS	36	6	2.4	1.39	4.87	0.98	1.68	< 0.725	43.4	0.08	0.13	0.33			100		24.9	7.59	60.8
Water Canyon Gallery	11/29	F DUP	36.7	6.11	2.44	1.42	4.97	0.98	1.74			0.08	0.12	0.33			101			7.6	60.8
Water Canyon Gallery	11/29	UF CS													2.35	< 0.0029		16			
Water Canyon Gallery	11/29	UF DUP														0.003		17.2			
San Ildefonso Pueblo																					
LA-5	06/19	F CS															133				
LA-5	06/19	UF CS	38	17.8	0.59	2.11	18.2	2.44	4.91	0.824	94.8	0.464	0.04	0.51	< 0.958	< 0.0028		< 0.699	46.8	8.34	165
Eastside Artesian Well	06/20	F CS															240				
Eastside Artesian Well	06/20	UF CS	2.62	3.32	0.18	0.963	96.5	3.51	15.9	15.9	197	0.885	0.03	0.01	< 0.958	< 0.0028		< 0.699	9.04	9.05	388
Pajarito Well (Pump 1)	06/19	F CS															876				
Pajarito Well (Pump 1)	06/19	UF CS	33.9	45.1	4.33	4	296	159	47.6	4.13	433	0.977	0.09	0.33	< 0.958	< 0.0028		< 0.699	131	7.53	1370
Pajarito Well (Pump 1)	06/19	UF DUP											0.1	0.32		< 0.0028				7.54	1380
Pajarito Well (Pump 1)	06/19	F CS															860				
Pajarito Well (Pump 1)	06/19	UF CS	34.4	44.9	4.31	3.94	290	158	46	4.37	448	0.962	0.04	0.32	< 0.958	< 0.0028		< 0.699	130	7.97	1360

Table 5-24. Chemical Quality of Groundwater in 2001 (mg/L[a]) (Cont.)

Station Name	Date	Code[b]	SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+N O_2-N	ClO_4 (µg/L)	CN (Total)	TDS[c]	TSS[d]	Hardness ($CaCO_3$)	Lab pH[e]	Conductance (µS/cm)
San Ildefonso Pueblo (Cont.)																					
Don Juan Playhouse Well	06/20	F CS															229				
Don Juan Playhouse Well	06/20	UF CS	24.8	6.51	0.49	0.987	73.1	3.32	16.6	3.4	141	0.653	0.03	2	< 0.958	< 0.0028		< 0.699	18.3	8.69	321
Martinez House Well	12/04	UF CS	38.6					13.4	25.3	< 1.45	179	0.636	0.09	3.39	< 0.801	0.0044	277	< 1.4		8.25	315
Martinez House Well	12/04	UF DUP	39.3							< 1.45	174		0.11		2.42	0.0048	283	< 1.4		8.25	
Otowi House Well	06/19	F CS															386				
Otowi House Well	06/19	F DUP															381				
Otowi House Well	06/19	UF CS	56.3	69.8	5.36	3.59	43.6	36.6	27.5	< 0.725	195	0.385	0.05	1.02	< 0.958	< 0.0028		< 0.699	196	7.2	543
Otowi House Well	06/19	UF DUP	56.1	69.7	5.35	3.53	43.3			< 0.725	195	0.41			< 0.958			< 0.699			
New Community Well	06/19	F CS															299				
New Community Well	06/19	UF CS	25.6	18.5	1.04	0.975	87.8	7.75	34.9	3.23	179	0.168	0.04	1.67	1.04	< 0.0028		< 0.699	50.6	8.28	447
Santa Fe Water Supply Wells																					
Buckman 1	08/16	UF CS												1.17	< 0.958						
Buckman 1	10/31	UF CS		11.5	0.84	2.59	102	2.58	14.1	3.12	249	0.683		1.13	1.89		306				
Buckman 1	10/31	UF DUP		11.6	0.84	2.61	101	2.68	14.5	2.76	236	0.689		1.13	< 0.958		310				
Buckman 2	08/16	UF CS												0.79	< 0.958						
Buckman 2	10/31	UF CS		45.9	7.76	5.06	124	3.16	21.7	1.13	417	0.392		1.18	2.65		475				
Buckman 3	10/31	UF CS		41.2	5.69	5.42	114	3.22	21.5	1.7	362	0.435		1.6	< 0.958		414				
Buckman 4	10/31	UF CS		87.9	12.3	6.76	103	3.99	18.3	< 0.725	501	0.281		1.4	< 0.958		537				
Buckman 6	10/31	UF CS		65.7	8.81	5.16	87.6	3.44	18.3	< 0.725	399	0.477		1.5	< 0.958		441				
Buckman 7	08/16	UF CS												1.42							
Buckman 7	08/16	UF DUP												1.41	< 0.958						
Buckman 7	10/31	UF CS		34.4	4.92	4.57	85.1	3.2	22.7	1.98	273	0.432		1.55	< 0.958		323				
Buckman 8	10/31	UF CS		14.5	2.19	2.56	98.1	1.87	8.79	1.96	242	0.439		0.62	1.25		296				
Buckman 8	10/31	UF CS		14.5	2.19	2.56	98.1	1.93	8.41	1.87	252	0.435		0.63	2.16		292				
Water Quality Standards[g]																					
EPA Primary Drinking Water Standard									500			4		10		0.2					
EPA Secondary Drinking Water Standard								250	250								500			6.8-8.5	
EPA Health Advisory							20														
NMWQCC Groundwater Limit								250	600			2		10		0.2	1,000			6-9	

[a]Except where noted.
[b]Codes: UF-unfiltered; F-filtered; CS-customer sample; DUP-laboratory duplicate; TRP-laboratory triplicate.
[c]Total dissolved solids.
[d]Total suspended solids.
[e]Standard units.
[f]Less than symbol (<) means measurement was below the specified limit of detection of the analytical method.
[g]Standards given here for comparison only; see Appendix A.

Table 5-25. Perchlorate in Groundwater during 2001 (µg/L)[a]

Station Name	Sample Date	Analysis Date	Codes[b]	Field QC Type Code[c]	Result	MDL	Lab Qual Code[d]	Valid Flag Code[d]	Lab[e]
Regional Aquifer Wells									
Test Wells:									
Test Well 1	06/05/01	06/19/01	UF	CS	1.37	0.958	J		GELC
Test Well 3	06/04/01	06/19/01	UF	CS	<0.958	0.958	U		GELC
Test Well 4	06/04/01	06/19/01	UF	CS	<0.958	0.958	U		GELC
Test Well 8	06/04/01	06/19/01	UF	CS	FB <0.958	0.958	U		GELC
Test Well 8	06/04/01	06/19/01	UF	CS	3.26	0.958	J		GELC
Test Well 8	11/06/01	12/04/01	UF	CS	FD <0.25	0.25	U		ACCU
Test Well 8	11/06/01	12/04/01	UF	CS	<0.25	0.25	U		ACCU
Test Well 8	11/06/01	12/02/01	UF	CS	<0.958	0.958	U		GELC
Test Well 8	11/06/01	12/02/01	UF	CS	2.37	0.958	J		GELC
Test Well 8	11/06/01	12/02/01	UF	DUP	1.74	0.958	J		GELC
Test Well DT-5A	06/06/01	06/19/01	UF	CS	<0.958	0.958	U		GELC
Test Well DT-9	06/07/01	06/19/01	UF	CS	<0.958	0.958	U		GELC
Test Well DT-10	06/06/01	06/19/01	UF	DUP	<0.958	0.958	U		GELC
Test Well DT-10	06/06/01	06/19/01	UF	CS	<0.958	0.958	U		GELC
Water Supply Wells:									
O-1	01/09/01	01/10/01	UF	CS	1.5	1	J		BABC
O-1	01/09/01	01/10/01	UF	CS	1.5	1	J		BABC
O-1	02/14/01	02/21/01	UF	CS	<1.2	1.2	U		BABC
O-1	02/14/01	02/21/01	UF	CS	FB <1.2	1.2	U		BABC
O-1	02/14/01	03/05/01	UF	CS	<0.958	0.958	U	UJ	GELC
O-1	02/14/01	03/05/01	UF	CS	FD <0.958	0.958	U	UJ	GELC
O-1	03/13/01	03/20/01	UF	CS	<1.2	1.2	U		BABC
O-1	04/11/01	04/18/01	UF	CS	<1.2	1.2	U		BABC
O-1	04/11/01	04/18/01	UF	CS	<1.2	1.2	U		BABC
O-1	04/11/01	04/18/01	UF	CS	<1.2	1.2	U		BABC
O-1	04/11/01	04/18/01	UF	CS	<1.2	1.2	U		BABC
O-1	04/11/01	05/01/01	UF	CS	<0.801	0.801	U		GELC
O-1	04/11/01	05/01/01	UF	CS	2.24	0.801	J		GELC
O-1	04/11/01	05/01/01	UF	CS	1.18	0.801	J		GELC
O-1	04/11/01	05/01/01	UF	CS	1.16	0.801	J		GELC
O-1	05/09/01	05/18/01	UF	CS	<1.2	1.2	U		BABC
O-1	06/13/01	06/28/01	UF	CS	<2.17	2.17	U		BABC
O-1	06/13/01	06/20/01	UF	DUP	1.71	0.958	J		GELC
O-1	06/13/01	06/20/01	UF	CS	1.12	0.958	J		GELC
O-1	07/11/01	08/06/01	UF	CS	5.85	0.958			GELC
O-1	07/11/01	08/06/01	UF	CS	3.74	0.958	J		GELC
O-1	08/08/01	08/30/01	UF	CS	3.48	0.958	J		GELC
O-1	08/08/01	08/30/01	UF	CS	FD 3.32	0.958	J		GELC
O-1	08/08/01	10/03/01	UF	CS	<0.958	0.958	U		GELC
O-1	09/05/01	09/12/01	UF	CS	<2.17	2.17	U		BABC
O-1	09/05/01	09/12/01	UF	CS	FD <2.17	2.17	U		BABC
O-1	09/05/01	10/01/01	UF	TRP	<2.17	2.17	U		BABC
O-1	09/05/01	10/01/01	UF	DUP	<2.17	2.17	U		BABC
O-1	09/05/01	09/14/01	UF	CS	3.86	0.958	J		GELC
O-1	09/05/01	10/03/01	UF	DUP	3.24	0.958	J		GELC

Table 5-25. Perchlorate in Groundwater during 2001 (µg/L)[a] (Cont.)

Station Name	Sample Date	Analysis Date	Codes[b]	Field QC Type Code[c]	Result	MDL	Lab Qual Code[d]	Valid Flag Code[d]	Lab[e]
Regional Aquifer Wells (Cont.)									
Water Supply Wells: (Cont.)									
O-1	09/05/01	10/03/01	UF	TRP	2.55	0.958	J		GELC
O-1	09/05/01	10/04/01	UF	QUD	3.07	0.958	J		GELC
O-1	09/05/01	10/04/01	UF	QNT	2.92	0.958	J		GELC
O-1	10/24/01	12/04/01	UF	CS	<2.1	0.25	B		ACCU
O-1	10/24/01	11/05/01	UF	CS	<2.17	2.17	U		BABC
O-1	10/24/01	11/01/01	UF	CS	3.16	0.958	J	J	GELC
O-1	11/28/01	01/21/02	UF	CS	2	0.25			ACCU
O-1	11/28/01	12/04/01	UF	CS	<2.17	2.17	U		BABC
O-1	11/28/01	12/02/01	UF	CS	3.27	0.958	J		GELC
O-1	12/15/01	01/22/02	UF	CS	1.8	0.25			ACCU
O-1	12/15/01	01/22/02	UF	DUP	1.7	0.25			ACCU
O-1	12/15/01	12/18/01	UF	CS	<1.51	1.51	U		BABC
O-1	12/15/01	12/28/01	UF	CS	3.04	0.801	J		GELC
O-4	02/14/01	02/21/01	UF	CS	<1.2	1.2	U		BABC
O-4	02/14/01	03/05/01	UF	CS	<0.958	0.958	U	UJ	GELC
O-4	08/08/01	08/30/01	UF	CS	1.65	0.958	J		GELC
O-4	08/08/01	10/10/01	UF	CS	1.43	0.958	J		GELC
O-4	10/24/01	12/04/01	UF	CS	<0.55	0.25	B		ACCU
O-4	10/24/01	11/05/01	UF	CS	<2.17	2.17	U		BABC
O-4	10/24/01	11/02/01	UF	CS	<0.958	0.958	U	UJ	GELC
O-4	11/28/01	01/21/02	UF	CS	<0.25	0.25	U		ACCU
O-4	11/28/01	12/04/01	UF	CS	<2.17	2.17	U		BABC
O-4	11/28/01	12/02/01	UF	CS	3.6	0.958	J		GELC
PM-1	02/14/01	02/21/01	UF	CS	<1.2	1.2	U		BABC
PM-1	02/14/01	03/05/01	UF	CS	<0.958	0.958	U	UJ	GELC
PM-1	05/09/01	05/25/01	UF	CS	FB	<0.958	0.958	U		GELC
PM-1	08/08/01	08/28/01	UF	CS	2.12	0.958	J	U	GELC
PM-1	08/08/01	10/03/01	UF	CS	1.88	0.958	J		GELC
PM-1	10/24/01	12/04/01	UF	CS	<0.52	0.25	B		ACCU
PM-1	10/24/01	11/05/01	UF	CS	<2.17	2.17	U		BABC
PM-1	10/24/01	11/01/01	UF	CS	1.3	0.958	J	R	GELC
PM-1	11/28/01	01/21/02	UF	DUP	<0.25	0.25	U		ACCU
PM-1	11/28/01	01/21/02	UF	CS	<0.25	0.25	U		ACCU
PM-1	11/28/01	12/04/01	UF	CS	<2.17	2.17	U		BABC
PM-1	11/28/01	12/02/01	UF	CS	1.92	0.958	J		GELC
PM-2	02/14/01	02/21/01	UF	CS	<1.2	1.2	U		BABC
PM-2	02/14/01	03/05/01	UF	CS	<0.958	0.958	U	UJ	GELC
PM-2	08/08/01	08/28/01	UF	CS	<0.958	0.958	U		GELC
PM-2	11/28/01	01/21/02	UF	CS	<0.25	0.25	U		ACCU
PM-2	11/28/01	12/04/01	UF	CS	<2.17	2.17	U		BABC
PM-2	11/28/01	12/02/01	UF	CS	<0.958	0.958	U		GELC
PM-2	11/28/01	12/02/01	UF	CS	FD	1.54	0.958	J		GELC
PM-3	04/11/01	04/18/01	UF	CS	<1.2	1.2	U		BABC
PM-3	04/11/01	04/18/01	UF	CS	<1.2	1.2	U		BABC
PM-3	04/11/01	04/18/01	UF	CS	<1.2	1.2	U		BABC
PM-3	04/11/01	04/18/01	UF	CS	<1.2	1.2	U		BABC

Table 5-25. Perchlorate in Groundwater during 2001[a] (µg/L) (Cont.)

Station Name	Sample Date	Analysis Date	Codes[b]	Field QC Type Code[c]	Result	MDL	Lab Qual Code[d]	Valid Flag Code[d]	Lab[e]
Regional Aquifer Wells (Cont.)									
Water Supply Wells: (Cont.)									
PM-3	04/11/01	05/01/01	UF	CS	<0.801	0.801	U		GELC
PM-3	04/11/01	05/01/01	UF	CS	2.29	0.801	J		GELC
PM-3	04/11/01	05/02/01	UF	CS	<0.801	0.801	U		GELC
PM-3	04/11/01	05/02/01	UF	CS	1.01	0.801	J		GELC
PM-3	05/09/01	05/18/01	UF	CS	<1.2	1.2	U		BABC
PM-3	05/09/01	05/25/01	UF	CS	1.35	0.958	J		GELC
PM-3	06/13/01	06/28/01	UF	CS	<2.17	2.17	U		BABC
PM-3	06/13/01	06/20/01	UF	CS	<0.958	0.958	U		GELC
PM-3	07/11/01	08/06/01	UF	CS	<0.958	0.958	U		GELC
PM-3	07/11/01	08/06/01	UF	CS	3.96	0.958	J		GELC
PM-3	08/08/01	08/30/01	UF	DUP	<0.958	0.958	U		GELC
PM-3	08/08/01	08/30/01	UF	CS	<0.958	0.958	U		GELC
PM-3	09/05/01	09/12/01	UF	CS	<2.17	2.17	U		BABC
PM-3	09/05/01	09/12/01	UF	CS	FD <2.17	2.17	U		BABC
PM-3	09/05/01	10/01/01	UF	TRP	<2.17	2.17	U		BABC
PM-3	09/05/01	10/01/01	UF	DUP	<2.17	2.17	U		BABC
PM-3	09/05/01	09/14/01	UF	CS	<0.958	0.958	U		GELC
PM-3	09/05/01	09/14/01	UF	CS	FD 2.56	0.958	J		GELC
PM-3	09/05/01	10/04/01	UF	QUD	<0.958	0.958	U		GELC
PM-3	09/05/01	10/04/01	UF	DUP	<0.958	0.958	U		GELC
PM-3	09/05/01	10/04/01	UF	QNT	1.62	0.958	J		GELC
PM-3	09/05/01	10/04/01	UF	TRP	1.47	0.958	J		GELC
PM-3	10/24/01	12/04/01	UF	DUP	<0.58	0.25	B		ACCU
PM-3	10/24/01	12/04/01	UF	QUD	<0.57	0.25	B		ACCU
PM-3	10/24/01	12/04/01	UF	TRP	<0.57	0.25	B		ACCU
PM-3	10/24/01	12/04/01	UF	QNT	<0.51	0.25	B		ACCU
PM-3	10/24/01	12/04/01	UF	CS	<0.5	0.25	B		ACCU
PM-3	10/24/01	11/02/01	UF	QUD	<2.17	2.17	U		BABC
PM-3	10/24/01	11/02/01	UF	DUP	<2.17	2.17	U		BABC
PM-3	10/24/01	11/02/01	UF	CS	<2.17	2.17	U		BABC
PM-3	10/24/01	11/02/01	UF	TRP	<2.17	2.17	U		BABC
PM-3	10/24/01	11/02/01	UF	QNT	<2.17	2.17	U		BABC
PM-3	10/24/01	11/19/01	UF	DUP	<0.958	0.958	U		GELC
PM-3	10/24/01	11/19/01	UF	QNT	<0.958	0.958	U		GELC
PM-3	10/24/01	11/19/01	UF	QUD	<0.958	0.958	U		GELC
PM-3	10/24/01	11/19/01	UF	TRP	<0.958	0.958	U		GELC
PM-3	10/24/01	11/19/01	UF	CS	1.62	0.958	J	U	GELC
PM-3	11/28/01	01/21/02	UF	CS	<0.4	0.25	B		ACCU
PM-3	11/28/01	12/04/01	UF	CS	<2.17	2.17	U		BABC
PM-3	11/28/01	12/16/01	UF	DUP	<0.801	0.801	U		GELC
PM-3	11/28/01	12/16/01	UF	CS	2.42	0.801	J		GELC
PM-3	12/15/01	01/22/02	UF	CS	<0.25	0.25	U		ACCU
PM-3	12/15/01	12/18/01	UF	CS	<1.51	1.51	U		BABC
PM-3	12/15/01	12/28/01	UF	CS	<0.801	0.801	U		GELC
PM-3	12/15/01	12/28/01	UF	DUP	<0.801	0.801	U		GELC
PM-4	02/14/01	02/21/01	UF	CS	<1.2	1.2	U		BABC

Table 5-25. Perchlorate in Groundwater during 2001 (µg/L)[a] (Cont.)

Station Name	Sample Date	Analysis Date	Codes[b]	Field QC Type Code[c]	Result	MDL	Lab Qual Code[d]	Valid Flag Code[d]	Lab[e]
Regional Aquifer Wells (Cont.)									
Water Supply Wells: (Cont.)									
PM-4	02/14/01	03/05/01	UF	CS	<0.958	0.958	U	UJ	GELC
PM-4	08/08/01	08/30/01	UF	CS	<0.958	0.958	U		GELC
PM-4	11/28/01	01/21/02	UF	CS	<0.3	0.25	B		ACCU
PM-4	11/28/01	12/04/01	UF	CS	<2.17	2.17	U		BABC
PM-4	11/28/01	12/02/01	UF	CS	1.71	0.958	J		GELC
PM-5	02/14/01	02/21/01	UF	CS	<1.2	1.2	U		BABC
PM-5	02/14/01	03/05/01	UF	CS	1.06	0.958	J	J	GELC
PM-5	04/11/01	04/18/01	UF	CS	<1.2	1.2	U		BABC
PM-5	04/11/01	04/18/01	UF	CS	<1.2	1.2	U		BABC
PM-5	04/11/01	04/18/01	UF	CS	<1.2	1.2	U		BABC
PM-5	04/11/01	04/18/01	UF	CS	<1.2	1.2	U		BABC
PM-5	04/11/01	05/02/01	UF	CS	<0.801	0.801	U		GELC
PM-5	04/11/01	05/02/01	UF	CS	<0.801	0.801	U		GELC
PM-5	04/11/01	05/02/01	UF	CS	<0.801	0.801	U		GELC
PM-5	04/11/01	05/02/01	UF	CS	<0.801	0.801	U		GELC
PM-5	05/09/01	05/18/01	UF	CS	<1.2	1.2	U		BABC
PM-5	05/09/01	05/25/01	UF	CS	<0.958	0.958	U		GELC
PM-5	06/13/01	06/15/01	UF	CS	<2.17	2.17	U		BABC
PM-5	06/13/01	06/20/01	UF	CS	<0.958	0.958	U		GELC
PM-5	07/11/01	08/06/01	UF	CS	2.42	0.958	J		GELC
PM-5	08/08/01	08/30/01	UF	CS	<0.958	0.958	U		GELC
PM-5	09/05/01	09/12/01	UF	CS	<2.17	2.17	U		BABC
PM-5	09/05/01	09/13/01	UF	CS	FD	<2.17	2.17	U		BABC
PM-5	09/05/01	10/01/01	UF	DUP	<2.17	2.17	U		BABC
PM-5	09/05/01	10/01/01	UF	TRP	<2.17	2.17	U		BABC
PM-5	09/05/01	09/13/01	UF	DUP	FD	<0.958	0.958	U		GELC
PM-5	09/05/01	09/13/01	UF	CS	FD	<0.958	0.958	U		GELC
PM-5	09/05/01	09/13/01	UF	CS	2.05	0.958	J		GELC
PM-5	09/05/01	10/03/01	UF	QNT	<0.958	0.958	U		GELC
PM-5	09/05/01	10/03/01	UF	DUP	<0.958	0.958	U		GELC
PM-5	09/05/01	10/03/01	UF	QUD	1.66	0.958	J		GELC
PM-5	09/05/01	10/03/01	UF	TRP	1.49	0.958	J		GELC
PM-5	10/24/01	12/05/01	UF	DUP	<0.3	0.25	B		ACCU
PM-5	10/24/01	12/05/01	UF	CS	<0.3	0.25	B		ACCU
PM-5	10/24/01	12/05/01	UF	QNT	<0.25	0.25	U		ACCU
PM-5	10/24/01	12/05/01	UF	QUD	<0.25	0.25	U		ACCU
PM-5	10/24/01	12/05/01	UF	TRP	<0.25	0.25	U		ACCU
PM-5	10/24/01	11/01/01	UF	CS	<2.17	2.17	U		BABC
PM-5	10/24/01	11/01/01	UF	DUP	<2.17	2.17	U		BABC
PM-5	10/24/01	11/01/01	UF	TRP	<2.17	2.17	U		BABC
PM-5	10/24/01	11/01/01	UF	QUD	<2.17	2.17	U		BABC
PM-5	10/24/01	11/01/01	UF	QNT	<2.17	2.17	U		BABC
PM-5	10/24/01	11/20/01	UF	CS	<0.958	0.958	U	U	GELC
PM-5	10/24/01	11/20/01	UF	DUP	<0.958	0.958	U		GELC
PM-5	10/24/01	11/20/01	UF	QNT	<0.958	0.958	U		GELC
PM-5	10/24/01	11/20/01	UF	TRP	<0.958	0.958	U		GELC

Table 5-25. Perchlorate in Groundwater during 2001 (µg/L)[a] (Cont.)

Station Name	Sample Date	Analysis Date	Codes[b]		Field QC Type Code[c]	Result	MDL	Lab Qual Code[d]	Valid Flag Code[d]	Lab[e]
Regional Aquifer Wells (Cont.)										
Water Supply Wells: (Cont.)										
PM-5	10/24/01	11/20/01	UF	QUD		1.05	0.958	J		GELC
PM-5	11/28/01	01/21/02	UF	CS		<0.25	0.25	U		ACCU
PM-5	11/28/01	12/04/01	UF	CS		<2.17	2.17	U		BABC
PM-5	11/28/01	12/02/01	UF	DUP		1.61	0.958	J		GELC
PM-5	11/28/01	12/02/01	UF	CS		1.29	0.958	J		GELC
PM-5	12/15/01	01/22/02	UF	CS	FD	<0.3	0.25	B		ACCU
PM-5	12/15/01	01/22/02	UF	CS		<0.25	0.25	U		ACCU
PM-5	12/15/01	12/18/01	UF	CS		<1.51	1.51	U		BABC
PM-5	12/15/01	12/28/01	UF	CS		<0.801	0.801	U		GELC
G-1A	02/14/01	02/21/01	UF	CS		<1.2	1.2	U		BABC
G-1A	02/14/01	03/05/01	UF	DUP		<0.958	0.958	U	UJ	GELC
G-1A	02/14/01	03/05/01	UF	CS		<0.958	0.958	U	UJ	GELC
G-1A	08/08/01	08/30/01	UF	CS		<0.958	0.958	U		GELC
G-1A	10/24/01	12/05/01	UF	QUD		<0.62	0.25	B		ACCU
G-1A	10/24/01	12/05/01	UF	DUP		<0.5	0.25	B		ACCU
G-1A	10/24/01	12/05/01	UF	CS		<0.5	0.25	B		ACCU
G-1A	10/24/01	12/05/01	UF	TRP		<0.5	0.25	B		ACCU
G-1A	10/24/01	12/05/01	UF	QNT		<0.3	0.25	B		ACCU
G-1A	10/24/01	11/01/01	UF	QNT		<2.17	2.17	U		BABC
G-1A	10/24/01	11/01/01	UF	TRP		<2.17	2.17	U		BABC
G-1A	10/24/01	11/01/01	UF	CS		<2.17	2.17	U		BABC
G-1A	10/24/01	11/01/01	UF	DUP		<2.17	2.17	U		BABC
G-1A	10/24/01	11/01/01	UF	QUD		<2.17	2.17	U		BABC
G-1A	10/24/01	11/19/01	UF	TRP		<0.958	0.958	U		GELC
G-1A	10/24/01	11/19/01	UF	CS		<0.958	0.958	U	U	GELC
G-1A	10/24/01	11/19/01	UF	SXT		<0.958	0.958	U		GELC
G-1A	10/24/01	11/19/01	UF	QNT		<0.958	0.958	U		GELC
G-1A	10/24/01	11/19/01	UF	DUP		1.52	0.958	J		GELC
G-1A	10/24/01	11/19/01	UF	QUD		1.4	0.958	J		GELC
G-1A	11/28/01	01/21/02	UF	CS		<0.25	0.25	U		ACCU
G-1A	11/28/01	12/04/01	UF	CS		<2.17	2.17	U		BABC
G-1A	11/28/01	12/17/01	UF	CS		2.9	0.801	J		GELC
G-2A	05/09/01	05/18/01	UF	CS		<1.2	1.2	U		BABC
G-2A	05/09/01	05/25/01	UF	CS		<0.958	0.958	U		GELC
G-2A	08/08/01	08/30/01	UF	CS		<0.958	0.958	U		GELC
G-2A	11/28/01	01/21/02	UF	CS		<0.25	0.25	U		ACCU
G-2A	11/28/01	12/04/01	UF	CS		<2.17	2.17	U		BABC
G-2A	11/28/01	12/17/01	UF	CS		2.63	0.801	J		GELC
G-3A	02/14/01	02/21/01	UF	CS		<1.2	1.2	U		BABC
G-3A	02/14/01	03/05/01	UF	CS		<0.958	0.958	U	UJ	GELC
G-3A	08/08/01	08/30/01	UF	CS		<0.958	0.958	U		GELC
G-3A	11/28/01	01/21/02	UF	CS		<0.3	0.25	B		ACCU
G-3A	11/28/01	01/21/02	UF	CS	FB	<0.25	0.25	U		ACCU
G-3A	11/28/01	12/04/01	UF	CS		<2.17	2.17	U		BABC
G-3A	11/28/01	12/17/01	UF	CS		2.64	0.801	J		GELC
G-4A	02/14/01	02/21/01	UF	CS		<1.2	1.2	U		BABC

Table 5-25. Perchlorate in Groundwater during 2001 (µg/L) [a] (Cont.)

Station Name	Sample Date	Analysis Date	Codes[b]		Field QC Type Code[c]	Result	MDL	Lab Qual Code[d]	Valid Flag Code[d]	Lab[e]
Regional Aquifer Wells (Cont.)										
Water Supply Wells: (Cont.)										
G-4A	02/14/01	03/05/01	UF	CS		<0.958	0.958	U	UJ	GELC
G-4A	08/08/01	08/30/01	UF	CS		<0.958	0.958	U		GELC
G-4A	11/28/01	01/21/02	UF	CS		<0.3	0.25	B		ACCU
G-4A	11/28/01	12/04/01	UF	CS		<2.17	2.17	U		BABC
G-4A	11/28/01	12/17/01	UF	CS		2.69	0.801	J		GELC
G-5A	08/08/01	08/30/01	UF	CS		1.75	0.958	J		GELC
G-5A	08/08/01	10/10/01	UF	CS		1.2	0.958	J		GELC
G-5A	09/05/01	09/13/01	UF	CS	FD	<2.17	2.17	U		BABC
G-5A	09/05/01	09/13/01	UF	CS		<2.17	2.17	U		BABC
G-5A	09/05/01	10/01/01	UF	TRP		<2.17	2.17	U		BABC
G-5A	09/05/01	10/01/01	UF	DUP		<2.17	2.17	U		BABC
G-5A	09/05/01	09/13/01	UF	CS		<0.958	0.958	U		GELC
G-5A	09/05/01	09/14/01	UF	CS	FD	2.61	0.958	J		GELC
G-5A	09/05/01	10/03/01	UF	DUP		<0.958	0.958	U		GELC
G-5A	09/05/01	10/03/01	UF	QNT		<0.958	0.958	U		GELC
G-5A	09/05/01	10/03/01	UF	TRP		1.47	0.958	J		GELC
G-5A	09/05/01	10/03/01	UF	QUD		1.29	0.958	J		GELC
G-5A	10/24/01	12/04/01	UF	CS		<0.54	0.25	B		ACCU
G-5A	10/24/01	11/05/01	UF	CS		<2.17	2.17	U		BABC
G-5A	10/24/01	11/02/01	UF	CS		1.28	0.958	J	R	GELC
G-5A	11/28/01	01/21/02	UF	CS		<0.3	0.25	B		ACCU
G-5A	11/28/01	12/04/01	UF	CS		<2.17	2.17	U		BABC
G-5A	11/28/01	12/17/01	UF	CS		2.65	0.801	J		GELC
Regional Aquifer Springs										
White Rock Canyon Group I:										
Sandia Spring	09/24/01	10/09/01	UF	CS	FD	<0.958	0.958	U		GELC
Sandia Spring	09/24/01	10/09/01	UF	CS		<0.958	0.958	U		GELC
Spring 3	09/24/01	10/09/01	UF	CS		<0.958	0.958	U		GELC
Spring 3	09/24/01	10/09/01	UF	CS	FB	<0.958	0.958	U		GELC
Spring 4	09/24/01	10/09/01	UF	DUP		<0.958	0.958	U		GELC
Spring 4	09/24/01	10/09/01	UF	CS		<0.958	0.958	U		GELC
Spring 4	11/01/01	12/04/01	UF	CS		<0.65	0.25	B		ACCU
Spring 4	11/01/01	11/29/01	UF	CS		2.35	0.958	J	U	GELC
Spring 4B	03/09/01	04/06/01	UF	CS		6.62	0.958			GELC
Spring 4B	03/09/01	05/02/01	UF	RE		<0.801	0.801	U		GELC
Spring 4B	11/01/01	12/04/01	UF	CS		<0.58	0.25	B		ACCU
Spring 4B	11/01/01	12/04/01	UF	DUP		<0.5	0.25	B		ACCU
Spring 4B	11/01/01	11/29/01	UF	CS		1.4	0.958	J	U	GELC
Spring 4C	11/01/01	12/04/01	UF	CS		<0.67	0.25	B		ACCU
Spring 4C	11/01/01	11/29/01	UF	CS		2.63	0.958	J	U	GELC
Spring 4C	11/01/01	11/29/01	UF	DUP		2.5	0.958	J		GELC
Spring 4A	09/25/01	10/09/01	UF	DUP		<0.958	0.958	U		GELC
Spring 4A	09/25/01	10/09/01	UF	CS		<0.958	0.958	U		GELC
Spring 4A	11/01/01	12/04/01	UF	CS		<0.5	0.25	B		ACCU

Table 5-25. Perchlorate in Groundwater during 2001 (µg/L)[a] (Cont.)

Station Name	Sample Date	Analysis Date	Codes[b]	Field QC Type Code[c]	Result	MDL	Lab Qual Code[d]	Valid Flag Code[d]	Lab[e]
Regional Aquifer Springs (Cont.)									
White Rock Canyon Group I:									
Spring 4A	11/01/01	11/29/01	UF	CS	1.71	0.958	J	U	GELC
Spring 4AA	11/01/01	12/04/01	UF	CS	<0.55	0.25	B		ACCU
Spring 4AA	11/01/01	11/29/01	UF	CS	1.57	0.958	J	U	GELC
Spring 5	09/25/01	10/09/01	UF	CS	1.29	0.958	J		GELC
Ancho Spring	10/24/01	11/01/01	UF	CS	<0.958	0.958	U		GELC
Ancho Spring	10/24/01	11/01/01	UF	DUP	<0.958	0.958	U		GELC
White Rock Canyon Group II:									
Spring 6A	09/25/01	10/09/01	UF	CS	<0.958	0.958	U		GELC
Spring 9	09/25/01	10/09/01	UF	CS	<0.958	0.958	U		GELC
White Rock Canyon Group III:									
Spring 1	09/24/01	10/09/01	UF	CS	<0.958	0.958	U		GELC
Spring 2	09/24/01	10/09/01	UF	CS	<0.958	0.958	U		GELC
White Rock Canyon Group IV:									
La Mesita Spring									
	10/23/01	11/01/01	UF	CS	<0.958	0.958	U		GELC
Other Springs:									
Sacred Spring	10/23/01	11/01/01	UF	CS	<0.958	0.958	U		GELC
Sacred Spring	10/23/01	11/01/01	UF	CS	<0.958	0.958	U		GELC
Sacred Spring	10/23/01	11/01/01	UF	DUP	1.95	0.958	J		GELC
Canyon Alluvial Groundwater Systems									
Acid/Pueblo Canyons:									
APCO-1	04/03/01	04/27/01	UF	CS	<0.801	0.801	U		GELC
DP/Los Alamos Canyons:									
LAO-C	04/03/01	04/27/01	UF	CS	<0.801	0.801	U		GELC
LAO-0.7	03/29/01	04/25/01	UF	CS	<0.801	0.801	U		GELC
LAO-1	04/05/01	05/01/01	UF	DUP	<0.801	0.801	U		GELC
LAO-1	04/05/01	05/01/01	UF	CS	<0.801	0.801	U		GELC
DP Spring	04/03/01	04/27/01	UF	CS	<0.801	0.801	U		GELC
LAO-2	03/29/01	04/25/01	UF	CS	<0.801	0.801	U		GELC
LAO-3A	03/28/01	04/25/01	UF	CS	FD	1.28	0.801	J	GELC
LAO-3A	03/28/01	04/25/01	UF	CS	1.17	0.801	J		GELC
LAO-4	04/05/01	05/01/01	UF	CS	<0.801	0.801	U		GELC
LAO-4.5C	03/28/01	04/25/01	UF	CS	<0.801	0.801	U		GELC
LAO-6A	03/28/01	04/25/01	UF	CS	<0.801	0.801	U		GELC
Mortandad Canyon:									
MCO-3	03/12/01	03/20/01	UF	CS	140	1.2			BABC
MCO-3	05/24/01	06/07/01	UF	CS	FB	3.36	0.958	J	GELC
MCO-3	05/24/01	06/08/01	UF	CS	107	1.92			GELC
MCO-3	07/31/01	08/07/01	UF	CS	114	1.92			GELC
MCO-3	09/07/01	09/17/01	F	DUP	57.1	1.92			GELC

Table 5-25. Perchlorate in Groundwater during 2001 (µg/L)[a] (Cont.)

Station Name	Sample Date	Analysis Date	Codes[b]		Field QC Type Code[c]	Result	MDL	Lab Qual Code[d]	Valid Flag Code[d]	Lab[e]
Canyon Alluvial Groundwater Systems (Cont.)										
Mortandad Canyon: (Cont.)										
MCO-3	09/07/01	09/17/01	F	CS		53.6	1.92		J	GELC
MCO-3	11/16/01	12/02/01	F	CS		132	9.58		J	GELC
MCO-4B	05/24/01	06/08/01	UF	CS		157	3.83			GELC
MCO-5	08/02/01	08/08/01	UF	CS		157	4.79			GELC
MCO-5	08/02/01	08/08/01	UF	DUP		156	4.79			GELC
MCO-6	03/12/01	03/20/01	UF	CS		220	1.2			BABC
MCO-6	05/24/01	06/07/01	UF	CS	FD	139	3.83			GELC
MCO-6	05/24/01	06/08/01	UF	CS		145	3.83			GELC
MCO-6	09/10/01	09/17/01	F	CS		139	1.92		J	GELC
MCO-6	11/16/01	12/02/01	F	CS		109	9.58		J	GELC
MCO-7	03/12/01	03/20/01	UF	CS		180	1.2			BABC
MCO-7	05/24/01	06/07/01	UF	CS		141	3.83			GELC
MCO-7	05/24/01	06/07/01	UF	CS	FB	3.03	0.958	J	U	GELC
MCO-7	09/10/01	09/17/01	F	CS		148	1.92		J	GELC
MCO-7.5	08/07/01	08/28/01	UF	DUP		204	4.79			GELC
Cañada del Buey:										
CDBO-6	05/01/01	05/08/01	UF	CS		2.38	0.958	J	U	GELC
Pajarito Canyon:										
PCO-1	04/10/01	05/01/01	UF	CS		<0.801	0.801	U		GELC
PCO-1	04/10/01	05/01/01	UF	CS		<0.801	0.801	U		GELC
PCO-3	04/10/01	05/02/01	UF	CS		<3.2	3.2	U		GELC
Intermediate Perched Groundwater Systems										
Pueblo/Los Alamos/Sandia Canyon Area Perched System in Conglomerates and Basalt:										
POI-4	08/01/01	08/08/01	UF	CS		1.73	0.958	J		GELC
Test Well 2A	07/30/01	08/07/01	UF	CS		<0.958	0.958	U		GELC
Basalt Spring	10/23/01	11/01/01	UF	CS		1.3	0.958	J		GELC
Water Canyon Gallery	11/29/01	12/17/01	UF	CS		2.35	0.801	J		GELC
San Ildefonso Pueblo										
LA-5	06/19/01	07/09/01	UF	CS		<0.958	0.958	U		GELC
Eastside Artesian Well	06/20/01	07/09/01	UF	CS		<0.958	0.958	U		GELC
Pajarito Well (Pump 1)	06/19/01	07/09/01	UF	CS		<0.958	0.958	U		GELC
Pajarito Well (Pump 1)	06/19/01	07/09/01	UF	CS		<0.958	0.958	U		GELC
Don Juan Playhouse Well	06/20/01	07/09/01	UF	CS		<0.958	0.958	U		GELC
Martinez House Well	12/04/01	12/16/01	UF	CS		<0.801	0.801	U		GELC
Martinez House Well	12/04/01	12/16/01	UF	DUP		2.42	0.801	J		GELC
Otowi House Well	06/19/01	07/09/01	UF	CS		<0.958	0.958	U		GELC
Otowi House Well	06/19/01	07/09/01	UF	DUP		<0.958	0.958	U		GELC
New Community Well	06/19/01	07/09/01	UF	CS		1.04	0.958	J		GELC

Table 5-25. Perchlorate in Groundwater during 2001 (µg/L)[a] (Cont.)

Station Name	Sample Date	Analysis Date	Codes[b]		Field QC Type Code[c]	Result	MDL	Lab Qual Code[d]	Valid Flag Code[d]	Lab[e]
Quality Assurance Samples										
DI Blank	10/31/01	12/04/01	UF	CS	PEB	<0.25	0.25	U		ACCU
DI Blank	11/27/01	12/04/01	UF	CS	PEB	<2.17	2.17	U		BABC
DI Blank	06/06/01	06/19/01	UF	CS	PEB	<0.958	0.958	U		GELC
DI Blank	06/13/01	06/20/01	UF	CS	PEB	<0.958	0.958	U		GELC
DI Blank	06/20/01	07/09/01	UF	CS	PEB	<0.958	0.958	U		GELC
DI Blank	08/03/01	08/07/01	UF	CS	PEB	<0.958	0.958	U		GELC
DI Blank	08/07/01	08/28/01	UF	CS	PEB	<0.958	0.958	U		GELC
DI Blank	09/07/01	09/14/01	F	CS	PEB	<0.958	0.958	U	UJ	GELC
DI Blank	10/24/01	11/01/01	UF	CS	PEB	<0.958	0.958	U	UJ	GELC
Santa Fe Water Supply Wells										
Buckman 1	08/16/01	08/24/01	UF	CS	FB	<2.17	2.17	U		BABC
Buckman 1	08/16/01	08/24/01	UF	CS		<2.17	2.17	U		BABC
Buckman 1	08/16/01	09/06/01	UF	CS		<0.958	0.958	U		GELC
Buckman 1	08/16/01	09/06/01	UF	CS	FB	<0.958	0.958	U		GELC
Buckman 1	10/31/01	12/04/01	UF	CS		<0.3	0.25	B		ACCU
Buckman 1	10/31/01	11/28/01	UF	DUP		<0.958	0.958	U		GELC
Buckman 1	10/31/01	11/28/01	UF	CS		1.89	0.958	J	U	GELC
Buckman 2	08/16/01	08/27/01	UF	CS		<2.17	2.17	U		BABC
Buckman 2	08/16/01	09/06/01	UF	CS		<0.958	0.958	U		GELC
Buckman 2	10/31/01	12/04/01	UF	CS		<0.25	0.25	U		ACCU
Buckman 2	10/31/01	11/29/01	UF	CS		2.65	0.958	J	U	GELC
Buckman 3	10/31/01	12/04/01	UF	CS		<0.25	0.25	U		ACCU
Buckman 3	10/31/01	11/29/01	UF	CS		<0.958	0.958	U		GELC
Buckman 4	10/31/01	12/04/01	UF	CS		<0.25	0.25	U		ACCU
Buckman 4	10/31/01	11/06/01	UF	CS	FD	<2.17	2.17	U		BABC
Buckman 4	10/31/01	11/29/01	UF	CS		<0.958	0.958	U		GELC
Buckman 6	10/31/01	12/04/01	UF	CS		<0.25	0.25	U		ACCU
Buckman 6	10/31/01	11/29/01	UF	CS		<0.958	0.958	U		GELC
Buckman 7	08/16/01	08/24/01	UF	CS		<2.17	2.17	U		BABC
Buckman 7	08/16/01	09/06/01	UF	DUP		<0.958	0.958	U		GELC
Buckman 7	08/16/01	09/06/01	UF	CS		0.999	0.958	J		GELC
Buckman 7	08/16/01	10/10/01	UF	CS		1.12	0.958	J		GELC
Buckman 7	10/31/01	12/04/01	UF	CS		<0.25	0.25	U		ACCU
Buckman 7	10/31/01	11/29/01	UF	CS		<0.958	0.958	U		GELC
Buckman 8	10/31/01	12/04/01	UF	CS		<0.3	0.25	B		ACCU
Buckman 8	10/31/01	11/29/01	UF	CS	FD	2.16	0.958	J	U	GELC
Buckman 8	10/31/01	11/29/01	UF	CS		1.25	0.958	J	U	GELC

[a]Detections are shaded.
[b]Codes: UF–unfiltered; F–filtered; CS–customer sample; RE–reanalysis; DUP–laboratory duplicate; TRP–laboratory triplicate; QUD–laboratory quadruplicate; QNT–laboratory quintuplicate.
[c]FTB–trip blank; FD–field duplicate; FB–field blank; PEB–performance evaluation blank.
[d]For Lab Qualifier Codes and Valid Flag Codes, see Table 5-4.
[e]GEL-General Engineering Labs; ACCU-Acculabs; BABC-Edward S. Babcock and Sons, Inc.

Table 5-26. Trace Metals in Groundwater for 2001 (µg/L)

Station	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Regional Aquifer Wells															
Test Wells:															
Test Well 1	6/5	UF	CS	<[b] 0.871	< 31.9	< 2.33	78.3	84.6	< 0.158	< 0.096	< 0.638	< 0.582	< 2.15	434	< 0.057
Test Well 1	6/5	UF	DUP												< 0.057
Test Well 3	6/4	UF	CS	< 0.871	< 7.57	< 2.33	< 22.9	33.2	< 0.158	< 0.092	< 0.419	< 1.21	< 3.28	2,220	< 0.057
Test Well 4	6/4	UF	CS	< 0.871	< 22.6	< 2.33	< 25.4	59.1	< 0.158	< 0.595	< 0.419	< 0.75	14.1	376	< 0.057
Test Well 8	6/4	UF	CS	< 0.871	88.3	< 2.33	< 9.71	7.78	< 0.158	< 0.066	< 0.419	< 3.73	< 1.36	121	< 0.057
Test Well DT-5A	6/6	UF	CS	< 0.871	< 7.57	< 2.33	< 7.23	24.5	< 0.158	< 0.066	< 0.419	< 1.65	< 0.83	104	< 0.057
Test Well DT-9	6/7	UF	CS	< 0.871	< 7.57	< 2.33	< 11.4	17.1	< 0.158	< 0.066	< 0.419	< 1.94	< 0.886	< 3.27	< 0.057
Test Well DT-10	6/6	UF	CS	< 0.871	< 14.6	< 2.33	< 3.61	7.55	< 0.158	< 0.066	< 0.419	< 2.65	< 0.834	169	< 0.057
Test Well DT-10	6/6	UF	DUP	< 0.871	< 18.1	< 2.33	< 3.61	7.6	< 0.158	< 0.066	< 0.419	< 2.9	< 0.879	168	< 0.057
Regional Aquifer Springs															
White Rock Canyon Group I:															
Sandia Spring	9/24	F	CS	< 0.197	< 34.3	< 4.57	< 18.2	57.1	< 0.203		< 0.295	< 1.48	< 2.67	< 20.6	
Sandia Spring	9/24	F	CS	< 0.197	< 11.2	< 4.57	< 22	58.3	< 0.203		8.57	< 1.44	< 2.37	< 20.6	
Sandia Spring	9/24	UF	CS												< 0.073
Sandia Spring	9/24	UF	CS												< 0.073
Spring 3	9/24	F	CS	< 0.197	< 34.3	< 4.57	< 15.3	42.5	< 0.203		< 0.295	< 3.7	< 2.67	< 20.6	
Spring 3	9/24	UF	CS												< 0.073
Spring 4	9/24	UF	CS												< 0.365
Spring 4	9/24	UF	DUP												< 0.073
Spring 4	9/24	UF	CS	< 2.56	< 34.3	< 4.57	< 8.72	46.1	< 0.203		< 1.24	< 3.35	< 2.67	< 20.6	
Spring 4	9/24	UF	DUP	< 0.879	< 34.3	< 4.57	< 7.33	45.9	< 0.203		< 0.789	< 2.96	< 2.67	< 20.6	
Spring 4A	9/25	F	CS	< 0.197	< 34.3	< 4.57	< 24.8	43.6	< 0.203		< 4.97	< 3.92	< 2.67	< 20.6	
Spring 4A	9/25	UF	CS												< 0.073
Spring 5	9/25	F	CS	< 0.197	< 34.3	< 4.57	< 31.5	28.4	< 0.203		< 0.295	< 3.92	< 2.67	< 20.6	
Spring 5	9/25	UF	CS												< 0.073
Ancho Spring	10/24	F	CS	< 0.197	< 34.3	< 3.05	< 22.8	25.7	< 0.203	< 0.19	< 0.295	< 3.47	< 2.67	< 20.6	
Ancho Spring	10/24	F	DUP	< 0.197	< 34.3	< 4.57	< 19.6	26.2	< 0.203	< 0.26	< 0.295	< 3.08	< 2.67	< 20.6	
Ancho Spring	10/24	UF	CS												< 0.073
Ancho Spring	10/24	UF	DUP												< 0.073
White Rock Canyon Group II:															
Spring 6A	9/25	UF	CS												< 0.073
Spring 6A	9/25	F	CS	< 0.197	< 34.3	< 4.57	< 13	20.3	< 0.203		< 0.295	< 3.73	< 2.67	< 20.6	
Spring 9	9/25	UF	CS												< 0.073
Spring 9	9/25	UF	DUP												
Spring 9	9/26	F	CS	< 0.197	< 34.3	< 4.57	< 12.7	18.6	< 0.203		5.36	< 1.74	< 2.67	< 20.6	

Table 5-26. Trace Metals in Groundwater for 2001 (µg/L) (Cont.)

Station	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Regional Aquifer Springs (Cont.)															
White Rock Canyon Group III:															
Spring 1	9/24	UF	CS												< 0.073
Spring 1	9/24	F	CS	< 0.197	< 21.7	< 4.29	51.6	42	< 0.203		< 0.295	< 4.19	< 2.67	< 16.1	
Spring 2	9/24	UF	CS												< 0.073
Spring 2	9/24	F	CS	< 0.197	< 34.3	23	65.9	24.4	< 0.203		< 1.4	< 0.669	< 2.67	< 3	
White Rock Canyon Group IV:															
La Mesita Spring	10/23	UF	CS												< 0.073
La Mesita Spring	10/23	F	CS	< 0.197	< 45.6	< 4.57	58.8	118	< 0.203	< 0.29	< 0.295	< 1.41	< 2.36	57.4	
Other Springs:															
Sacred Spring	10/23	F	CS	< 0.197	< 34.3	< 3.68	< 27.4	81.1	< 0.203	< 0.28	< 0.295	< 1.96	< 2.67	< 20.6	
Sacred Spring	10/23	F	DUP	< 0.197	< 34.3	< 4.57	< 24.8	80.1	< 0.203	< 0.26	< 0.295	< 1.93	< 2.67	< 7.65	
Sacred Spring	10/23	UF	CS												< 0.073
Sacred Spring	10/23	UF	DUP												< 0.073
Sacred Spring	10/23	F	CS	< 0.197	< 34.3	< 4.57	< 28.7	81.2	< 0.203	< 0.24	< 0.81	< 1.61	< 2.67	< 20.6	
Sacred Spring	10/23	UF	CS												< 0.073
Canyon Alluvial Groundwater Systems															
Acid/Pueblo Canyons:															
APCO-1	4/3	UF	CS	< 0.871	< 20.2	< 2.85	295	55.2	< 0.203	< 0.251	< 4.47	< 0.781	< 4.33	934	< 0.108
APCO-1	4/3	UF	DUP	< 0.197	< 18.3	< 3.78	290	53.7	< 0.203	< 0.329	< 4.44	< 0.781	< 4.51	913	< 0.073
APCO-1	4/3	F	CS	< 0.871	< 34.3	< 4.57	290	43.2	< 0.203	< 0.375	< 4.28	< 0.781	< 3.52	621	< 0.073
DP/Los Alamos Canyons:															
LAO-C	4/3	UF	CS	< 0.871	1,190	< 4.57	< 3.61	62.3	< 0.203	< 0.251	< 0.295	< 0.618	< 2.34	699	< 0.073
LAO-C	4/3	F	CS	< 0.871	2,440	< 4.57	< 3.61	63.1	< 0.203	< 0.251	< 1.47	< 0.943	< 3.07	1290	< 0.073
LAO-0.7	3/29	UF	CS	< 0.197	1,240	< 4.57	< 12.7	60.8	< 0.203	< 0.251	< 0.295	< 0.781	< 2.3	671	< 0.073
LAO-0.7	3/29	UF	DUP												
LAO-0.7	3/29	F	CS	< 0.197	203	< 4.57	< 13.6	43.8	< 0.203	< 0.251	< 0.295	< 0.781	< 0.882	126	< 0.073
LAO-0.7	3/29	F	DUP	< 0.197	< 201	< 4.57	< 13	44.2	< 0.203	< 0.251	< 0.295	< 0.781	< 1.1	< 100	< 0.073
LAO-1	4/5	UF	CS	< 0.197	150	< 4.57	< 6.34	58.8	< 0.203	< 0.251	< 0.295	8.86	< 1.16	137	< 0.073
LAO-1	4/5	F	CS	< 0.197	77	< 4.57	< 15.1	58.1	< 0.203	< 0.251	< 0.295	8.9	< 0.902	< 38.5	< 0.073
LAO-1	4/5	F	DUP	< 0.197	73.8	< 4.57	< 13.3	59.1	< 0.203	< 0.251	< 0.295	8.96	< 0.919	< 39.4	
DP Spring	4/3	F	CS	< 0.871	< 34.3	< 4.57	< 3.61	83	< 0.203	< 0.251	< 0.295	< 0.781	< 2.67	< 5.43	< 0.073
DP Spring	4/3	UF	CS	< 0.871	< 34.8	< 4.57	< 3.61	83.4	< 0.203	< 0.251	< 0.295	< 0.781	< 2.75	< 26.6	< 0.073
LAO-2	3/29	UF	CS	< 0.197	< 33.8	< 4.57	< 23.4	78.7	< 0.203	< 0.251	< 0.295	< 0.781	< 1.33	59.8	< 0.073
LAO-2	3/29	F	CS	< 0.197	< 19.7	< 4.57	< 27.2	77.6	< 0.203	< 0.251	< 0.295	< 0.781	< 1.36	< 38.8	0.331
LAO-3A	3/28	UF	CS	< 0.197	< 45.6	< 4.57	< 15.9	65.4	< 0.203	< 0.251	< 0.295	< 0.781	< 1.03	< 26.5	< 0.073
LAO-3A	3/28	F	CS	< 0.197	< 34.3	< 4.57	< 23.8	68	< 0.203	< 0.251	< 0.295	< 0.781	< 2.07	< 20.6	< 0.073

Table 5-26. Trace Metals in Groundwater for 2001 (µg/L) (Cont.)

Station	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Canyon Alluvial Groundwater Systems (Cont.)															
DP/Los Alamos Canyons: (Cont.)															
LAO-3A	3/28	F	CS	< 0.197	< 34.3	< 4.57	< 26.2	68.9	< 0.203	< 0.251	< 0.295	< 0.727	< 1.18	< 20.6	< 0.073
LAO-3A	3/28	UF	CS	< 0.197	< 10.3	< 4.57	< 24	66.3	< 0.203	< 0.251	< 0.295	< 0.781	< 1.07	< 18.9	< 0.073
LAO-4	4/5	UF	CS	< 0.197	76.9	< 4.57	< 12.1	58.6	< 0.203	< 0.251	< 0.295	< 0.629	< 1.24	< 42	< 0.073
LAO-4	4/5	F	CS	< 0.197	< 31.6	< 4.57	< 13.4	57.6	< 0.203	< 0.251	< 0.295	< 0.687	< 1.28	< 16.4	< 0.073
LAO-4.5C	3/28	UF	CS	< 0.197	111	< 4.57	< 18.3	50.4	< 0.203	< 0.251	< 0.295	< 0.781	< 1.19	53.9	< 0.073
LAO-4.5C	3/28	F	CS	< 0.197	69.1	< 4.57	< 13.6	48.7	< 0.203	< 0.251	< 0.295	< 0.781	< 2.04	< 33.5	< 0.073
LAO-6A	3/28	UF	CS	< 0.197	64.3	< 4.57	< 17.9	36.5	< 0.203	< 0.251	< 0.295	< 0.781	< 1.23	< 27.9	< 0.073
LAO-6A	3/28	F	CS	< 0.197	< 49.6	< 4.57	< 15.7	37	< 0.203	< 0.317	< 0.295	< 0.781	< 1.28	< 28.4	< 0.073
Mortandad Canyon:															
MCO-3	7/31	UF	CS	< 0.666	< 9.54	< 2.6	69.2	36.2	< 0.212	< 0.243	< 0.737	< 1.82	32.8	< 4.25	< 0.064
MCO-3	7/31	F	CS	< 0.666	< 9.54	< 2.6	58.1	35.9	< 0.212	< 0.249	< 0.737	< 1.88	33	< 2.24	< 0.064
MCO-5	8/2	UF	CS	< 0.666	< 9.54	< 2.6	60.2	92.3	< 0.212	< 0.112	< 0.737	< 0.759	< 4.66	< 2.24	< 0.064
MCO-5	8/2	UF	DUP	< 1.45			60.5	92		< 0.093		< 1.81	< 4.37		< 0.064
MCO-5	8/2	F	CS	< 0.666	< 9.54	< 2.6	63.3	92.8	< 0.212	< 0.114	< 0.737	< 1.03	< 4.64	< 2.24	< 0.064
MCO-6	8/6	F	CS	< 0.197	< 14.8	< 4.57	80.3	89.7	< 0.203	< 0.153	< 3.87	< 0.728	< 4.48	< 20.6	< 0.073
MCO-7	8/7	F	CS	< 0.197	< 40.2	< 4.57	72.9	154	< 0.203	< 0.05	< 0.295	< 1.34	< 1.66	< 18.4	< 0.073
MCO-7.5	8/7	UF	DUP	< 0.197	104	< 4.57	68.5	156	< 0.203	< 0.05	< 0.295	< 1.22	< 1.99	57.8	< 0.073
MCO-7.5	8/7	F	CS	< 0.197	173	< 3.43	79.1	162	< 0.203	< 0.05	< 2.3	< 1.2	< 2.7	87.3	< 0.073
Cañada del Buey:															
CDBO-6	5/1	F	CS	< 0.871	2,580	< 3.89	58.1	80.9	< 0.158	< 0.338	44.1	< 1.48	< 2.37	1,310	< 0.057
CDBO-6	5/1	F	DUP	< 0.871	2,530	< 2.33	59.6	85.1	< 0.158	< 0.386	45.6	< 1.3	< 2.59	1,290	
CDBO-6	5/1	UF	CS	< 0.871	6,900	< 2.74	54.7	106	< 0.343	< 0.704	< 2.12	< 3.16	< 4.2	3,690	< 0.057
CDBO-6	5/1	UF	DUP												< 0.057
CDBO-6	11/7	F	CS	< 0.197		< 4.57		163		1.17		< 0.781	< 2.8	313	< 0.073
CDBO-6	11/7	F	DUP	< 0.197		< 4.57		164		1.29		< 0.781	< 2.66	300	< 0.073
Pajarito Canyon:															
PCO-1	4/10	F	CS	< 0.871	987	< 2.33	< 29.3	188	< 0.158	< 0.272	< 0.419	< 0.759	< 0.587	516	< 0.062
PCO-1	4/10	UF	CS	< 0.871	1,200	< 2.33	< 26.6	188	< 0.158	< 0.272	< 0.419	< 0.994	< 0.587	652	< 0.057
PCO-1	4/10	UF	DUP	< 0.871	1,270	< 2.33	< 26.8	192	< 0.158	< 0.272	< 0.419	< 0.594	< 0.587	676	< 0.057
PCO-1	4/10	F	CS	< 0.871	1,150	< 2.33	< 25.9	189	< 0.158	< 0.272	< 0.514	< 0.743	< 0.587	614	< 0.057
PCO-1	4/10	UF	CS	< 0.871	1,040	< 2.33	< 27.2	195	< 0.158	< 0.272	< 0.419	< 1.1	< 0.587	556	< 0.057
PCO-1	4/10	UF	DUP												
PCO-3	4/10	F	CS	< 0.871	< 47.3	< 2.33	51.2	77.6	< 0.158	< 0.272	5	< 0.582	< 2.13	136	< 0.057
PCO-3	4/10	UF	CS	< 0.871	142	< 2.33	< 47.7	83.8	< 0.158	< 0.272	5.13	< 1.34	< 2.03	214	< 0.057
PCO-3	4/10	UF	DUP												
PCO-3	4/10	UF	TRP												

Table 5-26. Trace Metals in Groundwater for 2001 (µg/L) (Cont.)

Station	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Intermediate Perched Groundwater Systems															
Pueblo/Los Alamos/Sanda Canyon Area Perched Systems in Conglomerates and Basalt:															
POI-4															
Test Well 2A	8/1	UF	CS	< 0.666	< 9.54	5.16	211	95.4	< 0.212	< 0.017	< 4.2	< 0.57	< 4.96	< 2.24	< 0.064
Basalt Spring	7/30	UF	CS	< 0.666	< 9.54	< 2.6	78	63.4	< 0.212	< 0.266	< 2.96	< 0.57	< 4.23	4,610	< 0.128
Basalt Spring	10/23	F	CS	< 0.197	< 34.3	< 3.75	209	137	< 0.203	< 0.36	< 4.05	< 0.781	6.52	< 20.6	
	10/23	UF	CS												0.474
Perched Groundwater System in Volcanics:															
Water Canyon Gallery															
Water Canyon Gallery	11/29	F	CS	< 0.197	147	< 4.57	< 12.9	12	< 0.203	< 0.05	< 0.295	< 1.28	< 2.67	289	
Water Canyon Gallery	11/29	F	DUP	< 0.197	154	< 4.57	< 12.6	12.3	< 0.203	< 0.05	< 0.295	< 0.781	< 1.79	54.2	
Water Canyon Gallery	11/29	UF	CS												< 0.073
	11/29	UF	DUP												< 0.073
San Ildefonso Pueblo															
LA-5															
Eastside Artesian Well	6/19	UF	CS	< 0.871	< 24.8	5.25	< 25.7	62.8	< 0.158	< 0.19	< 0.419	< 4.72	< 0.587	< 3.27	< 0.057
Pajarito Well (Pump 1)	6/20	UF	CS	< 0.871	55.4	< 4.5	135	< 3.63	< 0.158	< 0.13	< 0.419	< 0.582	< 0.587	141	< 0.057
Pajarito Well (Pump 1)	6/19	UF	CS	< 0.871	< 23.8	8.58	1,270	75.1	< 0.158	< 0.066	< 0.419	< 3.81	5.41	< 4.14	< 0.057
Pajarito Well (Pump 1)	6/19	UF	DUP												< 0.057
Don Juan Playhouse Well	6/19	UF	CS	< 0.871	< 8.69	9.49	1,260	74.9	< 0.158	< 0.066	< 0.419	< 3.82	9.66	< 3.27	< 0.057
Martinez House Well	6/20	UF	CS	< 0.871	< 33.7	6.39	93.7	< 3.74	< 0.158	< 0.16	< 1.39	10.3	< 0.587	< 3.27	< 0.057
Martinez House Well	12/4	UF	CS	< 0.197	< 21.1	7.84	107	151	< 0.203	< 0.05	< 0.295	< 1.77	7.55	< 13.2	< 0.073
Otowi House Well	12/4	UF	DUP	< 0.197	< 34.3	7.86	107	153	< 0.203	<	0.295	< 1.36	7.18	< 20.6	
Otowi House Well	6/19	UF	CS	< 0.871	< 19.9	< 2.86	72.6	312	< 0.158	< 0.18	< 0.419	< 0.582	22.7	63.6	< 0.057
New Community Well	6/19	UF	DUP	< 0.871	< 17	< 2.33	73.1	311	< 0.158	< 0.2	< 0.419	< 0.582	22.7	68.2	
	6/19	UF	CS	< 0.871	< 28	< 2.33	56.4	16.1	< 0.158	< 0.15	< 0.419	< 1.3	< 4.56	< 7.23	< 0.057
Water Quality Standards[c]															
EPA Primary Drinking Water Standard															
EPA Secondary Drinking Water Standard						10		2,000	4	5		100			2
EPA Action Level					50-200									300	
EPA Health Advisory													1,300		
NMWQCC Livestock Watering Standard															
NMWQCC Groundwater Limit					5,000	200	5,000			50	1,000	1,000	500		10
NMWQCC Wildlife Habitat Standard				50	5,000	100	750	1,000		10	50	50	1,000	1,000	2
															~~0.77~~

Table 5-26. Trace Metals in Groundwater for 2001 (µg/L)

Station	Date	Codes[a]		Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn	TSS (mg/L)
Regional Aquifer Wells															
Test Wells:															
Test Well 1	6/5	UF	CS	16.8	< 1.36	< 3.14	15.4	1.89	< 2.93	< 2.31	292	< 0.077	< 2.58	513	1.8
Test Well 1	6/5	UF	DUP												
Test Well 3	6/4	UF	CS	75.3	< 1.59	< 0.815	3.64	< 0.153	< 2.93	< 2.31	72.8	< 0.077	5.87	196	1.4
Test Well 4	6/4	UF	CS	61.3	< 1.28	< 0.815	30.4	< 0.153	< 2.93	< 2.31	51.2	< 0.077	< 0.638	543	2
Test Well 8	6/4	UF	CS	< 1.97	< 2.01	< 0.815	4.26	0.453	< 2.93	< 2.31	54.1	< 0.452	5.3	328	< 0.699
Test Well DT-5A	6/6	UF	CS	< 8.72	< 1.28	< 1.7	< 0.505	1.21	< 2.93	< 2.31	47.3	< 0.077	8.32	246	< 0.699
Test Well DT-9	6/7	UF	CS	< 0.338	< 1.28	< 0.815	< 1.12	0.531	< 2.93	< 2.31	50.4	< 0.077	6.1	124	< 0.699
Test Well DT-10	6/6	UF	CS	< 6.31	< 1.67	< 0.815	< 0.701	0.209	< 2.93	< 2.31	49.2	< 0.077	< 4.44	87	< 0.699
Test Well DT-10	6/6	UF	DUP	< 6.13	< 1.28	< 0.874	< 0.659	< 0.153	< 2.93	< 2.31	49	< 0.077	< 4.62	85	
Regional Aquifer Springs															
White Rock Canyon Group I:															
Sandia Spring	9/24	F	CS	18.2	< 0.594	< 0.743	< 0.077	< 0.111		< 2.4		< 0.014	7.85	< 0.889	
Sandia Spring	9/24	F	CS	18.6	< 0.594	< 0.743	< 0.077	< 0.111		< 2.83		< 0.014	7.8	< 2.79	
Sandia Spring	9/24	UF	CS						< 3.09						< 0.699
Sandia Spring	9/24	UF	CS						< 3.09						< 0.699
Spring 3	9/24	F	CS	< 2.94	< 0.594	< 0.743	< 0.077	< 0.111		< 9.86		< 0.014	14.2	< 1.47	
Spring 3	9/24	UF	CS						< 3.09						7.45
Spring 4	9/24	UF	CS						< 3.09						6.54
Spring 4	9/24	UF	DUP						< 3.09						8.46
Spring 4	9/24	UF	CS	< 2.94	< 2.08	< 0.743	< 0.077	< 0.07		< 2.4		< 0.014	9.6	< 1.17	
Spring 4	9/24	UF	DUP	< 2.94	< 0.594	< 0.743	< 0.077	< 0.06		< 2.4		< 0.014	9.56	< 2.81	
Spring 4A	9/25	F	CS	< 2.94	< 0.594	< 0.743	< 0.077	< 0.111		< 5.73		< 0.014	8.45	< 2.35	
Spring 4A	9/25	UF	CS						< 3.09						< 0.672
Spring 5	9/25	F	CS	< 0.53	< 0.594	< 0.743	< 0.077	< 0.111		< 7.1		< 0.014	10.1	< 0.696	
Spring 5	9/25	UF	CS						< 3.09						3.27
Ancho Spring	10/24	F	CS	< 3.46	< 3.29	< 0.743	< 0.18	< 0.35		< 2.19	56.7	< 0.05	6.72	< 1.51	
Ancho Spring	10/24	F	DUP	< 3.43	< 1.55	< 0.743	< 0.23	< 0.15		< 2.4	58	< 0.04	7.09	< 1.18	
Ancho Spring	10/24	UF	CS						< 3.09						8.2
Ancho Spring	10/24	UF	DUP						< 3.09						7
White Rock Canyon Group II:															
Spring 6A	9/25	UF	CS						< 3.09						117
Spring 6A	9/25	F	CS	< 2.94	< 0.594	< 0.743	< 0.077	< 0.06		< 4.5		< 0.014	10.3	< 0.798	
Spring 9	9/25	UF	CS						< 3.09						11.7
Spring 9	9/25	UF	DUP						< 3.09						
Spring 9	9/26	F	CS	< 2.94	< 0.594	< 0.743	< 0.077	< 0.111		< 4.57		< 0.014	8.35	< 1.54	

Table 5-26. Trace Metals in Groundwater for 2001 (µg/L) (Cont.)

Station	Date	Codes[a]		Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn	TSS (mg/L)
Regional Aquifer Springs (Cont.)															
White Rock Canyon Group III:															
Spring 1	9/24	UF	CS						< 4.99						60.9
Spring 1	9/24	F	CS	< 1.79	< 2.21	< 0.743	< 0.077	< 0.111		< 2.4		< 0.014	16.4	< 1.53	
Spring 2	9/24	UF	CS						< 3.09						10.7
Spring 2	9/24	F	CS	< 8.29	< 2.9	< 0.743	< 0.077	< 0.111		< 2.4		< 0.014	22.2	< 2.81	
White Rock Canyon Group IV:															
La Mesita Spring	10/23	UF	CS						< 3.09						715
La Mesita Spring	10/23	F	CS	< 2.5	< 3.3	< 0.743	< 0.18	< 0.36		< 2.4	799	< 0.25	< 4.04	< 2.78	
Other Springs:															
Sacred Spring	10/23	F	CS	< 2.29	< 1.48	< 0.743	< 0.16	< 0.05		< 2.4	436	< 0.12	8.87	< 1.43	
Sacred Spring	10/23	F	DUP	< 2.17	< 2.33	< 0.743	< 0.15	< 0.111		< 2.4	430	< 0.09	8.57	< 1.3	
Sacred Spring	10/23	UF	CS						< 3.09						260
Sacred Spring	10/23	UF	DUP						< 3.09						294
Sacred Spring	10/23	F	CS	< 2.29	< 1.62	< 0.743	< 0.14	< 0.111		< 2.4	434	< 0.17	9.15	< 1.46	
Sacred Spring	10/23	UF	CS						< 3.09						3.2
Canyon Alluvial Groundwater Systems															
Acid/Pueblo Canyons:															
APCO-1	4/3	UF	CS	1440	< 2.78	8.25	< 2.77	< 0.168	< 3.09	< 2.4	171	< 0.471	< 4.55	25.6	3.2
APCO-1	4/3	UF	DUP	1410	< 3.28	8.64	< 1.83	< 0.181	< 3.09	< 2.4	167	< 0.119	< 4.34	26.6	
APCO-1	4/3	F	CS	1510	< 2.64	6.51	< 3.44	< 0.111	< 3.09	< 2.4	169	< 0.158	< 4.5	15.6	
DP/Los Alamos Canyons:															
LAO-C	4/3	UF	CS	21	< 0.594	< 0.929	< 2.64	< 0.188	< 3.09	< 2.4	104	0.626	< 1.74	5.12	< 1.4
LAO-C	4/3	F	CS	< 9.14	< 0.594	< 0.941	< 1.9	< 0.268	< 3.09	< 2.4	105	< 0.124	< 2.43	7.76	
LAO-0.7	3/29	UF	CS	417	< 0.594	< 1.04	< 2.65	< 0.111	< 3.09	< 2.4	131	< 0.077	< 2.26	12.1	46.4
LAO-0.7	3/29	UF	DUP												42.2
LAO-0.7	3/29	F	CS	64.7	< 0.594	< 0.743	< 3.44	< 0.111	< 3.09	< 2.4	136	0.683	< 0.9	10.1	
LAO-0.7	3/29	F	DUP	64.9	< 0.594	< 0.743	< 3.44	< 0.111	< 3.09	< 2.4	137	< 0.121	< 1.14	< 3.52	
LAO-1	4/5	UF	CS	< 2.99	11.6	< 0.743	< 3.44	< 0.111	< 3.09	< 2.4	174	< 0.014	< 1.86	< 2.58	2.8
LAO-1	4/5	F	CS	< 0.375	12.1	< 0.743	< 3.44	< 0.111	< 3.09	< 2.4	174	< 0.014	< 1.89	< 0.936	
LAO-1	4/5	F	DUP	< 0.416	11.3	< 0.743	< 3.44		< 3.39	< 2.4	177	<	1.42	< 1.28	
DP Spring	4/3	F	CS	< 2.94	< 1.43	< 0.743	< 1.53	< 0.267	< 3.09	< 2.4	197	< 0.014	< 2.09	< 1.64	
DP Spring	4/3	UF	CS	< 0.636	< 0.594	< 0.743	< 1.56	< 0.245	< 3.09	< 2.4	197	< 0.235	< 2.19	< 2.36	1.6
LAO-2	3/29	UF	CS	< 3.91	228	< 0.743	< 1.62	< 0.173	< 3.09	< 2.4	187	< 0.077	< 1.25	< 4.66	< 0.699
LAO-2	3/29	F	CS	< 2.89	232	< 0.743	< 2.45	< 0.237	< 3.09	< 2.4	186	< 0.129	< 1.02	< 4.89	
LAO-3A	3/28	UF	CS	< 1.06	706	< 0.743	< 3.44	< 0.111	< 3.09	< 2.4	178	< 0.077	< 2.46	< 2	1.4
LAO-3A	3/28	F	CS	< 7.96	745	< 0.743	< 2.2	< 0.176	< 3.09	< 2.4	187	< 0.086	< 2.66	< 2.78	

Table 5-26. Trace Metals in Groundwater for 2001 (µg/L) (Cont.)

