CONCENTRATIONS AND LOADS OF SELECTED TRACE ELEMENTS AND OTHER CONSTITUENTS IN THE RIO GRANDE IN THE VICINITY OF ALBUQUERQUE, NEW MEXICO, 1994

By Todd Kelly and H.E. Taylor

U.S. GEOLOGICAL SURVEY
Open-File Report 96-126

Prepared in cooperation with the
CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT

Albuquerque, New Mexico
1996

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
inch	25.40	millimeter
foot	0.3048	meter
mile	1.609	kilometer
cubic foot per second	0.02832	cubic meter per second
ton	0.9072	metric ton

Temperatures in degrees Celsius (°C) and degrees Fahrenheit (°F) can be converted by the equations:

$$°F = 9/5\ (°C) + 32$$

$$°C = (°F-32)/1.8$$

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929--a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

Use of brand names in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

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ABSTRACT

The Pueblo of Isleta and the New Mexico Environment Department have established water-quality standards for the Rio Grande, which flows through Albuquerque, New Mexico. Trace-element concentrations historically have been greater than maximum permissible concentrations allowed by these standards. It is not known if these concentrations are due to sources from the Albuquerque metropolitan area or are from natural or other sources outside Albuquerque.

Accurate water-quality data with lower reporting limits than have been previously available were collected, and instantaneous concentrations and loads were calculated for trace elements and other constituents in the Rio Grande during high-flow and low-flow conditions. Seven sampling sites were selected upstream from, in, and downstream from metropolitan Albuquerque. Concurrent streamflow measurements were made at the time of sampling to determine suspended-sediment loads. Samples were analyzed separately for trace elements dissolved in water (less than 0.4 micrometer in diameter) and for those contained in suspended sediment (greater than 0.1 micrometer in diameter). Sample collection and processing, analytical methods, and quality control are discussed.

INTRODUCTION

The Rio Grande flows southwardly through the west side of metropolitan Albuquerque and receives effluent from storm-water drains, riverside irrigation drainage canals, and wastewater treatment plants. The Pueblo of Isleta Indian Reservation, located downstream from Albuquerque, and the New Mexico Environment Department have established water-quality standards, including those for trace elements, for the Rio Grande. Historical concentrations of some constituents in the Rio Grande, such as aluminum, arsenic, selenium, and silver, have been greater than maximum permissible concentrations allowed by these water-quality standards. Natural sources of trace elements are known upstream from Albuquerque, such as arsenic from the Jemez Mountains, but their respective contributions to the Rio Grande have not been accurately quantified. It is not known, therefore, to what extent concentrations of trace elements in the reach of the Rio Grande flowing through Albuquerque are due to sources from the Albuquerque metropolitan area or due to natural or other sources outside the area. This uncertainty is due in part to current standard sampling and laboratory methods that may not produce sufficiently accurate data, particularly at lower concentrations, to discern small differences in concentrations among sampling sites on the river.

The objective of the study was to obtain accurate water-quality data with lower reporting limits for selected dissolved trace elements than previously available and to calculate instantaneous loads of selected trace elements and other constituents in the Rio Grande during steady high-flow and steady low-flow conditions. Water-quality data were collected at sites upstream from metropolitan Albuquerque, in the metropolitan area, and downstream from Albuquerque. These data will allow water-quality managers and regulators to better compare water-quality conditions among sampling sites on the river and help to determine sources of high constituent concentrations. The report was prepared in cooperation with the City of Albuquerque Public Works Department.

Purpose and Scope

This report presents water-quality data collected for this study and calculations of instantaneous concentrations and loads. Water samples were collected at seven sites (fig. 1) during high flow (May 31-June 2, 1994) and low flow (October 3-6, 1994). Samples were analyzed separately for trace elements dissolved in water (less than 0.4 micrometer in diameter) and for those contained in suspended sediment (greater than 0.1 micrometer in diameter). Streamflow measurements were made at the time of sampling, and companion suspended-sediment samples were collected to determine sediment concentrations and percentages of sand and finer particles. Specific conductance, pH, stream temperature, dissolved oxygen, and alkalinity also were measured at the time of sampling.

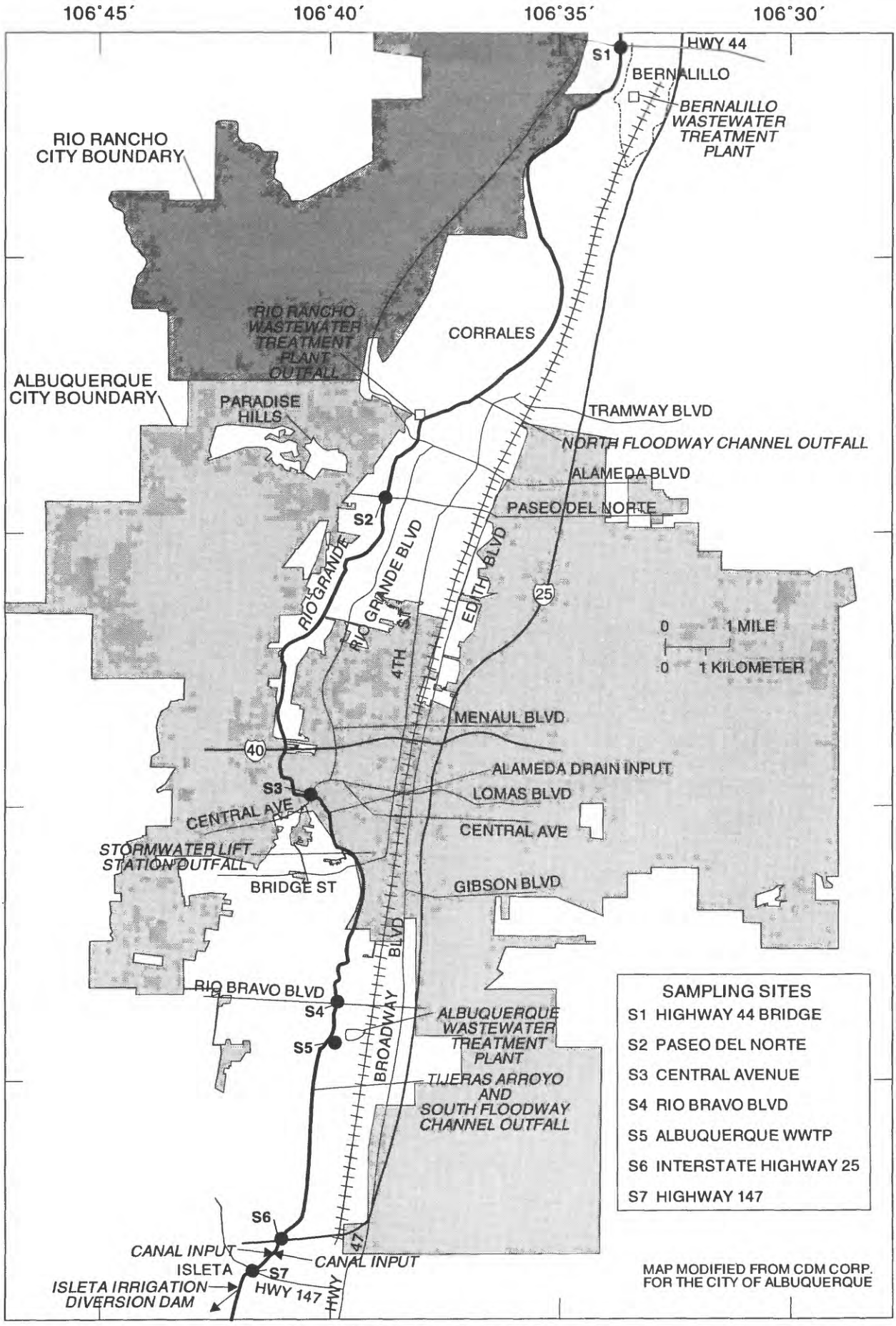

Figure 1.--Rio Grande sampling sites.

Description of Sampling Sites

Water samples were collected at seven sites. Location of the sites is shown in figure 1. The sites selected for the sampling are:

S1. State Highway 44 Bridge near Bernalillo (station 351921106332710)
Site S1 is in the Rio Grande immediately downstream from the Jemez River, which is known to contain relatively high, natural concentrations of certain trace elements such as arsenic, and upstream from metropolitan Albuquerque. It serves as a reference site for conditions upstream from Albuquerque.

S2. Paseo del Norte Bridge (station 08329928)
Site S2 is in the Rio Grande downstream from discharges from the Bernalillo wastewater treatment plant (WWTP), Rio Rancho WWTP, and the Albuquerque North Floodway Diversion Channel, which drains storm-water runoff from much of Albuquerque.

S3. Central Avenue Bridge (station 08330000)
Site S3 is in the Rio Grande about in the middle of the west side of metropolitan Albuquerque and downstream from inflows from the riverside drainage canals and storm-water pumping stations.

S4. Rio Bravo Boulevard Bridge (station 08330150)
Site S4 is in the Rio Grande downstream from discharges from downtown Albuquerque's storm sewers and approximately 0.7 mile upstream from the discharge to the Rio Grande from the Albuquerque WWTP.

S5. Albuquerque WWTP effluent channel (station 350104106401110)
Site S5 is in the effluent channel for Albuquerque's treated wastewater, which discharges to the river about 300 feet west of the sampling site.

S6. Interstate Highway 25 Bridge (station 345705106405210)
Site S6 is in the Rio Grande downstream from discharges from the Albuquerque WWTP, Tijeras Arroyo, and the South Floodway Diversion Channel. Tijeras Arroyo and the South Floodway Diversion Channel normally are dry and flow only after large rainstorms or snowmelt. The site represents Rio Grande inflow to the Pueblo of Isleta.

S7. State Highway 147 immediately upstream from the Isleta Irrigation Diversion Dam (station 08331000)
Site S7 is in the Rio Grande downstream from the confluence of riverside drains on the east and west banks of the Rio Grande and downstream from all point and non-point discharges from and adjacent to metropolitan Albuquerque.

Acknowledgments

Ron Antweiler, Dale Peart, Dave Roth, and Terry Brinton from H.E. Taylor's staff and George Sieber from the U.S. Geological Survey (USGS) Albuquerque Field Headquarters assisted in making field measurements, and collecting, processing, and analyzing samples. Kim Ong of the USGS New Mexico District Office provided technical review of field collection and analytical results.

METHODOLOGY

Sample Collection

During high flow, a modification of a previously described collapsible-bag sampler (Stevens and others, 1980; Nordin and others, 1983; Meade, 1985) was used to collect depth-integrated samples at three to five verticals from bridges at each sampling site (Moody and Meade, 1992). The equipment consisted of a USGS D-77 sampler (Horowitz and others, 1994) modified to hold a perforated 3-liter polyethylene bottle and a Teflon-bag liner. All verticals at each site were combined into a composite sample. Approximately 20 liters of total composited sample was collected at each site. Teflon bags used in the bag sampler minimized sample contamination and facilitated quantitative transfer of sample and suspended material. Possible metal contamination of the sample was minimized by using Teflon (polytetrafluoroethylene), high-density polyethylene, or Teflon-coated stainless steel sample processing equipment. Talc-free polyethylene, polyvinyl chloride, or Teflon gloves were used during the entire sample handling and processing procedure. At low flow, a modified Teflon USGS DH-81 hand-held sampler (Horowitz and others, 1994) was used to collect depth-integrated samples. A replaceable Teflon-bag liner (changed from site to site) in this sampler minimized cross-contamination between sampling sites. A minimum of 10 equally spaced verticals were composited into a 20-liter Teflon-coated churn.

Sample Processing

During compositing, samples were passed through a precleaned nylon 63-micron screen to remove sand-size suspended material and miscellaneous debris. Field blanks using deionized water indicate that the nylon screen contributed negligible contamination to trace-element concentrations. The composited samples, composed of water and particulate matter (smaller than 63 microns), were representatively split into subsamples using a Teflon-coated stainless steel churn splitter. Individual aliquots were taken from the splitter for analysis of trace elements, including mercury (Hg); major anions; dissolved organic carbon (DOC), and nutrients.

A Teflon vacuum filter apparatus (similar to the one shown in fig. 2) was used to remove particulate matter greater than 0.40 micrometer in diameter from the trace-element subsample. The following protocol was used for the filtration: (1) The filter funnel was thoroughly cleaned and rinsed with deionized water. (2) A new 0.40-micrometer-pore-size, 47-millimeter-diameter Nuclepore polycarbonate-membrane filter was placed on the filter support and precleaned by drawing approximately 20 milliliters of 0.1-percent (volume/volume) ultrapure nitric acid rinse solution through the filter into a waste bottle. (3) The filter was then rinsed by drawing approximately 50 milliliters of deionized water through it into a waste bottle. (4) About 20 milliliters of the shaken, composited subsample was then filtered to prerinse the sample bottle and also effectively "preload" the filter with particulate. (5) The balance of the subsample (about 225 milliliters) was filtered into the sample bottle. (6) Finally, the filtered sample was preserved with the addition of 2 milliliters of concentrated ultrapure nitric acid using a Teflon dispensing bottle as shown in figure 3 (Brinton and others, 1995). By squeezing the sides of this bottle, high purity nitric acid is forced up the Teflon tubing, filling the holding well. The volume of this well is changed by adjustment of the height of the Teflon plug. Excess acid returns to the bottom of the bottle when the well overflows. The Teflon cap is removed and the precise volume of acid in the well is dispensed by inverting the bottle. Only one filter membrane was used for the entire

aliquot. The filter apparatus was thoroughly cleaned and rinsed between samples to minimize trace-element contamination.

The 125-milliliter mercury subsample was filtered into a precleaned clear glass bottle, following the protocol outlined above for the trace-element subsample. It was subsequently preserved with 5 milliliters of a 1-percent potassium dichromate solution in concentrated ultrapure nitric acid. The dichromate preservative was always added remotely from the sample processing area to minimize the risk of chromium contamination to other trace-element samples.

During the May-June 1994 sampling, the major anion subsamples were filtered through a 0.45-micrometer-pore-size, 25-millimeter-diameter polysulfone-membrane syringe filter. During the October 1994 sampling, this subsample was filtered through a 0.45-micrometer-pore-size, 47-millimeter-diameter polysulfone-membrane filter in a polycarbonate filtration funnel. For both samplings, these subsamples were immediately chilled to approximately 4 °C and transported to the National Research Program (NRP) laboratory in Boulder, Colorado, for analysis.

Separate DOC and nutrient samples were split and processed by pressure filtration through a 47-millimeter, 0.45-micrometer silver membrane filter using nitrogen gas in a stainless steel pressure filtration apparatus. Prior to filtering the sample, the filter was thoroughly rinsed with deionized water. The DOC sample was filtered into a precleaned amber glass bottle and chilled prior to transport to the laboratory for analysis. The nutrient sample was filtered directly into an opaque polyethylene bottle, which was immediately chilled after filtration.

The remaining portion of the composited sample was processed through a tangential-flow ultrafilter (Millipore MiniTan) to remove particulates larger than 0.1 micrometer in diameter. The separated particulate fractions from the ultrafilter were retained for characterization and chemical analysis. The membranes used in the ultrafilter were made of deacetylated cellulose. Trace-element adsorption studies by Leenheer and others (1989) have determined that no significant adsorption occurs on this membrane material. The ultrafilter system was prepared for sample collection according to the following protocol: (1) Prior to sample processing, the ultrafilter system was dismantled and each component was individually cleaned with deionized water. (2) The system was reassembled and 2 liters of 0.1-percent (volume/volume) ultrapure nitric acid was recirculated for approximately 15 minutes to remove any metals from the filter plates. (3) A minimum of 20 liters of deionized water was pumped through the system to rinse out the dilute nitric acid. (4) The sample was then pumped through the system. A stack of eight precleaned filter plates was typically used for each sample to provide suitable processing times and to eliminate carryover contamination between samples.

