3R - 44

REPORTS

DATE:

SEPT. 1988

REPORT ON THE INSTALLATION OF A GROUND WATER MONITORING SYSTEM AT THE TENNECO RIDDLE FLS-3A WELL SITE

September 2, 1988

Prepared for:

MR. MARTIN BUYS
ENVIRONMENTAL COORDINATOR
TENNECO OIL COMPANY
6162 South Willow Drive
Englewood, CO 80111

Prepared by:

GEOSCIENCE CONSULTANTS, LTD.

HEADQUARTERS
500 Copper Avenue, NW
Suite 200
Albuquerque, New Mexico 87102
(505) 842-0001
FAX (505) 842-0595

WEST COAST REGIONAL OFFICE
1400 Quail Street
Suite 140
Newport Beach, CA 92660
(714) 724-0536
FAX (714) 724-0538

EASTERN REGIONAL OFFICE
1109 Spring Street
Suite 706
Silver Spring, Maryland 20910
(301) 587-2088
FAX (301) 587-3625

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1.0 EXECUTIVE SUMMARY

During late June, 1988, Geoscience Consultants, Ltd. (GCL) conducted a limited hydrogeologic study and monitor well installation program at Tenneco's Riddle FLS-3A well site in San Juan County, New Mexico. The Riddle FLS-3A well site is located approximately 20 miles southeast of Bloomfield, New Mexico. The site is an active natural gas producing well with an associated condensate storage tank, separator and waste water disposal facilities.

Four 2-inch PVC monitor wells were installed to quantify and determine the areal extent of any hydrocarbons in ground water at the Riddle FLS-3A facility. Minor concentrations of benzene, toluene and xylenes were present in ground-water samples from three wells at the site. However, no concentrations of hydrocarbons in excess of New Mexico drinking water standards were observed.

2.0 METHODS OF INVESTIGATION

Drilling and monitor well installation at the Riddle FLS-3A well site were performed on June 27 through June 29, 1988. Monitor wells were located in those areas where hydrocarbons were suspected based on a preliminary survey by the New Mexico Oil Conservation Division (NMOCD). Up- and down-gradient well locations were selected by a Tenneco representative.

Drilling was performed with a CME-55 hollow-stem auger owned and operated by Western Technologies, Inc. of Farmington, New Mexico. All drilling equipment and associated materials were thoroughly steam-cleaned with a hot water washer generating temperatures greater than 180° Fahrenheit prior to setting up on each borehole location.

During drilling operations, soil samples were recovered and logged by a GCL on-site geologist. Two boreholes, R-1 and R-4 (see Appendix A), were cored with a continuous sampler to obtain detailed subsurface information; the cores were cased in Lexan tubing and stored at the Tenneco warehouse in Farmington, New Mexico. The boreholes and working area were monitored constantly during drilling operations with a combustible gas and oxygen indicator (CGI) and an H-Nu photoionization detector. Hydrocarbon levels requiring protective measures were not encountered during drilling operations.

Flowing sands were encountered in all wells on the Riddle site. In order to complete the wells, it was necessary to introduce clean water into the borehole to build head on the water-bearing unit, thus minimizing the flow of formational sand into the borehole. Less than 10 gallons of water were introduced at each borehole. During development, immediately after completion of the well, a much greater volume of water was removed from the borehole. This procedure ensured that subsequent samples were representative of water in the formation and did not include any admixture of the water introduced during well completion.

The monitor wells were developed and purged by bailing. The limited amounts of water introduced into the wells during installation were bailed out to ensure that ground-water quality was not compromised. An additional three casing volumes of water were removed from each well prior to sampling.

Before sampling the monitor wells at the Riddle FLS-3A well site, static water levels were determined, then three casing volumes of water were purged from each monitor well to minimize the effect of the well on ground-water chemistry. A 5-foot stainless steel bailer was used to purge and sample the monitor wells. The samples were collected in 40-milliliter glass septum vials and sent to Radian Analytical Services, Austin, Texas. Radian Corporation analyzed the samples taken from Riddle FLS-3A monitor wells for purgeable halocarbons (EPA method 601), purgeable aromatics (EPA method 602), pH and total dissolved solids (TDS).

3.0 REGIONAL GEOLOGY AND HYDROLOGY

3.1 REGIONAL GEOLOGY

The Riddle FLS-3A well site is located in eastern San Juan County, New Mexico (Figure 3-1) in the east-central San Juan Basin. The San Juan Basin is located in the southeastern part of the Colorado Plateau and is approximately the eastern half of the Navajo physiographic section of the Colorado Plateau Province (Figure 3-2). The San Juan Basin is a Laramide (Late Cretaceous - early Tertiary) depression with maximum structural relief of 10,000 feet (Kelley, 1950). Local topographic relief is in the range of tens of feet. The Central Basin is bounded on all sides except the south by the "Hogback" monocline. To the south the principal structural boundary is the domal northwestward-trending Zuni uplift. At the east end of this uplift the boundary is a low, wide divide along the axis of the southward-trending Mount Taylor syncline and the Acoma embayment (Kelley, 1950). The lithologic units exposed in the Central Basin area are largely the San Jose, Nacimiento, and Animas formations of early Tertiary age (Kelley, 1950). Quaternary deposits are restricted mainly to major valleys.

Quaternary deposition in the San Juan Basin included the formation of outwash terraces along the San Juan River and its tributaries (Pleistocene), the growth and migration of sand dunes on higher plateaus (Pleistocene and Recent), and the cutting and filling of alluvial channels throughout the area (Stone and others, 1983). The Quaternary deposits consist of heterogeneous mixtures of gravel, sand, silt and clay. Texture and composition vary widely depending on age and source. In the valleys of the San Juan River and its tributaries, the alluvium does not exceed 100 feet in thickness (Stone and others, 1983). Terrace deposits consisting of boulder gravel rest on benches cut into the tertiary bedrock of the area. The boulders are very well rounded and consist of various igneous and metamorphic rock types. These deposits can be traced upstream to late Pleistocene glacial moraines in the mountains of Colorado and are termed outwash terraces by Stone and others (1983, p. 24). The valley fill and terrace deposits from a disconformable contact with all underlying units.