Station	Date	Codes[a]		Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn	TSS (mg/L)
Canyon Alluvial Groundwater Systems (Cont.)															
DP/Los Alamos Canyons: (Cont.)															
LAO-3A	3/28	F	CS	< 0.712	736	< 0.743	< 3.44	< 0.111	< 3.09	< 2.4	186	< 0.077	< 2.67	< 4.76	
LAO-3A	3/28	UF	CS		719	< 0.743	< 3.44	< 0.157	< 3.09	< 2.4	181	< 0.077	< 2.52	9.84	< 0.699
LAO-4	4/5	UF	CS	< 0.393	319	< 0.743	< 3.44	< 0.206	< 3.09	< 2.4	136	< 0.014	< 1.24	< 2.9	< 1.4
LAO-4	4/5	F	CS	< 0.392	318	< 0.743	< 3.44	< 0.213	< 3.09	< 2.4	135	< 0.014	< 1.5	< 1.72	
LAO-4.5C	3/28	UF	CS	< 0.932	20.1	< 0.743	< 1.63	< 0.111	< 3.09	< 2.4	117	< 0.077	< 0.784	< 4.33	0.889
LAO-4.5C	3/28	F	CS	40.6	19.5	< 0.743	< 1.93	< 0.111	< 3.09	< 2.4	113	< 0.077	< 0.765	< 3.79	
LAO-6A	3/28	UF	CS	< 1.44	< 8.61	< 0.743	< 1.9	< 0.111	< 3.09	< 2.4	110	< 0.077	< 0.93	< 3.73	< 0.699
LAO-6A	3/28	F	CS	< 0.362	< 8.57	< 0.743	< 3.44	< 0.111	< 3.09	< 2.4	112	< 0.077	< 0.926	< 3.68	
Mortandad Canyon:															
MCO-3	7/31	UF	CS	< 0.812	57.1	7.03	< 0.15	< 0.685	< 3.49	< 1.94	97.7	< 0.244	< 2	8.8	< 0.647
MCO-3	7/31	F	CS	< 0.437	55.2	7.04	< 0.051	< 0.665	< 3.49	< 1.94	97.6	< 0.232	< 1.92	7.96	
MCO-5	8/2	UF	CS	< 0.369	75	5.49	< 0.159	< 0.373	< 3.49	< 1.94	134	< 0.06	< 0.99	9.13	0.943
MCO-5	8/2	UF	DUP		76.1	< 4.51	< 0.213	< 0.294	<	2.75	134	<	2.14	9.05	
MCO-5	8/2	F	CS	< 0.369	74.6	< 4.81	< 0.135	< 0.233	< 3.49	< 1.94	135	< 0.021	< 0.904	9.92	
MCO-6	8/6	F	CS	< 0.486	87.7	6.37	< 0.077	< 0.248	< 3.09	< 2.4	137	< 0.014	< 1.03	14.7	
MCO-7	8/7	F	CS	< 2.94	92.1	7.38	< 0.077	< 0.111	< 3.09	< 2.4	127	< 0.014	< 1.92	< 4.18	
MCO-7.5	8/7	UF	DUP	< 1.52	90.1	7.34	< 0.077	< 0.102	< 3.09	< 2.4	127	< 0.014	< 2.05	< 2.71	
MCO-7.5	8/7	F	CS	< 0.577	108	5.74	< 0.077	< 0.067	< 3.09	< 2.4	121	< 0.014	< 2.97	< 4.71	
Cañada del Buey:															
CDBO-6	5/1	F	CS	< 5.91	< 1.28	7.98	< 1.47	< 0.153	< 2.93	< 2.31	81.6	0.576	5.98	13	
CDBO-6	5/1	F	DUP	< 6.05	< 1.29	8.32	7.52	<	2.93	< 2.31	83.4		6.04	12.6	
CDBO-6	5/1	UF	CS	31.3	< 1.48	< 2.84	< 2.03	< 0.203	< 2.93	< 2.31	86.3	< 0.352	10.5	18.3	25.6
CDBO-6	5/1	UF	DUP				<	0.153				< 0.156			28
CDBO-6	11/7	F	CS	< 9.96			3.32	<	4.31					10.8	
CDBO-6	11/7	F	DUP	< 9.9			3.35	<	3.8					10.2	
Pajarito Canyon:															
PCO-1	4/10	F	CS	< 3.2	< 1.28	< 0.815	< 1.47	< 0.153	< 2.93	< 2.31	255	0.588	< 1.55	< 3.38	
PCO-1	4/10	UF	CS	< 5.58	< 1.28	< 0.815	< 1.47	< 0.153	< 2.93	< 2.31	254	< 0.148	< 1.82	< 3.51	1.8
PCO-1	4/10	UF	DUP	< 5.63	< 1.28	< 0.815	< 2.53	< 0.153	< 2.93	< 2.31	260	< 0.077	< 1.72	< 3.95	
PCO-1	4/10	F	CS	< 4.12	< 1.28	< 0.815	< 1.47	< 0.193	< 2.93	< 2.31	255	< 0.077	< 1.72	9.59	
PCO-1	4/10	UF	CS	< 4.5	< 1.28	< 0.815	< 2.11	< 0.153	< 2.93	< 2.31	263	< 0.077	< 1.86	< 4.24	1
PCO-1	4/10	UF	DUP												1.2
PCO-3	4/10	F	CS	1,550	< 5.99	6.1	< 1.47	< 0.237	< 2.93	< 2.31	463	< 0.182	< 2.24	< 0.72	
PCO-3	4/10	UF	CS	1,700	< 6.88	6.79	< 1.47	< 0.285	< 2.93	< 2.31	475	< 0.077	< 2.28	< 2.02	1.52
PCO-3	4/10	UF	DUP												1.82
PCO-3	4/10	UF	TRP												1.82

Table 5-26. Trace Metals in Groundwater for 2001 (µg/L) (Cont.)

Station	Date	Codes[a]		Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Tl	V	Zn	TSS (mg/L)
Intermediate Perched Groundwater Systems															
Pueblo/Los Alamos/Sanda Canyon Area Perched System in Conglomerates and Basalt:															
POI-4															
Test Well 2A	8/1	UF	CS	< 0.369	< 3.19	9.93	< 0.011	< 0.283	< 3.49	< 1.94	216	< 0.039	< 4.07	< 2.33	0.5
Basalt Spring	7/30	UF	CS	514	< 1.28	< 1.8	3.57	< 0.086	< 3.49	< 1.94	203	< 0.021	< 0.482	20,800	
Basalt Spring	10/23	F	CS	15.4	< 7.15	9.89	< 0.35	< 0.11	<	< 2.4	229	< 0.22	7.06	< 3.58	
	10/23	UF	CS					<	3.09						26
Perched Groundwater System in Volcanics:															
Water Canyon Gallery															
Water Canyon Gallery	11/29	F	CS	< 3.63	< 1.45	< 0.743	< 0.077	< 0.09	<	< 2.4	42	< 0.014	< 2.79	< 2.49	
Water Canyon Gallery	11/29	F	DUP	< 1.41	< 0.594	< 4.22	< 0.077	< 0.08	< 3.09	< 2.4	42.7	< 0.014	< 2.85	< 3.33	
Water Canyon Gallery	11/29	UF	CS					<	3.09						16
	11/29	UF	DUP												17.2
San Ildefonso Pueblo															
LA-5															
Eastside Artesian Well	6/19	UF	CS	< 0.615	< 1.42	< 0.815	< 0.037	< 0.153	< 2.93	< 2.31	201	< 0.077	13.8	21.4	< 0.699
Pajarito Well (Pump 1)	6/20	UF	CS	10.4	< 5.93	< 0.815	< 0.037	< 0.153	< 2.97	< 2.31	47.9	< 0.077	< 0.638	11.4	< 0.699
Pajarito Well (Pump 1)	6/19	UF	CS	< 0.338	10.2	< 0.815	< 0.28	< 0.153	< 4.11	< 2.31	1010	< 0.077	17.2	6.58	< 0.699
Pajarito Well (Pump 1)	6/19	UF	DUP												
Don Juan Playhouse Well	6/19	UF	CS	< 0.338	< 9.08	< 0.815	< 0.25	< 0.153	< 2.93	< 2.31	1010	< 0.077	16.9	7.61	< 0.699
Martinez House Well	6/20	UF	CS	< 0.338	< 3.27	< 0.815	< 0.037	< 0.153	< 3.15	< 2.31	90	< 0.077	17.5	< 1.4	< 0.699
Martinez House Well	12/4	UF	CS	< 2.94	< 4.73	< 0.743	< 0.4	< 0.1	< 3.09	< 2.4	470	< 0.014	21.7	50.1	< 1.4
Otowi House Well	12/4	UF	DUP	< 2.94	< 3.96	< 0.743		<	3.09	< 2.4	477		22.1	50.9	< 1.4
Otowi House Well	6/19	UF	CS	< 1	< 1.28	< 0.815	< 0.72	< 0.76	< 2.93	< 2.31	766	< 0.077	6.36	46.7	< 0.699
New Community Well	6/19	UF	DUP	< 1.02	< 1.28	< 0.815	< 0.81	< 0.2	5.29	< 2.31	765	< 0.077	6.48	47.1	< 0.699
	6/19	UF	CS	< 0.338	< 1.28	< 0.815	< 0.25	< 0.153	< 2.93	< 2.31	216	< 0.077	5.73	7.59	< 0.699
Water Quality Standards[c]															
EPA Primary Drinking Water Standard															
EPA Secondary Drinking Water Standard						100		6	50			2			
EPA Action Level				50										5,000	
EPA Health Advisory							15								
NMWQCC Livestock Watering Standard											25,000-90,000		80-110		
NMWQCC Groundwater Limit							100		50				100	25,000	
NMWQCC Wildlife Habitat Standard				200	1,000	200	50		50					10,000	
									5						

[a]Codes: UF-unfiltered; F-filtered; CS-customer sample; DUP-laboratory duplicate.
[b]Less than symbol (<) means measurement was below the specified limit of detection of the analytical method.
[c]Standards given here for comparison only; see Appendix A. Note that New Mexico Livestock Watering and Groundwater limitsare based on dissolved concentrations, whereas many of these analyses are of unfiltered sample; thus, concentrations may include suspended sediment quantities.

Table 5-27. Number of Samples Collected for Each Suite of Organic Compounds in Groundwater in 2001

		Organic Suite[a]				
Station Name	**Date**	**Herbicide**	**HE**	**PCB**	**Semivolatile**	**Volatile**
Regional Aquifer Wells						
Test Wells:						
Test Well 1	06/05		1			
Test Well 3	10/04		1			
Test Well 4	10/04		1			
Test Well 8	06/04			1	1	1
Test Well 8	06/04			1	1	1
Test Well 8	10/04		1			
Test Well 8	10/05		1			
Test Well DT-5A	06/06		1			
Test Well DT-9	06/07		1			
Test Well DT-10	06/06		1			
Water Supply Wells:						
O-1	02/14		1			
O-1	02/14		1			
O-1	05/09		1			
O-1	05/09		1			
O-1	09/05	1		1	1	2
O-1	09/05	1		1	1	1
O-4	02/14		1			
O-4	05/09		1			
PM-1	02/14		1			
PM-1	05/09		1			
PM-1	05/09		1			
PM-2	02/14		1			
PM-2	05/09		1			
PM-2	09/05		1			
PM-2	11/28		2			
PM-3	05/09		1			
PM-4	02/14		1			
PM-4	05/09		1			
PM-4	09/05		1			
PM-4	11/28		1			
PM-5	02/14		1			
PM-5	05/09		1			
PM-5	09/05		1			
PM-5	09/05		1			
PM-5	11/28		1			
G-1A	02/14		1			
G-1A	05/09		1			
G-2A	05/09		1			
G-3A	02/14		1			
G-3A	05/09		1			
G-4A	02/14		1			
G-4A	05/09		1			
G-5A	09/05		1			

Table 5-27. Number of Samples Collected for Each Suite of Organic Compounds in Groundwater in 2001 (Cont.)

		Organic Suite[a]				
Station Name	**Date**	**Herbicide**	**HE**	**PCB**	**Semivolatile**	**Volatile**
Regional Aquifer Springs						
White Rock Canyon Group I:						
Sandia Spring	09/24		2	2	2	2
Spring 3	09/24			2	2	2
Spring 3	09/24			1	1	1
Spring 4	09/24					1
Spring 4	09/24		1	2	2	2
Spring 4A	09/25		1	1	1	1
Spring 5	09/25		1	1	1	1
White Rock Canyon Group II:						
Ancho Spring	10/24		1	1	1	2
Spring 6A	09/25		1	1	1	1
Spring 7	09/25					1
Spring 9	09/25		1	1	1	1
White Rock Canyon Group III:						
Spring 1	09/24			1	1	1
Spring 2	09/24			1	1	1
White Rock Canyon Group IV:						
La Mesita Spring	10/23			1	1	1
Other Springs:						
Sacred Spring	10/23					1
Sacred Spring	10/23			1	1	1
Sacred Spring	10/23			1	1	1
Canyon Alluvial Groundwater Systems						
Acid/Pueblo Canyons:						
APCO-1	04/03			1	1	2
DP/Los Alamos Canyons:						
LAO-C	04/03			1	1	1
LAO-0.7	03/29			1	1	1
LAO-1	04/05			1	1	1
DP Spring	04/03			1	1	1
LAO-2	03/29			1	1	1
LAO-3A	03/28			1	1	1
LAO-3A	03/28			1	1	2
LAO-4	04/05			1	1	1
LAO-4.5C	03/28			1	1	1
LAO-6A	03/28			1	1	1

Table 5-27. Number of Samples Collected for Each Suite of Organic Compounds in Groundwater in 2001 (Cont.)

		Organic Suite[a]				
Station Name	**Date**	**Herbicide**	**HE**	**PCB**	**Semivolatile**	**Volatile**
Canyon Alluvial Groundwater Systems						
Mortandad Canyon:						
MCO-3	07/31			1	1	1
MCO-5	08/02					1
MCO-5	08/02			1	1	1
MCO-6	08/06			1		
MCO-7	08/07			1		
MCO-7.5	08/07					1
MCO-7.5	08/07			1		
Cañada del Buey:						
CDBO-6	11/07				1	1
Pajarito Canyon:						
PCO-1	04/10		1	1	1	1
PCO-1	04/10		1	1	1	1
PCO-3	04/10		1	1	1	1
Intermediate Perched Groundwater Systems						
Pueblo/Los Alamos/Sandia Canyon Area Perched System in Conglomerates and Basalt:						
POI-4	08/01		1	1	1	1
Test Well 2A	07/30		1	1	1	1
Basalt Spring	10/23			1	1	1
Perched Groundwater System in Volcanics:						
Water Canyon Gallery	11/29					1
Water Canyon Gallery	11/29			1	1	1
San Ildefonso Pueblo:						
Don Juan Playhouse Well	06/19					1
Martinez House Well	12/04					1
Martinez House Well	12/04			1	1	1
Otowi House Well	06/19			1	1	1
Santa Fe Water Supply Wells						
Buckman 1	08/16		2			
Buckman 1	10/31		1			
Buckman 2	08/16		1			
Buckman 2	10/31		1			
Buckman 3	10/31		1			
Buckman 4	10/31		1			
Buckman 6	10/31		1			
Buckman 7	08/16		1			
Buckman 7	10/31		1			
Buckman 8	10/31		2			

Table 5-27. Number of Samples Collected for Each Suite of Organic Compounds in Groundwater in 2001 (Cont.)

		Organic Suite[a]				
Station Name	**Date**	**Herbicide**	**HE**	**PCB**	**Semivolatile**	**Volatile**
Quality Assurance Samples						
DI Blank	4/10/01					1
DI Blank	6/4/01					1
DI Blank	6/6/01		1	1	1	1
DI Blank	8/3/01			1	1	1
DI Blank	10/24/01		1	1	1	1
Organics Trip Blank	11/7/01					1

[a]Herbicides, high explosives, polychlorinated biphenyls, semivolatiles, and volatiles.

Table 5-28. Organic Compounds Detected in Groundwater in 2001 (µg/L)

Station Name	Field QC Sample Date	Type Code[a]	Lab Field Prep[b]	Sample Type	Dilution Factor	Suite[c]	Analyte	Result	Lab Qualifier Code[d]	Valid Flag Code[d]	EPA Tap Screen Level[e]	Result/ Screening Level
Test Well 8	06/04	FB	UF	CS	1	VOA	Butanone[2-]	5.3			1,904.34	0
Spring 3	09/24	FB	UF	CS	1	VOA	Butanone[2-]	8.4			1,904.34	0
LAO-3A	03/28		UF	CS	1	SVOA	Bis(2-ethylhexyl)phthalate	1		J-	4.8	0.21
PCO-3	04/10		UF	CS	1	SVOA	Bis(2-ethylhexyl)phthalate	1.4			4.8	0.29
Otowi House Well	06/19		UF	CS	1	VOA	Trichloroethane[1,1,1-]	1.2			792.24	0

[a]FTB–trip blank; FD–field duplicate; FB–field blank; PEB–performance evaluation blank.
[b]Codes: UF–unfiltered; F–filtered; CS–customer sample; DUP–laboratory duplicate.
[c]SVOA–semivolatile organics; VOA–volatile organics.
[d]For Lab Qualifier and Validation Flag Codes, see Table 5-4.
[e]EPA Region VI values *http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm*.

Table 5-29. Quality Assurance Sample Results for Radiochemical Analysis by GEL of Water Samples in 2001[a] (pCi/L)

Matrix[b]	Station Name	Date	Field QC Type[c]	Codes[d]		^{3}H Result	^{3}H Uncert	^{3}H MDA	^{90}Sr Result	^{90}Sr Uncert	^{90}Sr MDA	^{137}Cs Result	^{137}Cs Uncert	^{137}Cs MDA	^{234}U Result	^{234}U Uncert	^{234}U MDA	$^{235,236}U$ Result	$^{235,236}U$ Uncert	$^{235,236}U$ MDA
WG	DI Blank	02/14	PEB	UF	CS				–0.316	0.109	0.416									
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS				0.138	0.076	0.247	–1.47	0.66	2.03	0.0361	0.0231	0.0964	–0.0095	0.0055	0.1410
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	–145	49	180	0.235	0.083	0.268	0.59	0.84	2.96	0.0205	0.0143	0.0625	0.0073	0.0134	0.0811
WM	DI Blank	04/04	PEB	UF	CS	–29	53	180	0.083	0.069	0.233	3.00	1.37	4.87	0.0202	0.0112	0.0347	0.0142	0.0083	0.0128
WS	Jemez River	04/18	FB	UF	CS	–167	50	184	0.222	0.079	0.251	1.51	1.09	3.84	–0.0102	0.0100	0.0623	0.0037	0.0095	0.0477
WM	Pajarito above SR-4	05/02	FB	UF	CS				–0.034	0.059	0.205	–0.29	1.35	4.70	0.0501	0.0228	0.0879	0.0202	0.0117	0.0182
WM	Pajarito above SR-4	05/02	FB	UF	DUP								3.36	2.85	5.36					
WM	Pajarito above SR-4	05/02	FB	UF	CS	–142	52	187	–0.066	0.071	0.247	3.14	1.10	4.12	0.0187	0.0085	0.0260	0.0160	0.0080	0.0261
WG	PM-1	05/09	FB	UF	CS	–115	55	195	–0.040	0.073	0.249	0.95	0.81	3.05	0.0718	0.0272	0.0760	0.0240	0.0160	0.0517
WG	PM-1	05/09	FB	UF	DUP				0.046	0.042	0.137									
WG	Test Well 8	06/04	FB	UF	CS	–26	44		0.045	0.042		0.09	1.05	3.68	0.0245	0.0087	0.0194	–0.0038	0.0027	0.0246
WG	DI Blank	06/06	PEB	UF	CS	–26	44		0.057	0.048		1.18	0.85	3.22	0.0165	0.0107	0.0418	0.0056	0.0071	0.0318
WG	DI Blank	06/20	PEB	UF	CS	–26	47	159	0.293	0.126	0.444	0.61	0.75	2.87	0.0142	0.0084	0.0290	0.0018	0.0055	0.0291
WG	DI Blank	06/20	PEB	UF	DUP							–1.11	1.01	3.42						
WS	DI Blank	07/17	PEB	UF	CS	0	50	168	0.102	0.090	0.241	–0.78	1.91	6.74	0.0081	0.0057	0.0187	0.0000	0.0041	0.0188
WG	Test Well 3	07/30	FB	UF	CS				0.068	0.050	0.156									
WG	DI Blank	08/03	PEB	UF	CS	–79	49	169	0.140	0.061	0.181	1.41	1.31	4.89	–0.0024	0.0056	0.0333	0.0051	0.0066	0.0300
WG	DI Blank	08/07	PEB	UF	CS				–0.049	0.058	0.158									
WG	Buckman 1	08/16	FB	UF	CS				–0.044	0.066	0.181				–0.0073	0.0137	0.0579	–0.0110	0.0142	0.0610
WG	Spring 3	09/24	FB	UF	CS				–0.050	0.095	0.370	0.31	0.70	2.44	0.0913	0.0274	0.0851	0.0070	0.0158	0.0960
WG	Spring 3	09/24	FB	UF	CS	–136	52	184												
WS	Pajarito at Rio Grande	09/25	FB	UF	CS	–84	55	188	0.120	0.069	0.222	0.78	0.87	2.93	0.0516	0.0210	0.0653	–0.0060	0.0160	0.0774
WG	DI Blank	10/24	PEB	UF	CS				0.103	0.057	0.182	3.03	1.41	5.83	0.0136	0.0100	0.0398	0.0076	0.0063	0.0244
WG	DI Blank	10/24	PEB	UF	CS	0	50	166												
WG	Test Well DT-10	11/14	FB	UF	CS				–0.026	281.000	0.084									
Average of Blank Values						–75			0.049			0.96			0.0261			0.0051		
Standard Deviation of Blank Values						60			0.132			1.50			0.0280			0.0101		

Table 5-29. Quality Assurance Sample Results for Radiochemical Analysis by GEL of Water Samples in 2001[a] (pCi/L) (Cont.)

Matrix[b]	Station Name	Date	Field QC Type[c]	Codes[d]		^{238}U Result	^{238}U Uncert	^{238}U MDA	U-Total (ug/L)	^{238}U Result	^{238}U Uncert	^{238}U MDA	^{239,240}Pu Result	^{239,240}Pu Uncert	^{239,240}Pu MDA	^{241}AM Result	^{241}AM Uncert	^{241}AM MDA
WG	DI Blank	02/14	PEB	UF	CS													
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	–0.0131	0.0131	0.0355	<0.006	0.0140	0.0070	0.0095	0.0105	0.0061	0.0095	0.0444	0.0194	0.0515
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	–0.0065	0.0046	0.0625	<0.004	0.0000	1.0000	0.0128	0.0000	0.0067	0.0346	0.0666	0.0189	0.0139
WM	DI Blank	04/04	PEB	UF	CS	0.0107	0.0089	0.0347	<0.004	0.0000	1.0000	0.0348	0.0000	1.0000	0.0250	0.0120	0.0085	0.0163
WS	Jemez River	04/18	FB	UF	CS	–0.0032	0.0032	0.0325		0.0910	0.0227	0.0145	0.0039	0.0039	0.0105	0.0000	1.0000	0.0250
WM	Pajarito above SR-4	05/02	FB	UF	CS	0.0201	0.0117	0.0182	<0.004	0.0159	0.0093	0.0144	–0.0014	0.0071	0.0493	0.0375	0.0281	0.0921
WM	Pajarito above SR-4	05/02	FB	UF	DUP													
WM	Pajarito above SR-4	05/02	FB	UF	CS	0.0122	0.0066	0.0206	<0.004	0.0055	0.0039	0.0074	0.0010	0.0032	0.0201	–0.0051	0.0071	0.0475
WG	PM-1	05/09	FB	UF	CS	0.0192	0.0118	0.0353		0.0102	0.0051	0.0069	0.0026	0.0026	0.0069	0.0121	0.0067	0.0207
WG	PM-1	05/09	FB	UF	DUP													
WG	Test Well 8	06/04	FB	UF	CS	0.0079	0.0046	0.0072		0.0246	0.0143	0.0222	-0.0059	0.0059	0.0435	0.0293	0.0148	0.0199
WG	DI Blank	06/06	PEB	UF	CS	0.0101	0.0073	0.0284		–0.0072	0.0072	0.0527	0.0103	0.0103	0.0380	0.0135	0.0096	0.0184
WG	DI Blank	06/20	PEB	UF	CS	0.0089	0.0080	0.0336		0.0059	0.0042	0.0080	0.0029	0.0029	0.0080	0.0103	0.0060	0.0093
WG	DI Blank	06/20	PEB	UF	DUP													
WS	DI Blank	07/17	PEB	UF	CS	–0.0020	0.0035	0.0187		0.0061	0.0101	0.0366	0.0040	0.0057	0.0217	0.0134	0.0054	0.0124
WG	Test Well 3	07/30	FB	UF	CS													
WG	DI Blank	08/03	PEB	UF	CS	0.0019	0.0079	0.0391		0.0000	1.0000	0.0128	0.0000	1.0000	0.0128	0.0110	0.0059	0.0163
WG	DI Blank	08/07	PEB	UF	CS													
WG	Buckman 1	08/16	FB	UF	CS	0.0073	0.0127	0.0478										
WG	Spring 3	09/24	FB	UF	CS	–0.0051	0.0133	0.0958		0.0033	0.0033	0.0090	0.0133	0.0106	0.0359	0.0242	0.0087	0.0082
WG	Spring 3	09/24	FB	UF	CS													
WS	Pajarito at Rio Grande	09/25	FB	UF	CS	0.0276	0.0170	0.0607		–0.0098	0.0073	0.0393	–0.0131	0.0093	0.0461	0.0163	0.0082	0.0111
WG	DI Blank	10/24	PEB	UF	CS	0.0184	0.0095	0.0308		0.0029	0.0050	0.0210	0.0086	0.0064	0.0210	0.0369	0.0107	0.0194
WG	DI Blank	10/24	PEB	UF	CS													
WG	Test Well DT-10	11/14	FB	UF	CS													
Average of Blank Values						0.0088				0.0108			0.0024			0.0215		
Standard Deviation of Blank Values						0.0099				0.0238			0.0067			0.0186		

Table 5-29. Quality Assurance Sample Results for Radiochemical Analysis by GEL of Water Samples in 2001[a] (pCi/L) (Cont.)

Matrix[b]	Station Name	Date	Field QC Type[c]	Codes[d]	Gross Alpha Result	Gross Alpha Uncert	Gross Alpha MDA	Gross Beta Result	Gross Beta Uncert	Gross Beta MDA
WG	DI Blank	02/14	PEB	UF CS						
WM	Los Alamos above Ice Rink	03/15	FB	UF CS	–0.4	0.3	1.1	0.9	0.6	2.1
WM	Los Alamos above Ice Rink	03/15	FB	UF CS	0.3	0.3	1.1	0.7	0.7	2.3
WM	DI Blank	04/04	PEB	UF CS	–0.2	0.4	1.7	13.0	1.5	3.0
WS	Jemez River	04/18	FB	UF CS	0.4	0.5	1.6	0.6	0.8	2.6
WM	Pajarito above SR-4	05/02	FB	UF CS	0.0	0.3	1.1	0.0	0.5	1.6
WM	Pajarito above SR-4	05/02	FB	UF DUP						
WM	Pajarito above SR-4	05/02	FB	UF CS	–0.2	0.4	1.9	–0.2	0.8	2.7
WG	PM-1	05/09	FB	UF CS	0.3	0.3	1.2	3.5	0.7	2.0
WG	PM-1	05/09	FB	UF DUP						
WG	Test Well 8	06/04	FB	UF CS	0.3	0.3		1.3	0.6	
WG	DI Blank	06/06	PEB	UF CS	–0.1	0.3		1.1	0.8	
WG	DI Blank	06/20	PEB	UF CS	0.2	0.3	1.1	–0.1	0.6	2.8
WG	DI Blank	06/20	PEB	UF DUP						
WS	DI Blank	07/17	PEB	UF CS	0.2	0.3	1.6	0.9	0.7	3.1
WG	Test Well 3	07/30	FB	UF CS						
WG	DI Blank	08/03	PEB	UF CS	–0.2	0.4	1.6	0.7	0.4	1.5
WG	DI Blank	08/07	PEB	UF CS						
WG	Buckman 1	08/16	FB	UF CS						
WG	Spring 3	09/24	FB	UF CS	–0.1	0.2	1.1	0.8	0.3	1.1
WG	Spring 3	09/24	FB	UF CS						
WS	Pajarito at Rio Grande	09/25	FB	UF CS	0.2	0.3	1.3	0.3	0.3	1.3
WG	DI Blank	10/24	PEB	UF CS	0.8	0.4	1.5	0.8	0.6	2.5
WG	DI Blank	10/24	PEB	UF CS						
WG	Test Well DT-10	11/14	FB	UF CS						
Average of Blank Values					0.1			1.6		
Standard Deviation of Blank Values					0.3			3.3		

[a]Three colums are listed: the first is the value; the second is the radioactive counting uncertainty (1 standard deviation); the third is the measurement-specific minimum detectable activity.
Radioactivity counting uncertainties may be less than analytical method uncertainties.
[b]Matrix with which QA sample was submitted; WG-groundwater, WM-snowmelt, WS-surface water.
[c]PEB-Performance Evaluation Blank; FB-Field Blank.
[d]Codes: F–filtered; UF–unfiltered; CS–customer sample; DUP–laboratory duplicate.

Table 5-30. Quality Assurance Sample Results for Chemical Quality Analysis of Water Samples in 2001 (mg/L)[a]

Matrix[b]	Station Name	Date	QC Type[c]	Code[d]		Analytical Laboratory[e]	SiO_2	Ca	Mg	K	Na	Cl	SO_4
WG	DI Blank	02/07	PEB	UF	CS	ESB							
WG	DI Blank	02/07	PEB	UF	CS	GEL							
WG	DI Blank	02/07	PEB	UF	CS	GEL						0.4	0.5
WG	O-1	02/14	FB	UF	CS	ESB							
WG	DI Blank	02/14	PEB	UF	CS	ESB							
WG	DI Blank	02/14	PEB	UF	CS	GEL							
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	GEL			< 0.01			0.2	< 0.1
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	GEL			< 0.01				
WM	DI Blank	04/04	PEB	UF	CS	GEL			< 0.02				
WS	Jemez River	04/18	FB	UF	CS	GEL							
WE	DI Blank	05/02	PEB	UF	CS	GEL							
WE	DI Blank	05/02	PEB	UF	CS	GEL						0.5	
WG	DI Blank	05/02	PEB	UF	CS	GEL							
WG	DI Blank	05/02	PEB	UF	CS	GEL						0.2	
WG	DI Blank	05/02	PEB	UF	DUP	GEL							
WM	Pajarito above SR-4	05/02	FB	UF	CS	GEL		< 0.03	0.03	< 0.03	< 0.02	0.2	< 0.1
WM	Pajarito above SR-4	05/02	FB	UF	CS	GEL			0.03				
WG	PM-1	05/09	FB	UF	CS	GEL							
WG	PM-1	05/09	FB	UF	CS	GEL	< 0.04	< 0.03	< 0.00	< 0.07	< 0.01	< 0.0	< 0.1
WG	PM-1	05/09	FB	UF	DUP	GEL							
WG	MCO-7	05/24	FB	UF	CS	GEL							
WG	MCO-3	05/24	FB	UF	CS	GEL							
WG	MCO-3	05/24	FB	UF	DUP	GEL							
WG	MCO-3	05/24	FB	UF	CS	GEL							
WG	Test Well 8	06/04	FB	UF	CS	GEL							
WG	Test Well 8	06/04	FB	UF	CS	GEL	0.32	< 0.04	0.04	< 0.02	0.12	0.2	0.3
WG	DI Blank	06/06	PEB	UF	CS	GEL							
WG	DI Blank	06/06	PEB	UF	CS	GEL	0.33	< 0.03	0.03	< 0.02	0.11	0.2	< 0.1
WG	DI Blank	06/13	PEB	UF	CS	GEL							
WG	DI Blank	06/20	PEB	UF	CS	GEL							
WG	DI Blank	06/20	PEB	UF	CS	GEL	1.02	< 0.04	0.05	< 0.01	< 0.06	0.2	0.3
WS	DI Blank	07/17	PEB	UF	CS	GEL							
WS	DI Blank	07/17	PEB	UF	CS	GEL	0.46	< 0.04	< 0.01	< 0.02	0.15	< 0.0	< 0.1
WS	DI Blank	07/17	PEB	UF	CS	GEL							

Table 5-30. Quality Assurance Sample Results for Chemical Quality Analysis of Water Samples in 2001 (mg/L)[a] (Cont.)

Matrix[b]	Station Name	Date	QC Type[c]	Code[d]		Analytical Laboratory[e]	SiO_2	Ca	Mg	K	Na	Cl	SO_4
WG	DI Blank	08/03	PEB	UF	CS	GEL		< 0.03					
WG	DI Blank	08/03	PEB	UF	DUP	GEL							
WG	DI Blank	08/07	PEB	UF	CS	GEL							
WG	Buckman 1	08/16	FB	UF	CS	ESB							
WG	Buckman 1	08/16	FB	UF	CS	GEL							
WG	DI Blank	09/07	PEB	UF	CS	GEL							
WG	Spring 3	09/24	FB	UF	CS	GEL	< 0.02	< 0.04	< 0.01	< 0.01	< 0.01	< 0.0	< 0.1
WG	Spring 3	09/24	FB	UF	CS	GEL							
WS	Pajarito at Rio Grande	09/25	FB	UF	CS	GEL	< 0.08	< 0.03	< 0.01	< 0.01	< 0.01	0.2	< 0.1
WS	Pajarito at Rio Grande	09/25	FB	UF	CS	GEL							
WG	DI Blank	10/24	PEB	UF	CS	GEL	0.58	< 0.04	< 0.00	< 0.01	0.10	< 0.0	< 0.1
WG	DI Blank	10/24	PEB	UF	CS	GEL							
WS	SCS-1	11/27	FB	UF	CS	GEL							
WG	DI Blank	11/27	PEB	UF	CS	ESB							

Table 5-30. Quality Assurance Sample Results for Chemical Quality Analysis of Water Samples in 2001 (mg/L)[a] (Cont.)

Matrix[b]	Station Name	Date	QC Type[c]	Code[d]		Analytical Laboratory[e]	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+NO_2-N	ClO_4 (µg/L)	CN (Amenable)
WG	DI Blank	02/07	PEB	UF	CS	ESB						< 1.000	
WG	DI Blank	02/07	PEB	UF	CS	GEL							
WG	DI Blank	02/07	PEB	UF	CS	GEL					< 0.01		
WG	O-1	02/14	FB	UF	CS	ESB						< 1.200	
WG	DI Blank	02/14	PEB	UF	CS	ESB						1.500	
WG	DI Blank	02/14	PEB	UF	CS	GEL						< 0.960	
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	GEL	< 1	< 0.7					
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	GEL				< 0.02	< 0.01	7.830	< 0.000
WM	DI Blank	04/04	PEB	UF	CS	GEL				< 0.02	< 0.01	< 0.800	< 0.000
WS	Jemez River	04/18	FB	UF	CS	GEL						< 0.800	
WE	DI Blank	05/02	PEB	UF	CS	GEL							
WE	DI Blank	05/02	PEB	UF	CS	GEL					0.02		
WG	DI Blank	05/02	PEB	UF	CS	GEL							
WG	DI Blank	05/02	PEB	UF	CS	GEL					0.02		
WG	DI Blank	05/02	PEB	UF	DUP	GEL					0.02		
WM	Pajarito above SR-4	05/02	FB	UF	CS	GEL	< 1	1.5					
WM	Pajarito above SR-4	05/02	FB	UF	CS	GEL				< 0.02	0.02	1.270	< 0.000
WG	PM-1	05/09	FB	UF	CS	GEL							
WG	PM-1	05/09	FB	UF	CS	GEL	< 1	1.5	0.04	< 0.02	0.01	< 0.960	
WG	PM-1	05/09	FB	UF	DUP	GEL				< 0.02			
WG	MCO-7	05/24	FB	UF	CS	GEL						3.030	
WG	MCO-3	05/24	FB	UF	CS	GEL			0.03		20		
WG	MCO-3	05/24	FB	UF	DUP	GEL							
WG	MCO-3	05/24	FB	UF	CS	GEL						3.360	
WG	Test Well 8	06/04	FB	UF	CS	GEL							
WG	Test Well 8	06/04	FB	UF	CS	GEL	< 1	0.9	0.03	0.04	0.01	< 0.960	
WG	DI Blank	06/06	PEB	UF	CS	GEL							
WG	DI Blank	06/06	PEB	UF	CS	GEL	< 1	1.9	0.04	0.04	0.01	< 0.960	
WG	DI Blank	06/13	PEB	UF	CS	GEL						< 0.960	
WG	DI Blank	06/20	PEB	UF	CS	GEL							
WG	DI Blank	06/20	PEB	UF	CS	GEL	< 1	12.8	0.04	0.04	0.01	< 0.960	
WS	DI Blank	07/17	PEB	UF	CS	GEL							
WS	DI Blank	07/17	PEB	UF	CS	GEL	< 1	8.0	0.06	< 0.02	< 0.01		
WS	DI Blank	07/17	PEB	UF	CS	GEL						< 0.960	

Table 5-30. Quality Assurance Sample Results for Chemical Quality Analysis of Water Samples in 2001 (mg/L)[a] (Cont.)

Matrix[b]	Station Name	Date	QC Type[c]	Code[d]		Analytical Laboratory[e]	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3+NO_2-N	ClO_4 (µg/L)	CN (Amenable)
WG	DI Blank	08/03	PEB	UF	CS	GEL						< 0.960	
WG	DI Blank	08/03	PEB	UF	DUP	GEL							
WG	DI Blank	08/07	PEB	UF	CS	GEL						< 0.960	
WG	Buckman 1	08/16	FB	UF	CS	ESB						< 2.170	
WG	Buckman 1	08/16	FB	UF	CS	GEL					1.2	< 0.960	
WG	DI Blank	09/07	PEB	UF	CS	GEL			0.02		< 0.01	< 0.960	
WG	Spring 3	09/24	FB	UF	CS	GEL	< 1	2.9	0.02	< 0.02	0.01		
WG	Spring 3	09/24	FB	UF	CS	GEL						< 0.960	
WS	Pajarito at Rio Grande	09/25	FB	UF	CS	GEL	< 1	17.4	0.02	< 0.02	0.01		
WS	Pajarito at Rio Grande	09/25	FB	UF	CS	GEL						< 0.960	
WG	DI Blank	10/24	PEB	UF	CS	GEL	< 1	17.9	0.02	< 0.02	0.01		
WG	DI Blank	10/24	PEB	UF	CS	GEL						< 0.960	
WS	SCS-1	11/27	FB	UF	CS	GEL						< 0.800	
WG	DI Blank	11/27	PEB	UF	CS	ESB						< 2.170	

Table 5-30. Quality Assurance Sample Results for Chemical Quality Analysis of Water Samples in 2001 (mg/L)[a] (Cont.)

Matrix[b]	Station Name	Date	QC Type[c]	Code[d]		Analytical Laboratory[e]	CN (Total)	TDS[f]	TSS[g]	Hardness (as $CaCO_3$)	Lab pH[h]	Conductance (uS/cm)
WG	DI Blank	02/07	PEB	UF	CS	ESB						
WG	DI Blank	02/07	PEB	UF	CS	GEL		118				
WG	DI Blank	02/07	PEB	UF	CS	GEL						4.11
WG	O-1	02/14	FB	UF	CS	ESB						
WG	DI Blank	02/14	PEB	UF	CS	ESB						
WG	DI Blank	02/14	PEB	UF	CS	GEL						
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	GEL		< 5			5	
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	GEL	< 0.003		< 0.9			17.6
WM	DI Blank	04/04	PEB	UF	CS	GEL	< 0.003		< 1.2			36.7
WS	Jemez River	04/18	FB	UF	CS	GEL	0.003		< 1.4			
WE	DI Blank	05/02	PEB	UF	CS	GEL		< 5				
WE	DI Blank	05/02	PEB	UF	CS	GEL						
WG	DI Blank	05/02	PEB	UF	CS	GEL		< 5				
WG	DI Blank	05/02	PEB	UF	CS	GEL						
WG	DI Blank	05/02	PEB	UF	DUP	GEL						
WM	Pajarito above SR-4	05/02	FB	UF	CS	GEL		< 5		0.2	6	
WM	Pajarito above SR-4	05/02	FB	UF	CS	GEL	< 0.003		< 1.0			11500
WG	PM-1	05/09	FB	UF	CS	GEL		< 5				
WG	PM-1	05/09	FB	UF	CS	GEL	< 0.003		< 0.7	< 0.1	6	101
WG	PM-1	05/09	FB	UF	DUP	GEL						
WG	MCO-7	05/24	FB	UF	CS	GEL						
WG	MCO-3	05/24	FB	UF	CS	GEL		29				
WG	MCO-3	05/24	FB	UF	DUP	GEL		33				
WG	MCO-3	05/24	FB	UF	CS	GEL						
WG	Test Well 8	06/04	FB	UF	CS	GEL		< 5				
WG	Test Well 8	06/04	FB	UF	CS	GEL	< 0.003		< 0.7	0.3	6	417
WG	DI Blank	06/06	PEB	UF	CS	GEL		< 5				
WG	DI Blank	06/06	PEB	UF	CS	GEL	< 0.003		< 0.7	0.2	6	4.93
WG	DI Blank	06/13	PEB	UF	CS	GEL						
WG	DI Blank	06/20	PEB	UF	CS	GEL		< 5				
WG	DI Blank	06/20	PEB	UF	CS	GEL	< 0.003		< 0.7	0.3	6	5.06
WS	DI Blank	07/17	PEB	UF	CS	GEL		< 5				
WS	DI Blank	07/17	PEB	UF	CS	GEL				0.1	8	122
WS	DI Blank	07/17	PEB	UF	CS	GEL	< 0.003		< 0.7			

Table 5-30. Quality Assurance Sample Results for Chemical Quality Analysis of Water Samples in 2001 (mg/L)[a] (Cont.)

Matrix[b]	Station Name	Date	QC Type[c]	Code[d]		Analytical Laboratory[e]	CN (Total)	TDS[f]	TSS[g]	Hardness (as $CaCO_3$)	Lab pH[h]	Conductance (uS/cm)
WG	DI Blank	08/03	PEB	UF	CS	GEL	< 0.003		< 0.7			
WG	DI Blank	08/03	PEB	UF	DUP	GEL	< 0.003					
WG	DI Blank	08/07	PEB	UF	CS	GEL						
WG	Buckman 1	08/16	FB	UF	CS	ESB						
WG	Buckman 1	08/16	FB	UF	CS	GEL						
WG	DI Blank	09/07	PEB	UF	CS	GEL		< 5				
WG	Spring 3	09/24	FB	UF	CS	GEL		< 5		< 0.1	6	4.22
WG	Spring 3	09/24	FB	UF	CS	GEL	< 0.003		< 0.6			
WS	Pajarito at Rio Grande	09/25	FB	UF	CS	GEL		< 5		< 0.1	6	2
WS	Pajarito at Rio Grande	09/25	FB	UF	CS	GEL	< 0.003		< 0.6			
WG	DI Blank	10/24	PEB	UF	CS	GEL		< 5		< 0.1	6	4.71
WG	DI Blank	10/24	PEB	UF	CS	GEL	< 0.003		< 0.7			
WS	SCS-1	11/27	FB	UF	CS	GEL						
WG	DI Blank	11/27	PEB	UF	CS	ESB						

[a]Except where otherwise noted.
[b]Matrix with which QA sample was submitted; WG-groundwater, WM-snowmelt, WS-surface water.
[c]PEB-Performance Evaluation Blank; FB-Field Blank.
[d]Codes: UF-unfiltered; F-filtered; CS-customer sample; DUP-laboratory duplicate; TRP-laboratory triplicate.
[e]Analytical Laboratory: GELC-General Engineering Laboratories, Inc; BABC-Edward S. Babcock and Sons, Inc.
[f]TDS=total dissolved solids.
[g]TSS=total suspended solids.
[h]Standard units.

Table 5-31. Quality Assurance Sample Results for Metals Analysis by GEL of Water Samples in 2001 (µg/L)

Matrix[a]	Station Name	Date	Codes[b]	QC Type[c]	Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
WM	Los Alamos above Ice Rink	03/15	UF CS	FB	<0.3	<13	<3	<2	<0.5	0.47	<0.1	7.2	<1	8	<9	
WM	Los Alamos above Ice Rink	03/15	UF CS	FB	<0.3	<30	<3	<14	<0.2	0.24	<0.1	6.4	<1	7	<5	<0.07
WM	DI Blank	04/04	UF CS	PEB	<0.9	<38	<2	<9	<0.2	0.19	<0.1	<0.4	<1	<1	<10	<0.06
WS	Jemez River	04/18	UF CS	FB												<0.06
WM	Pajarito above SR-4	05/02	UF CS	FB	<0.9	42	<4	<10	<1.3	1.34	<0.1	<1.7	<1	<3	<8	<0.06
WM	Pajarito above SR-4	05/02	UF CS	FB	<0.9	63	<4	<22	<1.3	1.34	<0.1	<3.9	<1	<5	<13	<0.06
WG	Test Well 8	06/04	UF CS	FB	<0.9	<20	<2	<7	<0.6	<0.16	<0.1	<0.4	<1	6	<12	<0.06
WG	DI Blank	06/06	UF CS	PEB	<0.9	<26	<2	<11	<0.4	<0.16	<0.1	<0.4	<1	<4	<16	<0.06
WG	DI Blank	06/20	UF CS	PEB	<0.9	<42	<2	<14	<0.5	<0.16	<0.2	<0.4	<1	<3	<4	<0.06
WS	DI Blank	07/17	UF CS	PEB	<0.7	<10	<3	<7	<0.2	<0.21	<0.4	<0.7	<1	<1	<16	<0.06
WS	DI Blank	07/17	UF CS	PEB												<0.06
WG	DI Blank	08/03	UF CS	PEB	<0.7	<28	<3	<19	<0.4	<0.21	<0.02	6.7	<1	7[d]	<6	<0.06
WG	Spring 3	09/24	UF CS	FB	<0.2	<21	<5	<14	<0.4	<0.20	0.2	<0.3	9	<3	67	
WG	Spring 3	09/24	UF CS	FB												<0.07
WS	Pajarito at Rio Grande	09/25	UF CS	FB	<0.3	<27	<3	<7	<0.5	<0.25	<0.5	<0.9	<1	<2	<5	<0.07
WS	Pajarito at Rio Grande	09/25	UF CS	FB												<0.07
WG	DI Blank	10/24	UF CS	PEB	<0.2	<16	<3	<28	<0.3	<0.20	<0.3	<0.3	<1	<3	<3	
WG	DI Blank	10/24	UF CS	PEB												<0.07

Table 5-31. Quality Assurance Sample Results for Metals Analysis by GEL of Water Samples in 2001 (µg/L) (Cont.)

Matrix[a]	Station Name	Date	Codes[b]	QC Type[c]	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	V	Zn
WM	Los Alamos above Ice Rink	03/15	UF CS	FB	<0	<2	<2	0.31	<0.11	<2	<4	<0.19	<0.01	<1.0	29
WM	Los Alamos above Ice Rink	03/15	UF CS	FB	<1	<2	<1	0.46	<0.11	<3	<4	<0.19	<0.10	<1.0	35
WM	DI Blank	04/04	UF CS	PEB	<1	<1	<1	0.08	<0.15	<3	<2	<0.16	<0.08	<0.6	38
WS	Jemez River	04/18	UF CS	FB						<3					
WM	Pajarito above SR-4	05/02	UF CS	FB	<1	<2	<1	<0.04	<0.15	<3	<3	<0.21	<0.08	<0.7	66
WM	Pajarito above SR-4	05/02	UF CS	FB	<1	<2	<2	<0.04	<0.15	<3	<3	<0.21	<0.08	<0.7	77
WG	Test Well 8	06/04	UF CS	FB	<2	<1	<1	<0.59	<0.15	<3	<2	<0.16	<0.08	<0.6	110
WG	DI Blank	06/06	UF CS	PEB	<1	<1	<1	<0.47	<0.15	<3	<3	<0.16	<0.08	<0.6	75
WG	DI Blank	06/20	UF CS	PEB	<2	<1	<1	<0.32	<0.15	<3	<2	<0.16	<0.08	<0.6	124
WS	DI Blank	07/17	UF CS	PEB	<0.4	<1	<1	<2.43	<0.42	<3	<2	<0.19	<0.36	<0.5	<3
WS	DI Blank	07/17	UF CS	PEB						<3					
WG	DI Blank	08/03	UF CS	PEB	<1	<1	<2	<0.64	<0.14	<3	<2	<0.19	<0.16	<0.5	50
WG	Spring 3	09/24	UF CS	FB	<1	<1	<1	<0.08	<0.11		<7		<0.01	<1.1	<3
WG	Spring 3	09/24	UF CS	FB						<3					
WS	Pajarito at Rio Grande	09/25	UF CS	FB	<0	<2	<1	<2.57	<0.11		<4	<0.19	<0.01	<1.0	<3
WS	Pajarito at Rio Grande	09/25	UF CS	FB						<2					
WG	DI Blank	10/24	UF CS	PEB	<3	<2	<1	<0.15	<0.11		<2	<0.17	<0.16	<1.1	<3
WG	DI Blank	10/24	UF CS	PEB						<3					

[a]Matrix with which QA sample was submitted; WG-groundwater, WM-snowmelt, WS-surface water.
[b]Codes: UF–unfiltered; F–filtered; CS–customer sample; DUP–laboratory duplicate.
[c]QC Type: PEB-Performance Evaluation Blank; FB-Field Blank.
[d]Reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

Table 5-32. Radiological Detections in Quality Assurance Water Samples by GEL in 2001 (pCi/L)[a]

			QC			^{241}Am			^{234}U			^{238}Pu			Gross Beta		
Matrix[b]	Station Name	Date	Type[c]	Codes[d]		Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA	Result	Uncert	MDA
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	0.0666	0.0189	0.0139									
WM	DI Blank	04/04	PEB	UF	CS										13.0	1.5	3.0
WS	Jemez River	04/18	FB	UF	CS							0.0910	0.0227	0.0145			
WG	PM-1	05/09	FB	UF	CS										3.5	0.7	2.0
WG	Spring 3	09/24	FB	UF	CS				0.0913	0.0274	0.0851						
WG	DI Blank	10/24	PEB	UF	CS	0.0369	0.0107	0.0194									

[a]Three colums are listed: the first is the value; the second is the radioactive counting uncertainty (1 standard deviation); the third is the minimum detectable activity. Radioactivity counting uncertainties may be less than analytical method uncertainties.
[b]Matrix with which QA sample was submitted; WG-groundwater, WM-snowmelt, WS-surface water.
[c]PEB-Performance Evaluation Blank; FB-Field Blank.
[d]Codes: UF–unfiltered; CS–customer sample.

Table 5-33. Chemical Quality Detections in Quality Assurance Water Samples in 2001 (mg/L)[a]

Matrix[b]	Station Name	Date	QC Type[c]	Codes[d]		Analytical Laboratory[e]	SiO_2	Mg	Na	Cl	SO_4	Total Alkalinity	F	PO_4-P
WG	DI Blank	02/07	PEB	UF	CS	GEL								
WG	DI Blank	02/07	PEB	UF	CS	GEL				0.4	0.53			
WG	DI Blank	02/14	PEB	UF	CS	ESB								
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	GEL				0.2				
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	GEL								
WM	DI Blank	04/04	PEB	UF	CS	GEL								
WS	Jemez River	04/18	FB	UF	CS	GEL								
WE	DI Blank	05/02	PEB	UF	CS	GEL				0.5				
WG	DI Blank	05/02	PEB	UF	CS	GEL				0.2				
WG	DI Blank	05/02	PEB	UF	DUP	GEL								
WM	Pajarito above SR-4	05/02	FB	UF	CS	GEL		0.03		0.2		1.5		
WM	Pajarito above SR-4	05/02	FB	UF	CS	GEL		0.03						
WG	PM-1	05/09	FB	UF	CS	GEL						1.5	0.04	
WG	MCO-7	05/24	FB	UF	CS	GEL								
WG	MCO-3	05/24	FB	UF	CS	GEL							0.03	
WG	MCO-3	05/24	FB	UF	DUP	GEL								
WG	MCO-3	05/24	FB	UF	CS	GEL								
WG	Test Well 8	06/04	FB	UF	CS	GEL	0.3	0.04	0.12	0.2	0.33	0.9	0.03	0.04
WG	DI Blank	06/06	PEB	UF	CS	GEL	0.3	0.03	0.11	0.2		1.9	0.04	0.04
WG	DI Blank	06/20	PEB	UF	CS	GEL	1.0	0.05		0.2	0.26	12.8	0.04	0.04
WS	DI Blank	07/17	PEB	UF	CS	GEL	0.5		0.15			8.0	0.06	
WG	Buckman 1	08/16	FB	UF	CS	GEL								
WG	DI Blank	09/07	PEB	UF	CS	GEL							0.02	
WG	Spring 3	09/24	FB	UF	CS	GEL						2.9	0.02	
WS	Pajarito at Rio Grande	09/25	FB	UF	CS	GEL				0.2		17.4	0.02	
WG	DI Blank	10/24	PEB	UF	CS	GEL	0.6		0.10			17.9	0.02	

.

Table 5-33. Chemical Quality Detections in Quality Assurance Water Samples in 2001 (mg/L)[a] (Cont.)

Matrix[b]	Station Name	Date	QC Type[c]	Codes[d]		Analytical Laboratory[e]	NO_3+ NO_2-N	ClO_4 (µg/L)	CN (Total)	TDS[f]	Hardness as ($CaCO_3$)	Lab pH[g]	Conductance (µS/cm)
WG	DI Blank	02/07	PEB	UF	CS	GEL				118			
WG	DI Blank	02/07	PEB	UF	CS	GEL							4
WG	DI Blank	02/14	PEB	UF	CS	ESB		1.5					
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	GEL						5.4	
WM	Los Alamos above Ice Rink	03/15	FB	UF	CS	GEL		7.8					18
WM	DI Blank	04/04	PEB	UF	CS	GEL							37
WS	Jemez River	04/18	FB	UF	CS	GEL			0.00				
WE	DI Blank	05/02	PEB	UF	CS	GEL	0.02						
WG	DI Blank	05/02	PEB	UF	CS	GEL	0.02						
WG	DI Blank	05/02	PEB	UF	DUP	GEL	0.02						
WM	Pajarito above SR-4	05/02	FB	UF	CS	GEL					0.2	5.7	
WM	Pajarito above SR-4	05/02	FB	UF	CS	GEL	0.02	1.3					11,500
WG	PM-1	05/09	FB	UF	CS	GEL	0.01					5.5	101
WG	MCO-7	05/24	FB	UF	CS	GEL		3.0					
WG	MCO-3	05/24	FB	UF	CS	GEL	20			29			
WG	MCO-3	05/24	FB	UF	DUP	GEL				33			
WG	MCO-3	05/24	FB	UF	CS	GEL		3.4					
WG	Test Well 8	06/04	FB	UF	CS	GEL	0.01				0.3	5.7	417
WG	DI Blank	06/06	PEB	UF	CS	GEL	0.01				0.2	6.0	5
WG	DI Blank	06/20	PEB	UF	CS	GEL	0.01				0.3	6.1	5
WS	DI Blank	07/17	PEB	UF	CS	GEL					0.1	8.4	122
WG	Buckman 1	08/16	FB	UF	CS	GEL	1.2						
WG	DI Blank	09/07	PEB	UF	CS	GEL							
WG	Spring 3	09/24	FB	UF	CS	GEL	0.01					5.8	4
WS	Pajarito at Rio Grande	09/25	FB	UF	CS	GEL	0.01					6.2	2
WG	DI Blank	10/24	PEB	UF	CS	GEL	0.01					6.0	5

[a]Unless otherwise noted.
[b]Matrix with which QA sample was submitted; WG-groundwater, WM-snowmelt, WS-surface water.
[c]PEB-Performance Evaluation Blank; FB-Field Blank.
[d]Codes: UF-unfiltered; F-filtered; CS-customer sample; DUP-laboratory duplicate.
[e]Analytical Laboratory; GEL-General Engineering Laboratories, ESB-Edward S. Babcock & Sons, Inc.
[f]TDS=total dissolved solids.
[g]Standard units.

Table 5-34. Trace Metal Detections in Quality Assurance Water Samples in 2001 (µg/L)

Matrix[a]	Station Name	Date	Code[b]		QC Type[c]	Analytical Laboratory[d]	Al	Co	Cr	Cu	Fe	Pb	Zn
WM	Los Alamos above Ice Rink	03/15	UF	CS	FB	GEL		7.2		8		0.3	29
WM	Los Alamos above Ice Rink	03/15	UF	CS	FB	GEL		6.4		7		0.5	35
WM	DI Blank	04/04	UF	CS	PEB	GEL							
WM	Pajarito above SR-4	05/02	UF	CS	FB	GEL	42						66
WM	Pajarito above SR-4	05/02	UF	CS	FB	GEL	63						77
WG	Test Well 8	06/04	UF	CS	FB	GEL				6			110
WG	DI Blank	06/06	UF	CS	PEB	GEL							75
WG	DI Blank	06/20	UF	CS	PEB	GEL							124
WG	DI Blank	08/03	UF	CS	PEB	GEL		6.7		7[e]			50
WG	Spring 3	09/24	UF	CS	FB	GEL			9		67		

[a]Matrix with which QA sample was submitted; WG-groundwater, WM-snowmelt.
[b]Codes: UF–unfiltered; F–filtered; CS–customer sample.
[c]QC Type: FB–field blank; PEB–performance evaluation blank.
[d]Analytical Laboratory; GEL-General Engineering Laboratories.
[e]Reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

I. Figures

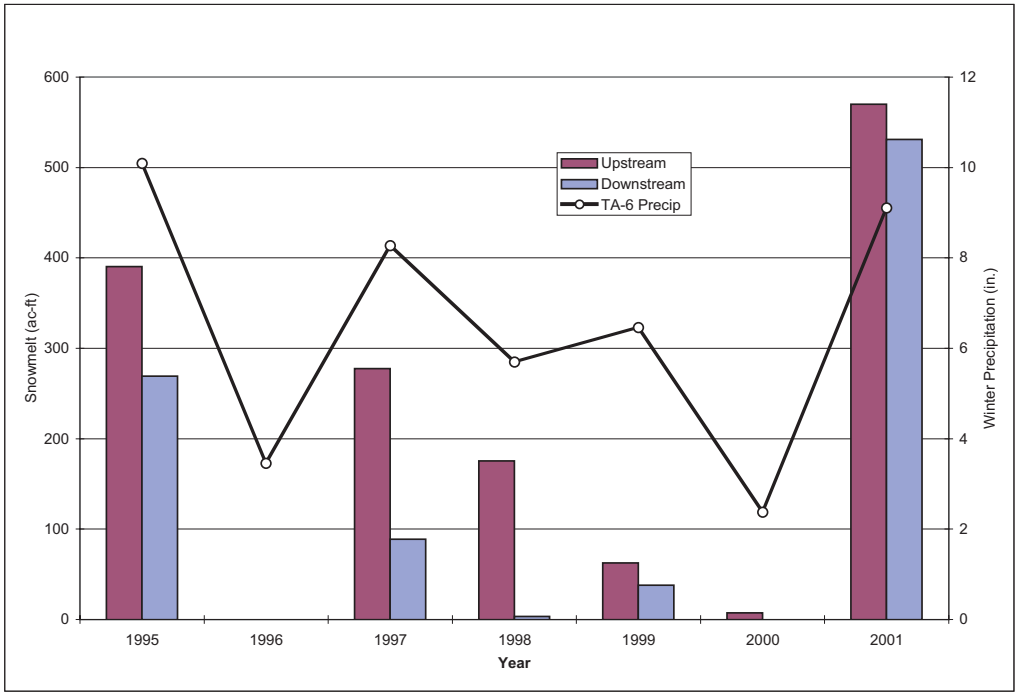


Figure 5-1. Annual snowmelt runoff at upstream and downstream LANL gages amd cumulative precipitaton for November through May.

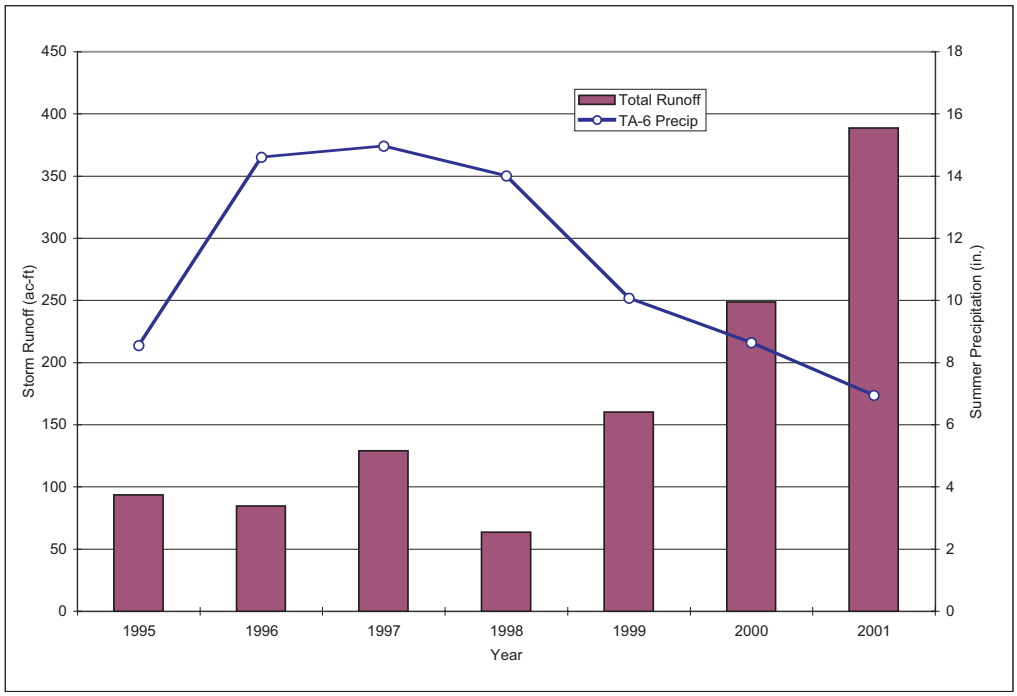


Figure 5-2. Annual seasonal precipitation (June through October) and storm runoff at downstream LANL gages.

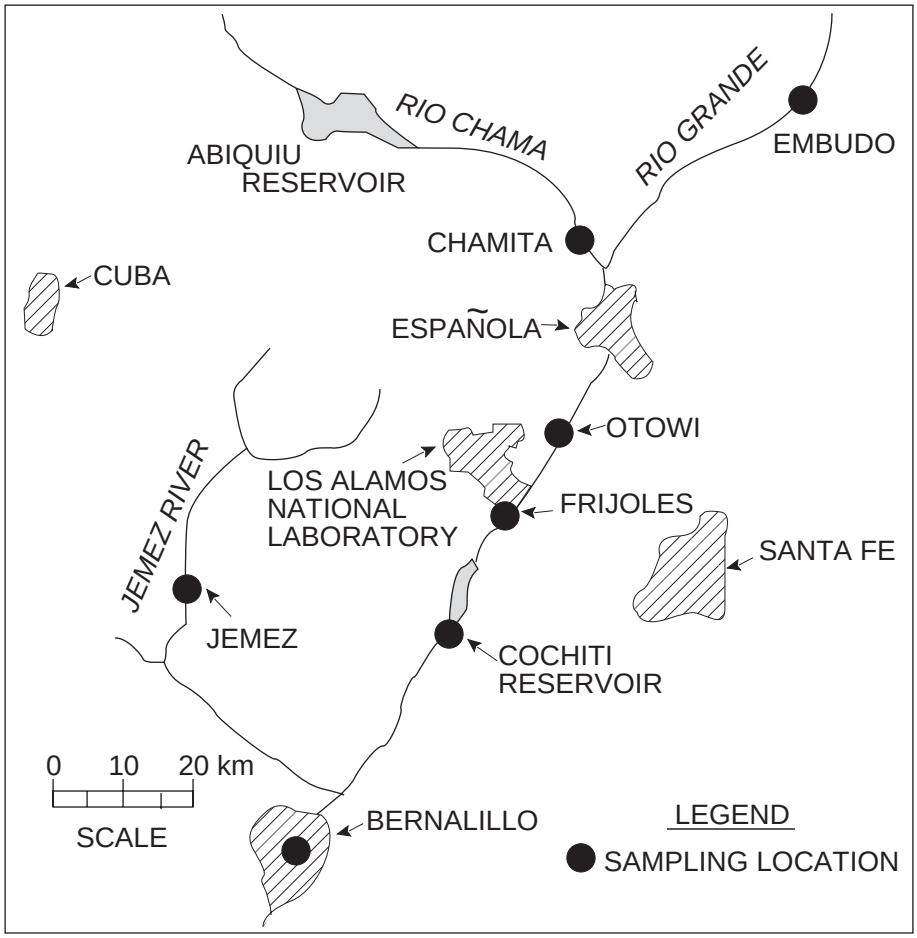


Figure 5-3. Regional base flow and sediment sampling locations.

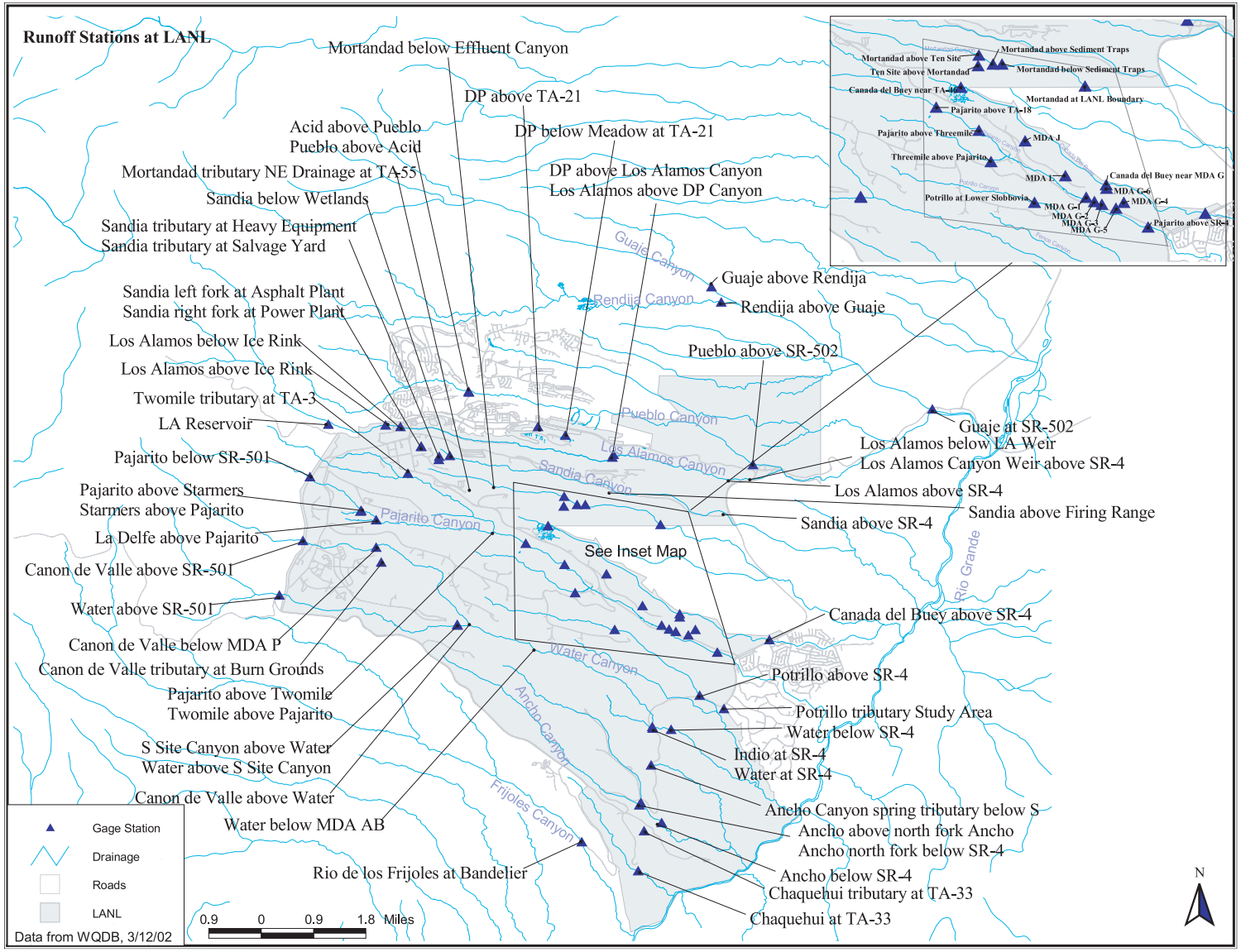


Figure 5-4. Storm runoff sampling (gaging) stations in the vicinity of Los Alamos National Laboratory.

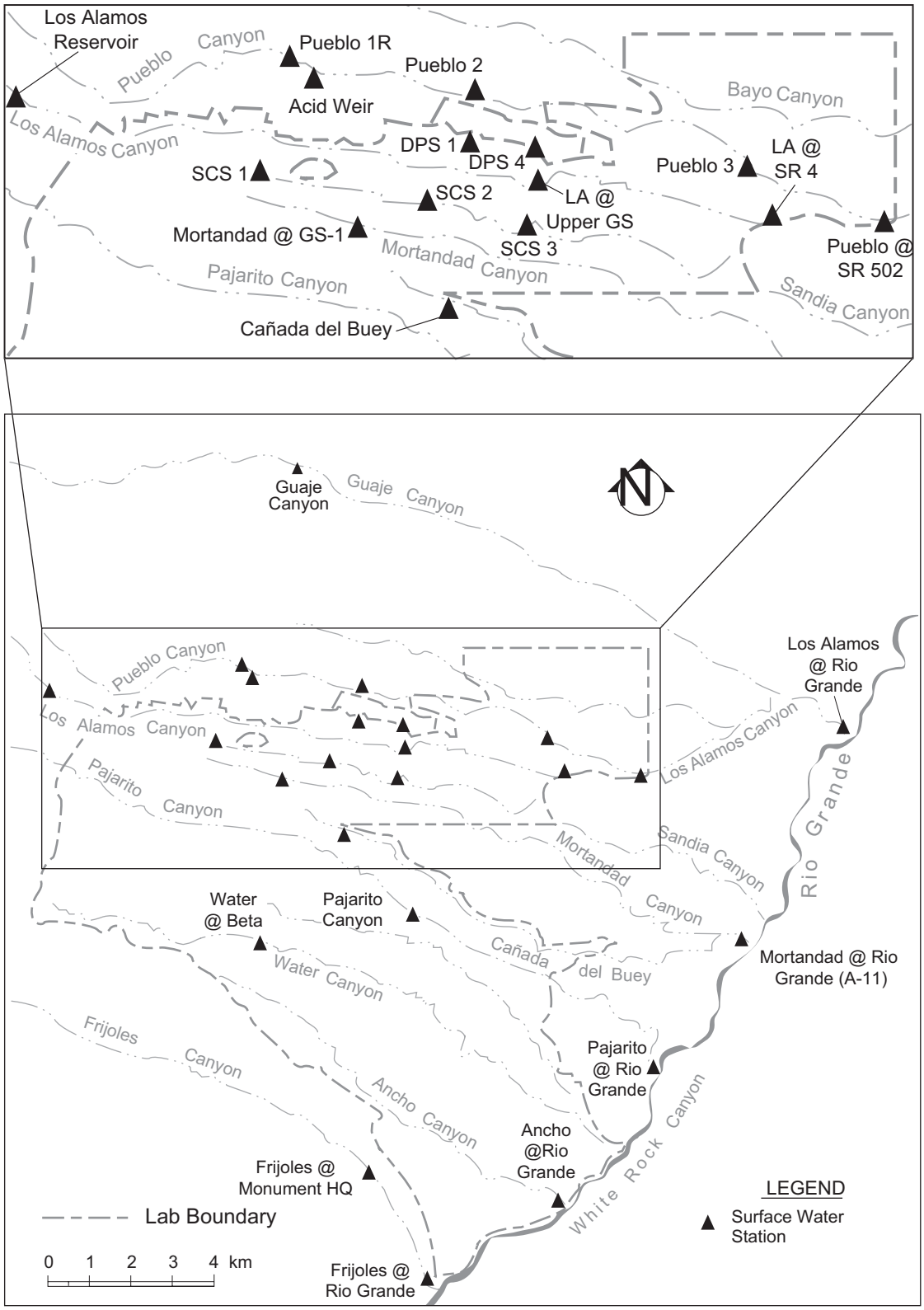


Figure 5-5. Base flow sampling locations in the vicinity of Los Alamos National Laboratory.

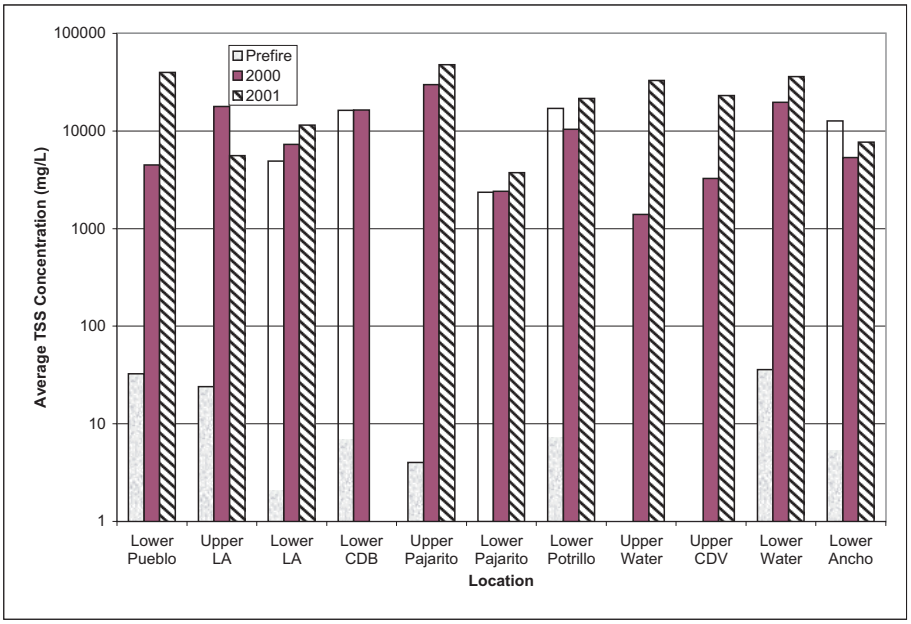


Figure 5-6. Average (volume-weighted) suspended sediment loads in summer storm runoff before and after the Cerro Grande fire.

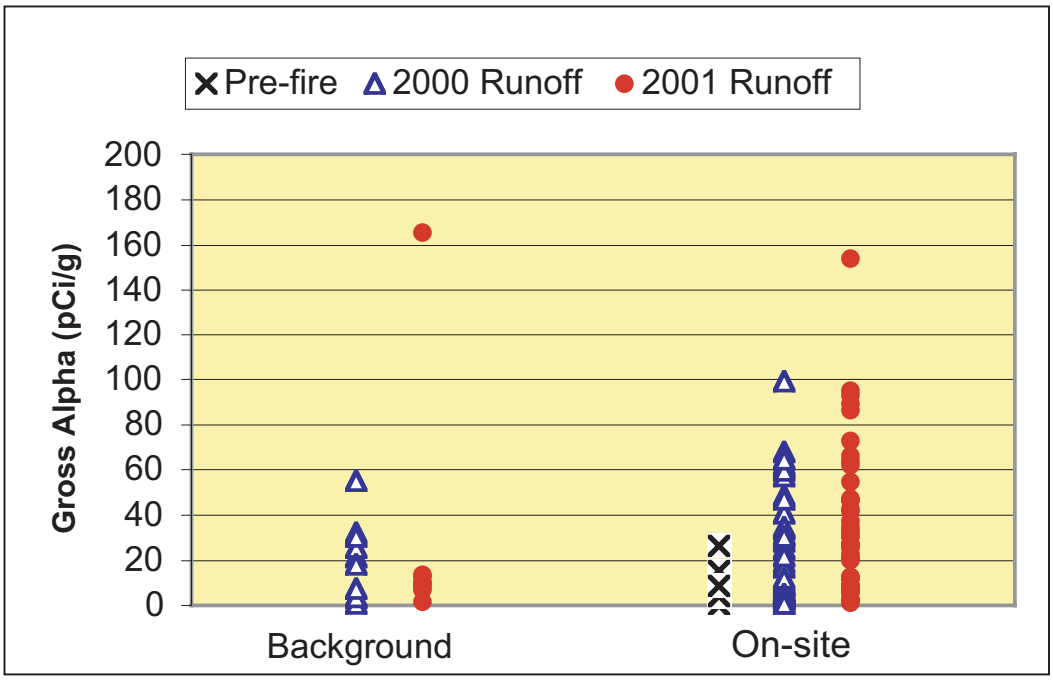


Figure 5-7. Gross alpha activity (calculated) in suspended sediment carried by storm runoff before and after the Cerro Grande fire. Background stations include those upstream or north of the Laboratory. There were no large storm runoff events at background stations before the fire.

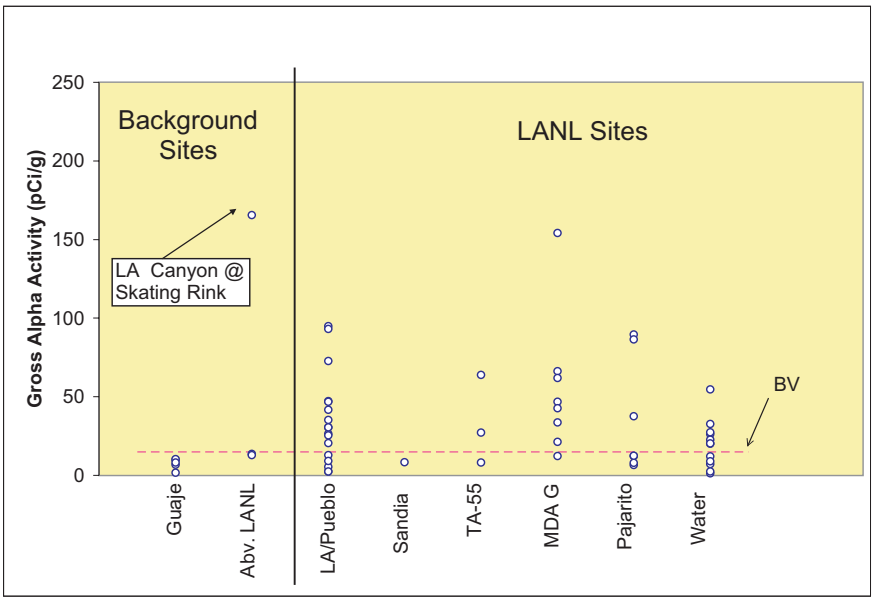


Figure 5-8. Gross alpha activity (calculated) in suspended sediment in various drainages in 2001.

