GRCC

GIANT REFINING CO. CINIZA REFINERY
GALLUP, NEW MEXICO

COMPREHENSIVE MONITORING EVALUATION
12 FEBRUARY 1985

SAMPLING AND ANALYSIS PLAN

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NM Environmental Improvement Division
Santa Fe, New Mexico

INTRODUCTION

On February 12, 1985, the NM Environmental Improvement Division (EID) will perform a Comprehensive Monitoring Evaluation (CME) at the Giant Refining Co. Ciniza Refinery, near Gallup, New Mexico. EPA inspectors will also be present in an oversight capacity.

In addition to the usual format for conducting a compliance inspection at a hazardous waste management facility, the CME will include a detailed evaluation of Giant's Interim Status ground-water monitoring program. EID and EPA will split samples with Giant from their RCRA monitoring wells, and also from one additional observation well.

This document decribes the procedure which EID intends to utilize for collecting and analyzing samples at Giant.

SAMPLE LOCATIONS

EID's proposed sample locations are shown on Figure 1. Ground water samples will be split with Giant from their four RCRA monitoring wells (MW-1 through MW-4). We also propose to obtain samples from OW-11, a well which was installed as part of a previous hydrologic investigation, and which is considerably upgradient from the land treatment area.

SAMPLING PROCEDURE

Table 1 lists the parameters to be analyzed for each sample. From each well, EID will fill a 1-gallon cubitainer for general chemistry parameters, a 1-liter cubitainer for metals, 2 40-ml vials for volatile organics, and 2 40-ml vials for total organic carbon (TOC) and nitrate.

Because Giant's wells have slow recovery times, their procedure is to evacuate the wells two to four days prior to the sampling date. They plan in this case to pump the wells on February 7. Before actually taking the sample, Giant again pumps the well until the conductivity stabilizes. Once the wells have been thus evacuated, we will take samples with a teflon bailer (EPA's or Giant's). Each sample container (except 40-ml vials) will be rinsed three times with well water, then filled. Special care will be taken to ensure that no bubbles are trapped in the vials to be used for volatile organic analysis.

For each RCRA well, EID will take four separate measurements of temperature, pH and conductivity. A glass beaker will be triple rinsed with well water, then filled. Measurements will be made on this water using an alcohol thermometer, a Hach Mini pH meter Model 17200, and a Yellow Springs Instrument Company S-C-T Model 33 conductivity meter. Instructions for using the meters are provided in Appendix A.