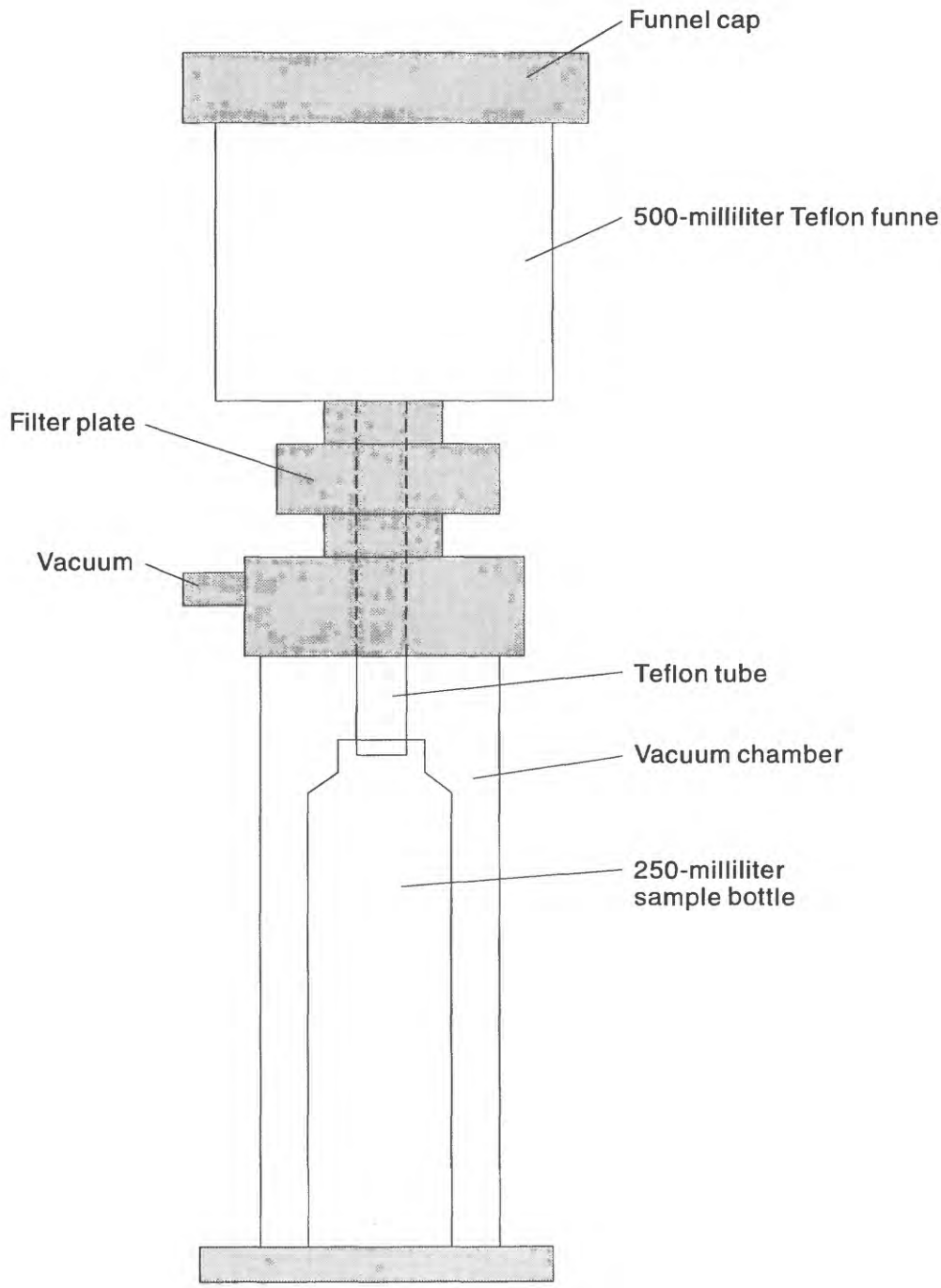

Figure 2.--Schematic diagram of filter apparatus used for filtration of trace-element samples.

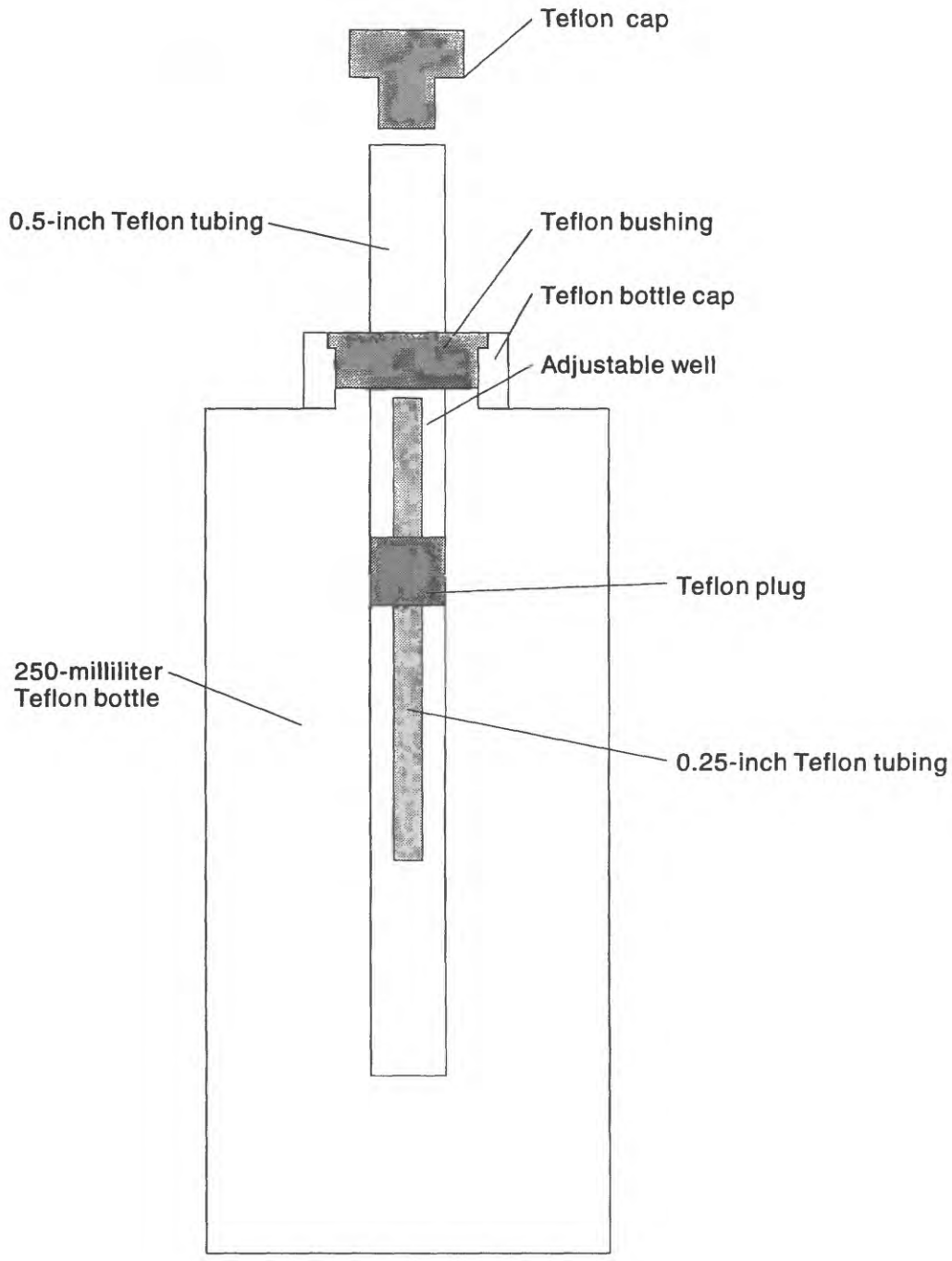

Figure 3.--Schematic diagram of nitric acid dispensing bottle.

Analytical Methods

Trace elements were determined by a combination of analytical techniques including inductively coupled plasma atomic emission spectrometry (ICP-AES) and flame atomic absorption spectrometry (F-AAS). A Perkin Elmer-Science Model 5000 inductively coupled plasma-mass spectrometer (ICP-MS) was configured and optimized for trace-element analysis as previously described (Taylor and Garbarino, 1991; Garbarino and Taylor, 1992). Individual trace elements were quantitatively analyzed with appropriate interference corrections for the following analytes: silver (Ag), aluminum (Al), arsenic (As), boron (B), barium (Ba), beryllium (Be), cadmium (Cd), cobalt (Co), chromium (Cr), copper (Cu), lithium (Li), manganese (Mn), molybdenum (Mo), nickel (Ni), lead (Pb), selenium (Se), strontium (Sr), thallium (Tl), uranium (U), vanadium (V), and zinc (Zn). A complete description of the analytical method and method accuracy and precision data is provided by Garbarino and Taylor (1992). Selenium concentrations were determined by a flow injection-hydride generation ICP-MS procedure (Stroh and others, 1993).

Other constituents were determined using a Jarrell-Ash Atomcomp 975 inductively coupled argon plasma-atomic emission spectrometer. The analytical system, methodology, detection limits, and accuracy and precision data for this method were described by Garbarino and Taylor (1979; 1980) and Skougstad and others (1979). Analytes determined by this method were iron (Fe), calcium (Ca), magnesium (Mg), sodium (Na), and silica (SiO_2). Potassium (K) was determined by flame-atomic absorption spectrometry (F-AAS) using a Varian Model AA-975 instrument; the method was described by Skougstad and others (1979).

Major anion concentrations of chloride (Cl) and sulfate (SO_4) and trace-concentration-level fluoride (F) and bromide (Br), which are used to describe general water chemistry, were determined by ion chromatographic techniques (Hedley and Fishman, 1982; T.I. Brinton, R.C. Antweiler, and H.E. Taylor, U.S. Geological Survey, written commun., 1992). Alkalinity was determined using an automated Radiometer titrator and calculated from pH data (Skougstad and others, 1979). DOC was determined by infrared absorption spectrometric methodology (Menzel and Vaccaro, 1964).

Nutrient species including the ions ammonium (NH_4^+), nitrite (NO_2^-), nitrate (NO_3^-), and orthophosphate (PO_4^{3-}) were determined with an Alpchem autoanalyzer (spectrophotometric determination) using methodologies previously reported by Antweiler and others (1993). Ultratrace-concentration-level mercury was determined by a cold vapor atomic fluorescence spectrometric methodology described by Roth (1994). Companion samples were submitted to the USGS National Water Quality Laboratory (NWQL) in Arvada, Colorado, for standard analysis of cyanide (CN^-) in the filtered water and the filtered suspended-sediment samples. The USGS Albuquerque Field Headquarters laboratory analyzed companion samples for suspended-sediment dry-weight concentrations and for dry-weight percentages of sand and fine particles using standard techniques.

Quality Control

The quality of the analytical results was controlled by collecting numerous field blanks and analyzing certified reference standards extensively along with analysis of the samples and the measurement of recoveries from artificially spiked samples. Field blanks were used to identify possible sources of contamination to samples during their collection and processing. The accuracy of the analysis and the performance of laboratory instrumentation were monitored using reference standards. Spike recoveries were used to estimate the probability of interelement interferences during analysis.

A series of field blanks was collected by processing about 20 liters of specially prepared NRP laboratory-deionized water through the entire sample collection, subsampling, and following all sample processing procedures in an effort to identify possible sources of sample contamination. NRP laboratory-deionized water is processed using a multi-stage reverse osmosis procedure. The subsequent product tests below reporting limits for all analytes. Aliquots were taken at various steps through the entire procedure when processing the deionized water. Samples collected for trace-element, major anion, DOC, and nutrient analyses represented water processed through the bag sampler using Teflon bags, 20-liter Teflon-coated churn splitters (designated churn A in table 1 (all tables are in the back of the report) and churn A2 in table 2), and Teflon holding bottles (designated as bottles A, F, and H in table 1 and bottles 2, 4, and H in table 2). Deionized water was also filtered through a Nuclepore filter to obtain a process (filter) blank. All field blank samples were preserved following the same protocols as their corresponding sample types. Results for the constituents in the field blanks for the two sampling trips, shown in tables 1 and 2, demonstrate negligible contamination for Ag, Al, As, Ca, Cr, K, Mn, Ni, PO_4, Zn, and DOC.

The accuracy of the sample data was ensured by analyzing one to seven standard reference materials periodically, within a set of unknown samples. Reference standards routinely composed about 30 percent of an analytical run. Data for each of the reference standards used for quality assurance during each sampling are listed in tables 3-5. The average and standard deviations are based on the sample population given and represent the accuracy and precision throughout the analysis of the entire set of samples. The measured values usually were within 10 percent of the standard reference material certified values. Exceptions were for Ag, Al, B, Cd, Co, Cr, V, Zn, and NH_4, which often were outside 10 percent of the standard reference material certified values but usually within 20 percent of the certified values.

Tables 6 and 7 list analyte recovery information for samples for the trace elements As, Be, Cd, Cr, Cu, Hg, Ni, Pb, U, and Zn, which were spiked in the field prior to transport to the laboratory. Analyte recoveries generally ranged from 90 to 110 percent.

DISCUSSION OF DATA

Loads in table 8-11 are reported in tons per day with the assumption that the instantaneous streamflow and concentration of each constituent at the time of sampling are representative of mean daily values. Sampling was completed during steady-state flow conditions; however, some fluctuation in flow, sediment concentration, and trace-element concentration was inevitable and is considered to be small. Table 8 summarizes dissolved-constituent concentrations for the May-June sampling, and table 9 summarizes those for the October 1994 sampling. Table 10 summarizes trace-element concentrations in suspended sediment which were analyzed using a "total digestion" method, whereby suspended sediments are totally dissolved, as well as any adsorbed ions and constituents, before the trace-element concentration is analyzed. Table 11 lists whole-water analyses of samples collected from three selected sampling sites during the high-flow and low-flow samplings. Whole-water analyses represent total recoverable ions, which are those readily leached from suspended sediments by a dilute hydrochloric acid solution, plus any dissolved ions in the water. Complete dissolution of all particulate matter is not achieved by the total recoverable method and thus represents 95 percent or less of "total digestion."

Minimum reporting limits for selected dissolved trace elements used in this study and those previously reported by the USGS are shown in table 12. The NWQL defines minimum reporting limit (MRL) as the smallest concentration of an analyte that may be reliably reported using a given analytical method (Timme, 1995). The MRL is not as well defined statistically and is generally greater than an MDL for a given analytical method. A maximum detection limit (MDL), as reported by the NWQL, is the minimum concentration at which a compound can be identified, measured, and reported with 99-percent confidence that the compound concentration is greater than zero (Timme, 1995). Even with the lower reporting limits available for this study, some trace-element concentrations remained below reporting limits. Be, Cd, and Cr (except at the WWTP effluent channel) concentrations were below detection limits during the high-flow sampling. Ag (except at the WWTP effluent channel), Be, Cd, Co (except at three upstream sites), and Fe (except at the WWTP effluent channel) concentrations were below detection limits during the low-flow sampling. CN concentration during both sampling periods was below the detection limit of 0.01 milligram per liter.

In general, dissolved trace-element concentrations were much higher in effluent from the Albuquerque WWTP than in the Rio Grande; however, both sampling sites downstream from the effluent channel showed no significant increase in dissolved trace-element concentrations during the high-flow sampling. Slight increases in concentrations of As, B, Mo, Pb, Sr, and V were detected at the two sampling sites downstream from the WWTP, but all were well within the State of New Mexico water-quality standards for either domestic or livestock water supply (New Mexico Water Quality Control Commission, 1995). State water-quality standards for B, Mo, Sr, and V have not been established for domestic water supplies. Generally, dissolved concentrations of trace elements showed a more marked increase downstream from Bernalillo (site S1) to Isleta (site S7) during the low-flow sampling; however, all were still well below State water-quality standards for waters designated as domestic or livestock supply.

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Table 1.--Field blank data from the May-June 1994 sampling

[µg/L, micrograms per liter; mg/L, milligrams per liter; <, less than; na, not applicable]

Chemical constituent and unit of measurement	Deionized water	Teflon bag	Churn A	Holding bottle A	Holding bottle F	Holding bottle H	Process blank[1]	Ultra-permeate
Ag (µg/L)	0.08	0.07	0.08	0.07	0.08	0.07	0.08	0.08
Al (µg/L)	0.6	<0.1	2.1	1.7	<0.1	0.1	0.5	1.6
As (µg/L)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08
B (µg/L)	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Ba (µg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Be (µg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Br (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	na
Ca (mg/L)	<0.007	<0.007	0.010	0.024	<0.007	<0.007	0.015	<0.007
Cd (µg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Cl (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	na
Co (µg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cr (µg/L)	<0.4	0.4	0.4	<0.4	<0.4	<0.4	0.4	<0.4
Cu (µg/L)	<0.02	0.05	0.11	0.07	0.06	0.08	<0.02	0.20
DOC (mg/L)	0.18	0.18	0.11	0.31	0.49	0.25	0.39	na
F (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	na
Fe (mg/L)	0.008	<0.006	<0.006	0.007	<0.006	0.007	<0.006	<0.006
Hg (µg/L)	<0.0004	<0.0004	<0.0004	0.0005	<0.0004	<0.0004	<0.0004	na
Li (µg/L)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Mg (mg/L)	<0.007	0.021	<0.007	<0.007	<0.007	0.017	<0.007	<0.007
Mn (µg/L)	0.08	0.08	0.14	0.15	0.09	0.09	0.13	0.11
Mo (µg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
NH_4 as N (mg/L)	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	na
NO_2 as N (mg/L)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	na
NO_3 as N (mg/L)	<0.002	<0.002	<0.002	0.005	0.022	0.006	<0.002	na
Na (mg/L)	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Ni (µg/L)	<0.02	0.03	0.04	0.04	<0.02	0.03	0.04	0.02
PO_4 as P (mg/L)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	na
Pb (µg/L)	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.055
SO_4 (mg/L)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	na
SiO_2 (mg/L)	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Sr (µg/L)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Tl (µg/L)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
U (µg/L)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
V (µg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Zn (µg/L)	<0.06	0.29	0.40	0.30	0.24	0.25	0.13	0.21

[1]Process blank is a blank that has been processed identically to field samples.