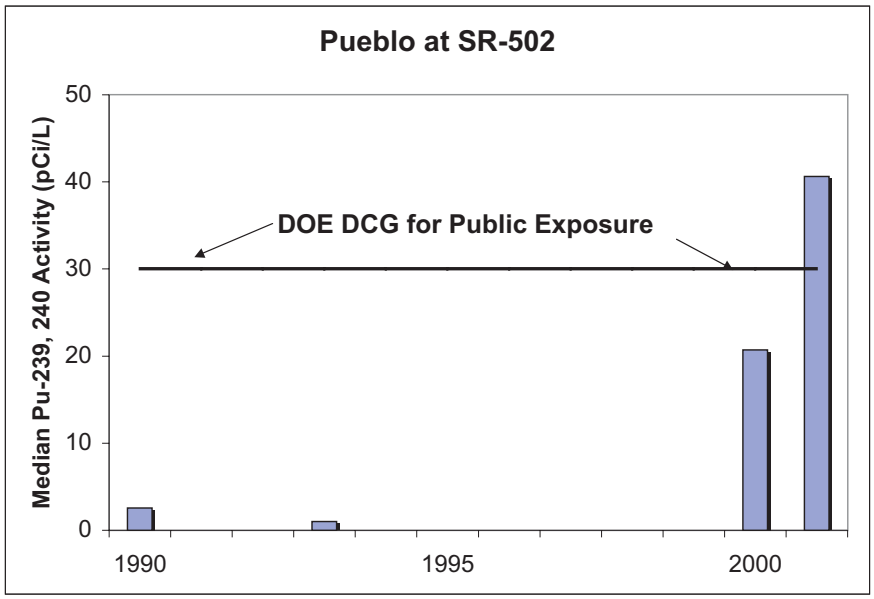
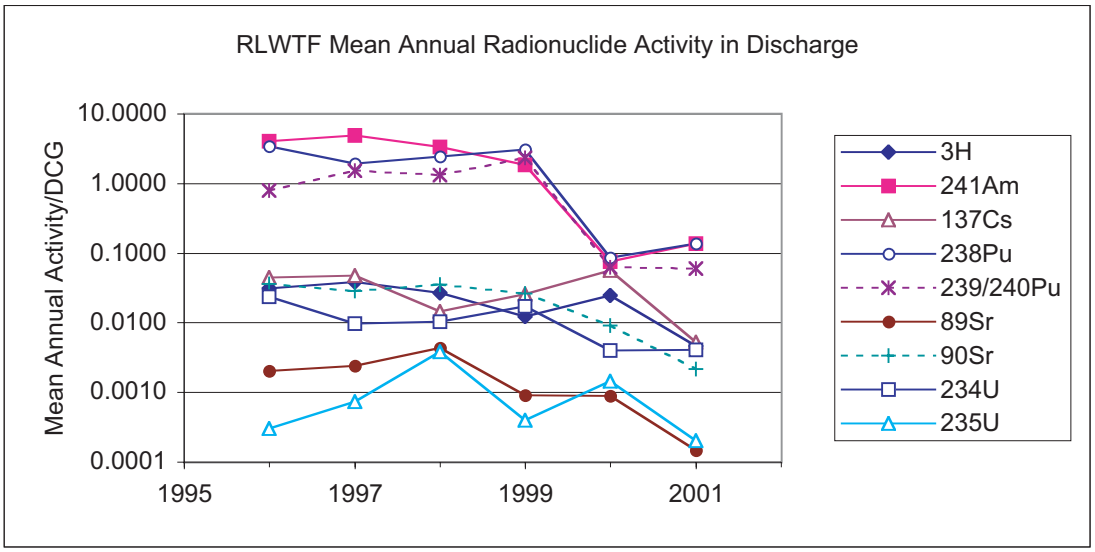


Figure 5-9. History of plutonium-239, -240 activities in unfiltered storm runoff in lower Pueblo Canyon.



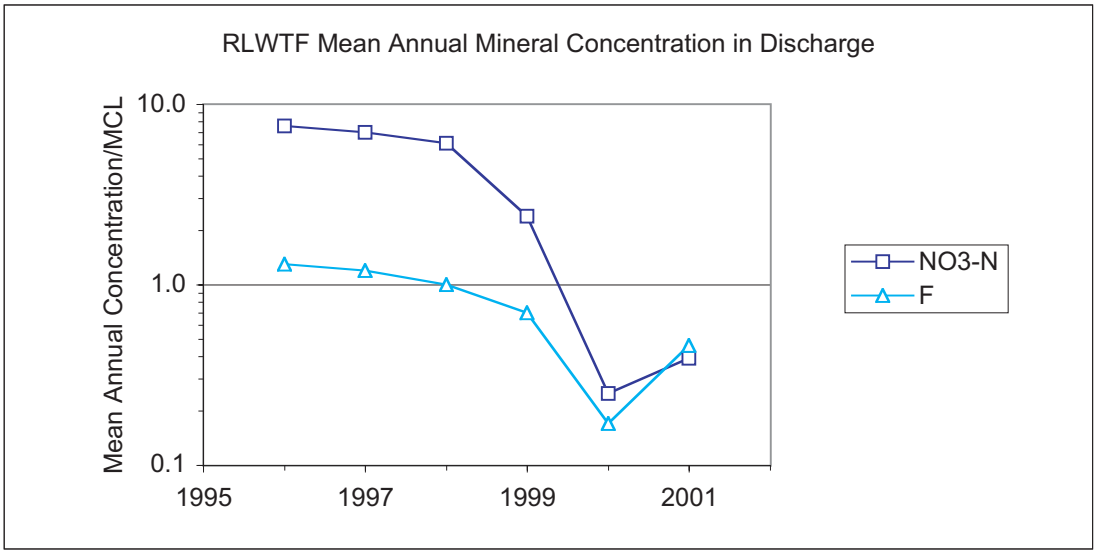


Figure 5-10. Relationship of annual average radionuclide activity and mineral concentration in RLWTF discharges to DOE DCGs or New Mexico groundwater standards for1996 to 2001.

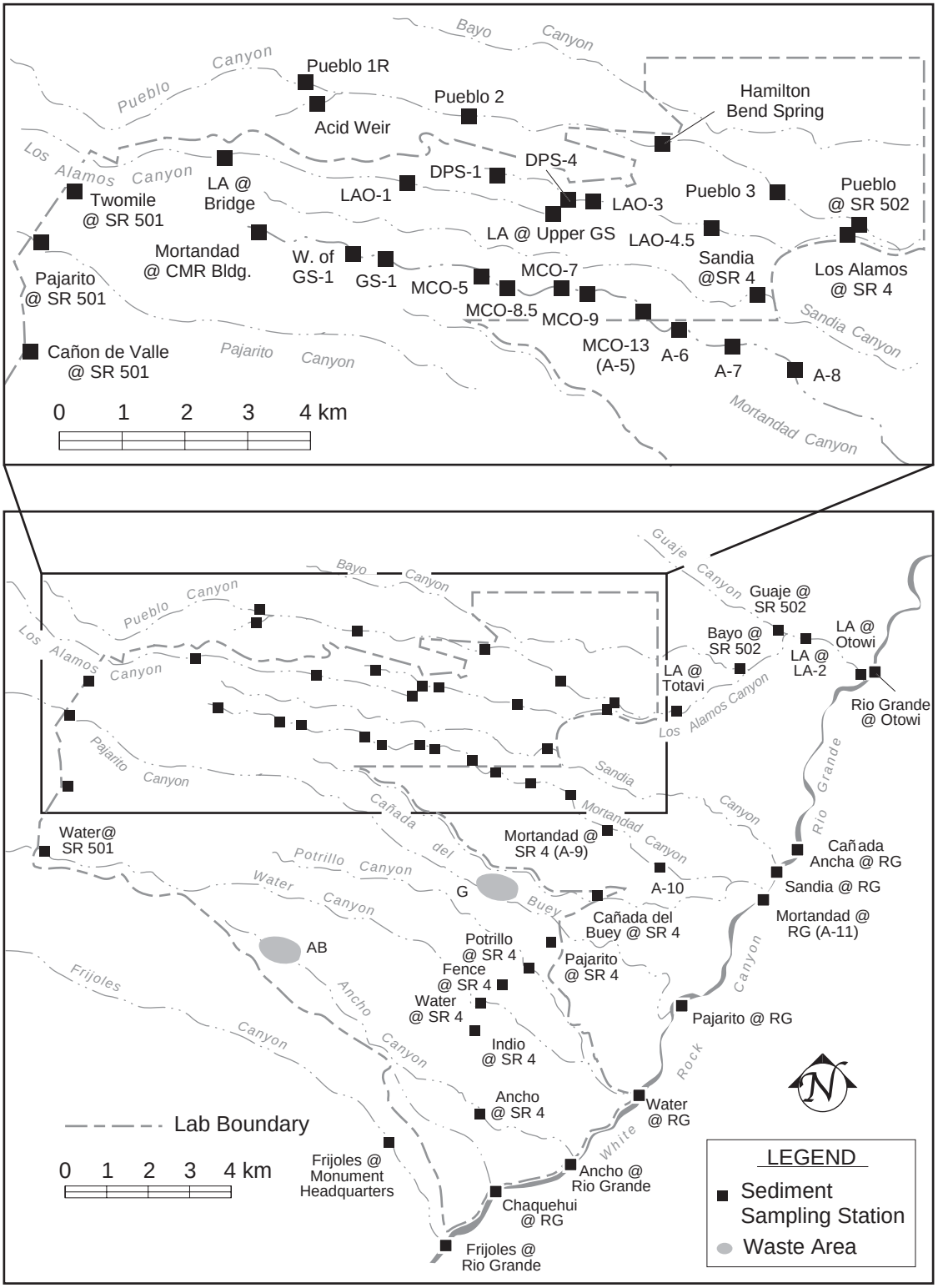


Figure 5-11. Sediment sampling stations on the Pajarito Plateau near Los Alamos National Laboratory. Solid waste management areas with multiple sampling locations are shown in Figures 5-12 and 5-13.

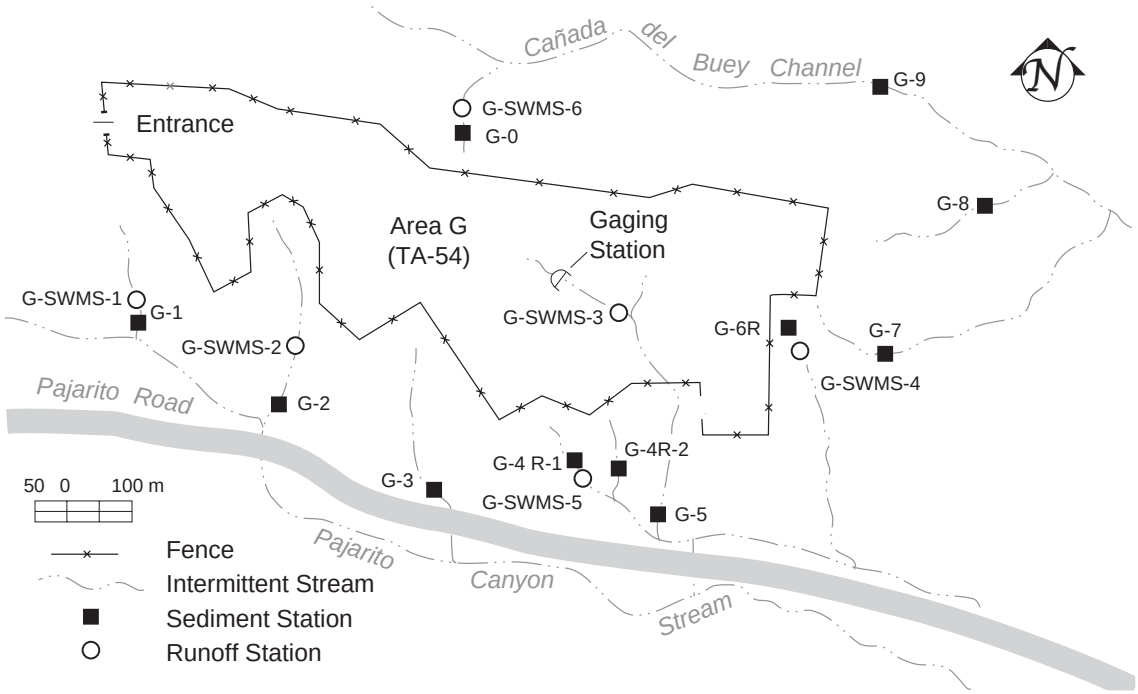


Figure 5-12. Sediment and runoff sampling stations at TA-54, Area G.

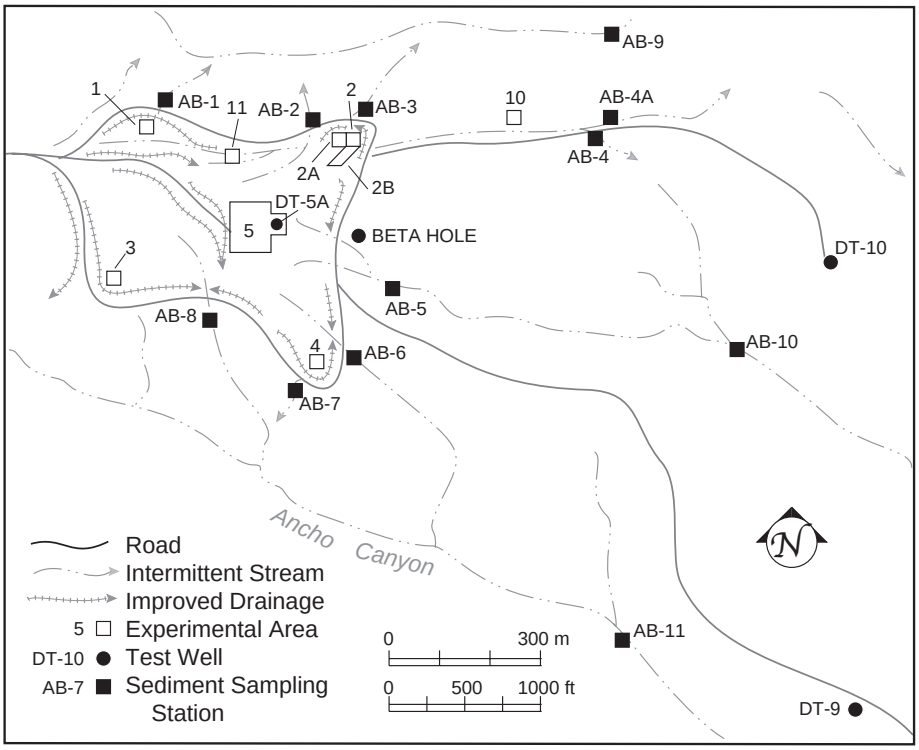


Figure 5-13. Sediment sampling stations at TA-49, MDA AB.

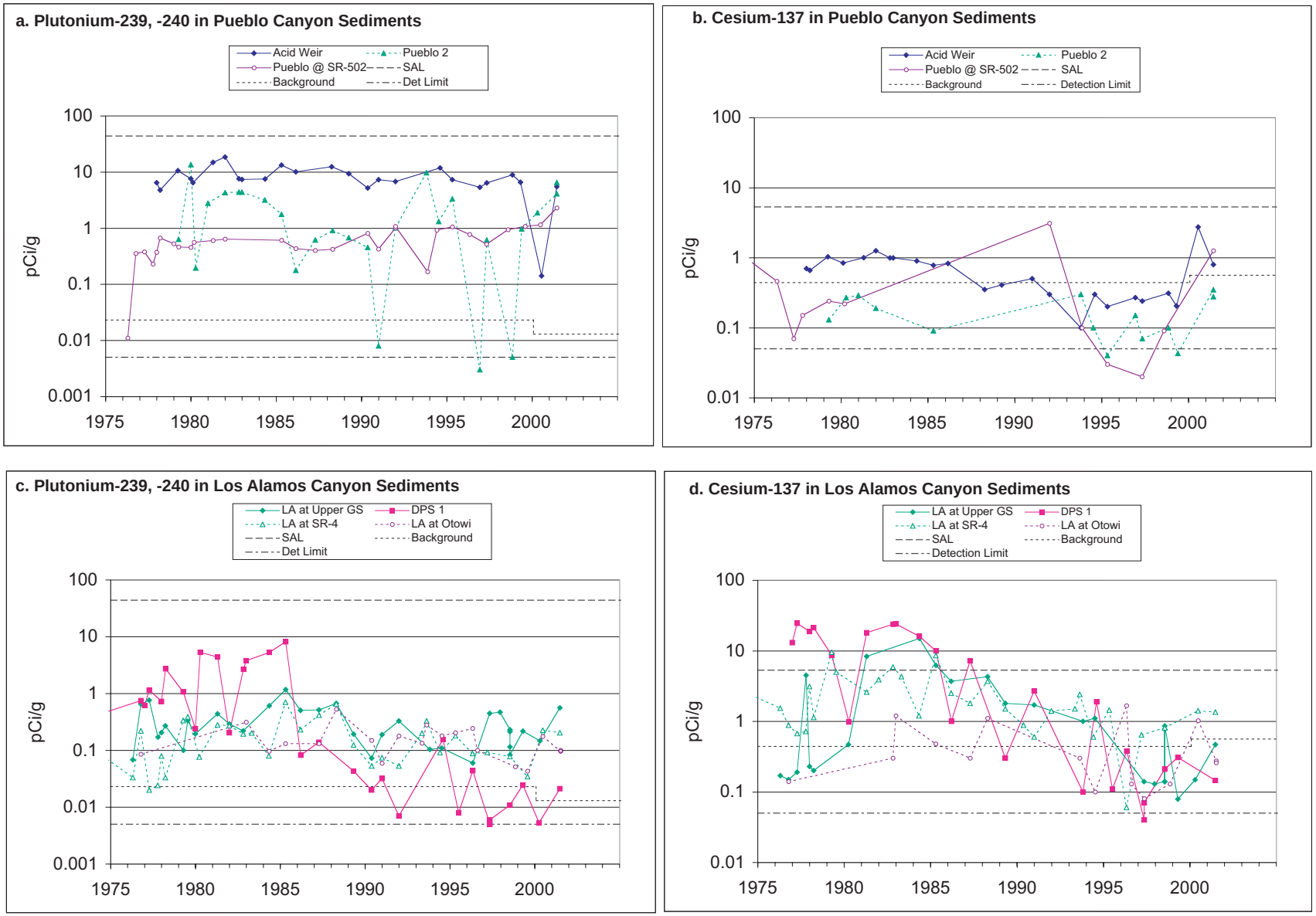
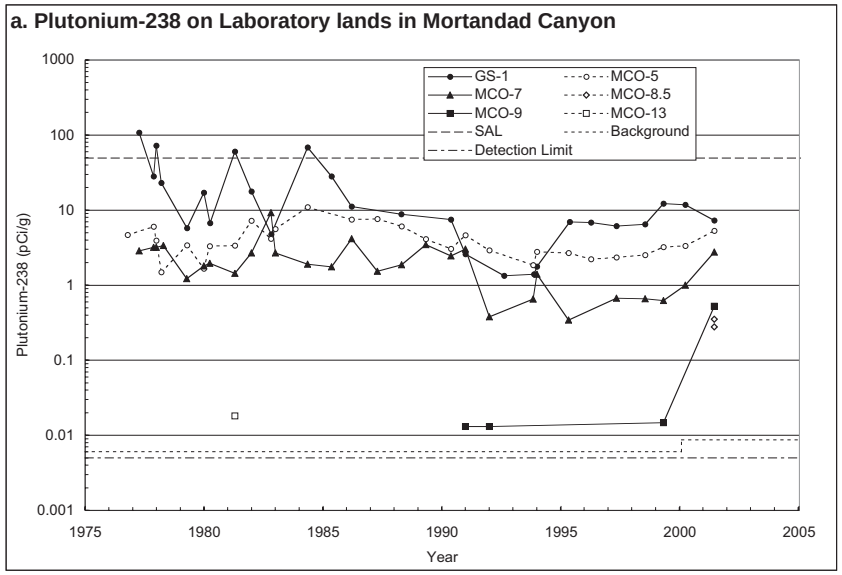
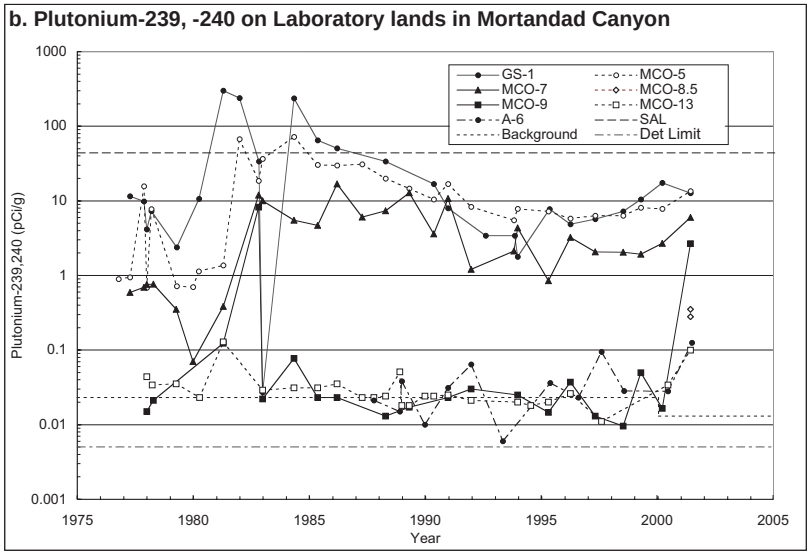


Figure 5-14. Sediment radioactivity histories for selected stations in Acid, Pueblo, DP, and Los Alamos Canyons. Only detections are shown although data are available for most years.





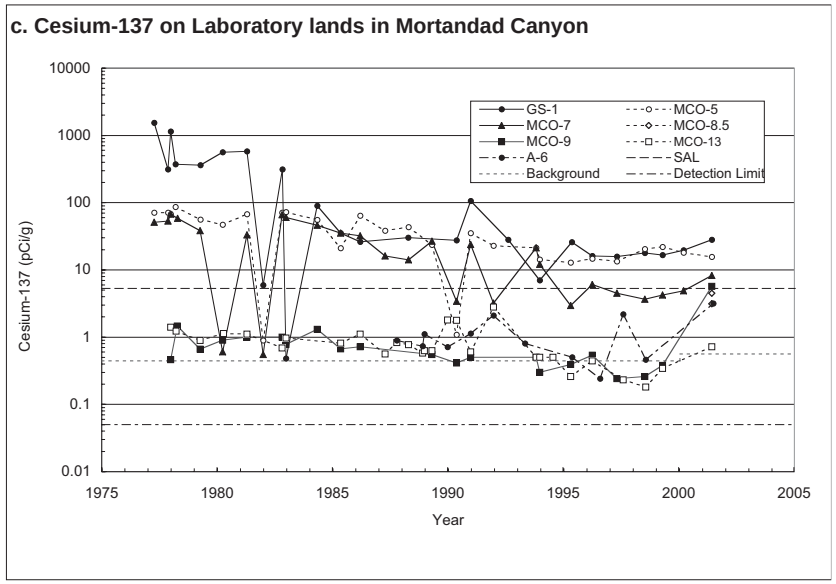


Figure 5-15. Sediment radioactivity histories for stations on Laboratory lands in Mortandad Canyon.

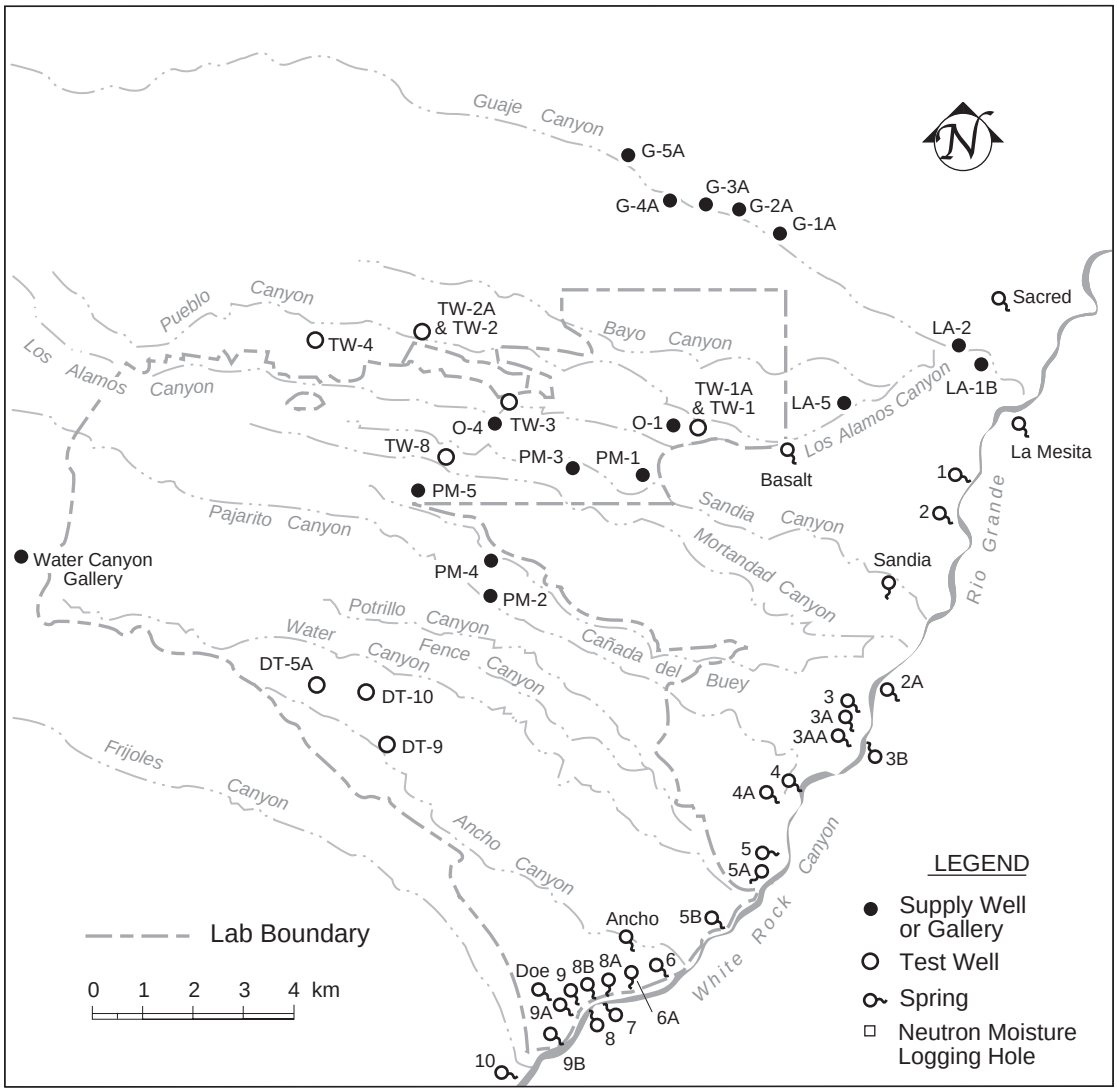


Figure 5-16. Springs and deep and intermediate wells used for groundwater sampling.

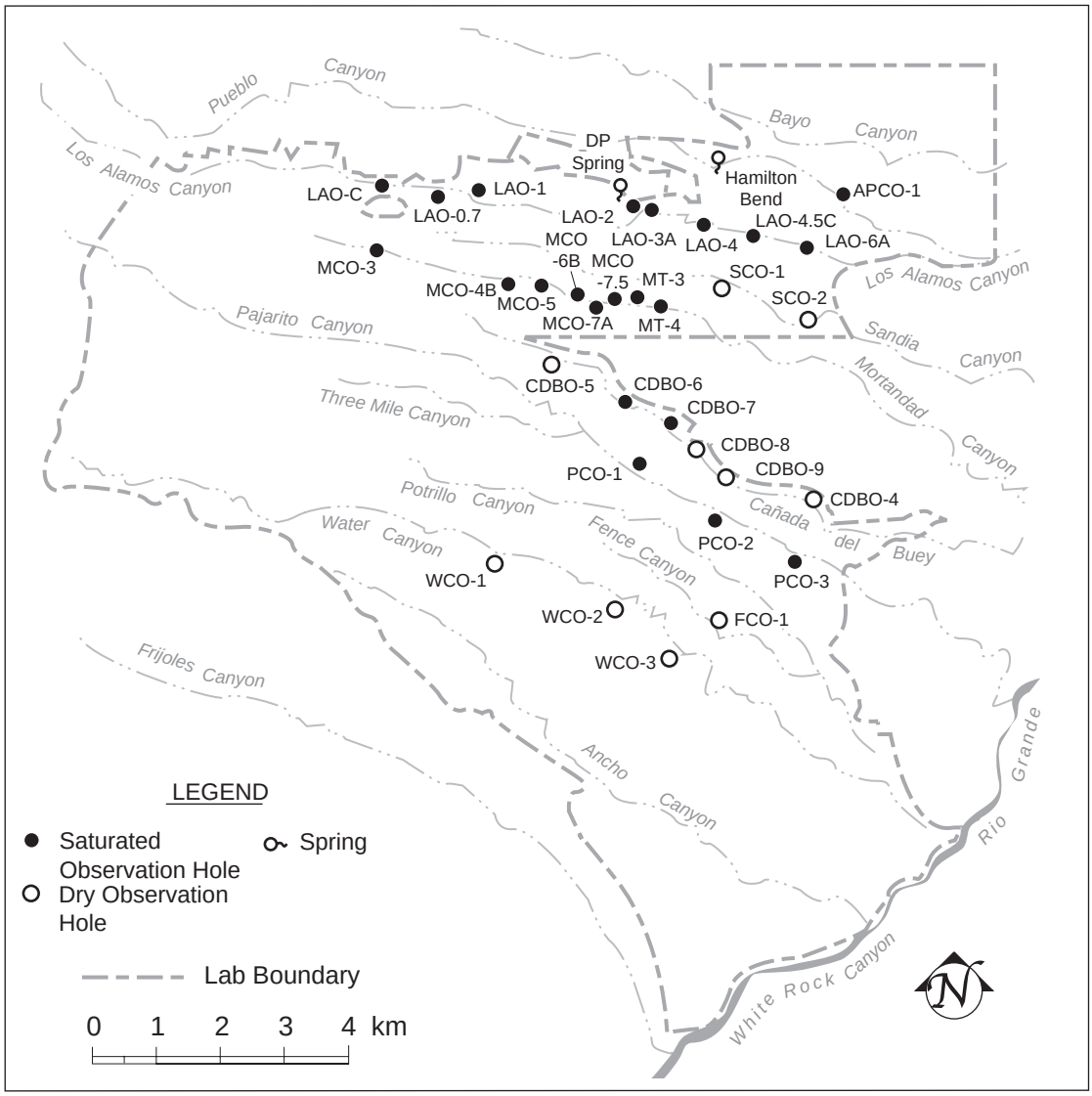


Figure 5-17. Observation wells and springs used for alluvial groundwater sampling.

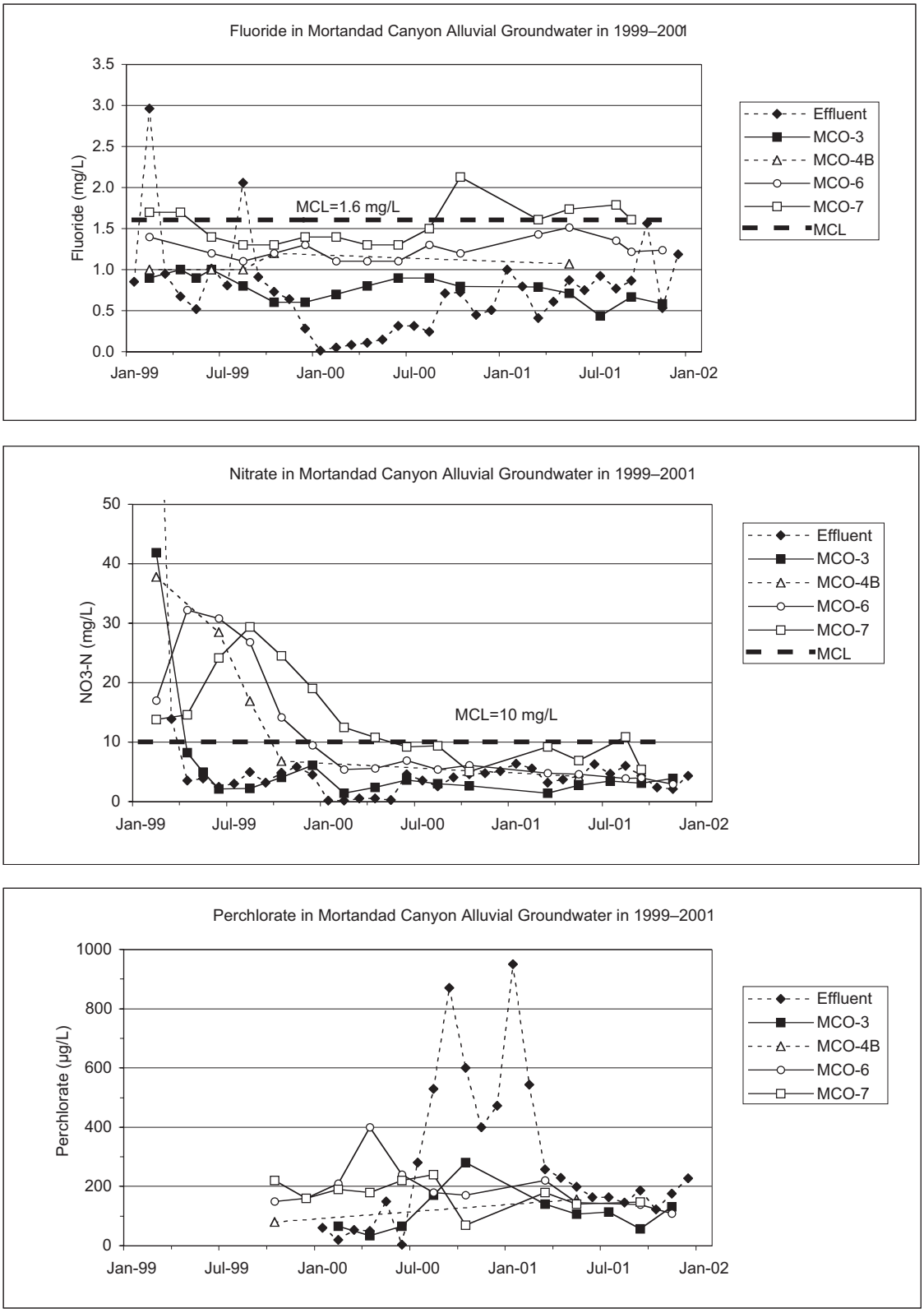


Figure 5-18. Fluoride, nitrate, and perchlorate in RLWTF effluent and Mortandad Canyon groundwater from 1999 through 2001.

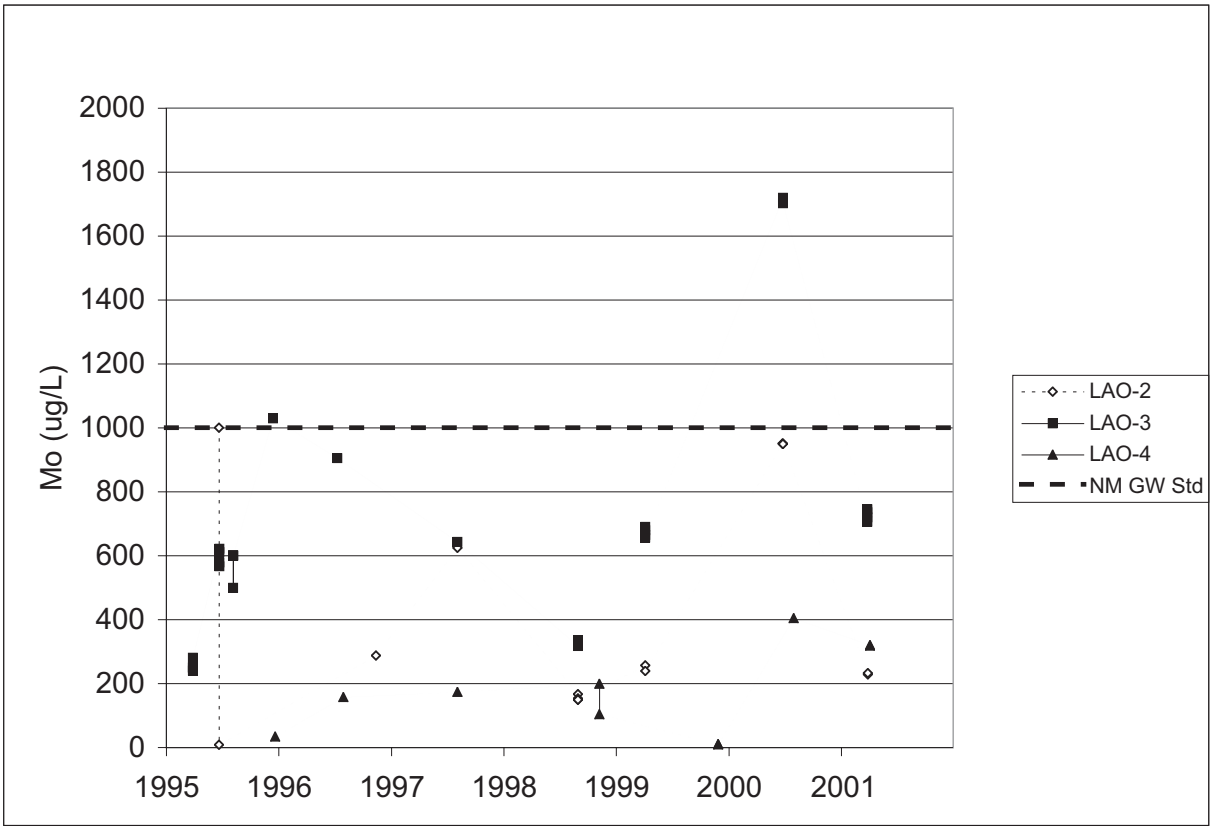
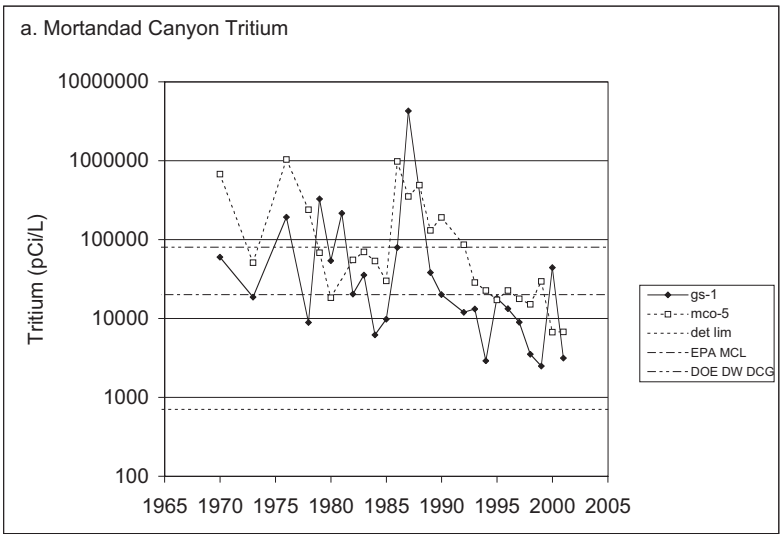
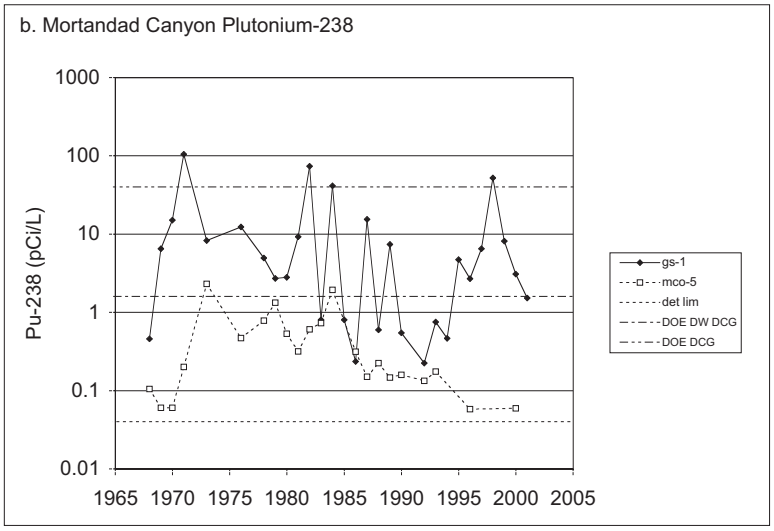


Figure 5-19. Molydenum history in Los Alamos Canyon alluvial groundwater.





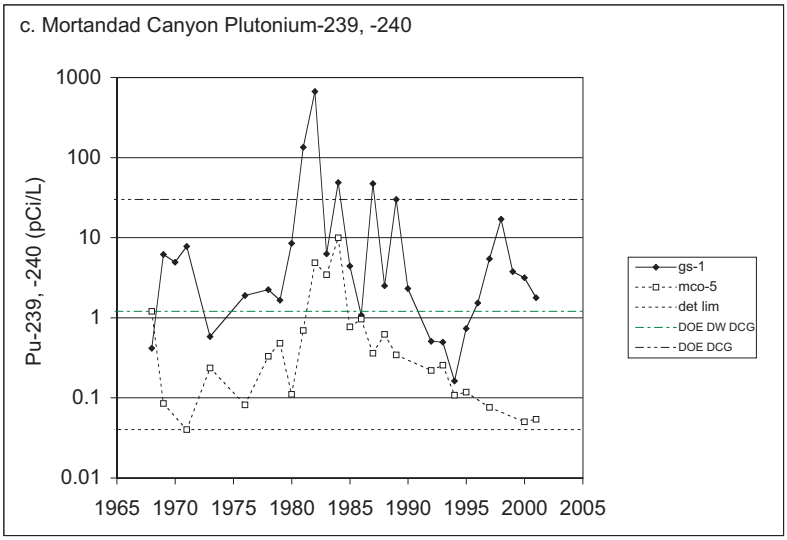
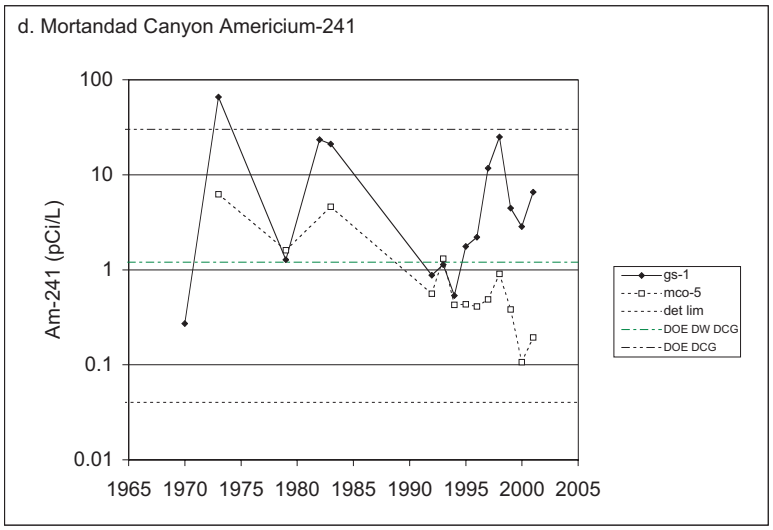


Figure 5-20. Annual average radioactivity in Mortandad Canyon (Cont. on page 412).



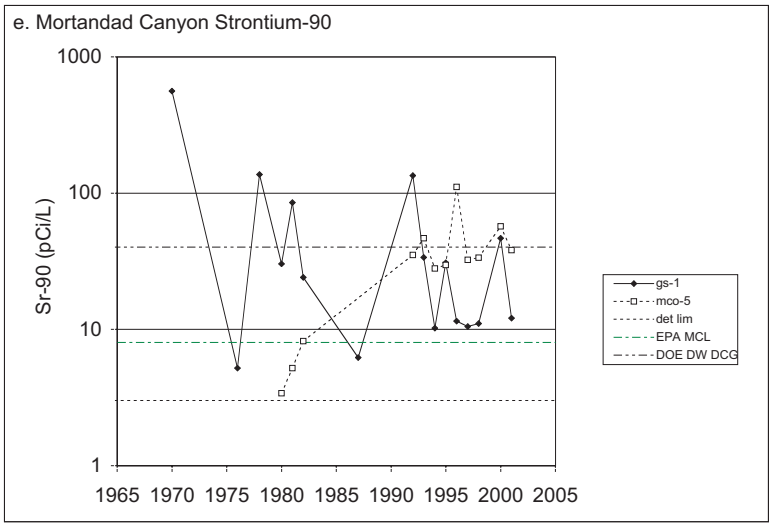


Figure 5-20. Annual average radioactivity in Mortandad Canyon (Cont. from page 411).

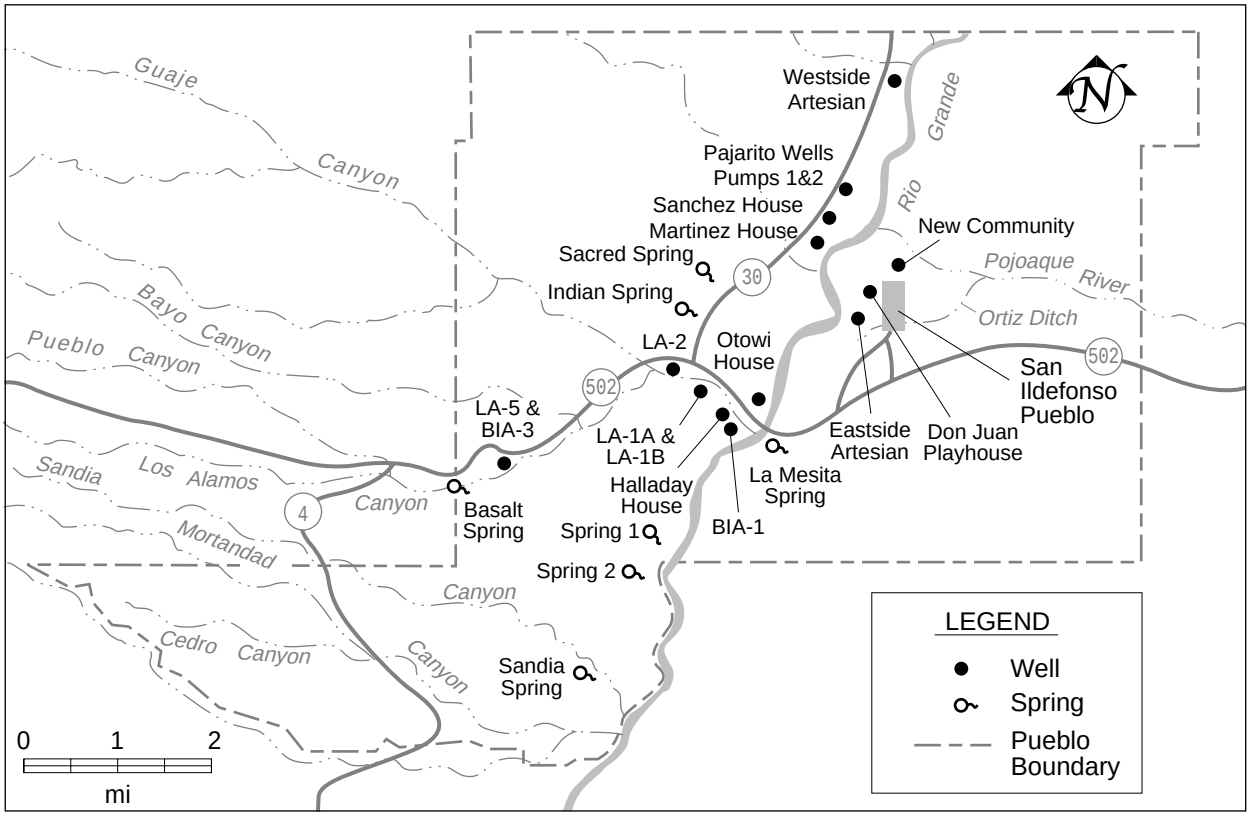


Figure 5-21. Springs and groundwater stations on or adjacent to San Ildefonso Pueblo.

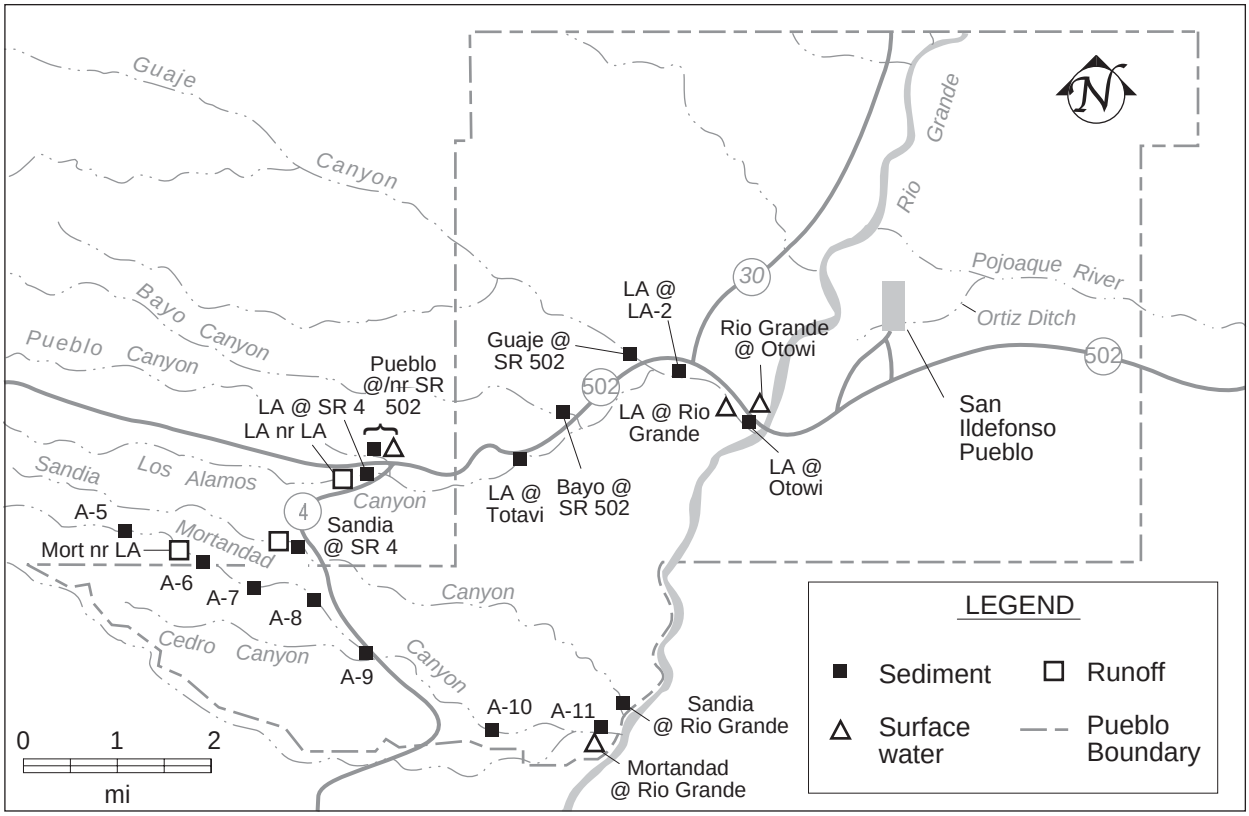


Figure 5-22. Sediment and surface water stations on or adjacent to San Ildefonso Pueblo.

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6. Soil, Foodstuffs, and Associated Biota

6. Soil, Foodstuffs, and Associated Biota

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Philip Fresquez, Gil Gonzales, John Nyhan, Tim Haarmann, Lars Soholt, Bruce Gallaher

Abstract

Soils, foodstuffs, and biota were collected within and around Los Alamos National Laboratory (LANL or the Laboratory) to help determine the impacts of Laboratory operations on human health and the human food chain. The first monitoring program, soils, included sampling surface materials from 12 on-site and 10 perimeter areas around LANL. We analyzed these samples for radiological and trace element constituents and then compared them with soils collected from regional locations in northern New Mexico. Also, these samples, which were collected in the second sampling year after the Cerro Grande fire—a catastrophic wildfire that burned nearly 50,000 acres, including 7,500 at LANL—were compared with samples collected in 1999. Most radionuclide concentrations (activity) in soils from individual sites were nondetectable or within upper-level regional concentrations. As a group (and using detectable and nondetectable values), uranium (mostly naturally occurring) and plutonium-239, -240 concentrations in soils collected from LANL and perimeter areas were statistically higher (α = 0.05) than regional areas. The differences were very low (pCi/g range), however, and all concentrations were far below screening action levels (SALs). Similarly, most trace elements, with the exception of beryllium and lead in soils from on-site and perimeter areas, were within regional concentrations; beryllium and lead, however, were far below SALs. Nearly all mean radionuclide and trace element concentrations in soils collected from LANL and perimeter areas after two sampling seasons following the Cerro Grande fire were statistically (α = 0.05) similar to soils collected before the fire.

We collected foodstuffs samples (produce, fish, elk, deer, and wild prickly pear fruit) from Laboratory and surrounding perimeter areas, including several Native American pueblo communities. The concentrations of radionuclides and trace elements in foodstuffs collected from the Laboratory and perimeter areas were within upper-level regional concentrations and were statistically (α = 0.05) indistinguishable from foodstuffs collected before the Cerro Grande fire. Produce and fish (fillets), in particular, because of the concern for airborne contaminants from smoke and fallout ash and contaminants in storm runoff, were not significantly affected. Although soils from on-site and perimeter areas contained significantly higher concentrations of beryllium and lead, beryllium was below detection levels in produce, and lead was not significantly higher in produce collected from on-site and perimeter areas as compared with regional areas.

Biota monitoring included sampling catfish from Abiquiu and Cochiti reservoirs and analyzing the fish for polychlorinated biphenyl (PCB) congeners, organochlorine pesticides, and dioxins/furans. Some fish were partitioned to determine the contribution of these contaminants from edible versus nonedible portions of the fish. Mean total dioxin-like, whole-body PCB concentrations were 7.86E-04 parts per million (ppm)-fresh weight (FW) and 8.14E-03 ppm-FW for Abiquiu and Cochiti samples, respectively. These levels were statistically (α = 0.05) similar. A comparison to PCB levels measured in the Rio Grande in 1997 implies that sources of PCBs above LANL influences may exist. Dioxins and furans were detected in 62% (48 of 78) of the possible total results in Cochiti fish, and all detected values were below even the most stringent (lowest) toxicological limit. Tetrachlorodibenzodioxin (TCDD) is the most toxic of the dioxins and furans. The mean TCDD levels for whole-body fish from Cochiti Reservoir were 1.14E-07 ppm. All detected levels of dioxins and furans in fish were below the recommended dietary limits for the protection of fish-eating animals. The mean total DDT and metabolites (DDT+DDD+DDE) concentration at Cochiti (5.9E-02 ppm-FW) was significantly higher (α = 0.05) than the mean concentration for Abiquiu (1.5E-02 ppm-FW). The primary source of DDT is thought to be a massive aerial application in 1963. These levels of DDT are within regional and national levels and are within limits suggested for the protection of piscivores and fish. We determined that the portion of catfish not usually

consumed by humans contains about 75% of the PCBs and 74% of the total DDT and metabolites in whole catfish. No impacts of the Cerro Grande fire on PCB and organochlorine levels in fish at Cochiti Reservoir were discernable.

Other biota monitoring projects we conducted this year included tritium concentrations in elk inhabiting the Pajarito Plateau; contaminant concentrations in conifer tree bark and wood following the Cerro Grande fire; effects of herbivory on vegetation recovery following the Cerro Grande fire; spring and fall small mammal sampling for Cañon de Valle and Pajarito Canyon; medium and large mammal spotlight surveys; surveys of fire effects, rehabilitation treatments, ecosystem recovery, and residual fire hazards, second year after the Cerro Grande fire; and biodiversity of fauna after the Cerro Grande fire.

In addition to monitoring Laboratory-wide areas, we assessed several facilities. We monitored radionuclide and trace elements in soil, vegetation, bees, small mammals, and predators at Technical Area (TA) 54, Area G, the Laboratory's primary low-level radioactive waste disposal area. Also soil, vegetation, and bees were collected within and around DARHT, the Laboratory's Dual Axis Radiographic Hydrodynamic Test facility, and we also report the results of soil, collected from around the plutonium processing facility at TA-55 on three different occasions (1984, 1990, and 2001) for plutonium isotope analysis.

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A. Soil Monitoring *(Philip Fresquez)*

1. Introduction

A soil sampling and analysis program provides the most direct means of determining the concentration (activity), inventory, and distribution of radionuclides and radioactivity around nuclear facilities (DOE 1991). Department of Energy (DOE) Orders 5400.1 and 5400.5 mandate this program. Soil provides an integrating medium that can account for contaminants released to the atmosphere, either directly in gaseous effluents (such as air stack emissions) or indirectly from resuspension of on-site contamination (such as firing sites and waste disposal areas) or through liquid effluents released to a stream that is subsequently used for irrigation (Purtymun et al., 1987). The knowledge gained from a soil radiological sampling program is critical for providing information about potential pathways (such as soil ingestion, food crops, resuspension into the air, and contamination of groundwater) that may result in a radiation dose to a person (Fresquez et al., 1998a).

The soil surveillance program at Los Alamos National Laboratory (LANL or the Laboratory) consists of an institutional program that monitors soil contaminants within and around LANL and a facility program that monitors soil contaminants directly around the perimeter of major facilities at LANL. The two main facilities where soil monitoring takes place on an annual basis are the Laboratory's principal low-level radioactive waste disposal site (Area G) at Technical Area (TA) 54 and the Dual Axis Radiographic Hydrodynamic Test (DARHT) facility at TA-15. In additon, we collected soil samples around TA-55—the Laboratory's Plutonium Research Facility. Although not previously documented, this is the third time that we have collected soil samples around TA-55; samples have been collected in 1984, 1990, and 2001, and we report the results of plutonium activity concentrations.

The main objectives of these programs include evaluating (1) radionuclide and nonradionuclide (trace element and organic) concentrations in soils collected from potentially impacted areas (institution- and facility-wide); (2) trends over time (that is, whether radionuclides and nonradionuclides are increasing or decreasing over time); and (3) committed effective dose equivalent (CEDE) to surrounding area residents.

The Ecology Group's (ESH-20's) Contaminant Monitoring Team compares soil samples collected from on-site and perimeter areas at LANL with regional areas; regional areas are located at such a distance away from the Laboratory that their radionuclide and nonradionuclide contents are mostly due to naturally occurring elements or to worldwide fallout. See Chapter 3 for potential radiation doses to individuals from exposure to soils.

On May 4, 2000, a catastrophic wildfire burned across the Los Alamos area (see section 1.D). Because the fire burned over 7,500 acres of LANL lands and some areas are known to contain radionuclides and chemicals in soils and plants above regional concentrations (Fresquez et al., 1998a; Gonzales et al., 2000a), some of these materials might have been suspended in smoke and ash and transported by wind—principally downwind of the fire (the predominant wind direction during the fire was to the northeast of LANL). Last year, we collected and compared many soil samples from areas impacted by the fire with samples collected before the fire. This year, we continue this evaluation by including summarization tables that compare data collected before the fire (1999) with data collected one and two sampling years after the fire (2000 and 2001).

2. Institutional Monitoring

a. Monitoring Network. We collect soil surface samples (0- to 2-in. depth) from relatively level, open, and undisturbed areas at regional locations (three sites), LANL's perimeter (10 sites), and at LANL (12 sites) (see Figure 6-1). Areas sampled at LANL are not from solid waste management units (SWMUs). Instead, the majority of on-site soil-sampling stations are located on mesa tops close to and downwind from major facilities or operations at LANL in an effort to assess radionuclides and nonradionuclides in soils that may have been contaminated as a result of air stack emissions and fugitive dust (the resuspension of dust from SWMUs and active firing sites).

The 10 perimeter stations are located within 4 km (2.5 mi.) of the Laboratory. These stations reflect the soil conditions of the inhabited areas to the north (Los Alamos town site area—four stations) and east (White Rock area and San Ildefonso Pueblo lands—four stations) of the Laboratory. The other two stations, one located on US Forest Service land to the west and the other located on US Park Service land (Bandelier) to the southwest, provide additional coverage. We compare soil samples from all these areas with soils collected from regional locations in northern New Mexico surrounding the Laboratory where radionuclides, radioactivity, and trace elements are from natural or worldwide fallout events; these areas are located around Embudo to the north, Cochiti Pueblo to the south, and Jemez Pueblo to the southwest. All are more than 32 km (20 mi.) from the Laboratory and are beyond the range of potential influence from normal Laboratory operations (DOE 1991).

b. Sampling Procedures, Data Management, and Quality Assurance. Collection of samples for chemical analyses follows a set procedure to ensure proper collection, processing, submittal, and posting of analytical results. Stations and samples have unique identifiers to provide chain-of-custody control from the time of collection through analysis and reporting. The ESH-20 operating procedure (OP) entitled "Soil Sampling for the Soil Monitoring Program," LANL-ESH-20-SF-OP-007, R0, 1997, contains all quality assurance/quality control (QA/QC) protocols, chemical analyses, data handling, validation, and tabulation information. Paragon Analytics, Inc., of Fort Collins, CO, analyzed the radionuclides, and an on-site laboratory at LANL (the Inorganic Trace Analysis Group, CST-9), analyzed the trace elements (light, heavy, and nonmetals). Both laboratories met all QA/QC requirements.

c. Radiochemical Analytical Results (On-Site, Perimeter, and Regional Background Soils). Table 6-1 shows data from soils collected in 2001. Most radionuclide concentrations (activity) and radioactivity in soils collected from on-site and perimeter stations were nondetectable (i.e., the analytical result was lower than three times the counting uncertainty = 99% confidence level) (Corely et al., 1981) or within regional statistical reference levels (RSRLs); and, the few that were detected and above RSRLs were still very low (e.g., in the pCi/g range). The RSRL is the upper-level regional concentration (mean plus two standard deviations = 95% confidence level) (Purtymun et al., 1987) from data collected from regional areas from 1994 through 2001 for worldwide fallout and natural sources of tritium; strontium-90; cesium-137; americium-241; plutonium-238; plutonium-239, -240; total uranium; and gross alpha, beta, and gamma radioactivity.

As a group (and using detectable and nondetectable values), the average concentrations of total uranium (and uranium isotopes, particularly uranium-234 and

uranium-238) and plutonium-239 in soils collected from both perimeter and on-site areas were significantly higher (α = 0.05 = 95% confidence level) than concentrations in soils from regional locations. These data are similar to past years (Fresquez et al., 1998a), and although the mean concentrations of these radionuclides, particularly plutonium-239, were statistically higher than regional areas, the differences in concentrations between the sites were very small. Also, mean concentrations of all radionuclides were far below LANL screening action levels (SALs) used to discern risk to humans. LANL SALs, developed by the Environmental Restoration (ER) Project at the Laboratory, identify the contaminants of concern on the basis of a 15-mrem/yr protective dose limit (ERP 2001).

Average concentrations of tritium in soils collected from perimeter and on-site areas were similar to soils collected from regional background areas. In the past, tritium concentrations in soils from perimeter and especially from on-site areas were higher than regional background concentrations, albeit the concentrations in soils from on-site areas have been generally decreasing over time. The average levels of tritium in soils collected from on-site areas in 2000, for example, were 0.59 pCi/mL (Fresquez et al., 2001) as compared with 0.80 pCi/mL of tritium in soils from on-site areas collected in 1996 (Fresquez et al., 1998a). This year, average concentrations of tritium in soils from on-site areas decreased further to 0.43 pCi/mL.

The higher levels of uranium detected in soil samples collected from perimeter and on-site areas may be a result of either geologic or soil differences between the areas rather than any contamination effects. Soils in the Los Alamos area, for example, are derived from Bandelier (volcanic) tuff and have higher-than-average natural uranium concentrations, ranging from 3 to 11 μg of uranium per gram of soil (Crowe et al., 1978). These results are similar to past years and are not changing (Fresquez et al., 1998a).

Table 6-2 shows the results of radionuclide concentrations in soils collected in 2000 and 2001 after the Cerro Grande fire and the results of soils collected in 1999 before the fire. Because only one regional site, Embudo, was predominantly downwind of the fire (Fresquez and Gonzales 2000), it was the only regional station compared with pre-fire soil conditions. With the exception of the regional station, we made statistical comparisons within LANL and perimeter sites and years (e.g., 1999 versus 2000 and 2001). All mean radionuclide concentrations in soils collected from LANL and perimeter areas after the Cerro Grande fire in 2000 and 2001were statistically similar (α = 0.05) to soils collected before the fire in 1999. And, in fact, most radionuclides in soils collected from all three sites were lower in concentrations in 2001 than in 1999. Individual soil stations in LANL TAs most affected by the fire—TA-06 (Twomile Mesa), TA-15 (R-Site Road East), and TA-16 (S-Site)—contained radionuclides similar to concentrations in soils collected in 1999. Similarly, soils collected from the perimeter of LANL lands directly within the predominant path of the smoke plume (airport area, North Mesa area, Sportsman's Club area, and Tsankawi area) contained radionuclides similar to concentrations in soils collected in 1999. For a more detailed discussion of these data comparisons in 2000, see the report by Fresquez et al. (2000).

d. Nonradiochemical Analytical Results (On-Site, Perimeter, and Regional Background Soils). We analyzed soils for 22 light (barium, beryllium, titanium), heavy (silver, cadmium, cobalt, chromium, copper, mercury, molybdenum, nickel, lead, antimony, tin, thallium, vanadium, zinc), and nonmetal (arsenic, boron, selenium, cyanide) trace elements (occur at <1000 μg/g in soil) and three light (aluminum) and heavy (iron, manganese) abundant elements (occur at >1000 μg/g in soil). Table 6-3 contains the results of the 2001 soil-sampling survey. In general, nine (silver, cadmium, mercury [partly], molybdenum, antimony, selenium, selenium, thallium, and cyanide) out of the 24 elements measured in surface soils collected from regional, perimeter, and on-site stations were below the limits of detection (LOD; the analytical reporting limit). Of those elements (aluminum, arsenic, boron, barium, beryllium, cobalt, chromium, copper, iron, manganese, nickel, lead, titanium, vanadium, and zinc) that were above the LOD in soils collected from perimeter and on-site areas, most were within RSRLs. The RSRLs were derived from regional data averaged over eight years (1992–1999). In addition, all trace element concentrations in soils from perimeter and on-site areas were far below SALs derived by the Environmental Protection Agency (EPA 2000a).

As a group, beryllium and lead concentrations in soils collected from perimeter and on-site areas were significantly higher (α = 0.05) than in soils from regional locations. These results are similar to those reported in past years (Fresquez 1999; Fresquez and Gonzales 2000; Fresquez et al., 2001). However, all

individual and average lead (on-site and perimeter means = 11.0 and 11.6 μg/g, respectively) and beryllium (mean = 0.88 and 0.75 μg/g, respectively) concentrations in soils were far below the SALs of 400 μg/g and 150 μg/g, respectively (EPA 2000a). Like uranium, natural beryllium concentrations in the Los Alamos area are at higher-than-average regional levels. Ferenbaugh et al. (1990) and Longmire et al. (1995), for example, report that naturally occurring beryllium in soils in the Los Alamos area ranges from 1.0 to 4.4 μg/g.

See Table 6-4 for the results of a comparison of trace elements before (1999) and after (2000 and 2001) the fire. Most mean trace elements in soils collected from perimeter and LANL areas after the Cerro Grande fire were statistically ($\alpha = 0.05$) similar to soils collected before the fire in 1999. Chromium and copper concentrations were significantly higher in soils collected from perimeter and on-site areas in 2001 than in soils collected before the fire in 1999; the differences, however, were small. Although the regional site could not be statistically compared between years, all of the elements in soils collected after the fire were equal to concentrations in soils collected before the fire in 1999 and were well within the long-term regional statistical range (Fresquez and Gonzales 2000). Also, cyanide, a compound ion of high concern because increased levels had been reported in storm runoff after the fire (Gallaher 2000), appears to be similar at all three sites (and lower in 2001 than in 2000) and is within regional concentrations (1.0 μg/g) from other regional areas (Eisler 2000). Individual soil stations in LANL TAs most affected by the fire (TA-06, TA-15, and TA-16) and from the perimeter of LANL lands directly within the predominant path of the smoke plume (airport area, North Mesa area, Sportsman's Club area, and Tsankawi area) contained trace elements similar to concentrations in soils collected in 1999. For a more detailed discussion of these data comparisons, see Fresquez et al. (2000).

e. Long-Term Trends. We performed a Mann-Kendal test for trend analysis on radionuclides and radioactivity in soils collected from on-site and perimeter stations from 1974 through 1996 (Fresquez et al., 1996a; Fresquez et al., 1998a). Although radionuclide and radioactivity levels were significantly higher in soils from on-site stations (9 out of 10) and perimeter stations (4 out of 10, including plutonium-239, -240) when compared with regional levels, most radionuclides, with the exception of plutonium-238 in soils from perimeter areas, exhibited significantly decreasing concentrations over time. The statistically significant (but very small) increase of plutonium-238 in perimeter soils over this interval may be related to the resuspension and redistribution of global fallout. Plutonium-238 and plutonium-239, -240 in soils from regional areas also exhibited statistically increasing trends; however, the plutonium levels in regional soils were still well within worldwide fallout concentrations.

The decreasing concentrations of the other isotopes in soils collected from on-site and perimeter areas over time may be a result of (1) cessation of aboveground nuclear weapons testing in the early 1960s, (2) weathering (water and wind erosion and leaching), (3) radioactive decay (half-life), and (4) reductions in operations or better engineering controls at LANL. Tritium, which has a half-life of about 12 years, exhibited the greatest decrease in activity over the 20-plus-year period of this study at all three areas: regional, perimeter, and on-site. Indeed, by 1996, the majority of radionuclide and radioactivity values in soils collected from both perimeter and on-site areas were statistically similar to values detected in regional locations. (Note: This trend analysis is the most current to date; however, concentrations of all radionuclides in soils collected from on-site and perimeter areas during the 2001 year, including tritium and uranium, were lower or similar to concentrations in 1996.)

Recently, these (long-term) data (1974 through 1999), particularly cesium-137 and plutonium-239, -240 data, were employed to determine the extent of LANL-added plutonium to the perimeter area environment. The ratio of cesium-137 to plutonium-239, -240 concentrations from worldwide fallout is about 33 (Hodge et al., 1996). Results (using median numbers) from data summarized over the 26-year period show cesium-137 (decay corrected)/plutonium-239, -240 ratios ranging from 2 to 27 in on-site soils and from 5 to 37 in perimeter soils; regional soils averaged 33, which compares well with cesium-137/plutonium-239, -240 ratios from other "background" areas. Maps of the ratios tend to show possible LANL-derived plutonium in a north to northeasterly direction generally concurrent with the major wind direction in the area. (Note: Plutonium-239 concentrations in soils collected from both perimeter and on-site areas in 2001 were significantly higher [$\alpha = 0.05$] than concentrations in soils from regional background locations [Table 6-1].) These interpretations are preliminary, and a more detailed study is currently

underway that may show the extent of LANL-derived plutonium with distance from the Laboratory (Fresquez and Gallaher 2002).

3. Facility Monitoring

a. Area G (TA-54). (*John Nyhan*) Low-level, radioactive solid waste has been disposed below ground at LANL since operations began in the 1940s. The 63-acre site (Area G) is located in TA-54 at the east end of the Laboratory, adjacent to San Ildefonso Pueblo lands and near the village of White Rock. We have been collecting and analyzing soils from the perimeter of Area G since the 1980s. For some of the more recent work at Area G, see reports by Conrad et al. (1995 and 1996), Fresquez et al. (1995a, 1996c, 1997d, 1998c, and 1999a), and Nyhan et al. (2000 and 2001a).

This year (2001), we collected 16 soil samples within and around the perimeter of Area G (Figure 6-2). Collection of soil samples for chemical analyses followed a set procedure to ensure proper collection, processing, submittal, and posting of analytical results. Stations and samples have unique identifiers to provide chain-of-custody control from the time of collection through analysis and reporting. All QA/QC protocols, chemical analyses, data handling, validation, and tabulation can be found in the ESH-20 OP entitled "Sampling and Sample Processing for the Waste-Site Monitoring Program," LANL-ESH-20-SF-OP/HCP-011, 1999. Paragon Analytics, Inc., analyzed the soil samples for tritium; plutonium-238 and plutonium-239, -240; strontium-90; americium-241; cesium-137; and total uranium, and all QA/QC requirements were met. Results are available in Table 6-5.

Over 60% of the samples contained detectable concentrations of radionuclides of interest (results that were greater than three times the counting uncertainty), yet all of the radionuclide concentrations in soils collected within and around Area G were far less than LANL SALs. More specifically, of the 16 soil samples collected in and around Area G, 75%, 93%, 56%, and 44% of the samples contained plutonium-239, -240, tritium, americium-241, and plutonium-238, respectively, at greater than the RSRL concentrations of these radionuclides. The concentrations of plutonium-238 and plutonium-239, -240 in soils were largest in samples collected on the northern and eastern sides of Area G, whereas tritium concentrations were largest on the southwestern and southern sides of Area G; both of these trends were consistent with results from previous years (Nyhan et al., 2001a).

b. DARHT (TA-15). (*John Nyhan*) At the DARHT facility, very intense x-ray sources are employed to radiograph a full-scale, nonnuclear mockup of a nuclear weapon's primary during the late stages of the explosively driven implosion of the device. Although explosive tests are conducted in containment vessels, the mitigation action plan (MAP) for DARHT mandates the collection of a variety of samples to identify any inadvertent releases of toxic and/or radioactive materials to the general environment. Therefore, under the MAP, we first collected baseline data on (potential) contaminants that may be inadvertently released at the facility during the operational phase. These (baseline) results, completed in 2001, list the concentrations of radionuclides and trace elements in soils, sediments, vegetation, small mammals, birds, and bees around the DARHT facility during the construction phase (1996 through 1999) (Nyhan et al., 2001b). These concentrations of radionuclides and trace elements now represent preoperational baseline statistical reference levels (BSRLs), which are calculated from the mean DARHT facility sample concentration plus two standard deviations. The BSRL for soils and sediments can be found in the section authored by Fresquez et al. (2001b).

In 2001, we collected four soil and four sediment samples during the operational phase within and around the DARHT facility (Figure 6-3). Collection, processing, and analysis of soil and sediment samples follow the protocols described in Section A.3.a. Paragon Analytics, Inc., analyzed the soil samples for tritium; plutonium-238 and plutonium-239, -240; strontium-90; americium-241; cesium-137; and total uranium. An internal laboratory at LANL—CST-9—analyzed for trace elements silver, arsenic, barium, beryllium, cadmium, chromium, copper, mercury, nickel, lead, antimony, selenium, and thallium. Tables 6-6 and 6-7 contain the results of radionuclides and trace elements for these soil and sediment samples.

Results show that most radionuclides and trace elements in soil and sediment samples were below BSRLs (Fresquez et al., 2001b). Exceptions were concentrations of uranium; cesium-137; and plutonium-239, -240 found in the soil and sediment samples collected at the east sample location, although a few other soil samples had slightly higher total uranium and cesium-137 concentrations than the

BSRLs and a few sediment samples had slightly higher concentrations of silver and copper than the BSRLs.

c. Plutonium Processing Facility (TA-55). (*Philip Fresquez*) We collected soil samples around the perimeter of the plutonium processing facility at TA-55, a facility that processes plutonium and conducts research on plutonium metallurgy, in 1984, 1990, and 2001. These data have not been published in prior reports. Collection, processing, and analysis of soil and sediment samples followed the protocols described in Section A.3.a. CST-9 analyzed the soil samples collected in 1984 and in 1990 for plutonium-238 and plutonium-239, -240. Paragon Analytics, Inc., analyzed the soil samples in 2001 for the same radionuclides, and all QA/QC requirements were met. Results are available in Table 6-8.

Soil samples were collected on each side (north, south, east and west) of the plutonium processing facility and ranged from four to six samples. Results show that most concentrations of plutonium-238 in soils around the TA-55 facility were low and were nondetectable or within regional concentrations. The mean concentrations of plutonium-238 (and using detectable and nondetectable values) were highest in soils collected in 1990 and lowest in soils collected in 2001.