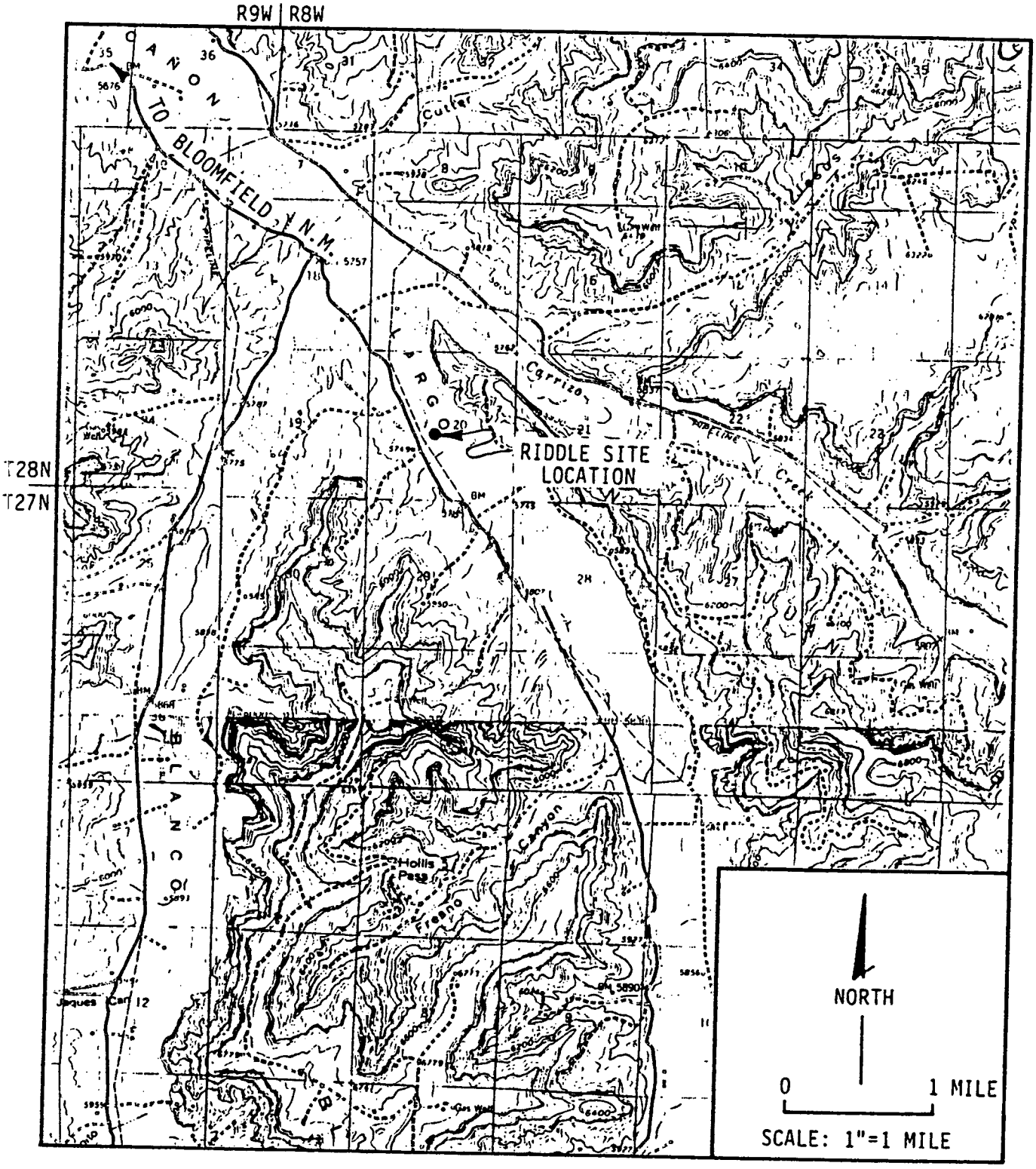


FIGURE 3-1

LOCATION MAP OF THE TENNECO RIDDLE FLS-3A SITE

(BASE FROM USGS 15 MINUTE BLOOMFIELD QUADRANGLE)

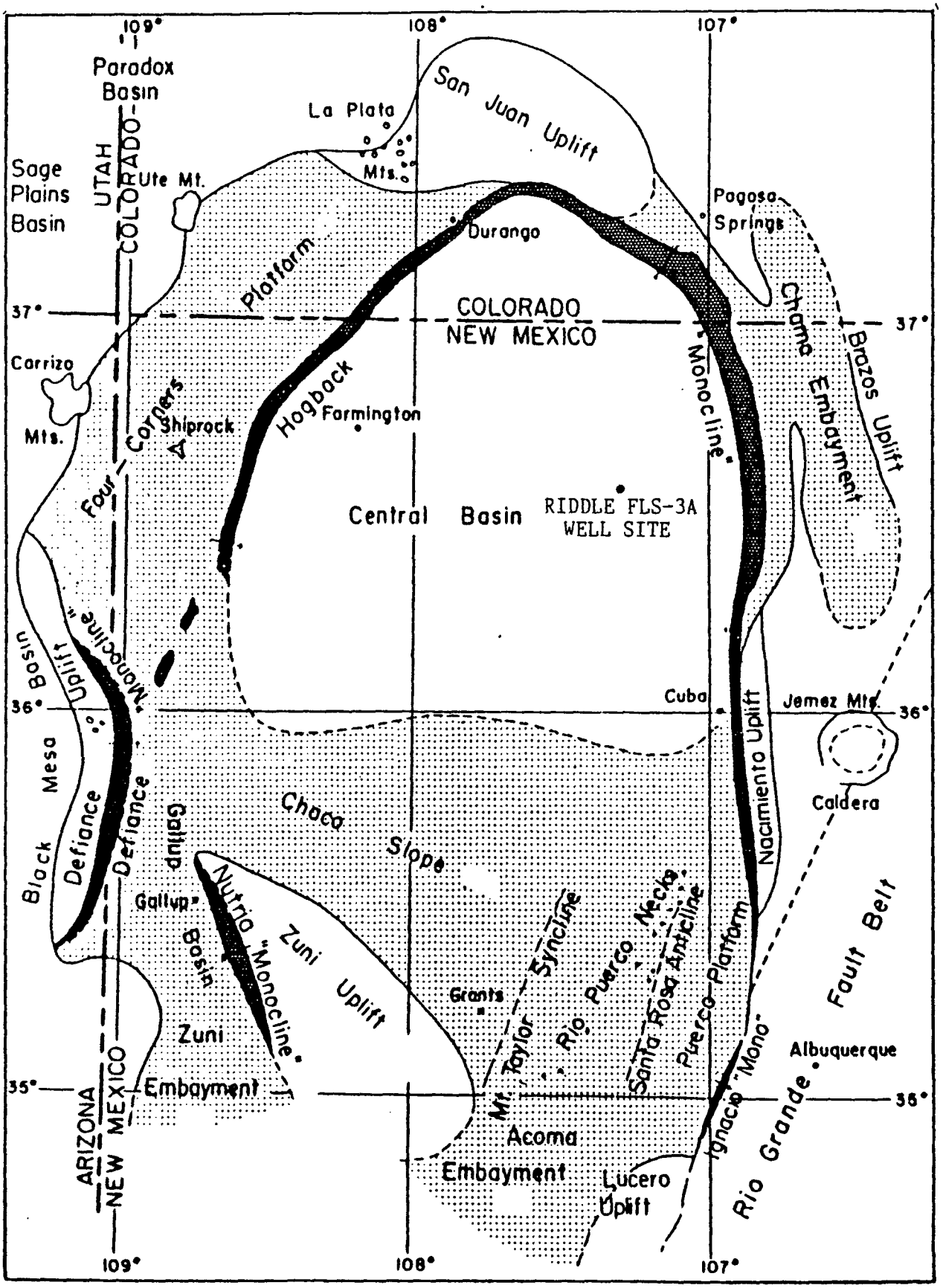


FIGURE 3-2

STRUCTURAL ELEMENTS OF THE SAN JUAN BASIN

(MODIFIED FROM KELLEY, 1951)

The Nacimiento Formation is largely characterized by interbedded black, carbonaceous mudstones and white, coarse-grained sandstones, but the upper part of the formation is dominated by more somber beds of mudstone and sandstone. Thickness of the Nacimiento ranges from about 400 to 2200 feet (Stone and others, 1983). The Nacimiento Formation outcrops throughout the central Basin and is in disconformable contact with Quaternary valley fill and San Juan River alluvium.

3.2 REGIONAL HYDROLOGY

Much of the recharge to ground water in the San Juan Basin occurs on the flanks of the Zuni, Chuska, and Cebolleta Mountains (Stone and others, 1983, p.22). Numerous ephemeral-stream channels filled with alluvium are the principal sources of ground-water recharge in some areas and the principal locations of discharge in others.

Numerous shallow wells produce water from valley fill for stock and domestic users along some streams in the San Juan Basin. In many areas valley fill provides the only source of potable water for rural inhabitants.

The transmissivity of valley fill varies widely, depending on the lithology and thickness of the fill materials. Highest transmissivities can be expected in the San Juan, Animas, and La Plata River Valleys where coarse sand and gravel predominate (Stone and others, 1983).

In the ephemeral-stream channels draining to the San Juan River, most recharge to the valley fill results from infiltration of stormflow, but small quantities are also contributed from bedrock sources, especially in lower reaches. In their upper reaches, these channels may be major sources of water for recharge to underlying bedrock aquifers.

In the Nacimiento Formation sandstone bodies near Cañon Largo there are several flowing wells, with reported outflow of 16 to 100 gallons per minute and transmissivities of as much as 100 feet squared per day (Stone and others, 1983). The Nacimiento provides water for domestic and stock use on ranches in its outcrop area.