Table 2.--Field blank data from the October 1994 sampling

[µm, micrometer; µg/L, micrograms per liter; mg/L, milligrams per liter; <, less than; na, not applicable]

Chemical constituent and unit of measurement	Deionized water	Teflon bag	Churn A2	Holding bottle 2	Holding bottle 4	Holding bottle H	Process blank[1]	Ultra-permeate	0.1-µm Nuclepore
Ag (µg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01
Al (µg/L)	<1.3	<1.3	2.8	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
As (µg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
B (µg/L)	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Ba (µg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Be (µg/L)	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Br (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	na
Ca (mg/L)	<0.007	<0.007	0.079	0.015	0.024	0.015	0.013	<0.007	0.021
Cd (µg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cl (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	na
Co (µg/L)	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cr (µg/L)	<0.06	0.10	<0.06	<0.06	<0.06	<0.06	0.06	0.07	<0.06
Cu (µg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DOC (mg/L)	0.07	0.05	0.07	0.23	0.02	0.05	0.14	0.16	na
F (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	na
Fe (mg/L)	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Hg (µg/L)	0.0006	0.0011	0.0012	0.0017	0.0008	<0.0004	0.0010	0.0010	na
K (mg/L)	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.02	0.02
Li (µg/L)	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Mg (mg/L)	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
Mn (µg/L)	<0.04	<0.04	0.40	0.05	0.04	<0.04	0.07	<0.04	0.05
Mo (µg/L)	<0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	0.02	0.01
NH_4 as N (mg/L)	<0.005	<0.005	<0.005	0.006	<0.005	0.005	<0.005	<0.005	na
NO_2 as N (mg/L)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	na
NO_3 as N (mg/L)	<0.005	<0.005	<0.005	0.045	0.009	<0.005	<0.005	<0.005	na
Na (mg/L)	<0.01	0.01	0.01	0.01	0.04	<0.01	<0.01	0.02	0.02
Ni (µg/L)	<0.03	<0.03	0.06	<0.03	0.04	<0.03	<0.03	<0.03	0.03
PO_4 as P (mg/L)	<0.002	<0.002	0.004	0.018	<0.002	<0.002	<0.002	0.005	na
Pb (µg/L)	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
SO_4 (mg/L)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	na
SiO_2 (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.3
Sr (µg/L)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	<0.1
Tl (µg/L)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
U (µg/L)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
V (µg/L)	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Zn (µg/L)	<0.06	0.16	0.20	0.30	0.10	0.11	0.15	<0.06	0.25

[1]Process blank is a blank that has been processed identically to field samples.

Table 3.--Standard reference materials used in the determination of accuracy during the May-June 1994 sampling

[All constituents reported in micrograms per liter, except Ca, Cl, F, Fe, K, Na, SiO_2, and SO_4, which are reported in milligrams per liter. Alkalinity reported in microequivalents per liter. Nitrite plus nitrate reported in milligrams per liter as nitrogen and orthophosphate reported in milligrams per liter as phosphorus; std. dev., standard deviation; na, not applicable; NBS, National Bureau of Standards; SLRS 2, St. Lawrence River System, reach 2; USGS, U.S. Geological Survey; SRWS, standard reference water sample]

NBS 1643b 1/10 dilution[1]

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Arsenic (As)	5.05	0.18	4.9	na
Boron (B)	10.6	1.6	9.4	na
Barium (Ba)	4.45	0.11	4.4	0.2
Beryllium (Be)	1.96	0.11	1.9	0.2
Cadmium (Cd)	2.18	0.23	2.0	0.1
Cobalt (Co)	2.86	0.05	2.6	0.1
Chromium (Cr)	1.83	0.45	1.86	0.04
Copper (Cu)	2.05	0.06	2.19	0.04
Manganese (Mn)	3.17	0.07	2.8	0.2
Molybdenum (Mo)	9.8	0.2	8.5	0.3
Nickel (Ni)	4.90	0.10	4.9	0.3
Lead (Pb)	2.28	0.06	2.37	0.07
Strontium (Sr)	25.0	0.6	22.7	0.6
Thallium (Tl)	0.75	0.02	0.80	0.02
Vanadium (V)	5.16	0.47	4.52	0.04
Zinc (Zn)	7.3	0.6	6.6	0.2

National Research Council of Canada SLRS 2

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Aluminum (Al)	87.3	3.4	84.4	3.4
Arsenic (As)	0.89	0.09	0.77	0.09
Barium (Ba)	13.8	0.1	13.8	0.3
Cadmium (Cd)	0.000	0.000	0.028	0.004
Cobalt (Co)	0.051	0.014	0.063	0.012
Chromium (Cr)	0.42	0.23	0.45	0.07
Copper (Cu)	2.94	0.11	2.76	0.17
Manganese (Mn)	10.7	0.5	10.1	0.3
Molybdenum (Mo)	0.15	0.02	0.16	0.02
Nickel (Ni)	1.48	0.10	1.03	0.10

Table 3.--Standard reference materials used in the determination of accuracy during the May-June 1994 sampling--Continued

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Lead (Pb)	0.13	0.03	0.129	0.011
Strontium (Sr)	32.1	0.5	27.3	0.4
Uranium (U)	0.027	0.005	0.049	0.002
Vanadium (V)	0.45	0.56	0.25	0.06
Zinc (Zn)	4.54	0.42	3.33	0.15

USGS SRWS T121

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Silver (Ag)	0.60	0.14	0.9	0.36
Aluminum (Al)	85.0	2.8	85.5	12.9
Arsenic (As)	8.00	0.15	8.00	1.11
Boron (B)	87.2	4.6	90	9
Barium (Ba)	45.9	0.5	46.3	4.3
Beryllium (Be)	12.0	0.6	10.6	1
Cadmium (Cd)	8.02	0.27	7.17	1.05
Cobalt (Co)	4.75	0.10	4.6	0.7
Chromium (Cr)	16.5	0.5	16	1.6
Copper (Cu)	4.67	0.16	4.8	0.67
Lithium (Li)	25.5	0.4	25.0	2.2
Manganese (Mn)	29.5	1.4	28.5	2.2
Molybdenum (Mo)	12.2	0.2	12.0	1.8
Nickel (Ni)	8.41	0.19	8.29	1.26
Lead (Pb)	8.09	0.11	7.75	1.03
Strontium (Sr)	47.4	1.0	44.0	4.9
Vanadium (V)	4.21	0.10	4.00	0.76
Zinc (Zn)	22.6	1.2	18	2.7

USGS SRWS T121 1/10 dilution[1]

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Silver (Ag)	0.09	0.07	0.09	0.036
Aluminum (Al)	8.65	0.35	8.55	1.29
Arsenic (As)	0.87	0.18	0.80	0.111
Boron (B)	10.0	1.3	9.0	0.9
Barium (Ba)	4.71	0.14	4.63	0.43

Table 3.--Standard reference materials used in the determination of accuracy during the May-June 1994 sampling--Continued

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Beryllium (Be)	1.11	0.05	1.06	0.1
Cadmium (Cd)	0.74	0.08	0.717	0.105
Cobalt (Co)	0.42	0.01	0.46	0.07
Chromium (Cr)	1.57	0.34	1.60	0.16
Copper (Cu)	0.48	0.03	0.48	0.067
Lithium (Li)	2.27	0.09	2.50	0.22
Manganese (Mn)	2.90	0.09	2.85	0.22
Molybdenum (Mo)	1.31	0.06	1.20	0.18
Nickel (Ni)	0.83	0.03	0.829	0.126
Lead (Pb)	0.85	0.06	0.775	0.103
Strontium (Sr)	4.66	0.08	4.40	0.49
Vanadium (V)	0.59	0.83	0.40	0.076
Zinc (Zn)	2.01	0.16	1.80	0.27

USGS SRWS T125

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Silver (Ag)	3.93	0.08	3.83	0.604
Aluminum (Al)	21.0	0.5	24.0	8.56
Arsenic (As)	10.3	0.2	10.2	1.54
Boron (B)	17.8	1.1	19.4	8.02
Barium (Ba)	16.7	0.3	16.9	1.67
Beryllium (Be)	17.1	0.9	15	1.19
Cadmium (Cd)	7.94	0.30	7.2	0.749
Cobalt (Co)	10.5	0.2	9.45	0.778
Chromium (Cr)	4.01	0.33	3.99	0.712
Copper (Cu)	17.4	0.7	17.4	2.08
Potassium (K)	1.01	0.04	1.04	0.074
Lithium (Li)	16.2	0.3	16.2	1.58
Manganese (Mn)	18.4	0.8	18.0	1.22
Molybdenum (Mo)	19.8	0.2	20.1	1.78
Nickel (Ni)	11.8	0.2	11.2	1.04
Lead (Pb)	8.86	0.11	8.11	1.216
Strontium (Sr)	50.5	0.9	46	2.29
Vanadium (V)	8.02	0.84	6.56	0.89
Zinc (Zn)	5.10	0.40	5.95	4.007

Table 3.--Standard reference materials used in the determination of accuracy during the May-June 1994 sampling--Continued

USGS SRWS T125 1/10 dilution[1]

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Silver (Ag)	0.40	0.03	0.38	0.06
Aluminum (Al)	3.09	1.62	2.40	0.86
Arsenic (As)	1.04	0.09	1.02	0.15
Boron (B)	3.66	1.62	1.94	0.80
Barium (Ba)	1.68	0.11	1.69	0.17
Beryllium (Be)	1.60	0.08	1.50	0.12
Cadmium (Cd)	0.61	0.05	0.72	0.07
Cobalt (Co)	0.99	0.02	0.95	0.08
Chromium (Cr)	0.34	0.33	0.40	0.07
Copper (Cu)	1.74	0.03	1.74	0.21
Lithium (Li)	1.29	0.06	1.62	0.16
Manganese (Mn)	1.79	0.06	1.80	0.12
Molybdenum (Mo)	2.01	0.07	2.01	0.18
Nickel (Ni)	1.17	0.04	1.12	0.10
Lead (Pb)	0.86	0.03	0.81	0.12
Strontium (Sr)	4.93	0.08	4.60	0.23
Vanadium (V)	0.88	0.50	0.66	0.09
Zinc (Zn)	0.45	0.06	0.60	0.40

USGS SRWS T103

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Silver (Ag)	3.93	0.08	3.83	0.604
Calcium (Ca)	55.0	2.53	54.7	2.0
Iron (Fe)	0.042	0.004	0.041	0.0076
Magnesium (Mg)	30.7	1.09	30.5	1.2
Sodium (Na)	96.1	9.61	107	5
Silica (SiO_2)	6.97	0.44	7.5	0.2

Table 3.--Standard reference materials used in the determination of accuracy during the May-June 1994 sampling--Continued

USGS SRWS T105

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Calcium (Ca)	73.1	2.4	73.0	4.2
Iron (Fe)	0.023	0.004	0.024	0.012
Magnesium (Mg)	67.0	2.0	66.8	2.7
Sodium (Na)	250	19	298	17
Silica (SiO_2)	24.5	1.4	25.4	1.5

USGS SRWS T107

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Calcium (Ca)	12.4	0.6	11.7	0.7
Iron (Fe)	0.055	0.006	0.052	0.007
Magnesium (Mg)	2.1	0.1	2.1	0.13
Sodium (Na)	20.1	2.3	20.7	1.1
Silica (SiO_2)	7.6	0.5	7.7	0.5

USGS SRWS Hg7 1/100 dilution[1]

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Mercury (Hg)	0.0018	0.0005	0.0022	0.0006

USGS SRWS Mercury (Hg)10 1/100 dilution[1]

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Mercury (Hg)	0.0140	0.0013	0.0140	0.0008

USGS SRWS P15

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Potassium (K)	0.14	0.01	0.19	0.02

Table 3.--Standard reference materials used in the determination of accuracy during the May-June 1994 sampling--Continued

USGS SRWS M112

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Alkalinity	567	4	759	10

USGS SRWS M102

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Alkalinity	3,529	18	3,517	20

USGS SRWS M94

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Alkalinity	4,921	7	4,896	40

USGS SRWS N36

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Nitrogen ($NO_2 + NO_3$)	0.184	0.011	0.180	0.016
Orthophosphate as P (PO_4)	0.196	0.006	0.208	0.010

USGS SRWS N38

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Nitrogen ($NO_2 + NO_3$)	0.220	0.002	0.210	0.018
Orthophosphate as P (PO_4)	0.112	0.002	0.120	0.014

USGS SRWS M6

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Chloride (Cl)	12.7	0.1	13.1	0.2
Fluoride (F)	0.83	0.02	0.85	0.02
Sulfate (SO_4)	74.8	1.0	74.5	0.9

Table 3.--Standard reference materials used in the determination of accuracy during the May-June 1994 sampling--Concluded

USGS SRWS M106

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Chloride (Cl)	13.1	0.0	13	
Fluoride (F)	0.30	0.01	0.25	0.01
Sulfate (SO_4)	28.0	0.4	27.6	0.4

[1]These standard reference materials were diluted 1/10 or 1/100 to better cover the range of concentrations found in the samples.

Table 4.--Standard reference materials used in the determination of accuracy during the October 1994 sampling

[All constituents reported in micrograms per liter, except Ca, Cl, F, Fe, K, Na, SiO_2, and SO_4, which are reported in milligrams per liter. Alkalinity reported in microequivalents per liter. Nitrite plus nitrate reported in milligrams per liter as nitrogen and orthophosphate reported in milligrams per liter as phosphorus; std. dev., standard deviation; na, not applicable; NBS, National Bureau of Standards; SLRS 2, St. Lawrence River System, reach 2; USGS, U.S. Geological Survey; SRWS, standard reference water sample]

NBS 1643b 1/10 dilution[1]

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Silver (Ag)	1.21	0.03	0.98	0.08
Arsenic (As)	5.50	0.32	4.9	na
Boron (B)	10.0	1.8	9.4	na
Barium (Ba)	4.57	0.13	4.4	0.2
Beryllium (Be)	1.93	0.17	1.9	0.2
Cadmium (Cd)	2.20	0.35	2.0	0.1
Cobalt (Co)	2.88	0.14	2.6	0.1
Chromium (Cr)	1.97	0.08	1.86	0.04
Copper (Cu)	2.10	0.09	2.19	0.04
Manganese (Mn)	3.03	0.13	2.8	0.2
Molybdenum (Mo)	9.46	0.29	8.5	0.3
Nickel (Ni)	4.56	0.05	4.9	0.3
Lead (Pb)	2.63	0.37	2.37	0.07
Strontium (Sr)	22.3	0.9	22.7	0.6
Thallium (Tl)	0.79	0.03	0.80	0.02
Vanadium (V)	4.46	0.13	4.52	0.04
Zinc (Zn)	8.47	0.25	6.6	0.2

National Research Council of Canada SLRS 2

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Aluminum (Al)	89.2	5.8	84.4	3.4
Arsenic (As)	0.84	0.03	0.77	0.09
Barium (Ba)	14.8	1.3	13.8	0.3
Cadmium (Cd)	0.06	0.07	0.028	0.004
Cobalt (Co)	0.11	0.00	0.063	0.012
Chromium (Cr)	0.60	0.12	0.45	0.07
Copper (Cu)	2.92	0.15	2.76	0.17
Manganese (Mn)	10.4	0.5	10.1	0.3
Molybdenum (Mo)	0.17	0.02	0.16	0.02
Nickel (Ni)	1.48	0.08	1.03	0.1

Table 4.--Standard reference materials used in the determination of accuracy during the October 1994 sampling--Continued

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Lead (Pb)	0.16	0.01	0.129	0.011
Strontium (Sr)	29.7	1.9	27.3	0.4
Uranium (U)	0.05	0.02	0.049	0.002
Vanadium (V)	0.27	0.02	0.25	0.06
Zinc (Zn)	4.98	0.41	3.33	0.15