FIGURE 1. SAMPLING LOCATIONS, GIANT CINIZA REFINERY

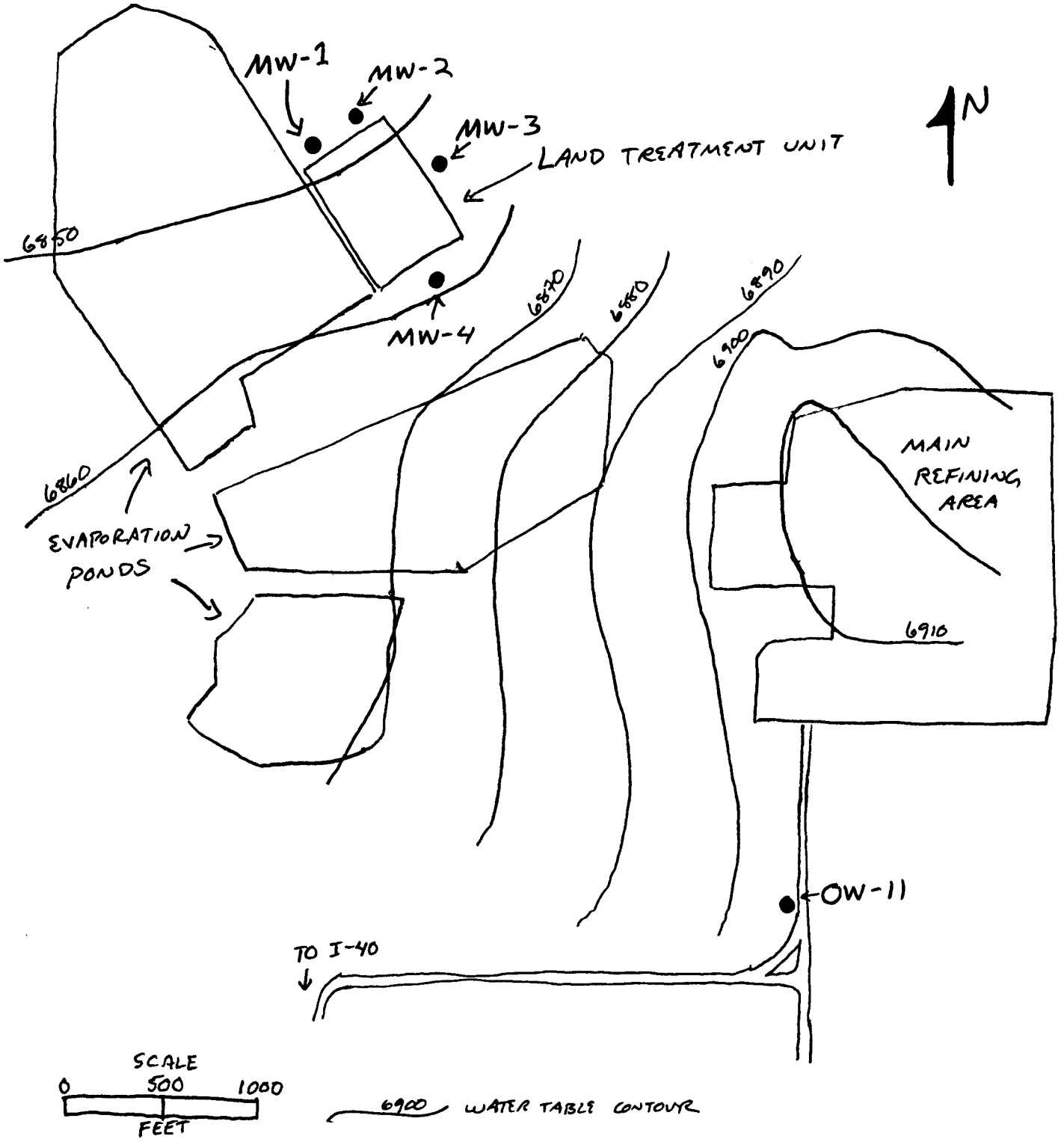


TABLE 1. SAMPLE CONTAINERS AND ANALYTICAL METHODS.

SAMPLE CONTAINER	PRESERVATION	PARAMETER(S)	ANALYTICAL METHOD
ORGANICS			
40 ml glass vial	Ice; keep in dark	Purgeables by GC/MS	EPA Method 624
METALS			
1 liter cubitainer	2 ml HNO_3	ICAP Scan	EPA Method 207
		Arsenic	EPA Method 206.2
		Mercury	EPA Method 245.1
		Selenium	EPA Method 270.2
GENERAL CHEMISTRY			
1 gallon cubitainer	Ice	Bicarbonate	EPA Method 310.1
		Chloride	EPA Method 325.2
		Fluoride	EPA Method 340.2
		pH	EPA Method 150.1
		Sodium/Potassium	Std. Methods 325(b)
		Specific Conductivity	EPA Method 120.1
		Sulfate	EPA Method 375.2
		Total Dissolved Solids	EPA Method 160.1
40 ml glass vial	5 drops H_2SO_4 and ice	Nitrate-N	EPA Method 353.2
		Total Organic Carbon	EPA Method 415.1

SAMPLE PRESERVATION

Preservative techniques for each type of sample are given in Table 1. No samples will be filtered. Water samples to be analyzed for metals will be acidified with 2 ml nitric acid (HNO_3); samples to be analyzed for nitrate and TOC will be acidified with 5 drops of sulfuric acid (H_2SO_4). The vials for volatile organics analysis will be sealed in plastic bags to help prevent cross-contamination. After acidification (if necessary), labeling and sealing, all samples will be put in a cooler with ice, and will be kept on ice until delivery to the laboratory.

SAMPLE SHIPMENT

The samples will be packer in coolers with ice packs, and will be driven to the laboratory by the EID inspector(s).

CHAIN-OF-CUSTODY

Appendix B shows the chain-of-custody seal which will be placed over the cap of each container as soon as it has been properly labeled and preserved. The seal will be signed and dated by the sampler. Appendix B also shows the chain-of-custody form which will be packed inside each cooler with the samples. It will be appropriately signed and dated when the samples are turned over to the laboratory.

ANALYSES

All analyses, other than field parameters, will be performed by the New Mexico Scientific Laboratory Division in Albuquerque. Table 1 lists the parameters to be analyzed and the methodologies to be used. Appendix C consists of the sample request forms which will accompany the samples.

A blank for volatile organics will be provided by the laboratory. The blank will be carried to Giant and then packed with the samples and returned to the lab.

PERSONNEL PROTECTION

Sampling personnel will be provided with steel-toed leather boots, steel-toed acid-resistant boots, disposable gloves, disposable cover suits, hard hats, and safety glasses. No other protective equipment is considered necessary at this site. Soap and water will be available.