4.0 SITE CONDITIONS AT RIDDLE FLS-3A WELL SITE

4.1 MONITOR WELL INSTALLATION

Drilling and monitor well installation were performed at the Riddle FLS-3A well site during June 27 through June 29, 1988. Four 2-inch diameter PVC monitor wells were installed at the site (Figure 4-1). Borehole depths ranged from 27 feet below ground level (BGL) at monitor wells R-2 and R-3 to 28 feet BGL at monitor well R-4. The total depth of the completed monitor wells ranges from 24.5 feet BGL at monitor well R-2 to 26.33 feet BGL at monitor well R-4 (Appendix B). Flowing sands were encountered below the static water level in all of the boreholes. Therefore water was introduced into the boreholes to build head on the sand to prevent it from flowing into the auger annulus and also aid in the installation of the well casing.

4.2 SITE GEOLOGY AND HYDROLOGY

The subsurface geology at the Riddle FLS-3A well site is composed of poorly sorted, unconsolidated sand of Quaternary age. The sand locally contains substantial amounts of clay, and isolated clay horizons were noted during drilling. Ground water was encountered at approximately 11 to 12 feet below the ground surface.

Shallow ground water at the Riddle FLS-3A well site is under water table conditions. Based on July 1988 data, ground water flows to the northwest with a hydrologic gradient of 0.0026 (Figure 4-2). The uppermost saturated zone beneath the site is a water-bearing fine-grained unit of Quaternary age which overlies the Nacimiento Formation. The water table occurs at depths below the land surface ranging from 11.66 feet in monitor well R-1 to 12 feet in monitor well R-4 (Appendix A).

During development of the monitor wells, low yields were observed. Each well may yield a sustainable rate of up to 2 gallons per minute. The fine-grained sediments that occur beneath the site, which typically can be expected to exhibit hydraulic conductivities of 10^{-2} to 10^{2} gallons per day per square foot (Figure 4-3).

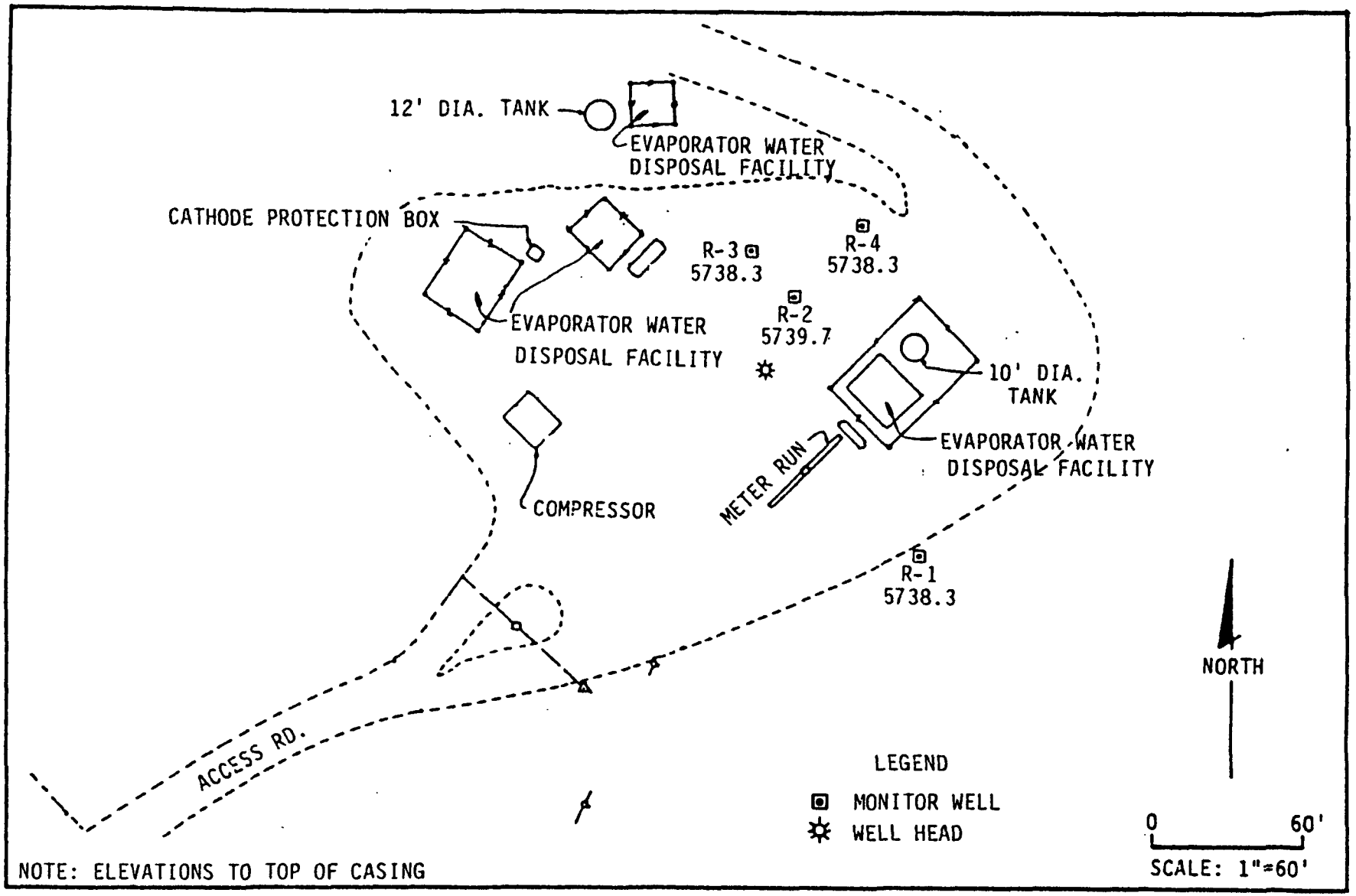


FIGURE 4-1

SITE MAP OF MONITOR WELL LOCATIONS AT TENNECO RIDDLE FLS-3A SITE.