USGS SRWS T121

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Silver (Ag)	0.34	0.15	0.90	0.36
Aluminum (Al)	88.3	5.9	85.5	12.9
Arsenic (As)	8.4	0.5	8.0	1.1
Boron (B)	103	10	90	9
Barium (Ba)	49.9	3.7	46.3	4.3
Beryllium (Be)	11.6	0.9	10.6	1.0
Cadmium (Cd)	6.7	0.4	7.2	1.1
Cobalt (Co)	5.0	0.4	4.6	0.7
Chromium (Cr)	18.3	1.3	16.0	1.6
Copper (Cu)	4.8	0.3	4.8	0.7
Lithium (Li)	27.0	2.1	25.0	2.2
Manganese (Mn)	29.1	1.4	28.5	2.2
Molybdenum (Mo)	12.0	0.8	12.0	1.8
Nickel (Ni)	8.4	0.4	8.3	1.3
Lead (Pb)	7.7	0.4	7.8	1.0
Strontium (Sr)	44.5	2.6	44.0	4.9
Vanadium (V)	3.9	0.2	4.0	0.8
Zinc (Zn)	24.1	1.4	18.0	2.7

USGS SRWS T121 1/10 dilution[1]

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Silver (Ag)	0.05	0.09	0.09	0.04
Aluminum (Al)	9.1	0.6	8.6	1.3
Arsenic (As)	0.75	0.03	0.80	0.11
Boron (B)	11.3	2.6	9.0	0.9
Barium (Ba)	4.80	0.32	4.63	0.43

Table 4.--Standard reference materials used in the determination of accuracy during the October 1994 sampling--Continued

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Beryllium (Be)	1.00	0.08	1.06	0.10
Cadmium (Cd)	1.00	0.06	0.72	0.11
Cobalt (Co)	0.49	0.02	0.46	0.07
Chromium (Cr)	1.71	0.17	1.60	0.16
Copper (Cu)	0.49	0.04	0.48	0.07
Lithium (Li)	2.46	0.20	2.50	0.22
Manganese (Mn)	2.80	0.10	2.85	0.22
Molybdenum (Mo)	1.24	0.06	1.20	0.18
Nickel (Ni)	0.82	0.04	0.83	0.13
Lead (Pb)	0.76	0.04	0.78	0.10
Strontium (Sr)	4.31	0.17	4.40	0.49
Vanadium (V)	0.37	0.02	0.40	0.08
Zinc (Zn)	2.15	0.16	1.80	0.27

USGS SRWS T125

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Silver (Ag)	4.34	0.26	3.83	0.60
Aluminum (Al)	21.4	1.4	24.0	8.6
Arsenic (As)	10.6	0.6	10.2	1.5
Boron (B)	20.1	2.6	19.4	8.0
Barium (Ba)	17.9	1.3	16.9	1.7
Beryllium (Be)	16.0	1.3	15.0	1.2
Calcium (Ca)	9.4	0.2	9.3	0.5
Cadmium (Cd)	6.6	0.4	7.2	0.7
Cobalt (Co)	11.0	0.8	9.5	0.8
Chromium (Cr)	4.5	0.5	4.0	0.7
Copper (Cu)	17.2	1.0	17.4	2.1
Iron (Fe)	0.091	0.002	0.098	0.007
Lithium (Li)	16.7	1.5	16.2	1.6
Magnesium (Mg)	2.00	0.01	2.00	0.11
Manganese (Mn)	18.0	1.0	18.0	1.2
Molybdenum (Mo)	19.9	1.2	20.1	1.8
Sodium (Na)	23.0	3.0	22.3	1.2
Nickel (Ni)	11.6	0.6	11.2	1.0
Lead (Pb)	8.4	0.4	8.1	1.2
Silica (SiO_2)	5.2	0.4	5.2	0.3

Table 4.--Standard reference materials used in the determination of accuracy during the October 1994 sampling--Continued

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Strontium (Sr)	46.4	2.7	46.0	2.3
Vanadium (V)	7.0	0.4	6.6	0.9
Zinc (Zn)	5.4	0.4	6.0	4.0

USGS SRWS T125 1/10 dilution[1]

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Silver (Ag)	0.45	0.04	0.38	0.06
Aluminum (Al)	1.81	0.52	2.40	0.86
Arsenic (As)	0.98	0.08	1.02	0.15
Boron (B)	2.11	2.04	1.94	0.80
Barium (Ba)	1.69	0.34	1.69	0.17
Beryllium (Be)	1.49	0.13	1.50	0.12
Cadmium (Cd)	0.76	0.04	0.72	0.07
Cobalt (Co)	1.10	0.09	0.95	0.08
Chromium (Cr)	0.58	0.34	0.40	0.07
Copper (Cu)	1.76	0.12	1.74	0.21
Lithium (Li)	1.58	0.18	1.62	0.16
Manganese (Mn)	1.81	0.13	1.80	0.12
Molybdenum (Mo)	2.04	0.14	2.01	0.18
Nickel (Ni)	1.17	0.06	1.12	0.10
Lead (Pb)	0.83	0.06	0.81	0.12
Strontium (Sr)	4.68	0.27	4.60	0.23
Vanadium (V)	0.72	0.06	0.66	0.09
Zinc (Zn)	0.58	0.11	0.60	0.40

High Purity Standards Certified Water Sample

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Silver (Ag)	2.48	0.01	2.50	0.13
Aluminum (Al)	112.8	4.1	115.0	5.8
Arsenic (As)	62.3	6.0	80.0	4.0
Barium (Ba)	54.8	1.5	50.0	2.5
Beryllium (Be)	14.5	0.2	20.0	1.0

Table 4.--Standard reference materials used in the determination of accuracy during the October 1994 sampling--Continued

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Cadmium (Cd)	8.8	0.4	12.0	0.6
Cobalt (Co)	26.7	0.2	25.0	1.3
Chromium (Cr)	22.0	1.1	20.0	1.0
Copper (Cu)	17.0	0.6	20.0	1.0
Lithium (Li)	15.5	0.6	15.0	0.8
Manganese (Mn)	32.6	0.2	35.0	1.8
Molybdenum (Mo)	94.0	3.7	100.0	5.0
Nickel (Ni)	55.7	1.2	60.0	3.0
Lead (Pb)	30.7	1.6	35.0	1.8
Strontium (Sr)	228	11	250	13
Thallium (Tl)	8.4	0.3	10.0	0.5
Vanadium (V)	28.4	1.3	30.0	1.5
Zinc (Zn)	49.6	2.7	70.0	3.5

USGS SRWS T103

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Calcium (Ca)	55.2	2.7	54.7	2
Iron (Fe)	0.042	0.005	0.041	0.008
Magnesium (Mg)	31.2	0.8	30.5	1.2
Sodium (Na)	101.5	7.0	107	5
Silica (SiO_2)	7.4	0.3	7.5	0.2

USGS SRWS T105

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Calcium (Ca)	71.9	2.5	73	4.2
Iron (Fe)	0.019	0.005	0.024	0.012
Magnesium (Mg)	67.7	1.3	66.8	2.7
Sodium (Na)	242	12	298	17
Silica (SiO_2)	25.0	0.9	25.4	1.5

Table 4.--Standard reference materials used in the determination of accuracy during the October 1994 sampling--Continued

USGS SRWS T107

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Calcium (Ca)	12.2	0.4	11.7	0.7
Iron (Fe)	0.052	0.005	0.052	0.007
Magnesium (Mg)	2.2	0.0	2.1	0.13
Sodium (Na)	20.9	1.4	20.7	1.1
Silica (SiO_2)	8.1	0.4	7.7	0.5

USGS SRWS Hg7 1/100 dilution[1]

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Mercury (Hg)	0.0021	0.0005	0.0022	0.0006

USGS SRWS Hg10 1/100 dilution[1]

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Mercury (Hg)	0.0153	0.0007	0.014	0.0008

USGS SRWS P14

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Potassium (K)	0.65	0.05	0.65	0.08

USGS SRWS M102

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Alkalinity	3,501	6	3,517	20

USGS SRWS M122

Chemical constituent	Measured value Mean	Measured value Std. dev.	Certified value Mean	Certified value Std. dev.
Alkalinity	728	6	759	28

Table 4.--Standard reference materials used in the determination of accuracy during the October 1994 sampling--Continued

USGS SRWS M130

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Alkalinity	1,099	11	1,199	38

USGS SRWS N32

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Ammonium ion as nitrogen (NH_4)	0.036	0.002	0.040	0.021
Nitrogen ($NO_2 + NO_3$)	0.135	0.004	0.148	0.024
Orthophosphate as P (PO_4)	0.086	0.014	0.091	0.01

USGS SRWS N36

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Ammonium ion as nitrogen (NH_4)	0.124	0.001	0.110	0.015
Nitrogen ($NO_2 + NO_3$)	0.172	0.015	0.180	0.016
Orthophosphate as P (PO_4)	0.217	0.009	0.208	0.01

USGS SRWS N38

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Ammonium ion as nitrogen (NH_4)	0.098	0.000	0.087	0.017
Nitrogen ($NO_2 + NO_3$)	0.205	0.004	0.210	0.018
Orthophosphate as P (PO_4)	0.110	0.004	0.120	0.014

USGS SRWS M6

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Chloride (Cl)	13.5	0.5	13	([2])
Fluoride (F)	0.84	0.01	0.85	0.02
Sulfate (SO_4)	69.9	0.3	74.5	0.9

Table 4.--Standard reference materials used in the determination of accuracy during the October 1994 sampling--Concluded

USGS SRWS M106

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Chloride (Cl)	14.2	0.5	13.1	0.2
Fluoride (F)	0.26	0.00	0.25	0.01
Potassium (K)	0.61	0.05	0.7	([2])
Sulfate (SO_4)	28.6	0.1	27.6	0.4

[1]These standard reference materials were diluted 1/10 or 1/100 to better cover the range of concentrations found in the samples.
[2]No certified standard deviation available.

Table 5.--Standard reference material NIST[1] Buffalo River sediment used in the determination of accuracy for suspended sediments for the May-June and October 1994 samplings

[All constituents reported in micrograms per gram. Std. dev., standard deviation]

Chemical constituent	Measured value		Certified value	
	Mean	Std. dev.	Mean	Std. dev.
Aluminum (Al)	48,900	6,600	61,100	1,600
Arsenic (As)	23.7	2.5	23.4	0.8
Barium (Ba)	279	24	414	12
Calcium (Ca)	24,200	400	26,000	300
Cadmium (Cd)	3.56	0.40	3.45	0.22
Cobalt (Co)	16.3	0.3	14.0	0.6
Chromium (Cr)	154	3	135	5
Copper (Cu)	97.3	5.4	98.6	5
Iron (Fe)	39,500	400	41,100	1,000
Mercury (Hg)	1.36	0.03	1.47	0.07
Lithium (Li)	36.3	1.6	47.5	4.1
Magnesium (Mg)	7,100	2,300	12,000	200
Manganese (Mn)	544	9	555	19
Sodium (Na)	5,590	30	5,470	140
Nickel (Ni)	41.4	2.1	44.1	3
Lead (Pb)	145	2	161	17
Silica (SiO_2)	664,000	3,000	622,000	2,800
Strontium (Sr)	131	7	130	
Titanium (Ti)	4,830	70	4,570	180
Thallium (Tl)	0.98	0.01	1.06	0.07
Uranium (U)	2.77	0.03	3.13	0.13
Vanadium (V)	86	6	95	4
Zinc (Zn)	451	6	438	12

[1]National Institute of Standards and Technology.

Table 6.--Spiked recovery data for samples collected during the May-June 1994 sampling

[All constituents reported in micrograms per liter. WWTP, wastewater treatment plant; na, not applicable]

Trace element	Site	Site number (fig. 1)	Indigenous concentration	Spiked concentration	Difference in concentrations	Theoretical concentration	Percent recovery
Silver (Ag)	Bernalillo	S1	0.00	9.55	9.55	13.20	72.4
	Paseo	S2	0.00	11.30	11.30	13.20	85.6
	Central	S3	0.00	11.14	11.14	13.20	84.4
	Rio Bravo	S4	0.00	12.87	12.87	13.20	97.5
	WWTP	S5	0.21	10.82	10.61	13.20	80.4
	I-25 Bridge	S6	0.00	11.87	11.87	13.20	89.9
	Isleta	S7	0.01	15.18	15.16	13.20	114.9
	Blank	na	0.08	14.01	13.93	13.20	105.5
Arsenic (As)	Bernalillo	S1	1.24	59.87	58.63	66.01	88.8
	Paseo	S2	1.41	60.82	59.40	66.01	90.0
	Central	S3	1.43	61.62	60.20	66.01	91.2
	Rio Bravo	S4	1.39	60.41	59.03	66.01	89.4
	WWTP	S5	8.14	68.61	60.47	66.01	91.6
	I-25 Bridge	S6	1.61	61.14	59.53	66.01	90.2
	Isleta	S7	1.77	61.31	59.54	66.01	90.2
	Blank	na	0.07	56.65	56.58	66.01	85.7
Beryllium (Be)	Bernalillo	S1	0.01	1.40	1.39	1.32	105.2
	Paseo	S2	0.00	1.33	1.32	1.32	100.2
	Central	S3	0.01	1.37	1.36	1.32	103.1
	Rio Bravo	S4	0.00	1.36	1.36	1.32	103.0
	WWTP	S5	0.00	1.30	1.30	1.32	9[illegible]6
	I-25 Bridge	S6	0.00	1.36	1.35	1.32	102.6
	Isleta	S7	0.01	1.34	1.34	1.32	101.2
	Blank	na	0.00	1.32	1.32	1.32	100.2
Cadmium (Cd)	Bernalillo	S1	0.00	1.12	1.12	1.32	8[illegible].0
	Paseo	S2	0.00	1.14	1.14	1.32	86.0
	Central	S3	0.00	1.14	1.14	1.32	86.2
	Rio Bravo	S4	0.00	1.15	1.15	1.32	86.8
	WWTP	S5	0.01	1.23	1.23	1.32	93.0
	I-25 Bridge	S6	0.00	1.15	1.15	1.32	86.8
	Isleta	S7	0.00	1.11	1.11	1.32	84.4
	Blank	na	0.00	1.04	1.04	1.32	7[illegible]9
Cobalt (Co)	Bernalillo	S1	0.12	6.97	6.85	6.60	103.8
	Paseo	S2	0.09	6.84	6.75	6.60	102.3
	Central	S3	0.13	7.08	6.94	6.60	10[illegible].2
	Rio Bravo	S4	0.11	6.91	6.80	6.60	103.0
	WWTP	S5	0.24	7.13	6.89	6.60	10[illegible].4
	I-25 Bridge	S6	0.10	6.90	6.80	6.60	103.1
	Isleta	S7	0.13	7.00	6.87	6.60	10[illegible].1
	Blank	na	0.00	6.48	6.48	6.60	9[illegible].2

Table 6.--Spiked recovery data for samples collected during the May-June 1994 sampling--Continued

Trace element	Site	Site number (fig. 1)	Indigenous concentration	Spiked concentration	Difference in concentrations	Theoretical concentration	Percent recovery
Chromium (Cr)	Bernalillo	S1	0.08	13.12	13.04	13.20	98.8
	Paseo	S2	0.02	13.24	13.22	13.20	100.1
	Central	S3	0.11	13.70	13.59	13.20	102.9
	Rio Bravo	S4	0.00	13.30	13.30	13.20	100.7
	WWTP	S5	0.67	14.35	13.68	13.20	103.7
	I-25 Bridge	S6	0.03	13.45	13.41	13.20	101.6
	Isleta	S7	0.12	13.40	13.28	13.20	100.6
	Blank	na	0.40	13.03	12.64	13.20	95.7
Copper (Cu)	Bernalillo	S1	1.50	57.95	56.45	66.01	85.5
	Paseo	S2	1.58	59.34	57.77	66.01	87.5
	Central	S3	1.52	62.03	60.50	66.01	91.7
	Rio Bravo	S4	1.45	60.26	58.80	66.01	89.1
	WWTP	S5	4.80	61.43	56.64	66.01	85.8
	I-25 Bridge	S6	1.46	60.72	59.26	66.01	89.8
	Isleta	S7	1.39	58.46	57.07	66.01	86.4
	Blank	na	0.01	59.84	59.84	66.01	90.6
Mercury (Hg)	Bernalillo	S1	0.0015	0.0061	0.0046	0.0052	89.0
	Paseo	S2	0.0012	na	na	na	na
	Central	S3	0.0014	0.0067	0.0053	0.0052	102.6
	Rio Bravo	S4	0.0016	0.0076	0.0060	0.0054	111.1
	WWTP	S5	0.0048	0.0096	0.0048	0.0052	92.6
	I-25 Bridge	S6	0.0007	0.0068	0.0061	0.0052	116.8
	Isleta	S7	0.0022	0.0074	0.0052	0.0050	104.4
	Blank	na	0	0.0060	0.0060	0.0052	115.4
Nickel (Ni)	Bernalillo	S1	4.18	62.26	58.08	66.01	88.0
	Paseo	S2	3.15	62.03	58.88	66.01	89.2
	Central	S3	2.98	64.41	61.42	66.01	93.1
	Rio Bravo	S4	2.99	61.86	58.87	66.01	89.2
	WWTP	S5	5.37	64.88	59.51	66.01	90.1
	I-25 Bridge	S6	3.03	62.30	59.27	66.01	89.8
	Isleta	S7	3.59	61.94	58.35	66.01	88.4
	Blank	na	0.04	57.78	57.74	66.01	87.5
Lead (Pb)	Bernalillo	S1	0.09	15.14	15.05	13.20	114.0
	Paseo	S2	0.03	14.84	14.81	13.20	112.2
	Central	S3	0.15	14.97	14.83	13.20	112.3
	Rio Bravo	S4	0.08	15.01	14.92	13.20	113.0
	WWTP	S5	0.47	15.68	15.20	13.20	115.2
	I-25 Bridge	S6	0.04	15.05	15.01	13.20	113.7
	Isleta	S7	0.05	14.96	14.92	13.20	113.0
	Blank	na	0.00	13.88	13.88	13.20	105.2