Concentrations of plutonium-239, -240 in most soil samples collected from all three years are detectable and above the regional statistical reference level (0.021 pCi/g dry). Concentrations of plutonium-239, -240 ranged from 0.008 to 0.155 pCi/g dry in 1984, from 0.003 to 0.455 pCi/g dry in 1990, and from 0.020 to 0.227 pCi/g dry in 2001. The mean concentrations of plutonium-239, -240 were lowest in 1984 and highest in 1990; they later decrease by almost one-half by 2001, although the differences are not statistically different from one another. In all cases, however, the concentrations of plutonium-239, -240 in soils collected around the plutonium processing facility at TA-55 are still low and far below the LANL SAL of 44 pCi/g dry.

B. Foodstuffs Monitoring (*Philip Fresquez*)

1. Introduction

A wide variety of wild and domestic edible plant, fruit, and animal products are grown or harvested in the area surrounding the Laboratory. Ingestion of foodstuffs constitutes a critical pathway by which radionuclides can be transferred to humans (Whicker and Schultz 1982). For this reason, we collect or have collected a wide host of foodstuffs (e.g., milk, eggs, produce [wild and domestic fruits, vegetables, and grains], fish, honey, herbal teas, mushrooms, piñon, domestic animals, and large and small game animals) from Laboratory property and from the surrounding communities. DOE Orders 5400.1 and 5400.5 mandate this Foodstuffs Monitoring program.

The three main objectives of the program are to determine (1) radioactive and nonradioactive (light, heavy, and nonmetal trace elements) constituents in foodstuffs from on-site LANL, perimeter, and regional areas; (2) trends; and (3) dose. Chapter 3 presents potential radiation doses to individuals from the ingestion of foodstuffs. This year, we report on produce, fish, and elk and deer collected around the Laboratory environs.

2. Produce

a. Monitoring Network. We collect fruits, vegetables, and grains each year from on-site, perimeter, and regional locations (Figure 6-4). We also collect samples of produce from Cochiti and San Ildefonso Pueblos, which are located in the general vicinity of LANL. We compare produce from areas within and around the perimeter of LANL with produce collected from regional gardens in northern New Mexico; this year, the gardens sampled from regional areas were located in the Chamita, Chimayo, Española, Ojo Sarco, and Jemez areas. The regional sampling locations are far enough from the Laboratory that they are unaffected by Laboratory airborne emissions.

b. Sampling Procedures, Data Management, and Quality Assurance. We collect produce samples from gardens in the summer and fall of each year. All QA/QC protocols, chemical analyses, data handling, validation, and tabulation can be found in the ESH-20 OP entitled, "Produce Sampling and Processing for the Foodstuffs Monitoring Program," LANL-ESH-20-SF-OP-001, R0, 1997. Paragon Analytics, Inc., of Fort Collins, CO, analyzed produce samples for radionuclides and heavy metals. All QA/QC requirements for analyzing the radionuclides and other trace metals of interest were met.

c. Radiochemical Analytical Results. See Table 6-9 for concentrations of radionuclides in produce collected from on-site, perimeter, and regional locations during the 2001 growing season.

All radionuclide concentrations in fruits, vegetables, and grains collected from on-site, perimeter, and regional areas were low (pCi/g range), and most were nondetectable or within RSRLs. The very few radionuclides that were detected and that exceeded RSRLs were found primarily in lettuce plants—one sample each from Los Alamos, White Rock, and Sile (near Cochiti Pueblo). These three plant samples had higher amounts of strontium-90 and uranium compared with the other crop (nonleafy) plant species, and a comparison of past data (1995 through 2001) shows that lettuce plants collected from all sites, including regional areas, were significantly higher ($\alpha = 0.05$) in strontium-90 (average = 173E-03 pCi/g dry) and total uranium (average = 64 ng/g dry) concentrations than other nonleafy crop plants (the average mean for strontium-90 and total uranium was 29E-03 pCi/g dry and 5 ng/g dry, respectively). Radionuclides differ in concentration from plant species to plant species (Seel et al., 1995), and tissues associated with the top growth (stems and leaves) tend to accumulate more radionuclides than the fruiting bodies of the same plant species (Menzel 1965). Strontium-90, in particular, accumulates in leaves and growing shoots (Carini and Lombi 1977), and Morishima et al. (1977) and Hayes et al. (2002) found that leafy (lettuce) vegetables have a higher uptake of uranium than tomato, pumpkin, and squash.

Another leafy crop plant—broccoli rabe—sampled this year from a regional location bears note because it also contained higher amounts of strontium-90 and total uranium than the other nonleafy crop plants. Last year (2000), strontium-90 in broccoli rabe collected from a regional site (Ojo Sarco) was not reported because it fell outside the boundaries of a normal distribution at the 99% confidence level. In other words, it was identified as an outlier and not reported. However, we resampled broccoli rabe collected from the same regional site in 2001, and the amount of strontium-90 (92E-03 pCi/g dry) was similar to concentrations detected in 2000 (118E-03 pCi/g dry). These results are similar, albeit lower, to the lettuce results, and the higher concentrations of these elements in broccoli rabe as compared with nonleafy plants are probably due to the same mechanisms of nutrient uptake and/or to leaf surface airborne deposition as for lettuce plants. (Note: Both lettuce and broccoli rabe plant leaves were washed thoroughly, and thus the main pathway for higher strontium-90 [which behaves like calcium] and uranium [which behaves like sulfur] levels may be from root uptake rather than from airborne deposition.)

As a group (and using detectable and nondetectable values), most radionuclides, with the exception of tritium, in crops collected from perimeter and on-site areas were not significantly higher ($\alpha = 0.05$) than in produce collected from regional locations. The only radionuclide in produce that was statistically higher between sites was tritium; concentrations of tritium were significantly higher in produce from Los Alamos and on-site areas as compared with regional areas. The differences, however, between the sites were small, and the results compare well with past years (Fresquez et al., 1995b; Fresquez et al., 2001).

See Table 6-10 for mean concentrations of radionuclides in produce collected from regional, perimeter, and on-site areas before (1997–1999) and after the fire (2000 and 2001). In general, most radionuclides, with the exception of tritium, in produce collected at most sites after the Cerro Grande fire were statistically ($\alpha = 0.05$) similar to produce collected before the fire. Tritium in produce collected from White Rock/Pajarito Acres in both 2000 and 2001 was in significantly higher concentrations than in pre-fire years (1997–1999). Because tritium is closely associated with the hydrologic cycle (Whicker and Schulz 1982), these "post-fire" results are probably not related to the burning of vegetation, however, but rather to Laboratory operations, although they are not as high as tritium in produce collected from on-site stations.

d. Nonradiochemical Analytical Results. The trace elements silver, arsenic, beryllium, cadmium, chromium (for the most part), mercury, and thallium in produce from on-site, perimeter, and regional locations were below the LOD (i.e., below the reporting limits) (Table 6-11). These findings are not unexpected because metal uptake in plants is restricted in many alkaline semiarid soils in the western portions of the US as a result of the formation of insoluble carbonate and phosphate complexes (Fresquez et al., 1991). In those cases where produce samples contained trace elements above the LOD (for barium, nickel, lead, selenium, and zinc), very few individual samples exceeded RSRLs. The uptake of trace elements by plants is dependent on natural sources, fertilization, and plant species (Hausenbuiller 1974).

As a group, the levels of barium, nickel, lead, selenium, and zinc in produce from all perimeter areas were not significantly higher ($\alpha = 0.05$) than in produce collected from regional areas. Conversely,

selenium concentrations in produce collected from Laboratory locations were significantly higher than regional concentrations. This finding was the same as last year's. Although the concentrations of selenium in produce collected from on-site stations were higher than regional areas, the differences between the sites were low (e.g., a difference of only 0.16 μg/g).

Of special note is that beryllium and lead, which were significantly higher in soils collected in perimeter and on-site areas, were not significantly higher (α= 0.05) in produce collected from perimeter or on-site areas as compared with produce collected from regional areas.

Table 6-12 shows trace elements in produce collected before (1999) and after (2000 and 2001) the Cerro Grande fire. With the exception of selenium, which was significantly higher in produce collected from all locations—including regional areas—in 2000 and 2001, none of the concentrations of trace elements in produce collected after the Cerro Grande fire were significantly different (α= 0.05) from trace element concentrations in produce collected before the fire. It is hard to say that selenium in produce increased in concentration because of the Cerro Grande fire because (1) selenium in produce collected upwind of the fire (Cochiti/Peña Blanca) also showed statistical differences between the years, (2) no other trace elements were elevated after the fire, and (3) selenium in soil samples collected from these same sites in 2000 (Fresquez et al., 2001) and 2001 (Table 6-3) was not significantly higher than selenium concentrations in soils collected in 1999 (Fresquez and Gonzales 2000). Instead, the statistically higher concentrations of selenium in produce collected in 2000 and 2001 from all sites as compared with selenium in produce collected in 1999 may be a result of a negative analytical laboratory bias, as selenium was not detected (< reporting limit) in any of the samples/sites in 1999.

3. Milk

a. Monitoring Network. No dairy operates in the immediate vicinity of LANL. At this time, the closest working dairy is no longer in operation; it was located approximately 30 miles east of LANL. We evaluated the milk produced there from 1994 to 1997. For the last four years (1997 to 2000), we have been evaluating goat milk obtained from the Los Alamos and White Rock/Pajarito Acres areas. These samples are compared with goat milk collected from Albuquerque, NM (regional); Albuquerque is located approximately 80 miles upwind of LANL.

This year, we did not collect milk. The last collection occurred in 2000, and we will collect milk again during the 2002 season. However, results from the 2000 year are reported here for general information.

b. Sampling Procedures, Data Management, and Quality Assurance. The farmer collected the milk and delivered it to our team. All QA/QC protocols, chemical analyses, data handling, validation, and tabulation can be found in the ESH-20 OP entitled, "Milk and Tea Sampling and Processing for the Foodstuffs Monitoring Program," LANL-ESH-20-SF-OP-005, R0, 1997. CST-9 analyzed the milk for radionuclides, and all QA/QC requirements were met.

c. Radiochemical Analytical Results. All radionuclide concentrations, including iodine-131, in goat milk from the perimeter areas in 2000 were nondetectable or within upper-level regional concentrations. Moreover, most radionuclides were lower than or similar to radionuclides in goat milk collected before the Cerro Grande fire in 1999 (Fresquez 1999; Fresquez and Gonzales 2000), and tritium and strontium-90 levels, in particular, were similar to tritium and strontium-90 levels in milk from other states around the country (Black et al., 1995). The data for these results can be found in Fresquez et al. (2001).

4. Fish

a. Monitoring Network. We collect fish annually upstream and downstream of the Laboratory—mainly because 19 canyons cut through Laboratory property, and some flow resulting from excessive storm events may eventually reach the Rio Grande (Figure 6-4). Cochiti Reservoir, a 10,690-acre flood and sediment control project, is located on the Rio Grande approximately five miles downstream from the Laboratory. We compared radionuclides and nonradionuclides in fish collected from Cochiti Reservoir with fish collected from a regional reservoir. The regional reservoir, Abiquiu, is located on the Rio Chama, upstream from the confluence of the Rio Grande and intermittent streams that cross Laboratory lands (Fresquez et al., 1994).

The samples include two types of fish: game (predators) and nongame (bottom-feeders). This year, game fish included northern pike (*Esox lucius*), largemouth bass (*Micropterus salmoides salmoides*),

smallmouth bass (*Micropterus dolomieui*), white crappie (*Pomoxis annularis*), brown trout (*Salmo trutta*), white bass (*Morone chrysops*), and walleye (*Stizostedion vitreum*). Nongame fish included the white sucker (*Catostomus commersoni*), channel catfish (*Ictalurus punctatus*), carp (*Cyprinus carpio*), and carp sucker (*Carpiodes carpio carpio*). (Note: Bottom-feeding fish are better indicators of environmental contamination than the predator game fish because they forage on the bottom where contaminants [e.g., radionuclides] readily bind to sediments [Whicker and Schultz 1982]).

b. Sampling Procedures, Data Management, and Quality Assurance. We collected fish by gill nets and transported them under ice to the laboratory for preparation. At the laboratory, fish were gutted, had their heads and tails removed, and were washed. We submitted muscle (plus associated bone) tissue for radiochemical analysis as an ash sample and submitted muscle (fillet) in a wet frozen state for trace element analysis. All QA/QC protocols, chemical analyses, data handling, validation and tabulation can be found in the ESH-20 OP entitled, "Fish Sampling and Processing for the Foodstuffs Monitoring Program," LANL-ESH-20-SF-OP-002, R0, 1997. Paragon Analytics, Inc., from Fort Collins, CO, analyzed the fish samples for radionuclides, and all QA/QC requirements were met. CST-9 analyzed the fish samples for heavy metals collected from Cochiti Reservoir in April (4/25/01) and from Abiquiu Reservoir in June (6/19/01), and Paragon Analytics, Inc., analyzed the fish samples for heavy metals collected from Cochiti in May (5/30/01) and August (8/14/01).

c. Radiochemical Analytical Results. Since the Cerro Grande fire in May 2000, we have collected fish on three occasions in 2000 (June, July, and August) (Fresquez et al., 2001) and on three occasions in 2001 (April, May, and August), mainly to monitor the effects of runoff, if any, into the Rio Grande. Table 6-13 shows the game fish results for 2001, and Table 6-14 shows nongame fish results. In general, most radionuclide concentrations (activity) in game and nongame fish collected from Cochiti Reservoir were nondetectable or within upper-level regional concentrations; the few detectable values that were above the RSRL were still very low (pCi/g range). These results were similar to radionuclide contents in crappie, trout, and salmon from comparable (background) reservoirs and lakes in Colorado (Whicker et al., 1972; Nelson and Whicker 1969) and New Mexico (Fresquez et al., 1996b; Fresquez et al., 1998b) and, more recently, to radionuclide contents in fish collected along the length of the Rio Grande from Colorado to Texas (Booher et al., 1998). Also, they compare well with fish collected in the Rio Grande below LANL in 1998 (Fresquez et al., 1999b).

As a group (and using detectable and nondetectable values), all radionuclide concentrations in both game and nongame fish collected downstream of LANL at Cochiti reservoir in April, May, or August were not significantly higher ($\alpha = 0.05$) than radionuclide concentrations in fish collected upstream of LANL at Abiquiu Reservoir.

As expected, the bottom-feeding fish from both downstream and upstream reservoirs from LANL contained significantly higher ($\alpha = 0.05$) average uranium contents (15 ng per dry gram) than the predator fish (5 ng per dry gram). The higher concentration of uranium in bottom-feeding fish compared with predator fish is attributed to the ingestion of sediments on the bottom of the lake (Gallegos et al., 1971). Radionuclides readily bind to sediments (Whicker and Schultz 1982).

Table 6-15 contains a comparison of radionuclide concentrations in fish collected at Abiquiu and Cochiti Reservoirs before (1999) and after (2000 and 2001) the Cerro Grande fire. With respect to fish collected at Cochiti after the Cerro Grande fire, all mean radionuclide concentrations in fish were not statistically higher ($\alpha = 0.05$) than radionuclide concentrations in fish from Cochiti collected before the fire in 1999. In fact, game and nongame fish collected in 1999 at Cochiti were generally higher in mean concentrations of strontium-90, total uranium, plutonium-238, plutonium-239, -240, and americium-241 than in fish collected after the fire, and particularly as compared with 2001. Comparing radionuclide concentration trends in both game and nongame fish collected from Cochiti from 1999 to 2001, the majority of radionuclides appear not to have changed. Some radionuclides like strontium-90 and plutonium-239 in nongame fish from Cochiti, however, appear to be decreasing in concentration during this time period.

d. Long-Term (Radionuclide) Trends. Fresquez et al. (1994) conducted a summary and trend analysis of radionuclides in game and nongame fish collected from reservoirs upstream (Abiquiu, Heron, and El Vado Reservoirs) and downstream (Cochiti Reservoir) of LANL from 1981 to 1993. In general,

the average levels of strontium-90, cesium-137, plutonium-238, and plutonium-239, -240 in game and nongame fish collected from Cochiti Reservoir were not significantly different ($\alpha = 0.05$) from concentrations in fish collected from reservoirs upstream of the Laboratory. Total uranium was the only radionuclide that we found to be significantly higher in both game and nongame fish from Cochiti Reservoir when compared with fish from Abiquiu, Heron, and El Vado Reservoirs. Sources of the higher uranium concentrations in fish from Cochiti as compared with fish upstream include (1) Cochiti receives greater amounts of sediments than the other reservoirs, (2) the Cochiti area has more uranium-bearing minerals, and (3) some uranium may be entering Cochiti reservoir by way of the Santa Fe River as it flows past the edge of an abandoned uranium mine site (La Bajada uranium mine). Uranium concentrations in fish collected from Cochiti Reservoir, however, significantly decreased from 1981 to 1993, and fish samples collected from Cochiti Reservoir in 1993 showed no evidence of depleted uranium (DU) (Fresquez and Armstrong 1996). (Note: This trend analysis is the most current to date; however, concentrations of all radionuclides in fish collected downstream of LANL during the 2001 sampling year were lower than or similar to concentrations in 1993.)

e. Nonradiological Analytical Results. Total recoverable trace elements in the muscle (fillet) of game and nongame fish collected upstream and downstream of LANL at three different sampling times are available in Table 6-16 and Table 6-17, respectively. In general, most of the trace elements in both game and nongame fish collected upstream and downstream of LANL were below the LOD. Of those elements that were above the LOD (barium, mercury, and selenium), we found that barium concentrations in game and nongame fish collected upstream of LANL at Abiquiu Reservoir were significantly higher ($\alpha = 0.05$) than in fish collected from Cochiti Reservoir on the last two collection periods (May and August). In contrast, selenium concentrations in both game and nongame fish collected from Cochiti Reservoir on the last two collection periods were significantly higher than fish collected from Abiquiu. As described in section b, “Sampling Procedures, Data Management, and Quality Assurance,” an in-house Laboratory group, CST-9, analyzed the fish samples for heavy metals collected in April (Cochiti) and June (Abiqiui), and Paragon Analytics, Inc., analyzed the fish samples for heavy metals collected in May (Cochiti) and August (Cochiti). These above-described differences in barium and selenium in fish collected from Abiquiu and Cochiti reservoirs, then, may be a result of a laboratory analytical bias rather than any effects of the Cerro Grande fire. (Note: The same selenium bias was also noted in Section B.2.d for produce.)

As for mercury, which was detected in game and nongame fish collected from both reservoirs, all concentrations in fish collected from Cochiti reservoir were statistically similar ($\alpha = 0.05$) to concentrations in fish collected upstream of the Laboratory at Abiquiu Reservoir on all three sampling dates. The results of the trace element analysis in bottom-feeding fish samples from Cochiti and Abiquiu Reservoirs in past years showed that mercury was the only element to be consistently detected above the LOD, and, this year as in past years, the concentrations of mercury in bottom-feeding fish from Cochiti reservoir were within the RSRL of 0.48 μg mercury per gram (wet weight basis) (Fresquez et al., 1999c). These data also compare well with bottom-feeding fish samples the New Mexico Environment Department (NMED) collected from Cochiti reservoir in July of 2000; we show 0.18 to 0.26 μg mercury per wet gram in fillet samples (N = 18), and they detected an average of 0.30 μg mercury per wet gram in gutted whole samples (N = 4) (Yanicak 2001). As for predator fish, we show 0.12 to 0.76 μg mercury per wet gram in fillet samples (N = 17), and NMED shows an average of 1.4 g mercury per wet gram in gutted whole samples (N = 4). Also, it should be noted that total cyanide, a compound ion that was detected in elevated concentrations in storm runoff as a result of the Cerro Grande fire (Gallaher 2000), was not detected in fish downstream of LANL in April of 2001. These results are similar to results from 2000 (Fresquez et al., 2001).

A comparison of mercury concentrations in predator (N = 4) and bottom-feeding (N = 4) fish collected from both Abiquiu and Cochiti Reservoirs (the data were pooled) shows that mercury concentrations in predator fish (mean = 0.32; std dev = 0.03) were significantly higher ($\alpha = 0.05$) than mercury in bottom-feeding fish (mean = 0.23; std dev = 0.04). These results are not surprising as methyl mercury, which is fat- and water-soluble and easily taken up by living cells (Hammond and Foulkes 1986), readily bioaccumulates (e.g., larger fish > smaller fish) (Bache et al., 1971) and biomagnifies (e.g., carnivorous fish > omnivorous fish > herbivorous fish) (Ochiai 1995). Some predator fish, for example,

particularly some of the large pike (≈10 lb fish) (0.76 μg mercury per wet gram) and bass (≈3 lb fish) (0.57 μg mercury per wet gram) collected at Cochiti Reservoir this year, contained some of the highest levels of mercury and exceeded the RSRL for game fish (<0.41 μg mercury per wet gram). All and all, however, the levels of mercury in predator fish muscle (fillets) collected at Cochiti Reservoir were still below the US Food and Drug Administration's ingestion limit of 1 μg mercury/gram wet weight (Torres 1998).

See Table 6-18 for a comparison of mercury in bottom-feeding fish collected before (1991–1999) and after (2000 and 2001) the Cerro Grande fire. (Note: Because most of the trace elements, with the exception of mercury, in past years were below the LOD, we collected only mercury data, for the most part, and comparisons over time are described here.) Results show no significant differences ($\alpha = 0.05$) in mercury concentrations in bottom-feeding fish collected at Cochiti Reservoir after the Cerro Grande fire (2000 and 2001) as compared with fish collected at Cochiti before the fire, and there appears to be no trend, either decreasing or increasing, as a result of the fire.

f. Long-Term (Nonradiological) Trends. From 1991 to 1999, we conducted a summary and trend analysis of major trace elements, with special reference to mercury, in mostly nongame fish (muscle fillets) collected from Abiquiu, Heron, and El Vado Reservoirs upstream of LANL (hereafter referred to collectively as Abiquiu Reservoir) and Cochiti Reservoir downstream of LANL (Fresquez et al., 1999c). With the exception of mercury, most trace elements in fish muscle collected from Abiquiu and Cochiti over a nine-year period were below the LOD. Mean mercury concentrations in all years in fish from Abiquiu Reservoir, upstream of LANL, were generally higher than mercury concentrations in fish from Cochiti Reservoir, and the statistical analysis of the mean of means showed that mercury in fish from Abiquiu Reservoir was significantly higher ($\alpha = 0.10$) than mercury in fish collected from Cochiti Reservoir. The highest individual mercury concentrations [1.0 μg/g wet weight] were detected in a single catfish each from Abiquiu and Cochiti Reservoirs in 1994, and the only carnivorous fish collected, brown trout from Abiquiu Reservoir and white crappie from Cochiti Reservoir in 1991, contained 0.30 and 0.36 μg/g of mercury (wet weight basis), respectively.

Mean concentrations of mercury in fish muscle from both Abiquiu and Cochiti Reservoirs were below the US Food and Drug Administration's ingestion limit of 1 μg mercury/g wet weight (Torres 1998). Concentrations of mercury in catfish from this study were very similar to mercury levels in catfish recently collected from Conchas Lake, which averaged 0.25 μg/g wet weight, and Santa Rosa Lake, which ranged from 0.22 to 0.33 μg/g wet weight (Bousek 1996; Torres 1998). These authors concluded that the health risks that mercury in fish from Conchas and Santa Rosa Lakes poses to the average sport fisherman were negligible.

Overall, mean mercury concentrations in fish collected from both reservoirs show significantly decreasing trends over time; Abiquiu ($p = 0.045$) was significant at the 0.05 probability level, and Cochiti ($p = 0.066$) was significant at the 0.10 probability level. It is not completely known why concentrations of mercury are decreasing in fish collected from Abiquiu and Cochiti, but the reduction of emissions in coal-burning power plants or the reduction of carbon sources within the reservoirs may be part of the reason. Since the early 1980s, for example, coal-burning power plants in the northwest corner of New Mexico have been required to install venturi scrubbers and baghouses to capture particulates and reduce air emissions (Martinez 1999). Additionally, because the conversion of mercury to methyl mercury is primarily a biological process, it has been demonstrated that mercury concentrations in fish tissue rise significantly in impoundments that form behind new dams and then gradually decline to an equilibrium level as the carbon provided by flooded vegetation is depleted (NMED 1999). (Note: This trend analysis is the most current to date; however, concentrations of most trace elements, including mercury, in fish muscle (fillet) collected downstream of LANL during the 2001 year [average = 0.23 μg/g wet weight] were statistically similar ($\alpha = 0.05$) to concentrations in 1999 [average = 0.14 μg/g wet weight].)

5. Game Animals (Elk and Deer)

a. Monitoring Network. Mule deer (*Odocoileus hemionus*) and Rocky Mountain elk (*Cervus elaphus*) are common inhabitants of LANL lands. Resident populations of deer number from 50 to 100; elk number from 100 to 200 and increase to as many as 2,000 animals during the winter months (Fresquez et al., 1999d), reflecting large mammal migration to lower elevations. We collect samples of elk and deer as roadkills; therefore, the availability of samples is

beyond our control, but usually the collection of one or two animals per year from Laboratory and perimeter areas is possible. At this point, we have collected approximately 23 elk and 11 deer from Laboratory property and approximately 7 elk and 4 deer from the perimeter of LANL property. When an animal is collected, the muscle and bone are processed and analyzed for a host of radionuclides—the muscle because it is the major organ that humans consume and the bone because it may also be consumed, albeit indirectly, and many radionuclides like strontium and plutonium are deposited there. We then compare these data with meat and bone samples from elk and deer collected from regional locations.

b. Sampling Procedures, Data Management, and Quality Assurance. We collected samples of elk and deer meat and bone tissue (1000 g each) from fresh roadkills around and within the Laboratory. The New Mexico Department of Game and Fish collected regional samples. All QA/QC protocols, chemical analyses, data handling, validation, and tabulation can be found in the ESH-20 OP entitled, "Game Animal Sampling and Processing for the Foodstuffs Monitoring Program," LANL-ESH-20-SF-OP-003, R0, 1997. Laboratory group CST-9 analyzed the samples. We collected the samples reported here in late 1999 and early 2000. (Note: These data were received late, so we could not report the results in the 2000 ESR; they are reported here, however, for completeness.)

c. Radiochemical Analytical Results. All radionuclide concentrations, with the exception of tritium in meat and bone tissue of a cow elk collected from LANL lands within TA-53, were nondetectable or below upper-level regional concentrations (Table 6-19) and were within concentrations from past years (Fresquez et al., 1998c). Although tritium concentrations in meat and bone samples collected from an elk at TA-53 were higher than regional background elk, the differences were quite low, just 1.4 times higher than the RSRL. The slightly higher levels of tritium in this elk collected at TA-53 as compared with background may be due to operations at TA-53—the Los Alamos Neutron Science Center (LANSCE)—that produce tritium as an activation product and/or from coolant water used at the target cell. Activities at TA-53 include the use of a high-energy linear particle accelerator, which, upon contact with the atmosphere, converts water vapor to tritium. Bees collected at TA-53 in the past have shown elevated concentrations of tritium as compared with regional levels (Fresquez et al., 1997b; Haarmann 1998).

All radionuclide concentrations in meat and bone tissue of a deer collected from a perimeter area, San Ildefonso Pueblo lands off State Road 502, were nondetectable or within RSRLs (Table 6-20). The deer collected off US Highway 84/285 near Tesuque was considered a regional animal and was added to the data base as such. All radionuclide concentrations in the deer collected from perimeter and regional areas were similar to past years (Fresquez et al., 1998c).

d. Long-Term Trends. A 1998 report summarized radionuclide concentrations (tritium, strontium-90; cesium-137; plutonium-238 and plutonium-239, -240; americium-241; and uranium) determined in meat and bone tissue of deer and elk collected from LANL lands from 1991 through 1998 (Fresquez et al., 1998c). Also, we estimated the CEDE to people who ingest meat and bone from deer and elk collected from LANL lands. Most radionuclide concentrations in meat and bone from individual deer and elk collected from LANL lands were at less than detectable quantities or within upper-level regional concentrations. As a group (and using detectable and nondetectable values), most radionuclides in meat and bone of deer and elk from LANL lands were not significantly higher ($\alpha = 0.05$) than in similar tissues from deer and elk collected from regional locations. Also, elk that had been tracked for two years with radio collars and spent an average time of 50% on LANL lands were not significantly different in most radionuclide levels from roadkill elk that have been collected on LANL lands as part of the Environmental Surveillance Program (ESP). All CEDEs were far below the International Commission on Radiological Protection guideline of 100 mrem/yr. (Note: This trend analysis is the most current to date; however, concentrations of all radionuclides in elk and deer collected from LANL lands during 1999 were lower or similar to concentrations in 1998.)

The modeling study, Ferenbaugh et al., 1999 and 2002, also takes long-term elk and deer data into account. That study used soil and vegetation data from the perimeter of Area G to estimate the dose to humans from tissue consumption of elk and deer that foraged around Area G. We compared results with the aforementioned study of Fresquez et al. (1998c) and found them to be on the same order of magnitude. Also, an estimate of the dose to deer and elk that foraged around the perimeter of Area G showed that

the doses were significantly less than established exposure limits or guidelines (<0.1 rad/day).

6. Honey

a. Monitoring Network. We did not sample honey bee (*Apis mellifera ligustica*) hives during the 2001 season; honey is generally collected every other year from two perimeter areas—Los Alamos town site and White Rock/Pajarito Acres. The last collection occurred in 2000 after the Cerro Grande fire, and we will collect it again during the 2002 season. We compare the honey from these hives with honey collected from regional hives located in Jemez and Española, New Mexico, and report the results here for general information.

b. Sampling Procedures, Data Management, and Quality Assurance. Honey is collected directly from the producer in their bottles. All QA/QC protocols, chemical analyses, data handling, validation, and tabulation can be found in the ESH-20 OP entitled, "Honey Sampling and Processing for the Foodstuffs Monitoring Program," LANL-ESH-20-SF-OP-004, RO, 1997.

c. Radiochemical Analytical Results. All radionuclide concentrations in honey collected from perimeter hives in 2000 were either nondetectable or within upper-level regional concentrations and were similar to past years (Fresquez et al., 1997a; Fresquez et al., 1997b; Fresquez and Gonzales 2000).

d. Long-Term Trends. Several long-term data evaluations have examined radionuclide concentrations, particularly tritium, in bees and honey within the LANL environs. The first study evaluated a host of radionuclides (tritium; cobalt-57; cobalt-60; europium-152; potassium-40; beryllium-7; sodium-22; manganese-54; rubidium-83; cesium-137; plutonium-238 and plutonium-239, -240; strontium-90; americium-241; and total uranium) in honey collected from hives located around the perimeter of LANL (Los Alamos and White Rock/Pajarito Acres) over a 17-year period (Fresquez et al., 1997a). All radionuclides, with the exception of tritium, in honey collected from perimeter hives around LANL were not significantly different ($\alpha = 0.05$) from regional areas. Overall, the maximum total net positive CEDE—based on the average concentration plus two standard deviations of all the radionuclides measured over the years after the subtraction of background—from consuming 11 lb. of honey (maximum consumption rate) collected from Los Alamos and White Rock/Pajarito Acres was 0.031 mrem/yr and 0.006 mrem/yr, respectively. The highest CEDE was <0.04% of the International Commission on Radiological Protection permissible dose limit of 100 mrem/yr from all pathways. (Note: This trend analysis is the most current to date; however, concentrations of all radionuclides in honey collected from perimeter locations during the 2000 year were lower or similar to concentrations in 1997.)

The second study examined tritium concentrations in bees and honey collected from within and around LANL over an 18-year period (Fresquez et al., 1997b). Based on the long-term average, bees from nine out of 11 hives and honey from six out of 11 hives on LANL lands contained tritium that was significantly higher ($\alpha = 0.05$) than regional areas. The bees with the highest average concentration of tritium (435 pCi/mL) collected over the years were from LANL's low-level radioactive waste disposal site (Area G) at TA-54. Similarly, the honey with the highest average concentration of tritium (709 pCi/mL) came from a hive located near three tritium-contaminated storage ponds at LANL TA-53. The average concentrations of tritium in bees and honey from regional hives were 1.0 pCi/mL and 1.5 pCi/mL, respectively. Although the concentrations of tritium in bees and honey from most LANL and perimeter (White Rock/Pajarito Acres) areas were significantly higher than regional areas, most areas, with the exception of TA-53 and TA-54, generally exhibited decreasing tritium concentrations over time. (Note: This trend analysis is the most current to date; however, concentrations of tritium in honey collected from perimeter and LANL lands in 2000 were lower or similar to concentrations in 1997.)

7. Special Foodstuffs Monitoring Studies

a. Prickly Pear. We collected prickly pear (fruit) (*Opuntia phaecantha*) from two perimeter areas in 2001: Los Alamos town site on the north and San Ildefonso Pueblo lands on the east. We also collected fruit from prickly pear in the Española/Santa Fe/Jemez area as a regional comparison. The regional sampling locations were far enough from the Laboratory that they were mostly unaffected by Laboratory airborne emissions. All QA/QC protocols, chemical analyses, data handling, validation, and tabulation can be found in the ESH-20 OP entitled, "Produce Sampling and Processing for the Foodstuffs Monitoring Program," LANL-ESH-20-SF-OP-001, R0, 1997. Paragon

Analytics, Inc., of Fort Collins, CO, analyzed the samples for radiological and trace element constituents, and all QA/QC requirements were met.

Tables 6-21 and 6-22 present the radionuclide and trace element results of the prickly pear fruit samples collected during 2001, respectively. Most radionuclides, with the exception of tritium, in prickly pear fruit collected from perimeter areas during the 2001 year were in nondetectable quantities or within RSRLs. These data, with the exception of tritium, were similar to the past year's data (Fresquez et al., 2001). Although tritium concentrations in prickly pear fruit collected from perimeter areas were two times higher than the RSRLs, the overall mean differences, based on 1999 and 2001 pooled data (San Ildefonso = 0.64 [± 0.50] pCi/mL and Los Alamos = 0.43 [± 0.81] pCi/mL), showed no significant differences ($\alpha = 0.05$) in tritium concentrations in prickly pear fruit between perimeter and regional (0.07 ± 0.23 pCi/mL) sites. Prickly pear fruit tended to have higher strontium-90 concentrations than other produce crops. For example, the overall average concentration for strontium-90 in prickly pear fruit from all sites (regional background and perimeter sites; N = 6) over two years of measurement was 678E-03 pCi/g dry versus the overall upper range (mean plus two std dev) amount for produce crops of 112E-03 pCi/g dry.

Of the 12 trace elements in prickly pear fruit collected from the perimeter areas, only five (barium, cadmium, nickel, lead, and selenium) were measured above the LOD (Table 6-22). And, of these five elements, only selenium was higher than the RSRL, although it was over by just a half of a ppm. In any case, most of these elements agree with past data, with the exception of barium.

In 2000, we reported that barium concentrations in prickly pear fruit collected in 1999 from the perimeter areas (120 μg/g) were relatively higher than in regional background fruit (23 μg/g) (Fresquez et al., 2001). This year (2001), barium concentrations in prickly pear fruit collected from regional areas (130 μg/g) were similar to concentrations in the perimeter areas (63 to 140 μg/g) and to the past year; therefore, the higher amounts of barium in prickly pear fruit detected in perimeter areas as compared with regional areas in 1999 were a result of natural variation.

b. Herbal Teas. We did not collect herbal teas this year for analysis as in past years. Please refer to past environmental surveillance reports for a description of radiological results from the analysis of Navajo Tea (*Thelesperma subnudum*) (Armstrong and Fresquez 1997; Fresquez 1998; Fresquez 1999; Fresquez and Gonzales 2000), Saint John's Wort (*Hypericum perforatum*), and Elderberry (*Sambucus canadensis*) (Fresquez et al., 2001).

C. Biota Monitoring (*Gil Gonzales*)

1. Introduction

In addition to mandating the monitoring of human foodstuffs for contaminants, DOE Orders 5400.1 and 5400.5 mandate the monitoring of nonfoodstuffs biota for the protection of ecosystems (DOE 1991). Although monitoring of biota mostly in the form of facility-specific or site-specific studies began in the 1970s with the ESP, in 1994 the DOE requested additional emphasis on nonfoodstuffs biota. Nonfoodstuffs biota, such as small mammals, amphibians, birds, and vegetation, are monitored within and around LANL on a systematic or special study basis for radiological and nonradiological constituents. We also monitor or study some human foodstuffs that serve as an important link in ecological food chains, such as fish consumed by bald eagles. We are currently emphasizing organic chemical analysis because research has determined that the highest risk to nonhuman biota at the Laboratory is generally not from radionuclides but rather from organic compounds such as pesticides and polychlorinated biphenyls (PCBs) (Gonzales 2000).

In 2000, we reported on vegetation that was collected at the 25 routine soil sampling stations within and around LANL (Fresquez and Gonzales 2000). Vegetation is one of the media that we will periodically sample as part of the routine surveillance program because it is the foundation of ecosystems as it provides a usable form of energy and nutrients that are transferred through food chains. Because of this function in the food chain, vegetation can serve as an important pathway of contaminants to biological systems including the ingestion of soil that occurs during the consumption of plants. Fish and small mammals are also on the routine surveillance list. As reported below, we sampled fish in the year 2000 at Cochiti Reservoir, which is downstream of LANL, and analyzed them for organic contaminants. We have sampled small mammals in special monitoring studies but never on a Laboratory-wide, routine basis.

The biota portion of the ESP is also important to ecological risk assessments conducted at LANL. Ecological risk assessment is becoming an important tool at LANL and other DOE sites because it helps risk managers prioritize the contaminants, areas, and biological species that need studying. Site-specific special monitoring studies, also discussed in this chapter, are important in establishing site-specific coefficients of contaminant transfer between different feeding levels so that accurate dose estimates can be made (Whicker and Schultz 1982; Calabrese and Baldwin 1993; EPA 1998). The relationship between ecological risk assessment and environmental surveillance is several-fold. First, the ESP provides contaminant data for assessing trend, exposure, and potential effects on ecological entities. The data collected for surveillance programs include concentrations of contaminants in living and nonliving media, both of which are useful in ecological risk assessments. The data on contaminant levels in living organisms can also validate ecological risk models by comparing the accuracy of model predictions with real data. Second, the results of ecological risk assessments can help identify gaps in the ESP. For example, ecological risk assessments on threatened and endangered (T&E) species at LANL established the need to develop an organic-contaminant focus area as a component of the LANL ESP (Gonzales et al., 1998). Another example is the need for knowledge of contaminant levels in reptiles and amphibians native to the LANL environment and related potential risk.

The monitoring of organic contaminants in the environment for the ESP helps to focus additional ecological risk assessments. Thus, the relationship between the ESP and ecological risk assessment is mutualistic and iterative. As does the ESP, ecological risk assessments help identify special studies that enhance the basis on which environmental compliance is founded, and this is probably the most useful outcome of ecological risk assessments. Last year's edition of the ESR contains a short summary of the history of ecological risk assessment.

The two main historical objectives of the biota program are to determine (1) on-site contaminant concentrations in biota and compare them with off-site regional background concentrations and (2) trends over time. On-site concentrations are the result of potentially Laboratory-added contamination plus, in many cases, natural sources. With the issuance of the interim standard on evaluating radiation doses to aquatic and terrestrial biota (DOE 2000), a new and third objective is providing data for use in evaluating compliance with specified limits on radiation dose to plants and animals. The standard will be implemented incrementally over time. Chapter 3 has the results of the applications of the standard that were made in 2001.

2. Institutional Surveillance of Organic Analytes in Fish

a. Monitoring Network. As discussed in Section 6.B.4, we sample and analyze fish from bodies of water that are adjacent to or potentially influenced by LANL as part of the routine surveillance program. In calendar year 2001, we sampled catfish at Cochiti Reservoir in April and August and Abiquiu Reservoir in June. Cochiti Reservoir is downriver from where canyons that traverse LANL meet the Rio Grande, and Abiquiu Reservoir is on the Chama River above LANL. Abiquiu Reservoir discharges into the Rio Grande above LANL. The Rio Grande discharges into Cochiti Reservoir. Though there are no perfect reference sites for comparing to Cochiti, we used Abiquiu as a reference site from which "background" data are compared with data obtained at Cochiti. The purpose is to try and determine whether any contamination at LANL is moving into Cochiti Reservoir and reservoir fish through hydrologic transport of any kind, though we know that there are/were sources of organic contaminants into Abiquiu Reservoir and the Rio Grande above LANL. We analyzed whole-body and partitioned samples for PCB congeners (i.e., individual PCBs), organochlorine pesticides, and dioxins/furans.

The presence of PCBs, DDT, and other organic contaminants in fish in the Los Alamos area and more broadly is not at all new. The pervasiveness of these compounds in fish worldwide and in the US has been documented since at least the 1970s (Stoker and Seager 1976; Schmitt et al., 1990), regionally and within New Mexico (Eisler 1986), and in the Rio Grande above and below Los Alamos as well as at Cochiti Reservoir (Roy et al., 1992; Carter 1997).

b. Sampling Procedures, Data Management, and Quality Assurance. The sampling procedure, data management, and quality assurance were generally the same as described in Section 6.B.4.b. Whole-body (head, tail, skin, viscera, bone, and muscle) fresh weight (FW) samples were homogenized and analyzed using a modified EPA Method 1668—high-resolution gas chromatography and high-resolution mass

spectrometry (HRGC/HRMS). The organochlorine pesticides measured were hexachlorobenzene; alpha, beta, and gamma hexachlorohexane; heptachlor, aldrin, oxychlordane, trans-chlordane, cis-chlordane, dichlorodiphenyltrichloroethane (DDT); dichlorodiphenyldichloroethane (DDD); dichlorodiphenylethane (DDE); trans-nonachlor, cis-nonachlor, mirex, alpha-endosulfan (I); dieldrin, endrin, beta-endosulfan (II); endosulfan sulfate; methoxychlor; delta HCH; and heptachlor epoxide. Theoretically, PCBs have 209 different possible congeners, but only about 130 have ever been detected, and the majority of the toxicity exhibited by PCBs is from the group of 13 coplanar PCBs that behave like dioxins ("dioxin-like PCBs"). The toxicities of the non-dioxin-like PCBs are still somewhat unknown. We analyzed the fish for the 13 dioxin-like PCBs: PCB No. 77 (3,3',4,4'-TeCB), 81 (3,4,4',5-TeCB), 105 (2,3,3',4,4'-PeCB), 114 (2,3,4,4',5-PeCB), 118 (2,3',4,4',5-PeCB), 123 (2',3,4,4',5-PeCB), 126 (3,3',4,4',5-PeCB), 156 (2,3,3',4,4',5-HxCB), 167 (2,3',4,4',5,5'-HxCB), 169 (3,3',4,4',5,5'-HxCB), 170 (2,2',3,3',4,4',5-HpCB), 180 (2,2',3,4,4',5,5'-HpCB), and 189 (2,3,3',4,4',5,5'-HpCB). We compared the results (1) between Abiquiu and Cochiti reservoirs, (2) to various ecological health "benchmarks," (3) to results obtained in previous years, and (4) to results NMED obtained on fish that were given to them by LANL.

Detection limits ranged from 0.01–15 pg/g (parts per trillion [ppt]) for the PCB congeners and 0.01–2.1 ng/g (parts per billion [ppb]) for the pesticides. Measured levels were generally two to four orders of magnitude above the detection limits. Axys, Inc., documented the specifics of the analytical method in a statement of qualification (Axys 1999).

To assess the toxicity of PCBs and dioxins, we computed one other parameter—Toxicity Equivalence Quotients (TEQs)—as follows. Some structurally related aromatic hydrocarbons, such as the 13 dioxin-like PCBs and dioxins, invoke a number of common toxic responses. The relative toxicity or potency of the 13 dioxin-like PCBs in comparison with the toxicity of tetrachlorodibenzodioxin (TCDD) is known. On this basis, the World Health Organization has developed TCDD equivalency factors (TEFs) for the 13 congeners and a method by which their toxicity can be assessed. To evaluate the dioxin-like toxicity PCBs cause, the concentration of each congener in biological tissue is multiplied by its TEF, and the 13 resulting values are summed, resulting in a total TEQ. The TEQ can then be used in a number of ways such as comparing it with a screening value or other benchmarks for TCDD.

In order to apply the contaminant data reported in this study to human risk endpoints, one needs to consider the portion of the whole fish that is edible. Contribution by tissue (e.g., bone) and media (e.g., sediment in the stomach) not usually consumed by humans should not be used to assess risk to humans. Because catfish are typically filleted when prepared for human consumption, we analyzed some of this year's samples (five August samples) partitioned into skin-on fillet, viscera (gills, gut [including stomach content], and organs), and carcass (bone, head, tail, fins, and muscle [meat] adhered to the skeleton). We measured the contributions of total dioxin-like PCBs, total dioxins, and total DDT and metabolites in these partitions. We calculated, based on the contribution to the whole by these parts, percentages of whole-body PCB and DDT concentration contributed by the partitions. We determined that viscera make up about 10% by wt. of a whole catfish and contribute about 32% of the PCBs in the whole fish; fillets make up about 26% by wt. of a whole catfish and contribute about 25% of the PCBs; and the carcass makes up about 64% by wt. of a whole catfish and contributes about 43% of the PCBs. We determined that viscera contribute about 34% of the total DDT and metabolites (DDT+DDD+DDE) in the whole fish, fillets contribute about 26%, and the carcass contributes about 40%. Thus, the portion of catfish not usually consumed by humans contains about 75% of the PCBs and 74% of the total DDT in a whole catfish.

c. Analytical Results (PCBs and TEQs). [Note: When used here, the phrase "total PCBs" means total dioxin-like PCBs.] Table 6-23 shows the congener analytical results, TEQs, and totals. With very low detection limits (ppt), we detected PCBs in all 13 samples (8 Cochiti and 5 Abiquiu). Total dioxin-like PCBs ranged from 5.4E-04 to 1.5E-03 μg/g-[or parts per million (ppm)]-fresh weight (FW) in Abiquiu reservoir and 3.0E-03 to 3.2E-02 ppm-FW in Cochiti Reservoir. Mean total whole-body PCB levels in Cochiti were 1.5E-02 ppm-FW in April and 4.2E-03 ppm-FW in August. To determine whether to combine data from the two sampling periods at Cochiti such that a combined set of Cochiti data is compared with Abiquiu, we statistically analyzed the effect of time (April versus August) for the Cochiti data. The effect of time for the Cochiti samples was nonsignificant

(P = 0.34, $t_{0.05, 2}$ = 1.2). The mean total PCB concentration for Abiquiu was 7.9E-04 ppm-FW and 8.1E-03 ppm-FW for Cochiti.

In 1999, the NMED analyzed for PCBs two fish (one carp, one catfish) given to them by LANL. The mean dioxin-like total PCB concentration from the two Cochiti fish was 6.9E-03 ppm (whole-body) (NMED 2002), which is within our range and in good agreement with our mean. The NMED mean total dioxin-like PCB concentration for fillets from three individual game fish taken from Cochiti in 2000—1.2E-03 ppm-FW (NMED 2002)—is in good agreement with our mean for catfish fillets—2.6E-03 ppm. The national mean concentration of total PCB mixtures in whole fish in 1984 was 0.39 ppm (EPA 1999); however, declines have occurred since then. The five Abiquiu values had a standard deviation of 54% of the mean. April values (N = 3) for Cochiti have a coeffience of variation of 100% of the mean, and August values (N = 5) varied by 25% of the mean.

The mean PCB concentration of fish from Cochiti Reservoir (8.1E-03 ppm) was not statistically higher (P = 0.07, $t_{0.05, 7}$ = 2.7) than the Abiquiu mean (7.9E-04 ppm). The mean total PCB concentration in catfish (8.1E-03 ppm) from Cochiti in 2001 (Table 6-23) is very close to the mean concentration (7.1E-03 ppm) that we measured in carp and carp sucker at Cochiti in 2000 (Figure 6-5) (Fresquez et al., 2001). The difference in PCBs between Cochiti and Abiquiu fish in 2000 was significant at the 95% confidence level (P = 0.02, $t_{0.05, 12}$ = 2.2) (Fresquez et al., 2001).

PCB Contribution from LANL. In 1997, we sampled three species of fish (catfish, common carp, and white sucker) at various points along the Rio Grande and analyzed them for PCB mixtures (Aroclors) using gas chromatography/electron capture detectors following EPA Method 8082 (Gonzales et al., 1999). Four of the sampling locations were within the potential influence of LANL (at or below LANL), and one was outside of the influence of LANL (above LANL on the Rio Grande). With low sensitivity (detections limits 0.1–0.5 ppm) when analyzing PCB mixtures, many of the results were "nondetections." Eight of 18 fish had measurable levels of Aroclor-1254, and 1 in 18 fish had Aroclor-1260. We did not detect Aroclors-1016, -1221, -1232, -1242, and -1248. Aroclor analysis is believed to be less accurate than congener analysis. Nevertheless, some comparison can be made. If "nondetects" for Aroclors-1254 and 1260 are replaced with one-half the detection limit (DL), the mean total PCB concentration from Aroclors at the "above-LANL" Rio Grande location was 1.6E-01 (Figure 6-6) (Gonzales et al., 1999), which is about 60 times the mean total PCB concentration in catfish fillets at Cochiti in 2001—2.6E-03 ppm-FW (August samples only). The mean total PCB concentration in fillets from Aroclors at the "below-LANL" Rio Grande location (1.9E-01 ppm-FW with one-half the DL for nondetects) is 119% of the above-LANL Rio Grande concentration, but the difference was not statistically significant. Thus, the data imply non-LANL sources of PCBs into the Rio Grande and Cochiti Reservoir. PCB distribution is known to be worldwide (Stoker and Seager 1976; EPA 1999). In addition to the local areas already mentioned where PCBs have been detected, PCBs have been detected at McAllister Lake east of Las Vegas, NM (NMED 2002). Thus, PCBs are pervasive. The contribution of PCBs into Cochiti Reservoir from LANL operations, if any, cannot be discerned from data only on Abiquiu and Cochiti reservoirs. To discern the LANL contribution, sampling of all adjacent waters on a long-term basis is needed as well as other studies.

Comparison to Safe Limits. In our 2001 data, the Cochiti mean total PCB concentration of 8.14 μg/kg and the maximum total PCB concentration of 31.6 μg/kg compare to a recommended whole-body total PCB concentration of <400 μg/kg FW for the protection of fish (Eisler and Belisle 1996). Niimi (1996) cites concentrations of >50 ppm as necessary to affect reproduction or growth and concludes that concentrations in the high ppb to low ppm can cause cellular or biochemical changes but also notes that the ecotoxicological significance of these changes is largely unknown. Barron et al. (1995) cites a dietary no-observable-adverse-effects-concentration (NOAEC) of 0.5 ppm in the American kestrel. Lastly, Giesy et al. (1995) estimated a dietary NOAEC of 0.14 mg total PCBs/kg fish for the protection of the bald eagle from "egg lethality." The highest PCB concentration in Cochiti Reservoir fish was about four times lower than the bald eagle NOAEC, and the mean concentration was about 17 times lower. Thus, both the fish themselves and predators of fish should be adequately protected from the potential effects of PCBs in Cochiti Reservoir.

TEQs for Cochiti ranged from 1.1E-06 to 6.3E-06 ppm. The maximum TEQ was the same as the maximum in carp and carp sucker in 2000 (Fresquez et al., 2001). The mean total TEQ for Cochiti fish was 2.17E-06 ppm, and the maximum total TEQ was 6.29E-06 ppm. Giesy and Kurunthachalam (1998) cite

a dietary NOAEC of 3.0E-07 ppm for the protection of mink. Mink are known to be extremely sensitive to PCBs. The whole-body PCB concentrations measured in this study are not suitable for comparison with human risk screening values because they include contribution by tissue (e.g., bone) and media (e.g., sediment in the stomach) not usually consumed by humans. The information provided at the end of Section C.2.b on percentage of PCB contribution from fillet portions of catfish can be used to derive PCB concentrations in fillets. These values would be suitable for comparison with human risk screening values. The concentrations of total PCBs that we measured in catfish fillets at Cochiti could result in minor consumption limits as based on EPA recommendations (EPA 2000b).

Cerro Grande Fire Impact. In 2000, we collected fish samples at Cochiti in June, July, and August after the Cerro Grande fire that occurred in May. Although the PCB concentrations at Cochiti showed a decreasing trend over the three-month period, it was concluded that the variation within each sampling time was too great to imply any effect from the fire. The same trend in PCB concentrations that occurred in 2000 (a 65% decrease in mean total PCBs) appeared again in 2001 (a 75% decrease in mean total PCBs), further supporting the notion that the peak concentration in the summer of 2000 was unrelated to the Cerro Grande fire. However, the length of time that would be required for a spike in the inflow of a contaminant into the Rio Grande to appear in fish is unknown. The mean total PCB concentration in 2001 was a slight increase (14%) from 2000. Although this increase could have been related to the Cerro Grande fire (i.e., an inflow of PCBs into the Rio Grande had a one-year lag to appear in fish), there may be too many variables to discern any impact of the Cerro Grande fire on PCB concentrations in fish at Cochiti Reservoir.

d. Analytical Results (Dioxins and Furans). Dioxin is the common name for a group of 75 related organic compounds. They have never been intentionally manufactured; they are an unwanted byproduct of the manufacture of other chemicals such as PCBs, wood preservatives (e.g. pentachlorophenol), and herbicides (e.g., 2,4-D) and of the combustion of organic matter. Combustion of organic matter is the largest source of dioxins in the environment. Thus, dioxins have both natural and human sources. Dioxins can be emitted in gaseous form or as particulates and are distributed through air, water, and sediment.

Although many dioxin compounds are toxic, the most toxic to humans is 2,3,7,8-TCDD (tetrachlorodibenzodioxin), sometimes referred to as the most toxic human-made chemical known. Few studies have documented the effects of dioxins on wildlife, but enough toxicology studies have been done to know that, in addition to humans, dioxins are quite toxic to nonhuman organisms. The primary source of dioxin toxicology is laboratory studies on mice and rats from which No-Observable-Adverse-Effect-Levels (NOAELs) are derived for wildlife species (Sample et al., 1996). The minimum (lowest or most stringent) ecological screening level (ESL) used in ecological risk screening at LANL is 1.8E-06 mg TCDD/kg soil-dry (ppt) based on the vagrant shrew (*Sorex vagrans*) (LANL 2000). ESLs for various organisms for TCDD range from 1.8 ppt to 5 ppm. Chronic effects from dioxins are a subject of controversy. Animal studies have shown that chronic exposure can result in reproductive dysfunction, birth defects, and cancer (EPA 2000c). Mammals tend to be more sensitive than birds. TCDD is known to be persistent in the environment and may last in excess of 10 years in soils. Like PCBs, the toxicity and persistence of dioxins likely increase with an increasing number of chlorine atoms. Also like PCBs, dioxins are poorly soluble in water but have a high affinity and solubility for lipids and fats. As a result, dioxins tend to bioaccumulate and biomagnify, at times resulting in their detection in animal life when they could not be detected in soil, sediment, or water.

The NOAEL-based benchmarks do not imply that adverse reactions occur above this level but suggest further investigation on the specific contaminants and potential environmental effects specific to a site when concentrations above this level are detected in the environment. Because of the gap in data pertaining to toxicity levels for wildlife, Sample et al. (1996) extrapolated NOAEL- and lowest-observable-adverse-effect-levels (LOAEL)-based benchmarks for 85 chemicals on 19 wildlife species based on previous studies. These values represent the most conservative NOAEL and LOAEL in that the study used the test animal with the most analogous physiological traits to the wildlife receptors of interest and the most stringent values.

In our study, dioxins are evaluated on an individual analyte basis, so comparisons are made either directly with TCDD or with the TEQ of another dioxin or furan. Detection limits for all dioxin/furan analytes were very low at 0.1 pg/g (1.0E-07 ppm). Table 6-24

shows the results of dioxin and furan analyses. TCDD was largely undetected, and detections at Cochiti Reservoir averaged 1.14E-07 ppm and had a maximum range of –1.53E-07 ppm. The lowest benchmark ("safe limit") concentration for dietary consumption that we found in the literature is for the little brown bat—3.0E-07 ppm (Sample et al., 1996); however, the bat is not a piscivore. The lowest dietary consumption benchmark for a mammalian piscivore from Sample's (1996) study was the river otter (*Lutra canadensis*) at 4.1E-07 ppm, and the belted kingfisher (*Ceryle alcyon*), an avian piscivore, has a dietary NOAEL benchmark of 2.76E-05 ppm. A concentration of 3.19E-07 ppm was the highest individual TEQ value for a fish caught from Cochiti for all analytes and is still below the NOAEL for the most sensitive piscivore in Sample's (1996) report. TCDD was not detected in any of the samples from Abiquiu Reservoir; therefore, we assume it was not present.

Studies show that dioxins settle in sediment (EPA 2000c), and, therefore, benthic feeders such as carp and catfish could accumulate dioxins at a higher rate than other fish. However, predator fish can, through biomagnification, accumulate relatively high levels of dioxins. Some piscivores such as the osprey (*Pandion haliaetus*) are not particular about the type of fish that they eat but will hunt only those that are within three feet of the water's surface (Alaska Department of Fish and Game 1994). Others, such as the river otter, prefer slow-moving fish such as the carp and catfish but will also consume other animals such as insects and crustaceans (USDA 2002). Mink (*Mustela vison*) and the belted kingfisher, both piscivores, have similar habits of eating at the water's surface but have also been known to eat a wide variety of foods such as eggs, birds, and insects (USDA 2002; Ivory 1997). Osprey and river otters occur in New Mexico, but bald eagles are much more ubiquitous, and a resident population resides at Cochiti Reservoir and the Rio Grande adjacent to LANL. Bald eagles are second-order piscivores and carnivores and also forage as opportunistic scavengers.

e. Analytical Results (Pesticides). Table 6-25 shows the analytical results for the pesticides. With very low detection limits (<ppb), we detected DDT, DDD, and DDE in all 13 samples (8 from Cochiti Reservoir and 5 from Abiquiu Reservoir). Total DDT and metabolites (DDT+DDD+DDE) ranged from 9.6E-03 to 2.5E-02 μg/g- or ppm-FW in Abiquiu fish and 4.6E-02 to 9.6E-02 ppm-FW in Cochiti fish. The mean total DDT (*o,p'*- and *p,p'*- isomers summed) concentration in Cochiti fish was 4.8E-03 ppm compared with the mean DDT concentration in Abiquiu fish of 3.5E-03 ppm. The mean total DDE concentration (*o,p'*- and *p,p'*- isomers summed) in Cochiti fish was 4.9E-02 ppm-FW compared with the mean DDE concentration in Abiquiu fish of 1.1 E-02 ppm-FW. These data cannot be directly compared with data in last year's ESR because only *p,p'*-DDT was reported last year. The mean and maximum *p,p'*-DDE concentrations in Cochiti fish were 4.8E-02 ppm-FW and 7.8E-02 ppm-FW, respectively. These values compare with the Abiquiu mean and maximum of 1.1 E-02 ppm-FW and 1.8E-02. All concentrations are below a dietary NOAEC of 0.16 ppm *p,p'*-DDE/kg fish for the protection of the bald eagle from "egg lethality" (Giesy et al., 1995). The 1990 national geometric mean concentration for this DDE isomer was 1.9E-01 ppm-FW (Schmitt et al., 1990). Our values are also below the upper end of the range (0.02–0.08 ppm) in whole-body concentration of Aroclors measured by Carter (1997) in the common carp in the Rio Grande at three locations below Cochiti Reservoir in 1992–1993. In 1985–1987, concentrations of *p,p'*-DDE up to 0.24 ppm-FW in fish were measured in the Rio Grande south of the Colorado border and up to 0.15 ppm-FW south of Santa Fe (Roy et al., 1992). A 1997 study of fish in the Rio Grande showed no statistical differences in concentrations of DDE between carp and catfish (Gonzales et al., 1999).

As with PCBs, to determine whether data from both sampling periods at Cochiti could be combined, we statistically analyzed the effect of time on total DDT and metabolites. The result was that the differences between the two data sets (April and August) are nonsignificant ($P = 0.49$, $t_{0.05,10} = 0.8$); thus, the two Cochiti data sets are statistically similar.

The mean total DDT and metabolites concentration at Cochiti (5.9E-02 ppm) was significantly higher ($P < 0.01$, $t_{0.05,10} = 6.8$) than the mean concentration for Abiquiu (1.5E-02 ppm). The largest historical source of DDT and metabolites into the area is unrelated to LANL operations. A previous study identified an aerial application of ~141,000 ppm of DDT in 1963 to half a million acres west of the Rio Grande as a timber pest control agent (Gonzales et al., 1999). This application was most likely greater in the vicinity of Cochiti Reservoir than Abiquiu because of greater areas of conifer forest west and directly upslope of Cochiti. Localized use of DDT was also common in

the 1960s and early 1970s. For example, isolated use of DDT in the Rito de los Frijoles watershed is documented (Allen 1989). Cochiti Reservoir is the second reservoir on the Rio Grande from its origin in Colorado, and many nonpoint sources from historical use are likely to exist. The distribution of DDT and its metabolites is known to be worldwide (Stoker and Seager 1976), and Carter (1997) documents detections in the Rio Grande upriver of LANL. The contribution, if any, of DDT and its metabolites into Cochiti Reservoir from LANL operations cannot be discerned from data only on these reservoirs. To discern the LANL contribution would require sampling of the Rio Grande, such as done in 1997 (Gonzales et al., 1999), on a long-term basis as well as other studies. DDT and DDE have been detected in fish at upriver locations in New Mexico and Colorado (Carter 1997) and more locally at locations just above and below LANL at higher concentrations than at the confluence of LANL's canyons with the Rio Grande (Gonzales et al., 1999).

The mean total DDE (*o,p'*-DDE + *p,p'*-DDE) concentration at Cochiti (4.85E-02 ppm) was significantly higher ($P < 0.01$, $t_{0.01,9} = 7.4$) than at Abiquiu (1.1E-02 ppm). The mean and maximum (7.92E-02 ppm) DDE concentrations compare with a recommended limit of 1.0 ppm in the diet of piscivores for protection from eggshell thinning. The effects of DDT and its metabolites on eggshell thinning, one of the most sensitive endpoints, are well documented.

3. Facility Monitoring

a. Area G.

Vegetation. (*John Nyhan*) We collected vegetation samples at the same sites and time at Area G as the soil collections described in Section A.3.a. For this segment of the overall Area G monitoring program, unwashed overstory and understory vegetation samples were collected at 11 locations within and around Area G in 2001 (Figure 6-2). Collection of vegetation samples for chemical analyses follows a set procedure to ensure proper collection, processing, submittal, and posting of analytical results. Stations and samples have unique identifiers to provide chain-of-custody control from the time of collection through analysis and reporting. All QA/QC protocols, chemical analyses, data handling, validation, and tabulation can be found in the ESH-20 OP entitled "Sampling and Sample Processing for the Waste-Site Monitoring Program," LANL-ESH-20-SF-OP/HCP-011, 1999. Paragon Analytics, Inc., analyzed the vegetation samples for tritium; plutonium-238 and plutonium-239, -240; strontium-90; americium-241; cesium-137; and total uranium; all QA/QC requirements were met.

Results show that most of the radionuclide concentrations in the unwashed vegetation samples collected in 2001 were below RSRLs, except for tritium and americium-241 (Table 6-26). Of the 15 vegetation samples collected in and around Area G (excluding samples collected at sampling locations 8 and 9), 87% and 40% of the samples contained tritium and americium-241, respectively, greater than both total propagated analytical uncertainty and RSRL values. Tritium concentrations in vegetation samples were largest on the southwestern and southern sides of Area G and were consistent with results from previous years (Nyhan et al., 2001a).

Bees. (*Tim Haarmann*) We collected honeybee samples in 2001 at Area G. Two colonies were established on the south end of Area G near the tritium shafts. We brought these colonies into the study site from a regional area. In addition, a reference (regional) site with one colony was established 10 km (6 mi.) south of Jemez Springs, NM. In the early fall 2001, we collected bee tissue samples from all of the colonies. Each of the three separate 100-g samples (one from each colony) consisted of approximately 1,000 bees. We used a small, rechargeable vacuum to collect the bee samples. Bees were vacuumed off frames that were removed from the hive, transferred to a plastic resealable bag, weighed, and double bagged into plastic resealable bags. We kept all samples in a cooler and froze them upon returning to the laboratory. After collecting each sample, we thoroughly cleaned the vacuum collection area to avoid cross-contamination of samples. All samples were analyzed for tritium; cesium-137; americium-241; plutonium-238; plutonium-239, -240; and total uranium; see Fresquez et al. (1997a) for a description of the methods. All QA/QC protocols, chemical analyses, data handling, validation, and tabulation can be found in the ESH-20 OP entitled, "Managing Bee Colonies," LANL-ESH-20-BIO-OP-024, RO, 1997. Paragon Analytics Inc., (Ft. Collins, CO) analyzed the bee samples, and all QA/QC requirements were met.

Five honeybee samples were above the RSRLs for tritium, plutonium-239, and uranium (data not given but can be found in Haarmann and Fresquez 2002). The RSRL is the upper-level regional concentration derived from the combined 1997, 1998, 1999, and

2001 control data (Haarmann and Fresquez 1998, 1999, 2002). Similar to our previous years' results, the largest concentration difference between Area G and the RSRL was in the tritium levels. Tritium levels in the Area G bees, for example, were at 559 and 1100 pCi/mL; the control colony contained -0.05 pCi/mL, with a RSRL of 4.7 pCi/mL. Concentrations of plutonium-239 were higher in both Area G colonies than the RSRL. Additionally, concentrations of total uranium in one of the Area G colonies were higher than the RSRL.

Small Mammals. (*Kathy Bennett*) In 1998, we sampled rodents at four locations at Area G, a control site within the proposed Area G expansion area, and a background site on Frijoles Mesa. The purpose of the sampling was (1) to identify radionuclides that are present within rodent tissues at waste burial sites, (2) to compare the amount of radionuclide uptake by small mammals at waste burial sites with the amount of uptake at a control site, and (3) to identify the primary mode of contamination to small mammals, either through surface contact or ingestion/inhalation. We collected three composite samples of approximately five animals per sample at each site. Pelts and carcasses were separated and analyzed independently. Samples were analyzed for americium-241, strontium-90, plutonium-238 and -239, total uranium, cesium-137, and tritium. The analysis detected higher levels of total uranium, plutonium-239, and cesium-137 in pelts as compared with the carcasses of small mammals, and strontium-90 was found to be higher in carcasses than pelts. Concentrations of other measured radionuclides in carcasses were not found to be statistically different ($\alpha = 0.05$) from that measured in pelts. However, pelts generally had higher concentrations than carcasses, indicating surface contamination may be the primary contamination mode. Mean concentrations of plutonium-239 and total uranium in small mammal carcasses were statistically greater at the active waste pits, whereas the mean concentrations of tritium in carcasses and pelts were the highest at the tritium shaft area. When we conducted a year-to-year comparison between sites, we found that mean carcass concentrations of americium-241, plutonium-238, plutonium-239, and tritium at the transuranic waste pad #2 area were the highest in 1997, and cesium-137 was the highest in 1996. We did not detect differences for any of the other contaminants of concern. For a more detailed discussion of these results, please see Bennett et al. (2002).

Predators. (*Lars Soholt*) Over the last decade, environmental surveillance activities at Area G have focused on evaluating the presence and mobilization of radionuclides in surface soils, bees, vegetation, and small rodents (Haarmann and Fresquez 2000; Gonzales et al., 2000b; Nyhan et al., 2001a; Bennett et al., 2002). Radionuclides at Area G are known to be transported through the food chain and could lead to elevated doses to nonhuman biota foraging in areas where they have been released to the environment.

The DOE recently released a dose assessment model for nonhuman biota to support the DOE's environmental radiation protection requirements for ecological systems (DOE 2000). At the same time, the department established an interim dose limit of 0.1 rad/day (0.001 Gy/day) for protection of terrestrial animal resources. We focused on the evaluation of doses to predators that forage on Area G to establish whether operations are in compliance with the DOE interim standard—predators like the American Kestrel (*Falco sparverius sparverius*), the great horned owl (*Bubo virginianus*). and the red tail hawk (*Buteo jamaicensis*) cannot be sacrificed for radionuclide analysis, hence the necessity for modeling the dose. The coyote (*Canis latrans*) also was included in this study because it is a major predator species within the LANL environs.

The source term data employed for this evaluation were from small mammals that were collected at Area G during the period 1994 to 1999 (Biggs et al., 1995 and 1997; Bennett et al., 1996, 1998, 2002; Soholt 2002a). In general, these data showed that, with the exception of strontium-90, the average activity concentrations on a live-weight basis are higher for small mammals captured on the Area G site than in the off-site areas (background). However, on-site and off-site data sets for cesium-137, strontium-90, and americium-241 were statistically indistinguishable from each other ($\alpha = 0.05$; Student's t-test for unequal variances); the others (tritium, plutonium-238, and plutonium-239) exhibited statistical differences between on-site and off-site data sets. We calculated doses to predators using the following parameters: (1) literature values for predator body weights and prey ingestion rates, (2) average measured concentrations in the prey, (3) fractional food-to-tissue transfer factors from the Laboratory's dose assessment methodology, (4) dose conversion factors assuming 100% deposition of decay product energy in the predator's body, and (5) radionuclide retention time

based on radiological and biological half-lives and estimated life spans. Many of these parameters were available from the biota dose assessment methodology developed by the Laboratory's Environmental Restoration Project (ERP 1999, LANL 2002). See Soholt et al. (2002b) for the specific values used.

The doses calculated for predators foraging on Area G ranged from 9E-07 rad/day for the American kestrel to 2E-04 rad/day for the coyote; generally, these doses were about 4 times those found for predators that would forage off-site, but they are still several orders of magnitude below the interim dose limit. The differences in the doses were dominated by tritium, plutonium, and americium.

The doses calculated here are deemed to be representative of upper bounding limits for predators foraging in the area because of the following factors:

The dose conversion factors were developed assuming that 100% of the energy released in decay is deposited in the body. This assumption may not be true for the gamma emitters dependent upon the track and energy of a given photon emission. However, because of the lack of dosimetric models specific to nonhuman biota, all models that we use for ecological dose assessment make this simplifying assumption.

The dose conversion factors are based on the assumption that alpha emissions carry a factor of 20 to account for their higher biological effectiveness over beta and gamma emissions. Some information in the literature indicates this factor is high. Because development of this factor for radiation protection of humans is based upon evaluating stochastic endpoints (cancer) and nonhuman endpoints of interest are deterministic (systemic), the factor of 20 may be too high. Limited studies suggest that a factor of 5 to 10 is more appropriate.

The dose estimates carry an implied area use factor of 1; i.e., the predators spend 100% of their foraging effort either on Area G or off-site. The area occupied by Area G is about 63 acres (0.1 mi^2). The medium-sized predators have foraging ranges that extend from 0.5 to 30 mi^2, dependent upon season and habitat. Thus, average medium-sized predator use of Area G would approach <1% to 20% of the foraging period. The smaller American kestrel could forage 100% of its time on Area G on occasion, but its foraging range can reach 1 mi^2; it is also migratory and can spend much of the year off the Pajarito Plateau.

Based on these bounding assumptions, we can conclude that, under current conditions at Area G, the calculated doses to predators foraging here are well within the protective dose limit of 0.1 rad/day, and the facility is operating in compliance with DOE Order 5400.5 requirements for protection of the environment.

b. DARHT.

Vegetation. (*John Nyhan*) We completed baseline concentrations of radionuclides and trace elements in vegetation around the DARHT facility during the construction phase (1996 through 1999) in 2000 (Fresquez et al., 2001b). The Mitigation Action Plan for the DARHT facility at LANL mandated the establishment of baseline concentrations for potential environmental contaminants. These concentrations of radionuclides and trace elements now represent preoperational BSRLs, which are calculated from the mean DARHT facility sample concentration plus two standard deviations. In 2001, we collected unwashed overstory and understory vegetation samples at four sampling locations during the operational phase within and around the DARHT facility. Collection, processing, submittal, and analysis of vegetation samples follow a set procedure described in Section C.3.a, with the exception that an internal laboratory at LANL—CST-9—analyzed trace elements silver, arsenic, barium, beryllium, cadmium, chromium, copper, mercury, nickel, lead, antimony, selenium, and thallium.

Tables 6-27 and 6-28 present the analytical results of radionuclides and trace elements, respectively. See Figure 6-3 for the locations of sampling points. None of the radionuclide concentrations found in overstory and understory vegetation samples were above BSRLs (Fresquez et al., 2001b), except for the concentration of total uranium found in overstory samples collected at the east and south sampling locations. Even these samples were not significantly different than the BSRL concentration because they were within one standard deviation of the BSRL concentration. Table 6-28 shows that the trace element concentrations in all of the samples were less than BSRL concentrations.

Bees. (*Tim Haarmann*) We sampled honeybees around the DARHT facility in 2000 and 2001. We collected bee samples from five colonies, established at the DARHT site approximately 100 m northwest of the DARHT facility. In addition, a control (regional) site with one colony was established 10 km (6 mi.) south of Jemez Springs, NM. We collected, processed, and analyzed these samples for the constituents described in Section C.3.a.

The 2000 samples were analyzed for various radionuclides and heavy metals (Tables 6-29 and

6-30). DARHT facility sample results from one colony were higher than the upper-level regional concentration for plutonium-238. Sample results from another colony were higher in plutonium-239 and copper. Sample results from all five colonies were higher than the upper-level regional concentration for barium. Of the results that exceeded the RSRL, the plutonium-238 concentration was the only sample concentration greater than the BSRLs (DARHT Construction Phase Level). For more details, see Haarmann 2001.

During the 2001 sampling, because of unforeseen sampling problems, we had to composite our radionuclide samples from all five hives into one sample. Therefore, we only have one analytical result per analyte. We sampled for tritium, cesium-137, americium-241, and plutonium-238 and -239. No radionuclide analytical results exceeded RSRLs (data not given but can be found in Haarmann 2002).