APPENDIX A

INSTRUCTIONS FOR USING FIELD INSTRUMENTS

INSTRUCTIONS FOR USE OF YSI MODEL 33 S-C-T METER

1. Switch MODE control to OFF. Use meter screw to adjust meter needle to 0 conductivity, if necessary.

2. Plug probe into jack.

3. Switch MODE to RED LINE. Use RED LINE control to adjust meter needle to red line.

4. TEMPERATURE: Switch MODE to temperature; read meter when needle is steady.

5. SALINITY: Read TEMPERATURE; set °C control to indicated temperature. Switch to SALINITY, read S o/oo scale.

6. CONDUCTIVITY: Switch MODE to apprpriate conductivity scale for on-scale meter readings. Read meter and multiply reading by scale.

7. Replace batteries when step 3 cannot be accomplished. Use Eveready E95 (or equivalent) alkaline battery.

Instructions for Mini pH Meter
Model 17200

1. **Battery Installation**
The 9-volt battery supplied with the instrument must be installed when received from the factory. Lift the foam insert above the panel and connect battery and battery cable. Secure the battery in the clip provided.

2. **Electrode Preparation**
The pH electrode is shipped in a soaker bottle containing a buffered solution with glycerin added to prevent freezing. The soaker bottle maintains the electrode junction in a wetted condition. Discard the soaker bottle solution and refill it with a pH 7 buffer solution. Replace the electrode in the bottle and swirl for 10 to 15 seconds. Remove the electrode from the bottle and examine the bulb area of the electrode. If not bubble free, shake the electrode downward to fill the bulb with solution. Slide down the rubber fill hole cover to expose the fill hole. The fill hole should be uncovered when the electrode is in use. Verify that the electrolyte solution in the electrode is well above the calomel reference element. It is recommended that the level be maintained just below the fill hole. Connect the electrode cable to the input connector.

3. **Standardization**-Perform before each series of tests.
   a. Prepare pH 7.0 and pH 4.0 buffer solutions by dissolving the contents of the corresponding buffer powder pillows in separate 50-ml portions of distilled water or by using Hach prepackaged liquid pH standards.
   b. Mechanically zero the meter by adjusting for a reading of 7 while the instrument is turned off.
   c. Slide the rubber sleeve down to expose the fill hole in the side of the electrode.
   d. Immerse the tip of the electrode in the pH 7 buffer solution and set the power switch to ON.
   e. Measure the temperature of the buffer and adjust the TEMP °C control to that temperature.
   f. Adjust the STANDARDIZE control to obtain a reading of exactly 7.
   g. Remove the electrode from the pH 7 buffer and rinse thoroughly with demineralized water.
   h. Place the electrode in the pH 4 buffer solution.
   i. Measure the temperature of the buffer and adjust the TEMP °C to that temperature.
   j. Adjust the SPAN control to obtain a meter reading of exactly 4.
   k. Rinse the electrode thoroughly with demineralized water.