Table 6.--Spiked recovery data for samples collected during the May-June 1994 sampling--Concluded

Trace element	Site	Site number (fig. 1)	Indigenous concentration	Spiked concentration	Difference in concentrations	Theoretical concentration	Percent recovery
Uranium (U)	Bernalillo	S1	1.43	73.02	71.59	66.01	108.5
	Paseo	S2	1.50	71.29	69.79	66.01	105.7
	Central	S3	1.50	72.16	70.66	66.01	107.0
	Rio Bravo	S4	1.48	72.54	71.06	66.01	107.6
	WWTP	S5	1.37	76.37	75.00	66.01	113.6
	I-25 Bridge	S6	1.48	72.16	70.69	66.01	107.1
	Isleta	S7	1.56	73.07	71.51	66.01	108.3
	Blank	na	0.00	63.24	63.24	66.01	95.8
Zinc (Zn)	Bernalillo	S1	0.65	69.81	69.16	66.01	104.8
	Paseo	S2	0.83	71.86	71.03	66.01	107.6
	Central	S3	0.89	71.82	70.93	66.01	107.5
	Rio Bravo	S4	1.05	70.93	69.88	66.01	105.9
	WWTP	S5	19.65	88.06	68.42	66.01	103.6
	I-25 Bridge	S6	1.03	70.71	69.68	66.01	105.6
	Isleta	S7	0.87	70.77	69.90	66.01	105.9
	Blank	na	0.13	68.59	68.46	66.01	103.7

Table 7.--Spiked recovery data for samples collected during the October 1994 sampling

[All constituents reported in micrograms per liter. WWTP, wastewater treatment plant; na, not applicable]

Element	Site	Site number (fig. 1)	Indigenous concentration	Spiked concentration	Difference in concentrations	Theoretical concentration	Percent recovery
Silver (Ag)	Bernalillo	S1	0.00	13.22	13.22	13.20	100.2
	Paseo	S2	0.00	10.26	10.26	13.20	77.7
	Central	S3	0.00	13.99	13.99	13.20	106.0
	Rio Bravo	S4	0.00	15.25	15.25	13.20	115.5
	WWTP	S5	0.06	6.99	6.93	13.20	52.5
	I-25 Bridge	S6	0.00	8.15	8.15	13.20	61.7
	Isleta	S7	0.00	14.12	14.12	13.20	106.9
	Blank	na	0.00	14.92	14.92	13.20	113.0
Arsenic (As)	Bernalillo	S1	1.85	70.93	69.08	66.01	104.6
	Paseo	S2	2.54	71.78	69.24	66.01	104.9
	Central	S3	2.32	66.19	63.87	66.01	96.8
	Rio Bravo	S4	2.42	73.21	70.79	66.01	107.2
	WWTP	S5	8.57	76.80	68.22	66.01	103.4
	I-25 Bridge	S6	3.37	70.93	67.57	66.01	102.4
	Isleta	S7	3.51	70.89	67.38	66.01	102.1
	Blank	na	0.00	57.60	57.60	66.01	87.3
Beryllium (Be)	Bernalillo	S1	0.00	1.386	1.38	1.32	104.9
	Paseo	S2	0.00	1.438	1.44	1.32	108.7
	Central	S3	0.00	1.320	1.32	1.32	100.0
	Rio Bravo	S4	0.00	1.382	1.38	1.32	104.5
	WWTP	S5	0.00	1.378	1.38	1.32	104.4
	I-25 Bridge	S6	0.00	1.376	1.37	1.32	103.9
	Isleta	S7	0.00	1.356	1.35	1.32	102.5
	Blank	na	0.00	1.207	1.21	1.32	91.4
Cadmium (Cd)	Bernalillo	S1	0.00	1.24	1.24	1.32	94.0
	Paseo	S2	0.00	1.2	1.21	1.32	91.7
	Central	S3	0.00	1.2	1.17	1.32	88.8
	Rio Bravo	S4	0.00	1.2	1.21	1.32	91.8
	WWTP	S5	0.00	1.3	1.28	1.32	96.6
	I-25 Bridge	S6	0.00	1.2	1.21	1.32	91.3
	Isleta	S7	0.00	1.2	1.23	1.32	93.2
	Blank	na	0.00	1.0	1.03	1.32	78.3
Cobalt (Co)	Bernalillo	S1	0.03	8.03	8.01	6.60	121.3
	Paseo	S2	0.02	8.20	8.18	6.60	123.9
	Central	S3	0.01	7.68	7.67	6.60	116.2
	Rio Bravo	S4	0.00	8.23	8.23	6.60	124.6
	WWTP	S5	0.22	8.28	8.07	6.60	122.2
	I-25 Bridge	S6	0.09	8.07	7.99	6.60	121.0
	Isleta	S7	0.07	8.02	7.95	6.60	120.4
	Blank	na	0.00	7.27	7.27	6.60	110.2

Table 7.--Spiked recovery data for samples collected during the October 1994 sampling--Continued

Element	Site	Site number (fig. 1)	Indigenous concentration	Spiked concentration	Difference in concentrations	Theoretical concentration	Percent recovery
Chromium (Cr)	Bernalillo	S1	0.43	17.12	16.69	13.20	126.4
	Paseo	S2	0.49	17.26	16.77	13.20	127.0
	Central	S3	0.49	15.94	15.45	13.20	117.0
	Rio Bravo	S4	0.43	17.23	16.80	13.20	127.3
	WWTP	S5	4.69	20.93	16.23	13.20	123.0
	I-25 Bridge	S6	0.93	17.22	16.29	13.20	123.4
	Isleta	S7	0.85	17.20	16.35	13.20	123.9
	Blank	na	0.06	14.22	14.17	13.20	107.3
Copper (Cu)	Bernalillo	S1	0.93	67.78	66.84	66.01	101.3
	Paseo	S2	1.01	67.58	66.56	66.01	100.8
	Central	S3	0.96	62.77	61.81	66.01	93.6
	Rio Bravo	S4	1.01	68.74	67.74	66.01	102.6
	WWTP	S5	8.83	75.40	66.57	66.01	100.8
	I-25 Bridge	S6	1.61	66.56	64.96	66.01	98.4
	Isleta	S7	1.29	67.61	66.32	66.01	100.5
	Blank	na	0.00	60.61	60.61	66.01	91.8
Mercury (Hg)	Bernalillo	S1	0.0009	0.0064	0.0055	0.0052	105.8
	Paseo	S2	0.0008	0.0071	0.0063	0.0052	121.9
	Central	S3	0.0007	0.0075	0.0068	0.0050	136.1
	Rio Bravo	S4	0.0009	0.0075	0.0066	0.0050	132.0
	WWTP	S5	0.0026	0.0080	0.0054	0.0050	108.6
	I-25 Bridge	S6	0.0013	0.0068	0.0055	0.0052	106.4
	Isleta	S7	0.0012	0.0075	0.0063	0.0050	126.5
	Blank	na	0.0010	0.0070	0.0060	0.0050	120.0
Nickel (Ni)	Bernalillo	S1	0.77	63.61	62.85	66.01	95.2
	Paseo	S2	0.82	64.63	63.81	66.01	96.7
	Central	S3	0.96	61.75	60.79	66.01	92.1
	Rio Bravo	S4	0.75	65.67	64.92	66.01	98.4
	WWTP	S5	3.70	66.30	62.60	66.01	94.8
	I-25 Bridge	S6	1.14	63.88	62.74	66.01	95.0
	Isleta	S7	1.16	65.50	64.35	66.01	97.5
	Blank	na	0.00	58.62	58.62	66.01	88.8
Lead (Pb)	Bernalillo	S1	0.01	15.597	15.58	13.20	118.1
	Paseo	S2	0.01	15.670	15.66	13.20	118.6
	Central	S3	0.02	15.364	15.34	13.20	116.2
	Rio Bravo	S4	0.01	15.597	15.59	13.20	118.1
	WWTP	S5	0.27	16.092	15.83	13.20	119.9
	I-25 Bridge	S6	0.03	16.040	16.01	13.20	121.3
	Isleta	S7	0.03	15.950	15.92	13.20	120.6
	Blank	na	0.00	12.935	12.94	13.20	98.0

Table 7.--Spiked recovery data for samples collected during the October 1994 sampling--Concluded

Element	Site	Site number (fig. 1)	Indigenous concentration	Spiked concentration	Difference in concentrations	Theoretical concentration	Percent recovery
Uranium (U)	Bernalillo	S1	2.76	90.03	87.27	66.01	132.2
	Paseo	S2	3.01	91.60	88.60	66.01	134.2
	Central	S3	2.90	90.65	87.75	66.01	132.9
	Rio Bravo	S4	2.90	90.77	87.87	66.01	133.1
	WWTP	S5	1.29	92.21	90.92	66.01	137.7
	I-25 Bridge	S6	2.83	93.48	90.65	66.01	137.3
	Isleta	S7	2.94	93.22	90.28	66.01	136.8
	Blank	na	0.00	68.66	68.66	66.01	104.0
Zinc (Zn)	Bernalillo	S1	0.38	85.31	84.93	66.01	128.7
	Paseo	S2	0.48	84.62	84.14	66.01	127.5
	Central	S3	0.79	76.97	76.18	66.01	115.4
	Rio Bravo	S4	0.36	86.29	85.93	66.01	130.2
	WWTP	S5	17.37	99.44	82.07	66.01	124.3
	I-25 Bridge	S6	1.84	82.50	80.67	66.01	122.2
	Isleta	S7	1.49	80.25	78.75	66.01	119.3
	Blank	na	0.15	76.84	76.68	66.01	116.2

Table 8.--Water-quality properties and dissolved constituents in the Rio Grande in the vicinity of Albuquerque, N. Mex., May-June 1994

[Errors are one standard deviation based on triplicate laboratory analyses. ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; µg/L, micrograms per liter; mg/L, milligrams per liter; meq/L, microequivalents per liter; WWTP, wastewater treatment plant; <, less than; --, no data]

Site and site number (fig. 1)		Discharge (ft^3/s)	Specific conductance (µS/cm)	pH	Ag (silver) (µg/L)	Ag (silver) (tons per day x 10^{-3})	Al (aluminum) (µg/L)	Al (aluminum) (tons per day x 10^{-3})	As (arsenic) (µg/L)	As (arsenic) (tons per day x 10^{-3})
Near Bernalillo Bridge	S1	4,730	233	8.1	0.039 ± 0.055	0.50	7.2 ± 0.1	92	1.23 ± 0.03	15.7
Paseo del Norte Bridge	S2	3,730	247	7.9	0.032 ± 0.042	0.32	8.2 ± 2.5	83	1.41 ± 0.02	14.2
Central Avenue Bridge	S3	4,650	240	8.2	0.029 ± 0.042	0.36	10.9 ± 5.9	137	1.41 ± 0.04	17.7
Rio Bravo Bridge	S4	5,230	241	7.8	0.008 ± 0.003	0.11	5.2 ± 1.4	73	1.39 ± 0.04	19.6
Effluent from WWTP	S5	84	797	6.9	0.184 ± 0.063	0.04	20.3 ± 2.8	5	8.22 ± 0.17	1.9
I-25 Bridge	S6	5,510	253	7.8	0.007 ± 0.008	0.10	5.7 ± 0.3	85	1.62 ± 0.03	24.1
Isleta	S7	5,040	267	8.0	0.011 ± 0.005	0.15	5.3 ± 0.4	72	1.78 ± 0.05	24.2

Site and site number (fig. 1)		B (boron) (µg/L)	B (boron) (tons per day x 10^{-3})	Ba (barium) (µg/L)	Ba (barium) (tons per day x 10^{-3})	Be (beryllium) (µg/L)	Be (beryllium) (tons per day)	Cd (cadmium) (µg/L)	Cd (cadmium) (tons per day)
Near Bernalillo Bridge	S1	23.4 ±0.2	299	42.8 ± 0.6	547	<0.02	<0.0003	<0.01	<0.0001
Paseo del Norte Bridge	S2	26.2 ± 1.3	264	45.7 ± 0.6	460	<0.02	<0.0002	<0.01	<0.0001
Central Avenue Bridge	S3	25.7 ± 1.5	323	46.1 ± 0.1	579	<0.02	<0.0003	<0.01	<0.0001
Rio Bravo Bridge	S4	26.3 ± 0.7	371	46.6 ± 0.6	658	<0.02	<0.0003	<0.01	<0.0001
Effluent from WWTP	S5	341 ± 29	77	32.3 ± 0.7	7	<0.02	<0.0001	<0.01	<0.0001
I-25 Bridge	S6	31.6 ±1.9	470	47.0 ± 0.4	699	<0.02	<0.0003	<0.01	<0.0001
Isleta	S7	36.3 ±1.0	494	47.8 ± 0.2	650	<0.02	<0.0003	<0.01	<0.0001

Site and site number (fig. 1)		Co (cobalt) (µg/L)	Co (cobalt) (tons per day x 10^{-3})	Cr (chromium) (µg/L)	Cr (chromium) (tons per day)	Cu (copper) (µg/L)	Cu (copper) (tons per day x 10^{-3})	Fe (iron) (µg/L)	Fe (iron) (tons per day x 10^{-3})
Near Bernalillo Bridge	S1	0.09 ± 0.02	1.1	<0.3	<0.004	1.46 ± 0.01	18.6	5 ± 2	60
Paseo del Norte Bridge	S2	0.10 ± 0.03	1.0	<0.3	<0.003	1.54 ± 0.19	15.5	8 ± 3	80
Central Avenue Bridge	S3	0.08 ± 0.03	1.0	<0.3	<0.004	1.40 ± 0.04	17.6	7 ± 4	90
Rio Bravo Bridge	S4	0.09 ± 0.04	1.3	<0.3	<0.004	1.38 ± 0.05	19.5	<5	<70
Effluent from WWTP	S5	0.24 ± 0.04	0.05	0.75 ± 0.29	0.0002	4.73 ± 0.35	1.1	86 ± 17	20
I-25 Bridge	S6	0.10 ± 0.03	1.5	<0.3	<0.004	1.44 ± 0.06	21.4	<5	<70
Isleta	S7	0.12 ± 0.03	1.6	<0.3	<0.004	1.37 ± 0.01	18.6	6 ± 1	80

Site and site number (fig. 1)		Hg (mercury) (µg/L)	Hg (mercury) (tons per day x 10^{-3})	Li (lithium) (µg/L)	Li (lithium) (tons per day x 10^{-3})	Mn (manganese) (µg/L)	Mn (manganese) (tons per day x 10^{-3})	Mo (molybdenum) (µg/L)	Mo (molybdenum) (tons per day x 10^{-3})
Near Bernalillo Bridge	S1	0.0015 ± 0.0001	0.019	11.3 ± 0.1	144	2.58 ± 0.22	32.9	1.99 ± 0.07	25.4
Paseo del Norte Bridge	S2	0.0012 ± 0.0002	0.012	13.3 ± 0.2	134	3.46 ± 0.27	34.8	2.07 ± 0.05	20.8
Central Avenue Bridge	S3	0.0014 ± 0.0000	0.018	12.2 ± 0.4	153	2.08 ± 0.57	26.1	2.09 ± 0.06	26.2
Rio Bravo Bridge	S4	0.0016 ± 0.0003	0.022	11.3 ± 0.3	160	2.00 ± 0.04	28.2	2.04 ± 0.08	28.8
Effluent from WWTP	S5	0.0048 ± 0.0004	0.001	60.2 ± 3.1	14	29.3 ± 0.51	6.6	33.5 ± 0.44	7.6
I-25 Bridge	S6	0.0007 ± 0.0001	0.010	12.3 ± 0.4	183	1.54 ± 0.08	22.9	2.78 ± 0.07	41.4
Isleta	S7	0.0022 ± 0.0001	0.030	14.5 ± 0.4	197	1.29 ± 0.09	17.6	3.04 ± 0.04	41.4