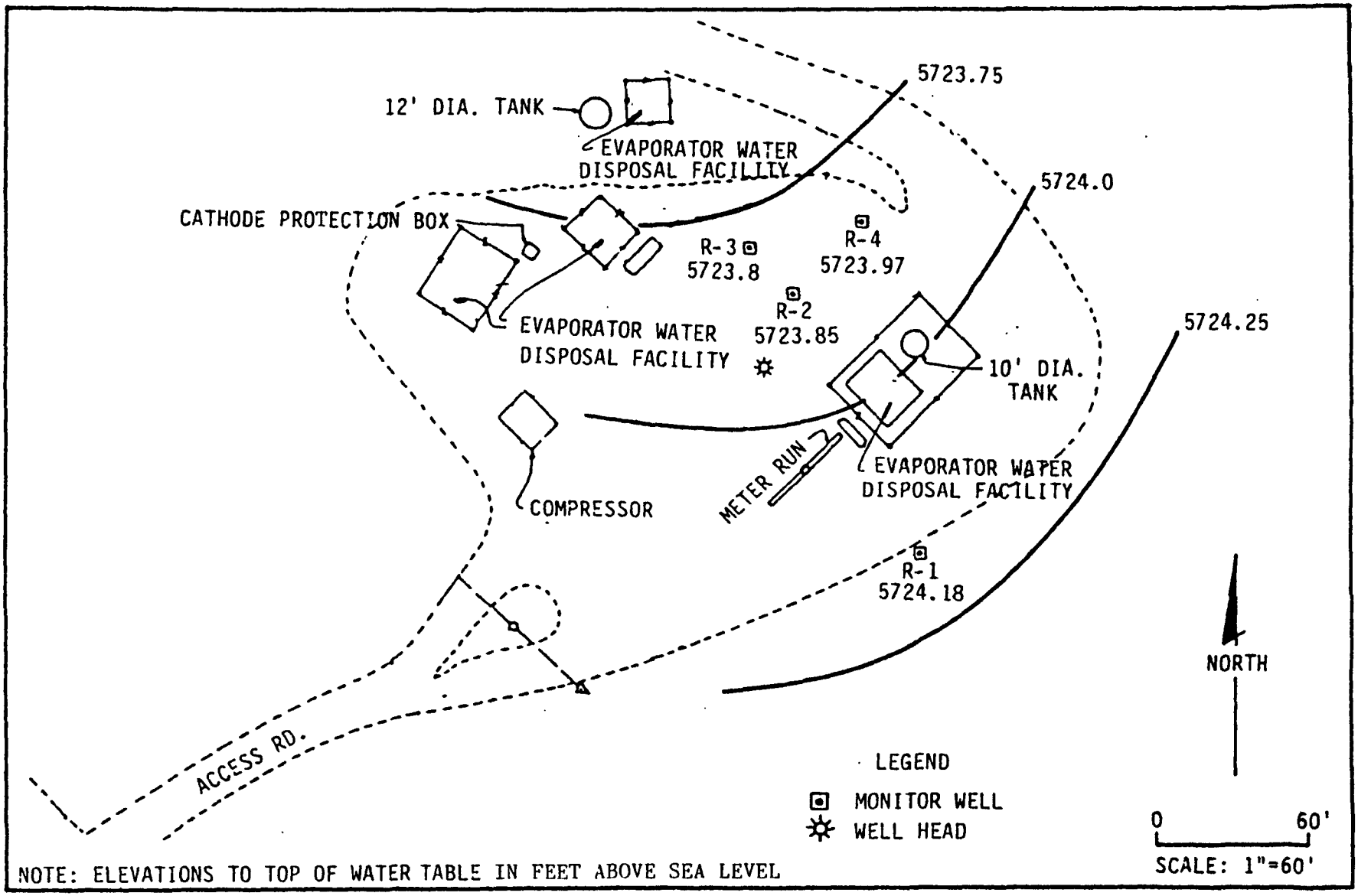


FIGURE 4-2
LOCAL HYDROLOGIC GRADIENT MAP OF TENNECO RIDDLE FLS-3A WELL SITE

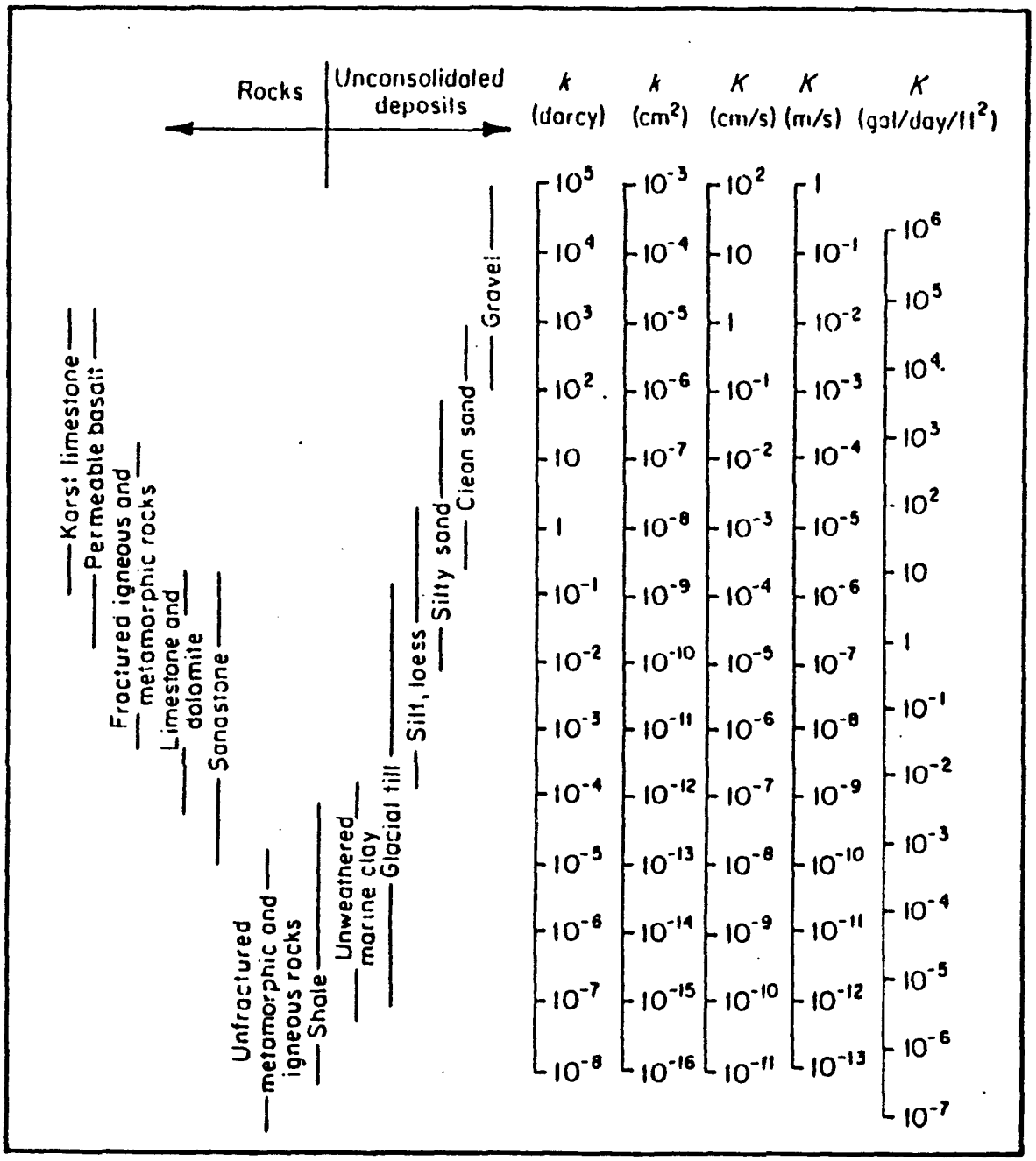


FIGURE 4-3

RANGE OF VALUES OF HYDRAULIC CONDUCTIVITY AND PERMEABILITY

(FROM FREEZE AND CHERRY, 1979)

5.0 ANALYTICAL RESULTS

Based on July 1988 data, the shallow ground water sampled at the Riddle FLS-3A well site indicated virtually no hydrocarbons (Table 5-1). Only trace amounts of chloroform were indicated from the analyses in monitor wells R-1 and R-2. Toluene in minor amounts was found in monitor wells R-1, R-3 and R-4. Benzene was present in monitor well R-3, at a level within New Mexico water quality standards. Minor amounts of xylenes were also present in monitor wells R-1, R-3 and R-4. All ground-water results were compared with the New Mexico Water Quality Control Commission regulations for drinking water as amended through February 27, 1987. The Radian reports of analytical results are included in Appendix C. All wells will be resampled during early September 1988.

TABLE 5-1

ANALYTICAL RESULTS, RIDDLE FLS-3A SITE
JULY 1988

WELL NUMBER

ANALYTE	R-1	R-2	R-3	R-4	REGULATORY STANDARDS FOR DRINKING WATER	DETECTION LIMITS
pH	7.2	7.1	7.3	7.5	6 TO 9	
BENZENE (ppb)	ND	ND	2.5	NA	<10	0.20
TOLUENE (ppb)	1.2	ND	0.5*	1.1	<750	0.20
ETHYLBENZENE (ppb)	ND	ND	ND	NA	<750	0.30
TOTAL XYLENES (ppb)	3.1	ND	ND	1.9	<620	0.20
CHLOROFORM (ppb)	0.2*	0.6	ND	NA	<100	0.05
FILTERABLE RESIDUE (TDS) (ppm)	8300	6200	6100	10300	<1000	3.00

NOTES:
ND = NOT DETECTED
NA = NOT ANALYZED
* = LESS THAN 5 TIMES THE DETECTION LIMIT
V-4 NOT SAMPLED DUE TO DAMAGED CASING
REGULATORY STANDARDS TAKEN FROM THE NEW MEXICO WATER QUALITY CONTROL COMMISSION (1987)
ppb = PARTS PER BILLION
ppm = PARTS PER MILLION

TENN\BTEX4.FIG

6.0 REFERENCES

Freeze, R. A., and Cherry, J. A., 1979, Groundwater. Englewood Cliffs, N.J., Prentice-Hall, 604 pp.