4. Special Biological Monitoring Studies

a. Tritium Concentrations in Elk Inhabiting the Pajarito Plateau. During several elk capturing and radio collaring exercises on Bandelier National Monument (BNM), Santa Clara Pueblo (SCP), and LANL lands, blood was drawn to determine several potential disease vectors and concentrations of the radioisotope tritium. Tritium follows the hydrologic cycle and enters animals through ingestion, inhalation, and direct absorption through the skin (Whicker and Schultz 1982). This section reports the results of the tritium analysis conducted on blood samples from approximately 69 elk trapped on BNM lands during the years 2000–2001, 5 elk trapped on SCP lands during 2001, and 28 elk that were trapped on LANL lands during the years 1995 to 2001 (Table 6-31). Tritium concentrations in elk that were trapped from the various locations were the following: BNM ranged from –0.29 to 2.96 pCi/mL, SCP ranged from –0.14 to 0.83 pCi/mL, and LANL ranged from 0.04 to 2.25 pCi/mL. Only the mean concentration of tritium in elk collected on LANL lands (0.55 ± 0.53 pCi/mL) was significantly higher than tritium in elk collected from regional areas (0.21 ± 0.16 pCi/mL). See Fresquez (2002) for more information on this subject.

b. Contaminant Concentrations in Burned Conifer Tree Bark Collected Within the Los Alamos National Laboratory. Immediately after the Cerro Grande fire of 2000, we sampled ponderosa pine (*Pinus ponderosa*) bark ash and surface ash at three of the 12 stations that are sampled for soils on an annual basis as part of the ESP. The three stations were at TA-06 (Twomile Mesa), TA-15 (R-Site Road East), and TA-16 (S-Site) and were the only routine sampling stations impacted by the fire for which pre-fire data exist. The primary intent was to infer whether conifer trees within the southwest area of the Laboratory might have contributed more contaminants (especially uranium isotopes) to ash than trees in off-site areas. We also compared our data with results from several other similar sampling efforts. Mean on-site concentrations of uranium-234, uranium-235, uranium-238, plutonium-239, and americium-241 in bark ash were above regional (reference) concentrations, and mean on-site concentrations of strontium-90 and cesium-137 were below regional concentrations. The relative differences were consistent with duplicate sample analyses that NMED made. Metal and non-metal trace elements concentrations in bark ash were also relatively low, although the TA-16 sample had slightly higher levels of boron, barium, aluminum, chromium, copper, iron, nickel, titanium, and zinc than the reference sample. We did not detect organochlorine pesticides or Aroclors in bark ash. In surface ash, the analytes for which on-site concentrations exceeded regional concentrations were 1,2,3,4,6,7,8-HpCDD, OCDD, Total HxCDD, and Total HpCDD, a result generally consistent with the analytical results for soil samples taken from the same locations after the fire. No detections of 2,3,7,8-TCDD, the most toxic of the dioxins, were made in any of the samples. For a more detailed description of results, please see Gonzales and Fresquez (2002).

c. Contaminant Concentrations in Conifer Tree Bark and Wood following the Cerro Grande Fire. After the Cerro Grande fire, conifer trees in Mortandad Canyon within the Laboratory were felled as a hazard reduction effort. Several potential disposal options and uses of those trees and of trees that continue to be thinned throughout LANL have been identified. There was interest in knowing whether on-site samples of conifer trees contained elevated levels of radionuclides or other contaminants. After the fire, we measured radioactivity in three samples each of bark and wood from ponderosa pine trees in Mortandad Canyon. We also made preliminary estimates of radiation dose to the public that could result from burning trees and wood waste material in air curtain destructors. In bark, plutonium-238, plutonium-239, and uranium-235 were two to three

orders of magnitude higher in Mortandad Canyon samples than in an off-site sample, and uranium-234, uranium-238, cesium-137, and strontium-90 were one order higher. In wood, strontium-90, tritium, cesium-137, and plutonium-239 concentrations in Mortandad Canyon were between one and two orders of magnitude higher than in the reference site sample. The actinides were generally two to three orders of magnitude higher in bark than in wood, and the strontium-90 concentration was about one order of magnitude higher in wood than in bark. The 50-year CEDE to the maximally exposed individual (MEI) resulting from one year of burning was 9.7E-03 mrem, which is about a 0.002% increase in the annual average radiation dose to individuals from other, non-Laboratory, sources of radiation. The 50-year CEDE to the MEI resulting from 10 years of burning was 0.097 mrem, and the risk to the surrounding population would be negligible (<0.01 latent cancer fatalities). No health effects from the inhalation of radionuclides are expected because doses are well below the >10,000 mrem dose at which health effects from radiation exposure have been observed in humans. We believe that the proposed burning operations will be safe to the public with regard to radiation dose. Additional broader, statistically robust sampling of wood, bark, and slash is ongoing. See Gonzales et al. (2001) for a complete description of results.

d. The Evaluation of Techniques for the Collection and Use of Scat and Hair for Noninvasive Genetic Analysis of Free-Ranging Carnivores. The loss of suitable habitat because of the Cerro Grande fire has likely affected carnivore numbers and distribution. For these reasons and the need to implement effective management strategies to reduce the potential for human-animal encounters, the Laboratory needs to develop and implement a long-term, cost-effective, and accurate method for monitoring carnivore populations. Current research procedures to study carnivore species provide limited information because they involve invasive, costly, and time-consuming techniques. The use of scat and hair for noninvasive genetic analysis to study natural populations is a relatively new method with the potential to answer many questions currently unanswered by traditional research methods. Hair snares are a common method of obtaining hair samples for genetic analysis from free-ranging carnivores. The objective of our study is to test four different techniques, including a carpet snare, a barbed-wire snare, and a cubby snare, to determine the most effective method for collecting carnivore hair and scat on LANL property. Scat collection is another method for gathering data to monitor carnivores. We will collect scat samples using line transects located in three canyon systems and one mesa top on LANL property. Transects are along dirt roads and drainage beds. We plan to collect and then store the samples until they are needed for genetic analysis. See Quintana et al. (2002) for more details.

e. The Use of Noninvasive Genetic Analysis to Study Distribution and Population Characteristics of Mountain Lion (*Puma concolor*) and Black Bear (*Ursus americanus*) in New Mexico. Long-term management of mountain lions (*Puma concolor*) and black bears (*Ursus americanus*) focuses on issues such as conservation, habitat loss and fragmentation caused by increased human encroachment, and nuisance animal control. To develop long-term management strategies, data collection typically involves labor-intensive and expensive invasive techniques such as radio collaring and mark-recapture. More recently, incorporating noninvasive genetic analysis into wildlife studies has decreased the time, cost, and handling of animals. Our research evaluates the efficacy of using hair and scat genetic analysis as a noninvasive technique for long-term studies of large carnivore distribution and population characteristics. The Laboratory is currently evaluating sample collection and processing techniques. We are collecting the fecal and hair samples of large carnivores in the east Jemez Mountains using a combination of hair snares and line transects (to collect scat). Eventually, the study area (east and central Jemez Mountains) will contain systematically placed sampling stations and transects for collecting hair and scat. We are plotting sample collection locations using the Global Positioning System (GPS) and the Geographical Information System (GIS). Microsatellites are amplified from DNA isolated from hair and scat samples and used for individual identification. We can then match individuals identified through genetic analysis with individuals that have been radio collared to evaluate the efficiency of sampling techniques and genetic analysis. We will also evaluate the distribution and population information gained from the genetic analysis and compare it with the radio-collared individuals. For a more detailed discussion of these results, see Alexander et al. (2001).

f. Assessing Effects of Herbivory on Vegetation Recovery Following the Cerro Grande Fire. Effects of the Cerro Grande fire will likely lead to alterations in the distribution of large herbivores such as Rocky Mountain elk (*Cervus elaphus nelsoni*). Early growth stages following wildfires typically provide forage species that are highly desirable to large ungulates. Excessive use of recently burned areas by ungulates results in adverse impacts to the topsoil (e.g., erosion) and vegetation recovery and succession rates. We propose to monitor changes in vegetation attributes over time to attempt to identify emerging adverse effects to and by wildlife species in order to implement mitigation measures to reduce the level of impact(s). We will track the effects of large herbivores on aspen regeneration and vegetation recovery and assess them using a series of exclosure plots located within the burn area on Forest Service property.

After inventorying the herbaceous and woody species and making standard measurements of frequency, density, foliar cover, stems per hectare (woody species), and species height, we will compare the results from the exclosure plots with the results from the control plots. Within two overstory vegetation types, mixed conifer and mixed conifer/aspen, four replicates will be established (a total of 8 fenced plots). Each replicate will consist of a 3-plot system: 1 plot = control, 1 plot = permanent exclosure, 1 = plot with 2 mobile 5 × 8 × 6 ft exclosures. We will divide the plot with mobile exclosures into a series of grid cells whereby the exclosures will be rotated annually.

The objective is to quantify the potential vegetation response for that growing season. The permanent exclosure will be 25 × 55 m in size and 3.3 meters in height and would be placed at 20–30 meters from the mobile exclosure plots and the control plots to minimize behavioral responses by animals to the exclosure. Within the permanent exclosure, we will use the modified Whitaker technique for understory measurement and line transects for overstory. We will also establish pellet transects near each set of plots to quantify elk and deer pellets for use as an indicator of herbivore grazing/browsing intensity in the vicinity of the exclosures. See Biggs and Orr (2001) for a more detailed description of results.

g. Relationship Between Home Range Characteristics and the Probability of Obtaining Successful Global Positioning System (GPS) Collar Positions for Elk in New Mexico. We compared the ability of GPS radio collars deployed on elk (*Cervus elaphus nelsoni)* to obtain valid positions (position acquisition rate [PAR]) in seasonal home ranges with differing vegetation and topographical characteristics. We also compared GPS collar PARs under varying levels of cloud cover and between differing daily time periods. We recorded a mean PAR of 69% (n = 10 elk, s = 14%) for collared elk. Multiple regression analysis of seasonal home range characteristics indicated that vegetation cover type and slope, either as individual variables or in combination with one another, were not significant predictors of GPS collar PARs. We did not observe statistical differences in position acquisition rates between cloud cover classes or varying cloud base heights. The PAR was significantly higher between 1600–2000 h (Mountain Standard Time) compared with 0000–1200 h, which may have been due to elk behavior. We believe the use of GPS collars is a more effective and efficient method of tracking elk in our study area than of very high frequency (VHF) collars because GPS collars can be programmed to obtain fixes automatically, have fewer logistical problems, and are more economical with long-term data collection efforts. Please see Biggs et al. (2001a) for a more detailed description of results.

h. Presumptuous Assumptions: Elk and the Pristine. Frequently, conservation biologists, naturalists, wildlife managers, and others suggest that biological resources should be managed to reflect a "pristine" state (a landscape that has not been culturally modified and that falls outside of human influence). However, pristine is rarely defined by researchers and, in the American West, is usually equated with the early 16th century or a pre-European cultural landscape. The use of pristine in this capacity is inaccurate and misleading when developing management strategies because it is still based on a culturally modified environment. In fact, recent literature suggests that Native Americans may have significantly impacted wildlife populations, particularly game species.

In developing species-specific management strategies, resource managers should select a target population level at some given point in time to reflect both the suspected environmental conditions of that time and the current management needs (i.e., biodiversity, animal health, and ecosystem health). To arbitrarily select a point in time, assuming that human influence on game populations was negligible and therefore more "natural," may be inappropriate. To elaborate on this issue, we use Rocky Mountain elk populations in the Jemez Mountains as an example. Some researchers

have suggested that elk populations in the Jemez Mountains were never large. This argument is based on the low abundance of elk remains relative to other ungulate species in the archaeological record. If this supposition is true, then frequencies of ungulate remains in the archaeological record should parallel the paleontological record. If both records indicate low abundances of elk relative to other ungulate species, then the assumption that elk populations were low may have merit. In other words, the number of elk hunted was proportional to the number of elk available. Conversely, if the paleontological record indicates more elk than the archaeological record, then other alternatives must be considered to explain the low numbers (i.e., cultural selection against elk, hunting strategies, trade). But, if the paleontological and archaeological records parallel each other and given that pre-16th century environmental conditions were likely as able to support populations as those found today, then possible reasons for the similarities need further examination.

We discuss possible alternatives to explain why elk populations were not necessarily at high levels in the Jemez. The Jemez Mountains were not a sparsely populated "pristine land" when Europeans initially arrived. A pre-European cultural landscape, and one that represented trial and error as well as the achievement of countless human generations, was already in place. It is upon this imprint that the more familiar Euro-American landscape was grafted and not necessarily created anew. The West at the time of the earliest European exploration was most likely past any "pristine" condition that might serve as an absolute benchmark for resource managers if managing towards the more traditional definition of "pristine." See Schmidt and Biggs (2001) for more information.

i. Development and Implementation of a Wildlife Management Plan for the Los Alamos National Laboratory. Recent large-scale wildfires, landscape development, and day-to-day operations on and near Laboratory property in north-central New Mexico may be resulting in large-scale alterations in behavior and landscape use by wildlife species. Wildlife management concerns include human/animal conflicts (animal/vehicle collisions), habitat loss affecting biological diversity, and ecosystem health.

We have developed and implemented a plan to minimize threats to people and property, protect important habitats, and assess ecological roles and values of wildlife species without adversely affecting optimum species numbers, movement patterns, or animal health. This plan is part of a larger Biological Resources Management Plan that integrates wildlife management with forest and range management, wildfire management, and watershed management. The plan also includes strategies to monitor and minimize the potential adverse impacts to biological resources resulting from the recent Cerro Grande fire. Monitoring and research efforts include making spotlight surveys to establish distribution and population trends of large herbivores; establishing plots for long-term wildlife monitoring and vegetation responses to herbivory; conducting food habits analyses of herbivores; analyzing wildlife population genetics; and integrating GPS telemetry studies and GIS to identify activity patterns and movements of large game species in relation to vegetation, fire burn intensity, water sources, human uses and disturbances, and topography. The Laboratory is using the data collected as part of the monitoring efforts to develop habitat suitability models, mitigate impacts of wildlife on humans and LANL operations, and mitigate impacts of humans and LANL operations on wildlife. See Biggs et al. (2001b) for more information.

j. A Comparison of Elk and Mule Deer Diets on Los Alamos National Laboratory. Increased population size and expansion of elk (*Cervus elaphus nelsoni*) in New Mexico has raised questions about the management of this species. Throughout the southwestern US, concern is also growing about a decline in mule deer (*Odocoileus hemionus*) populations. This study compares the seasonal food habits and dietary overlap of elk and mule deer on Laboratory property for two years. We are currently determining seasonal food habits by microhistological analysis of feces, and we processed all collected samples using standard microhistological techniques. Results of the winter diets of mule deer for 1998 consisted of 65% browse, 27% forbs, and 8% grasses. Results of the winter diets of elk for 1998 consisted of 26% browse, 18% forbs, and 56% grasses. The inverse relationship between elk and mule deer winter diets for 1998 shows little dietary overlap. Knowledge and understanding of the food habits of these animals are essential for the management of these species for evaluating diet quality, preference, and competition. Please see Sandoval et al. (2001) for a more detailed discussion of results.

k. Spring and Fall Small Mammal Sampling Report for Cañon de Valle and Pajarito Canyon, 2001. We performed a screening ecological risk assessment for Cañon de Valle. Six contaminants of

potential ecological concern (COPECs) failed the screen for the terrestrial and riparian systems in the canyon, establishing a need for further site-specific evaluations. We initiated a small mammal study as a means for assessing potential adverse effects in the canyon that could be attributed to the COPECs in the terrestrial and riparian systems. The study resulted in sampling small mammals in late spring to early summer and again in early fall in Cañon de Valle and a reference canyon, Pajarito Canyon. Species composition, body weights, and general reproductive status of small mammals in both Cañon de Valle and Pajarito Canyon were similar. Cañon de Valle samples had a slightly lower mean body weight of males than did Pajarito Canyon during spring sampling, but weights were similar during fall sampling. Capture rates for both Cañon de Valle and Pajarito Canyon were very low when compared with other years in similar locations and habitat. This low capture rate also resulted in low density estimates in both canyons. Low capture rates have also been seen through spring and summer at other sites within the Laboratory during 2001. Low capture rates and density estimates may be attributed to previous drought years as well as impacts from the Cerro Grande fire. However, Cañon de Valle had higher capture rates, density estimates, and species diversity than the reference site, Pajarito Canyon. Based on these limited data from just two sampling periods, Cañon de Valle did not show adverse population characteristics when compared with the reference site, Pajarito Canyon. Please see Bennett et al. (2001) for more information about this study.

l. Medium and Large Mammal Spotlight Surveys, 2000–2002. We initiated spotlight surveys in fiscal year (FY) 2000 as a monitoring technique to detect trends in abundance of medium and large mammals on LANL lands. This information allows us to quantify changes in animal populations and to correlate such changes to human-caused and natural events impacting the LANL area. The surveys also provide baseline information for environmental analyses required in project planning. Spotlight surveys are conducted along 27 km of paved and dirt roads on the interior of LANL property. We repeat all transects on four consecutive nights (weather permitting) twice a year (in February and July) and calculate an average abundance index value for each species in each season as numbers seen per kilometer traveled. As of February 2002, we have three years of winter data and two years of summer data. The most common animals seen during spotlight surveys are Rocky Mountain elk, mule deer, and cottontail rabbits. Other animals occasionally seen have included gray fox, bobcat, and coyote. Rocky Mountain elk occur on LANL year-round. However, the greatest short-term impact on elk numbers is the movement of migratory elk onto LANL during winters with deep snow cover. A peak in abundance of elk during February 2001 documented an up to 10-fold increase in the numbers of elk wintering on LANL in a wet winter versus the drier winters of 2000 and 2002. There have been anecdotal reports of increases in mule deer numbers in the years since the Cerro Grande fire. We did observe more mule deer in February 2002 than we have seen in previous winters; however, we do not know if this represents a long-term increase. Mule deer survival is known to increase in years with mild, snow-free winters. Therefore, the recent trend toward mild, drier winters may be favoring mule deer in this region. In addition, fewer elk winter on LANL under dry conditions, and this situation may reduce potential competition between elk and mule deer for forage at critical times of the year. Although cottontail rabbit abundance remained relatively high the summer after the Cerro Grande fire, we saw a steep decline in rabbit numbers during the winter of 2001. Deep snow cover during this winter may have made rabbits more vulnerable to predation and starvation. Although rabbit abundance indices have not increased markedly, we did observe juvenile rabbits during our February 2002 surveys. This evidence of winter breeding suggests that rabbits are in good condition this winter and that the rabbit population is starting to recover. The greatest value in spotlight surveys lies in the trend information gained from repeated measurements over time. We plan to continue doing spotlight surveys using the protocols we developed in FY 2000. See Hansen et al. (2002) for a more complete description of results.

m. Surveys of Fire Effects, Rehabilitation Treatments, Ecosystem Recovery, and Residual Fire Hazards: Second Year after the Cerro Grande Fire. During the summer of 2001, we sampled site characteristics, topographic conditions, and vegetation structures at 51 permanent plots in the Los Alamos region. Twenty-five of these plots had been previously sampled from 1997 to 2000, whereas twenty-six plots were newly established. The purpose of this sampling effort is to evaluate the effects of the Cerro Grande

fire on selected vegetation types, assess the effectiveness of rehabilitation treatments, document recovery of ecosystems, quantify the residual fire hazards that remain after the fire, and assess the reduction of fire hazards after the application of treatments. Because this is a multiagency collaborative effort, we sampled plots on several land ownerships including the Laboratory (25), US Forest Service (14), Bandelier National Monument (6), Los Alamos County (3), and the Valles Caldera National Preserve (3). We permanently marked the plots and recorded the coordinates with a global positioning system. The recent fire history of the plots ranged from unburned (22) to burned at low (4), moderate (4), or high (21) burn severities. Of the plots that were burned, 21 were rehabilitated with one or more treatments. We are currently analyzing the data to determine the effects of the rehabilitation treatments and for the presence and abundance of weedy plant species.

n. Biodiversity of Fauna after the Cerro Grande Fire. This study assesses the impacts of the Cerro Grande fire on fauna at the Laboratory. We chose ten plots, each 20 m × 50 m, within ponderosa pine areas. Five of the plots were located in severely burned areas and are characterized by having 100% tree mortality. We chose five unburned areas as the control sites for comparisons. Target species during 2001 included bats, small mammals, large mammals, and arthropods. Monitoring techniques varied according to the particular target species. We monitored bats using the Anabat 5 system for four nights per plot. Small mammals were monitored for five days per plot using tracking tubes, which are open-ended PVC tubes that contain ink padded inserts. When the small mammal steps through the tube, it leaves behind footprints that can be identified. We used photostations to monitor large mammals for a month. Finally, we monitored arthropods for eight weeks using pitfall traps. We will also monitor birds during the summer of 2002 using the Eco-Pro Digital Audio Processor. The Eco-Pro records all audible sounds and can be preprogrammed for a specific frequency and signal strength. We reported 53 small mammal visitations in burned areas and 30 small mammal visitations in unburned areas. Photostations detected five deer, one elk, and two ravens in burned areas as opposed to two deer and three ravens in the unburned areas. We counted 445 bat calls in burned areas and 425 bat calls in the unburned areas. We are currently identifying the species. Biodiversity will be a measure of species richness within burned and unburned areas over a two-year period. For more information about this project, see Nathanson-Hargis et al. (2002).

D. Acknowledgements

In this second sampling year after the Cerro Grande fire, we collected and analyzed more samples than usual. Thanks to the staff of ESH-20, Rick Velasquez, and Louie Naranjo for collecting and processing samples and to many of the ESH-20 undergraduate students (David Lujan, Julie Hill, Adrian Martinez, Amanda Chavez, and Jennifer Montoya) for helping summarize, tabulate, and QA the data.

Table 6-1. Radionuclide Concentrations in Surface (0- to 2-inch depth) Soils Collected from Regional, Perimeter, and On-Site Locations during 2001

Location	^{3}H (pCi/mL)	^{90}Sr (pCi/g dry)	^{137}Cs (pCi/g dry)	^{tot}U (µg/g dry)	^{238}Pu (pCi/g dry)	$^{239,240}Pu$ (pCi/g dry)	^{241}Am (pCi/g dry)	Gross Alpha (pCi/g dry)	Gross Beta (pCi/g dry)	Gross Gamma (pCi/g dry)
Regional Background Stations:										
Embudo	0.38 (0.40)[a]	0.24 (0.14)	0.24 (0.04)	1.77 (0.13)	0.003 (0.001)	0.014 (0.003)	0.005 (0.002)	3.9 (0.47)	4.4 (0.44)	7.0 (0.3)
Cochiti	0.94 (0.44)	0.07 (0.13)	0.25 (0.05)	1.79 (0.13)	0.001 (0.001)	0.009 (0.002)	0.004 (0.002)	3.7 (0.47)	3.7 (0.38)	8.0 (0.3)
Jemez	0.26 (0.25)	0.05 (0.14)	0.13 (0.45)	2.52 (0.19)	–0.001 (0.001)	0.006 (0.002)	0.002 (0.001)	4.2 (0.90)	4.5 (0.75)	8.0 (0.3)
Mean (std dev)	0.53 (0.36)	0.12 (0.10)	0.21 (0.07)	2.03 (0.43)	0.001 (0.002)	0.010 (0.004)	0.004 (0.002)	3.9 (0.24)	4.2 (0.43)	7.7 (0.6)
RSRL[c]	0.98	0.60	0.49	3.12	0.009	0.021	0.012	7.9	7.5	6.2
SAL[d]	6,4000[e]	5.70	5.30	100.00	49.00	44.000	39.000	---	---	---
Perimeter Stations:										
Otowi	–0.01 (0.12)[b]	0.14 (0.15)	0.26 (0.04)	3.37 (0.24)	0.001 (0.001)	0.098 (0.010)	0.026 (0.004)	3.5 (0.40)	3.8 (0.35)	10.0 (0.4)
TA-8 (GT Site)	0.33 (0.13)	0.45 (0.14)	0.65 (0.11)	2.71 (0.21)	0.001 (0.001)	0.022 (0.004)	0.014 (0.005)	4.5 (0.46)	4.0 (0.37)	11.0 (0.5)
Near TA-49 (BNP)	0.02 (0.16)	0.16 (0.15)	0.39 (0.06)	4.02 (0.29)	–0.000 (0.001)	0.011 (0.003)	0.002 (0.003)	7.7 (0.75)	6.1 (0.55)	9.0 (0.4)
East Airport	0.56 (0.14)	0.21 (0.13)	0.26 (0.07)	3.19 (0.24)	0.001 (0.001)	0.029 (0.004)	0.005 (0.003)	5.4 (0.55)	4.5 (0.41)	11.0 (0.4)
West Airport	0.19 (0.23)	0.12 (0.14)	0.26 (0.04)	4.17 (0.29)	0.001 (0.001)	0.110 (0.010)	0.008 (0.003)	4.6 (0.50)	4.5 (0.43)	9.0 (0.3)
North Mesa	0.53 (0.18)	0.07 (0.13)	0.24 (0.06)	3.37 (0.24)	–0.001 (0.001)	0.018 (0.003)	0.009 (0.003)	6.1 (0.65)	4.5 (0.43)	11.0 (0.4)
Sportsman's Club	0.01 (0.16)	0.14 (0.12)	0.30 (0.07)	3.79 (0.27)	0.000 (0.001)	0.017 (0.003)	0.006 (0.003)	6.3 (0.65)	5.7 (0.50)	11.0 (0.4)
Tsankawi/PM-1	0.25 (0.25)	0.10 (0.14)	0.19 (0.04)	6.97 (0.49)	0.000 (0.001)	0.008 (0.002)	0.006 (0.002)	3.6 (0.40)	3.3 (0.33)	16.0 (0.6)
White Rock (East)	0.24 (0.17)	0.13 (0.12)	0.33 (0.07)	2.32 (0.17)	–0.001 (0.001)	0.012 (0.003)	0.004 (0.002)	7.0 (1.00)	5.2 (0.80)	12.0 (0.4)
San Ildefonso	0.90 (0.65)	0.27 (0.14)	0.23 (0.06)	2.14 (0.16)	0.006 (0.002)	0.023 (0.004)	0.008 (0.003)	3.5 (0.38)	3.2 (0.31)	11.0 (0.4)
Mean (std dev)	0.30 (0.29)	0.18 (0.11)	0.31 (0.13)	3.61 (1.36)*[f]	0.001 (0.002)	0.035 (0.037)*	0.009 (0.007)	5.2 (1.52)*	4.5 (0.98)	11.1 (2.0)*
On-Site Stations:										
TA-16 (S-Site)	0.33 (0.13)	0.27 (0.14)	0.61 (0.08)	5.64 (0.41)	0.003 (0.001)	0.029 (0.004)	0.010 (0.003)	8.0 (0.75)	8.1 (0.65)	12.0 (0.5)
TA-21 (DP-Site)	0.38 (0.17)	0.00 (0.12)	0.07 (0.03)	2.42 (0.18)	0.000 (0.001)	0.058 (0.007)	0.005 (0.002)	4.1 (0.45)	3.6 (0.34)	11.0 (0.4)
Near TA-33	0.31 (0.13)	0.12 (0.12)	0.33 (0.06)	3.34 (0.25)	–0.001 (0.002)	0.010 (0.003)	0.008 (0.002)	6.1 (0.60)	4.8 (0.41)	10.0 (0.4)
TA-50	0.22 (0.13)	–0.04 (0.15)	0.03 (0.03)	2.41 (0.18)	0.004 (0.002)	0.022 (0.004)	0.006 (0.003)	5.0 (0.55)	3.7 (0.39)	10.0 (0.4)
TA-51	0.26 (0.13)	0.07 (0.14)	0.26 (0.07)	3.35 (0.24)	0.000 (0.001)	0.026 (0.004)	0.010 (0.003)	5.6 (0.60)	5.2 (0.48)	11.0 (0.5)
West of TA-53	0.68 (0.31)	0.13 (0.13)	0.13 (0.04)	3.63 (0.26)	0.004 (0.002)	0.015 (0.003)	0.004 (0.002)	5.8 (0.60)	4.7 (0.45)	10.0 (0.4)
East of TA-53	0.28 (0.49)	0.15 (0.12)	0.46 (0.08)	3.04 (0.22)	0.004 (0.002)	0.039 (0.005)	0.015 (0.004)	6.8 (0.70)	4.5 (0.44)	13.0 (0.5)
East of TA-54	0.79 (0.18)	0.16 (0.13)	0.20 (0.06)	2.70 (0.20)	0.004 (0.003)	0.027 (0.004)	0.018 (0.004)	5.5 (0.50)	2.9 (0.29)	13.0 (0.5)
Potrillo Drive/TA-36	0.40 (0.17)	0.09 (0.13)	0.15 (0.05)	2.62 (0.19)	–0.001 (0.002)	0.005 (0.002)	0.003 (0.002)	4.9 (0.50)	3.6 (0.35)	11.0 (0.5)
Near Test Well DT-9	0.22 (0.24)	0.01 (0.14)	0.42 (0.08)	2.98 (0.21)	0.001 (0.002)	0.022 (0.004)	0.010 (0.003)	5.2 (0.55)	5.5 (0.50)	12.0 (0.5)
R-Site Road East	0.23 (0.23)	0.16 (0.12)	0.21 (0.05)	4.98 (0.36)	0.002 (0.001)	0.013 (0.003)	0.007 (0.003)	6.5 (0.70)	6.1 (0.55)	10.0 (0.4)
Two-Mile Mesa	1.08 (0.29)	0.04 (0.13)	0.43 (0.08)	3.52 (0.26)	0.002 (0.001)	0.022 (0.004)	0.009 (0.003)	5.9 (0.60)	4.5 (0.43)	11.0 (0.4)
Mean (std dev)	0.43 (0.27)	0.10 (0.09)	0.28 (0.18)	3.39 (1.00)*	0.002 (0.002)	0.024 (0.014)*	0.009 (0.004)	5.8 (1.02)*	4.8 (1.39)	11.2 (1.1)*

Table 6-1. Radionuclide Concentrations in Surface (0- to 2-inch depth) Soils Collected from Regional, Perimeter, and On-Site Locations during 2001 (Cont.)

Location	^{234}U (pCi/g dry)	^{235}U (pCi/g dry)	^{238}U (pCi/g dry)
Regional Background Stations:			
Embudo	0.55 (0.04)	0.033 (0.005)	0.59 (0.04)
Cochiti	0.55 (0.04)	0.057 (0.007)	0.59 (0.04)
Jemez	0.76 (0.06)	0.077 (0.009)	0.84 (0.06)
Mean (std dev)	0.62 (0.12)	0.056 (0.022)	0.68 (0.14)
RSRL[c]	0.85	0.090	0.93
SAL[d]	63.0	17.0	93.0
Perimeter Stations:			
Otowi	1.15 (0.08)	0.083 (0.009)	1.12 (0.08)
TA-8 (GT Site)	0.78 (0.06)	0.053 (0.008)	0.90 (0.07)
Near TA-49 (BNP)	1.25 (0.09)	0.099 (0.011)	1.34 (0.10)
East Airport	0.98 (0.07)	0.067 (0.008)	1.06 (0.08)
West Airport	1.23 (0.09)	0.129 (0.013)	1.38 (0.10)
North Mesa	1.13 (0.08)	0.084 (0.009)	1.12 (0.08)
Sportsman's Club	1.12 (0.08)	0.101 (0.010)	1.26 (0.09)
Tsankawi/PM-1	2.25 (0.16)	0.188 (0.017)	2.32 (0.16)
White Rock (East)	0.77 (0.06)	0.086 (0.009)	0.77 (0.06)
San Ildefonso	0.70 (0.05)	0.047 (0.006)	0.71 (0.05)
Mean (std dev)	1.14 (0.44)*	0.094 (0.041)*	1.20 (0.45)*
On-Site Stations:			
TA-16 (S-Site)	1.64 (0.12)	0.152 (0.015)	1.87 (0.14)
TA-21 (DP-Site)	0.77 (0.06)	0.065 (0.008)	0.80 (0.06)
Near TA-33	1.13 (0.09)	0.053 (0.008)	1.12 (0.08)
TA-50	0.75 (0.06)	0.047 (0.006)	0.80 (0.06)
TA-51	1.10 (0.08)	0.056 (0.007)	1.12 (0.08)
West of TA-53	1.14 (0.08)	0.071 (0.008)	1.21 (0.09)
East of TA-53	1.00 (0.07)	0.048 (0.006)	1.01 (0.07)
East of TA-54	0.86 (0.06)	0.044 (0.006)	0.90 (0.07)
Potrillo Drive/TA-36	0.82 (0.06)	0.056 (0.007)	0.87 (0.06)
Near Test Well DT-9	0.95 (0.07)	0.052 (0.007)	1.00 (0.07)
R-Site Road East	1.38 (0.10)	0.086 (0.010)	1.66 (0.12)
Two-Mile Mesa	1.10 (0.08)	0.076 (0.009)	1.17 (0.09)
Mean (std dev)	1.05 (0.26)*	0.067 (0.030)	1.13 (0.33)*

[a] (±1 counting uncertainty);values are the uncertainty of the analytical results at the 65% confidence level.
[b] See Appendix B for an explanation of the presence of negative values.
[c] Regional Statistical Reference Level; this is the upper-limit background concentration (mean + 2 std dev) based on data from 1994 to 2001; isotopic U is from 2000 and 2001.
[d] Los Alamos National Laboratory Screening Action Level (ER 2001).
[e] Equivalent to the SAL of 880 pCi/g dry soil at 12% moisture.
[f] Means from perimeter and on-site stations within the same column followed by an * were statistically higher than regional background using a Student's t-test at the 0.05 probability level.

Table 6-2. Mean (±SD) Radionuclide Concentrations in Surface (0- to 2-inch depth) Soils Collected from Regional, Perimeter, and On-Site Locations Before (1999) and After (2000 and 2001) the Cerro Grande Fire[a]

Location Date	^{3}H (pCi/mL)	^{90}Sr (pCi/g dry)	^{137}Cs (pCi/g dry)	^{tot}U (µg/g dry)	^{238}Pu (pCi/g dry)	$^{239,240}Pu$ (pCi/g dry)	^{241}Am (pCi/g dry)	Alpha (pCi/g dry)	Beta (pCi/g dry)	Gamma (pCi/g dry)
Regional Background Stations[b]										
1999[c]	0.21	0.30	0.23	1.78	0.001	0.012	0.011	3.1	2.8	2.1
	(0.64)	(0.07)	(0.06)	(0.18)	(0.001)	(0.002)	(0.003)	(0.6)	(0.3)	(0.2)
2000[d]	0.03	0.34	0.31	1.57	0.002	0.011	0.014	4.1	3.2	2.5
	(0.45)	(0.09)	(0.05)	(0.16)	(0.001)	(0.002)	(0.004)	(1.3)	(1.0)	(0.2)
2001	0.38	0.24	0.24	1.77	0.003	0.014	0.005	3.9	4.4	7.7
	(0.40)	(0.14)	(0.04)	(0.13)	(0.001)	(0.003)	(0.002)	(0.5)	(0.4)	(0.6)
Perimeter Stations[e]										
1999	0.32	0.34	0.45	2.93	0.007	0.039	0.007	5.0	4.3	4.4
	(0.09)	(0.18)	(0.29)	(0.58)	(0.006)	(0.040)	(0.004)	(1.1)	(1.2)	(1.6)
2000	0.23	0.29	0.28	2.99	0.002	0.033	0.009	5.6	3.7	3.1
	(0.13)	(0.08)	(0.13)	(1.23)	(0.001)	(0.036)	(0.014)	(1.7)	(1.0)	(0.6)
2001	0.30	0.18	0.31	3.61	0.001	0.035	0.009	5.2	4.5	11.1
	(0.29)	(0.11)	(0.13)	(1.36)	(0.002)	(0.037)	(0.007)	(1.5)	(1.0)	(2.0)*
On-Site Stations (LANL)[f]										
1999	0.39	0.42	0.36	4.12	0.005	0.025	0.014	5.9	4.1	3.4
	(0.59)	(0.18)	(0.16)	(1.75)	(0.006)	(0.015)	(0.015)	(1.4)	(1.2)	(0.7)
2000	0.59	0.27	0.30	3.50	0.003	0.032	0.013	6.3	4.0	3.2
	(0.60)	(0.10)	(0.14)	(0.78)	(0.004)	(0.023)	(0.015)	(1.7)	(1.0)	(0.2)
2001	0.43	0.10	0.28	3.39	0.002	0.024	0.009	5.8	4.8	11.2
	(0.27)	(0.09)	(0.18)	(1.00)	(0.002)	(0.014)	(0.004)	(1.0)	(1.4)	(1.1)*

[a]Means from 2000 and 2001 within the same column and location followed by an * were significantly higher than 1999 using a Student's t-test at the 0.05 probability level.
[b]Represents Embudo only; this was the only regional background station out of three that was located predominantly downwind of the Cerro Grande fire (and LANL).
[c]Data from Fresquez and Gonzales (2000).
[d]Data from Fresquez et al. (2001c).
[e]Represents 10 perimeter stations; four located on north side, four on east side, one on west side, and one on southwest side of LANL.
[f]Represents 12 on-site (LANL) stations.
[g]Sample lost in analysis or not analyzed or outlier omitted. An outlier was omitted when the result was greater than three standard deviations of the mean (99% confidence level).

Table 6-3. Total Recoverable Trace Element Concentrations (µg/g dry) in Surface (0- to 2-inch depth) Soils Collected from Regional, Perimeter, and On-Site Locations during 2001[a]

Location	Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Regional Background Stations												
Embudo	1.0[b]	11,000	1.1	10.0	107	0.62	0.20[b]	5.3	15.2	10.1	11,700	0.005[b]
Cochiti	1.0[b]	8,600	1.6	7.0	114	0.48	0.20[b]	4.3	9.8	9.2	10,200	0.040
Jemez	1.0[b]	11,100	2.7	13.0	154	0.74	0.20[b]	7.9	22.7	10.7	15,300	0.020
Mean	1.0	10,233	1.8	10.0	125	0.61	0.20	5.8	15.9	10.0	12,400	0.020
(std dev)	(0.0)	(1,415)	(0.8)	(3.0)	(25)	(0.13)	(0.00)	(1.9)	(6.5)	(0.8)	(2,621)	(0.020)
RSRL[c]	<2.0	36,600	6.1	16.7	194	0.73	<0.40	6.7	14.7	11.0	21,800	0.040
SAL[d]	390.0	76,000	6.1	5,500.0	5,400	150.00	39.00	3,400.0	210.0	2,900.0	23,000	23.000
Perimeter Stations												
Otowi	1.0[b]	5,100	0.5	5.0	72	0.48	0.20[b]	3.3	9.4	6.6	7,500	0.005[b]
TA-8 (GT Site)	1.0[b]	6,570	1.7	7.0	98	0.46	0.20[b]	3.8	10.1	6.7	7,840	0.020
TA-49 (BNP)	1.0[b]	10,800	2.3	6.0	153	0.87	0.20[b]	6.8	12.9	10.1	11,300	0.005[b]
East Airport	1.0[b]	9,380	2.3	6.0	88	0.74	0.20[b]	5.0	12.3	7.4	9,610	0.010
West Airport	1.0[b]	8,950	2.7	5.0	130	0.77	0.20[b]	6.5	12.3	9.6	10,600	0.010
North Mesa	1.0[b]	7,830	1.9	4.0	60	0.62	0.20[b]	4.4	11.2	10.0	8,830	0.050
Sportsman's Club	1.0[b]	13,100	2.0	3.0	185	0.91	0.20[b]	3.1	9.2	9.2	7,720	0.005[b]
Tsankawi/PM-1	1.0[b]	5,760	0.3[b]	4.0	35	0.82	0.20[b]	1.7	6.5	7.3	5,580	0.005[b]
White Rock (East)	1.0[b]	11,400	2.1	5.0	129	1.08	0.20[b]	4.5	11.3	11.7	9,980	0.005[b]
San Ildefonso	1.0[b]	6,870	1.2	4.0	67	0.70	0.20[b]	4.6	10.4	12.1	8,580	0.005[b]
Mean	1.0	8,576	1.7	4.9	102	0.75	0.20	4.4	10.6	9.1	8,754	0.010
(std dev)	(0.0)	(2,618)	(0.8)	(1.2)	(47)	(0.19)	(0.00)	(1.5)	(1.9)	(2.0)	(1,690)	(0.010)

Table 6-3. Total Recoverable Trace Element Concentrations (µg/g dry) in Surface (0- to 2-inch depth) Soils Collected from Regional, Perimeter, and On-Site Locations during 2001[a] (Cont.)

Location	Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
On-Site Stations												
TA-16 (S-Site)	1.0[b]	9,380	1.8	4.0	120	0.81	0.20[b]	6.5	13.6	9.7	11,300	0.040
TA-21 (DP-Site)	1.0[b]	12,800	1.8	9.0	121	0.95	0.20[b]	4.6	14.1	10.1	11,900	0.005[b]
Near TA-33	1.0[b]	6,920	1.3	4.0	60	0.65	0.20[b]	2.9	8.7	7.7	8,470	0.005[b]
TA-50	1.0[b]	10,600	1.5	5.0	101	0.72	0.20[b]	6.6	15.0	11.3	11,300	0.005[b]
TA-51	1.0[b]	15,700	1.6	7.0	142	0.84	0.20[b]	6.2	16.5	9.6	11,800	0.005[b]
West of TA-53	1.0[b]	12,700	2.2	3.0	183	0.91	0.20[b]	3.2	9.1	10.6	7,600	0.005[b]
East of TA-53	1.0[b]	13,500	1.9	6.0	120	0.80	0.20[b]	6.1	17.4	8.2	12,400	0.005[b]
East of TA-54	1.0[b]	10,000	2.1	4.0	114	0.76	0.20[b]	4.5	11.3	8.8	9,680	0.020
Potrillo Drive/TA-36	1.0[b]	9,160	1.1	4.0	126	0.77	0.20[b]	4.6	11.5	7.3	8,670	0.005[b]
Near Test Well DT-9	1.0[b]	15,300	3.2	7.0	186	1.09	0.20[b]	9.9	20.1	13.9	15,700	0.070
R-Site Road	1.0[b]	22,800	2.6	12.0	200	1.33	0.20[b]	9.4	22.5	16.8	15,900	0.010
Two-Mile Mesa	1.0[b]	15,800	2.9	8.0	135	0.89	0.20[b]	7.8	20.6	13.4	12,400	0.010
Mean	1.0	12,888	2.0	6.1	134	0.88*[e]	0.20	6.0	15.0	10.6	11,427	0.020
(std dev)	(0.0)	(4,224)	(0.6)	(2.6)	(39)	(0.18)	(0.00)	(2.2)	(4.5)	(2.8)	(2,604)	(0.020)

Table 6-3. Total Recoverable Trace Element Concentrations (µg/g dry) in Surface (0- to 2-inch depth) Soils Collected from Regional, Perimeter, and On-Site Locations during 2001[a] (Cont.)

Location	Mn	Mo	Ni	Pb	Sb	Se	Sn	Ti	Tl	V	Zn	CN
Regional Background Stations												
Embudo	290	1.0	9.0	7.8	0.20[b]	0.20[b]	0.50[b]	240	0.20[b]	22.1	32	0.06
Cochiti	311	1.0	6.0	7.6	0.20[b]	0.20[b]	0.50[b]	60	0.20[b]	19.0	30	0.01[b]
Jemez	639	1.0	15.0	9.3	0.20[b]	1.10	0.50[b]	62	0.20[b]	26.6	67	0.01[b]
Mean	413	1.0	10.0	8.2	0.20	0.50	0.50	121	0.20	22.6	43	0.03
(std dev)	(196)	(0.0)	(4.6)	(0.9)	(0.00)	(0.50)	(0.00)	(103)	(0.00)	(3.8)	(21)	(0.03)
RSRL[e]	421	0.8	10.5	14.0	<0.40	0.60	15.90	201	<0.40	40.1	49	0.50
SAL[f]	3,200	390.0	1,600.0	400.0	31.00	390.00	47,000.00	NA	5.50	550.0	23,000	1,200.0
Perimeter Stations												
Otowi	226	1.0	6.0	8.3	0.20[b]	0.20[b]	0.50[b]	176	0.20[b]	14.3	25	0.01[b]
TA-8 (GT Site)	412	1.0	5.0	15.0	0.20[b]	0.20[b]	0.50[b]	237	0.20[b]	13.5	30	0.01[b]
TA-49 (BNP)	455	1.0	8.0	14.5	0.20[b]	0.20[b]	0.50[b]	214	0.20[b]	21.0	28	0.01[b]
East Airport	334	1.0	7.0	13.0	0.20[b]	0.20[b]	0.50[b]	161	0.20[b]	17.5	26	0.01[b]
West Airport	465	1.0	8.0	16.6	0.20[b]	0.20[b]	0.50[b]	104	0.20[b]	20.1	34	0.01[b]
North Mesa	316	1.0	5.0	9.4	0.20[b]	0.20[b]	1.00	239	0.20[b]	15.7	29	0.01[b]
Sportsman's Club	197	0.0	6.0	9.7	0.20[b]	0.20[b]	0.50[b]	132	0.20[b]	10.2	19	0.01[b]
Tsankawi/PM-1	236	1.0	4.0	10.3	0.20[b]	0.20[b]	1.00	101	0.20[b]	6.2	29	0.01[b]
White Rock (East)	324	1.0	8.0	11.6	0.20[b]	0.20[b]	1.00	39	0.20[b]	14.0	35	0.01[b]
San Ildefonso	345	1.0	6.0	7.9	0.20[b]	0.20[b]	1.00	112	0.20[b]	14.2	27	0.01[b]
Mean	331	0.9	6.3	11.6*	0.20	0.20	0.70	152	0.20	14.7	28	0.01
(std dev)	(93)	(0.3)	(1.4)	(3.0)	(0.00)	(0.00)	(0.30)	(66)	(0.00)	(4.4)	(5)	(0.00)

Table 6-3. Total Recoverable Trace Element Concentrations (µg/g dry) in Surface (0- to 2-inch depth) Soils Collected from Regional, Perimeter, and On-Site Locations during 2001[a] (Cont.)

Location	Mn	Mo	Ni	Pb	Sb	Se	Sn	Ti	Tl	V	Zn	CN
On-Site Stations:												
TA-16 (S-Site)	451	1.0	8.0	9.8	0.20[b]	0.20[b]	0.50[b]	143	0.20[b]	21.1	27	0.01[b]
TA-21 (DP-Site)	397	1.0	7.0	19.5	0.20[b]	0.20[b]	0.50[b]	215	0.20[b]	17.9	45	0.01[b]
Near TA-33	340	1.0	4.0	10.3	0.20[b]	0.20[b]	0.50[b]	170	0.20[b]	10.7	41	0.01[b]
TA-50	401	1.0	8.0	9.3	0.20[b]	0.20[b]	0.50[b]	269	0.20[b]	24.0	28	0.01[b]
TA-51	341	1.0	8.0	9.4	0.20[b]	0.20[b]	0.50[b]	378	0.20[b]	23.8	26	0.01[b]
West of TA-53	196	0.0	6.0	12.1	0.20[b]	0.20[b]	0.50[b]	125	0.20[b]	10.4	18	0.01[b]
East of TA-53	319	1.0	8.0	10.4	0.20[b]	0.20[b]	0.50[b]	273	0.20[b]	24.3	32	0.01[b]
East of TA-54	301	1.0	7.0	8.9	0.20[b]	0.20[b]	0.50[b]	122	0.20[b]	15.7	38	0.01[b]
Potrillo Drive/TA-36	238	1.0	8.0	7.0	0.20[b]	0.20[b]	0.50[b]	80	0.20[b]	12.5	22	0.01[b]
Near Test Well DT-9	677	1.0	12.0	13.2	0.20[b]	0.20[b]	0.50[b]	372	0.20[b]	31.3	37	0.01[b]
R-Site Road	697	1.0	11.0	10.8	0.20[b]	0.20[b]	0.50[b]	502	0.20[b]	36.2	38	0.01[b]
Two-Mile Mesa	561	1.0	9.0	11.5	0.20[b]	0.20[b]	0.50[b]	372	0.20[b]	32.2	25	0.01[b]
Mean	410	0.9	8.0	11.0*	0.20	0.20	0.50	252	0.20	21.7	32	0.01
(std dev)	(161)	(0.3)	(2.1)	(3.1)	(0.00)	(0.00)	(0.00)	(132)	(0.00)	(8.6)	(8)	(0.00)

[a]Trace elements were digested using EPA method 3051 and analyzed using EPA method 6020 (Sb, Tl, Pb), 7000A (As, Se), 7471A (Hg), and 6010B (all others).

[b]All less-than values were converted to one-half the concentration.

[c]Regional Statistical Reference Level; this is the upper-limit background concentration (mean + 2 std dev) based on data from 1992 to 1999 (Fresquez and Gonzales 2000; Fresquez et al., 2001a).

[d]Los Alamos National Laboratory Screening Action Level (EPA 2000a).

[e]Means from perimeter and on-site stations within the same column followed by an * were statistically higher than regional background using a Student's t-test at the 0.05 probability level.

Table 6-4. Mean (±SD) Total Recoverable Trace Element Concentrations (µg/g dry) in Surface (0- to 2-inch depth) Soils Collected from Regional, Perimeter, and On-Site Locations Before (1999) and After (2000 and 2001) the Cerro Grande Fire[a]

Location/Date	Ag	Al	As	Ba	Be	Cd	Co	Cr	Cu	Fe
Regional Background Stations[b]										
1999[c]	1.0	2.9	1.0	87	0.62	0.20	4.3	12.0	5.7	1.4
2000[d]	1.0	0.6	1.1	79	0.41	0.20	3.7	7.0	3.7	0.8
2001	1.0	1.1	1.1	107	0.62	0.20	5.3	15.2	10.1	1.2
Perimeter Stations[e]										
1999	1.0	3.3	1.9	91	0.84	0.23	4.7	8.1	5.9	1.2
	(0.00)	(0.09)	(0.8)	(29)	(0.25)	(0.09)	(1.7)	(3.2)	(1.5)	(0.23)
2000	1.0	0.9	2.1	106	0.85	0.20	6.1	8.6	5.5	1.0
	(0.00)	(0.02)	(0.7)	(35)	(0.22)	(0.00)	(3.1)	(1.9)	(1.0)	(0.02)
2001	1.0	0.86	1.7	102	0.75	0.20	4.4	10.6*	9.1*	0.88
	(0.00)	(0.26)	(0.8)	(47)	(0.19)	(0.00)	(1.5)	(1.9)	(2.0)	(0.17)
On-Site Stations (LANL)[f]										
1999	1.0	3.4	2.4	109	0.87	0.23	5.2	7.7	6.0	1.3
	(0.0)	(0.46)	(0.7)	(29)	(0.16)	(0.09)	(1.4)	(2.5)	(1.8)	(0.25)
2000	1.0	1.1	2.3	109	0.82	0.23	5.5	8.9	4.6	1.1
	(0.0)	(0.04)	(1.0)	(34)	(0.16)	(0.10)	(1.9)	(3.9)	(1.7)	(0.03)
2001	1.0	1.3	2.0	134	0.88	0.20	6.0	15.0*	10.6*	1.1
	(0.0)	(0.42)	(0.6)	(39)	(0.18)	(0.00)	(2.2)	(4.5)	(2.8)	(0.26)

Table 6-4. Mean (±SD) Total Recoverable Trace Element Concentrations (µg/g dry) in Surface (0- to 2-inch depth) Soils Collected from Regional, Perimeter, and On-Site Locations Before (1999) and After (2000 and 2001) the Cerro Grande Fire[a] (Cont.)

Location/Date	Hg	Mn	Ni	Pb	Sb	Se	Tl	V	Zn	CN
Regional Background Stations[c]										
1999	0.01	229	6.4	12	0.10	0.20	0.10	20	26	
2000	0.01	190	5.1	7	0.10	0.40	0.10	12	23	0.20
2001	0.01	290	9.0	8	0.20	0.20	0.20	22	32	0.06
Perimeter Stations[e]										
1999	0.02	382	4.8	20	0.10	0.20	0.20	15	33	
	(0.01)	(135)	(2.2)	(7.8)	(0.07)	(0.00)	(0.08)	(6.7)	(8.4)	
2000c	0.01	443	7.3*	17	0.10	0.50	0.20	16	40	0.50
	(0.01)	(280)	(2.6)	(4.0)	(0.00)	(0.10)	(0.10)	(4.5)	(12.2)	(0.50)
2001	0.01	331	6.3	12	0.20	0.20	0.20	15	28	0.01
	(0.01)	(93)	(1.4)	(3.0)	(0.00)	(0.00)	(0.00)	(4.4)	(5.0)	(0.00)
On-Site Stations (LANL)[f]										
1999	0.05	349	5.2	14	0.20	0.20	0.20	21	34	
	(0.13)	(129)	(1.7)	(2.8)	(0.00)	(0.00)	(0.06)	(4.5)	(7.4)	
2000	0.02	347	6.3	15	0.10	0.50	0.30	16	32	0.30
	(0.01)	(111)	(2.4)	(5.0)	(0.00)	(0.20)	(0.20)	(7.1)	(6.5)	(0.20)
2001	0.02	410	8.0*	11	0.20	0.20	0.20	22	32	0.01
	(0.02)	(161)	(2.1)	(3.1)	(0.00)	(0.00)	(0.00)	(8.6)	(8.0)	(0.00)

[a]All trace elements, with the exception of Al and Fe, are reported on a ppm basis. Al and Fe are reported on a percent basis.
[b]Represents Embudo only; this was the only regional station out of three that was located predominantly downwind of the Cerro Grande fire (and LANL).
[c]Fresquez and Gonzales (2000).
[d]Data from Fresquez et al., (2001c).
[e]Represents 10 perimeter stations; four located on north side, four on east side, one on west side, and one on southwest side of LANL.
[f]Represents 12 on-site (LANL) stations.
[g]Means from 2000 and 2001 within the same column and respective station followed by an * were statistically higher than 1999 (before the Cerro Grande fire) using a Student's t-test at the 0.05 probability level.

Table 6-5. Mean Radionuclide Concentrations (Total Propagated Analytical Uncertainty, 99% Confidence Level) in Soils (Dry Weight) Collected from Area G in 2001[a]. [Bold values are equal to or greater than both the total propagated analytical uncertainty and regional statistical reference level (RSRL) values.]

Sample Locations	Radionuclide						
	^{3}H (pCi/mL)[b]	^{241}Am (pCi/g)	^{137}Cs (pCi/g)	^{238}Pu (pCi/g)	$^{239,240}Pu$ (pCi/g)	^{90}Sr (pCi/g)	^{tot}U (µg/g)
1	411.0 (78.0)	0.0053 (0.0129)	0.188 (0.149)	0.000 (0.005)	0.008 (0.011)	–0.04 (0.29)	3.05 (0.72)
2	616.0 (117)	0.013 (0.020)	0.26 (0.15)	0.011 (0.014)	0.022 (0.020)	0.04 (0.26)	3.14 (0.72)
3	2.83 (1.10)	0.028 (0.023)	0.17 (0.17)	0.008 (0.014)	0.040 (0.021)	–0.06 (0.30)	3.02 (0.68)
3b	2.82 (1.10)	0.0076 (0.0123)	0.44 (0.17)	0.011 (0.015)	0.014 (0.017)	0.32 (0.32)	3.05 (0.68)
4	6.0 (3.6)	0.079 (0.044)	0.28 (0.17)	0.189 (0.068)	0.262 (0.084)	0.12 (0.30)	3.57 (0.81)
6b	2.8 (2.3)	0.174 (0.071)	0.345 (0.134)	0.032 (0.101)	0.790 (0.200)	0.03 (0.27)	2.78 (0.63)
7a	18.0 (4.2)	0.0033 (0.0126)	0.003 (0.066)	0.029 (0.021)	0.004 (0.009)	0.11 (0.29)	2.94 (0.68)
7b	6.0 (1.5)	0.019 (0.018)	0.071 (0.080)	0.006 (0.009)	0.100 (0.041)	0.09 (0.29)	2.76 (0.63)
7c	7.5 (3.0)	0.179 (0.065)	0.47 (0.21)	0.126 (0.053)	1.90 (0.44)	0.03 (0.30)	3.18 (0.72)
8	0.54 (0.89)	0.0056 (0.0144)	0.23 (0.15)	0.003 (0.011)	0.017 (0.015)	0.12 (0.35)	2.96 (0.68)
G-29-03	1,450 (270)	0.019 (0.021)	0.256 (0.144)	0.024 (0.023)	0.025 (0.023)	0.06 (0.27)	3.32 (0.77)
G-31-01	910 (180)	0.028 (0.026)	0.54 (0.21)	0.009 (0.014)	0.027 (0.020)	0.09 (0.26)	3.14 (0.72)
G-41-02	10.2 (6.90)	0.105 (0.048)	0.48 (0.20)	2.13 (0.48)	0.479 (0.129)	0.15 (0.29)	3.84 (0.86)
G-43-01	20.9 (9.9)	0.065 (0.038)	0.29 (0.17)	0.187 (0.066)	0.314 (0.093)	0.15 (0.30)	2.90 (0.68)
G-48-02	19.0 (7.8)	0.390 (0.128)	0.26 (0.17)	0.214 (0.071)	2.850 (0.615)	0.12 (0.32)	3.18 (0.72)
G-58-01	NA[c]	0.0120 (0.0128)	0.70 (0.29)	0.008 (0.017)	0.032 (0.024)	0.16 (0.29)	3.11 (0.68)
BG (9)	0.31 (0.45)	0.0057 (0.0110)	0.43 (0.21)	–0.001 (0.011)	0.020 (0.017)	–0.02 (0.26)	3.15 (0.72)
RBG[d]	0.53 (0.36)	0.004 (0.002)	0.21 (0.07)	0.001 (0.002)	0.010 (0.004)	0.12 (0.10)	2.03 (0.43)
RSRL[e]	0.98	0.012	0.49	0.009	0.021	0.60	3.12
SAL[f]	6,400	39.0	5.30	49.0	44.0	5.7	100

[a]See Figure 6-2 for sample location points; samples without a G prefix collected at the 0- to 2-inch depth; samples with a G prefix collected at the 0- to 6-inch depth.
[b]Concentration for ^{3}H is based on soil moisture.
[c]NA means no analysis because of a lack of soil water in the sample.
[d]Regional background is the mean background concentration for samples from Embudo, Cochiti, and Jemez collected in 2001 (Table 6-1).
[e]Regional Statistical Reference Level; this is the upper- (95%) level background concentration (mean + 2 std dev) from 1994–2001 (Table 6-1); Isptopic U is from 2000 and 2001 (Table 6-1).
[f]Screening Action Level (ERP 2001).

Table 6-6. Radionuclide Concentrations (Total Propagated Analytical Uncertainty, 99% Confidence Level) in Surface Soil, and Sediment Collected around the DARHT Facility in 2001[a]. [Bold values are equal to or greater than both the total propagated analytical uncertainty and Baseline Statistical Reference Level (BSRL) values.]

	Sample Element Concentration (dry weight basis)						
Sample Locations	**^{3}H (pCi/mL)[b]**	**^{90}Sr (pCi/g)**	**^{tot}U (µg/g)**	**^{137}Cs (pCi/g)**	**^{238}Pu (pCi/g)**	**^{239,240}Pu (pCi/g)**	**^{241}Am (pCi/g)**
Soil							
North	0.24 (0.39)	0.04 (0.30)	5.68 (1.35)	0.13 (0.09)	0.001 (0.006)	0.006 (0.009)	0.002 (0.009)
East	0.31 (0.39)	0.13 (0.29)	7.80 (2.07)	0.39 (0.15)	0.003 (0.008)	0.014 (0.014)	0.011 (0.015)
South	0.20 (0.23)	0.23 (0.30)	8.19 (1.94)	0.36 (0.21)	0.004 (0.014)	0.008 (0.017)	0.001 (0.008)
West	0.24 (0.38)	0.10 (0.32)	4.46 (1.26)	0.16 (0.15)	0.006 (0.015)	–0.000 (0.009)	0.007 (0.012)
Mean (SD)	0.25 (0.05)	0.13 (0.08)	6.53 (1.77)	0.26 (0.13)	0.004 (0.002)	0.007 (0.006)	0.005 (0.005)
Sediment							
North	0.11 (0.39)	–0.03 (0.32)	5.71 (1.49)	0.09 (0.08)	–0.001 (0.005)	0.009 (0.011)	–0.004 (0.011)
East	1.07 (1.41)	0.22 (0.32)	18.47 (4.49)	1.18 (0.39)	0.003 (0.008)	0.042 (0.024)	0.010 (0.015)
South	2.90 (5.70)	–0.01 (0.30)	3.16 (0.95)	0.04 (0.08)	0.001 (0.006)	0.002 (0.006)	0.008 (0.015)
Southwest	0.51 (0.63)	0.01 (0.29)	3.79 (0.95)	0.04 (0.09)	0.002 (0.006)	0.002 (0.006)	0.003 (0.008)
Mean (SD)	1.15 (1.23)	0.05 (0.12)	7.78 (7.21)	0.34 (0.56)	0.001 (0.002)	0.014 (0.019)	0.004 (0.006)
RBG[c]	0.53 (0.36)	0.12 (0.10)	2.03 (0.43)	0.21 (0.07)	0.001 (0.002)	0.010 (0.004)	0.004 (0.002)
Soil BSRL[d]	0.53	0.34	6.5	0.27	0.003	0.017	0.008
Sediment BSRL[d]	0.90	0.26	9.99	0.51	0.005	0.026	0.015
LANL SAL[e]	6,400	5.7	100	5.30	49.0	44.0	39.0

[a]See Figure 6-3 for locations of sampling sites.
[b]Concentration for ^{3}H is based on soil moisture: a value of 6400 is equivalent to a SAL value of 880 pCi/g ^{3}H for a soil at a water content of 12%.
[c]Regional background is the mean background concentration for samples from Embudo, Cochiti, and Jemez collected in 2001 (Table 6-1).
[d]Baseline Statistical Reference Level (Fresquez et al., 2001b).
[e]Screening Action Level (ERP 2001).

Table 6-7. Trace Element Concentrations (µg/g dry) in Surface Soils and Sediments Collected Around the DARHT Facility in 2001[a]

Location	Ag	As	Ba	Be	Cd	Cr	Cu	Hg	Ni	Pb	Sb	Se	Tl
Soil													
North	1.0[b]	1.70	124.0	0.80	0.20[b]	8.2	7.0	0.015	7.0	11.6	0.2[b]	0.4	0.2[b]
East	1.0[b]	1.80	87.0	0.60	0.20[b]	6.3	7.0	0.015	6.0	12.7	0.2[b]	0.2[b]	0.2[b]
South	1.0[b]	1.00	114.0	0.80	0.20[b]	7.5	5.0	0.028	6.0	11.0	0.2[b]	0.4	0.2[b]
West	1.0[b]	1.60	122.0	0.80	0.20[b]	8.4	6.0	0.015	7.0	10.4	0.2[b]	0.5	0.2[b]
Mean	1.0	1.53	111.8	0.75	0.20	7.6	6.3	0.018	6.5	11.4	0.02	0.4	0.2
(SD)	(0.0)	(0.4)	(17.1)	(0.1)	(0.00)	(0.9)	(0.9)	(0.007)	(0.6)	(0.9)	(0.0)	(0.1)	(0.0)
Sediment													
North	25.0	1.4	73.7	0.40	0.20[b]	5.1	5.0	0.011	5.0	8.2	0.2[b]	0.2[b]	0.2[b]
East	1.0[b]	1.1	64.3	0.30	0.20[b]	3.5	7.0	0.015	3.0	12.9	0.2[b]	0.2[b]	0.2[b]
South	1.0[b]	0.6	68.0	0.50	0.20[b]	3.8	4.0	0.005[b]	4.0	7.2	0.2[b]	0.2[b]	0.2[b]
Southwest	30.0	1.7	113.0	0.70	0.20[b]	8.9	13.3	0.011	7.0	8.9	0.2[b]	0.2[b]	0.2[b]
Mean	14.3	1.2	79.8	0.48	0.20	5.3	7.3	0.01	4.8	9.3	0.2	0.2	0.2
(SD)	(15.4)	(0.5)	(22.5)	(0.17)	(0.0)	(2.5)	(4.2)	(0.004)	(1.7)	(2.5)	(0.0)	(0.0)	(0.0)
RBG[c] (SD)	1.0	1.8	125	0.61	0.20	15.9	10.0	0.02	10.0	8.2	0.20	0.50	0.20
	(0.0)	(0.8)	(25)	(0.13)	(0.00)	(6.5)	(0.8)	(0.02)	(4.6)	(0.9)	(0.0)	(0.5)	(0.0)
Soil BSRL[d]	1.62	3.16	147	1.08	0.52	14.4	7.02	0.04	9.62	13.5	0.40	0.55	0.40
Sediment BSRL[d]	1.56	3.48	161	1.19	0.55	12.0	7.90	0.04	9.45	15.4	0.38	0.43	0.30
LANL SAL[e]	390	6.1	5,400	150	39.0	210	2,900	23.0	1,600	400	31.0	390	5.5

[a]See Figure 6-3 for locations of sampling sites.
[b]Less than values are reported as one-half the detection limit.
[c]Regional background is the mean background concentration (±SD) for samples from Embudo, Cochiti, Jemez, and Bandelier collected in 2001 (Table 6-3).
[d]Baseline Statistical Reference Level (Fresquez et al., 2001b).
[e]Screening Action Level (EPA 2000).

Table 6-8. Plutonium Concentrations in Surface Soils Collected Around the Plutonium Processing Facility (TA-55) in Current and Past Years

Year/Location	^{238}Pu (pCi/g dry)		^{239}Pu (pCi/g dry)	
1984[a]				
North	0.0000	(0.0005)[f]	0.009	(0.002)
	0.0041	(0.0018)	0.008	(0.002)
	0.0474	(0.0051)	0.049	(0.005)
	0.0094	(0.0029)	0.101	(0.009)
Northwest	0.0008	(0.0013)	0.013	(0.003)
Northeast	0.0035	(0.0020)	0.155	(0.011)
Mean (±std dev)	0.0109	(0.0182)	0.056	(0.060)
1990[b]				
North	0.0043	(0.0010)	0.036	(0.003)
Northeast	0.0117	(0.0017)	0.130	(0.007)
East	0.1270	(0.0067)	0.264	(0.012)
South	0.0002	(0.0004)	0.003	(0.001)
West	0.0087	(0.0015)	0.455	(0.017)
Mean (±std dev)	0.0304	(0.0542)	0.178	(0.185)
2001				
North	0.0108	(0.0053)	0.227	(0.037)
East	0.0011	(0.0032)	0.020	(0.007)
South	0.0014	(0.0027)	0.057	(0.012)
West	0.0029	(0.0027)	0.063	(0.013)
Mean (±std dev)	0.0041	(0.0046)	0.092	(0.092)
RBG[c]	0.0010	(0.0016)	0.010	(0.004)
RSRL[d]	0.0090		0.021	
SAL[e]	49.0		44.0	

[a]These soil samples were collected on July 16, 1984, as part of a preoperational survey.
[b]These soil samples were collected on October 23, 1990, as part of a preoperational survey.
[c]Regional Background from Table 6-1.
[d]Regional Statistical Reference Level from Table 6-1.
[e]Screening Action Level from Table 6-1.
[f](±1 counting uncertainity); values are the uncertainity of the analytical results at the 65% confidence level.

Table 6-9. Radionuclide Concentrations in Produce Collected from Regional, Perimeter, and On-Site Locations during the 2001 Growing Season[a]

Location	^{3}H (pCi/mL)		^{137}Cs (10^{-3} pCi/g dry)		^{90}Sr (10^{-3} pCi/g dry)		^{tot}U (ng/g dry)		^{238}Pu (10^{-5} pCi/g dry)		^{239}Pu (10^{-5} pCi/g dry)		^{241}Am (10^{-5} pCi/g dry)	
Regional Background Stations														
Chamita (C)/Chimayo (Ch)/Espanola Valley (EV)/Jemez (J)/Ojo Sarco (OS):														
Apricots (J/EV)	0.06	(0.16)[b]	18.04	(37.72)	7.71	(2.30)	4.43	(1.64)	21.32	(25.42)	0.00	(17.22)	11.48	(31.16)
Beets (OS)	–0.07	(0.16)[c]	–0.67	(15.75)	13.27	(1.54)	10.65	(2.08)	–4.02	(5.36)	–4.02	(5.36)	8.04	(12.06)
Broccoli Rabe (OS)	–0.10	(0.15)	–13.14	(32.12)	91.98	(8.76)	27.74	(3.80)	14.60	(14.60)	0.00	(13.87)	23.36	(21.17)
Cabbage (OS)	0.10	(0.16)	–31.62	(28.56)	17.14	(3.01)	1.43	(0.87)	–1.02	(17.85)	9.18	(10.71)	49.98	(24.48)
Cherries (Ch)	–0.02	(0.16)	–83.30	(31.36)	[d]		16.17	(3.09)	–29.40	(16.66)	3.92	(16.17)	68.60	(25.48)
Cucumbers (C)	–0.13	(0.15)	–14.63	(36.58)	40.70	(5.19)	6.52	(2.40)	–42.56	(53.87)	27.93	(27.93)	93.10	(33.92)
Cucumbers (OS)	–0.03	(0.15)	9.31	(23.94)	13.83	(2.39)	6.78	(2.06)	–25.27	(24.61)	33.25	(19.29)	5.32	(21.95)
Green Beans (EV)	0.00	(0.16)	–24.18	(19.50)	45.24	(4.29)	18.41	(2.07)	–3.12	(7.41)	–3.12	(7.41)	11.70	(16.38)
Plums (OS)	0.31	(0.16)	34.44	(29.52)	8.49	(1.85)	0.74	(0.68)	0.00	(17.22)	17.22	(12.30)	–9.84	(15.38)
Plums (OS)	0.24	(0.16)	–19.68	(27.06)	3.44	(1.66)	0.74	(0.80)	8.61	(12.92)	8.61	(12.92)	8.61	(11.07)
Pumpkin (OS)	–0.02	(0.15)	–19.20	(21.00)	8.04	(2.04)	3.84	(1.32)	13.20	(9.60)	–4.80	(7.20)	–48.00	(114.00)
Ruby Chard (OS)	0.00	(0.16)	–40.48	(42.32)	46.00	(4.88)	19.50	(3.40)	40.48	(38.64)	12.88	(22.08)	23.92	(19.32)
Squash (EV)	0.37	(0.16)	3.93	(37.34)	47.29	(4.78)	12.97	(2.49)	9.17	(11.12)	–5.24	(7.21)	–11.79	(27.51)
Mean (std dev)	0.05	(0.16)	–13.94	(29.43)	28.59	(26.24)	9.99	(8.46)	0.15	(22.32)	7.37	(12.56)	18.04	(36.21)
RSRL[e]	0.54		78.5		112.4		26.6		46.8		67.6		113.8	
Perimeter Stations														
Los Alamos:														
Apples	0.16	(0.14)	–7.56	(14.76)	32.40	(4.14)	1.19	(0.50)	8.64	(9.72)	15.84	(8.82)	6.48	(6.84)
Apricots	0.11	(0.14)	22.96	(27.06)	17.22	(2.71)	0.51	(0.76)	1.64	(20.50)	0.00	(17.22)	18.04	(29.52)
Cherries	0.07	(0.14)	–7.84	(16.17)	22.54	(2.40)	1.86	(0.78)	16.66	(20.58)	8.82	(16.66)	–1.96	(10.29)
Green Beans	0.15	(0.14)	–13.26	(14.82)	114.66	(10.53)	3.82	(0.94)	10.92	(9.36)	–6.24	(4.68)	21.84	(21.45)
Lettuce	–0.10	(0.14)	–42.50	(52.50)	167.50	(16.25)	72.25	(9.25)	35.00	(42.50)	32.50	(22.50)	–5.00	(37.50)
Peaches	0.20	(0.14)	3.04	(11.78)	10.72	(1.37)	1.75	(0.68)	–16.72	(9.88)	25.84	(19.00)	85.12	(37.62)
Plums	0.30	(0.15)	3.69	(20.30)	15.50	(2.15)	1.10	(0.92)	–13.53	(13.53)	–4.92	(12.92)	23.37	(17.22)
Squash	–0.04	(0.14)	13.10	(27.51)	158.51	(14.41)	2.88	(1.57)	5.24	(23.58)	22.27	(17.03)	–15.72	(12.45)
Squash	0.09	(0.14)	–17.03	(13.76)	30.00	(3.34)	1.57	(1.05)	–17.03	(12.45)	22.27	(14.41)	–6.55	(30.13)
Mean (std dev)	0.10	(0.12)	–5.04	(18.98)	63.23	(64.67)	9.66	(23.49)	3.42	(17.23)	12.93	(14.15)	13.96	(30.00)

Table 6-9. Radionuclide Concentrations in Produce Collected from Regional, Perimeter, and On-Site Locations during the 2001 Growing Season[a] (Cont.)

Location	^{3}H (pCi/mL)		^{137}Cs (10^{-3} pCi/g dry)		^{90}Sr (10^{-3} pCi/g dry)		^{tot}U (ng/g dry)		^{238}Pu (10^{-5} pCi/g dry)		^{239}Pu (10^{-5} pCi/g dry)		^{241}Am (10^{-5} pCi/g dry)	
Perimeter Stations (Cont.)														
White Rock (WR)/Pajarito Acres (PA):														
Apples (WR)	0.24	(0.16)	–5.04	(10.08)	5.47	(0.79)	0.18	(0.20)	1.08	(7.92)	–1.44	(4.50)	1.80	(5.04)
Apricots (WR)	0.18	(0.16)	–24.60	(37.72)	–0.66	(2.21)	1.80	(0.98)	4.92	(33.62)	–6.56	(18.86)	68.88	(45.92)
Cherries (WR)	0.11	(0.16)	–24.50	(21.56)	3.43	(1.27)	0.32	(0.33)	24.50	(21.07)	23.52	(16.66)	32.34	(24.01)
Cucumbers (WR)	0.10	(0.16)	–37.24	(40.57)	[d]		4.66	(2.46)	7.98	(23.94)	0.00	(15.30)	45.22	(25.27)
Green Beans (PA)	0.19	(0.16)	33.54	(20.28)	25.51	(2.57)	7.41	(1.72)	–7.02	(10.14)	–4.68	(6.63)	15.60	(12.87)
Lettuce (WR)	0.64	(0.17)	–270.00	(105.00)	322.50	(33.75)	52.75	(9.13)	65.00	(77.50)	15.00	(42.50)	52.50	(66.25)
Peaches (WR)	0.28	(0.16)	–15.96	(16.34)	1.60	(1.06)	0.076	(0.53)	6.08	(8.74)	17.48	(12.16)	5.32	(14.44)
Rhubarb (PA)	0.16	(0.16)	–1.56	(18.33)	77.22	(7.41)	2.50	(0.70	14.04	(17.16)	–1.56	(10.53)	0.00	(9.36)
Squash (WR)	0.47	(0.17)	–13.10	(36.03)	30.00	(3.47)	2.10	(1.44)	–23.58	(28.82)	–13.10	(17.69)	–9.17	(26.86)
Mean (std dev)	0.26	(0.18)*	–39.83	(88.60)	58.13	(109.89)	7.98	(16.96)	10.33	(24.48)	3.18	(12.42)	23.61	(27.23)
Cochiti (C)/Peña Blanca (PB)/ Sile (S):														
Apricots (PB)	–0.14	(0.15)	9.84	(28.70)	7.05	(2.30)	5.25	(1.64)	–8.20	(12.30)	–11.48	(8.20)	44.28	(30.34)
Bell Peppers (S)	0.68	(0.17)	–40.88	(21.17)	[d]		4.23	(1.31)	–8.76	(17.89)	12.41	(14.60)	23.36	(13.14)
Cherries (C/PB)	–0.15	(0.15)	–8.82	(19.60)	4.80	(1.47)	4.61	(1.23)	3.92	(10.29)	4.90	(5.39)	–21.56	(36.75)
Lettuce (S)	0.24	(0.16)	–42.50	(50.00)	59.75	(6.63)	180.00	(16.25)	–20.00	(27.50)	0.00	(13.75)	100.00	(57.50)
Tomatos (S)	0.14	(0.16)	–29.00	(22.00)	[d]	8.10	(1.80)	–1.00	(11.00)	18.00	(10.50)	3.00	(12.00)	
Mean (std dev)	0.15	(0.34)	–22.27	(22.43)	23.87	(31.10)	40.44	(78.03)	–6.81	(9.06)	4.77	(11.40)	29.82	(46.19)
San Ildefonso (SI)/El Rancho (ER):														
Apples (SI)	0.03	(0.14)	–15.48	(6.66)	28.44	(2.88)	10.37	(1.48)	–1.44	(4.86)	18.00	(8.64)	1.80	(5.94)
Apricots (ER)	–0.03	(0.14)	–18.04	(38.54)	4.76	(1.97)	2.95	(1.23)	18.04	(18.86)	–11.48	(17.22)	11.48	(32.80)
Cherries (ER)	–0.01	(0.14)	8.82	(32.34)	47.04	(5.39)	26.75	(3.87)	–20.58	(15.19)	15.68	(11.27)	27.44	(15.68)
Corn (SI)	–0.01	(0.14)	–9.60	(14.72)	5.82	(1.09)	1.79	(0.54)	0.64	(7.68)	–1.92	(6.40)	0.00	(8.00)
Squash (SI)	–0.10	(0.14)	5.24	(34.72)	17.55	(2.36)	2.36	(1.24)	0.00	(13.76)	–3.93	(13.76)	51.09	(33.41)
Mean (std dev)	0.02	(0.05)	–5.81	(12.18)	20.72	(17.60)	8.84	(10.60)	–0.67	(13.69)	3.27	(12.92)	18.36	(21.29)

Table 6-9. Radionuclide Concentrations in Produce Collected from Regional, Perimeter, and On-Site Locations during the 2001 Growing Season[a] (Cont.)

Location	^{3}H (pCi/mL)		^{137}Cs (10^{-3} pCi/g dry)		^{90}Sr (10^{-3} pCi/g dry)		^{tot}U (ng/g dry)		^{238}Pu (10^{-5} pCi/g dry)		^{239}Pu (10^{-5} pCi/g dry)		^{241}Am (10^{-5} pCi/g dry)	
On-Site Stations														
LANL (Mesa):														
Apples (TA-21)	1.93	(0.22)	–9.36	(14.22)	[d]		0.40	(0.27)	–16.56	(7.74)	–6.48	(5.94)	0.72	(6.84)
Apples (TA-52)	0.40	(0.16)	–17.28	(9.54)	[d]		1.15	(0.56)	–10.08	(7.38)	9.36	(7.38)	–1.08	(7.56)
Apricots (TA-21)	0.24	(0.16)	31.16	(39.36)	43.62	(4.59)	4.26	(1.39)	1.64	(9.02)	–5.41	(8.12)	–41.00	(18.04)
Apricots (TA-35)	0.47	(0.17)	–29.52	(37.72)	18.37	(2.79)	1.31	(0.82)	–21.32	(12.30)	32.80	(20.50)	93.48	(36.08)
Nectarines (TA-3)	0.10	(0.16)	17.16	(17.55)	2.81	(1.05)	1.01	(0.51)	9.36	(10.92)	–5.46	(3.90)	–23.40	(10.14)
Peaches (TA-21)	3.07	(0.28)	–6.08	(16.34)	6.38	(1.10)	2.96	(0.76)	–6.08	(7.98)	12.16	(7.98)	17.48	(10.26)
Peaches (TA-3)	0.11	(0.16)	5.32	(14.82)	1.52	(1.06)	–0.038	(0.26)	25.84	(12.16)	3.80	(3.80)	4.56	(9.12)
Peaches (TA-53)	0.56	(0.17)	21.28	(17.10)	7.45	(1.33)	0.99	(0.46)	–9.88	(7.22)	–3.04	(4.18)	1.52	(11.40)
Mean (std dev)	0.86	(1.07)*	1.59	(20.77)	13.36	(15.97)	1.51	(1.41)	–3.39	(15.27)	4.72	(13.41)	6.54	(39.56)

Table 6-9. Radionuclide Concentrations in Produce Collected from Regional, Perimeter, and On-Site Locations during the 2001 Growing Season[a] (Cont.)