Site and site number (fig. 1)		Ni (nickel) (µg/L)	Ni (nickel) (tons per day x 10^{-3})	Pb (lead) (µg/L)	Pb (lead) (tons per day x 10^{-3})	Se (selenium) (µg/L)	Se (selenium) (tons per day x 10^{-3})	Sr (strontium) (µg/L)	Sr (strontium) (tons per day x 10^{-3})
Near Bernalillo Bridge	S1	3.73 ± 0.60	47.6	0.050 ± 0.070	0.64	0.24 ± 0.05	3.06	201 ± 1	2,570
Paseo del Norte Bridge	S2	3.12 ± 0.44	31.4	0.024 ± 0.033	0.24	0.24 ± 0.03	2.42	209 ± 3	2,100
Central Avenue Bridge	S3	2.71 ± 0.51	34.0	< 0.007	<0.09	0.22 ± 0.03	2.76	212 ± 3	2,660
Rio Bravo Bridge	S4	2.89 ± 0.56	40.8	0.024 ± 0.035	0.34	0.25 ± 0.06	3.53	212 ± 4	2,990
Effluent from WWTP	S5	4.97 ± 0.60	1.1	0.439 ± 0.087	0.10	0.39 ± 0.06	0.09	366 ± 10	83
I-25 Bridge	S6	2.82 ± 0.52	42.0	0.030 ± 0.031	0.45	0.28 ± 0.05	4.17	216 ± 2	3,210
Isleta	S7	3.41 ± 0.57	46.4	0.039 ± 0.034	0.53	0.22 ± 0.07	2.99	227 ± 3	3,090

Table 8.--Water-quality properties and dissolved constituents in the Rio Grande in the vicinity of Albuquerque, N. Mex., May-June 1994--Concluded

Site and site number (fig. 1)		Tl (thallium) (µg/L)	Tl (thallium) (tons per day x 10^{-3})	U (uranium) (µg/L)	U (uranium) (tons per day x 10^{-3})	V (vanadium) (µg/L)	V (vanadium) (tons per day x 10^{-3})	Zn (zinc) (µg/L)	Zn (zinc) (tons per day x 10^{-3})
Near Bernalillo Bridge	S1	0.006 ± 0.002	0.077	1.41 ± 0.03	18.0	2.27 ± 0.02	29.0	0.81 ± 0.67	10.3
Paseo del Norte Bridge	S2	0.006 ± 0.002	0.060	1.47 ± 0.04	14.8	2.57 ± 0.03	25.9	0.87 ± 0.26	8.8
Central Avenue Bridge	S3	0.006 ± 0.003	0.075	1.44 ± 0.04	18.1	2.64 ± 0.07	33.1	0.65 ± 0.27	8.2
Rio Bravo Bridge	S4	0.005 ± 0.002	0.071	1.44 ± 0.03	20.3	2.66 ± 0.08	37.6	0.80 ± 0.30	11.3
Effluent from WWTP	S5	0.011 ± 0.005	0.002	1.37 ± 0.01	0.3	10.1 ± 0.08	2.3	20 ± 1.48	4.5
I-25 Bridge	S6	0.006 ± 0.001	0.089	1.46 ± 0.03	21.7	3.12 ± 0.07	46.4	1.17 ± 0.22	17.4
Isleta	S7	0.009 ± 0.005	0.122	1.55 ± 0.03	21.1	3.24 ± 0.04	44.1	0.87 ± 0.16	11.8

Site and site number (fig. 1)		Br (bromide) (mg/L)	Br (bromide) (tons per day)	Ca (calcium) (mg/L)	Ca (calcium) (tons per day)	Cl (chloride) (mg/L)	Cl (chloride) (tons per day)	CN (cyanide) (mg/L)	CN (cyanide) (tons per day)
Near Bernalillo Bridge	S1	<0.02	<0.3	27.5 ± 1.5	351	3.97	50.7	<0.01	<0.13
Paseo del Norte Bridge	S2	<0.02	<0.2	28.0 ± 0.8	282	4.46	44.9	<0.01	<0.10
Central Avenue Bridge	S3	<0.02	<0.3	27.5 ± 1.1	345	4.46	56.0	<0.01	<0.13
Rio Bravo Bridge	S4	0.03	0.42	27.0 ± 0.2	381	4.02	56.8	<0.01	<0.14
Effluent from WWTP	S5	0.14	0.03	40.4 ± 1.1	9	90.3	20.5	--	--
I-25 Bridge	S6	0.02	0.30	28.1 ± 1.6	418	5.10	15.9	<0.01	<0.15
Isleta	S7	0.02	0.27	28.3 ± 0.7	385	6.69	91.0	<0.01	<0.14

Site and site number (fig. 1)		F (fluoride) (mg/L)	F (fluoride) (tons per day)	K (potassium) (mg/L)	K (potassium) (tons per day)	Mg (magnesium) (mg/L)	Mg (magnesium) (tons per day)	Na (sodium) (mg/L)	Na (sodium) (tons per day)
Near Bernalillo Bridge	S1	0.19	2.4	1.93 ± 0.04	24.6	5.08 ± 0.28	64.9	12.1 ± 0.8	155
Paseo del Norte Bridge	S2	0.19	1.9	1.82 ± 0.02	18.3	5.04 ± 0.18	50.8	12.0 ± 0.7	121
Central Avenue Bridge	S3	0.19	2.4	1.88 ± 0.06	23.6	4.87 ± 0.26	61.1	11.4 ± 0.9	143
Rio Bravo Bridge	S4	0.19	2.7	1.80 ± 0.02	25.4	4.81 ± 0.20	67.9	9.9 ± 0.1	140
Effluent from WWTP	S5	1.37	0.3	14.2 ± 0.21	3.2	6.32 ± 0.19	1.4	92 ± 7	21
I-25 Bridge	S6	0.20	3.0	2.13 ± 0.07	31.7	5.02 ± 0.34	74.7	13.4 ± 1.9	199
Isleta	S7	0.23	3.1	2.22 ± 0.05	30.2	4.93 ± 0.30	67.1	13.4 ± 0.9	182

Site and site number (fig. 1)		SiO_2 (silica as SiO_2) (mg/L)	SiO_2 (silica as SiO_2) (tons per day)	Alkalinity (µeq/L)	DOC (carbon, organic dissolved) (mg/L)	DOC (carbon, organic dissolved) (tons per day)	NH_4 (ammonium ion as N) (mg/L)	NH_4 (ammonium ion as N) (tons per day)
Near Bernalillo Bridge	S1	14.2 ± 0.3	181	1,470 ± 5	4.59 ± 0.11	58.6	<0.008	<0.1
Paseo del Norte Bridge	S2	13.9 ± 0.5	140	1,510 ± 7	4.78 ± ??	48.1	<0.008	<0.1
Central Avenue Bridge	S3	13.5 ± 0.7	169	1,506 ± 3	10.1 ± 0.65	127	0.009 ± 0.004	0.11
Rio Bravo Bridge	S4	12.2 ± 0.1	172	1,507 ± 5	4.28 ± 0.06	60.4	<0.008	<0.1
Effluent from WWTP	S5	46.7 ± 2.2	11	2,772 ± 5	9.46 ± 0.69	2.1	8.59 ± 0.083	1.95
I-25 Bridge	S6	14.0 ± 1.4	208	1,521 ± 6	6.67 ± ??	99.2	0.119 ± 0.005	1.77
Isleta	S7	13.8 ± 0.8	188	1,563 ± 5	4.23 ± 0.01	57.6	0.106 ± 0.006	1.44

Site and site number (fig. 1)		NO_2 (nitrite as N) (mg/L)	NO_2 (nitrite as N) (tons per day)	NO_3 (nitrate as N) (mg/L)	NO_3 (nitrate as N) (tons per day)	PO_4 (orthophosphate as P) (mg/L)	PO_4 (orthophosphate as P) (tons per day)	Sulfate as SO_4 (mg/L)	Sulfate as SO_4 (tons per day)
Near Bernalillo Bridge	S1	0.012 ± 0.001	0.15	0.16 ± 0.03	2.04	0.081 ± 0.006	1.03	34.6	442
Paseo del Norte Bridge	S2	0.010 ± 0.001	0.10	0.26 ± 0.03	2.62	0.128 ± 0.011	1.29	32.2	324
Central Avenue Bridge	S3	0.023 ± 0.027	0.29	0.21 ± 0.03	2.64	0.104 ± 0.031	1.31	35.0	439
Rio Bravo Bridge	S4	0.007 ± 0.003	0.10	0.24 ± 0.07	3.39	0.074 ± 0.009	1.04	35.7	504
Effluent from WWTP	S5	2.88 ± 0.038	0.65	38.1 ± 0.71	8.64	9.26 ± 0.089	2.10	85.0	19
I-25 Bridge	S6	0.058 ± 0.002	0.86	1.36 ± 0.03	20.2	0.257 ± 0.009	3.82	31.9	475
Isleta	S7	0.065 ± 0.003	0.88	1.55 ± 0.06	21.1	0.313 ± 0.009	4.26	37.3	508

Table 9.--Water-quality properties and dissolved constituents in the Rio Grande in the vicinity of Albuquerque, N. Mex., October 1994

[Errors are one standard deviation based on triplicate laboratory analyses. ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; µg/L, micrograms per liter; mg/L, milligrams per liter; µeq/L, microequivalents per liter. <, less than; --, no data]

Site and site number (fig. 1)		Discharge (ft^3/s)	Specific conductance (µS/cm)	pH	Ag (silver) (µg/L)	Ag (silver) (tons per day)	Al (aluminum) (µg/L)	Al (aluminum) (tons per day x 10^{-3})	As (arsenic) (µg/L)	As (arsenic) (tons per day x 10^{-3})
Near Bernalillo Bridge	S1	565	322	8.4	<0.01	<0.00002	<1.3	<2.0	1.85 ± 0.04	2.82
Paseo del Norte Bridge	S2	609	342	8.5	<0.01	<0.00002	2.1 ± 0.3	3.5	2.54 ± 0.05	4.18
Central Avenue Bridge	S3	595	332	8.3	<0.01	<0.00002	1.4 ± 0.8	2.2	2.32 ± 0.05	3.73
Rio Bravo Bridge	S4	508	366	8.4	<0.01	<0.00001	1.8 ± 0.5	2.5	2.42 ± 0.08	3.32
Effluent from WWTP	S5	88	822	7.0	0.06 ± 0.02	0.00001	21.4 ± 0.9	5.1	8.57 ± 0.13	2.04
I-25 Bridge	S6	558	428	8.1	<0.01	<0.00002	3.9 ± 0.6	5.9	3.37 ± 0.08	5.08
Isleta	S7	691	426	8.2	<0.01	<0.00002	2.9 ± 0.7	5.4	3.46 ± 0.11	6.46

Site and site number (fig. 1)		B (boron) (µg/L)	B (boron) (tons per day x 10^{-3})	Ba (barium) (µg/L)	Ba (barium) (tons per day x 10^{-3})	Be (beryllium) (µg/L)	Be (beryllium) (tons per day x 10^{-3})	Cd (cadmium) (µg/L)	Cd (cadmium) (tons per day x 10^{-3})
Near Bernalillo Bridge	S1	38 ± 1	58	95 ± 2	140	<0.006	<0.009	<0.01	<1.0
Paseo del Norte Bridge	S2	42 ± 1	69	80 ± 1	130	<0.006	<0.010	<0.01	<1.0
Central Avenue Bridge	S3	46 ± 2	74	81 ± 1	130	<0.006	<0.010	<0.01	<1.0
Rio Bravo Bridge	S4	46 ± 2	63	80 ± 2	110	<0.006	<0.008	<0.01	<1.0
Effluent from WWTP	S5	384 ± 23	91	22 ± 0	5	<0.006	<0.001	0.11	<0.2
I-25 Bridge	S6	88 ± 6	133	72 ± 3	110	<0.006	<0.009	<0.01	<1.0
Isleta	S7	82 ± 5	153	77 ± 1	140	<0.006	<0.011	<0.01	<2.0

Site and site number (fig. 1)		Co (cobalt) (µg/L)	Co (cobalt) (tons per day x 10^{-3})	Cr (chromium) (µg/L)	Cr (chromium) (tons per day x 10^{-3})	Cu (copper) (µg/L)	Cu (copper) (tons per day x 10^{-3})	Fe (iron) (µg/L)	Fe (iron) (tons per day)
Near Bernalillo Bridge	S1	0.03 ± 0.01	0.046	0.43 ± 0.07	0.66	0.93 ± 0.06	1.42	<5	<0.008
Paseo del Norte Bridge	S2	0.02 ± 0.01	0.033	0.51 ± 0.05	0.84	1.01 ± 0.08	1.66	<5	<0.008
Central Avenue Bridge	S3	0.01 ± 0.01	0.016	0.49 ± 0.10	0.79	0.96 ± 0.03	1.54	<5	<0.008
Rio Bravo Bridge	S4	<0.01	<0.014	0.43 ± 0.04	0.59	1.01 ± 0.06	1.39	<5	<0.007
Effluent from WWTP	S5	<0.01	<0.002	4.59 ± 0.22	1.09	8.83 ± 0.08	2.10	83 ± 3	0.020
I-25 Bridge	S6	<0.01	<0.015	0.97 ± 0.09	1.46	1.57 ± 0.10	2.37	<5	<0.008
Isleta	S7	<0.01	<0.019	0.85 ± 0.07	1.59	1.29 ± 0.05	2.41	<5	<0.009

Site and site number (fig. 1)		Hg (mercury) (µg/L)	Hg (mercury) (tons per day x 10^{-3})	Li (lithium) (µg/L)	Li (lithium) (tons per day x 10^{-3})	Mn (manganese) (µg/L)	Mn (manganese) (tons per day x 10^{-3})	Mo (molybdenum) (µg/L)	Mo (molybdenum) (tons per day x 10^{-3})
Near Bernalillo Bridge	S1	0.0009 ± 0.0000	0.0013	15.8 ± 0.2	24.1	2.0 ± 0.3	3.05	4.21 ± 0.06	6.42
Paseo del Norte Bridge	S2	0.0008 ± 0.0002	0.0013	19.6 ± 0.7	32.2	1.60 ± 0.04	2.63	4.42 ± 0.09	7.27
Central Avenue Bridge	S3	0.0007 ± 0.0002	0.0011	21.2 ± 0.5	34.1	0.8 ± 0.1	1.29	4.3 ± 0.2	6.91
Rio Bravo Bridge	S4	0.0009 ± 0.0002	0.0012	21.8 ± 0.4	29.9	1.55 ± 0.07	2.13	4.34 ± 0.07	5.95
Effluent from WWTP	S5	0.0026 ± 0.0001	0.0006	66.5 ± 0.5	15.8	17.4 ± 0.6	4.13	28.4 ± 0.2	6.75
I-25 Bridge	S6	0.0013 ± 0.0002	0.0019	28.5 ± 0.8	42.9	5.0 ± 0.3	7.53	7.7 ± 0.6	11.6
Isleta	S7	0.0012 ± 0.0001	0.0022	28.3 ± 0.9	52.8	9.5 ± 0.2	17.7	6.5 ± 0.1	12.1

Site and site number (fig. 1)		Ni (nickel) (µg/L)	Ni (nickel) (tons per day x 10^{-3})	Pb (lead) (µg/L)	Pb (lead) (tons per day x 10^{-3})	Se (selenium) (µg/L)	Se (selenium) (tons per day x 10^{-3})	Sr (strontium) (µg/L)	Sr (strontium) (tons per day x 10^{-3})
Near Bernalillo Bridge	S1	0.77 ± 0.07	1.17	0.013 ± 0.008	0.020	0.25 ± 0.04	0.38	302 ± 7	461
Paseo del Norte Bridge	S2	0.82 ± 0.14	1.35	0.009 ± 0.012	0.015	0.22 ± 0.18	0.36	307 ± 4	505
Central Avenue Bridge	S3	0.96 ± 0.13	1.54	0.026 ± 0.004	0.042	0.21 ± 0.13	0.34	313 ± 6	503
Rio Bravo Bridge	S4	0.75 ± 0.13	1.03	0.014 ± 0.016	0.019	0.24 ± 0.09	0.33	319 ± 7	438
Effluent from WWTP	S5	3.70 ± 0.07	0.88	0.255 ± 0.030	0.061	0.59 ± 0.05	0.14	310 ± 6	74
I-25 Bridge	S6	1.14 ± 0.19	1.72	0.028 ± 0.008	0.042	0.35 ± 0.05	0.53	318 ± 4	479
Isleta	S7	1.16 ± 0.24	2.16	0.032 ± 0.004	0.060	0.29 ± 0.03	0.54	321 ± 7	599