Kelley, V. C., 1950, Regional structure of the San Juan Basin; in New Mexico Geological Society, Guidebook of the San Juan Basin, New Mexico and Colorado, pp. 101-108.

Kelley, V. C., 1951, Tectonics of the San Juan Basin; in New Mexico Geological Society, Guidebook of the South and West Sides of the San Juan Basin, New Mexico and Arizona, pp. 124-130.

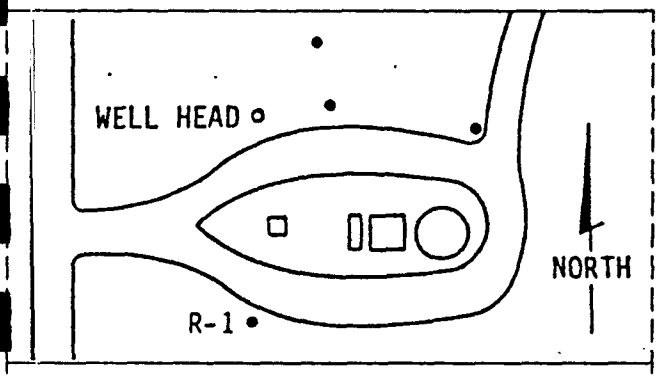
New Mexico Water Quality Control Commission, 1987, New Mexico Water Quality Control Commission Regulations as amended through February 27, 1987.

Stone, W. J., Lyford, F. P., Frenzel, P. F., Mizell, N. H., and Padgett, E. T., 1983, Hydrogeology and Water Resources of San Juan Basin, New Mexico: Hydrologic Report 6, New Mexico Bureau of Mines and Mineral Resources.

APPENDIX A

LITHOLOGIC LOGS OF BOREHOLES

BOREHOLE LOG (SOIL)



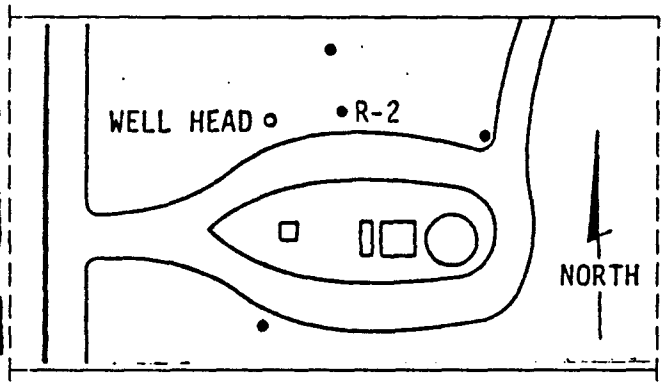
___1/4 ___1/4 ___1/4 ___1/4 S 20 T 28N R 8W

SITE ID: Riddle LOCATION ID: R-1
SITE COORDINATES (ft.): 1825 FNL, 1625 FWL
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: New Mexico COUNTY: San Juan
DRILLING METHOD: HSA
DRILLING CONTR.: Western Technologies
DATE STARTED: 6/29/88 DATE COMPLETED: 6/29/88
FIELD REP.: W.S. Dubyk, P. Linley
COMMENTS: Cored w/continuous sampler.

LOCATION DESCRIPTION: _____

DEPTH	LITH.	REC	SAM	RUN #	RUN FROM	RUN TO	SAMPLE REC.	SAMPLE TYPE	USCS	VISUAL CLASSIFICATION
0				1	0'	3'	25%		SM	0'-3' Sand - pale brn 5 YR 5/2 minor org material, poorly srt, v fn to crs, qtz rich, uncons. Damp 5 YR 5/2
5				2	3'	7.5'	20%			3'-7.5' - Sand. As above, damp.
10				3	7.5'	12.5'	20%		SM	7.5'-12.5' Sand - v fn to v crs, qtz rich w/lithic & feldspar grains, pale brn 5 YR 5/2 to dk ylsh org 10 YR 6/6. Minor clay layers, damp.
15				4	12.5'	17.5'	50%		SC	12.5'-17.5' Sand - v fn to v crs qtz rich, as above, no clay layers but some admixed clay. Wet.
20				5	17.5'	22.5'	75%		SL	17.5'-22.5' Sand, Silt and Clay: mixed sample - flowing sand. Grain size from mud to small gravel.
25				6	22.5'	27.5'	0%		SC	22.5'-27.5' Sand - No sample - sampler stuck in auger. Abundant water in sand, flowing. Small amount of sample is light brown gray, 5 YR 6/1, medium to coarse grained quartz-rich sand.
30	TD 27.5'									

BOREHOLE LOG (SOIL)



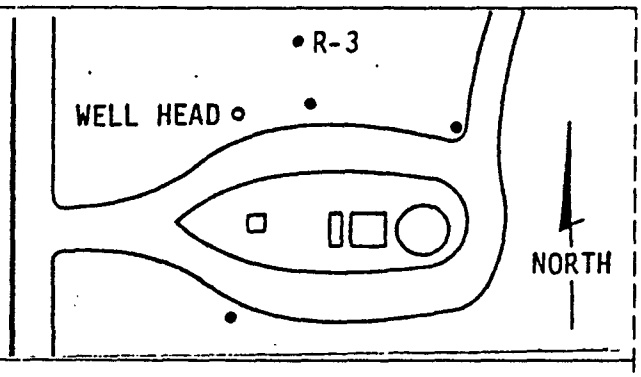
___1/4 ___1/4 ___1/4 ___1/4 S 20 T 28N R 8W

SITE ID: Riddle LOCATION ID: R-2
SITE COORDINATES (ft.): 1825 FNL, 1625 FWL
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: New Mexico COUNTY: San Juan
DRILLING METHOD: HSA
DRILLING CONTR.: Western Technologies
DATE STARTED: 6/27/88 DATE COMPLETED: 6/27/88
FIELD REP.: W.S. Dubyk
COMMENTS: _____

LOCATION DESCRIPTION: _____

DEPTH	LITH.	REC	SAM	RUN #	RUN FROM	RUN TO	SAMPLE REC.	SAMPLE TYPE	USCS	VISUAL CLASSIFICATION
0									SC	0'-11' Sand - w/minor clay (8') - pale to medium brown 5 YR 5/2 to 5 YR 3/4 fine to coarse grained, uncemented, no odor.
5										
10									CH	12'-13' - Clay very fine grained pale brown 5 YR 5/2 laminated, plastic; no odor.
15									SC	13'-18' Sand & Clay - poorly sorted pale brown 5 YR 5/2. H_2O at -18', odor noted, at -18'.
20									SC	18'-28' Sand - as above, flowing, T. D. at 28'.
25										
30	TD 27.0'									

BOREHOLE LOG (SOIL)



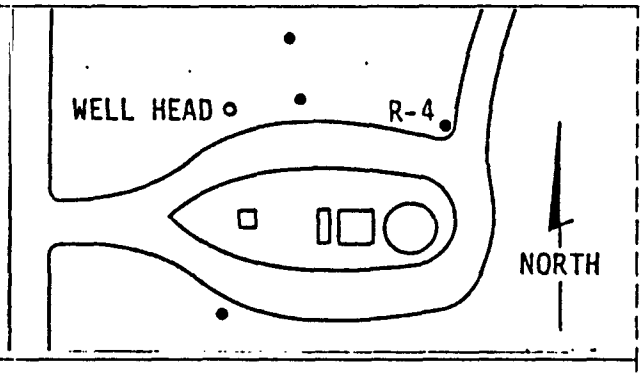
___1/4 ___1/4 ___1/4 ___1/4 S 20 T 28N R 8W

SITE ID: Riddle LOCATION ID: R-3
SITE COORDINATES (ft.): 1825 FNL, 1625 FWL
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: New Mexico COUNTY: San Juan
DRILLING METHOD: HSA
DRILLING CONTR.: Western Technologies
DATE STARTED: 6/27/88 DATE COMPLETED: 6/27/88
FIELD REP.: W.S. Dubyk, P. Linley
COMMENTS: _____