Location	^{234}U (10^{-3} pCi/g dry)		^{235}U (10^{-4} pCi/g dry)		^{238}U (10^{-3} pCi/g dry)	
Regional Background Stations						
Chamita (C)/Chimayo (Ch)/Espanola Valley (EV)/Jemez (J)/Ojo Sarco (OS):						
Apricots (J/EV)	1.67	(0.59)	3.28	(2.21)	1.43	(0.53)
Beets (OS)	2.21	(0.40)	–1.61	(0.74)	1.81	(0.34)
Broccoli Rabe (OS)	18.83	(1.97)	20.73	(5.33)	9.05	(1.17)
Cabbage (OS)	1.22	(0.38)	0.71	(1.53)	0.48	(0.26)
Cherries (Ch)	4.70	(0.93)	3.72	(2.79)	5.39	(0.98)
Cucumbers (C)	2.13	(0.86)	5.19	(5.59)	2.13	(0.73)
Cucumbers (OS)	3.86	(1.00)	1.73	(4.06)	2.25	(0.63)
Green Beans (EV)	9.83	(0.94)	3.28	(1.21)	6.16	(0.66)
Plums (OS)	0.07	(0.25)	–1.48	(1.85)	0.26	(0.20)
Plums (OS)	0.14	(0.26)	–0.74	(1.35)	0.26	(0.25)
Pumpkin (OS)	0.82	(0.39)	1.20	(2.04)	1.27	(0.41)
Ruby Chard (OS)	10.67	(1.47)	9.57	(4.05)	6.44	(1.10)
Squash (EV)	6.29	(0.92)	1.05	(3.41)	4.32	(0.79)
Mean (std dev)	4.80	(5.45)	3.59	(5.97)	3.17	(2.81)
RSRL[e]	13.5		11.7		8.7	
Perimeter Stations						
Los Alamos:						
Apples	0.43	(0.20)	–1.30	(0.88)	0.42	(0.15)
Apricots	1.66	(0.51)	4.59	(3.36)	0.10	(0.21)
Cherries	1.11	(0.30)	0.29	(1.72)	0.62	(0.23)
Green Beans	2.73	(0.47)	0.78	(1.25)	1.28	(0.30)
Lettuce	24.00	(3.00)	17.50	(7.75)	24.00	(3.00)
Peaches	0.73	(0.32)	0.25	(1.72)	0.37	(0.27)
Plums	0.95	(0.28)	–1.37	(1.14)	0.62	(0.21)
Squash	1.59	(0.54)	6.55	(3.47)	0.88	(0.47)
Squash	1.32	(0.43)	3.80	(2.82)	0.48	(0.30)
Mean (std dev)	3.84	(7.59)	3.45	(5.93)	3.20	(7.81)

Table 6-9. Radionuclide Concentrations in Produce Collected from Regional, Perimeter, and On-Site Locations during the 2001 Growing Season[a] Cont.)

Location	^{234}U (10^{-3} pCi/g dry)		^{235}U (10^{-4} pCi/g dry)		^{238}U (10^{-3} pCi/g dry)	
Perimeter Stations (Cont.)						
White Rock (WR)/Pajarito Acres (PA):						
Apples (WR)	0.23	(0.09)	0.76	(0.72)	0.05	(0.06)
Apricots (WR)	1.26	(0.45)	2.79	(2.13)	0.57	(0.30)
Cherries (WR)	0.26	(0.17)	1.27	(0.88)	0.09	(0.10)
Cucumbers (WR)	1.46	(0.73)	2.53	(5.99)	1.46	(0.73)
Green Beans (PA)	3.82	(0.70)	2.26	(2.26)	2.50	(0.55)
Lettuce (WR)	25.25	(3.63)	37.50	(15.00)	17.25	(2.88)
Peaches (WR)	–0.045	(0.24)	–1.67	(1.60)	0.045	(0.16)
Rhubarb (PA)	1.01	(0.25)	0.23	(0.66)	0.83	(0.23)
Squash (WR)	1.32	(0.48)	–0.66	(2.88)	0.72	(0.45)
Mean (std dev)	3.84	(8.11)	5.00	(12.28)	2.61	(5.55)
Cochiti (C)/Peña Blanca (PB)/Sile (S):						
Apricots (PB)	1.61	(0.55)	2.79	(1.97)	1.72	(0.52)
Bell Peppers (S)	1.10	(0.44)	–0.80	(1.50)	1.46	(0.40)
Cherries (C/PB)	2.06	(0.47)	0.20	(1.37)	1.54	(0.38)
Lettuce (S)	79.25	(6.88)	50.75	(11.25)	59.75	(5.50)
Tomatos (S)	5.30	(0.90)	0.90	(1.85)	2.70	(0.60)
Mean (std dev)	17.86	(34.36)	10.77	(22.39)	13.43	(25.90)
San Ildefonso (SI)/El Rancho (ER):						
Apples (SI)	3.35	(0.47)	1.15	(1.33)	3.49	(0.47)
Apricots (ER)	0.92	(0.40)	3.77	(2.21)	0.93	(0.37)
Cherries (ER)	10.09	(1.37)	2.25	(3.63)	8.92	(1.23)
Corn (SI)	0.67	(0.19)	1.02	(0.77)	0.60	(0.17)
Squash (SI)	0.68	(0.30)	–3.80	(2.23)	0.84	(0.37)
Mean (std dev)	3.14	(4.04)	0.88	(2.84)	2.96	(3.54)

Table 6-9. Radionuclide Concentrations in Produce Collected from Regional, Perimeter, and On-Site Locations during the 2001 Growing Season[a] (Cont.)

Location	^{234}U (10^{-3} pCi/g dry)		^{235}U (10^{-4} pCi/g dry)		^{238}U (10^{-3} pCi/g dry)	
On-Site Stations						
LANL (Mesa):						
Apples (TA-21)	0.51	(0.17)	–0.36	(0.65)	0.14	(0.08)
Apples (TA-52)	0.65	(0.23)	–1.19	(0.97)	0.40	(0.17)
Apricots (TA-21)	0.066	(0.35)	0.66	(1.64)	1.44	(0.46)
Apricots (TA-35)	1.03	(0.41)	2.62	(3.36)	0.39	(0.22)
Nectarines (TA-3)	0.40	(0.19)	0.94	(1.29)	0.33	(0.16)
Peaches (TA-21)	0.53	(0.20)	0.84	(0.87)	0.98	(0.24)
Peaches (TA-3)	0.57	(0.20)	–0.15	(0.76)	–0.02	(0.08)
Peaches (TA-53)	0.52	(0.19)	–0.76	(0.87)	0.33	(0.14)
Mean (std dev)	0.53	(0.27)	0.33	(1.21)	0.50	(0.48)

[a]There are no concentration guides for produce, and with the exception of tritium, there were no statistical differences in any of the mean values from perimeter and on-site locations when compared with regional background at the 0.05 probability level using a Student's t-test. Means followed by an * were statistically higher than regional background.

[b](+1 counting uncertainty); values are the uncertainty of the analytical results at the 65% confidence level.

[c]See Appendix B for an explanation of the presence of negative values.

[d]Sample lost in analysis or not analyzed or outlier omitted. An outlier was omitted when the result was greater than three standard deviations of the mean (99% confidence level).

[e]Regional Statistical Reference Level; this is the upper-limit background concentration (mean + 2 std dev) based on data from 1994 to 2001; total uranium is based on data from 1999–2001.

Table 6-10. Mean (±SD) Radionuclide Concentrations in Produce Collected from Regional, Perimeter, and On-Site Locations Before (1997–1999) and After (2000 and 2001) the Cerro Grande Fire

Location/Date	^{3}H (pCi/mL)	^{137}Cs (10^{-3} pCi/g dry)	^{90}Sr (10^{-3} pCi/g dry)	^{tot}U (ng/g dry)	^{238}Pu (10^{-5} pCi/g dry)	^{239}Pu (10^{-5} pCi/g dry)	^{241}Am (10^{-5} pCi/g dry)
Regional Background Stations							
Abiquiu/Arroyo Seco/Embudo/Espanola Valley/La Puebla/Ojo Sarco:							
1997–1999[a]	–0.03 (0.22)	34.60 (22.9)	165.5 (91.8)	6.0 (4.9)	–7.8 (8.1)	13.2 (12.8)	19.6 (28.4)
2000	0.13 (0.21)	–0.78 (12.7)	13.3 (17.3)	7.8 (8.7)	25.2 (28.5)*[b]	33.9 (42.8)	58.6 (57.7)
2001	0.05 (0.16)	–13.94 (29.4)	28.6 (26.2)	10.0 (8.5)	0.15 (22.3)	7.4 (12.6)	18.0 (36.2)
Perimeter Stations							
Los Alamos:							
1997–1999[a]	0.19 (0.36)	6.60 (4.0)	47.0 (50.8)	2.9 (1.1)	33.2 (39.0)	12.6 (25.4)	38.9 (45.3)
2000	0.30 (0.11)	4.07 (13.9)	10.2 (3.6)	4.0 (3.1)	26.1 (65.0)	40.8 (45.9)	85.5 (36.7)
2001	0.10 (0.12)	–5.04 (19.0)	63.2 (64.7)	9.7 (23.5)	3.4 (17.2)	12.9 (14.2)	14.0 (30.0)
White Rock/Pajarito Acres							
1997–1999[a]	–0.03 (0.26)	30.60 (38.4)	115.9 (85.3)	4.7 (3.1)	48.7 (74.8)	9.3 (16.4)	33.9 (30.1)
2000	0.24 (0.12)*	0.66 (7.8)	20.0 (22.5)	8.2 (10.9)	21.1 (64.4)	28.0 (41.7)	59.2 (61.7)
2001	0.26 (0.18)*	–39.83 (88.6)	58.1 (109.9)	8.0 (17.0)	10.3 (24.5)	3.2 (12.4)	23.6 (27.2)
Cochiti/Peña Blanca/Sile:							
1997–1999[a]	0.04 (0.29)	16.70 (12.8)	118.7 (147.8)	11.4 (8.3)	41.9 (49.6)	18.6 (38.8)	59.6 (58.3)
2000	0.25 (0.15)	6.03 (9.4)	14.6 (21.2)	14.6 (30.4)	26.5 (59.9)	62.1 (72.2)	105.2 (134.1)
2001	0.15 (0.34)	–22.37 (22.4)	23.9 (31.1)	40.4 (78.0)	–6.8 (9.1)	4.8 (11.4)	29.8 (46.2)
San Ildefonso/El Rancho:							
1997–1999[a]	–0.12 (0.31)	12.40 (23.9)	64.5 (54.7)	7.7 (6.3)	31.4 (27.2)	8.7 (24.2)	20.0 (31.6)
2000	0.32 (0.05)*	0.63 (3.2)	9.6 (12.5)	4.4 (2.4)	33.3 (42.1)	35.4 (37.9)	42.4 (31.9)
2001	0.02 (0.05)	–5.81 (12.2)	20.7 (17.6)	8.8 (10.6)	–0.7 (13.7)	3.3 (12.9)	18.4 (21.3)
On-Site Stations							
LANL (Mesa):							
1997–1999[a]	1.49 (1.11)	13.60 (18.1)	37.1 (39.3)	1.8 (0.5)	10.9 (14.3)	7.8 (10.5)	11.3 (7.7)
2000	1.59 (2.21)	–0.56 (5.0)	8.9 (11.9)	1.9 (1.1)	26.5 (34.2)	17.3 (19.2)	13.0 (23.1)
2001	0.86 (1.07)	1.59 (20.8)	13.4 (16.0)	1.5 (1.4)	–3.4 (15.3)	4.7 (13.4)	6.5 (39.6)

Table 6-10. Mean (±SD) Radionuclide Concentrations in Produce Collected from Regional, Perimeter, and On-Site Locations Before (1997–1999) and After (2000 and 2001) the Cerro Grande Fire (Cont.)

Location/Date	^{234}U (10^{-3} pCi/g dry)		^{235}U (10^{-4} pCi/g dry)		^{238}U (10^{-3} pCi/g dry)	
Regional Background Stations:						
Abiquiu/Arroyo Seco/Embudo/Espanola Valley/La Puebla/Ojo Sarco:						
1997–1999[a]	4.47	(3.24)	1.65	(1.86)	3.63	(3.35)
2000	3.90	(4.46)	2.90	(3.68)	2.60	(2.88)
2001	4.80	(5.45)	3.59	(5.97)	3.17	(2.81)
Perimeter Stations						
Los Alamos:						
1997–1999[a]	0.50	(0.61)	0.51	(1.06)	0.60	(0.43)
2000	1.16	(0.70)	3.97	(4.21)*	1.28	(1.02)
2001	3.84	(7.59)	3.45	(5.93)	3.20	(7.81)
White Rock/Pajartio Acres:						
1997–1999[a]	0.93	(0.81)	0.60	(1.50)	0.75	(0.82)
2000	3.48	(3.66)	7.81	(7.87)*	2.63	(3.55)
2001	3.84	(8.11)	5.00	(12.28)	2.61	(5.55)
Cochiti/Peña Blanca/Sile:						
1997–1999[a]	0.60	(0.76)	–1.37	(1.25)	0.70	(0.90)
2000	6.38	(13.11)	5.31	(5.26)*	4.82	(10.20)
2001	17.86	(34.36)	10.77	(22.39)	13.43	(25.90)
San Ildefonso/El Rancho:						
1997–1999[a]	6.02	(5.91)	1.65	(1.95)	4.97	(4.50)
2000	1.92	(0.62)	1.83	(5.84)	1.45	(0.81)
2001	3.14	(4.04)	0.88	(2.84)	2.96	(3.54)

Table 6-10. Mean (±SD) Radionuclide Concentrations in Produce Collected from Regional, Perimeter, and On-Site Locations Before (1997–1999) and After (2000 and 2001) the Cerro Grande Fire (Cont.)

Location/Date	^{234}U (10^{-3} pCi/g dry)		^{235}U (10^{-4} pCi/g dry)		^{238}U (10^{-3} pCi/g dry)	
On-Site Stations						
LANL (Mesa):						
1997–1999[a]	0.52	(0.47)	–0.09	(0.45)	0.40	(0.27)
2000	0.81	(0.54)	2.66	(3.54)	0.61	(0.34)
2001	0.53	(0.27)	0.33	(1.21)	0.50	(0.48)

[a]These data are the mean of means Fresquez and Gonzales (2000).

[b]Means from 2000 and 2001 within the same column and location followed by an * were statistically different from 1997–1999 (before the Cerro Grande fire) using a using a Student's t-test at the 0.05 probability level.

Table 6-11. Total Recoverable Trace Element Concentrations (µg/g dry) in Produce Collected from Regional, Perimeter, and On-Site Locations during the 2001 Growing Season[a]

Location	Ag	As	Ba	Be	Cd	Cr	Hg	Ni	Pb	Se	Tl	Zn
Regional Background Stations												
Chamita (C)/Chimayo (Ch)/Espanola Valley (EV)/Jemez (J)/Ojo Sarco (OS):												
Apricots (J/EV)	U[b]	U	6.5	U	U	U	U	U	3.40	0.49	U	8.4
Beets (OS)	U	U	13.0	U	U	U	U	6.5	5.20	0.61	U	5.3
Broccoli Rabe (OS)	U	U	96.0	U	U	U	U	U	U	0.66	U	32.0
Cabbage (OS)	U	U	23.0	U	U	U	U	U	0.55	0.83	U	25.0
Cherries (Ch)	U	U	4.7	U	U	U	U	U	0.50	0.32	U	5.9
Cucumbers (C)	U	U	3.2	U	U	U	U	U	0.69	0.42	U	24.0
Cucumbers (OS)	U	U	5.4	U	U	U	U	U	0.58	0.67	U	40.0
Green Beans (EV)	U	U	15.0	U	U	U	U	1.4	0.77	0.67	U	32.0
Plums (OS)	U	U	35.0	U	U	U	U	U	1.50	0.53	U	24.0
Plums (OS)	U	U	6.0	U	U	U	U	2.6	3.40	0.32	U	6.2
Pumpkin (OS)	U	U	16.0	U	U	U	U	U	1.10	0.72	U	26.0
Ruby Chard (OS)	U	U	71.0	U	U	U	U	3.0	0.50	0.57	U	29.0
Squash (EV)	U	U	11.0	U	U	U	U	U	1.60	0.62	U	33.0
Mean			23.5					1.5	1.37	0.57		22.4
(std dev)			(28.5)					(1.8)	(1.49)	(0.15)		(11.9)
RL[c]	<0.50	<0.50	<0.20	<0.20	<0.25	<0.50	<0.05	<1.0	<0.15	<0.25	<0.40	<1.0
RSRL[d]	0.96	0.52	26.5	0.40	0.60	1.56	0.05	19.5	14.27	0.70	0.28	27.8
Perimeter Stations												
Los Alamos:												
Apples	U	U	30.0	U	U	0.71	U	U	0.57	0.79	U	29.0
Apricots	U	U	4.9	U	U	U	U	U	0.76	0.65	U	14.0
Cherries	U	U	4.4	U	U	U	U	2.6	1.10	0.48	U	6.4
Green Beans	U	U	4.2	U	U	U	U	U	1.20	0.71	U	5.1
Lettuce	U	U	17.0	U	U	U	U	U	0.94	0.72	U	41.0
Peaches	U	U	1.3	U	U	0.69	U	7.2	1.20	0.58	U	13.0
Plums	U	U	2.3	U	U	U	U	U	1.40	0.41	U	8.0
Squash	U	U	7.9	U	U	U	U	U	1.10	0.82	U	40.0
Squash	U	U	6.5	U	U	0.53	U	14.0	7.40	0.75	U	43.0
Mean			8.7			0.38		3.0	1.74	0.66		22.2
(std dev)			(9.2)			(0.20)		(4.7)	(2.14)	(0.14)		(16.0)

Table 6-11. Total Recoverable Trace Element Concentrations (µg/g dry) in Produce Collected from Regional, Perimeter, and On-Site Locations during the 2001 Growing Season[a] (Cont.)

Location	Ag	As	Ba	Be	Cd	Cr	Hg	Ni	Pb	Se	Tl	Zn
Perimeter Stations (Cont.)												
White Rock (WR)/Pajarito Acres (PA):												
Apples (WR)	U	U	3.5	U	U	U	U	U	0.76	0.33	U	2.4
Apricots (WR)	U	U	6.1	U	U	U	U	2.1	4.20	0.49	U	11.0
Cherries (WR)	U	U	2.9	U	U	U	U	U	U	0.43	U	5.0
Cucumbers (WR)	U	U	19.0	U	U	U	U	U	0.27	0.62	U	35.0
Green Beans (PA)	U	U	11.0	U	U	U	U	1.9	0.66	0.50	U	33.0
Lettuce (WR)	U	U	38.0	U	U	U	U	U	0.73	0.61	U	24.0
Peaches (WR)	U	U	3.2	U	U	0.55	U	1.2	0.24	0.52	U	8.7
Rhubarb (PA)	U	U	86.0	U	U	U	U	8.2	3.70	0.49	U	9.1
Squash (WR)	U	U	7.0	U	U	0.53	U	4.7	1.30	0.71	U	54.0
Mean			19.6			0.31		2.2	1.33	0.52		20.2
(std dev)			(27.3)			(0.13)		(2.6)	(1.53)	(0.11)		(17.4)
Cochiti (C)/Peña Blanca (PB)/Sile (S):												
Apricots (PB)	U	U	2.3	U	U	U	U	4.40	1.90	0.42	U	8.5
Bell Peppers (S)	U	U	1.9	U	U	U	U	U	2.10	0.53	U	14.0
Cherries (C/PB)	U	U	5.0	U	U	U	U	U	1.30	0.69	U	6.5
Lettuce (S)	U	U	26.0	U	0.32	U	U	U	2.10	0.74	U	40.0
Tomatoes (S)	U	U	4.8	U	U	1.40	U	2.80	2.20	0.85	U	21.0
Mean			8.0		0.16	0.48		1.7	1.92	0.65		18.0
(std dev)			(10.2)		(0.09)	(0.51)		(1.8)	(0.36)	(0.17)		(13.5)
San IldefonsoPueblo (SI)/El Rancho (ER):												
Apples (SI)	U	U	1.6	U	U	U	U	U	2.50	0.43	U	2.0
Apricots (ER)	U	U	6.0	U	U	U	U	[e]	18.00	0.72	U	11.0
Cherries (ER)	U	U	4.9	U	U	U	U	2.50	3.20	0.84	U	7.6
Corn (SI)	U	U	0.3	U	U	U	U	U	5.10	0.62	U	30.0
Squash (SI)	U	U	15.0	U	U	U	U	17.00	3.60	0.81	U	27.0
Mean			5.6					5.1	6.48	0.68		15.5
(std dev)			(5.8)					(8.0)	(6.51)	(0.17)		(12.3)

Table 6-11. Total Recoverable Trace Element Concentrations (µg/g dry) in Produce Collected from Regional, Perimeter, and On-Site Locations during the 2001 Growing Season[a] (Cont.)

Location	Ag	As	Ba	Be	Cd	Cr	Hg	Ni	Pb	Se	Tl	Zn
On-Site Stations												
LANL (Mesa):												
Apples (TA-21)	U	U	5.1	U	U	U	U	1.3	3.80	0.77	U	2.9
Apples (TA-52)	U	U	4.1	U	U	U	U	1.3	1.60	0.78	U	2.0
Apricots (TA-21)	U	U	16.0	U	U	U	U	1.5	0.87	0.71	U	6.0
Apricots (TA-35)	U	U	13.0	U	U	U	U	70.0	34.00	0.77	U	7.3
Nectarines (TA-3)	U	U	5.0	U	U	U	U	U	0.30	0.69	U	8.8
Peaches (TA-21)	U	U	4.7	U	U	U	U	4.7	3.40	0.58	U	6.2
Peaches (TA-3)	U	U	4.5	U	U	U	U	2.8	1.40	0.72	U	9.2
Peaches (TA-53)	U	U	2.5	U	U	U	U	10.0	8.30	0.85	U	11.0
Mean			6.9					11.5	6.71	0.73		6.7
(std dev)			(4.9)					(23.8)	(11.31)	(0.08)*[f]		(3.1)

[a]Analysis by EPA Method 3051 for total recoverable metals.
[b]U = undetected; an analyte was analyzed but not detected above the reporting limit and was given a value of one-half the concentration (of the reporting limit when a statistical calculation was needed. (Note: A mean was calculated when at least one number within the respective field was above the reporting limit.)
[c]Reporting Limit
[d]Regional Statistical Reference Level; this is the upper-limit background concentration (mean + 2 std dev) based on data from 1994 to 2001.
[e]Sample lost in analysis or not analyzed or outlier omitted. An outlier was omitted when the result was greater than three standard deviations of the mean (99% confidence level).
[f]Means within the same column followed by an * were statistically higher than regional background using a using a Student's t-test at the 0.05 probability level.

Table 6-12. Mean (±SD) Total Recoverable Trace Element Concentrations (µg/g dry) in Produce Collected from Background, Perimeter, and On-Site Locations Before (1999) and After (2000 and 2001) the Cerro Grande Fire

Location/Date	Ag	As	Ba	Be	Cd	Cr	Hg	Ni	Pb	Se	Tl	Zn
Regional Background Stations												
Chamita/Chimayo/Española Valley/Jemez/Ojo Sarco:												
1999[a]	U[f]	U	7.6	U	U	0.80	U	4.4	8.6	U	U	19.5
			(6.2)			(0.73)		(7.7)	(12.8)			(14.2)
2000[b]	U	U	19.7	U	0.53	1.03	U	8.9	4.4	0.39	U	24.5
			(35.5)		(0.12)	(2.06)		(15.0)	(5.7)	(0.22)*[g]		(16.7)
2001[c]	U	U	23.5	U	U	U	U	1.5	1.4	0.57	U	22.4
			(28.5)					(1.8)	(1.5)	(0.15)*		(11.9)
RL[d]	<0.50	<0.50	<0.20	<0.20	<0.25	<0.50	<0.05	<1.0	<0.15	<0.25	<0.40	<1.0
RSRL[e]	1.3	0.57	19.5	0.45	0.65	1.56	0.06	21.9	15.9	0.63	0.27	22.3
Perimeter Stations												
Los Alamos:												
1999	U	U	4.7	U	U	U	U	3.4	9.2	U	U	16.2
			(3.1)					(6.5)	(8.9)			(18.4)
2000	U	U	5.2	U	U	1.60	U	21.5	13.5	1.19	U	9.6
			(5.3)			(1.38)		(32.0)	(12.5)	(0.26)*		(9.6)
2001	U	U	8.7	U	U	0.38	U	3.0	1.7	0.66	U	22.1
			(9.2)			(0.20)		(4.7)	(2.1)	(0.14)*		(16.0)
White Rock/Pajarito Acres:												
1999	U	U	7.2	U	U	0.58	U	3.5	7.5	U	U	20.0
			(10.0)			(0.20)		(6.1)	(6.6)			(11.6)
2000	U	U	6.5	U	U	1.21	U	6.3	4.0	1.33	U	16.4
			(4.4)			(1.40)		(3.2)	(4.4)	(0.33)*		(10.7)
2001	U	U	19.6	U	U	0.31	U	2.2	1.3	0.52	U	20.2
			(27.3)			(0.13)		(2.6)	(1.5)	(0.11)*		(17.4)

Table 6-12. Mean (±SD) Total Recoverable Trace Element Concentrations (µg/g dry) in Produce Collected from Background, Perimeter, and On-Site Locations Before (1999) and After (2000 and 2001) the Cerro Grande Fire (Cont.)

Location/Date	Ag	As	Ba	Be	Cd	Cr	Hg	Ni	Pb	Se	Tl	Zn
Cochiti/Peña Blanca:												
1999	U	U	4.4	U	U	0.72	U	2.3	4.8	U	U	19.0
			(7.1)			(0.49)		(1.2)	(3.2)			(12.0)
2000	U	U	2.4	U	U	1.02	U	5.0	3.6	0.88	U	12.6
			(2.3)			(0.60)		(4.4)	(1.8)	(0.08)*		(5.9)
2001	U	U	8.0	U	0.16	0.48	U	1.7	1.9	0.65	U	18.0
			(10.2)		(0.09)	(0.51)		(1.8)	(0.4)	(0.17)*		(13.5)
San Ildefonso Pueblo:												
1999	U	U	7.7	U	U	U	U	4.6	6.9	U	U	19.6
			(9.0)					(7.0)	(5.1)			(10.3)
2000	U	U	3.6	U	0.53	1.23	U	4.3	2.8	0.76	U	17.1
			(4.2)		(0.22)	(0.96)		(5.2)	(1.3)	(0.28)*		(8.8)
2001	U	U	5.6	U	U	U	U	5.1	6.5	0.68	U	15.5
			(5.8)					(8.0)	(6.5)	(0.17)*		(12.3)
On-Site Stations												
LANL (Mesa):												
1999	U	U	6.5	U	U	U	U	U	4.8	U	U	6.0
			(4.9)						(1.9)			(2.8)
2000	U	U	5.6	0.18	U	1.42	U	10.1	1.9	1.16	U	8.1
			(2.1)	(0.18)		(1.60)		(9.4)	(1.0)	(0.27)*		(4.0)
2001	U	U	6.9	U	U	U	U	11.5	6.7	0.73	U	6.7
			(4.9)					(23.8)	(11.3)	(0.08)*		(3.1)

[a]Data from Fresquez and Gonzales (2000).
[b]Data from Fresquez et al. (2001c).
[c]Data from Table 6-11.
[d]Reporting Limit = Reporting Limit.
[e]Regional Statistical Reference Level; this is the upper-limit background concentration (mean + 2 std dev) based on data from 1994 to 2000.
[f]U = undetected; an analyte was analyzed but not detected above the reporting limit and was given a value of one-half the concentration (of the reporting limit) when a statistical calculation was needed. (Note: A mean was calculated when at least one number within the respective field was above the reporting limit.)
[g]Post-fire means (2000 or 2001) within the same column and location followed by an * were significantly higher than pre-fire means using a Student's t-test at the 0.05 probability level.

Table 6-13. Radionuclide Concentrations in Game (Predators) Fish Upstream and Downstream of Los Alamos National Laboratory during 2001

Location	^{90}Sr (10^{-2}pCi/g dry)	^{137}Cs (10^{-2}pCi/g dry)	^{tot}U (ng/g dry)	^{238}Pu (10^{-5}pCi/g dry)	^{239}Pu (10^{-5}pCi/g dry)	^{241}Am (10^{-5}Ci/g dry)	^{234}U (10^{-3}pCi/g dry)	^{235}U (10^{-4}pCi/g dry)	^{238}U (10^{-3}pCi/g dry)
Upstream (Abiquiu Reservoir)									
6-19-01									
Brown Trout	0.71 (0.15)[a]	–0.36 (2.96)[b]	8.47 (4.17)	–6.05 (17.55)	13.31 (19.97)	35.09 (24.20)	2.06 (1.15)	3.0 (5.9)	2.78 (1.33)
Crappie	3.50 (0.37)	–0.97 (2.60)	12.71 (5.26)	14.52 (21.78)	58.08 (36.91)	20.57 (21.18)	4.60 (1.69)	16.9 (10.3)	3.99 (1.57)
Smallmouth Bass	2.08 (0.26)	–1.94 (1.50)	3.27 (2.78)	20.57 (20.57)	20.57 (20.57)	–3.63 (21.18)	3.15 (1.39)	15.7 (9.7)	0.85 (0.79)
Walleye	1.08 (0.20)	0.97 (2.72)	–0.36 (2.12)	–18.15 (18.15)	41.14 (28.44)	9.68 (33.28)	5.08 (1.82)	12.1 (9.1)	–0.31 (0.57)
Walleye	1.15 (0.21)	4.96 (2.78)	2.42 (2.24)	–8.47 (25.41)	–8.47 (25.41)	14.52 (30.25)	3.03 (1.39)	25.4 (12.7)	0.42 (0.56)
Mean (std dev)	1.70 (1.12)	0.53 (2.69)	5.30 (5.23)	0.48 (16.36)	24.93 (25.65)	15.25 (14.23)	3.58 (1.23)	14.6 (8.1)	1.55 (1.78)
RSRL[c]	17.0	27.7	6.5	23.6	28.3	28.9	6.04	30.8	5.11
Downstream (Cochiti Reservoir)									
4-25-01									
Pike	1.42 (0.23)	4.84 (2.72)	3.51 (2.12)	10.89 (10.29)	–4.84 (9.08)	16.94 (29.04)	5.45 (1.33)	–3.6 (2.7)	1.21 (0.67)
Pike	1.14 (0.24)	1.21 (2.96)	7.87 (2.96)	–6.05 (14.52)	27.83 (12.10)	45.98 (29.65)	1.82 (0.79)	5.6 (4.4)	2.54 (0.91)
Pike	1.40 (0.25)	3.99 (2.42)	5.93 (2.60)	–20.57 (29.04)	26.62 (18.67)	16.94 (21.78)	2.30 (0.91)	–3.5 (2.6)	2.06 (0.85)
Walleye	1.74 (0.25)	0.12 (2.72)	6.53 (2.84)	12.10 (19.36)	6.05 (13.92)	43.56 (29.04)	3.75 (1.21)	7.1 (5.0)	2.06 (0.85)
Smallmouth Bass	3.19 (0.37)	2.78 (3.27)	2.78 (2.00)	44.77 (21.18)	–13.31 (15.73)	0.00 (19.97)	3.39 (1.15)	–1.5 (3.2)	0.97 (0.61)
White Bass	3.52 (0.39)	0.85 (2.36)	1.69 (1.39)	15.73 (11.50)	15.73 (15.13)	–70.18 (49.61)	2.78 (0.91)	6.7 (4.8)	0.45 (0.39)
White Bass	3.33 (0.38)	–0.61 (2.66)	2.30 (1.75)	–16.94 (9.08)	49.61 (18.15)	52.03 (29.04)	3.75 (1.15)	4.1 (4.2)	0.71 (0.52)
Mean (std dev)	2.25 (1.05)[d]	1.88 (2.03)	4.37 (2.38)	5.70 (22.49)	15.38 (21.49)	15.04 (42.10)	3.32 (1.19)	2.1 (4.8)	1.43 (0.79)
5-30-01									
Walleye	0.68 (0.20)	–3.75 (2.54)	2.18 (2.84)	20.57 (30.25)	0.00 (26.62)	–10.89 (18.76)	2.18 (1.45)	–1.2 (7.3)	0.73 (0.85)
Pike	1.26 (0.19)	4.11 (3.03)	3.63 (3.09)	121.00 (66.55)	49.61 (48.40)	14.52 (15.13)	2.90 (1.39)	10.9 (9.1)	1.09 (0.91)
Pike	4.48 (0.45)	–2.42 (1.45)	5.45 (3.45)	–30.25 (34.49)	21.78 (41.75)	47.19 (27.23)	3.63 (1.39)	1.5 (5.4)	1.82 (1.09)
Crappie	3.41 (0.36)	–0.73 (2.72)	12.95 (5.02)	52.03 (33.88)	19.36 (19.36)	12.10 (41.75)	5.81 (1.82)	15.7 (9.1)	4.11 (1.57)
White Bass	1.00 (0.18)	–4.24 (2.90)	8.11 (4.30)	20.57 (20.57)	–6.05 (18.76)	15.73 (32.67)	3.51 (1.51)	–0.7 (5.3)	2.78 (1.33)
Mean (std dev)	2.17 (1.68)	–1.40 (3.37)	6.46 (4.25)	36.78 (55.55)	16.94 (21.86)	15.73 (20.69)	3.61 (1.36)	5.2 (7.6)	2.11 (1.37)
8-14-01									
Pike	1.37 (0.21)	4.11 (2.84)	2.78 (0.85)	10.89 (19.97)	2.42 (12.10)	81.07 (26.02)	1.00 (0.31)	0.73 (0.85)	0.93 (0.27)
Walleye	1.44 (0.22)	0.24 (1.27)	3.15 (0.91)	3.63 (16.34)	20.57 (13.92)	24.20 (13.92)	1.79 (0.38)	0.61 (1.63)	1.06 (0.27)
White Bass	3.84 (0.41)	0.12 (2.48)	6.90 (1.45)	–10.89 (14.52)	–4.84 (10.29)	21.78 (20.57)	3.56 (0.55)	2.42 (2.06)	2.26 (0.45)
Walleye	1.74 (0.25)	–1.94 (2.60)	2.90 (0.91)	–2.42 (12.10)	0.00 (9.68)	36.30 (15.73)	(0.33) 0.00	(1.21) 0.98	(0.29)
Largemouth Bass	3.59 (0.38)	2.78 (2.18)	5.81 (1.09)	0.00 (20.57)	24.20 (16.94)	1.21 (15.13)	2.14 (0.38)	0.48 (0.61)	1.94 (0.34)
Mean (std dev)	2.40 (1.22)	1.06 (2.39)	4.31 (1.91)	0.24 (8.00)	8.47 (13.03)	32.91 (29.73)	1.87 (1.09)	0.85 (0.92)	1.43 (0.62)

[a](+1 counting uncertainty); values are the uncertainty of the analytical results at the 65% confidence level.
[b]See Appendix B for an explanation of the presence of negative values.
[c]Regional Statistical Reference Level; this is the upper-limit background concentration (mean + 2 std dev) based on data from 1981–1999. For U isotopes, the RSRL is based on current (2001) data.
[d]Means within the same column and fish type followed by an * were significantly different from Abiquiu (background) using a Student's t-test at the 0.05 probability level. (Note: Mean concentrations in fish collected from Cochiti were not significantly higher than fish collected from Abiquiu on any given date.)

Table 6-14. Radionuclide Concentrations in Nongame (Bottom-Feeding) Fish Upstream and Downstream of Los Alamos National Laboratory during 2001

Location	^{90}Sr (10^{-2}pCi/g dry)		^{137}Cs (10^{-2}pCi/g dry)		^{tot}U (ng/g dry)		^{238}Pu (10^{-5}pCi/g dry)		^{239}Pu (10^{-5}pCi/g dry)		^{241}Am (10^{-5}Ci/g dry)		^{234}U (10^{-3}pCi/g dry)		^{235}U (10^{-4}pCi/g dry)		^{238}U (10^{-3}pCi/g dry)	
Upstream (Abiquiu Reservoir)																		
6-19-01																		
Carp Sucker	3.32	(0.35)[a]	1.33	(2.23)	12.26	(4.51)	17.10	(22.80)	–4.75	(13.78)[b]	–50.35	(25.65)	2.76	(1.24)	9.5	(7.1)	3.99	(1.43)
Catfish	1.93	(0.22)	–0.38	(2.00)	5.80	(3.42)	1.90	(17.58)	16.15	(15.68)	–11.40	(20.90)	6.94	(2.00)	7.6	(7.1)	1.81	(1.05)
Carp	3.76	(0.38)	0.95	(1.14)	24.70	(5.70)	24.70	(20.90)	5.70	(15.68)	36.10	(27.08)	11.02	(2.19)	27.6	(10.5)	7.98	(1.85)
Carp	3.26	(0.34)	–1.71	(2.14)	19.95	(5.70)	–13.30	(19.95)	–24.70	(14.73)	6.65	(18.53)	10.26	(2.23)	8.6	(6.2)	6.75	(1.81)
Catfish	1.95	(0.24)	–0.57	(2.38)	14.25	(4.75)	6.65	(16.63)	15.20	(15.20)	54.15	(26.60)	9.60	(2.23)	19.0	(9.5)	4.37	(1.47)
Mean (std dev)	2.84	(0.85)	–0.08	(1.23)	15.39	(7.26)	7.41	(14.60)	1.52	(16.92)	7.03	(40.92)	8.12	(3.37)	14.5	(8.6)	4.98	(2.43)
RSRL[c]	13.2		26.9		16.2		9.8		19.2		16.1		14.86		31.7		9.84	
Downstream (Cochiti Reservoir)																		
4-25-01																		
Carp	2.96	(0.31)	2.00	(2.28)	30.40	(5.23)	20.90	(13.78)	3.80	(5.23)	11.40	(11.40)	19.48	(2.52)	13.3	(6.2)	9.98	(1.71)
Carp Sucker	4.07	(0.41)	–0.67	(1.90)	4.47	(2.04)	3.80	(9.03)	3.80	(9.03)	22.80	(15.58)	2.95	(0.95)	5.1	(3.6)	1.43	(0.62)
Catfish	1.28	(0.19)	0.86	(2.76)	12.92	(3.47)	–31.35	(15.68)	4.75	(7.60)	23.75	(16.15)	6.08	(1.38)	2.9	(2.8)	4.28	(1.14)
Catfish	1.57	(0.21)	–0.10	(2.19)	13.49	(3.71)[c]	–8.55	(6.18)	–4.75	(5.23)	–8.55	(19.00)	7.03	(1.52)	4.1	(4.2)	4.47	(1.19)
Mean (std dev)	2.47	(1.29)[d]	0.52	(1.17)	15.32	(10.87)	–3.80	(21.98)	1.90	(4.46)	12.35	(15.02)	8.89	(7.28)	6.4	(4.7)	5.04	(3.57)
5-30-01p																		
Catfish	1.44	(0.19)	–0.95	(2.09)	15.20	(4.75)	43.70	(25.18)	–4.75	(13.30)	38.00	(28.50)	11.78	(2.42)	8.6	(6.7)	5.13	(1.52)
Catfish	1.44	(0.18)	–2.95	(2.33)	6.08	(3.23)	16.15	(16.15)	–4.75	(14.73)	–10.45	(19.00)	5.23	(1.62)	–2.2	(4.0)	2.09	(1.05)
Carp	3.52	(0.35)	1.14	(0.71)	19.95	(5.23)	22.80	(23.28)	6.65	(17.10)	71.25	(38.95)	14.82	(2.47)	18.1	(8.1)	6.56	(1.57)
Carp Sucker	2.41	(0.25)	0.57	(2.47)	6.84	(2.95)	–16.15	(18.05)	–4.75	(13.30)	0.00	(26.13)	4.09	(1.28)	25.7	(10.0)	1.90	(0.86)
Carp Sucker	2.56	(0.28)	3.71	(2.38)	9.79	(4.13)	22.80	(37.53)	–16.15	(15.68)	55.10	(27.55)	4.09	(1.47)	9.5	(7.1)	3.14	(1.28)
Carp Sucker	2.56	(0.28)	–2.19	(1.19)	17.10	(5.23)	31.35	(31.35)	–10.45	(15.68)	51.30	(30.88)	13.59	(2.66)	4.2	(4.7)	5.61	(1.66)
Mean (std dev)	2.32	(0.79)	–0.11	(2.43)	12.49	(5.74)	20.11	(20.14)	–5.70	(7.58)	34.20	(32.49)	8.93	(5.00)	10.7	(9.9)	4.07	(1.96)

Table 6-14. Radionuclide Concentrations in Nongame (Bottom-Feeding) Fish Upstream and Downstream of Los Alamos National Laboratory during 2001 (Cont.)

Location	^{90}Sr (10^{-2}pCi/g dry)	^{137}Cs (10^{-2}pCi/g dry)	^{tot}U (ng/g dry)	^{238}Pu (10^{-5}pCi/g dry)	^{239}Pu (10^{-5}pCi/g dry)	^{241}Am (10^{-5}Ci/g dry)	^{234}U (10^{-3}pCi/g dry)	^{235}U (10^{-4}pCi/g dry)	^{238}U (10^{-3}pCi/g dry)
Downstream (Cochiti Reservoir) (Cont.)									
8-14-01									
Catfish	1.62 (0.20)	1.05 (1.90)	16.91 (1.90)	4.75 (9.03)	4.75 (9.03)	17.10 (11.88)	7.79 (0.76)	3.90 (1.52)	5.61 (0.62)
Carp Sucker	2.25 (0.25)	–1.43 (2.23)	3.90 (0.90)	29.45 (21.85)	17.10 (15.20)	1.90 (12.83)	3.03 (0.42)	–0.38 (1.09)	1.30 (0.29)
Carp Sucker	2.32 (0.26)	0.00 (2.33)	4.37 (0.95)	–9.50 (7.60)	–2.85 (7.60)	0.00 (7.60)	3.08 (0.42)	–0.76 (1.43)	1.50 (0.29)
Carp Sucker	2.81 (0.30)	–0.19 (1.81)	17.96 (1.90)	–1.90 (6.18)	–1.90 (6.18)	5.70 (12.35)	8.27 (0.76)	4.56 (1.52)	5.99 (0.62)
Carp Sucker	2.23 (0.25)	1.43 (1.81)	5.70 (1.00)	–2.85 (7.60)	4.75 (8.55)	54.15 (21.38)	3.16 (0.41)	1.62 (1.24)	1.88 (0.31)
Carp	3.51 (0.35)	–1.90 (2.38)	14.82 (1.71)	–12.35 (7.13)	9.50 (10.93)	30.40 (18.05)	7.32 (0.76)	0.86 (1.19)	4.94 (0.57)
Carp	2.76 (0.31)	–0.38 (1.00)	24.61 (2.47)	–32.30 (11.40)	3.80 (16.15)	–14.25 (17.58)	14.63 (1.24)	3.90 (1.66)	8.17 (0.81)
Carp	2.81 (0.32)	1.24 (2.09)	20.52 (2.28)	–17.10 (8.08)	–3.80 (7.60)	36.10 (19.48)	12.45 (1.14)	2.38 (2.04)	6.84 (0.71)
Mean (std dev)	2.54 (0.56)	–0.02 (1.23)	13.60 (7.95)	–5.23 (17.97)	3.92 (7.03)	16.39 (22.50)	7.47 (4.38)	2.01 (2.02)	4.53 (2.64)

[a](+1 counting uncertainty); values are the uncertainty of the analytical results at the 65% confidence level.
[b]See Appendix B for an explanation of the presence of negative values.
[c]Regional Statistical Reference Level; this is the upper-limit background concentration (mean + 2 std dev) based on data from 1981–1999. For U isotopes, the RSRL is based on current (2001) data.
[d]Means within the same column and fish type followed by an * were significantly different from Abiquiu (background) using a Student's t-test at the 0.05 probability level. (Note: Mean concentrations in fish collected from Cochiti were not significantly higher than fish collected from Abiquiu on any given date.)

Table 6-15. Mean (±SD) Radionuclide Concentrations in Game (Predators) and Nongame (Bottom-Feeding) Fish Upstream and Downstream of Los Alamos National Laboratory Before (1999) and After (2000 and 2001) the Cerro Grande Fire

Location Date	^{90}Sr (10^{-2} pCi/g dry)	^{137}Cs (10^{-2} pCi/g dry)	^{tot}U (ng/g dry)	^{238}Pu (10^{-5} pCi/g dry)	^{239}Pu (10^{-5} pCi/g dry)	^{241}Am (10^{-5} pCi/g dry)
Game Fish (Predators)						
Upstream (Abiquiu Reservoir):						
1999[a]	1.57 (2.4)	0.90 (0.41)	2.7 (0.61)	11.2 (1.5)	22.39 (14.7)	22.3 (21.6)
2000[b]	–0.10 (1.3)	–0.61 (0.80)	2.1 (1.05)	15.9 (40.3)	6.78 (3.3)	–22.9 (8.3)
2001[c]	1.70 (1.1)	0.53 (2.69)	5.3 (5.23)	0.5 (16.4)	24.93 (25.7)	15.3 (14.2)
Downstream (Cochiti Reservoir):						
1999[a]	3.73 (2.5)	0.54 (0.79)	4.6 (1.99)	17.6 (31.3)	30.55 (22.1)	67.9 (103.3)
2000[b]	1.69 (3.0)	0.06 (0.97)	5.3 (2.24)	7.7 (35.5)	0.48 (13.7)	–11.7 (13.6)
2001[c]	2.27 (0.1)	0.51 (1.70)	5.1 (1.22)	14.2 (19.7)	13.60 (4.5)	21.2 (10.1)
Nongame Fish (Bottom Feeders)						
Upstream (Abiquiu Reservoir):						
1999[a]	5.24 (2.3)	0.24 (0.23)	10.3 (3.96)	2.5 (25.8)	10.93 (11.8)	14.4 (12.2)
2000[b]	3.84 (1.9)	–0.77 (0.69)	8.3 (5.20)	32.1 (23.4)*[d]	12.16 (7.4)	–1.5 (5.9)
2001[c]	2.84 (0.9)	–0.08 (1.23)	15.4 (7.26)	7.4 (14.6)	1.52 (16.9)	7.0 (40.9)
Downstream (Cochiti Reservoir):						
1999[a]	4.56 (3.0)	0.05 (0.23)	21.1 (10.13)	11.4 (5.9)	22.80 (13.5)	30.2 (42.7)
2000[b]	1.15 (3.8)	–0.25 (0.60)	10.7 (6.85)	11.7 (50.1)	6.87 (7.3)	–1.9 (26.4)
2001[c]	2.44 (0.1)	0.13 (0.34)	13.8 (1.43)	3.7 (14.2)	0.04 (5.1)	21.0 (11.6)

[a]Data from Fresquez and Gonzales (2000).
[b]Data from Fresquez et al. (2001c).
[c]2001 year data are the mean and standard deviation of three sampling dates at Cochiti Reservoir.
[d]Means from 2000 and 2001 (after the Cerro Grande fire) within the same column, fish type, and location followed by an * were significantly higher than 1999 (before the Cerro Grande fire) using a Student's t-test at the 0.05 probability level. (Note: Most mean concentrations in fish collected post-fire were not significantly higher than fish collected pre-fire.)

Table 6-16. Total Recoverable Trace Element Concentrations (µg/g wet weight) in Game (Predators) Fish (Muscle Fillet) Collected Upstream and Downstream of Los Alamos National Laboratory in 2001

Location/Date	Ag	As	Ba	Be	Cd	Cr	Hg	Ni	Pb	Sb	Se	CN
Upstream (Abiquiu Reservoir)												
6-19-01												
B. Trout	U[a]	[d]	0.30	U	U	U	0.33	U	U	U	0.50	U
Crappie	[d]	[d]	U	U	U	U	0.23	U	U	U	0.60	U
S. Bass	U	[d]	1.70	U	U	U	0.38	U	U	U	U	U
Walleye	U	[d]	0.50	U	U	U	0.30	U	U	U	U	U
Walleye	U	[d]	0.70	U	U	U	0.30	U	U	U	0.40	U
Mean			0.66				0.31				0.35	
(std dev)			(0.62)				(0.05)				(0.22)	
RL[b]	<0.50	<0.50	<0.20	<0.20	<0.25	<0.50	<0.05	<1.0	<0.15	<0.40	<0.25	<0.50
RSRL[c]	1.00		1.88	0.10	0.50	0.50	0.41	1.00	0.20	0.20	0.74	0.03
Downstream (Cochiti Reservoir)												
4-25-01												
Pike	[d]	U	0.68	U	U	U	0.42	U	U	U	U	U
Pike	U	U	0.60	U	U	U	0.48	U		U	U	U
Pike	U	U	0.53	U	U	U	0.76	U	[d]	U	U	U
Walleye	U	U	U	U	U	U	0.19	U	U	U	U	U
S.M.Bass	2.60	U	0.36	U	U	U	0.19	U	U	U	U	U
W. Bass	U	U	U	U	U	U	0.19	U	U	U	U	U
W. Bass	U	U	U	U	U	U	0.22	U	U	U	U	U
Mean	0.64		0.35				0.35					
(std dev)	(0.96)		(0.26)				(0.22)					
5-30-01												
Walleye	U	U	U	U	U	U	0.42	U	U	U	0.54	[d]
Pike	U	U	U	U	U	U	0.24	U	U	U	0.47	[d]
Pike	U	U	U	U	U	U	0.42	U	U	U	0.55	[d]
Crappie	U	U	U	U	U	U	0.17	U	U	U	0.58	[d]
W. Bass	U	U	U	U	U	U	0.15	U	U	U	0.77	[d]
Mean							0.28				0.58	
(std dev)							(0.13)				(0.11)*	

Table 6-16. Total Recoverable Trace Element Concentrations (µg/g wet weight) in Game (Predators) Fish (Muscle Fillet) Collected Upstream and Downstream of Los Alamos National Laboratory in 2001(Cont.)

Location/Date	Ag	As	Ba	Be	Cd	Cr	Hg	Ni	Pb	Sb	Se	CN
Downstream (Cochiti Reservoir) (Cont.)												
8-14-01												
Pike	U	U	U	U	U	U	0.25	U	U	U	0.60	[d]
Walleye	U	U	U	U	U	U	0.31	U	U	U	0.62	[d]
W. Bass	U	U	U	U	U	U	0.12	U	U	U	0.77	[d]
Walleye	U	U	U	U	U	U	0.34	U	U	U	0.78	[d]
L. Bass	U	U	U	U	U	U	0.57	U	U	U	0.57	[d]
Mean							0.32				0.67	
(std dev)							(0.16)				(0.10)*[e]	

[a]U = undetected; an analyte was analyzed but not detected above the reporting limit and was given a value of one-half the concentration (of the reporting limit) when a statistical calculation was needed. (Note: A mean was calculated when at least one number within the respective field was above the reporting limit.)

[b]Reporting Limit.

[c]Regional Statistical Reference Level is the upper-limit background (mean plus two standard deviations) from present data for the game fish. CN is from 1999 data.

[d]Sample lost in analysis or not analyzed or outlier omitted. An outlier was omitted when the result was greater than three standard deviations of the mean.

[e]Means within the same column and date followed by an * were significantly different from Abiquiu (background) using a Student's t-test at the 0.05 probability level.

Table 6-17. Total Recoverable Trace Element Concentrations (µg/g wet weight) in Nongame (Bottom-Feeding) Fish (Muscle Fillet) Collected Upstream and Downstream of Los Alamos National Laboratory in 2001

Location/Date	Ag	As	Ba	Be	Cd	Cr	Hg	Ni	Pb	Sb	Se	CN
Nongame Fish (Bottom Feeders)												
Upstream (Abiquiu Reservoir)												
6-19-01												
C. Sucker	U[a]	d	4.90	U	U	U	0.21	U	U	U	U	U
Catfish	U	d	0.30	U	U	U	0.26	U	U	U	U	U
Carp	U	d	0.40	U	U	U	0.32	U	U	U	0.60	U
Carp	U	d	3.60	U	U	U	0.28	U	U	U	U	U
Catfish	U	d	0.30	U	U	U	0.12	U	U	U	U	U
Mean			1.90				0.24				0.20	
(std dev)			(2.19)				(0.08)				(0.19)	
RL[b]	<0.50	<0.50	<0.20	<0.20	<0.25	<0.50	<0.05	<1.0	<0.15	<0.40	<0.25	<0.50
RSRL[c]	1.4	0.62	1.30	1.20	1.50	1.80	0.48	1.5	3.50	1.74	1.48	2.96
Downstream (Cochiti Reservoir)												
4-25-01												
Carp	U	U	0.21	U	U	U	0.34	U	U	U	U	U
C. Sucker	U	U	U	U	U	U	0.10	U	U	U	U	U
Catfish	U	U	2.38	U	d	U	0.10	d	U	U	U	U
Catfish	U	U	U	U	U	U	0.16	U	U	U	U	U
Mean			0.70				0.18					
(std dev)			(1.12)				(0.11)					
5-30-01												
Catfish	U	U	U	U	U	U	0.30	U	U	U	0.41	d
Catfish	U	U	U	U	U	U	0.30	U	U	U	0.42	d
Carp	U	U	U	U	U	U	0.08	U	U	U	0.53	d
C. Sucker	U	U	0.44	U	U	U	0.28	U	U	U	0.46	d
C. Sucker	U	U	0.24	U	U	U	0.37	U	U	U	0.63	d
C. Sucker	U	U	U	U	U	U	0.20	U	U	U	0.54	d
Mean			0.18				0.26				0.50	
(std dev)			(0.14)				(0.10)				(0.08)*[e]	

Table 6-17. Total Recoverable Trace Element Concentrations (µg/g wet weight) in Nongame (Bottom-Feeding) Fish (Muscle Fillet) Collected Upstream and Downstream of Los Alamos National Laboratory in 2001 (Cont.)

Location/Date	Ag	As	Ba	Be	Cd	Cr	Hg	Ni	Pb	Sb	Se	CN
8-14-01												
Catfish	U	U	U	U	U	U	0.20	U	U	U	0.42	d
C. Sucker	U	U	U	U	U	U	0.23	U	U	U	0.47	d
C. Sucker	U	U	0.36	U	U	U	0.25	U	U	U	0.54	d
C. Sucker	U	U	0.27	U	[d]	U	0.19	U	U	U	0.54	d
C. Sucker	U	0.56	U	U	U	U	0.10	U	U	U	0.55	d
Carp	U	U	U	U	U	U	0.18	U	U	U	0.74	d
Carp	U	U	U	U	U	U	0.36	U	U	U	0.60	d
Carp	U	U	U	U	U	U	0.42	U	U	U	0.53	d
Mean		0.29	0.15				0.24				0.55	
(std dev)		(0.11)	(0.10)				(0.10)				(0.09)*	

[a]U = undetected; an analyte was analyzed but not detected above the reporting limit and was given a value of one-half the concentration (of the reporting limit) when a statistical calculation was needed. (Note: A mean was calculated when at least one number within the respective field was above the reporting limit.)

[b]Reporting Limit.

[c]Regional Statistical Reference Level is the upper-limit background (mean plus two standard deviations) from present data for the game fish. CN is from 1999 data.

[d]Sample lost in analysis or not analyzed or outlier omitted. An outlier was omitted when the result was greater than three standard deviations of the mean.

[e]Means within the same column and date followed by an * were significantly different from Abiquiu (background) using a Student's t-test at the 0.05 probability level.

Table 6-18. Mean (±SD) Total Recoverable Mercury Concentrations (µg/g wet weight) in Bottom-Feeding Fish (Muscle) Collected Upstream and Downstream of Los Alamos National Laboratory Before (1991–1999) and after (2000 and 2001) the Cerro Grande Fire[a]

Location/Date	Hg	
Upstream (Abiquiu Reservoir)		
1991–1999[b]	0.30	(0.10)
2000[c]	0.10	(0.06)
2001[d]	0.31	(0.05)
Downstream (Cochiti Reservoir)		
1991–1999[b]	0.20	(0.10)
2000[c]	0.17	(0.05)
2001[d]	0.23	(0.04)

[a]Game fish were not collected and analyzed for trace elements before the Cerro Grande fire, so only the bottom-feeders are given.
[b]Data from Fresquez and Gonzales (2000).
[c]Data from Fresquez et al. (2001c) and are the average of all three sampling dates.
[d]Data from Table 6-17 and are the average of all three sampling dates.

Table 6-19. Radionuclide Concentrations in Muscle and Bone Tissues of Elk Collected from On-Site, Perimeter, and Regional Areas during 1999 and 2000

Tissue/Location Sample	^{3}H (pCi/mL)[a]	^{tot}U (ng/g dry)	^{137}Cs (10^{-3} pCi/g dry)	^{90}Sr (10^{-3} pCi/g dry)	^{238}Pu (10^{-5} pCi/g dry)	^{239}Pu (10^{-5} pCi/g dry)	^{241}Am (10^{-5} pCi/g dry)
Muscle:							
LANL Elk[b]							
TA-53	0.81 (0.27)[c]	[h]	8.4 (12.8)	0.88 (1.32)	–16.3 (22.0)[d]	3.52 (12.8)	8.8 (17.6)
TA-18	0.29 (0.24)	0.53 (0.75)	3.5 (12.8)	2.20 (1.76)	3.1 (11.0)	0.00 (11.0)	20.2 (21.6)
San Ildefonso Pueblo Elk[e]							
	0.74 (0.26)	1.32 (0.88)	4.0 (14.1)	2.64 (1.32)	–3.1 (13.2)	18.92 (16.7)	5.3 (20.3)
Jemez Pueblo Elk[f]							
	–0.02 (0.23)	1.28 (0.97)	–22.0 (48.4)	[h]	–11.4 (16.7)	–2.64 (16.7)	–11.9 (31.7)
Regional Background Elk							
Mean (std dev)[g]	0.08 (0.25)	0.88 (0.61)	72.9 (107.8)	1.20 (2.05)	3.1 (16.5)	4.02 (13.7)	3.9 (10.2)
RSRL[g]	0.58	2.10	288.5	5.3	36.2	31.4	24.2
Leg Bone:							
LANL Elk[b]							
TA-53	0.95 (0.28)	8.12 (8.12)	0.0 (133.4)	864.2 (156.6)	–156.6 (156.6)	0.00 (150.8)	[h]
TA-18	0.40 (0.25)	8.70 (8.70)	–34.8 (139.2)	1374.6 (249.4)	0.0 (139.2)	0.00 (139.2)	58.0 (203.0)
San Ildefonso Pueblo Elk[e]							
	0.77 (0.27)	4.12 (5.63)	–58.0 (179.8)	1270.2 (232.0)	46.4 (150.8)	75.40 (133.4)	[h]
Jemez Pueblo Elk[f]							
	0.44 (0.71)	8.12 (6.96)	–58.0 (156.6)	922.2 (168.2)	–11.6 (150.8)	–29.00 (150.8)	[h]
Regional Background Elk							
Mean (std dev)[g]	0.08 (0.30)	3.02 (2.75)	30.5 (80.2)	1253.4 (827.9)	10.6 (44.9)	–9.83 (11.9)	41.0 (5.3)
RSRL[g]	0.68	8.52	190.8	2909.4	100.4	14.0	51.6

Table 6-19. Radionuclide Concentrations in Muscle and Bone Tissues of Elk Collected from On-Site, Perimeter, and Regional Areas during 1999 and 2000 (Cont.)

[a]pCi/mL of tissue moisture.
[b]Harvested on LANL lands on December 17, 1999, and November 19, 1999, respectively.
[c](± counting uncertainty); values are the uncertainty of the analytical results at 65% confidence level.
[d]See Appendix B for an explanation of the presence of negative values.
[e]This cow elk was radiocollared by LANL on March 31, 1999 (#1603503), and spent approximately 90% of the time in TAs-03 and -53 (James Biggs, personnel communication, 2001). She was harvested on San Ildefonso lands near Mortandad Canyon on January 29, 2000.
[f]Harvested on Jemez Pueblo lands on February 23, 2000.
[g]The mean (std dev) and the Regional Statistical Reference Level (mean + 2 std dev) are based on data collected from 1991 to 2000 (n=9).
[h]Sample lost in analysis or not analyzed, or outlier omitted. An outlier was omitted when the result was greater than three standard deviations of the mean (99% confidence level).

Table 6-20. Radionuclide Concentrations in Muscle and Bone Tissues of Deer Collected from On-Site, Perimeter, and Regional Areas during 2000

Tissue/Location Sample	^{3}H (pCi/mL)[a]		^{tot}U (ng/g dry)		^{137}Cs (10^{-3} pCi/g dry)		^{90}Sr (10^{-3} pCi/g dry)		^{238}Pu (10^{-5} pCi/g dry)		^{239}Pu (10^{-5} pCi/g dry)		^{241}Am (10^{-5} pCi/g dry)	
Muscle:														
LANL Deer (none collected during 2000)														
San Ildefonso Deer[b]	0.36	(0.44)[c]	0.99	(0.90)	–1.4	(11.7)	4.15	(1.80)	1.35	(13.05)	–0.09	(13.05)	4.5	(17.1)
Tesuque Deer[d]	–0.05	(0.22)[e]	0.09[e]	(0.77)	18.9	(16.7)	0.90	(1.35)	1.80	(16.65)	–2.70	(15.75)	3.2	(25.2)
Regional Background Deer														
Mean (std dev)[f]	0.09	(0.20)	0.86	(0.64)	13.7	(6.9)	20.47	(23.91)	2.33	(7.67)	4.97	(8.31)	–4.1	(22.7)
RSRL[f]	0.49		2.14		27.5		68.30		17.67		21.59		41.2	
Leg Bone:														
LANL Deer (none collected during 2000)														
San Ildefonso Deer[b]	0.07	(0.22)	0.11	(0.33)	–17.6	(110.0)	831.6	(154.0)	–0.90	(12.60)	1.35	(12.60)	4.5	(16.2)
Tesuque Deer[d]	–0.09	(0.22)	0.41	(0.45)	17.6	(110.0)	585.2	(105.6)	–5.85	(11.25)	4.50	(11.25)	12.6	(18.5)
Regional Background Deer														
Mean (std dev)[f]	0.01	(0.20)	1.30	(1.80)	10.5	(18.8)	959.0	(335.1)	–11.73	(14.96)	10.06	(19.1)	38.2	(35.7)
RSRL[f]	0.41		4.90		48.1		1629.2		18.19		48.18		109.6	

[a]pCi/mL of tissue moisture.
[b]A roadkill buck deer collected on October 4, 2000.
[c](±1 counting uncertainty); values are the uncertainty of the analytical results at the 65% confidence level.
[d]A roadkill doe collected on August 4, 2000.
[e]See Appendix B for an explanation of the presence of negative values.
[f]The mean (std dev) and the Regional Statistical Reference Level (mean + 2 std dev) are based on data collected from 1991 to 2000 (n=5).

Table 6-21. Radionuclide Concentrations in Prickly Pear (Fruit) Collected from Regional and Perimeter Areas during the 2001 Growing Season

Location	^{3}H (pCi/mL)	^{tot}U (ng/g dry)	^{137}Cs (10^{-3}pCi/g dry)	^{90}Sr (10^{-3}pCi/g dry)	^{238}Pu (10^{-5}pCi/g dry)	^{239}Pu (10^{-5}pCi/g dry)	^{241}Am (10^{-5}pCi/g dry)
Regional Background:							
Española/Santa Fe/ Jemez	0.23 (0.16)[a]	1.4 (0.81)	–32.3 (23.8)[b]	212.8 (19.5)	8.6 (10.5)	18.1 (10.9)	13.3 (12.4)
RSRL[c]	0.54	26.6	75.5	112.4	46.8	67.6	113.8
RSRL[d]	0.52	11.7	11.2	1,253.1	19.5	39.0	24.0
Off-Site Perimeter:							
San Ildefonso	0.99 (0.18)	9.50 (1.52)	–6.7 (19.5)	552.5 (47.0)	1.90 (11.9)	14.3 (8.1)	–1.9 (10.0)
Los Alamos Town Site	1.00 (0.18)	9.21 (1.62)	36.1 (24.2)	523.5 (47.5)	–6.7 (4.8)	5.7 (7.1)	37.1 (13.3)

Table 6-21. Radionuclide Concentrations in Prickly Pear (Fruit) Collected from Regional and Perimeter Areas during the 2001 Growing Season (Cont.)

Location	^{234}U (10^{-3}pCi/g dry)	^{235}U (10^{-4}pCi/g dry)	^{238}U (10^{-4}pCi/g dry)
Regional Background:			
Española/Santa Fe/ Jemez	0.89 (0.32)	0.48 (2.33)	0.48 (0.23)
RSRL[c]	6.5	2.6	5.6
RSRL[d]	1.5	5.1	1.0
Off-Site Perimeter:			
San Ildefonso	1.90 (0.37)	2.38 (1.47)	3.14 (0.48)
Los Alamos Town Site	2.95 (0.48)	2.00 (1.81)	3.04 (0.52)

[a](±1 counting uncertainty); values are the uncertainty of the analytical results at the 65% confidence level.
[b]See Appendix B for an explanation of the presence of negative values.
[c]Regional Statistical Reference Level; this is the upper-limit background concentration (mean + 2 std dev) based on produce data from 1994 to 2001 (Table 6-12).
[d]Regional Statistical Reference Level; this is the upper-limit background concentration (mean + 2 std dev) based on prickly pear data in 1999 and 2001.

Table 6-22. Total Recoverable Trace Element Concentrations (µg/g dry) in Prickly Pear (Fruit) Collected from Regional and Perimeter Areas during the 2001 Growing Season[a]

Location	Ag	As	Ba	Be	Cd	Cu	Hg	Ni	Pb	Sb	Se	Tl	Zn
Regional Background:													
Española/Santa Fe/Jemez	U[b]	U	130.0	U	U	U	U	1.2	1.7	U	0.43	U	11
RL[c]	<0.50	<0.50	<0.20	<0.20	<0.25	<0.50	<0.05	<1.0	<0.15	<0.40	<0.25	<0.40	<1
RSRL[d]	0.96	0.52	26.5	0.40	0.60	1.56	0.05	19.5	14.3	0.60	0.70	0.28	28
RSRL[e]	<0.50	<0.50	227.8	<0.20	<0.25	<0.50	<0.05	108.0	101.8	0.60	0.70	<0.40	11
Off-Site Perimeter:													
San Ildefonso	U	U	63.0	U	0.26	U	U	2.3	7.7	U	1.1	U	25
Los Alamos	U	U	140.0	U	0.45	U	U	4.2	3.6	U	1.3	U	27

[a]Analysis by EPA Method 3051 for total recoverable metals.
[b]U = undetected; an analyte was analyzed but not detected above the reporting limit and was given a value of one-half the concentration (of the reporting limit) when a statistical calculation was needed (e.g., RSRL).
[c]Reporting Limit.
[d]Regional Statistical Reference Level; this is the upper-limit background concentration (mean + 2 std dev) based on produce data from 1994 to 2001 (Table 6-11).
[e]Regional Statistical Reference Level; this is the upper-limit background concentration (mean + 2 std dev) based on prickly pear data from 1999 and 2001.

Table 6-23. Whole-Body Concentrations (µg/g fresh wt.) of PCBs and TEQs for Catfish Collected from Cochiti and Abiquiu Reservoirs

IUPAC No.:	#77		#81		#105		#114		#118		#123		#126	
Compound:	3,3',4,4'-TeCB		3,4,4',5-TeCB		2,3,3',4,4'-PeCB		2,3,4,4',5-PeCB		2,3',4,4',5-PeCB		2',3,4,4',5-PeCB		3,3',4,4',5-PeCB	
Sample ID	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ
Abiquiu Reservoir														
June														
6ARCAT1	9.36E-07	9.36E-11	5.38E-07	5.38E-11	5.35E-05	5.35E-09	4.20E-06	2.10E-09	1.48E-04	1.48E-08	3.38E-06	3.38E-10	3.36E-06	3.36E-07
6ARCAT2	[R]7.15E-07	7.15E-11	[R]7.79E-07	7.79E-11	1.39E-04	1.39E-08	1.04E-05	5.20E-09	3.72E-04	3.72E-08	7.52E-06	7.52E-10	5.20E-06	5.20E-07
6ARCAT3	9.81E-07	9.81E-11	[U]2.67E-07	2.67E-11	4.54E-05	4.54E-09	3.40E-06	1.70E-09	1.28E-04	1.28E-08	2.58E-06	2.58E-10	2.91E-06	2.91E-07
6ARCAT4	[R]7.21E-07	7.21E-11	[U]3.98E-07	3.98E-11	5.47E-05	5.47E-09	[R]3.91E-06	1.96E-09	1.61E-04	1.61E-08	3.51E-06	3.51E-10	[R]2.94E-06	2.94E-07
6ARCAT5	[R]1.04E-06	1.04E-10	[U]1.83E-07	1.83E-11	4.91E-05	4.91E-09	3.81E-06	1.91E-09	1.39E-04	1.39E-08	3.12E-06	3.12E-10	[R]3.10E-06	3.10E-07
Mean	8.79E-07	8.79E-11	4.33E-07	4.33E-11	6.83E-05	6.83E-09	5.14E-06	2.57E-09	1.90E-04	1.90E-08	4.02E-06	4.02E-10	3.50E-06	3.50E-07
Std Deviation	1.51E-07	1.51E-11	2.36E-07	2.36E-11	3.97E-05	3.97E-09	2.95E-06	1.48E-09	1.03E-04	1.03E-08	1.99E-06	1.99E-10	9.66E-07	9.66E-08
Cochiti Reservoir														
April														
4CRCAT1	2.12E-04	2.12E-08	[U]7.78E-07	7.78E-11	6.58E-04	6.58E-08	3.89E-05	1.95E-08	1.77E-03	1.77E-07	4.34E-05	4.34E-09	1.06E-05	1.06E-06
4CRCAT2	7.61E-06	7.61E-10	[U]1.74E-06	1.74E-10	1.10E-03	1.10E-07	7.28E-05	3.64E-08	3.30E-03	3.30E-07	7.43E-05	7.43E-09	1.33E-05	1.33E-06
4CRCAT3	8.89E-06	8.89E-10	[U]1.60E-06	1.60E-10	[D]5.65E-03	5.65E-07	4.18E-04	2.09E-07	[D]1.57E-02	1.57E-06	2.74E-04	2.74E-08	2.18E-05	2.18E-06
Mean	7.62E-05	7.62E-09	1.37E-06	1.37E-10	2.47E-03	2.47E-07	1.77E-04	8.83E-08	6.92E-03	6.92E-07	1.31E-04	1.31E-08	1.52E-05	1.52E-06
Std Deviation	1.18E-04	1.18E-08	5.20E-07	5.20E-11	2.76E-03	2.76E-07	2.10E-04	1.05E-07	7.64E-03	7.64E-07	1.25E-04	1.25E-08	5.85E-06	5.84E-07
August														
8CRCAT1*	3.64E-05	3.64E-09	2.99E-06	2.99E-10	5.17E-04	5.17E-08	3.30E-05	1.65E-08	1.68E-03	1.68E-07	4.80E-05	4.80E-09	1.06E-05	1.06E-06
8CRCAT2*	6.07E-06	6.07E-10	1.53E-06	1.42E-10	3.93E-04	3.93E-08	2.35E-05	1.17E-08	1.26E-03	1.26E-07	3.23E-05	3.23E-09	7.50E-06	7.50E-07
8CRCAT3*	5.24E-06	5.24E-10	2.53E-06	2.53E-10	5.00E-04	5.00E-08	3.07E-05	1.53E-08	1.77E-03	1.77E-07	4.53E-05	4.53E-09	1.08E-05	1.07E-06
8CRCAT4*	1.15E-05	1.15E-09	1.04E-06	1.33E-11	5.87E-04	5.87E-08	3.69E-05	1.85E-08	1.76E-03	1.76E-07	4.06E-05	4.06E-09	8.94E-06	8.94E-07
8CRCAT5*	6.17E-06	6.17E-10	[U]6.54E-07	6.54E-11	7.34E-04	7.34E-08	4.50E-05	2.25E-08	2.54E-03	2.54E-07	5.97E-05	5.97E-09	1.33E-05	1.33E-06
Mean	1.31E-05	1.31E-09	1.75E-06	1.54E-10	5.46E-04	5.46E-08	3.38E-05	1.69E-08	1.80E-03	1.80E-07	4.52E-05	4.52E-09	1.02E-05	1.02E-06
Std Deviation	1.33E-05	1.33E-09	9.85E-07	1.21E-10	1.26E-04	1.26E-08	7.95E-06	3.98E-09	4.64E-04	4.64E-08	1.00E-05	1.00E-09	2.16E-06	2.16E-07

Table 6-23. Whole-Body Concentrations (µg/g fresh wt.) of PCBs and TEQs for Catfish Collected from Cochiti and Abiquiu Reservoirs (Cont.)