Table 9.--Water-quality properties and dissolved constituents in the Rio Grande in the vicinity of Albuquerque, N. Mex., October 1994--Concluded

Site and site number (fig. 1)		Tl (thallium) (µg/L)	Tl (thallium) (tons per day x 10^{-3})	U (uranium) (µg/L)	U (uranium) (tons per day x 10^{-3})	V (vanadium) (µg/L)	V (vanadium) (tons per day x 10^{-3})	Zn (zinc) (µg/L)	Zn (zinc) (tons per day x 10^{-3})
Near Bernalillo Bridge	S1	0.005 ± 0.000	0.008	2.76 ± 0.04	4.21	4.12 ± 0.09	6.28	0.42 ± 0.13	0.64
Paseo del Norte Bridge	S2	0.006 ± 0.000	0.010	3.01 ± 0.05	4.95	5.49 ± 0.10	9.03	0.48 ± 0.14	0.79
Central Avenue Bridge	S3	0.007 ± 0.001	0.011	2.90 ± 0.05	4.66	4.35 ± 0.09	6.99	0.8 ± 0.4	1.29
Rio Bravo Bridge	S4	0.007 ± 0.001	0.010	2.90 ± 0.04	3.98	4.75 ± 0.08	6.52	0.40 ± 0.11	0.55
Effluent from WWTP	S5	0.005 ± 0.001	0.001	1.29 ± 0.02	0.31	9.64 ± 0.19	2.29	17.4 ± 0.3	4.13
I-25 Bridge	S6	0.008 ± 0.001	0.012	2.86 ± 0.07	4.31	5.44 ± 0.27	8.20	1.78 ± 0.15	2.68
Isleta	S7	0.008 ± 0.001	0.015	2.94 ± 0.04	5.49	5.05 ± 0.24	9.42	1.49 ± 0.08	2.78

Site and site number (fig. 1)		Br (bromide) (mg/L)	Br (bromide) (tons per day)	Ca (calcium) (mg/L)	Ca (calcium) (tons per day)	Cl (chloride) (mg/L)	Cl (chloride) (tons per day)	CN (cyanide) (mg/L)	CN (cyanide) (tons per day)
Near Bernalillo Bridge	S1	<0.02	<0.03	40.1 ± 1.5	61.2	5.34	8.2	<0.01	<0.015
Paseo del Norte Bridge	S2	0.03	0.05	41.1 ± 1.1	67.6	6.98	11.5	<0.01	<0.016
Central Avenue Bridge	S3	0.04	0.06	43.0 ± 1.7	69.1	7.42	11.9	<0.01	<0.016
Rio Bravo Bridge	S4	0.02	0.03	43.2 ± 0.1	59.3	7.35	10.1	<0.01	<0.014
Effluent from WWTP	S5	0.16	0.04	40.6 ± 1.4	9.6	98.3	23.4	--	--
I-25 Bridge	S6	0.05	0.08	43.3 ± 1.1	65.2	16.9	25.5	<0.01	<0.015
Isleta	S7	0.05	0.09	43.8 ± 1.0	81.7	14.5	27.1	<0.01	<0.019

Site and site number (fig. 1)		F (fluoride) (mg/L)	F (fluoride) (tons per day)	K (potassium) (mg/L)	K (potassium) (tons per day)	Mg (magnesium) (mg/L)	Mg (magnesium) (tons per day)	Na (sodium) (mg/L)	Na (sodium) (tons per day)
Near Bernalillo Bridge	S1	0.28	0.43	2.44 ± 0.11	3.72	7.04 ± 0.15	10.7	16.9 ± 1.0	25.8
Paseo del Norte Bridge	S2	0.29	0.48	2.78 ± 0.10	4.57	6.93 ± 0.11	11.4	19.3 ± 1.3	31.7
Central Avenue Bridge	S3	0.26	0.42	2.66 ± 0.05	4.27	7.31 ± 0.14	11.7	19.1 ± 1.6	30.7
Rio Bravo Bridge	S4	0.29	0.40	2.79 ± 0.06	3.83	7.32 ± 0.16	10.0	20.2 ± 1.8	27.7
Effluent from WWTP	S5	1.25	0.30	15.0 ± 2.1	3.56	5.95 ± 0.09	1.4	105 ± 1.5	24.9
I-25 Bridge	S6	0.49	0.74	3.89 ± 0.24	5.86	7.12 ± 0.12	10.7	29.7 ± 1.6	44.7
Isleta	S7	0.40	0.75	3.86 ± 0.12	7.20	7.20 ± 0.09	13.4	28.3 ± 1.4	52.8

Site and site number (fig. 1)		SiO_2 (silica as SiO_2) (mg/L)	SiO_2 (silica as SiO_2) (tons per day)	Alkalinity (µeq/L)	DOC (carbon, organic dissolved) (mg/L)	DOC (carbon, organic dissolved) (tons per day)	NH_4 (ammonium ion as N) (mg/L)	NH_4 (ammonium ion as N) (tons per day)
Near Bernalillo Bridge	S1	14.3 ± 0.4	21.8	2,230 ± 30	3.00 ± 0.16	4.58	<0.005	<0.008
Paseo del Norte Bridge	S2	15.4 ± 0.4	25.3	2,214 ± 9	2.60 ± 0.04	4.28	<0.005	<0.008
Central Avenue Bridge	S3	15.8 ± 0.7	25.4	2,311 ± 11	2.50 ± 0.08	4.02	0.009 ± 0.006	0.0145
Rio Bravo Bridge	S4	15.9 ± 0.5	21.8	2,321 ± 11	2.51 ± 0.07	3.44	<0.005	<0.007
Effluent from WWTP	S5	47.3 ± 0.6	11.2	2,560 ± 14	10.9 ± 0.5	2.59	6.09 ± 0.06	1.45
I-25 Bridge	S6	19.6 ± 0.4	29.5	2,280 ± 30	3.45 ± 0.07	5.20	0.649 ± 0.002	0.978
Isleta	S7	19.2 ± 0.6	35.8	2,380 ± 7	3.01 ± 0.20	5.62	0.464 ± 0.005	0.866

Site and site number (fig. 1)		NO_2 (nitrite as N) (mg/L)	NO_2 (nitrite as N) (tons per day)	NO_3 (nitrate as N) (mg/L)	NO_3 (nitrate as N) (tons per day)	PO_4 (orthophosphate as P) (mg/L)	PO_4 (orthophosphate as P) (tons per day)	Sulfate as SO_4 (mg/L)	Sulfate as SO_4 (tons per day)
Near Bernalillo Bridge	S1	<0.002	<0.003	<0.005	<0.008	0.007 ± 0.007	0.0107	53.5	81.6
Paseo del Norte Bridge	S2	<0.002	<0.003	0.012 ± 0.006	0.020	0.016 ± 0.008	0.0263	55.6	91.4
Central Avenue Bridge	S3	<0.002	<0.003	0.012 ± 0.003	0.019	0.018 ± 0.008	0.0289	55.9	89.8
Rio Bravo Bridge	S4	<0.002	<0.003	0.007 ± 0.001	0.0096	0.016 ± 0.005	0.0219	58.3	80.0
Effluent from WWTP	S5	0.19 ± 0.01	0.045	9.87 ± 0.27	2.35	2.59 ± 0.11	0.615	78.9	18.7
I-25 Bridge	S6	0.064 ± 0.003	0.096	1.38 ± 0.004	2.08	0.338 ± 0.020	0.509	61.6	92.8
Isleta	S7	0.037 ± 0.001	0.069	0.78 ± 0.01	1.46	0.247 ± 0.002	0.461	62.9	117.4

Table 10.--Trace-element concentrations in suspended sediment in the Rio Grande in the vicinity of Albuquerque, N. Mex., May and October 1994

[ft^3/s, cubic feet per second; µg/g, micrograms per gram; mg/L, milligrams per liter; --, no data; %, percent]

Date	Site and site number (fig. 1)		Discharge (ft^3/s)	Sediment concentration (mg/L)	Ag (silver) (µg/g)	Ag (silver) (tons per day x 10^{-3})	As (arsenic) (µg/g)	As (arsenic) (tons per day x 10^{-3})	Ba (barium) (µg/g)	Ba (barium) (tons per day x 10^{-3})
5/94	Near Bernalillo Bridge	S1	4,730	480	1.08 ± 0.07	6.62	8.6 ± 0.5	53	355 ± 1	2,180
5/94	Paseo del Norte Bridge	S2	3,730	245	1.10 ± 0.08	2.71	8.4 ± 0.1	21	301 ± 4	740
5/94	Central Avenue Bridge	S3	4,650	482	1.09 ± 0.04	6.60	8.5 ± 0.0	51	386 ± 4	2,340
5/94	Rio Bravo Bridge	S4	5,230	726	1.06 ± 0.01	10.87	6.5 ± 0.3	67	402 ± 1	4,120
5/94	I-25 Bridge	S6	5,510	698	1.14 ± 0.00	11.84	11.7 ± 1.7	121	469 ± 9	4,870
5/94	Isleta	S7	5,040	394	1.17 ± 0.09	6.27	12.9 ± 2.8	69	424 ± 4	2,270
10/94	Near Bernalillo Bridge	S1	565	88	1.09 ± 0.04	0.146	10.5 ± 2.1	1.41	408 ± 3	54.8
10/94	Paseo del Norte Bridge	S2	609	171	0.88 ± 0.02	0.247	8.9 ± 1.8	2.50	327 ± 4	91.9
10/94	Central Avenue Bridge	S3	595	208	0.97 ± 0.08	0.324	12.3 ± 2.2	4.11	358 ± 3	119.6
10/94	Rio Bravo Bridge	S4	508	2,270	0.90 ± 0.03	2.802	13.7 ± 0.2	42.65	350 ± 3	1,089.7
10/94	I-25 Bridge	S6	558	239	3.59 ± 0.05	0.129	10.3 ± 0.7	3.71	339 ± 2	122
10/94	Isleta	S7	691	206	3.77 ± 0.07	1.449	12.2 ± 2.0	4.69	352 ± 2	135

Date	Site and site number (fig. 1)		Be (beryllium) (µg/g)	Be (beryllium) (tons per day x 10^{-3})	Ca (calcium) (%)	Ca (calcium) (tons per day x 10^{-3})	Cd (cadmium) (µg/g)	Cd (cadmium) (tons per day x 10^{-3})	Co (cobalt) (µg/g)	Co (cobalt) (tons per day x 10^{-3})
5/94	Near Bernalillo Bridge	S1	2.18 ± 0.30	13.4	2.93 ± 0.02	180,000	0.54 ± 0.03	3.3	16.7 ± 0.9	102
5/94	Paseo del Norte Bridge	S2	2.05 ± 0.10	5.1	2.78 ± 0.02	69,000	0.79 ± 0.05	1.9	16.1 ± 0.3	40
5/94	Central Avenue Bridge	S3	1.75 ± 0.09	10.6	3.27 ± 0.01	198,000	0.37 ± 0.01	2.2	15.3 ± 0.3	93
5/94	Rio Bravo Bridge	S4	1.66 ± 0.08	17.0	3.40 ± 0.02	349,000	0.56 ± 0.06	5.7	14.8 ± 0.0	152
5/94	I-25 Bridge	S6	1.65 ± 0.16	17.1	3.38 ± 0.01	351,000	0.13 ± 0.01	1.3	14.6 ± 0.4	152
5/94	Isleta	S7	1.79 ± 0.03	9.6	3.39 ± 0.00	182,000	0.21 ± 0.05	1.1	15.7 ± 0.2	84
10/94	Near Bernalillo Bridge	S1	1.44 ± 0.02	0.193	3.40 ± 0.02	4,600	0.41 ± 0.09	0.055	16.2 ± 0.3	2.17
10/94	Paseo del Norte Bridge	S2	1.69 ± 0.14	0.475	3.75 ± 0.02	10,500	0.51 ± 0.04	0.143	16.6 ± 0.4	4.67
10/94	Central Avenue Bridge	S3	1.94 ± 0.04	0.648	4.16 ± 0.03	13,900	0.51 ± 0.03	0.170	17.3 ± 0.6	5.78
10/94	Rio Bravo Bridge	S4	1.83 ± 0.02	5.698	4.27 ± 0.01	133,000	0.45 ± 0.02	1.401	18.5 ± 0.0	57.60
10/94	I-25 Bridge	S6	1.85 ± 0.10	0.666	3.91 ± 0.01	14,100	0.34 ± 0.03	0.122	16.0 ± 0.4	5.76
10/94	Isleta	S7	1.90 ± 0.00	0.730	4.26 ± 0.02	16,400	0.47 ± 0.05	0.181	17.5 ± 0.6	6.73

Date	Site and site number (fig. 1)		Cr (chromium) (µg/g)	Cr (chromium) (tons per day x 10^{-3})	Cu (copper) (µg/g)	Cu (copper) (tons per day x 10^{-3})	Fe (iron) (%)	Fe (iron) (tons per day x 10^{-3})	Hg (mercury) (µg/g)	Hg (mercury) (tons per day x 10^{-3})
5/94	Near Bernalillo Bridge	S1	59 ± 2	360	44.2 ± 2.0	271	3.59 ± 0.05	220,000	0.119 ± 0.005	0.729
5/94	Paseo del Norte Bridge	S2	57 ± 2	140	43.9 ± 0.1	108	3.66 ± 0.01	90,000	0.085 ± 0.001	0.210
5/94	Central Avenue Bridge	S3	50 ± 2	300	35.0 ± 0.5	212	2.93 ± 0.01	177,000	0.112 ± 0.014	0.678
5/94	Rio Bravo Bridge	S4	50 ± 3	510	32.6 ± 0.4	334	2.68 ± 0.01	275,000	0.062 ± 0.006	0.636
5/94	I-25 Bridge	S6	48 ± 1	500	32.7 ± 2.1	400	2.57 ± 0.01	267,000	0.089 ± 0.003	0.924
5/94	Isleta	S7	51 ± 1	270	36.5 ± 1.2	196	2.95 ± 0.00	158,000	0.078 ± 0.001	0.418
10/94	Near Bernalillo Bridge	S1	50 ± 1	6.7	49.0 ± 1.9	6.58	2.71 ± 0.01	3,600	0.086 ± 0.001	0.012
10/94	Paseo del Norte Bridge	S2	55 ± 2	15.5	38.4 ± 1.3	10.79	3.15 ± 0.03	8,900	0.097 ± 0.001	0.027
10/94	Central Avenue Bridge	S3	56 ± 2	18.7	58.4 ± 1.4	19.51	3.18 ± 0.02	10,600	0.056 ± 0.006	0.019
10/94	Rio Bravo Bridge	S4	57 ± 1	177.5	43.4 ± 0.0	135.1	3.31 ± 0.00	103,000	0.068 ± 0.005	0.212
10/94	I-25 Bridge	S6	55 ± 0	19.8	44.7 ± 1.0	16.09	3.35 ± 0.00	12,100	0.086 ± 0.007	0.031
10/94	Isleta	S7	59 ± 3	22.7	59.0 ± 1.5	22.67	3.32 ± 0.01	12,800	0.108 ± 0.006	0.042