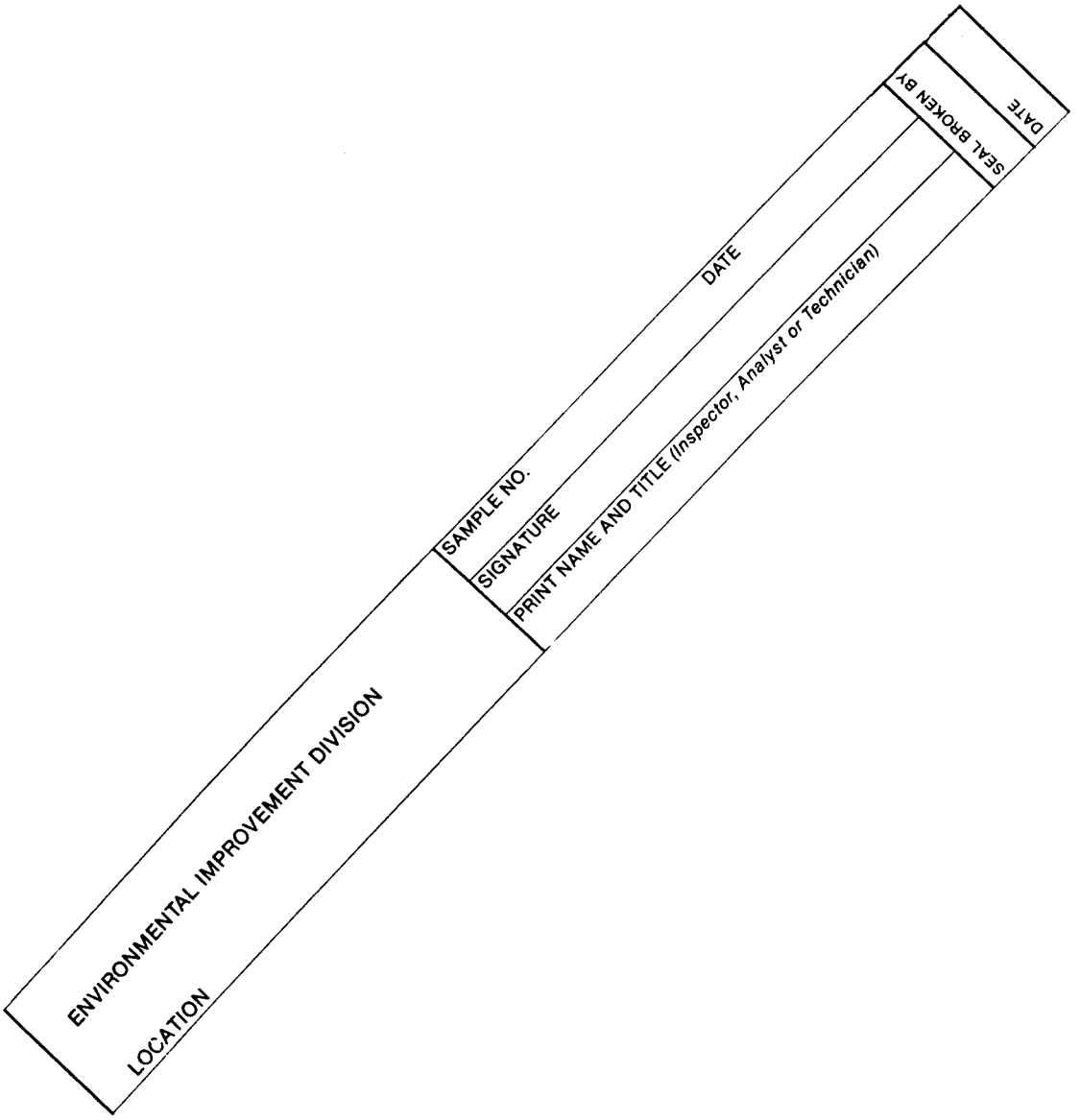
4. **Taking the pH Measurement**
   a. Measure the temperature of the test sample and adjust the TEMP °C control to that temperature.
   b. Rinse the electrode thoroughly with demineralized water and place it in the test sample.
   c. Read the pH value from the meter.

5. **Electrode Care**
   When not in use, the electrode should be replaced in the soaker bottle containing pH 7 buffer. The fill hole cover should be replaced to prevent evaporation and to slow the flow of electrolyte solution through the junction. To replace the electrode in the bottle, remove the bottle cap and o-ring from the bottle and slip them individually over the electrode. Then insert the electrode into the bottle and screw on the cap. Tighten the cap moderately to provide a good seal. Store where the solution cannot freeze.

APPENDIX B

CHAIN-OF-CUSTODY FORMS

CHAIN-OF-CUSTODY SEAL



NM ENVIRONMENTAL IMPROVEMENT DIVISION, HAZARDOUS WASTE SECTION

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME					NO. OF CONTAINERS								REMARKS
SAMPLERS: *(Signature)*														
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION									

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

APPENDIX C

ANALYSIS REQUEST FORMS

ANALYSES REQUESTED LAB. NO

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN	QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBON SCREEN			ALIPHATIC HYDROCARBONS
		AROMATIC HYDROCARBON SCREEN			CHLORINATED HYDROCARBON PESTICIDES
		HALOGENATED HYDROCARBON SCREEN			CHLOROPHENOXY ACID HERBICIDES
		GAS CHROMATOGRAPH/MASS SPECTROMETER			HYDROCARBON FUEL SCREEN
					ORGANOPHOSPHATE PESTICIDES
					POLYCHLORINATED BIPHENYLS (PCB's)
					POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS			**SPECIFIC COMPOUNDS**

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONC-ENTRATION	COMPOUND	CONC-ENTRATION
		* DETECTION LIMIT	

REMARKS:

CETRIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes No . Seal(s)-Broken by_____ date_____ .
I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.
Date(s) of analysis _____. Analysts signature _____
Icertify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers Signature:

REPORT TO: Hazardous Waste Section
Environmental Improvement Division
P.O. Box 968
Santa Fe, New Mexico 87504