IUPAC No.:	#156		#167		#169		#170		#180		#189			
Compound:	2,3,3',4,4',5-HxCB		2,3',4,4',5,5'-HxCB		3,3',4,4',5,5'-HxCB		2,2',3,3',4,4',5-HpCB		2,2',3,4,4',5,5'-HpCB		2,3,3',4,4',5,5'-HpCB			
Sample ID	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Total Conc.	Total TEQ
Abiquiu Reservoir														
June														
6ARCAT1	2.65E-05	1.33E-08	1.59E-05	1.59E-10	6.12E-06	6.12E-08	7.91E-05	7.91E-09	2.64E-04	2.64E-09	3.13E-06	3.13E-10	6.09E-04	4.44E-07
6ARCAT2	6.72E-05	3.36E-08	3.69E-05	3.69E-10	9.33E-06	9.33E-08	2.22E-04	2.22E-08	6.62E-04	6.62E-09	7.63E-06	7.63E-10	1.54E-03	7.34E-07
6ARCAT3	2.28E-05	1.14E-08	1.38E-05	1.38E-10	5.61E-06	5.61E-08	7.27E-05	7.27E-09	2.35E-04	2.35E-09	2.71E-06	2.71E-10	5.36E-04	3.88E-07
6ARCAT4	2.60E-05	1.30E-08	1.59E-05	1.59E-10	[U]1.47E-05	1.47E-07	7.96E-05	7.96E-09	2.70E-04	2.70E-09	2.82E-06	2.82E-10	6.36E-04	4.89E-07
6ARCAT5	2.56E-05	1.28E-08	1.52E-05	1.52E-10	4.89E-06	4.89E-08	8.54E-05	8.54E-09	2.73E-04	2.73E-09	3.09E-06	3.09E-10	6.07E-04	4.05E-07
Mean	3.36E-05	1.68E-08	1.95E-05	1.95E-10	8.13E-06	8.13E-08	1.08E-04	1.08E-08	3.41E-04	3.41E-09	3.88E-06	3.88E-10	7.86E-04	4.92E-07
Std Deviation	1.88E-05	9.41E-09	9.74E-06	9.74E-11	4.05E-06	4.05E-08	6.40E-05	6.40E-09	1.80E-04	1.80E-09	2.11E-06	2.11E-10	4.24E-04	1.41E-07
Cochiti Reservoir														
April														
4CRCAT1	2.43E-04	1.22E-07	1.38E-04	1.38E-09	[U]2.50E-06	2.50E-08	3.13E-04	3.13E-08	9.85E-04	9.85E-09	1.18E-05	1.18E-09	4.43E-03	1.54E-06
4CRCAT2	5.00E-04	2.50E-07	2.82E-04	2.82E-09	[U]9.00E-06	9.00E-08	6.93E-04	6.93E-08	2.10E-03	2.10E-08	2.40E-05	2.40E-09	8.18E-03	2.25E-06
4CRCAT3	2.82E-03	1.41E-06	9.68E-04	9.68E-09	[U]7.12E-06	7.12E-08	2.02E-03	2.02E-07	3.63E-03	3.63E-08	8.17E-05	8.17E-09	3.16E-02	6.29E-06
Mean	1.19E-03	5.94E-07	4.63E-04	4.63E-09	6.21E-06	6.21E-08	1.01E-03	1.01E-07	2.24E-03	2.24E-08	3.92E-05	3.92E-09	1.47E-02	3.36E-06
Std Deviation	1.42E-03	7.10E-07	4.44E-04	4.44E-09	3.35E-06	3.34E-08	8.96E-04	8.96E-08	1.33E-03	1.33E-08	3.73E-05	3.73E-09	1.47E-02	2.56E-06
August														
8CRCAT1*	2.03E-04	1.01E-07	1.44E-04	1.44E-09	[U]2.25E-06	2.25E-08	2.81E-04	2.81E-08	9.50E-04	9.50E-09	9.91E-06	9.91E-10	3.92E-03	1.47E-06
8CRCAT2*	1.46E-04	7.30E-08	1.13E-04	1.13E-09	[U]2.60E-06	2.60E-08	2.29E-04	2.29E-08	7.86E-04	7.86E-09	7.98E-06	7.98E-10	3.01E-03	1.06E-06
8CRCAT3*	2.03E-04	1.02E-07	1.76E-04	1.76E-09	[U]4.59E-06	4.59E-08	2.85E-04	2.85E-08	1.10E-03	1.10E-08	1.06E-05	1.06E-09	4.15E-03	1.51E-06
8CRCAT4*	2.37E-04	1.19E-07	1.35E-04	1.35E-09	[U]2.31E-06	2.31E-08	2.86E-04	2.86E-08	9.01E-04	9.01E-09	1.07E-05	1.07E-09	4.01E-03	1.33E-06
8CRCAT5*	3.37E-04	1.69E-07	2.64E-04	2.64E-09	[U]2.95E-06	2.95E-08	3.51E-04	3.51E-08	1.48E-03	1.48E-08	1.44E-05	1.44E-09	5.84E-03	1.93E-06
Mean	2.25E-04	1.13E-07	1.66E-04	1.66E-09	2.94E-06	2.94E-08	2.86E-04	2.86E-08	1.04E-03	1.04E-08	1.07E-05	1.07E-09	4.19E-03	1.46E-06
Std Deviation	7.05E-05	3.53E-08	5.91E-05	5.91E-10	9.62E-07	9.62E-09	4.30E-05	4.30E-09	2.67E-04	2.67E-09	2.33E-06	2.33E-10	1.03E-03	3.17E-07

* Whole-body concentrations are based on weight ratio of carcass, filet, and viscera times their respective concentrations.

[D] Indicates a value that resulted from the analysis of a diluted sample after the original concentration exceeded the calibrated linear range.

[R] Indicates that a peak was detected but did not meet quantification criteria; therefore, an estimated value was used.

[U] Indicates a concentration that was far enough below the detection limit that an estimate of concentration could not be made, thereby yielding a result of "nondetect." If the analyte was detected or quantified in other samples of the group of samples, the detection limit was entered as a conservative value.

Table 6-24. Whole-Body Concentration (µg/g wet weight) of PCDD/PCDF and TEQs[A] in Catfish From Cochiti and Abiquiu Reservoirs

Compound:	2,3,7,8-	1,2,3,7,8-PeCDD[4]		1,2,3,4,7,8-HxCDD		1,2,3,6,7,8-HxCDD		1,2,3,7,8,9-HxCDD		1,2,3,4,6,7,8-HpCDD		OCDD	
Sample ID	TCDD	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ
Abiquiu Reservoir													
June													
6ARCAT1	U	U	0.00E-06	U	0.00E-06	[U]1.00E-07	1.00E-08	U	0.00E-06	1.39E-07	1.39E-09	2.71E-07	2.71E-11
6ARCAT2	U	U	0.00E-06	U	0.00E-06	1.30E-07	1.30E-08	U	0.00E-06	1.79E-07	1.79E-09	2.46E-07	2.46E-11
6ARCAT3	U	U	0.00E-06	U	0.00E-06	[U]1.00E-07	1.00E-08	U	0.00E-06	[U]1.00E-07	1.00E-09	2.20E-07	2.20E-11
6ARCAT4	U	U	0.00E-06	U	0.00E-06	3.12E-07	3.12E-08	U	0.00E-06	9.80E-07	9.80E-09	6.37E-06	6.37E-10
6ARCAT5	U	U	0.00E-06	U	0.00E-06	[U]1.00E-07	1.00E-08	U	0.00E-06	[R]2.18E-07	2.18E-09	1.01E-06	1.01E-10
Mean	–	–	0.00E-06	–	0.00E-06	1.48E-07	1.48E-08	–	0.00E-06	3.23E-07	3.23E-09	1.62E-06	1.62E-10
Std Dev	–	–	0.00E-06	–	0.00E-06	9.24E-08	9.24E-09	–	0.00E-06	3.70E-07	3.70E-09	2.67E-06	2.67E-10
Cochiti Reservoir													
April													
4CRCAT1	1.08E-07	1.94E-07	1.94E-07	[R]1.09E-07	1.09E-08	[R]3.57E-07	3.57E-08	[R]1.16E-07	1.16E-08	[R]6.09E-07	6.09E-09	1.34E-06	1.34E-10
4CRCAT2	1.53E-07	3.19E-07	3.19E-07	1.31E-07	1.31E-08	[R]4.79E-07	4.79E-08	1.45E-07	1.45E-08	3.45E-07	3.45E-09	[R]4.73E-07	4.73E-11
4CRCAT3	[R]1.36E-07	[R]1.70E-07	1.70E-07	[U]1.00E-07	1.00E-08	2.57E-07	2.57E-08	[U]1.00E-07	1.00E-08	3.49E-07	3.49E-09	8.11E-07	8.11E-11
Mean	1.32E-07	2.28E-07	2.28E-07	1.13E-07	1.13E-08	3.64E-07	3.64E-08	1.20E-07	1.20E-08	4.34E-07	4.34E-09	8.75E-07	8.75E-11
Std Dev	2.27E-08	8.00E-08	8.00E-08	1.59E-08	1.59E-09	1.11E-07	1.11E-08	2.28E-08	2.28E-09	1.51E-07	1.51E-09	4.37E-07	4.37E-11
August													
8CRCAT1*	1.04E-07	1.52E-07	1.52E-07	1.01E-07	1.01E-08	2.43E-07	2.43E-08	1.01E-07	1.01E-08	3.28E-07	3.28E-09	6.74E-07	6.74E-11
8CRCAT2*	1.09E-07	1.17E-07	1.17E-07	[U]1.00E-07	1.00E-08	1.43E-07	1.43E-08	[U]1.00E-07	1.00E-08	2.12E-07	2.12E-09	4.69E-07	4.69E-11
8CRCAT3*	[U]1.00E-07	2.01E-07	2.01E-07	1.00E-07	1.00E-08	2.47E-07	2.47E-08	[U]1.00E-07	1.00E-08	3.14E-07	3.14E-09	3.87E-07	3.87E-11
8CRCAT4*	[U]1.00E-07	1.12E-07	1.12E-07	[U]1.00E-07	1.00E-08	1.31E-07	1.31E-08	[U]1.00E-07	1.00E-08	2.18E-07	2.18E-09	2.99E-07	2.99E-11
8CRCAT5*	[U]1.00E-07	1.38E-07	1.38E-07	[U]1.00E-07	1.00E-08	1.72E-07	1.72E-08	[U]1.00E-07	1.00E-08	1.94E-07	1.94E-09	2.95E-07	2.95E-11
Mean	1.03E-07	1.44E-07	1.44E-07	1.00E-07	1.00E-08	1.87E-07	1.87E-08	1.00E-07	1.00E-08	2.53E-07	2.53E-09	4.25E-07	4.25E-11
Std Dev	4.13E-09	3.57E-08	3.57E-08	4.51E-10	4.51E-11	5.50E-08	5.50E-09	5.54E-10	5.54E-11	6.29E-08	6.29E-10	1.57E-07	1.57E-11
Mean April + Aug.	1.14E-07												

Table 6-24. Whole-Body Concentration (µg/g wet weight) of PCDD/PCDF and TEQs[A] in Catfish From Cochiti and Abiquiu Reservoirs (Cont.)

Compound:	2,3,7,8-TCDF		2,3,7,8-TCDF		1,2,3,7,8-PeCDF		2,3,4,7,8-PeCDF		1,2,3,4,7,8-HxCDF		1,2,3,6,7,8-HxCDF		1,2,3,7,8,9-HxCDF	
Sample ID	**Conc.**	**TEQ**	**Conc.**	**TEQ**	**Conc.**	**TEQ**	**Conc.**	**TEQ**	**Conc.**	**TEQ**	**Conc.**	**TEQ**	**Conc.**	**TEQ**
Abiquiu Reservoir														
June														
6ARCAT1	1.15E-07	1.15E-08	[U]1.00E-07	1.00E-08	U	0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06
6ARCAT2	[U]1.00E-07	1.00E-08		0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06
6ARCAT3	1.25E-07	1.25E-08	[U]1.00E-07	1.00E-08	U	0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06
6ARCAT4	[U]1.00E-07	1.00E-08		0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06
6ARCAT5	[U]1.00E-07	1.00E-08		0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06	U	0.00E-06
Mean	1.08E-07	1.08E-08	4.00E-08	4.00E-09	–	0.00E-06	–	0.00E-06	–	0.00E-06	–	0.00E-06	–	0.00E-06
Std Dev	1.15E-08	1.15E-09	0.00E-06	5.48E-09	–	0.00E-06	–	0.00E-06	–	0.00E-06	–	0.00E-06	–	0.00E-06
Cochiti Reservoir														
April														
4CRCAT1	2.12E-07	2.12E-08	1.93E-07	1.93E-08	U	0.00E-06	1.44E-07	7.20E-08	U	0.00E-06	U	0.00E-06	U	0.00E-06
4CRCAT2	[R]1.26E-07	1.26E-08	1.68E-07	1.68E-08	U	0.00E-06	[R]2.42E-07	1.21E-07	U	0.00E-06	U	0.00E-06	U	0.00E-06
4CRCAT3	2.46E-07	2.46E-08	2.57E-07	2.57E-08	U	0.00E-06	1.88E-07	9.40E-08	U	0.00E-06	U	0.00E-06	U	0.00E-06
Mean	1.95E-07	1.95E-08	2.06E-07	2.06E-08	–	0.00E-06	1.91E-07	9.57E-08	–	0.00E-06	–	0.00E-06	–	0.00E-06
Std Dev	6.18E-08	6.18E-09	4.59E-08	4.59E-09	–	0.00E-06	4.91E-08	2.45E-08	–	0.00E-06	–	0.00E-06	–	0.00E-06
August														
8CRCAT1*	3.77E-07	3.77E-08	3.57E-07	3.57E-08	1.02E-07	5.09E-09	1.73E-07	8.63E-08	U	0.00E-06	U	0.00E-06	U	0.00E-06
8CRCAT2*	2.59E-07	2.59E-08	2.64E-07	2.64E-08	1.03E-07	5.14E-09	1.95E-07	9.76E-08	U	0.00E-06	U	0.00E-06	U	0.00E-06
8CRCAT3*	1.45E-07	1.45E-08	1.36E-07	1.36E-08	1.01E-07	5.05E-09	2.13E-07	1.06E-07	U	0.00E-06	U	0.00E-06	U	0.00E-06
8CRCAT4*	3.34E-07	3.34E-08	3.10E-07	3.10E-08	[U]1.00E-07	5.00E-09	1.23E-07	6.16E-08	U	0.00E-06	U	0.00E-06	U	0.00E-06
8CRCAT5*	2.53E-07	2.53E-08	2.35E-07	2.35E-08	[U]1.00E-07	5.00E-09	1.57E-07	7.87E-08	U	0.00E-06	U	0.00E-06	U	0.00E-06
Mean	2.74E-07	2.74E-08	2.60E-07	2.60E-08	1.01E-07	5.05E-09	1.72E-07	8.61E-08	–	0.00E-06	–	0.00E-06	–	0.00E-06
Std Dev	8.87E-08	8.87E-09	8.37E-08	8.37E-09	1.18E-09	5.91E-11	3.46E-08	1.73E-08	–	0.00E-06	–	0.00E-06	–	0.00E-06

Table 6-24. Whole-Body Concentration (µg/g wet weight) of PCDD/PCDF and TEQs[A] in Catfish From Cochiti and Abiquiu Reservoirs (Cont.)

Compound:	2,3,4,6,7,8-HxCDF		1,2,3,4,6,7,8-HpCDF		1,2,3,4,7,8,9-HpCDF		OCDF		Total Tetra-Dioxins[b]		Total Penta-Dioxins[b]	
Sample ID	**Conc.**	**TEQ**	**Conc.**	**TEQ**	**Conc.**	**TEQ**	**Conc.**	**TEQ**	**Conc.**	**TEQ**	**Conc.**	**TEQ**
Abiquiu Reservoir												
June												
6ARCAT1	U	0.00E-06	[R]1.04E-07	1.04E-09	U	0.00E-06	1.11E-07	1.11E-11	U	0.00E-06	U	0.00E-06
6ARCAT2	U	0.00E-06	[U]1.00E-07	1.00E-09	U	0.00E-06	1.23E-07	1.23E-11	U	0.00E-06	U	0.00E-06
6ARCAT3	U	0.00E-06	[U]1.00E-07	1.00E-09	U	0.00E-06	[R]1.03E-07	1.03E-11	U	0.00E-06	U	0.00E-06
6ARCAT4	U	0.00E-06	[R]1.20E-07	1.20E-09	U	0.00E-06	1.16E-07	1.16E-11	U	0.00E-06	U	0.00E-06
6ARCAT5	U	0.00E-06	[U]1.00E-07	1.00E-09	U	0.00E-06	[U]1.00E-07	1.00E-11	U	0.00E-06	U	0.00E-06
Mean	–	0.00E-06	1.05E-07	1.05E-09	–	0.00E-06	1.11E-07	1.11E-11	–	0.00E-06	–	0.00E-06
Std Dev	–	0.00E-06	8.67E-09	8.67E-11	–	0.00E-06	9.40E-09	9.40E-13	–	0.00E-06	–	0.00E-06
Cochiti Reservoir												
April												
4CRCAT1	U	0.00E-06	[R]3.29E-07	3.29E-09	U	0.00E-06	1.97E-07	1.97E-11	1.08E-07	1.08E-07	1.94E-07	9.70E-08
4CRCAT2	U	0.00E-06	[R]6.56E-07	6.56E-09	U	0.00E-06	[U]1.00E-07	1.00E-11	1.53E-07	1.53E-07	3.19E-07	1.60E-07
4CRCAT3	U	0.00E-06	[R]4.85E-07	4.85E-09	U	0.00E-06	1.21E-07	1.21E-11	[U]1.00E-07	1.00E-07	[U]1.00E-07	5.00E-08
Mean	–	0.00E-06	4.90E-07	4.90E-09	–	0.00E-06	1.39E-07	1.39E-11	1.20E-07	1.20E-07	2.04E-07	1.02E-07
Std Dev	–	0.00E-06	1.64E-07	1.64E-09	–	0.00E-06	5.10E-08	5.10E-12	2.86E-08	2.86E-08	1.10E-07	5.49E-08
August												
8CRCAT1*	U	0.00E-06	[R]4.03E-07	4.03E-09	U	0.00E-06	1.01E-07	1.01E-11	1.78E-07	1.78E-07	1.52E-07	7.62E-08
8CRCAT2*	U	0.00E-06	[R]3.38E-07	3.38E-09	U	0.00E-06	1.05E-07	1.05E-11	1.73E-07	1.73E-07	1.15E-07	5.75E-08
8CRCAT3*	U	0.00E-06	1.03E-07	1.03E-09	U	0.00E-06	[U]1.00E-07	1.00E-11	[U]1.00E-07	1.00E-07	1.21E-07	6.06E-08
8CRCAT4*	U	0.00E-06	1.03E-07	1.03E-09	U	0.00E-06	[U]1.00E-07	1.00E-11	[U]1.00E-07	1.00E-07	1.15E-07	5.77E-08
8CRCAT5*	U	0.00E-06	[U]1.00E-07	1.00E-09	U	0.00E-06	[U]1.00E-07	1.00E-11	[U]1.00E-07	1.00E-07	1.37E-07	6.84E-08
Mean	–	0.00E-06	2.10E-07	2.10E-09	–	0.00E-06	1.01E-07	1.01E-11	1.30E-07	1.30E-07	1.28E-07	6.41E-08
Std Dev	–	0.00E-06	1.49E-07	1.49E-09	–	0.00E-06	2.29E-09	2.29E-13	4.14E-08	4.14E-08	1.62E-08	8.08E-09

Table 6-24. Whole-Body Concentration (µg/g wet weight) of PCDD/PCDF and TEQs[A] in Catfish From Cochiti and Abiquiu Reservoirs (Cont.)

Compound:	Total Hexa-Dioxins		Total Hepta-Dioxins		Total Tetra-Furans		Total Penta-Furans		Total Hexa-Furans		Total Hepta-Furans		Total Dioxin/Furan	
Sample ID	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ	Conc.	TEQ
Abiquiu Reservoir														
June														
6ARCAT1	[U]1.00E-07	1.00E-08	1.39E-07	1.39E-09	1.15E-07	1.15E-08	U	0.00E-06	[U]1.00E-07	1.00E-08	U	0.00E-06	1.39E-12	6.72E-14
6ARCAT2	1.30E-07	1.30E-08	1.79E-07	1.79E-09	[U]1.00E-07	1.00E-08	U	0.00E-06	[U]1.00E-07	1.00E-08	U	0.00E-06	1.39E-12	6.09E-14
6ARCAT3	[U]1.00E-07	1.00E-08	[U]1.00E-07	1.00E-09	1.25E-07	1.25E-08	U	0.00E-06	[U]1.00E-07	1.00E-08	U	0.00E-06	1.27E-12	6.83E-14
6ARCAT4	3.12E-07	3.12E-08	1.20E-06	1.20E-08	[U]1.00E-07	1.00E-08	U	0.00E-06	1.22E-07	1.22E-08	U	0.00E-06	9.73E-12	1.24E-13
6ARCAT5	[U]1.00E-07	1.00E-08	1.63E-07	1.63E-09	[U]1.00E-07	1.00E-08	U	0.00E-06	[U]1.00E-07	1.00E-08	U	0.00E-06	2.09E-12	5.59E-14
Mean	1.48E-07	1.48E-08	3.56E-07	3.56E-09	1.08E-07	1.08E-08	–	0.00E-06	1.04E-07	1.04E-08	–	0.00E-06	3.18E-12	7.53E-14
Std Dev	9.24E-08	9.24E-09	4.73E-07	4.73E-09	1.15E-08	1.15E-09	–	0.00E-06	9.84E-09	9.84E-10	–	0.00E-06	3.68E-12	2.77E-14
Cochiti Reservoir														
April														
4CRCAT1	[U]1.00E-07	1.00E-08	2.51E-07	2.51E-09	2.12E-07	2.12E-08	2.44E-07	1.22E-07	[U]1.00E-07	1.00E-08	U	0.00E-06	5.22E-12	7.62E-13
4CRCAT2	2.76E-07	2.76E-08	3.45E-07	3.45E-09	[U]1.00E-07	1.00E-08	3.46E-07	1.73E-07	1.41E-07	1.41E-08	U	0.00E-06	5.12E-12	1.09E-12
4CRCAT3	2.57E-07	2.57E-08	3.49E-07	3.49E-09	4.62E-07	4.62E-08	1.88E-07	9.40E-08	[U]1.00E-07	1.00E-08	U	0.00E-06	4.88E-12	7.55E-13
Mean	2.11E-07	2.11E-08	3.15E-07	3.15E-09	2.58E-07	2.58E-08	2.59E-07	1.30E-07	1.14E-07	1.14E-08	–	0.00E-06	5.07E-12	8.71E-13
Std Dev	9.66E-08	9.66E-09	5.55E-08	5.55E-10	1.85E-07	1.85E-08	8.01E-08	4.01E-08	2.37E-08	2.37E-09	–	0.00E-06	1.75E-13	1.94E-13
August														
8CRCAT1*	6.62E-07	6.62E-08	4.64E-07	4.64E-09	5.30E-07	5.30E-08	3.74E-07	1.87E-07	U	0.00E-06	U	0.00E-06	6.28E-12	1.01E-12
8CRCAT2*	1.43E-07	1.43E-08	1.99E-07	1.99E-09	2.72E-07	2.72E-08	2.31E-07	1.15E-07	U	0.00E-06	U	0.00E-06	4.35E-12	8.04E-13
8CRCAT3*	2.86E-07	2.86E-08	6.06E-07	6.06E-09	1.46E-07	1.46E-08	2.35E-07	1.18E-07	U	0.00E-06	U	0.00E-06	4.44E-12	7.69E-13
8CRCAT4*	1.04E-07	1.04E-08	2.57E-07	2.57E-09	3.34E-07	3.34E-08	1.02E-07	5.09E-08	U	0.00E-06	U	0.00E-06	3.84E-12	6.31E-13
8CRCAT5*	1.74E-07	1.74E-08	5.29E-07	5.29E-09	2.53E-07	2.53E-08	1.57E-07	7.87E-08	U	0.00E-06	U	0.00E-06	4.09E-12	6.89E-13
Mean	2.74E-07	2.74E-08	4.11E-07	4.11E-09	3.07E-07	3.07E-08	2.20E-07	1.10E-07	–	0.00E-06	–	0.00E-06	4.60E-12	7.81E-13
Std Dev	2.28E-07	2.28E-08	1.76E-07	1.76E-09	1.42E-07	1.42E-08	1.02E-07	5.12E-08	–	0.00E-06	–	0.00E-06	9.66E-13	1.47E-13

[A] Indicates Toxicity Equivalence Quotient (TEQ) values as established by the World Health Organization.
[B] Values were based on World Health Organization for other dioxins/furans of similar composition.
* Whole-body concentrations are based on weight ratio of carcass, filet, and viscera times their respective concentrations.
[U] Indicates a concentration that was far enough below the detection limit that an estimate of concentration could not be made, thereby yielding a result of "nondetect." If the analyte was detected or quantified in other samples of the group of samples, the detection limit was entered as a conservative value.
[R] Indicates that a peak was detected but did not meet quantification criteria; therefore, an estimated value was used.

Table 6-25. Concentration (ng/g fresh wt.) of Organochlorine Pesticides in Whole-Body Catfish Collected from Cochiti and Abiquiu Reservoirs

Sample ID	Hexachloro-benzene	Alpha HCH	Beta HCH	Gamma HCH	Heptachlor	Aldrin	Oxychlordane	Trans-Chlordane	cis-Chlordane	Mirex
Abiquiu Reservoir										
June										
6ARCAT1	0.543	0.216	^{U}0.105	^{R}0.172	^{U}0.063	^{U}0.529	^{U}0.571	0.162	0.554	^{R}0.134
6ARCAT2	0.482	0.123	^{U}0.120	^{R}0.198	^{R}0.487	^{U}0.573	^{U}0.638	0.126	0.440	0.180
6ARCAT3	0.433	^{U}0.183	^{U}0.212	^{R}0.177	^{R}1.380	^{U}0.810	^{R}3.88	0.102	0.356	^{U}0.196
6ARCAT4	0.495	^{U}0.805	^{U}0.933	^{R}0.293	^{R}0.931	^{U}0.981	^{U}0.285	0.125	0.425	^{R}0.122
6ARCAT5	0.442	0.208	^{U}0.115	^{R}0.248	^{R}0.531	^{U}1.18	^{U}0.458	0.151	0.491	0.133
Mean	0.479	0.307	0.297	0.218	0.679	0.815	1.17	0.133	0.453	0.153
Std Deviation	0.044	0.281	0.358	0.052	0.498	0.274	1.52	0.024	0.074	0.033
Cochiti Reservoir										
April										
4CRCAT1	0.736	^{U}0.076	^{U}0.147	0.328	^{U}0.080	^{U}0.066	^{R}0.413	2.12	3.93	0.145
4CRCAT2	0.761	^{U}0.093	^{U}0.108	^{R}0.187	^{U}0.117	^{U}0.100	0.894	4.11	7.39	^{R}0.260
4CRCAT3	0.696	^{U}0.144	^{U}0.166	^{R}0.314	^{R}0.147	^{U}0.913	^{R}0.692	3.76	6.03	0.291
Mean	0.731	0.104	0.140	0.276	0.115	0.359	0.666	3.33	5.78	0.232
Std Deviation	0.033	0.035	0.030	0.078	0.034	0.480	0.242	1.06	1.74	0.077
August										
8CRCAT1*	0.643	^{U}0.143	^{U}0.165	^{U}0.191	0.114	^{U}0.425	0.464	2.22	3.39	^{R}0.195
8CRCAT2*	0.464	0.116	0.125	0.122	^{U}0.050	0.088	^{U}0.198	1.45	2.54	0.168
8CRCAT3*	0.485	0.251	^{U}0.276	^{U}0.371	^{U}0.257	0.081	^{U}0.452	1.81	3.37	0.168
8CRCAT4*	0.408	^{U}0.101	^{U}0.112	^{U}0.196	0.126	^{U}0.081	^{U}0.168	1.52	2.65	0.194
8CRCAT5*	0.281	^{U}0.109	^{U}0.120	^{U}0.154	^{U}0.096	^{U}0.073	0.311	1.33	2.87	0.224
Mean	0.456	0.144	0.160	0.207	0.129	0.149	0.319	1.67	2.96	0.190
Std Deviation	0.131	0.062	0.068	0.097	0.077	0.154	0.138	0.357	0.398	0.023

Table 6-25. Concentration (ng/g fresh wt.) of Organochlorine Pesticides in Whole-Body Catfish Collected from Cochiti and Abiquiu Reservoirs (Cont.)

Sample ID	*o,p′*-DDT	*p,p′*-DDT	Total DDT	*o,p′*-DDD	*p,p′*-DDD	Total DDD	*o,p′*-DDE	*p,p′*-DDE	Total DDE	Total DDT, DDD, and DDE (ppm)
Abiquiu Reservoir										
June										
6ARCAT1	0.11	0.901	1.01	0.052	0.515	0.567	0.138	10.0	10.1	0.012
6ARCAT2	0.10	0.693	0.795	0.043	0.554	0.597	0.093	18.2	18.3	0.020
6ARCAT3	[R]13.5	[NQ]0.719	[NQ]14.2	[U]0.376	[U]0.412	[U]0.788	[R]0.427	9.39	9.82	0.025
6ARCAT4	0.083	0.677	0.760	0.061	0.503	0.564	0.178	8.10	8.28	0.010
6ARCAT5	0.087	0.605	0.692	0.051	0.516	0.567	[R]0.132	8.85	8.98	0.010
Mean	2.78	0.719	3.50	0.117	0.500	0.617	0.194	10.9	11.1	0.015
Std Deviation	6.00	0.110	6.00	0.145	0.053	0.097	0.134	4.14	4.09	0.007
Cochiti Reservoir										
April										
4CRCAT1	0.320	2.53	2.85	0.423	4.84	5.26	0.476	38.5	39.0	0.047
4CRCAT2	0.721	6.04	6.76	0.757	9.04	9.80	1.05	[D]78.1	[D]79.2	0.096
4CRCAT3	[R]0.393	3.57	3.96	0.625	5.49	6.12	0.636	[D]47.5	[D]48.1	0.058
Mean	0.478	4.05	4.53	0.6017	6.46	7.06	0.721	54.7	55.4	0.067
Std Deviation	0.214	1.80	2.02	0.1682	2.26	2.41	0.296	20.8	21.1	0.026
August										
8CRCAT1*	0.706	5.48	6.19	0.965	6.86	7.83	1.10	47.1	48.2	0.062
8CRCAT2*	0.479	3.59	4.07	0.599	4.44	5.04	0.666	36.4	37.1	0.046
8CRCAT3*	0.671	5.23	5.90	0.439	3.86	4.30	0.834	49.6	50.5	0.061
8CRCAT4*	0.689	3.57	4.26	0.479	3.38	3.86	0.442	38.4	38.9	0.047
8CRCAT5*	0.428	4.21	4.63	0.186	3.52	3.71	0.473	47.0	47.5	0.056
Mean	0.594	4.42	5.01	0.534	4.41	4.94	0.703	43.7	44.4	0.054
Std Deviation	0.131	0.901	0.972	0.284	1.43	1.69	0.273	5.89	6.02	0.008

Table 6-25. Concentration (ng/g fresh wt.) of Organochlorine Pesticides in Whole-Body Catfish Collected from Cochiti and Abiquiu Reservoirs (Cont.)

Sample ID	Alpha Endosulphan	Dieldrin	Endrin	Beta Endosulphan	Endosulphan Sulphate	Methoxychlor	Delta HCH	Heptachlor Epoxide	trans-Nonachlor	cis-Nonachlor
Abiquiu Reservoir										
June										
6ARCAT1	0.056	0.123	^{U}0.014	^{U}0.019	0.220	^{U}0.003	^{U}0.003	0.039	0.945	0.402
6ARCAT2	^{U}0.017	^{R}0.087	^{R}0.017	^{U}0.022	0.135	^{U}0.020	^{U}0.002	0.029	0.993	0.406
6ARCAT3	0.066	^{J}0.121	^{U}0.008	^{U}0.041	^{J}0.142	^{U}0.004	^{U}0.004	0.019	0.712	0.307
6ARCAT4	0.076	0.116	^{U}0.011	^{U}0.016	0.179	^{U}0.004	^{U}0.002	0.043	0.713	0.320
6ARCAT5	^{R}0.090	0.112	^{U}0.018	^{U}0.030	0.199	^{U}0.007	^{U}0.003	0.041	0.749	0.328
Mean	0.061	0.112	0.014	0.026	0.175	0.008	0.003	0.034	0.822	0.353
Std Deviation	0.028	0.015	0.004	0.010	0.036	0.007	0.001	0.010	0.136	0.048
Cochiti Reservoir										
April										
4CRCAT1	^{R}0.099	0.229	^{U}0.018	^{U}0.018	0.420	^{U}0.010	^{R}0.005	0.124	3.63	1.31
4CRCAT2	0.090	0.210	^{U}0.020	0.072	0.320	^{U}0.008	0.003	0.100	5.95	2.15
4CRCAT3	^{R}0.129	0.254	^{U}0.023	0.055	0.365	^{U}0.009	0.005	0.168	4.11	1.46
Mean	0.106	0.231	0.021	0.048	0.368	0.009	0.004	0.131	4.56	1.64
Std Deviation	0.020	0.022	0.003	0.027	0.050	0.001	0.001	0.035	1.23	0.448
August										
8CRCAT1*	0.214	0.322	^{U}0.023	0.076	0.873	^{U}0.010	^{U}0.003	0.125	2.98	1.03
8CRCAT2*	0.124	0.298	0.009	0.029	0.470	^{U}0.003	^{U}0.004	0.078	2.57	1.05
8CRCAT3*	0.084	^{J}0.356	^{U}0.010	^{U}0.029	^{J}0.542	^{U}0.006	^{U}0.004	0.088	3.14	1.18
8CRCAT4*	0.086	^{J}0.331	^{U}0.010	^{U}0.033	^{J}0.589	^{U}0.004	^{U}0.004	0.080	2.91	1.11
8CRCAT5*	0.058	0.186	^{U}0.010	^{U}0.036	^{J}0.332	^{U}0.003	^{U}0.004	0.042	3.69	1.45
Mean	0.113	0.299	0.012	0.041	0.561	0.005	0.004	0.082	3.06	1.16
Std Deviation	0.061	0.066	0.006	0.020	0.200	0.003	0.001	0.029	0.412	0.172

* Whole concentration values are based on weight ratio of carcass, filet, and viscera times their respective concentrations.

^{D} Indicates a value that resulted from the analysis of a diluted sample after the original concentration exceeded the calibrated linear range.

^{R} Indicates that a peak was detected but did not meet quantification criteria; therefore, an estimated value was used.

^{U} Indicates a concentration that was far enough below the detection limit that an estimate of concentration could not be made, thereby yielding a result of "nondetect." If the analyte was detected or quantified in other samples of the group of samples, the detection limit was entered as a conservative value.

^{NQ} Indicates a concencentration for p,p' DDT could not be quantified. A value consisting of the mean of the other samples was entered to allow for evaluation.

^{J} Denotes "J" Lab Flags indicating a concentration between the required detection limit of 0.10 and Axys detection limit of 0.5.

Table 6-26. Radionuclide Concentrations (Total Propagated Analytical Uncertainty, 99% Confidence Level) in Unwashed Vegetation Collected from Area G in 2001[a]

Sample Location and Type[1]	^{3}H (pCi/mL)[b]	^{241}Am (pCi/g ash)	^{137}Cs (pCi/g ash)	^{238}Pu (pCi/g ash)	$^{239,240}Pu$ (pCi/g ash)	^{90}Sr (pCi/g ash)	^{tot}U (µg/g ash)
1-OS	481 (91.5)	0.028 (0.014)	–0.14 (0.75)	0.0015 (0.0047)	0.0073 (0.0074)	2.00 (0.56)	0.33 (0.11)
1-US	900 (165)	0.003 (0.008)	–0.16 (0.69)	0.0010 (0.0051)	0.0012 (0.0039)	1.77 (0.48)	0.22 (0.08)
2-OS	256 (48.0)	0.283 (0.075)	–0.39 (0.72)	0.0179 (0.0146)	0.0710 (0.0285)	13.2 (3.60)	0.44 (0.14)
2-US	418 (79.5)	0.003 (0.006)	0.14 (0.78)	0.0000 (0.0023)	0.0038 (0.0051)	1.91 (0.53)	0.14 (0.06)
3-OS	3.71 (0.86)	0.030 (0.018)	–0.04 (0.39)	0.0061 (0.0065)	0.0260 (0.0141)	2.07 (0.57)	0.79 (0.23)
3-US	3.78 (0.87)	0.004 (0.008)	0.42 (0.69)	0.0035 (0.0054)	0.0019 (0.0044)	1.80 (0.50)	0.20 (0.08)
3b-OS	1.75 (0.53)	0.007 (0.006)	–0.01 (0.69)	0.0038 (0.0053)	0.0047 (0.0062)	7.60 (2.10)	0.55 (0.17)
3b-US	1.63 (0.51)	0.002 (0.005)	–0.23 (0.77)	–0.0001 (0.0027)	0.0038 (0.0053)	2.89 (0.78)	0.20 (0.08)
4-OS	2.27 (0.62)	0.019 (0.012)	0.04 (0.36)	–0.0002 (0.0036)	0.0029 (0.0068)	4.16 (1.13)	0.36 (0.11)
4-US	2.06 (0.39)	0.086 (0.029)	–0.19 (0.77)	0.0151 (0.0137)	0.0210 (0.0150)	4.26 (1.16)	0.16 (0.06)
6b-OS	0.77 (0.41)	0.006 (0.008)	–0.13 (0.80)	0.0008 (0.0041)	0.0054 (0.0065)	5.27 (1.43)	0.37 (0.11)
7a-US	8.00 (1.65)	0.006 (0.009)	–0.50 (0.74)	–0.0001 (0.0029)	0.0015 (0.0032)	0.51 (0.14)	0.28 (0.09)
7b-US	7.15 (1.47)	0.004 (0.009)	–0.12 (0.36)	–0.0018 (0.0057)	0.0110 (0.0092)	0.97 (0.27)	0.13 (0.06)
7c-OS	3.64 (0.84)	0.003 (0.006)	0.20 (0.83)	0.0031 (0.0081)	0.0034 (0.0065)	3.40 (0.93)	0.31 (0.09)
7c-US	2.74 (0.69)	0.096 (0.035)	–0.23 (0.77)	0.0620 (0.027)	0.2560 (0.0705)	2.06 (0.56)	0.38 (0.12)
8-OS	0.71 (0.39)	0.000 (0.005)	0.22 (0.78)	0.0043 (0.0080)	0.0010 (0.0048)	3.45 (0.93)	0.30 (0.11)
8-US	0.11 (0.35)	0.001 (0.005)	0.01 (0.38)	–0.0045 (0.0050)	0.0016 (0.0048)	0.96 (0.27)	0.15 (0.06)
BG-OS (9)	0.32 (0.36)	0.044 (0.020)	0.04 (0.59)	0.0105 (0.0087)	0.0610 (0.0225)	9.10 (2.40)	0.49 (0.14)
BG-US (9)	0.23 (0.36)	0.004 (0.005)	0.17 (0.39)	–0.0013 (0.0023)	0.0014 (0.0030)	1.17 (0.32)	0.16 (0.06)
RSRL-OS[c]	1.9	0.017	1.7	0.038	0.075	17.09	1.6
RSRL-US[c]	1.6	0.010	0.94	0.005	0.011	3.8	1.5

[a]See Figure 6-3 for locations of sampling sites.
[b]Concentration for ^{3}H is based on moisture in vegetation.
[c]Regional Statistical Reference Level; this is the upper- (95%) level background concentration (mean + 2 std dev) from 1994–1997.

Table 6-27. Radionuclide Concentrations (Total Propagated Analytical Uncertainty, 99% Confidence Level) in Overstory (OS) and Understory (US) Vegetation Collected Around the DARHT Facility in 2001[a]

Sample Location	Element Concentration (Ash Weight Basis)						
	^{3}H (pCi/mL)	^{90}Sr (pCi/g)	^{tot}U (µg/g)	^{137}Cs (pCi/g)	^{238}Pu (pCi/g)	$^{239,240}Pu$ (pCi/g)	^{241}Am (pCi/g)
North							
OS	–0.09 (0.35)	0.40 (0.12)	0.46 (0.15)	0.21 (0.54)	0.004 (0.011)	0.006 (0.011)	–0.006 (0.009)
US	–0.06 (0.35)	0.44 (0.14)	0.49 (0.14)	–0.07 (0.66)	0.002 (0.006)	0.001 (0.003)	0.000 (0.006)
East							
OS	0.22 (0.36)	6.40 (1.80)	6.46 (1.40)	0.22 (0.57)	–0.000 (0.002)	0.001 (0.002)	0.000 (0.024)
US	-0.12 (0.35)	3.95 (1.08)	1.85 (0.42)	0.08 (0.60)	–0.002 (0.005)	0.001 (0.005)	0.001 (0.005)
South							
OS	0.21 (0.36)	4.34 (1.17)	7.39 (1.58)	–0.18 (0.74)	0.001 (0.005)	–0.001 (0.003)	0.009 (0.011)
US	–0.09 (0.35)	1.12 (0.32)	7.45 (1.58)	0.02 (0.84)	–0.001 (0.003)	0.001 (0.005)	0.003 (0.008)
West							
OS	0.07 (0.35)	6.50 (1.80)	0.99 (0.24)	–0.10 (0.30)	0.002 (0.006)	0.002 (0.005)	0.005 (0.009)
US	0.16 (0.35)	0.99 (0.27)	1.01 (0.24)	–0.05 (0.62)	–0.001 (0.003)	0.000 (0.003)	0.001 (0.005)
Mean(SD)							
OS	0.10 (0.15)	4.41 (2.85)	3.83 (3.61)	0.04 (0.21)	0.002 (0.002)	0.002 (0.003)	0.002 (0.006)
US	–0.03 (0.13)	1.63 (1.58)	2.70 (3.22)	–0.01 (0.07)	–0.001 (0.002)	0.001 (0.001)	0.001 (0.001)
RBG[b]							
OS	0.063 (0.64)	2.08 (0.32)	0.373 (0.040)	0.39 (0.59)	0.001 (0.001)	0.002 (0.001)	0.005 (0.002)
US	0.287 (0.66)	2.08 (0.39)	0.240 (0.027)	0.23 (0.47)	0.001 (0.001)	0.003 (0.002)	0.004 (0.002)
BSRL[c]							
OS	1.02	8.03	1.97	1.33	0.028	0.006	0.016
US	0.99	4.75	2.89	0.98	0.004	0.013	0.011

[a]See Figure 6-3 for locations of sample sites.
[b]RBG is the mean regional background concentration for samples from Embudo, Cochiti, and Jemez collected in 1999 (Tables 6-24 and 6-25 in Fresquez and Gonzales 2000).
[c]BSRL is the Baseline Statistical Reference Level (Fresquez et al., 2001b).

Table 6-28. Total Trace Element Concentrations (µg/g dry) in Overstory (OS) and Understory (US) Vegetation Collected Around the DARHT Facility in 2001[a]

Location	Ag	As	Ba	Be	Cd	Cr	Cu	Hg	Ni	Pb	Sb	Se	Tl
North													
OS	1.00[b]	0.25[b]	8.80	0.10[b]	0.50[b]	0.50[b]	RR[c]	0.03[b]	1.00[b]	0.5	0.2[b]	0.2[b]	0.2[b]
US	1.00[b]	0.25[b]	13.0	0.10[b]	0.50[b]	0.50[b]	RR[c]	0.03[b]	1.00[b]	0.9	0.2[b]	0.2[b]	0.2[b]
East													
OS	1.00[b]	0.25[b]	31.5	0.10[b]	0.50[b]	0.50[b]	RR[c]	0.03[b]	1.00[b]	0.7	0.2[b]	0.2[b]	0.2[b]
US	1.00[b]	0.25[b]	43.3	0.10[b]	0.50[b]	0.50[b]	RR[c]	0.03[b]	1.00[b]	0.2[b]	0.2[b]	0.2[b]	0.2[b]
South													
OS	1.00[b]	0.25[b]	25.6	0.10[b]	0.50[b]	0.50[b]	RR[c]	0.03[b]	1.00[b]	1.0	0.2[b]	0.2[b]	0.2[b]
US	1.00[b]	0.25[b]	36.4	0.10[b]	0.50[b]	0.50[b]	RR[c]	0.03[b]	1.00[b]	0.2[b]	0.2[b]	0.2[b]	0.2[b]
West													
OS	1.00[b]	0.25[b]	17.6	0.10[b]	0.50[b]	0.50[b]	RR[c]	0.03[b]	1.00[b]	0.5	0.2[b]	0.2[b]	0.2[b]
US	1.00[b]	0.25[b]	19.7	0.10[b]	0.50[b]	0.50[b]	RR[c]	0.03[b]	1.00[b]	0.5	0.2[b]	0.2[b]	0.2[b]
OS Mean	1.00[b]	0.25[b]	20.87	0.10[b]	0.50[b]	0.50[b]	RR[c]	0.03[b]	1.00[b]	0.68	0.20[b]	0.20[b]	0.20[b]
(SD)	(0.00)	(0.00)	(9.86)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.24)	(0.00)	(0.00)	(0.00)
US Mean	1.00[b]	0.25[b]	28.1	0.10[b]	0.50[b]	0.50[b]	RR[c]	0.03[b]	1.00[b]	0.45	0.20[b]	0.20[b]	0.20[b]
(SD)	(0.00)	(0.00)	(14.2)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.33)	(0.00)	(0.00)	(0.00)
RBG[d]													
OS	0.13[b]	0.10[b]	32.5	0.06[b]	0.13[b]	0.63	NA[e]	0.05[b]	1.10[b]	0.40	0.20[b]	0.20[b]	0.50[b]
US	0.13[b]	0.10[b]	69.0	0.06[b]	0.25	0.63	4.8	0.05	1.10[b]	0.70	0.20[b]	0.20[b]	0.50[b]
BSRL[f]													
OS	1.03	0.28	67.9	0.13	0.56	1.00	4.60	0.06	4.95	6.10	8.55	0.35	0.27
US	1.11	0.28	82.0	0.12	0.56	0.77	12.4	0.09	5.58	3.19	8.54	0.27	0.27

[a]See Figure 6-3 for locations of sampling sites.
[b]Analysis was below the specific detection limit of the analytical method, so these values are reported as one-half the detection limit.
[c]Analytical results suspected of being incorrect; resampling and reanalysis underway (RR).
[d]Regional background (RBG) overstory and understory vegetation samples collected 1996 (Fresquez et al., 1997c).
[e]No analysis (NA).
[f]BSRL is the Baseline Statistical Reference Level (Fresquez et al., 2001b).

Table 6-29. Radionuclide Analytical Results from Honey Bee Samples Collected from Colonies Near DARHT and a Control Site in 2000

	Units	DARHT Colony 1	Analytical Uncertainty[a]	DARHT Colony 2	Analytical Uncertainty	DARHT Colony 3	Analytical Uncertainty	DARHT Colony 4	Analytical Uncertainty	DARHT Colony 5	Analytical Uncertainty	Control Colony	Analytical Uncertainty	RSRL
^{3}H	pCi/L	180	410	1,530	540	270	420	1,800	560	90	400	–270	360	4763.20[b]
^{137}Cs	pCi/g	–9.32	27.46	0.00	6.61	–5.76	44.29	–1.84	9.85	–1.13	5.31	0.00	13.41	0.38[b]
^{241}Am	pCi/g	0.1520	0.1033	0.0715	0.0507	0.0169	0.0127	–0.0053	0.0079	–0.0078	0.1139	0.0091	0.0049	0.0268[b]
^{7}Be	pCi/g	116	68	0.00	44.33	0.0	124	25.88	19.05	16.73	11.20	–15.9	143.5	29.16[c]
^{214}Bi	pCi/g	20.0	7.1	3.63	1.64	13.32	4.59	2.44	1.77	2.31	1.19	13.50	3.72	17.59[c]
^{57}Co	pCi/g	–2.20	7.42	0.335	0.850	–2.33	18.67	1.88	1.48	2.22	0.85	0.00	11.85	0.86[c]
^{60}Co	pCi/g	–0.71	3.67	–1.51	2.67	–1.03	3.26	0.00	7.86	–1.10	2.03	0.68	2.62	26.31[c]
^{40}K	pCi/g	101	50	69.1	19.9	218.64	50.40	101	24	180	25	229	46	628.69[c]
^{54}Mn	pCi/g	0.00	16.18	0.314	0.484	1.19	2.30	–0.46	1.05	0.00	4.66	0.28	1.92	2.44[c]
^{214}Pb	pCi/g	20.2	7.3	2.16	2.59	11.74	4.40	1.82	3.54	2.39	2.10	13.9	4.5	27.10[c]
^{208}Tl	pCi/g	–4.7	21.2	–2.10	2.32	–3.95	4.23	–1.28	1.96	–0.85	1.67	–4.16	15.80	–0.85[c]
^{238}Pu	pCi/g	0.1996	0.0203	0.0166	0.0105	0.0054	0.0071	–2.5019	3.4058	0.0044	0.0034	0.0006	0.0052	0.0070[b]
^{239}Pu	pCi/g	0.0065	0.0072	0.0312	0.0096	0.0191	0.0089	–1.7870	4.4424	0.0108	0.0037	0.0010	0.0069	0.0193[b]
^{90}Sr	pCi/g	–0.93	1.69	1.34	1.49	–0.10	1.56	1.68	1.49	1.74	1.08	0.41	0.95	2.75[d]

[a]Analytical Uncertainty. Values are the uncertainty in the analytical results at the 65% confidence level (one sigma).
[b]Regional Statistical Reference Level. The upper- (95%) level background concentration (mean + two sigma) from 1997, 1998, 1999, and 2000 control data.
[c]Regional Statistical Reference Level. The upper- (95%) level background concentration (mean + two sigma) from 1998 and 2000 control data.
[d]Regional Statistical Reference Level. The upper- (95%) level background concentration (mean + two sigma) from 1999 and 2000 control data.
Note: Results are considered valid if they are >2 times the analytical uncertainty.

Table 6-30. Heavy Metal Analytical Results from Honey Bee Samples Collected from Colonies Near DARHT and a Control Site in 2000

	Units	DARHT Colony 1	Analytical Uncertainty[a]	DARHT Colony 2	Analytical Uncertainty	DARHT Colony 3	Analytical Uncertainty	DARHT Colony 4	Analytical Uncertainty	DARHT Colony 5	Analytical Uncertainty	Control Colony	Analytical Uncertainty	RSRL[b]
Ag	mg/kg	<2	0	<2	0	<2	0	<2	0	<2	0	<2	0	1.00
Ba	mg/kg	1.8	0.2	3.2	0.3	2.2	1	3.1	1	3.2	1	0.78	0.2	1.39
Be	mg/kg	<0.2	0	<0.2	0	<0.2	0	<0.2	0	<0.2	0	<0.2	0	0.15
Cr	mg/kg	<1	0	<1	0	<1	0	<1	0	<1	0	<1	0	0.55
Cu	mg/kg	6.6	1	7	1	5.8	7	6.5	1	5.1	1	6	1	6.96
Ni	mg/kg	<2	0	<2	0	<2	0	<2	0	2	2	<2	0	2.91
Pb	mg/kg	<0.4	0	<0.4	0	<0.4	0	<0.4	0	<0.4	0	<0.4	0	0.25
Sb	mg/kg	<0.4	0	<0.4	0	<0.4	0	<0.4	0	<0.4	0	<0.4	0	0.25
Tl	mg/kg	<0.4	0	<0.4	0	<0.4	0	<0.4	0	<0.4	0	<0.4	0	0.25
As	mg/kg	<0.5	0	<0.5	0	<0.5	0	<0.5	0	<0.5	0	<0.5	0	0.30
Se	mg/kg	0.9	0.4	0.9	0.9	0.8	0.9	0.9	2	1.6	0.7	1.5	0.5	2.73
Hg	mg/kg	<0.05	0	<0.05	0	<0.05	0	<0.05	0	<0.05	0	<0.05	0	0.03

[a]Analytical Uncertainty. Values are the uncertainty in the analytical results at the 65% confidence level (one sigma).
[b]Regional Statistical Reference Level. The upper- (95%) level background concentration (mean + two sigma) from 1997 and 2000 control data.
Note: Results are considered valid if they are >2 times the analytical uncertainty.

Table 6-31. Tritium Concentrations (± Counting Uncertainty) in Blood from Elk Collected from LANL and Perimeter Areas 1995–2001

Location and Date of Collection	Game Animal/ Identification Number[a]	pCi/mL
LANL/TA-49/2-03-95	Elk Cow/#43251	0.30 (0.15)
LANL/TA-49/2-28-95	Elk Cow/#43253	0.60 (0.15)*
LANL/TA-49/3-21-95	Elk Bull/#43250	0.80 (0.15)*
LANL/TA-18/3-21-95	Elk Cow/#43254	0.40 (0.15)
LANL/TA-18/3-12-96	Elk Cow/#16037	0.30 (0.20)
LANL/TA-18/3-15-96	Elk Cow/#16036	0.50 (0.20)
LANL/TA-18/3-19-96	Elk Cow/#1603401	2.20 (0.20)*
LANL/TA-18/3-27-96	Elk Cow/#1603501	0.50 (0.20)
LANL/TA-16/4-02-96	Elk Cow/#1603301	0.20 (0.20)
LANL/TA-16/4-23-96	Elk Bull/#1603801	0.20 (0.20)
LANL/TA-8/4-22-96	Elk Cow	0.40 (0.20)
LANL/TA-15/3-14-97	Elk Cow/#1603802	0.40 (0.22)
LANL/TA-15/1-06-98	Elk Cow/#E3002	0.27 (0.24)
LANL/TA-36/1-15-98	Elk Bull/#E3003	0.10 (0.23)
LANL/TA-40/2-26-98	Elk Cow/#1603502	0.63 (0.25)
LANL/TA-40/3-10-98	Elk Cow/#1603302	0.65 (0.25)
LANL/TA-40/3-11-98	Elk Cow/#1603402	0.14 (0.24)
LANL/TA-22/3-31-99	Elk Cow/1603503	0.21 (0.21)
LANL/TA-36/1-24-01	Elk Cow/#21	0.79 (0.13)*[d]
LANL/TA-54/1-24-01	Elk Cow/#37	0.10 (0.12)
LANL/TA-36/1-24-01	Elk Bull/#23	0.79 (0.13)*
LANL/TA-36/1-30-01	Elk Cow/#22	0.82 (0.14)*
LANL/TA-36/1-31-01	Elk/#L27	2.25 (0.22)*
LANL/TA-54/1-31-01	Elk/#L28	0.28 (0.12)
LANL/TA-54/1-31-01	Elk/#CDBY1	0.38 (0.12)*
LANL/TA-54/1-31-01	Elk/#L25	0.73 (0.13)*
LANL/TA-54/2-01-01	Elk/#L31	0.51 (0.13)*
LANL/TA-36/2-06-01	Elk/#24	0.04 (0.11)
Min.		0.04
Max.		2.25
Mean (std dev)		*0.55 (0.53)***[e]
Bandelier National Park/1-06-00	Elk/#52	0.07 (0.23)
Bandelier National Park/1-06-00	Elk/#58	0.71 (0.27)
Bandelier National Park/1-06-00	Elk/#59	0.69 (0.23)*
Bandelier National Park/1-06-00	Elk/#62	0.64 (0.23)
Bandelier National Park/1-06-00	Elk/#63	0.11 (0.24)
Bandelier National Park/1-06-00	Elk/#65	0.71 (0.23)*
Bandelier National Park/1-06-00	Elk/#68	0.10 (0.24)
Bandelier National Park/1-06-00	Elk/#70	–0.17 (0.23)
Bandelier National Park/1-07-00	Elk/#5	0.55 (0.26)
Bandelier National Park/1-07-00	Elk/#69	–0.10 (0.23)
Bandelier National Park/1-07-00	Elk/#13	–0.16 (0.23)
Bandelier National Park/1-07-00	Elk/#17	0.10 (0.24)
Bandelier National Park/1-07-00	Elk/#20	0.02 (0.23)

Table 6-31. Tritium Concentrations (± Counting Uncertainty) in Blood from ElkCollected from LANL and Perimeter Areas 1995–2001 (Cont.)

Location and Date of Collection	Game Animal/ Identification Number[a]	pCi/mL
Bandelier National Park/1-08-00	Elk/#26	0.35 (0.24)
Bandelier National Park/1-08-00	Elk/#28	–0.29 (0.22)
Bandelier National Park/1-08-00	Elk/#8	0.24 (0.23)
Bandelier National Park/1-08-00	Elk/#9	0.02 (0.23)
Bandelier National Park/1-10-01	Elk/#L1-471958	1.15 (0.15)*
Bandelier National Park/1-10-01	Elk/#33	1.14 (0.15)*
Bandelier National Park/1-10-01	Elk/#34	0.74 (0.13)*
Bandelier National Park/1-10-01	Elk/#35	0.28 (0.12)
Bandelier National Park/1-10-01	Elk/#37	0.25 (0.12)
Bandelier National Park/1-10-01	Elk/#38	–0.01 (0.11)
Bandelier National Park/1-10-01	Elk/#39	0.29 (0.12)
Bandelier National Park/1-10-01	Elk/#40	0.70 (0.13)*
Bandelier National Park/1-11-01	Elk/#L13	0.22 (0.12)
Bandelier National Park/1-11-01	Elk/#L14	0.59 (0.13)*
Bandelier National Park/1-11-01	Elk Bull/#L15	0.77 (0.13)*
Bandelier National Park/1-11-01	Elk/#L18	0.34 (0.12)
Bandelier National Park/1-11-01	Elk/#L11	0.10 (0.12)
Bandelier National Park/1-11-01	Elk/#L12	0.21 (0.12)
Bandelier National Park/1-11-01	Elk/#L8	0.15 (0.12)
Bandelier National Park/1-11-01	Elk/#L7	2.96 (0.23)*
Bandelier National Park/1-11-01	Elk/L4	0.87 (0.14)*
Bandelier National Park/1-11-01	Elk/#L3	0.05 (0.11)
Bandelier National Park/1-12-01	Elk/#44	0.29 (0.12)
Bandelier National Park/1-12-01	Elk/#L6	0.28 (0.12)
Bandelier National Park/1-12-01	Elk/#L5	0.43 (0.12)*
Bandelier National Park/1-12-01	Elk/#L9	0.31 (0.12)
Bandelier National Park/1-12-01	Elk/#L10	0.25 (0.12)
Bandelier National Park/1-12-01	Elk/#L19	0.36 (0.12)*
Bandelier National Park/1-12-01	Elk/#L20	0.20 (0.12)
Bandelier National Park/1-12-01	Elk/#43	1.36 (0.16)*
Bandelier National Park/1-12-01	Elk/#L16	0.38 (0.12)*
Bandelier National Park/1-12-01	Elk/#L17	0.13 (0.12)
Bandelier National Park/1-16-01	ElkCow/#50	0.03 (0.11)
Bandelier National Park/1-16-01	Elk/#48	1.10 (0.15)*
Bandelier National Park/1-16-01	ElkCow/#46	0.15 (0.12)
Bandelier National Park/2-03-01	ElkCow/#127	0.83 (0.14)*
Bandelier National Park/2-03-01	ElkCow/#30	2.05 (0.19)*
Bandelier National Park/2-03-01	ElkCow/#47	0.10 (0.11)
Bandelier National Park/2-03-01	Elk/#45	0.43 (0.12)*
Bandelier National Park/2-03-01	ElkCow/#128	0.00 (0.11)
Bandelier National Park/2-03-01	ElkBull/#BM16	0.31 (0.12)
Bandelier National Park/2-03-01	ElkCow/#126	–0.09 (0.11)
Bandelier National Park/2-03-01	ElkCow/#54	0.11 (0.12)
Bandelier National Park/2-03-01	ElkCow/#51	0.09 (0.12)
Bandelier National Park/2-03-01	ElkCow/#32	-0.03 (0.11)

Table 6-31. Tritium Concentrations (± Counting Uncertainty) in Blood from Elk Collected from LANL and Perimeter Areas 1995–2001 (Cont.)

Location and Date of Collection	Game Animal/ Identification Number[a]	pCi/mL
Bandelier National Park/2-03-01	ElkCow/#36	0.06 (0.11)
Bandelier National Park/2-03-01	ElkCow/#49	0.20 (0.12)
Bandelier National Park/2-03-01	Elk Cow/#41	–0.07 (0.11)
Bandelier National Park/2-03-01	Elk Cow/#121	–0.13 (0.11)
Bandelier National Park/2-03-01	Elk Cow/#31	0.57 (0.13)*
Bandelier National Park/2-04-01	Elk Bull/#131	0.15 (0.12)
Bandelier National Park/2-04-01	Elk Cow/#133	0.11 (0.12)
Bandelier National Park/2-04-01	Elk Bull/#132	0.17 (0.12)
Bandelier National Park/2-04-01	Elk Bull/#53	–0.09 (0.11)
Bandelier National Park/2-04-01	Elk Cow/#129	–0.10 (0.11)
Bandelier National Park/2-04-01	Elk/#130	0.20 (0.12)
Min.		–0.29
Max.		2.96
Mean (std dev)		*0.36 (0.52)*
Santa Clara Pueblo/2-05-01	Elk/#42	0.02 (0.11)
Santa Clara Pueblo/2-05-01	Elk/#462926	0.60 (0.13)*
Santa Clara Pueblo/2-05-01	Elk/#462928	–0.04 (0.11)
Santa Clara Pueblo/2-05-01	Elk/#462924	–0.14 (0.11)
Santa Clara Pueblo/2-05-01	Elk/#462927	0.83 (0.14)*
Min.		–0.14
Max.		0.83
Mean (std dev)		*0.25 (0.43)*
Regional Background (mean ± std dev.)[b]		0.21 (0.16)
RSRL[c]		0.53

[a]Refers to a radio collar number or ear tag placed on the animal at time of capture.
[b]Represents tissue moisture from elk muscle (Fresquez et al., 1999c); a statistical test at the 0.05 probability level using a Student's t-test shows no significant differences between tritium distilled from muscle collected from elk on LANL lands (n=18) versus tritium distilled from blood collected from elk on LANL lands (n=28).
[c]Regional Statistical Reference Level (mean plus two standard deviations).
[d]* Denotes a detectable value; one that is greater than three times its analytical uncertainty.
[e]** Denotes a statistical significant difference with regional background at the 0.05 probability level using a Student's t-test.

F. Figures

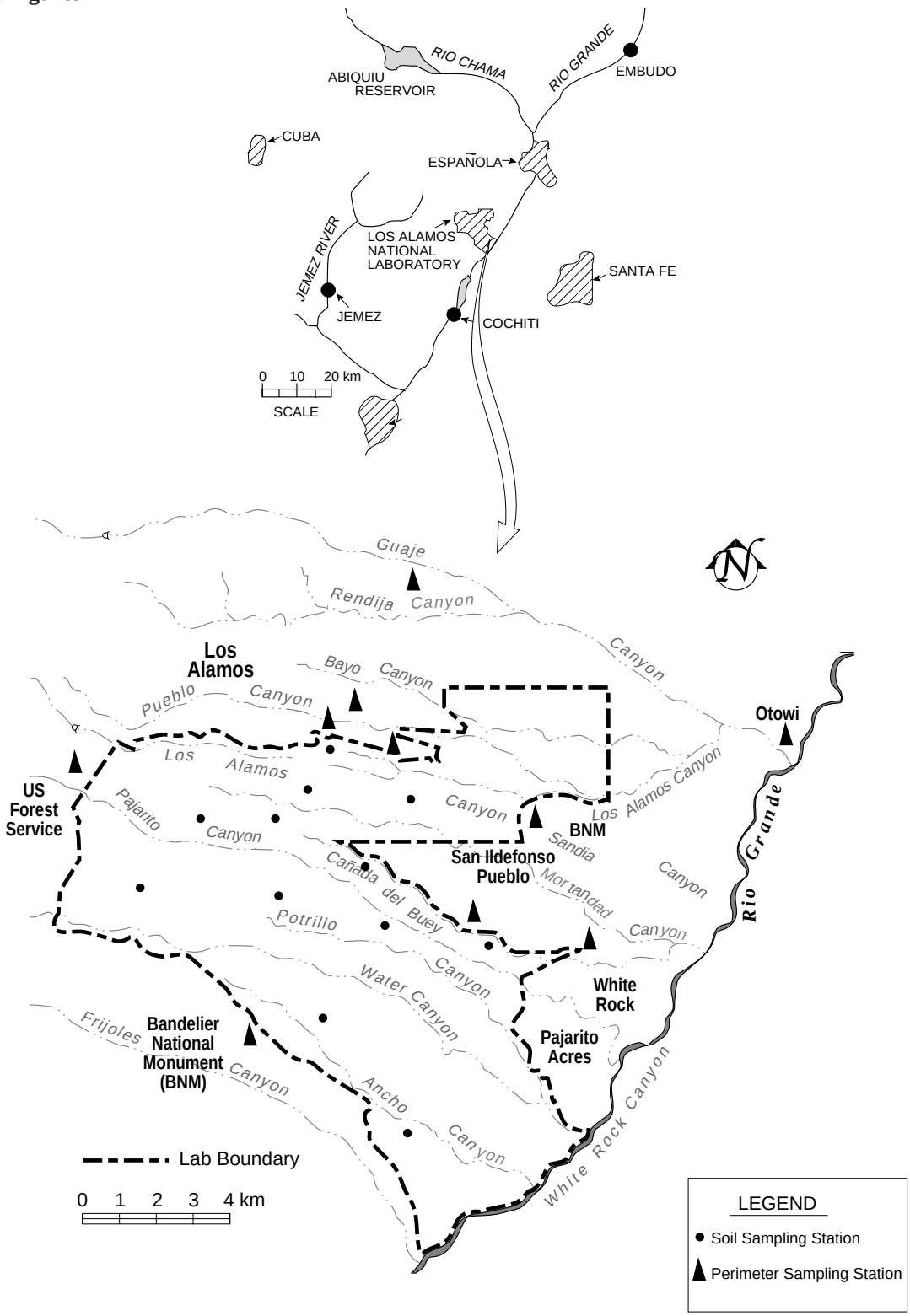

Figure 6-1. Off-site regional (top) and perimeter and on-site (bottom) Laboratory soil sampling locations.

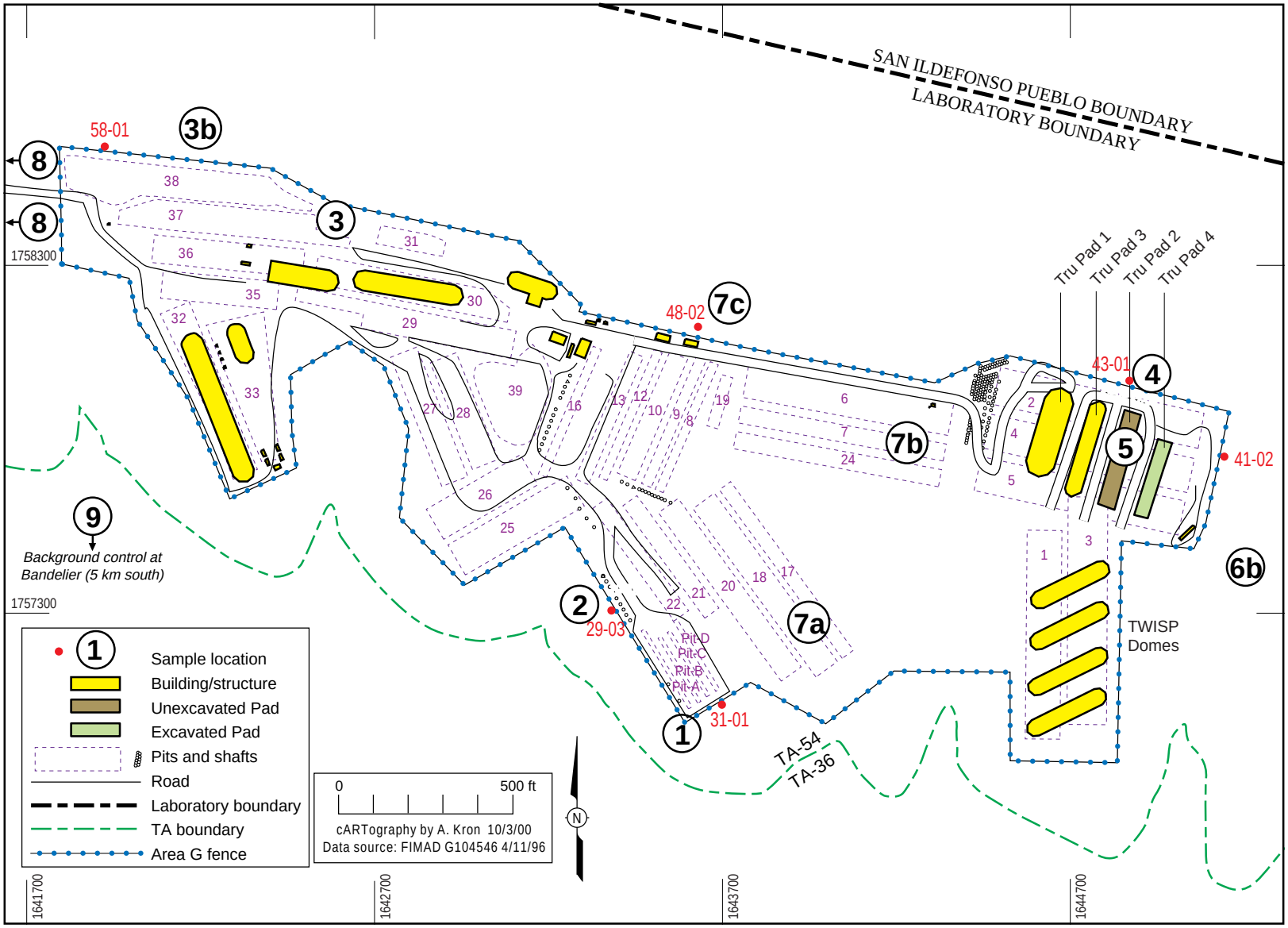

Figure 6-2. Site/sample locations of soils and vegetation at Area G. Site #8 is located farther west and Site #9 is located farther south than what is shown here.

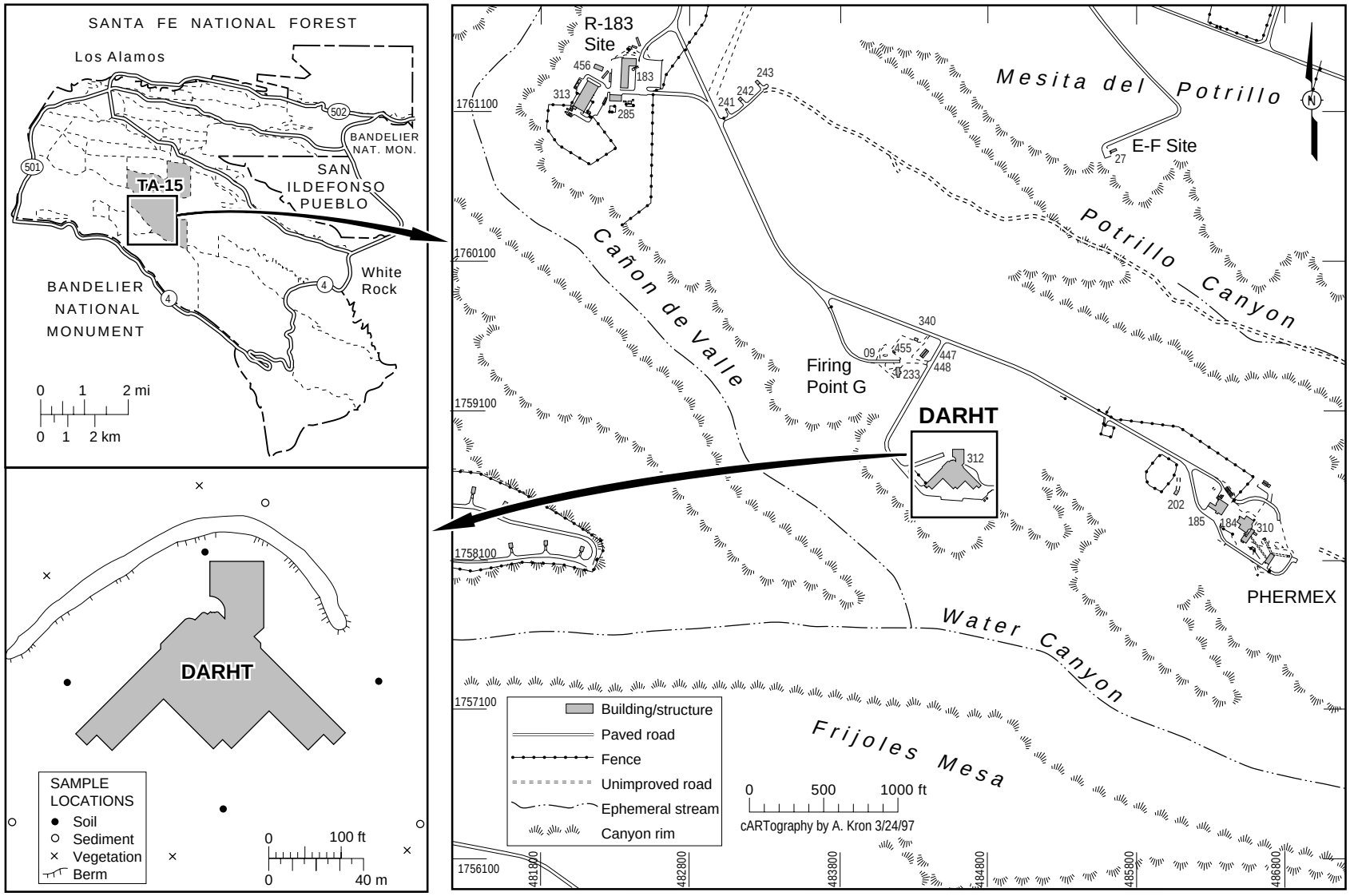

Figure 6-3. Sampling locations at the DARHT facility at TA-15.

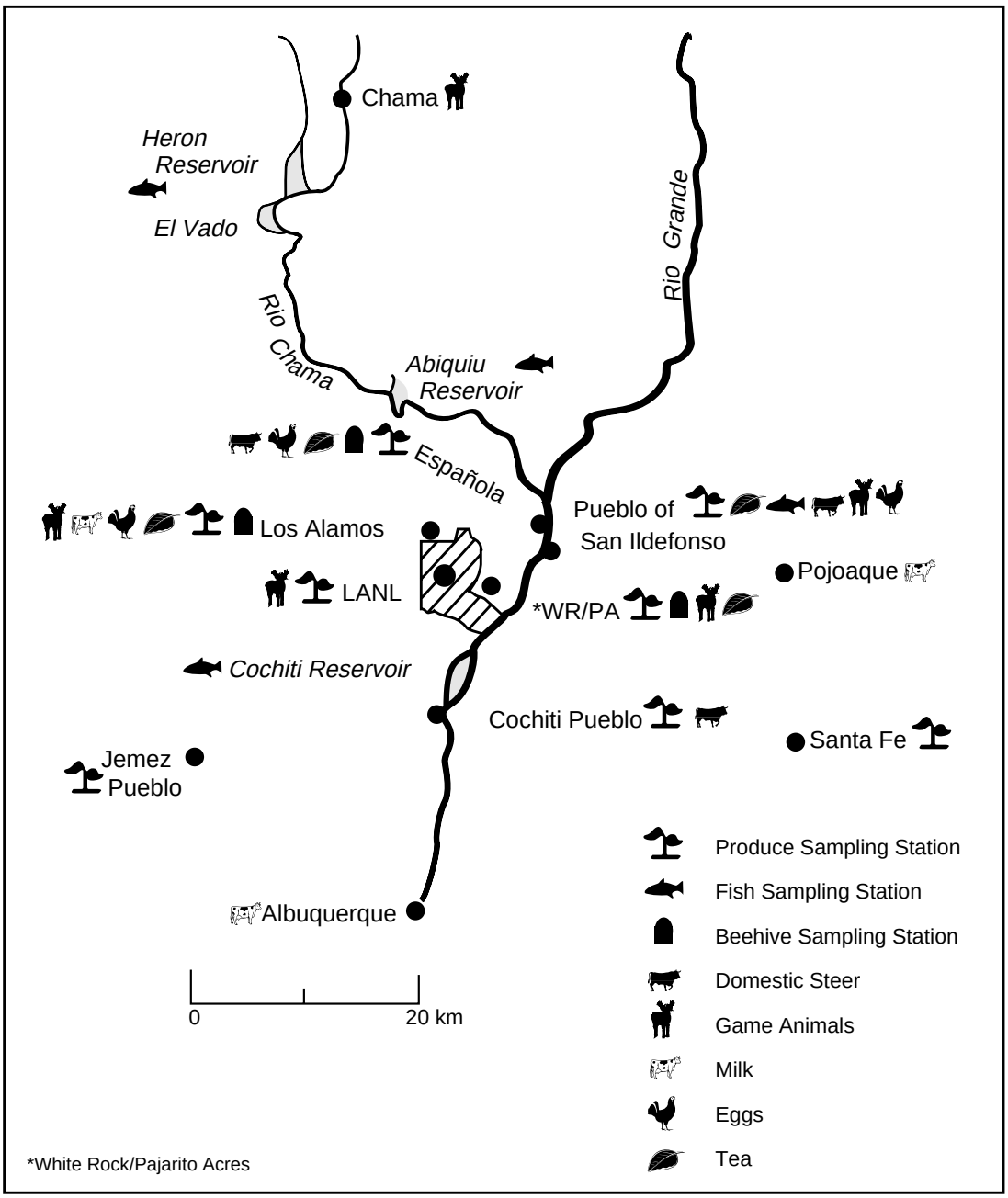

Figure 6-4. Produce, fish, milk, eggs, tea, domestic and game animals, and beehive sampling locations. (Map denotes general locations only.)