LOCATION DESCRIPTION: _____

DEPTH	LITH.	REC	SAM	RUN #	RUN FROM	RUN TO	SAMPLE REC.	SAMPLE TYPE	USCS	VISUAL CLASSIFICATION
0									SW	0'-12' Recent Dune Sand and alluvium; no odor.
5										
10									CH	12'-13' - Clay light brown 5 YR 6/4 plastic, no odor.
									SC	13'-22' - Clay & Sand - light brown, 5 YR 6/4 saturated at -14', H_2O -17'. No odor.
15										
20										
									SC	22'-28' Sand - minor clay, poorly sorted, uncemented, fine to medium grained, clayey, flowing. T.D. at 28'. No odor.
25										
30	TD 28.0'									

BOREHOLE LOG (SOIL)



___1/4 ___1/4 ___1/4 ___1/4 S 20 T 28N R 8W

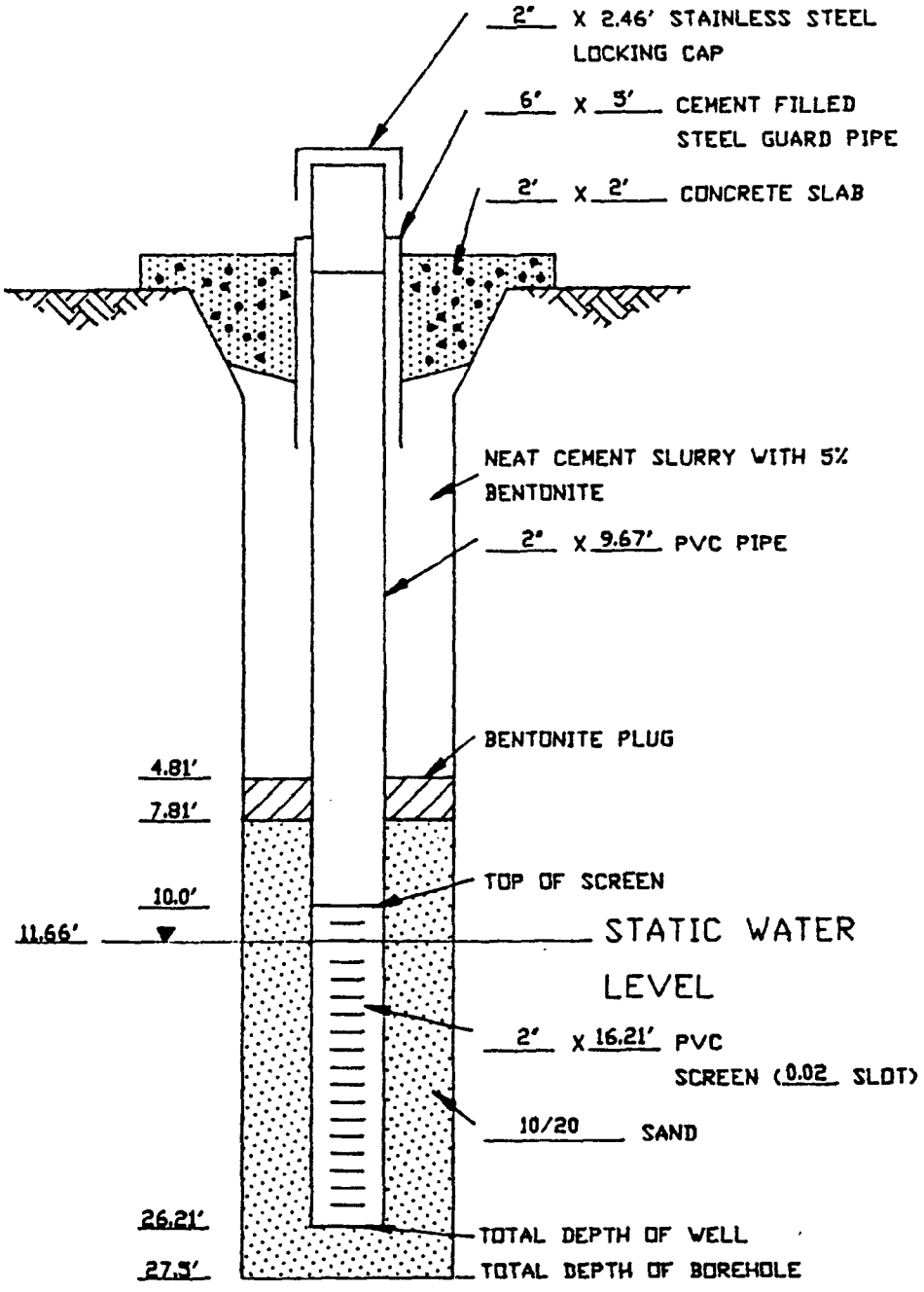
SITE ID: Riddle LOCATION ID: R-4
SITE COORDINATES (ft.): 1825 FNL, 1625 FWL
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: New Mexico COUNTY: San Juan
DRILLING METHOD: HSA
DRILLING CONTR.: Western Technologies
DATE STARTED: 6/29/88 DATE COMPLETED: 6/29/88
FIELD REP.: W.S. Dubyk
COMMENTS: Cored w/continuous sampler.

LOCATION DESCRIPTION: _____

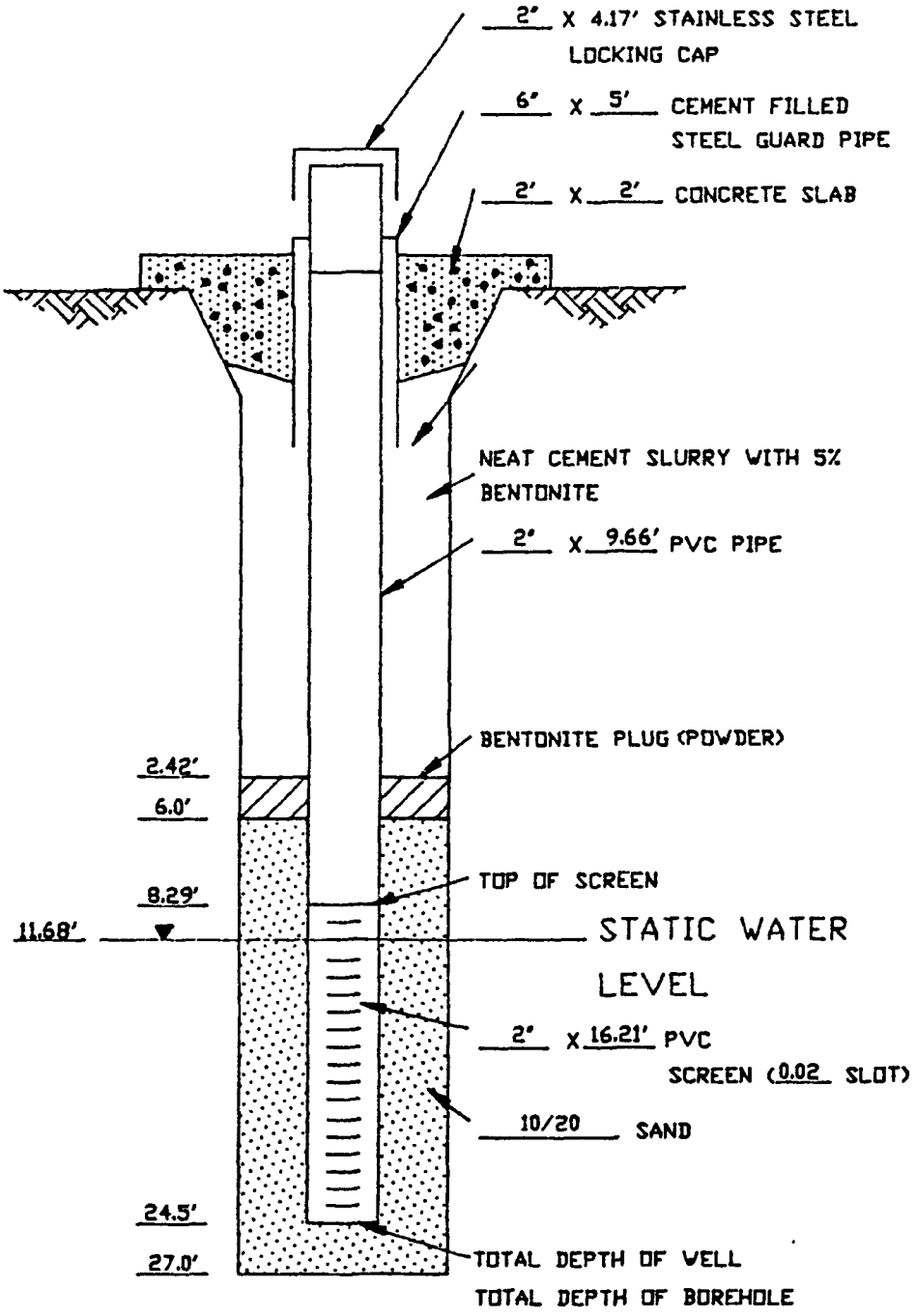
DEPTH	LITH.	REC	SAM	RUN #	RUN FROM	RUN TO	SAMPLE REC.	SAMPLE TYPE	USCS	VISUAL CLASSIFICATION
0				1	0'	2.5'	90%		SW	0'-2.5' Sand - light brown 5 YR 6/4 fine to medium grained, well sorted, quartz rich, moderate to well rounded, concentrated, damp.
5				2	2.5'	7.5'	50%		SW	2.5'-7.5' Sand - light brown 5 YR 6/4 to dark yellowish orange 10 YR 6/6; fine-medium grained quartz rich, some organic material, 1 piece of gravel, damp.
									SW	7.5'-12.5' Sand - as above, some layers of coarse, angular sand. Predominantly quartz, some organic material. Damp.
10				3			90%			
									SC	12.5'-17.5' Sand and Silt - very fine to medium grained, well sorted light brown gray 5 YR 6/1 to light brown 5 YR 6/2. Some admixed clay. Wet.
15				4	7.5'	12.5'	35%			
									SC	17.5'-22.5' Sand and Silt - clayey, very fine to coarse grained, light brown gray 5 YR 6/1, very wet, probably flowed into barrel.
20				5	12.5'	17.5'	50%			
									SC	22.5'-27.5' - as above, flowing sand.
25				6	17.5'	22.5'	0%			
	T.D. 27.5									
30				7	22.5'	27.5'	50%			