Attn: _____
SLD USER CODE NUMBER 53300

METAL ANALYSIS REQUEST

LAB NUMBER _____

DATE RECEIVED _____

DATE REPORTED _____

Sample Number: _____ Location: _____

Sample Type: ☐ water ☐ soil ☐ sediment ☐ sludge ☐ other _____

Collected (date & time) _____ by: _____

Temperature: _____ celcius conductivity: _____ umhos/cm pH: _____

Sample container: ☐ 1-liter cubitainer(s) ☐ 1-quart glass jar(s) ☐ other _____

Treatment: ☐ Filtered ☐ 2 ml HNO3 ☐ ice ☐ other _____

☐ WATER ANALYSIS FOR ☐ dissolved ☐ suspended ☐ total

☐ SOIL ANALYSIS FOR ☐ supernatant ☐ total digestion ☐ EP Toxicity

☐ ICAP SCAN UG/ML OR UG/G DATE ANALYZED _____

Aluminum	_____	Copper	_____	Silicon	_____
Barium	_____	Iron	_____	Silver	_____
Berrylium	_____	Lead	_____	Strontium	_____
Boron	_____	Magnesium	_____	Tin	_____
Cadmium	_____	Manganese	_____	Vanadium	_____
Calcium	_____	Molybdenum	_____	Yttrium	_____
Chromium	_____	Nickel	_____	Zinc	_____
Cobalt	_____				

☐ ATOMIC ABSORPTION UG/ML OR UG/G DATE ANALYZED _____

Arsenic	_____	Selenium	_____	Mercury	_____
_____	_____	_____	_____	_____	_____

☐ EP TOXICITY MG/L DATE ANALYZED _____

Arsenic	_____	Chromium	_____	Selenium	_____
Barium	_____	Lead	_____	Silver	_____
Cadmium	_____	Mercury	_____		

ANALYST _____ REVIEWER _____

COMMENTS:

New Mexico Health and Environment Department
SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED	LAB NO.	USER CODE ☐ 59300 ☐ 59600 ☐ OTHER:
Collection DATE / Collection TIME	SITE INFORMATION ►	Sample location
Collected by — Person/Agency		Collection site description

SEND FINAL REPORT TO ►
GROUND WATER & HAZARDOUS WASTE BUREAU
NM ENVIRONMENT IMPROVEMENT DIVISION/HED
Crown Building, PO Box 968
Santa Fe, NM 87504-0968
Attn: ----------

Station/ well code

Owner

SAMPLING CONDITIONS

☐ Bailed ☐ Pump ☐ Dipped ☐ Tap	Water level	Discharge	Sample type
pH (00400)	Conductivity (Uncorrected) μmho	Water Temp. (00010) °C	Conductivity at 25°C (00094) μmho
Field comments			

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted	☐ NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 μ membrane filter	☐ A: 2 ml H_2SO_4/L added

☐ NA: No acid added ☐ Other-*specify:*

ANALYTICAL RESULTS from SAMPLES

NF, NA	Units	Date analyzed
☐ Conductivity (Corrected) 25°C (00095)	μmho	
☐ Total non-filterable residue (suspended) (00530)	mg/l	
☐ Other:		
☐ Other:		
☐ Other:		

F, NA	Units	Date analyzed
☐ Calcium (00915)	mg/l	
☐ Magnesium (00925)	mg/l	
☐ Sodium (00930)	mg/l	
☐ Potassium (00935)	mg/l	
☐ Bicarbonate (00440)	mg/l	
☐ Chloride (00940)	mg/l	
☐ Sulfate (00945)	mg/l	
☐ Total filterable residue (dissolved) (70300)	mg/l	
☐ Other:		

NF, A-H_2SO_4	Units	Date analyzed
☐ Nitrate-N +, Nitrate-N total (00630)	mg/l	
☐ Ammonia-N total (00610)	mg/l	
☐ Total Kjeldahl-N ( )	mg/l	
☐ Chemical oxygen demand (00340)	mg/l	
☐ Total organic carbon ( )	mg/l	
☐ Other:		
☐ Other:		

F, A-H_2SO_4	Units	Date analyzed
☐ Nitrate-N +, Nitrate-N dissolved (00631)	mg/l	
☐ Ammonia-N dissolved (00608)	mg/l	
☐ Total Kjeldahl-N ( )	mg/l	
☐ Other:		

Analyst	Date Reported	Reviewed by

Laboratory remarks

SLD 726 (12/84) *DISTRIBUTION:* **WHITE** — EID, GW&HW Bureau **CANARY** — WS System **PINK** — EID Local Office **GOLDENROD** — SLD