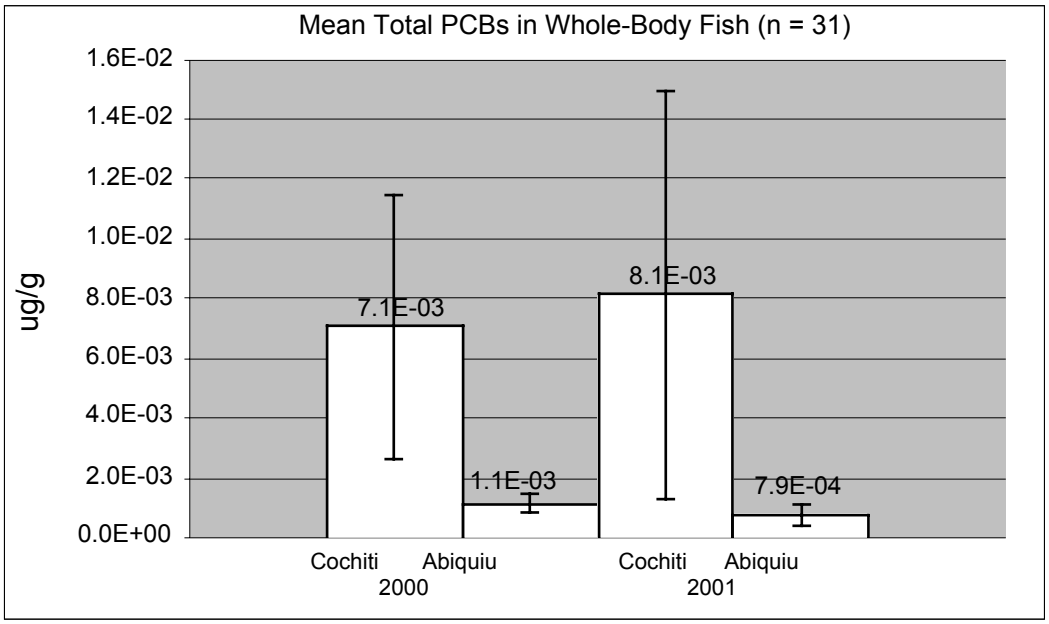

Figure 6-5. Mean concentration of total PCBs (from congeners) in whole-body fish from Cochiti and Abiquiu reservoirs. Error bars are 2 × the standard error of the mean.

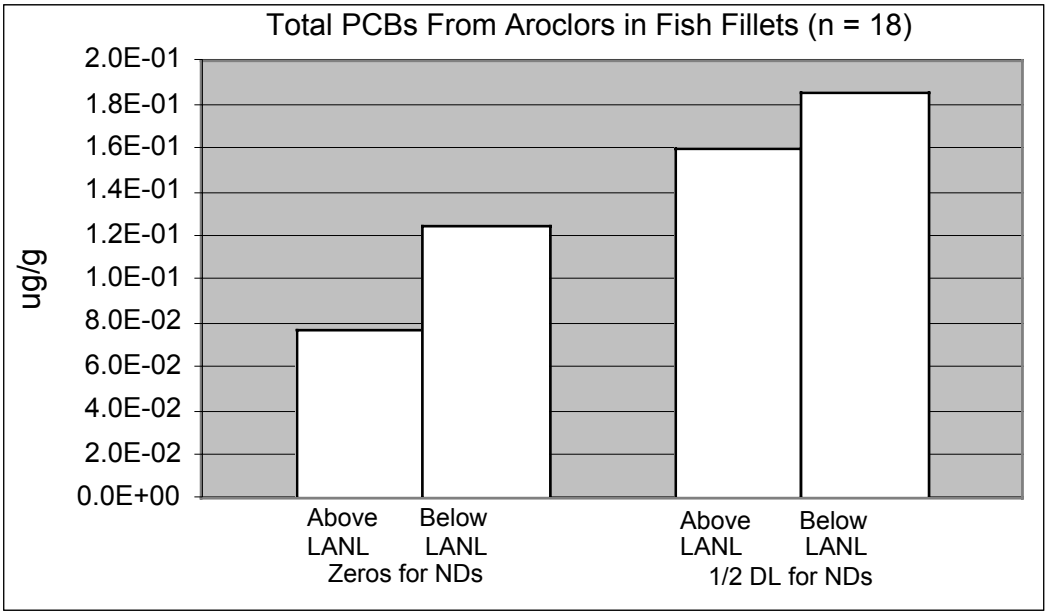

Figure 6-6. Total PCBs from Aroclors in fish fillets from the Rio Grande in 1997. First bar pair had non-detects replaced by zeros; second pair had nondetects replaced by 1/2 the detection limit. source of data: Gonzales et al. (1999).

G. References

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Standards for Environmental Contaminants

Throughout this report, we compare concentrations of radioactive and chemical constituents in air and water samples with pertinent standards and guidelines in regulations of federal and state agencies. No comparable standards for soils, sediments, or foodstuffs are available. Los Alamos National Laboratory (LANL or the Laboratory) operations are conducted in accordance with directives for compliance with environmental standards. These directives are contained in Department of Energy (DOE) Orders 5400.1, "General Environmental Program;" 5400.5, "Radiation Protection of the Public and the Environment;" and 231.1, "Environmental Safety and Health Reporting."

Radiation Standards. DOE regulates radiation exposure to the public and the worker by limiting the radiation dose that can be received during routine Laboratory operations. Because some radionuclides remain in the body and result in exposure long after intake, DOE requires consideration of the dose commitment caused by inhalation, ingestion, or absorption of such radionuclides. This evaluation involves integrating the dose received from radionuclides over a standard period of time. For this report, 50-yr dose commitments were calculated using the DOE dose factors from DOE 1988a and DOE 1988b. The dose factors DOE adopted are based on the recommendations of Publication 30 of the International Commission on Radiological Protection (ICRP 1988).

In 1990, DOE issued Order 5400.5, which finalized the interim radiation protection standard (RPS) for the public (NCRP 1987). Table A-1 lists currently applicable RPSs, now referred to as public dose limits (PDLs), for operations at the Laboratory. DOE's comprehensive PDL for radiation exposure limits the effective dose equivalent (EDE) that a member of the public can receive from DOE operations to 100 mrem per year. The PDLs and the DOE dose factors are based on recommendations in ICRP (1988) and the National Council on Radiation Protection and Measurements (NCRP 1987).

The EDE is the hypothetical whole-body dose that would result in the same risk of radiation-induced cancer or genetic disorder as a given exposure to an individual organ. It is the sum of the individual organ doses, weighted to account for the sensitivity of each organ to radiation-induced damage. The weighting factors are taken from the recommendations of the ICRP. The EDE includes doses from both internal and external exposure.

Radionuclide concentrations in air or water are compared to DOE's Derived Concentration Guides (DCGs) to evaluate potential impacts to members of the public. The DCGs for air are the radionuclide concentrations in air that, if inhaled continuously for an entire year, would give a dose of 100 mrem. Similarly, the DCGs for water are those concentrations in water that if consumed at a maximum rate of 730 liters per year, would give a dose of 100 mrem per year. Derived air concentrations (DACs) were developed for protection of workers and are the air concentrations that, if inhaled throughout a "work year," would give the limiting allowed dose to the worker. Table A-2 shows the DCGs and DACs.

In addition to DOE standards, in 1985 and 1989, the EPA established the National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities, 40 CFR 61, Subpart H. This regulation states that emissions of radionuclides to the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr. DOE has adopted this dose limit (Table A-1). This dose is calculated at the location of a residence, school, business or office. In addition, the regulation requires monitoring of all release points that can produce a dose of 0.1 mrem to a member of the public. A complete listing a 40 CFR 61 Subpart H is available in ESH-17 2000.

Nonradioactive Air Quality Standards. Table A-3 shows federal and state ambient air quality standards for nonradioactive pollutants.

National Pollutant Discharge Elimination System. Table A-4 presents a summary of the outfalls, the types of monitoring required under National Pollutant Discharge Elimination System (NPDES), and the limits established for sanitary and industrial outfalls. Table A-5 presents NPDES annual water quality parameters for all outfalls.

Drinking Water Standards. For chemical constituents in drinking water, regulations and standards are issued by the Environmental Protection Agency (EPA) and adopted by the New Mexico Environment

Department (NMED) as part of the New Mexico Drinking Water Regulations (Table A-6) (NMEIB 1995). EPA's secondary drinking water standards, which are not included in the New Mexico Drinking Water Regulations and are not enforceable, relate to contaminants in drinking water that primarily affect aesthetic qualities associated with public acceptance of drinking water (EPA 1989b). There may be health effects associated with considerably higher concentrations of these contaminants.

Radioactivity in drinking water is regulated by EPA regulations contained in 40 CFR 141 (EPA 1989b) and New Mexico Drinking Water Regulations, Sections 206 and 207 (NMEIB 1995). These regulations provide that combined radium-226 and radium-228 may not exceed 5 pCi per liter. Gross alpha activity (including radium-226, but excluding radon and uranium) may not exceed 15 pCi per liter.

A screening level of 5 pCi per liter for gross alpha is established to determine when analysis specifically for radium isotopes is necessary. In this report, plutonium concentrations are compared with both the EPA gross alpha standard for drinking water (Table A-6) and the DOE guides calculated for the DCGs applicable to drinking water (Table A-2).

For man-made beta- and photon-emitting radionuclides, EPA drinking water standards are limited to concentrations that would result in doses not exceeding 4 mrem per year, calculated according to a specified procedure. In addition, DOE Order 5400.5 requires that persons consuming water from DOE-operated public water supplies do not receive an EDE greater than 4 mrem per year. DCGs for drinking water systems based on this requirement are in Table A-2.

Surface Water Standards. Concentrations of radionuclides in surface water samples may be compared to either the DOE DCGs (Table A-2) or the New Mexico Water Quality Control Commission (NMWQCC) stream standard, which references the state's radiation protection regulations. However, New Mexico radiation levels are in general two orders of magnitude greater than DOE's DCGs for public dose, so only the DCGs will be discussed here. The concentrations of nonradioactive constituents may be compared with the NMWQCC Livestock Watering and Wildlife Habitat stream standards (NMWQCC 1995). (See Tables A-7 and A-8.) The NMWQCC groundwater standards can also be applied in cases where discharges may affect groundwater.

Organic Analysis of Surface and Groundwaters: Methods and Analytes. Organic analyses of surface waters, groundwaters, and sediments are made using SW-846 methods as shown in Table A-9. This table shows the number of analytes included in each analytical suite. The specific compounds analyzed in each suite are listed in Tables A-10 through A-13.

Table A-1. Department of Energy Public Dose Limits for External and Internal Exposures

	Effective Dose Equivalent[a] at Point of Maximum Probable Exposure
Exposure of Any Member of the Public[b]	
All Pathways	100 mrem/yr[c]
Air Pathway Only[d]	10 mrem/yr
Drinking Water	4 mrem/yr
Occupational Exposure[b]	
Stochastic Effects	5 rem (annual EDE[e])
Nonstochastic Effects	
Lens of eye	15 rem (annual EDE[e])
Extremity	50 rem (annual EDE[e])
Skin of the whole body	50 rem (annual EDE[e])
Organ or tissue	50 rem (annual EDE[e])
Unborn Child	
Entire gestation period	0.5 rem (annual EDE[e])

[a]As used by DOE, effective dose equivalent (EDE) includes both the EDE from external radiation and the committed EDE to individual tissues from ingestion and inhalation during the calendar year.

[b]In keeping with DOE policy, exposures must be limited to as small a fraction of the respective annual dose limits as practicable. DOE's public dose limit (PDL) applies to exposures from routine Laboratory operation, excluding contributions from cosmic, terrestrial, and global fallout; self-irradiation; and medical diagnostic sources of radiation. Routine operation means normal, planned operation and does not include actual or potential accidental or unplanned releases. Exposure limits for any member of the general public are taken from DOE Order 5400.5 (DOE 1990). Limits for occupational exposure are taken from 10 CFR 835, Occupational Radiation Protection.

[c]Under special circumstances and subject to approval by DOE, this limit on the EDE may be temporarily increased to 500 mrem/yr, provided the dose averaged over a lifetime does not exceed the principal limit of 100 mrem per year.

[d]This level is from EPA's regulations issued under the Clean Air Act, (40 CFR 61, Subpart H) (EPA 1989a).

[e]Annual EDE is the EDE received in a year.

Table A-2. Department of Energy's Derived Concentration Guides for Water and Derived Air Concentrations[a]

Nuclide	f_1[b]	DCGs for Water Ingestion in Uncontrolled Areas (pCi/L)	DCGs for Drinking Water Systems (pCi/L)	DCGs for Air Inhalation by the Public (µCi/mL)	Class[b]	DACs for Occupational Exposure (µCi/mL)
^{3}H	—	2,000,000	80,000	1×10^{-7}[c]	—	2×10^{-5}[c]
^{7}Be	5×10^{-3}	1,000,000	40,000	4×10^{-8}	Y	8×10^{-6}
^{89}Sr	3×10^{-1}	20,000	800	3×10^{-10}	Y	6×10^{-8}
^{90}Sr	3×10^{-1}	1,000	40	9×10^{-12}	Y	2×10^{-9}
^{137}Cs	1×10^{0}	3,000	120	4×10^{-10}	D	7×10^{-8}
^{234}U	5×10^{-2}	500	20	9×10^{-14}	Y	2×10^{-11}
^{235}U	5×10^{-2}	600	24	1×10^{-13}	Y	2×10^{-11}
^{238}U	5×10^{-2}	600	24	1×10^{-13}	Y	2×10^{-11}
^{238}Pu	1×10^{-3}	40	1.6	3×10^{-14}	W	3×10^{-12}
^{239}Pu	1×10^{-3}	30	1.2	2×10^{-14}	W	2×10^{-12}
^{240}Pu	1×10^{-3}	30	1.2	2×10^{-14}	W	2×10^{-12}
^{241}Am	1×10^{-3}	30	1.2	2×10^{-14}	W	2×10^{-12}

[a]Guides for uncontrolled areas are based on DOE's public dose limit for the general public (DOE 1990); those for occupational exposure are based on radiation protection standards in 10 CFR 835. Guides apply to concentrations in excess of those occurring naturally or that are due to worldwide fallout.
[b]Gastrointestinal tract absorption factors (f_1) and lung retention classes (Class) are taken from ICRP30 (ICRP 1988). Codes: Y = year, D = day, W = week.
[c]Tritium in the HTO form.

Table A-3. National (40 CFR 50) and New Mexico (20 NMAC 2.3) Ambient Air Quality Standards

Pollutant	Averaging Time	Unit	New Mexico Standard	Federal Standards Primary	Federal Standards Secondary
Sulfur dioxide	Annual	ppm	0.02	0.030[a]	
	24 hours	ppm	0.10	0.14[b]	
	3 hours	ppm			0.5[b]
Hydrogen sulfide	1 hour	ppm	0.010[b]		
Total reduced sulfur	1/2 hour	ppm	0.003[b]		
Total Suspended Particulates	Annual	$\mu g/m^3$	60	50	50
	30 days	$\mu g/m^3$	90		
	7 days	$\mu g/m^3$	110		
	24 hours	$\mu g/m^3$	150		
PM_{10}[c]	Annual	$\mu g/m^3$		50	50
	24 hours	$\mu g/m^3$		150	150
$PM_{2.5}$[d]	Annual	$\mu g/m^3$		15[e]	15[e]
	24 hours	$\mu g/m^3$		65[e]	65[e]
Carbon monoxide	8 hours	ppm	8.7	9[b]	
	1 hour	ppm	13.1	35[b]	
Ozone[f]	1 hour	ppm		0.12	0.12
	8 hours	ppm		0.08	0.08
Nitrogen dioxide	Annual	ppm	0.05	0.053	0.053
	24 hours	ppm	0.10		
Lead and lead compounds	Calendar quarter	$\mu g/m^3$		1.5	1.5

[a]Not to be exceeded in a calendar year.
[b]Not to be exceeded more than once in a calendar year.
[c]Particles ≤10 μm in diameter.
[d]Particles ≤2.5 μm in diameter.
[e]Applicable when the EPA approves changes to the NM State Implementation Plan. Until then, PM_{10} is the regulated pollutant.
[f]As the result of a May 14, 1999, court ruling, EPA does not have the authority to implement the eight-hour ozone standard. Currently, LANL must meet the one-hour ozone standard. EPA has appealed the court decision.

Table A-4. Limits Established by National Pollutant Discharge Elimination System Permit No. NM0028355 for Sanitary and Industrial Outfall Discharges for 2001

Discharge Category	Permit Parameter	Daily Average			Daily Maximum	
Sanitary						
13S TA-46 SWS Facility	BOD[a]	concentration	30	mg/L	45	mg/L
		loading limit	100	lb/day	N/A[b]	
	TSS[c]	concentration	30	mg/L	45	mg/L
		loading limit	100	lb/day	N/A	
	Fecal coliform bacteria[d]		500	colonies/100 mL	500	colonies/100 mL
	pH		6.0–9.0 s.u.		6.0–9.0 s.u.	
	Flow[e]		Report			Report

Discharge Category	Number of Outfalls	Sampling Frequency	Permit Parameter	Daily Average	Daily Maximum	Unit of Measurement
Industrial						
001 Power Plant	1	Monthly	TSS	30	100	mg/L
			Free available CL_2	0.2	0.5	mg/L
			pH	6.0–9.0	6.0–9.0	s.u.
02A Boiler Blowdown	1	Every 3 months	TSS	30	100	mg/L
			Total Fe	10	40	mg/L
			Total Cu	1.0	1.0	mg/L
			Total P	20	40	mg/L
			Sulfite	35	70	mg/L
			Total Cr	1.0	1.0	mg/L
			pH	6.0–9.0	6.0–9.0	s.u.
03A Treated Cooling Water	16	Every 3 months	TSS	30	100	mg/L
			Free available Cl	0.2	0.5	mg/L
			Total P	20	40	mg/L
			Total As	0.04	0.04	mg/L
			pH	6.0–9.0	6.0–9.0	s.u.
04A Noncontact Cooling Water	13	Every 3 months	pH	6.0–9.0	6.0–9.0	s.u.
			Total residual CL_2	Report[f]	Report	mg/L
051 Radioactive Liquid Waste Treatment Facility (TA-50)	1	Variable: weekly to monthly	COD[g]	94	156	lb/day
			TSS	18.8	62.6	lb/day
			Total Cd	0.06	0.30	lb/day
			Total Cr	0.19	0.38	lb/day
			Total Cu	0.63	0.63	lb/day
			Total Fe	1.0	2.0	lb/day
			Total Pb	0.06	0.15	lb/day
			Total Hg	0.003	0.09	lb/day
			Total Zn	0.62	1.83	lb/day
			TTO[h]	1.0	1.0	mg/L
			Total Ni[f]	Report	Report	mg/L
			Total N[f]	Report	Report	mg/L
			Nitrate-Nitrate as N[f]	Report	Report	mg/L
			Ammonia (as N)[f]	Report	Report	mg/L

Table A-4. (Cont.)

Discharge Category	Number of Outfalls	Sampling Frequency	Permit Parameter	Daily Average	Daily Maximum	Unit of Measurement
051 (Cont.)			pH	6.0–9.0	6.0–9.0	s.u.
			COD	125	125	mg/L
			Total Cd	0.2	0.2	mg/L
			Total Cr	5.1	5.1	mg/L
			Total Cu	1.6	1.6	mg/L
			Total Pb	0.4	0.4	mg/L
			Total Zn	95.4	95.4	mg/L
			^{226}Ra and ^{228}Ra	30.0	30.0	pCi/L
05A High Explosive Wastewater	2	Every 3 months	Oil & Grease	15	15	mg/L
			COD	125	125	mg/L
			TSS	30.0	45.0	mg/L
			pH	6.0–9.0	6.0–9.0	s.u.
06A Photo Wastewater	1	Every 3 months	Total Ag	0.5	1.0	mg/L
			pH	6.0–9.0	6.0–9.0	s.u.

[a]Biochemical oxygen demand.
[b]Not applicable.
[c]Total suspended solids.
[d]Logarithmic mean.
[e]Discharge volumes are reported to EPA but are not subject to limits.
[f]Concentrations are reported to EPA but are not subject to limits.
[g]Chemical oxygen demand.
[h]Total toxic organics.
Note: Sampling frequency for the sanitary outfall varies from once a week to once every three months, depending on the parameter.

Table A-5. Annual Water Quality Parameters Established by National Pollutant Discharge Elimination System Permit No. NM0028355 for Sanitary and Industrial Outfall Discharges for 2000

Discharge Category	Number of Outfalls	Sampling Frequency	Permit Parameter	Daily Average	Daily Maximum	Unit of Measurement
All Outfall Categories: Annual Water Quality Parameters	36	Annually	Total Al	5.0	5.0	mg/L
			Total As	0.04	0.04	mg/L
			Total B	5.0	5.0	mg/L
			Total Cd	0.2	0.2	mg/L
			Total Cr	5.1	5.1	mg/L
			Total Co	1.0	1.0	mg/L
			Total Cu	1.6	1.6	mg/L
			Total Pb	0.4	0.4	mg/L
			Total Hg	0.01	0.01	mg/L
			Total Se	0.05	0.05	mg/L
			Total V	0.1	0.1	mg/L
			Total Zn	95.4	95.4	mg/L
			^{226}Ra and ^{228}Ra	30.0	30.0	pCi/L
			^{3}H[a]	3,000,000	3,000,000	pCi/L

[a]When accelerator produced.

Table A-6. Safe Drinking Water Act Maximum Contaminant Levels in the Water Supply for Radiochemicals, Inorganic Chemicals, and Microbiological Constituents

Contaminants	Level
Radiochemical:	**Maximum Contaminant Level**
Gross alpha	15 pCi/L
Gross beta & photon	4 mrem/yr
^{226}Ra & ^{228}Ra	5 pCi/L
U	30 μg/L[a]
Radon	300/4000 pCi/L[b]
	Screening Level
Gross alpha	5 pCi/L
Gross beta	50 pCi/L
Inorganic Chemical:	
Primary Standards	**Maximum Contaminant Level (mg/L)**
Asbestos	7 million fibers/L (longer than 10 μm)
As	0.05[c]
Ba	2
Be	0.004
Cd	0.005
CN	0.2
Cr	0.1
F	4
Hg	0.002
Ni	0.1
NO_3 (as N)	10
NO_2 (as N)	1
SO_4	500[d]
Se	0.05
Sb	0.006
Tl	0.002
	Action Levels (mg/L)
Pb	0.015
Cu	1.3
Secondary Standards	**(mg/L)**
Cl	250
Cu	1
Fe	0.3
Mn	0.05
Zn	5
Total Dissolved Solids	500
pH	6.5–8.5
Microbiological:	**Maximum Contaminant Level**
Presence of total coliforms	5% of samples/month
Presence of fecal coliforms or Escherichia coli	No coliform-positive repeat samples following a fecal coliform-positive sample

[a]Effective December 2003.
[b]Radon standard is 4000 pCi/L with an approved state Multimedia Mitigation program and 300 pCi/L in states without an approved program.
[c]Proposed standard. Scheduled for revision in 2001.
[d]The proposed MCL for sulfate was suspended by the EPA on August 6, 1996.

Table A-7. Livestock Watering Standards[a]

Livestock Contaminant	Concentration	
Dissolved Al	5	mg/L
Dissolved As	0.2	mg/L
Dissolved B	5	mg/L
Dissolved Cd	0.05	mg/L
Dissolved Cr	1	mg/L
Dissolved Co	1	mg/L
Dissolved Cu	0.5	mg/L
Dissolved Pb	0.1	mg/L
Total Hg	0.01	mg/L
Dissolved Se	0.05	mg/L
Dissolved V	0.1	mg/L
Dissolved Zn	25	mg/L
^{226}Ra and ^{228}Ra	30	pCi/L
^{3}H	20,000	pCi/L
Gross alpha	15	pCi/L

[a]**NMWQCC 1995.**

Table A-8. Wildlife Habitat Stream Standards[a]

The following narrative standard shall apply:

1. Except as provided below in Paragraph 2 of this section, no discharge shall contain any substance, including, but not limited to selenium, DDT, PCBs, and dioxin, at a level which, when added to background concentrations, can lead to bioaccumulation to toxic levels in any animal species. In the absence of site-specific information, this requirement shall be interpreted as establishing a stream standard of 2 μg per liter for total recoverable selenium and of 0.012 μg per liter for total mercury.

2. The discharge of substances that bioaccumulate in excess of levels specified above in Paragraph 1 is allowed if, and only to the extent that, the substances are present in the intake waters which are diverted and utilized prior to discharge, and then only if the discharger utilizes best available treatment technology to reduce the amount of bioaccumulating substances which are discharged.

3. Discharges to waters which are designated for wildlife habitat uses, but not for fisheries uses, shall not contain levels of ammonia or chlorine in amounts which reduce biological productivity and/or species diversity to levels below those which occur naturally and in no case shall contain chlorine in excess of 1 mg per liter nor ammonia in excess of levels that can be accomplished through best reasonable operating practices at existing treatment facilities.

4. A discharge which contains any heavy metal at concentrations in excess of the concentrations set forth in Section 3101.J.1 of these standards shall not be permitted in an amount, measured by total mass, which exceeds by more than 5% the amount present in the intake waters which are diverted and utilized prior to the discharge, unless the discharger has taken steps (an approved program to require industrial pretreatment or a corrosion program) appropriate to reduce influent concentration to the extent practicable.

[a]**NMWQCC 1995.**

Table A-9. Organic Analytical Methods

Test	SW-846 Method	Number of Compounds
Volatiles	624, 8260B	68
Semivolatiles	625, 8270C	69
PCB[a]	608, 8082, 8081	8
HE[b]	8330	14

[a] Polychlorinated biphenyls.
[b] High explosives.

Table A-10. Volatile Organic Compounds

Analytes	Limit of Quantitation Water (μg/L)
1,1,1,2-Tetrachloroethane	1
1,1,1-Trichloroethane	1
1,1,2,2-Tetrachloroethane	1
1,1,2-Trichloroethane	1
1,1-Dichloroethane	1
1,1-Dichloroethylene	1
1,1-Dichloropropene	1
1,2,3-Trichloropropane	1
1,2,4-Trimethylbenzene	1
1,2-Dibromo-3-chloropropane	1
1,2-Dibromoethane	1
1,2-Dichlorobenzene	1
1,2-Dichloroethane	1
1,2-Dichloropropane	1
1,3,5-Trimethylbenzene	1
1,3-Dichlorobenzene	1
1,3-Dichloropropane	1
1,4-Dichlorobenzene	1
2,2-Dichloropropane	1
2-Butanone	5
2-Chloroethylvinyl ether	5
2-Chlorotoluene	1
2-Hexanone	5
4-Chlorotoluene	1
4-Isopropyltoluene	1
4-Methyl-2-pentanone	5
Acetone	5
Acrolein	10
Acrylonitrile	10
Benzene	1

Table A-10. Volatile Organic Compounds (Cont.)

Analytes	Limit of Quantitation Water (μg/L)
Bromobenzene	1
Bromochloromethane	1
Bromodichloromethane	1
Bromoform	1
Bromomethane	1
Carbon disulfide	5
Carbon tetrachloride	1
Chlorobenzene	1
Chloroethane	1
Chloroform	1
Chloromethane	1
cis-1,3-Dichloropropylene	1
Dibromochloromethane	1
Dibromomethane	1
Dichlorodifluoromethane	1
Ethylbenzene	1
Hexachlorobutadiene	1
Iodomethane	5
Isopropylbenzene	1
m,p-Xylenes	2
Methylene chloride	5
Naphthalene	1
n-Butylbenzene	1
n-Propylbenzene	1
o-Xylene	1
sec-Butylbenzene	1
Styrene	1
tert-Butylbenzene	1
Tetrachloroethylene	1
Toluene	1
Toluene-d8	1
trans-1,2-Dichloroethylene	1
trans-1,3-Dichloropropylene	1
Trichloroethylene	1
Trichlorofluoromethane	1
Trichlorotrifluoroethane	5
Vinyl chloride	1
Xylenes (total)	3

Table A-11. Semivolatile Organic Compounds

Analytes	Limit of Quantitation Water (μg/L)	Sediments (mg/kg)
1,2,4-Trichlorobenzene	10	0.33
1,2-Dichlorobenzene	10	0.33
1,2-Diphenylhydrazine	10	0.33
1,3-Dichlorobenzene	10	0.33
1,4-Dichlorobenzene	10	0.33
2,4,5-Trichlorophenol	10	0.33
2,4,6-Trichlorophenol	10	0.33
2,4-Dichlorophenol	10	0.33
2,4-Dimethylphenol	10	0.33
2,4-Dinitrophenol	20	0.67
2,4-Dinitrotoluene	10	0.33
2,6-Dinitrotoluene	10	0.33
2-Chloronaphthalene	1	0.03
2-Chlorophenol	10	0.33
2-Methyl-4,6-dinitrophenol	10	0.33
2-Methylnaphthalene	1	0.03
2-Nitrophenol	10	0.33
2-Picoline	10	0.33
3,3'-Dichlorobenzidine	10	0.33
4-Bromophenylphenylether	10	0.33
4-Chloro-3-methylphenol	10	0.33
4-Chloroaniline	10	0.33
4-Chlorophenylphenylether	10	0.33
4-Nitrophenol	10	0.33
Acenaphthene	1	0.03
Acenaphthylene	1	0.03
Aniline	10	0.33
Anthracene	1	0.03
Benzidine	50	1.67
Benzo(a)anthracene	1	0.03
Benzo(a)pyrene	1	0.03
Benzo(b)fluoranthene	1	0.03
Benzo(ghi)perylene	1	0.03
Benzo(k)fluoranthene	1	0.03
Benzoic acid	20	0.67
Benzyl alcohol	10	0.33
bis(2-Chloroethoxy)methane	10	0.33
bis(2-Chloroethyl) ether	10	0.33
bis(2-Chloroisopropyl)ether	10	0.33
bis(2-Ethylhexyl)phthalate	10	0.03
Butylbenzylphthalate	10	0.33
Chrysene	1	0.03
Dibenzo(a,h)anthracene	1	0.03
Dibenzofuran	10	0.33

Table A-11. Semivolatile Organic Compounds (Cont.)

Analytes	Limit of Quantitation Water (µg/L)	Limit of Quantitation Sediments (mg/kg)
Diethylphthalate	10	0.33
Dimethylphthalate	10	0.33
Di-n-butylphthalate	10	0.33
Di-n-octylphthalate	10	0.33
Fluoranthene	1	0.03
Fluorene	1	0.03
Hexachlorobenzene	10	0.33
Hexachlorobutadiene	10	0.33
Hexachlorocyclopentadiene	10	0.33
Hexachloroethane	10	0.33
Indeno(1,2,3-cd)pyrene	1	0.03
Isophorone	10	0.33
m-Nitroaniline	10	0.33
Naphthalene	1	0.03
Nitrobenzene	10	0.33
N-Methyl-N-nitrosomethylamine	10	0.33
N-Nitrosodiphenylamine	10	0.07
N-Nitrosodipropylamine	10	0.33
o-Nitroaniline	10	0.33
p-(Dimethylamino)azobenzene	10	0.33
Pentachlorophenol	10	0.33
Phenanthrene	1	0.03
Phenol	10	0.33
Pyrene	1	0.03
Pyridine	10	0.33

Table A-12. Polychlorinated Biphenyls

Analytes	Limit of Quantitation Water (µg/L)	Limit of Quantitation Sediments (mg/kg)
Aroclor 1016	0.5	0.003
Aroclor 1221	0.5	0.003
Aroclor 1232	0.5	0.003
Aroclor 1242	0.5	0.003
Aroclor 1248	0.5	0.003
Aroclor 1254	0.5	0.003
Aroclor 1260	0.5	0.003
Aroclor 1262	0.5	0.003

Table A-13. High-Explosives Compounds

Analytes	Limit of Quantitation Water (μg/L	Sediments (mg/kg)
1,3,5-Trinitrobenzene	0.105	0.08
2,4,6-Trinitrotoluene	0.105	0.08
2,4-Dinitrotoluene	0.105	0.08
2,6-Dinitrotoluene	0.105	0.08
2-Amino-4,6-dinitrotoluene	0.105	0.08
4-Amino-2,6-dinitrotoluene	0.105	0.08
HMX	0.105	0.08
Nitrobenzene	0.105	0.08
RDX	0.105	0.08
Tetryl	0.105	0.08
m-Dinitrobenzene	0.105	0.08
m-Nitrotoluene	0.105	0.08
o-Nitrotoluene	0.105	0.08
p-Nitrotoluene	0.105	0.08

References

DOE 1988a: US Department of Energy, "Internal Dose Conversion Factors for Calculation of Dose to the Public," US Department of Energy report DOE/EH-0071 (July 1988).

DOE 1988b: US Department of Energy, "External Dose-Rate Conversion Factors for Calculation of Dose to the Public," US Department of Energy report DOE/EH-0070 (July 1988).

DOE 1990: US Department of Energy, "Radiation Protection of the Public and the Environment," US Department of Energy Order 5400.5 (February 8, 1990).

EPA 1989a: US Environmental Protection Agency, "40CFR 61, National Emission Standards for Hazardous Air Pollutants, Radionuclides; Final Rule and Notice of Reconsideration," Federal Register 54, 51 653-51 715 (December 15, 1989).

EPA 1989b: US Environmental Protection Agency, "National Interim Primary Drinking Water Regulations," Code of Federal Regulations, Title 40, Parts 141 and 142 (1989), and "National Secondary Drinking Water Regulations," Part 143 (1989).

ESH-17 2000: Air Quality Group, "Quality Assurance Project Plan for the Rad-NESHAP Compliance Project," Air Quality Group Document ESH-17-RN, R1 (January 2000).

ICRP 1988: International Commission on Radiological Protection, "Limits for Intakes of Radionuclides by Workers," ICRP Publication 30, Parts 1, 2, and 3, and their supplements, Annals of the ICRP 2(3/4) -8(4) (1979-1982), and Publication 30, Part 4, 19(4) (1988).

NCRP 1987: National Council on Radiation Protection and Measurements, "Recommendations on Limits for Exposure to Ionizing Radiation," NCRP report No. 91 (June 1987).

NMEIB 1995: New Mexico Environmental Improvement Board, "New Mexico Drinking Water Regulations," (as amended through January 1995).

NMWQCC 1995: New Mexico Water Quality Control Commission, "State of New Mexico Water Quality Standards for Interstate and Intrastate Streams," Section 3-101.K (as amended through January 23, 1995).

Units of Measurement

Throughout this report the International System of Units (SI) or metric system of measurements has been used, with some exceptions. For units of radiation activity, exposure, and dose, US Customary Units (that is, curie [Ci], roentgen [R], rad, and rem) are retained as the primary measurement because current standards are written in terms of these units. The equivalent SI units are the becquerel (Bq), coulomb per kilogram (C/kg), gray (Gy), and sievert (Sv), respectively.

Table B-1 presents prefixes used in this report to define fractions or multiples of the base units of measurements. Scientific notation is used in this report to express very large or very small numbers. Translating from scientific notation to a more traditional number requires moving the decimal point either left or right from the number. If the value given is 2.0×10^3, the decimal point should be moved three numbers (insert zeros if no numbers are given) to the **right** of its present location. The number would then read 2,000. If the value given is 2.0×10^{-5}, the decimal point should be moved five numbers to the **left** of its present location. The result would be 0.00002.

Table B-2 presents conversion factors for converting SI units into US Customary Units. Table B-3 presents abbreviations for common measurements.

Data Handling of Radiochemical Samples

Measurements of radiochemical samples require that analytical or instrumental backgrounds be subtracted to obtain net values. Thus, net values are sometimes obtained that are lower than the minimum detection limit of the analytical technique. Consequently, individual measurements can result in values of positive or negative numbers. Although a negative value does not represent a physical reality, a valid long-term average of many measurements can be obtained only if the very small and negative values are included in the population calculations (Gilbert 1975).

For individual measurements, uncertainties are reported as one standard deviation. The standard deviation is estimated from the propagated sources of analytical error.

Standard deviations for the station and group (off-site regional, off-site perimeter, and on-site) means are calculated using the following equation:

$$s = \sqrt{\frac{\sum_{i=1}^{N}\left(\bar{c} - c_i\right)^2}{(N-1)}},$$

where

c_i = sample i,

$\bar{c}$ = mean of samples from a given station or group, and

N = number of samples a station or group comprises.

This value is reported as one standard deviation (1*s*) for the station and group means.

Tables

Table B-1. Prefixes Used with SI (Metric) Units

Prefix	Factor	Symbol
mega	1 000 000 or 10^6	M
kilo	1 000 or 10^3	k
centi	0.01 or 10^{-2}	c
milli	0.001 or $10^{-}3$	m
micro	0.000001 or 10^{-6}	μ
nano	0.000000001 or 10^{-9}	n
pico	0.000000000001 or 10^{-12}	p
femto	0.000000000000001 or 10^{-15}	f
atto	0.000000000000000001 or 10^{-18}	a

Table B-2. Approximate Conversion Factors for Selected SI (Metric) Units

Multiply SI (Metric) Unit	by	to Obtain US Customary Unit
Celsius (°C)	9/5 + 32	Fahrenheit (°F)
centimeters (cm)	0.39	inches (in.)
cubic meters (m^3)	35.3	cubic feet (ft^3)
hectares (ha)	2.47	acres
grams (g)	0.035	ounces (oz)
kilograms (kg)	2.2	pounds (lb)
kilometers (km)	0.62	miles (mi)
liters (L)	0.26	gallons (gal.)
meters (m)	3.28	feet (ft)
micrograms per gram (µg/g)	1	parts per million (ppm)
milligrams per liter (mg/L)	1	parts per million (ppm)
square kilometers (km^2)	0.386	square miles (mi^2)

Table B-3. Common Measurement Abbreviations and Measurement Symbols

aCi	attocurie
Bq	becquerel
Btu/yr	British thermal unit per year
Ci	curie
cm^3/s	cubic centimeters per second
cpm/L	counts per minute per liter
fCi/g	femtocurie per gram
ft	foot
ft^3/min	cubic feet per minute
ft^3/s	cubic feet per second
kg	kilogram
kg/h	kilogram per hour
lb/h	pound per hour
lin ft	linear feet
m^3/s	cubic meter per second
µCi/L	microcurie per liter
µCi/mL	microcurie per milliliter
µg/g	microgram per gram
$\mu g/m^3$	microgram per cubic meter
mL	milliliter
mm	millimeter
µm	micrometer
µmho/cm	micro mho per centimeter
mCi	millicurie
mg	milligram
mR	milliroentgen

Table B-3. Common Measurement Abbreviations and Measurement Symbols (Cont.)

m/s	meters per second
mrad	millirad
mrem	millirem
mSv	millisievert
nCi	nanocurie
nCi/dry g	nanocurie per dry gram
nCi/L	nanocurie per liter
ng/m^3	nanogram per cubic meter
pCi/dry g	picocurie per dry gram
pCi/g	picocurie per gram
pCi/L	picocurie per liter
pCi/m^3	picocurie per cubic meter
pCi/mL	picocurie per milliliter
pg/g	picogram per gram
pg/m^3	picogram per cubic meter
PM_{10}	small particulate matter (less than 10 μm diameter)
$PM_{2.5}$	small particulate matter (less than 2.5 μm diameter)
R	roentgen
s, SD, or σ	standard deviation
s.u.	standard unit
sq ft (ft^2)	square feet
TU	tritium unit
>	greater than
<	less than
≥	greater than or equal to
≤	less than or equal to
±	plus or minus
~	approximately

Reference

Gilbert 1975: R. O. Gilbert, "Recommendations Concerning the Computation and Reporting of Counting Statistics for the Nevada Applied Ecology Group," Batelle Pacific Northwest Laboratories report BNWL-B-368 (September 1975).

Description of Technical Areas and Their Associated Programs

Locations of the technical areas (TAs) operated by the Laboratory in Los Alamos County are shown in Figure 1-2. The main programs conducted at each of the areas are listed in this Appendix.

TA-0: The Laboratory has about 180,000 sq ft of leased space for training, support, architectural engineering design, and unclassified research and development in the Los Alamos town site and White Rock. The publicly accessible Community Reading Room and the Bradbury Science Museum are also located in the Los Alamos town site.

TA-2, Omega Site: Omega West Reactor, an 8-MW nuclear research reactor, is located here. It was placed into a safe shutdown condition in 1993 and was removed from the nuclear facilities list. The reactor will be transferred to the institution for placement into the decontamination and decommissioning (D&D) program beginning in 2006.

TA-3, Core Area: The Administration Complex contains the Director's office, administrative offices, and support facilities. Laboratories for several divisions are in this main TA of the Laboratory. Other buildings house central computing facilities, chemistry and materials science laboratories, earth and space science laboratories, physics laboratories, technical shops, cryogenics laboratories, the main cafeteria, and the Study Center. TA-3 contains about 50% of the Laboratory's employees and floor space.

TA-5, Beta Site: This site contains some physical support facilities such as an electrical substation, test wells, several archaeological sites, and environmental monitoring and buffer areas.

TA-6, Twomile Mesa Site: The site is mostly undeveloped and contains gas cylinder staging and vacant buildings pending disposal.

TA-8, GT Site (or Anchor Site West): This is a dynamic testing site operated as a service facility for the entire Laboratory. It maintains capability in all modern nondestructive testing techniques for ensuring quality of material, ranging from test weapons components to high-pressure dies and molds. Principal tools include radiographic techniques (x-ray machines with potentials up to 1,000,000 V and a 24-MeV betatron), radioisotope techniques, ultrasonic and penetrant testing, and electromagnetic test methods.

TA-9, Anchor Site East: At this site, fabrication feasibility and physical properties of explosives are explored. New organic compounds are investigated for possible use as explosives. Storage and stability problems are also studied.

TA-11, K Site: Facilities are located here for testing explosives components and systems, including vibration testing and drop testing, under a variety of extreme physical environments. The facilities are arranged so that testing may be controlled and observed remotely and so that devices containing explosives or radioactive materials, as well as those containing nonhazardous materials, may be tested.

TA-14, Q Site: This dynamic testing site is used for running various tests on relatively small explosive charges for fragment impact tests, explosives sensitivities, and thermal responses.

TA-15, R Site: This is the home of PHERMEX (the pulsed high-energy radiographic machine emitting x-rays), a multiple-cavity electron accelerator capable of producing a very large flux of x-rays for weapons development testing. It is also the site where DARHT (the dual-axis radiographic hydrotest facility) is being constructed. This site is also used for the investigation of weapons functioning and systems behavior in nonnuclear tests, principally through electronic recordings.

TA-16, S Site: Investigations at this site include development, engineering design, prototype manufacture, and environmental testing of nuclear weapons warhead systems. TA-16 is the site of the Weapons Engineering Tritium Facility for tritium handled in gloveboxes. Development and testing of high explosives, plastics, and adhesives and research on process development for manufacture of items using these and other materials are accomplished in extensive facilities.

TA-18, Pajarito Laboratory Site: This is a nuclear facility that studies both static and dynamic behavior of multiplying assemblies of nuclear materials. The Category I quantities of special nuclear materials (SNM) are used to support a wide variety of programs such as Stockpile Management, Stockpile Stewardship, Emergency Response, Nonproliferation, Safeguards, etc. Experiments near critical are operated by remote control using low-power reactors called criti-

cal assemblies. The machines are housed in buildings known as kivas and are used primarily to provide a controlled means of assembling a critical amount of fissionable material so that the effects of various shapes, sizes, and configurations can be studied. These machines are also used as a large-quantity source of fission neutrons for experimental purposes. In addition, this facility provides the capability to perform hands-on training and experiments with SNM in various configurations below critical.

TA-21, DP Site: This site has two primary research areas: DP West and DP East. DP West has been in the D&D program since 1992, and six buildings have been demolished. The programs conducted at DP West, primarily in inorganic and biochemistry, were relocated during 1997, and the remainder of the site was scheduled for D&D in future years. DP East is a tritium research site.

TA-22, TD Site: This site is used in the development of special detonators to initiate high-explosive systems. Fundamental and applied research in support of this activity includes investigating phenomena associated with initiating high explosives and research in rapid shock-induced reactions.

TA-28, Magazine Area A: This is an explosives storage area.

TA-33, HP Site: An old, high-pressure, tritium-handling facility located here is being phased out. An intelligence technology group and the National Radio Astronomy Observatory's Very Large Baseline Array Telescope are located at this site.

TA-35, Ten Site: This site is divided into five facility management units. Work here includes nuclear safeguards research and development that are concerned with techniques for nondestructive detection, identification, and analysis of fissionable isotopes. Research is also done on reactor safety, laser fusion, optical sciences, pulsed-power systems, high-energy physics, tritium fabrication, metallurgy, ceramic technology, and chemical plating.

TA-36, Kappa Site: Phenomena of explosives, such as detonation velocity, are investigated at this dynamic testing site.

TA-37, Magazine Area C: This is an explosives storage area.

TA-39, Ancho Canyon Site: The behavior of nonnuclear weapons is studied here, primarily by photographic techniques. Investigations are also made into various phenomenological aspects of explosives, interactions of explosives, explosions involving other materials, shock wave physics, equation state measurements, and pulsed-power systems design.

TA-40, DF Site: This site is used in the development of special detonators to initiate high-explosive systems. Fundamental and applied research in support of this activity includes investigating phenomena associated with the physics of explosives.

TA-41, W Site: Personnel at this site engage primarily in engineering design and development of nuclear components, including fabrication and evaluation of test materials for weapons.

TA-43, Health Research Laboratory: This site is adjacent to the Los Alamos Medical Center in the town site. Research performed at this site includes structural, molecular, and cellular radiobiology, biophysics, mammalian radiobiology, mammalian metabolism, biochemistry, and genetics. The Department of Energy Los Alamos Area Office is also located within TA-43.

TA-46, WA Site: This TA contains two facility management units. Activities include applied photochemistry research including the development of technology for laser isotope separation and laser enhancement of chemical processes. A new facility completed during 1996 houses research in inorganic and materials chemistry. The Sanitary Wastewater System Facility is located at the east end of this site. Environmental management operations are also located here.

TA-48, Radiochemistry Site: Laboratory scientists and technicians perform research and development (R&D) activities at this site on a wide range of chemical processes including nuclear and radiochemistry, geochemistry, biochemistry, actinide chemistry, and separations chemistry. Hot cells are used to produce medical radioisotopes.

TA-49, Frijoles Mesa Site: This site is currently restricted to carefully selected functions because of its location near Bandelier National Monument and past use in high-explosive and radioactive materials experiments. The Hazardous Devices Team Training Facility is located here.

TA-50, Waste Management Site: This site is divided into two facility management units, which include managing the industrial liquid and radioactive liquid

waste received from Laboratory technical areas and activities that are part of the waste treatment technology effort.

TA-51, Environmental Research Site: Research and experimental studies on the long-term impact of radioactive waste on the environment and types of waste storage and coverings are performed at this site.

TA-52, Reactor Development Site: A wide variety of theoretical and computational activities related to nuclear reactor performance and safety are done at this site.

TA-53, Los Alamos Neutron Science Center: The Los Alamos Neutron Science Center, including the linear proton accelerator, the Manuel Lujan Jr. Neutron Scattering Center, and a medical isotope production facility is located at this TA. Also located at TA-53 are the Accelerator Production of Tritium Project Office, including the Low-Energy Demonstration Accelerator, and R&D activities in accelerator technology and high-power microwaves.

TA-54, Waste Disposal Site: This site is divided into two facility management units for the radioactive solid and hazardous chemical waste management and disposal operations and activities that are part of the waste treatment technology effort.

TA-55, Plutonium Facility Site: Processing of plutonium and research on plutonium metallurgy are done at this site.

TA-57, Fenton Hill Site: This site is located about 28 miles west of Los Alamos on the southern edge of the Valles Caldera in the Jemez Mountains and was the location of the Laboratory's now decommissioned Hot Dry Rock geothermal project. The site is used for the testing and development of downhole well-logging instruments and other technologies of interest to the energy industry. The high elevation and remoteness of the site make Fenton Hill a choice location for astrophysics experiments. A gamma ray observatory is located at the site.

TA-58: This site is reserved for multiuse experimental sciences requiring close functional ties to programs currently located at TA-3.

TA-59, Occupational Health Site: Occupational health and safety and environmental management activities are conducted at this site. Emergency management offices are also located here.

TA-60, Sigma Mesa: This area contains physical support and infrastructure facilities, including the Test Fabrication Facility and Rack Assembly and the Alignment Complex.

TA-61, East Jemez Road: This site is used for physical support and infrastructure facilities, including the Los Alamos County sanitary landfill.

TA-62: This site is reserved for multiuse experimental science, public and corporate interface, and environmental research and buffer zones.

TA-63: This is a major growth area at the Laboratory with expanding environmental and waste management functions and facilities. This area contains physical support facilities operated by Johnson Controls Northern New Mexico.

TA-64: This is the site of the Central Guard Facility and headquarters for the Laboratory Hazardous Materials Response Team.

TA-66: This site is used for industrial partnership activities.

TA-67: This is a dynamic testing area that contains significant archeological sites.

TA-68: This is a dynamic testing area that contains archeological and environmental study areas.

TA-69: This undeveloped TA serves as an environmental buffer for the dynamic testing area.

TA-70: This undeveloped TA serves as an environmental buffer for the high-explosives test area.

TA-71: This undeveloped TA serves as an environmental buffer for the high-explosives test area.

TA-72: This is the site of the Protective Forces Training Facility.

TA-73: This area is the Los Alamos Airport.

TA-74, Otowi Tract: This large area, bordering the Pueblo of San Ildefonso on the east, is isolated from most of the Laboratory and contains significant concentrations of archeological sites and an endangered species breeding area. This site also contains Laboratory water wells and future well fields.

Related Web Sites

For more information on environmental topics at Los Alamos National Laboratory, access the following Web sites:

http://lib-www.lanl.gov/cgi-bin/getfile?LA-13979.htm provides access to *Environmental Surveillance at Los Alamos during 2001*.

http://lib-www.lanl.gov/cgi-bin/getfile?00783121.pdf provides access to *Overview of Environmental Surveillance at Los Alamos during 2001*.

http://www.lanl.gov reaches the Los Alamos National Laboratory Web site.

http://www.energy.gov reaches the national Department of Energy Web site.

http://labs.ucop.edu provides information on the three laboratories managed by the University of California.

http://www.esh.lanl.gov/~AirQuality accesses LANL's Air Quality Group.

http://www.esh.lanl.gov/~esh18/ accesses LANL's Water Quality and Hydrology Group.

http://www.esh.lanl.gov/~esh19/ accesses LANL's Hazardous and Solid Waste Group.

http://www.esh.lanl.gov/%7Eesh20/ accesses LANL's Ecology Group.

http://erproject.lanl.gov provides information on LANL's Environmental Restoration Project.

activation products Radioactive products generated as a result of neutrons and other subatomic particles interacting with materials such as air, construction materials, or impurities in cooling water. These activation products are usually distinguished, for reporting purposes, from fission products.

albedo dosimeters Albedo dosimeters are used to measure neutrons around TA-18. They use a neutron-sensitive polyethylene phantom to capture neutron backscatter to simulate the human body.

alpha particle A positively charged particle (identical to the helium nucleus) composed of two protons and two neutrons that are emitted during decay of certain radioactive atoms. Alpha particles are stopped by several centimeters of air or a sheet of paper.

ambient air The surrounding atmosphere as it exists around people, plants, and structures. It is not considered to include the air immediately adjacent to emission sources.

aquifer A saturated layer of rock or soil below the ground surface that can supply usable quantities of groundwater to wells and springs. Aquifers can be a source of water for domestic, agricultural, and industrial uses.

artesian well A well in which the water rises above the top of the water-bearing bed.

background radiation Ionizing radiation from sources other than the Laboratory. This radiation may include cosmic radiation; external radiation from naturally occurring radioactivity in the earth (terrestrial radiation), air, and water; internal radiation from naturally occurring radioactive elements in the human body; worldwide fallout; and radiation from medical diagnostic procedures.

beta particle A negatively charged particle (identical to the electron) that is emitted during decay of certain radioactive atoms. Most beta particles are stopped by 0.6 cm of aluminum.

biota The types of animal and plant life found in an area.

blank sample A control sample that is identical, in principle, to the sample of interest, except that the substance being analyzed is absent. The measured value or signals in blanks for the analyte is believed to be caused by artifacts and should be subtracted from the measured value. This process yields a net amount of the substance in the sample.

blind sample A control sample of known concentration in which the expected values of the constituent are unknown to the analyst.

BOD Biochemical (biological) oxygen demand. A measure of the amount of oxygen in biological processes that breaks down organic matter in water; a measure of the organic pollutant load. It is used as an indicator of water quality.

CAA Clean Air Act. The federal law that authorizes the Environmental Protection Agency (EPA) to set air quality standards and to assist state

and local governments to develop and execute air pollution prevention and control programs.

CERCLA — Comprehensive Environmental Response, Compensation, and Liability Act of 1980. Also known as Superfund, this law authorizes the federal government to respond directly to releases of hazardous substances that may endanger health or the environment. The EPA is responsible for managing Superfund.

CFR — Code of Federal Regulations. A codification of all regulations developed and finalized by federal agencies in the *Federal Register*.

COC — Chain-of-Custody. A method for documenting the history and possession of a sample from the time of collection, through analysis and data reporting, to its final disposition.

contamination — (1) Substances introduced into the environment as a result of people's activities, regardless of whether the concentration is a threat to health (see pollution). (2) The deposition of unwanted radioactive material on the surfaces of structures, areas, objects, or personnel.

controlled area — Any Laboratory area to which access is controlled to protect individuals from exposure to radiation and radioactive materials.

Ci — Curie. Unit of radioactivity. One Ci equals 3.70×10^{10} nuclear transformations per second.

cosmic radiation — High-energy particulate and electromagnetic radiations that originate outside the earth's atmosphere. Cosmic radiation is part of natural background radiation.

CWA — Clean Water Act. The federal law that authorizes the EPA to set standards designed to restore and maintain the chemical, physical, and biological integrity of the nation's waters.

DOE — US Department of Energy. The federal agency that sponsors energy research and regulates nuclear materials used for weapons production.

dose — A term denoting the quantity of radiation energy absorbed.

EDE — Effective dose equivalent. The hypothetical whole-body dose that would give the same risk of cancer mortality and serious genetic disorder as a given exposure but that may be limited to a few organs. The effective dose equivalent is equal to the sum of individual organ doses, each weighted by degree of risk that the organ dose carries. For example, a 100-mrem dose to the lung, which has a weighting factor of 0.12, gives an effective dose that is equivalent to $100 \times 0.12 = 12$ mrem.
CEDE: committed effective dose equivalent
TEDE: total effective dose equivalent

maximum individual dose — The greatest dose commitment, considering all potential routes of exposure from a facility's operation, to an individual at or outside the

	Laboratory boundary where the highest dose rate occurs. It takes into account shielding and occupancy factors that would apply to a real individual.
population dose	The sum of the radiation doses to individuals of a population. It is expressed in units of person-rem. (For example, if 1,000 people each received a radiation dose of 1 rem, their population dose would be 1,000 person-rem.)
whole body dose	A radiation dose commitment that involves exposure of the entire body (as opposed to an organ dose that involves exposure to a single organ or set of organs).
EA	Environmental Assessment. A report that identifies potentially significant environmental impacts from any federally approved or funded project that may change the physical environment. If an EA shows significant impact, an Environmental Impact Statement is required.
effluent	A liquid waste discharged to the environment.
EIS	Environmental Impact Statement. A detailed report, required by federal law, on the significant environmental impacts that a proposed major federal action would have on the environment. An EIS must be prepared by a government agency when a major federal action that will have significant environmental impacts is planned.
emission	A gaseous waste discharged to the environment.
environmental compliance	The documentation that the Laboratory complies with the multiple federal and state environmental statutes, regulations, and permits that are designed to ensure environmental protection. This documentation is based on the results of the Laboratory's environmental monitoring and surveillance programs.
environmental monitoring	The sampling of contaminants in liquid effluents and gaseous emissions from Laboratory facilities, either by directly measuring or by collecting and analyzing samples in a laboratory.
environmental surveillance	The sampling of contaminants in air, water, sediments, soils, food-stuffs, and plants and animals, either by directly measuring or by collecting and analyzing samples in a laboratory.
EPA	Environmental Protection Agency. The federal agency responsible for enforcing environmental laws. Although state regulatory agencies may be authorized to administer some of this responsibility, EPA retains oversight authority to ensure protection of human health and the environment.
exposure	A measure of the ionization produced in air by x-ray or gamma ray radiation. (The unit of exposure is the roentgen.)
external radiation	Radiation originating from a source outside the body.
gallery	An underground collection basin for spring discharges.

gamma radiation Short-wavelength electromagnetic radiation of nuclear origin that has no mass or charge. Because of its short wavelength (high energy), gamma radiation can cause ionization. Other electromagnetic radiation (such as microwaves, visible light, and radiowaves) has longer wavelengths (lower energy) and cannot cause ionization.

GENII Computer code used to calculate doses from all pathways (air, water, foodstuffs, and soil).

gross alpha The total amount of measured alpha activity without identification of specific radionuclides.

gross beta The total amount of measured beta activity without identification of specific radionuclides.

groundwater Water found beneath the surface of the ground. Groundwater usually refers to a zone of complete water saturation containing no air.

^{3}H Tritium.

half-life, radioactive The time required for the activity of a radioactive substance to decrease to half its value by inherent radioactive decay. After two half-lives, one-fourth of the original activity remains (1/2 × 1/2), after three half-lives, one-eighth (1/2 × 1/2 × 1/2), and so on.

hazardous waste Wastes exhibiting any of the following characteristics: ignitability, corrosivity, reactivity, or yielding toxic constituents in a leaching test. In addition, EPA has listed as hazardous other wastes that do not necessarily exhibit these characteristics. Although the legal definition of hazardous waste is complex, the term generally refers to any waste that EPA believes could pose a threat to human health and the environment if managed improperly. Resource Conservation and Recovery Act (RCRA) regulations set strict controls on the management of hazardous wastes.

hazardous waste constituent The specific substance in a hazardous waste that makes it hazardous and therefore subject to regulation under Subtitle C of RCRA.

HSWA Hazardous and Solid Waste Amendments of 1984 to RCRA. These amendments to RCRA greatly expanded the scope of hazardous waste regulation. In HSWA, Congress directed EPA to take measures to further reduce the risks to human health and the environment caused by hazardous wastes.

hydrology The science dealing with the properties, distribution, and circulation of natural water systems.

internal radiation Radiation from a source within the body as a result of deposition of radionuclides in body tissues by processes such as ingestion, inhalation, or implantation. Potassium-40, a naturally occurring radionuclide, is a major source of internal radiation in living organisms. Also called self-irradiation.

ionizing radiation Radiation possessing enough energy to remove electrons from the substances through which it passes. The primary contributors to

ionizing radiation are radon, cosmic and terrestrial sources, and medical sources such as x-rays and other diagnostic exposures.

isotopes Forms of an element having the same number of protons in their nuclei but differing in the number of neutrons. Isotopes of an element have similar chemical behaviors but can have different nuclear behaviors.

- long-lived isotope - A radionuclide that decays at such a slow rate that a quantity of it will exist for an extended period (half-life is greater than three years).
- short-lived isotope - A radionuclide that decays so rapidly that a given quantity is transformed almost completely into decay products within a short period (half-life is two days or less).

LLW Low-level waste. The level of radioactive contamination in LLW is not strictly defined. Rather, LLW is defined by what it is not. It does not include nuclear fuel rods, wastes from processing nuclear fuels, transuranic (TRU) waste, or uranium mill tailings.

MCL Maximum contaminant level. Maximum permissible level of a contaminant in water that is delivered to the free-flowing outlet of the ultimate user of a public water system (see Appendix A and Table A-6). The MCLs are specified by the EPA.

MEI Maximally exposed individual. The average exposure to the population in general will always be less than to one person or subset of persons because of where they live, what they do, and their individual habits. To try to estimate the dose to the MEI, one tries to find that population subgroup (and more specifically, the one individual) that potentially has the highest exposure, intake, etc. This becomes the MEI.

mixed waste Waste that contains a hazardous waste component regulated under Subtitle C of the RCRA and a radioactive component consisting of source, special nuclear, or byproduct material regulated under the federal Atomic Energy Act (AEA).

mrem Millirem. See definition of rem. The dose equivalent that is one-thousandth of a rem.

NEPA National Environmental Policy Act. This federal legislation, passed in 1969, requires federal agencies to evaluate the impacts of their proposed actions on the environment before decision making. One provision of NEPA requires the preparation of an EIS by federal agencies when major actions significantly affecting the quality of the human environment are proposed.

NESHAP National Emission Standards for Hazardous Air Pollutants. These standards are found in the CAA; they set limits for such pollutants as beryllium and radionuclides.

nonhazardous waste Chemical waste regulated under the Solid Waste Act, Toxic Substances Control Act, and other regulations, including asbestos, PCB, infectious

wastes, and other materials that are controlled for reasons of health, safety, and security.

NPDES National Pollutant Discharge Elimination System. This federal program, under the Clean Water Act, requires permits for discharges into surface waterways.

nuclide A species of atom characterized by the constitution of its nucleus. The nuclear constitution is specified by the number of protons, number of neutrons, and energy content—or alternately, by the atomic number, mass number, and atomic mass. To be a distinct nuclide, the atom must be capable of existing for a measurable length of time.

outfall The location where wastewater is released from a point source into a receiving body of water.

PCB Polychlorinated biphenyls. A family of organic compounds used since 1926 in electric transformers, lubricants, carbonless copy paper, adhesives, and caulking compounds. PCB are extremely persistent in the environment because they do not break down into new and less harmful chemicals. PCB are stored in the fatty tissues of humans and animals through the bioaccumulation process. EPA banned the use of PCB, with limited exceptions, in 1976.

PDL Public Dose Limit. The new term for Radiation Protection Standards, a standard for external and internal exposure to radioactivity as defined in DOE Order 5400.5 (see Appendix A and Table A-1).

perched groundwater A groundwater body above a slow-permeablity rock or soil layer that is separated from an underlying main body of groundwater by a vadose zone.

person-rem A quantity used to describe the radiological dose to a population. Population doses are calculated according to sectors, and all people in a sector are assumed to get the same dose. The number of person-rem is calculated by summing the modeled dose to all receptors in all sectors. Therefore, person-rem is the sum of the number of people times the dose they receive.

pH A measure of the hydrogen ion concentration in an aqueous solution. Acidic solutions have a pH less than 7, basic solutions have a pH greater than 7, and neutral solutions have a pH of 7.

pollution Levels of contamination that may be objectionable (perhaps because of a threat to health [see contamination]).

point source An identifiable and confined discharge point for one or more water pollutants, such as a pipe, channel, vessel, or ditch.

ppb Parts per billion. A unit measure of concentration equivalent to the weight/volume ratio expressed as μg/L or ng/mL. Also used to express the weight/weight ratio as ng/g or μg/kg.

ppm Parts per million. A unit measure of concentration equivalent to the weight/volume ratio expressed as mg/L. Also used to express the weight/weight ratio as μg/g or mg/kg.

QA Quality assurance. Any action in environmental monitoring to ensure the reliability of monitoring and measurement data. Aspects of quality assurance include procedures, interlaboratory comparison studies, evaluations, and documentation.

QC Quality control. The routine application of procedures within environmental monitoring to obtain the required standards of performance in monitoring and measurement processes. QC procedures include calibration of instruments, control charts, and analysis of replicate and duplicate samples.

rad Radiation absorbed dose. The rad is a unit for measuring energy absorbed in any material. Absorbed dose results from energy being deposited by the radiation. It is defined for any material. It applies to all types of radiation and does not take into account the potential effect that different types of radiation have on the body.

1 rad = 1,000 millirad (mrad)

radionuclide An unstable nuclide capable of spontaneous transformation into other nuclides through changes in its nuclear configuration or energy level. This transformation is accompanied by the emission of photons or particles.

RESRAD A computer modeling code designed to model radionuclide transport in the environment.

RCRA Resource Conservation and Recovery Act of 1976. RCRA is an amendment to the first federal solid waste legislation, the Solid Waste Disposal Act of 1965. In RCRA, Congress established initial directives and guidelines for EPA to regulate hazardous wastes.

release Any discharge to the environment. Environment is broadly defined as water, land, or ambient air.

rem Roentgen equivalent man. The rem is a unit for measuring dose equivalence. It is the most commonly used unit and pertains only to people. The rem takes into account the energy absorbed (dose) and the biological effect on the body (quality factor) from the different types of radiation.

rem = rad × quality factor
1 rem = 1,000 millirem (mrem)

SAL Screening Action Limit. A defined contaminant level that if exceeded in a sample requires further action.

SARA Superfund Amendments and Reauthorization Act of 1986. This act modifies and reauthorizes CERCLA. Title III of this act is known as the Emergency Planning and Community Right-to-Know Act of 1986.

saturated zone Rock or soil where the pores are completely filled with water, and no air is present.

SWMU Solid waste management unit. Any discernible site at which solid wastes have been placed at any time, regardless of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at or around a facility at which solid wastes have been routinely and systematically released, such as waste tanks, septic tanks, firing sites, burn pits, sumps, landfills (material disposal areas), outfall areas, canyons around LANL, and contaminated areas resulting from leaking product storage tanks (including petroleum).

terrestrial radiation Radiation emitted by naturally occurring radionuclides such as internal radiation source; the natural decay chains of uranium-235, uranium-238, or thorium-232; or cosmic-ray-induced radionuclides in the soil.

TLD Thermoluminescent dosimeter. A material (the Laboratory uses lithium fluoride) that emits a light signal when heated to approximately 300°C. This light is proportional to the amount of radiation (dose) to which the dosimeter was exposed.

TRU Transuranic waste. Waste contaminated with long-lived transuranic elements in concentrations within a specified range established by DOE, EPA, and Nuclear Regulatory Agency. These are elements shown above uranium on the chemistry periodic table, such as plutonium, americium, and neptunium, that have activities greater than 100 nanocuries per gram.

TSCA Toxic Substances Control Act. TSCA is intended to provide protection from substances manufactured, processed, distributed, or used in the United States. A mechanism is required by the act for screening new substances before they enter the marketplace and for testing existing substances that are suspected of creating health hazards. Specific regulations may also be promulgated under this act for controlling substances found to be detrimental to human health or to the environment.

tuff Rock formed from compacted volcanic ash fragments.

uncontrolled area An area beyond the boundaries of a controlled area (see controlled area in this glossary).

unsaturated zone See vadose zone in this glossary.

UST Underground storage tank. A stationary device, constructed primarily of nonearthen material, designed to contain petroleum products or hazardous materials. In a UST, 10% or more of the volume of the tank system is below the surface of the ground.

vadose zone The partially saturated or unsaturated region above the water table that does not yield water for wells. Water in the vadose zone is held to rock or soil particles by capillary forces and much of the pore space is filled with air.

water table	The water level surface below the ground at which the unsaturated zone ends and the saturated zone begins. It is the level to which a well that is screened in the unconfined aquifer would fill with water.
water year	October through September.
watershed	The region draining into a river, a river system, or a body of water.
wetland	A lowland area, such as a marsh or swamp, that is inundated or saturated by surface water or groundwater sufficient to support hydrophytic vegetation typically adapted for life in saturated soils.
wind rose	A diagram that shows the frequency and intensity of wind from different directions at a particular place.
worldwide fallout	Radioactive debris from atmospheric weapons tests that has been deposited on the earth's surface after being airborne and cycling around the earth.

AA-2	Internal Assessment Group (LANL)
AEC	Atomic Energy Commission
AIP	Agreement in Principle
AIRFA	American Indian Religious Freedom Act
AIRNET	Air Monitoring Network
AL	Albuquerque Operations Office (DOE)
AO	Administrative Order
AQCR	Air Quality Control Regulation (New Mexico)
ARPA	Archeological Resources Protection Act
ATDSR	Agency for Toxic Substances and Disease Registry
BAER	Burned Area Rehabilitation Team
BCG	Biota Concentration Guides
BEIR	biological effects of ionizing radiation
BOD	biochemical/biological oxygen demand
BRMP	Biological Redources Management Plan
BSRL	baseline statistical reference level
BTEX	total aromatic hydrocarbon
Btu	British thermal unit
C	Chemistry Division
CAA	Clean Air Act
C-ACS	Analytical Chemistry Services Group
CAS	Connected Action Statement
CCNS	Concerned Citizens for Nuclear Safety
CEDE	committed effective dose equivalent
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CRO	Community Relations Office (LANL)
CMR	Chemistry and Metallurgy Research (LANL building)
CO	compliance order
COC	chain-of-custody
COD	chemical oxygen demand
COE	Army Corps of Engineers
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
CY	calendar year
DAC	derived air concentration (DOE)
DARHT	Dual Axis Radiographic Hydrotest facility
DCG	Derived Concentration Guide (DOE)
D&D	decontamination and decommissioning
DEC	DOE Environmental Checklist
DOE	Department of Energy
DOE-EM	DOE, Environmental Management
DOU	Document of Understanding

EA	Environmental Assessment
EDE	effective dose equivalent
EIS	Environmental Impact Statement
EML	Environmental Measurements Laboratory
EO	Executive Order
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ER	Environmental Restoration
ESH	Environment, Safety, & Health
ESH-4	Health Physics Measurements Group (LANL)
ESH-13	ESH Training Group (LANL)
ESH-14	Quality Assurance Support Group (LANL)
ESH-17	Air Quality Group (LANL)
ESH-18	Water Quality & Hydrology Group (LANL)
ESH-19	Hazardous & Solid Waste Group (LANL)
ESH-20	Ecology Group (LANL)
ESO	Environmental Stewardship Office (LANL)
EST	Ecological Studies Team (ESH-20)
FFCA	Federal Facilities Compliance Agreement
FFCAct	Federal Facilities Compliance Act
FFCAgreement	RCRA Federal Facility Compliance Agreement
FFCO	Federal Facility Compliance Order
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIMAD	Facility for Information Management, Analysis, and Display
FONSI	Finding of No Significant Impact
FWO	Facilities and Waste Operations Division (LANL)
FY	fiscal year
GENII	Generation II
GIS	geographic information system
G/MAP	gaseous/mixed air activation products
GPS	global positioning system
GWPMPP	Groundwater Protection Management Program Plan
HAP	hazardous air pollutants
HAZWOPER	hazardous waste operations (training class)
HE	high-explosive
HEWTP	High-Explosive Wastewater Treatment Plant
HMPT	Hazardous Materials Packaging and Transportation
HPTL	High Pressure Tritium Labortory
HPAL	Health Physics Analytical Laboratory
HSWA	Hazardous and Solid Waste Amendments
HWA	Hazardous Waste Act (New Mexico)
HWMR	Hazardous Waste Management Regulations (New Mexico)
ICRP	International Commission on Radiological Protection
IRMP	Integrated Resources Management Plan

JCNNM	Johnson Controls Northern New Mexico
JENV	JCNNM Environmental Laboratory
LAAO	Los Alamos Area Office (DOE)
LANSCE	Los Alamos Neutron Science Center
LANL	Los Alamos National Laboratory (or the Laboratory)
LEDA	Low-Energy Demonstration Accelerator
LLW	low-level radioactive waste
LLMW	low-level mixed waste
LOD	limits of detection
LOQ	limit of quantitation
MAP	Mitigation Action Plan
MCL	maximum contaminant level
MDA	minimum detectable activity
MEI	maximally exposed individual
MRL	minimum risk level
MSGP	Multi-Sector General Permit
NAGPRA	Native American Grave Protection and Repatriation Act
NCB	NEPA, Cultural, and Biological
NCF	neutron correction factor
NCRP	National Council on Radiation Protection and Measurements
NEPA	National Environmental Policy Act
NERF	NEPA Review Form
NESHAP	National Emission Standards for Hazardous Air Pollutants
NEWNET	Neighborhood Environmental Watch Network
NHPA	National Historic Preservation Act
NMDA	New Mexico Department of Agriculture
NMDOB	New Mexico DOE Oversight Bureau
NMED	New Mexico Environment Department
NMED-SWQB	New Mexico Environment Department's Surface Water Quality Bureau
NMEIB	New Mexico Environmental Improvement Board
NMWQCA	New Mexico Water Quality Control Act
NMWQCC	New Mexico Water Quality Control Commission
NPDES	National Pollutant Discharge Elimination System
NRC	US Nuclear Regulatory Commission
NTISV	Nontraditional In Situ Vitrification
NWP	Nationwide Work Permit
OB/OD	open burning/open detonation
OCP	organochlorine pesticides
ODS	ozone depleting substance
O&G	oil and grease
OHL	Occupational Health Laboratory (LANL)
OSHA	Occupational Safety and Health Act/Administration
PCB	polychlorinated biphenyls
PDL	public dose limit

PE	performance evaluation
PHERMEX	Pulsed high-energy radiographic machine emitting x-rays
ppb	parts per billion
ppm	parts per million
PRS	potential release site
P/VAP	particulate/vapor activation products
QA	quality assurance
QAP	Quality Assurance Program
QC	quality control
RAC	Risk Assessment Corporation
RAWS	Remote Automated Weather System
RCRA	Resource Conservation and Recovery Act
RD&D	research, development, and demonstration
RESRAD	residual radioactive material computer code
RLWTF	Radioactive Liquid Waste Treatment Facility (LANL)
RSRL	regional statistical reference level
SA	supplement assessment
SAL	screening action level
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SEA	Special Environmental Analysis
SHPO	State Historic Preservation Officer (New Mexico)
SLD	Scientific Laboratory Division (New Mexico)
SOC	synthetic organic compound
SOW	statement of work
SPCC	Spill Prevention Control and Countermeasures
SVOC	semivolatile organic compound
SWA	Solid Waste Act
SWEIS	site-wide environmental impact statement
SWIPO	Site-Wide Projects Office
SWPP	Storm Water Prevention Plan
SWMR	solid waste management regulations
SWMU	solid waste management unit
SWS	Sanitary Wastewater Systems Facility (LANL)
TA	Technical Area
TDS	total dissolved solids
T&E	threatened and endangered
TEDE	total effective dose equivalent
TLD	thermoluminescent dosimeter
TLDNET	thermoluminescent dosimeter network
TRI	toxic chemical release inventory
TRU	transuranic waste
TRPH	total recoverable petroleum hydrocarbon
TSCA	Toxic Substances Control Act
TSFF	Tritium Science and Fabrication Facility

TSS	total suspended solids
TTHM	total trihalomethane
TWISP	Transuranic Waste Inspectable Storage Project (LANL)
UC	University of California
USFS	United States Forest Service
USGS	United States Geological Survey
UST	underground storage tank
VAP	vaporous activation products
VCA	voluntary corrective action
VOC	volatile organic compound
WASTENET	Waste Management Areas Network (for air monitoring)
WETF	Weapons Engineering Tritium Facility
WM	Waste Management (LANL)
WSC	Waste Stream Characterization
WWW	World Wide Web

Elemental and Chemical Nomenclature

Actinium	Ac
Aluminum	Al
Americium	Am
Argon	Ar
Antimony	Sb
Arsenic	As
Astatine	At
Barium	Ba
Berkelium	Bk
Beryllium	Be
Bicarbonate	HCO_3
Bismuth	Bi
Boron	B
Bromine	Br
Cadmium	Cd
Calcium	Ca
Californium	Cf
Carbon	C
Cerium	Ce
Cesium	Cs
Chlorine	Cl
Chromium	Cr
Cobalt	Co
Copper	Cu
Curium	Cm
Cyanide	CN
Carbonate	CO_3
Dysprosium	Dy
Einsteinium	Es
Erbium	Er
Europium	Eu
Fermium	Fm
Fluorine	F
Francium	Fr
Gadolinium	Gd
Gallium	Ga
Germanium	Ge
Gold	Au
Hafnium	Hf
Helium	He
Holmium	Ho
Hydrogen	H
Hydrogen oxide	H_2O
Indium	In
Iodine	I
Iridium	Ir
Iron	Fe
Krypton	Kr
Lanthanum	La
Lawrencium	Lr (Lw)
Lead	Pb
Lithium	Li
Lithium fluoride	LiF
Lutetium	Lu
Magnesium	Mg
Manganese	Mn
Mendelevium	Md
Mercury	Hg
Molybdenum	Mo
Neodymium	Nd
Neon	Ne
Neptunium	Np
Nickel	Ni
Niobium	Nb
Nitrate (as Nitrogen)	NO_3-N
Nitrite (as Nitrogen)	NO_2-N
Nitrogen	N
Nitrogen dioxide	NO_2
Nobelium	No
Osmium	Os
Oxygen	O
Palladium	Pd
Phosphaeus	P
Phosphate (as Phosphous)	PO_4-P
Platinum	Pt
Plutonium	Pu
Polonium	Po
Potassium	K
Praseodymium	Pr
Promethium	Pm
Protactinium	Pa
Radium	Ra
Radon	Rn
Rhenium	Re
Rhodium	Rh
Rubidium	Rb
Ruthenium	Ru
Samarium	Sm
Scandium	Sc
Selenium	Se
Silicon	Si
Silver	Ag
Sodium	Na
Stronium	Sr
Sulfate	SO_4
Sulfite	SO_3
Sulfur	S
Tantalum	Ta
Technetium	Tc
Tellurium	Te
Terbium	Tb
Thallium	Tl
Thorium	Th
Thulium	Tm
Tin	Sn
Titanium	Ti
Tritiated water	HTO
Tritium	^3H
Tungsten	W
Uranium	U
Vanadium	V
Xenon	Xe
Ytterbium	Yb
Yttrium	Y
Zinc	Zn
Zirconium	Zr

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Group ESH-18, Water Quality and Hydrology
Group ESH-19, Hazardous and Solid Waste
Group ESH-20, Ecology Group
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