APPENDIX B

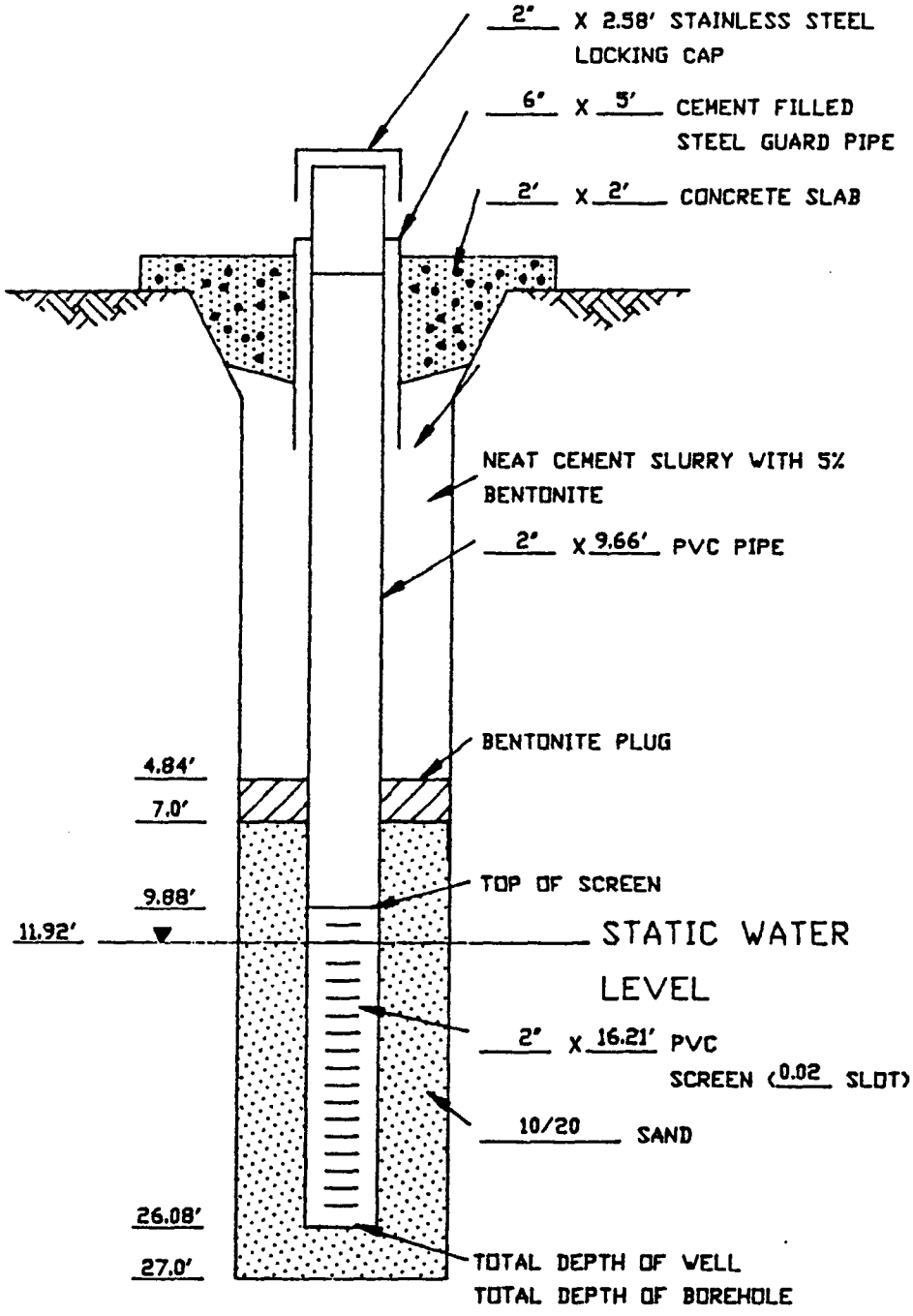
WELL COMPLETION DIAGRAMS



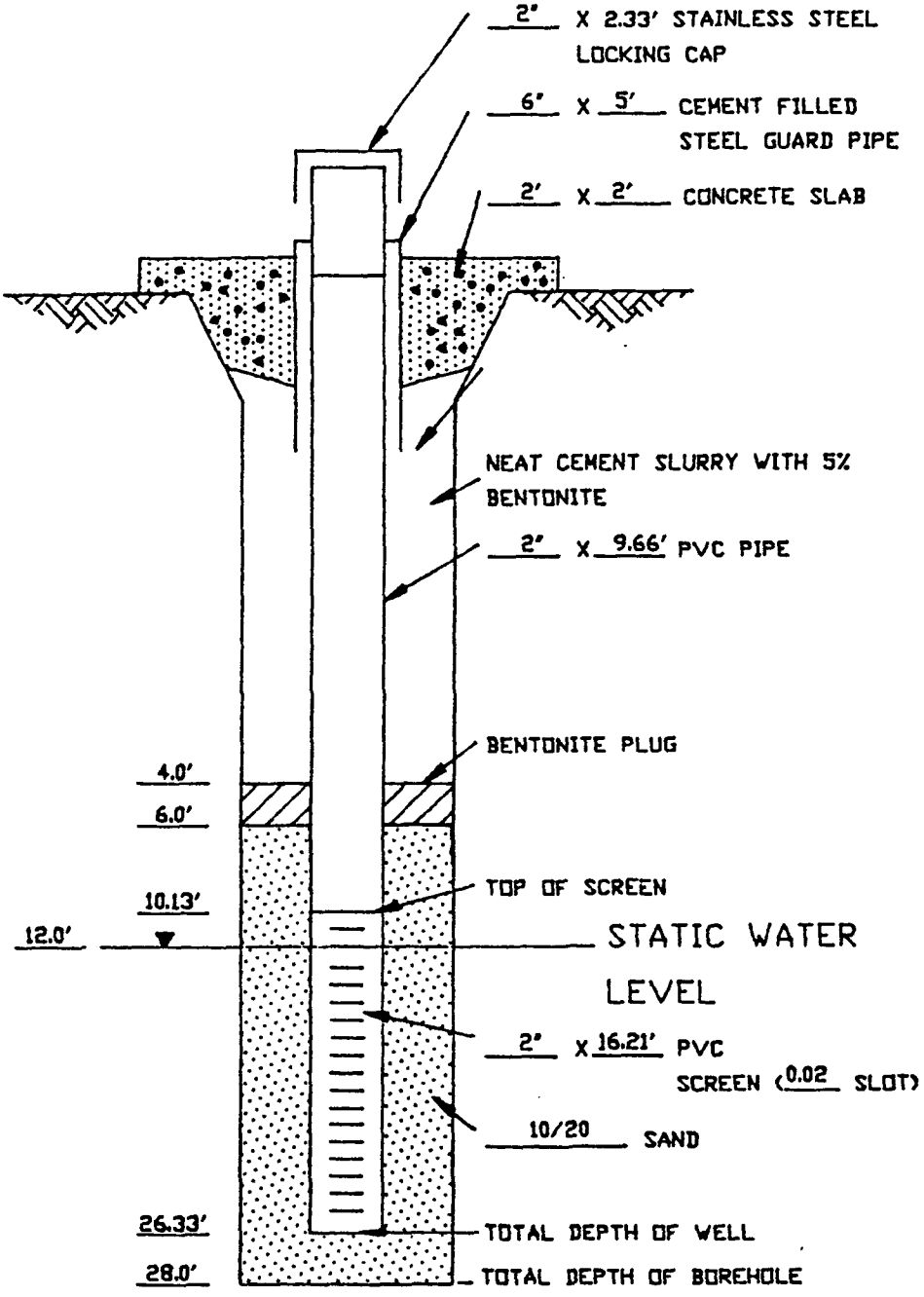
TENNECO WELL COMPLETION DIAGRAM
RIDDLE SITE: WELL R-1



TENNECO WELL COMPLETION DIAGRAM
RIDDLE SITE: WELL R-2



TENNECO WELL COMPLETION DIAGRAM
RIDDLE SITE: WELL R-3



TENNECO WELL COMPLETION DIAGRAM
RIDDLE SITE: WELL R-4

APPENDIX C

ANALYTICAL RESULTS

Received: 07/08/88 07/25/88 09:32:24

REPORT TO
Geoscience Consultants, Ltd.
500 Copper NW
Suite 200
Albuquerque, NM 87102
ATTEN Anita Larson

CLIENT GEOSCIENCE SAMPLES 6
COMPANY Geoscience Consultants, Ltd.
FACILITY

WORK ID Tenneco
TAKEN PL
TRANS Fed Ex
TYPE
P.O. # 88-0490-100
INVOICE under separate cover

PREPARED BY
Radian Analytical Services
8501 Mo-pac Bl.
PO Box 201088
Austin, TX 78720-1088
ATTEN
PHONE 512-454-4797

CERTIFIED BY

CONTACT GIBSON

Unknown compounds present in 602 analyses of -02, -04, -05.

Footnotes and Comments

* Indicates a value less than 5 times the detection limit. Potential error for such low values ranges between 50 and 100%.

@ Indicates that spike recovery for this analysis on the specific matrix was not within acceptable limits indicating an interferent present.

SAMPLE IDENTIFICATION

01	Domestic
02	R-1
03	R-2
04	R-3
05	R-4
06	reagent blank

TEST CODES and NAMES used on this report

EPA601	EPA method 601
EPA602	EPA method 602
PH	pH
TDS	Total dissolved solids
XYLENE	Xylenes, EPA 602

Results By Test

SAMPLE Sample Id	Test: PH pH units
01 Domestic	7.1
02 R-1	7.2
03 R-2	7.1
04 R-3	7.3
05 R-4	7.5

Received: 07/08/88

Results by Sample

SAMPLE ID R-1 FRACTION 02B TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

ANALYST BM VERIFIED CL
INSTRMT G INJECTD 07/08/88 FILE # UNITS ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
74-87-3	Chloromethane	ND	0.30
74-83-9	Bromomethane	ND	1.2
75-01-4	Vinyl chloride	ND	0.20
75-00-3	Chloroethane	ND	0.50
75-09-2	Methylene chloride	ND	0.30
75-69-4	Trichlorofluoromethane	ND	0.10
75-35-4	1,1-Dichloroethene	ND	0.10
75-34-3	1,1-Dichloroethane	ND	0.090
156-60-5	trans-1,2-Dichloroethene	ND	0.20
67-66-3	Chloroform	0.2*	0.050
107-06-2	1,2-Dichloroethane	ND	0.030
71-55-6	1,1,1-Trichloroethane	ND	0.090
56-23-5	Carbon tetrachloride	ND	0.10
75-27-4	Bromodichloromethane	ND	0.10

SAMPLE ID R-1 FRACTION 02D TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 07/06/88 Category