Date	Site and site number (fig. 1)		Li (lithium) (µg/g)	Li (lithium) (tons per day x 10^{-3})	Mg (magnesium) (%)	Mg (magnesium) (tons per day x 10^{-3})	Mn (manganese) (µg/g)	Mn (manganese) (tons per day x 10^{-3})	Mo (molybdenum) (µg/g)	Mo (molybdenum) (tons per day x 10^{-3})
5/94	Near Bernalillo Bridge	S1	43.8 ± 0.1	268	0.49 ± 0.00	30,000	876 ± 17	5,370	3.29 ± 0.01	20.2
5/94	Paseo del Norte Bridge	S2	43.5 ± 0.6	107	0.41 ± 0.01	10,000	858 ± 18	2,120	2.83 ± 0.16	7.0
5/94	Central Avenue Bridge	S3	34.2 ± 2.2	207	0.45 ± 0.01	27,000	688 ± 16	4,160	1.85 ± 0.08	11.2
5/94	Rio Bravo Bridge	S4	29.9 ± 1.6	307	0.59 ± 0.01	60,000	615 ± 1	6,300	1.47 ± 0.14	15.1
5/94	I-25 Bridge	S6	29.2 ± 1.1	303	0.80 ± 0.01	83,000	584 ± 5	6,060	1.94 ± 0.39	20.1
5/94	Isleta	S7	34.9 ± 0.5	187	0.87 ± 0.01	47,000	712 ± 1	3,820	2.07 ± 0.05	11.1
10/94	Near Bernalillo Bridge	S1	34.1 ± 2.0	4.58	1.00 ± 0.01	1,340	766 ± 23	103	1.68 ± 0.15	0.225
10/94	Paseo del Norte Bridge	S2	35.0 ± 0.3	9.84	0.53 ± 0.01	1,490	686 ± 5	193	1.46 ± 0.07	0.410
10/94	Central Avenue Bridge	S3	38.0 ± 1.2	12.70	1.13 ± 0.02	3,780	665 ± 9	222	1.32 ± 0.06	0.441
10/94	Rio Bravo Bridge	S4	38.8 ± 0.9	120.8	0.70 ± 0.00	21,800	657 ± 6	2,050	1.30 ± 0.15	4.048
10/94	I-25 Bridge	S6	35.4 ± 0.4	12.74	0.51 ± 0.00	1,840	569 ± 4	205	2.37 ± 0.04	0.853
10/94	Isleta	S7	37.7 ± 1.3	14.49	0.67 ± 0.00	2,570	567 ± 16	218	2.23 ± 0.13	0.857

Table 10.--Trace-element concentrations in suspended sediment in the Rio Grande in the vicinity of Albuquerque, N. Mex., May and October 1994--Concluded

Date	Site and site number (fig. 1)		Ni (nickel) (µg/g)	Ni (nickel) (tons per day x 10^{-3})	Pb (lead) (µg/g)	Pb (lead) (tons per day x 10^{-3})	Sb (antimony) (µg/g)	Sb (antimony) (tons per day x 10^{-3})	Se (selenium)* (µg/g)	Se (selenium)* (tons per day x 10^{-3})
5/94	Near Bernalillo Bridge	S1	24.8 ± 0.7	152	30.5 ± 0.8	187	1.06 ± 0.08	6.50	--	--
5/94	Paseo del Norte Bridge	S2	24.4 ± 0.7	60	31.9 ± 0.5	79	1.09 ± 0.01	2.69	--	--
5/94	Central Avenue Bridge	S3	18.7 ± 0.3	113	24.1 ± 0.0	146	1.10 ± 0.02	6.66	--	--
5/94	Rio Bravo Bridge	S4	16.6 ± 0.1	170	21.7 ± 0.4	222	0.99 ± 0.11	10.15	--	--
5/94	I-25 Bridge	S6	15.6 ± 0.6	162	21.3 ± 0.2	221	0.81 ± 0.07	8.41	--	--
5/94	Isleta	S7	18.0 ± 0.4	97	25.2 ± 0.1	135	0.83 ± 0.02	4.45	--	--
10/94	Near Bernalillo Bridge	S1	25.0 ± 0.5	3.36	22.7 ± 0.6	3.05	0.87 ± 0.07	0.117	--	--
10/94	Paseo del Norte Bridge	S2	21.4 ± 0.7	6.02	22.7 ± 0.2	6.38	0.94 ± 0.05	0.264	--	--
10/94	Central Avenue Bridge	S3	21.1 ± 0.1	7.05	22.5 ± 0.2	7.52	0.92 ± 0.01	0.307	--	--
10/94	Rio Bravo Bridge	S4	22.3 ± 0.7	69.4	24.2 ± 0.6	75.35	0.99 ± 0.07	3.082	--	--
10/94	I-25 Bridge	S6	21.2 ± 0.1	7.63	2.69 ± 0.4	9.68	1.04 ± 0.03	0.374	--	--
10/94	Isleta	S7	22.7 ± 0.3	8.72	27.3 ± 0.8	10.49	1.03 ± 0.10	0.396	--	--

Date	Site and site number (fig. 1)		Sr (strontium) (µg/g)	Sr (strontium) (tons per day x 10^{-3})	Ti (titanium) (%)	Ti (titanium) (tons per day x 10^{-3})	Tl (thallium) (µg/g)	Tl (thallium) (tons per day x 10^{-3})	U (uranium) (µg/g)	U (uranium) (tons per day x 10^{-3})
5/94	Near Bernalillo Bridge	S1	205 ± 4	1,260	0.334 ± 0.001	20,500	0.60 ± 0.05	3.7	3.48 ± 0.02	21.3
5/94	Paseo del Norte Bridge	S2	173 ± 3	430	0.263 ± 0.030	6,500	0.58 ± 0.02	1.4	3.55 ± 0.03	8.8
5/94	Central Avenue Bridge	S3	227 ± 4	1,370	0.357 ± 0.001	21,600	0.54 ± 0.03	3.3	3.18 ± 0.05	19.2
5/94	Rio Bravo Bridge	S4	230 ± 4	2,360	0.302 ± 0.020	31,000	0.50 ± 0.02	5.1	2.98 ± 0.09	30.6
5/94	I-25 Bridge	S6	235 ± 4	2,440	0.328 ± 0.035	34,100	0.49 ± 0.02	5.1	2.89 ± 0.09	30.0
5/94	Isleta	S7	234 ± 2	1,250	0.311 ± 0.007	16,700	0.56 ± 0.03	3.0	3.03 ± 0.09	16.2
10/94	Near Bernalillo Bridge	S1	232 ± 6	31.1	0.355 ± 0.092	480	0.52 ± 0.04	0.070	3.11 ± 0.15	0.417
10/94	Paseo del Norte Bridge	S2	191 ± 3	53.7	0.316 ± 0.049	890	0.55 ± 0.00	0.155	2.97 ± 0.02	0.835
10/94	Central Avenue Bridge	S3	226 ± 3	75.5	0.360 ± 0.010	1,200	0.58 ± 0.01	0.194	3.03 ± 0.04	1.012
10/94	Rio Bravo Bridge	S4	214 ± 8	66.6	0.347 ± 0.002	10,800	0.60 ± 0.03	1.868	3.11 ± 0.05	9.683
10/94	I-25 Bridge	S6	192 ± 1	69.1	0.339 ± 0.018	1,220	0.61 ± 0.00	0.220	3.18 ± 0.03	1.145
10/94	Isleta	S7	220 ± 6	84.5	0.355 ± 0.006	1,360	0.59 ± 0.01	0.227	3.31 ± 0.12	1.272

Date	Site and site number (fig. 1)		V (vanadium) (µg/g)	V (vanadium) (tons per day x 10^{-3})	Zn (zinc) (µg/g)	Zn (zinc) (tons per day x 10^{-3})
5/94	Near Bernalillo Bridge	S1	59 ± 2	360	140 ± 2	858
5/94	Paseo del Norte Bridge	S2	56 ± 2	140	145 ± 1	358
5/94	Central Avenue Bridge	S3	55 ± 1	330	102 ± 0	617
5/94	Rio Bravo Bridge	S4	49 ± 1	500	93 ± 3	953
5/94	I-25 Bridge	S6	55 ± 10	570	87 ± 1	903
5/94	Isleta	S7	57 ± 8	310	105 ± 4	563
10/94	Near Bernalillo Bridge	S1	57 ± 3	7.6	101 ± 5	13.6
10/94	Paseo del Norte Bridge	S2	66 ± 18	18.6	105 ± 3	29.5
10/94	Central Avenue Bridge	S3	74 ± 18	24.7	107 ± 2	35.7
10/94	Rio Bravo Bridge	S4	90 ± 5	280.2	110 ± 5	342.0
10/94	I-25 Bridge	S6	80±7	28.8	117 ± 0	42.1
10/94	Isleta	S7	83 ± 9	31.9	121 ± 4	46.5

*Reliable data not available due to difficulties with analytical method.

Table 11.--Total recoverable concentrations of selected constituents in the Rio Grande in the vicinity of Albuquerque, N. Mex., May and October 1994

[Errors are one standard deviation based on triplicate laboratory analyses. ft^3/s, cubic feet per second; µg/L, micrograms per liter; mg/L, milligrams per liter; --, no data]

Date	Site	Discharge (ft^3/s)	Ag (silver) (µg/L)	Ag (silver) (tons per day x 10^{-3})	As (arsenic) (µg/L)	As (arsenic) (tons per day x 10^{-3})	Ba (barium) (µg/L)	Ba (barium) (tons per day x 10^{-3})	Be (beryllium) (µg/L)	Be (beryllium) (tons per day x 10^{-3})
5/94	Near Bernalillo Bridge	4,730	<0.01	<0.1	<10	<128	54 ± 0.8	690	0.07 ± 0.01	0.89
5/94	Effluent from WWTP	84	1.02 ± 0.02	0.23	<10	<2	38 ± 0.2	9	<0.02	<0.004
5/94	Isleta	5,040	0.05 ± 0.00	0.68	<10	<136	72 ± 1.1	980	0.12 ± 0.01	1.63
10/94	Near Bernalillo Bridge	565	<0.02	<0.03	<10	<15	98 ± 0.6	149	0.06 ± 0.00	0.09
10/94	Effluent from WWTP	88	1.27 ± 0.01	0.30	14 ± 10	3	40 ± 0.4	10	<0.01	<0.002
10/94	Isleta	691	0.36 ± 0.01	0.67	<10	<19	98 ± 0.0	183	0.14 ± 0.01	0.26

Date	Site	Cd (cadmium) (µg/L)	Cd (cadmium) (tons per day x 10^{-3})	Co (cobalt) (µg/L)	Co (cobalt) (tons per day x 10^{-3})	Cr (chromium) (µg/L)	Cr (chromium) (tons per day x 10^{-3})	Cu (copper) (µg/L)	Cu (copper) (tons per day x 10^{-3})
5/94	Near Bernalillo Bridge	<0.4	<5.1	0.41 ± 0.01	5.2	<0.7	<8.9	1.8 ± 0.1	23.0
5/94	Effluent from WWTP	<0.4	<0.09	0.19 ± 0.00	0.04	<0.7	<0.2	6.1 ± 0.2	1.4
5/94	Isleta	<0.4	<5.4	0.78 ± 0.01	10.6	<0.7	<9.5	2.7 ± 0.0	36.7
10/94	Near Bernalillo Bridge	1.3 ± 0.01	2.0	0.27 ± 0.02	0.4	1.1 ± 0.2	1.7	<2	<3.1
10/94	Effluent from WWTP	0.3 ± 0.00	0.07	0.26 ± 0.01	0.06	2.2 ± 0.3	0.5	8.5 ± 2	2.0
10/94	Isleta	0.7 ± 0.02	1.3	0.58 ± 0.03	1.1	1.4 ± 0.3	2.6	<2	<3.7

Date	Site	Hg (mercury) (µg/L)	Hg (mercury) (tons per day x 10^{-3})	Mn (manganese) (µg/L)	Mn (manganese) (tons per day x 10^{-3})	Mo (molybdenum) (µg/L)	Mo (molybdenum) (tons per day x 10^{-3})	Ni (nickel) (µg/L)	Ni (nickel) (tons per day x 10^{-3})
5/94	Near Bernalillo Bridge	--		48 ± 0.3	613	1.9 ± 0.0	24.3	4.6 ± 0.1	58.7
5/94	Effluent from WWTP	0.015 ± 0.000	0.0034	29 ± 0.3	7	31.5 ± 0.3	7.1	4.2 ± 0.1	1.0
5/94	Isleta	--		93 ± 0.4	1,270	2.7 ± 0.0	36.7	4.0 ± 0.0	54.4
10/94	Near Bernalillo Bridge	<0.001	<0.002	48 ± 0.2	73	3.8 ± 0.1	5.8	<0.04	<0.06
10/94	Effluent from WWTP	0.013 ± 0.001	0.003	32 ± 0.2	8	29.8 ± 0.5	7.1	3.5 ± 0.2	0.8
10/94	Isleta	0.001 ± 0.000	0.002	94 ± 2.8	175	5.9 ± 0.1	11.0	0.4 ± 0.1	0.7

Date	Site	Pb (lead) (µg/L)	Pb (lead) (tons per day x 10^{-3})	Se (selenium) (µg/L)	Se (selenium) (tons per day x 10^{-3})	Sr (strontium) (µg/L)	Sr (strontium) (tons per day x 10^{-3})	Tl (thallium) * (µg/L)	Tl (thallium) * (tons per day x 10^{-3})
5/94	Near Bernalillo Bridge	1.3 ± 0.0	16.6	--	--	196 ± 2	2,503	0.009 ± 0.000	0.11
5/94	Effluent from WWTP	1.0 ± 0.0	0.2	--	--	348 ± 3	79	<0.004	<0.0009
5/94	Isleta	2.5 ± 0.1	34.0	--	--	226 ± 2	3,075	0.073 ± 0.001	0.99
10/94	Near Bernalillo Bridge	1.0 ± 0.02	1.5	--	--	325 ± 3	496	0.006 ± 0.001	0.009
10/94	Effluent from WWTP	1.5 ± 0.02	0.4	-	--	366 ± 3	87	0.001 ± 0.001	0.0002
10/94	Isleta	2.5 ± 0.04	4.7	--	--	362 ± 0	675	0.014 ± 0.002	0.026

Date	Site	U (uranium) (µg/L)	U (uranium) (tons per day x 10^{-3})	V (vanadium) (µg/L)	V (vanadium) (tons per day x 10^{-3})	Zn (zinc) (µg/L)	Zn (zinc) (tons per day x 10^{-3})	Ca (calcium) (mg/L)	Ca (calcium) (tons per day)
5/94	Near Bernalillo Bridge	1.51 ± 0.01	19.3	<10	<128	<5	<64	30 ± 0.5	383
5/94	Effluent from WWTP	1.39 ± 0.02	0.3	<10	<2	26 ± 1.1	6	41 ± 1.2	9
5/94	Isleta	1.69 ± 0.01	23.0	<10	<136	6 ± 0.1	82	35 ± 0.9	476
10/94	Near Bernalillo Bridge	2.50 ± 0.03	3.8	<4	<6	<5	<8	40 ± 0.5	61
10/94	Effluent from WWTP	1.28 ± 0.01	0.3	7 ± 4	2	25 ± 5	6	41 ± 0.9	10
10/94	Isleta	2.76 ± 0.01	5.1	<4	<7	<5	<9	48 ± 0.1	90

Date	Site	CN (cyanide) (mg/L)	CN (cyanide) (tons per day)	Fe (iron) (mg/L)	Fe (iron) (tons per day)	Li (lithium) (mg/L)	Li (lithium) (tons per day)	Mg (magnesium) (mg/L)	Mg (magnesium) (tons per day)
5/94	Near Bernalillo Bridge	<0.01	<.10	370 ± 0.01	4,730	11 ± 0.2	140	5.3 ± 0.02	67.7
5/94	Effluent from WWTP	<0.01	<0.002	310 ± 0.01	70	56 ± 0.3	13	6.5 ± 0.03	1.5
5/94	Isleta	<0.01	<.10	840 ± 0.01	11,430	14 ± 0.2	191	5.7 ± 0.06	77.6
10/94	Near Bernalillo Bridge	<0.01	<0.02	210 ± 0.003	320	15 ± 0.07	23	7.1 ± 0.2	10.8
10/94	Effluent from WWTP	<0.01	<0.002	750 ± 0.010	180	64 ± 0.02	15	6.3 ± 0.1	1.5
10/94	Isleta	<0.01	<0.02	550 ± 0.003	1,030	29 ± 0.04	54	7.6 ± 0.1	14.2

*Reliable data not available due to difficulties with analytical method.

Table 12.--Minimum reporting limits for selected dissolved trace elements used in this study and those previously reported by the U.S. Geological Survey

[All values reported in micrograms per liter]

Trace element	Values for this study	Values previously reported by U.S. Geological Survey
Silver	0.01	1.0
Aluminum	1.3	10
Arsenic	0.02	1.0
Barium	0.2	1.0
Beryllium	0.02	0.5
Cadmium	0.02	0.1
Cobalt	0.01	0.5
Chromium	0.4	0.5
Copper	0.05	0.5
Mercury	0.0004	0.1
Molybdenum	0.01	1.0
Nickel	0.03	1.0
Lead	0.009	0.5
Selenium	0.2	1.0
Strontium	0.1	0.5
Thallium	0.004	0.5
Uranium	0.03	0.01
Vanadium	0.02	1.0
Zinc	0.06	0.5

*U.S. GOVERNMENT PRINTING OFFICE: 1996-775-167/45026