A-Chlorobenzene and m-xylene co-elute.
Quantitated as chlorobenzene unless
otherwise noted.

SAMPLE ID R-1 FRACTION 02A TEST CODE TDS NAME Total dissolved solids
Date & Time Collected 07/06/88 Category

VERIFIED LM

ANALYST TBL
INSTRMT
ANALYZED 07/11/88 UNITS mg/L

ANALYTE	RESULT	DET LIMIT
Filterable Residue (TDS)	8300	3.0

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A = not available

SAMPLE ID R-1 FRACTION 02D TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected 07/06/88 Category

VERIFIED CL

ANALYST CL
INSTRMT D
FILE #
INJECTD 07/08/88 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT
106-42-3	p-Xylene	0.5*Q	0.2
108-38-3	m-Xylene-A	0.9*	0.2
95-47-6	o-Xylene	1.7	0.1

SAMPLE ID R-1 FRACTION 02D TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected 07/06/88 Category

SURROGATES

98-08-8 a,a,a-Trifluorotoluene 98% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A = not available
Second column confirmation NOT performed unless otherwise noted.
Q = daily EPA standard recovery outside 95% confidence interval.
Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

SAMPLE ID R-2 FRACTION 03B TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

ANALYST RW VERIFIED CL
INSTRMT G INJECTD 07/08/88 FILE # UNITS ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
74-87-3	Chloromethane	ND	0.30
74-83-9	Bromomethane	ND	1.2
75-01-4	Vinyl chloride	ND	0.20
75-00-3	Chloroethane	ND	0.50
75-09-2	Methylene chloride	ND	0.30
75-69-4	Trichlorofluoromethane	ND	0.10
75-35-4	1,1-Dichloroethene	ND	0.10
75-34-3	1,1-Dichloroethane	ND	0.090
156-60-5	trans-1,2-Dichloroethene	ND	0.20
67-66-3	Chloroform	0.6	0.050
107-06-2	1,2-Dichloroethane	ND	0.030
71-55-6	1,1,1-Trichloroethane	ND	0.090
56-23-5	Carbon tetrachloride	ND	0.10
75-27-4	Bromodichloromethane	ND	0.10

SAMPLE ID R-2 FRACTION 03B TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

CAS#	COMPOUND	RESULT	DET LIMIT
78-87-5	1,2-Dichloropropane	ND	0.10
10061-02-6	trans-1,3-Dichloropropene	ND	0.30
79-01-6	Trichloroethene	ND	0.20
124-48-1	Dibromochloromethane-A	ND	0.20
79-00-5	1,1,2-Trichloroethane-A	ND	0.070
10061-01-5	cis-1,3-Dichloropropene-A	ND	N\A
110-75-8	2-Chloroethylvinyl ether	ND	0.20
75-25-2	Bromoform	ND	0.30
79-34-5	1,1,2,2-Tetrachloroethane-B	ND	0.12
127-18-4	Tetrachloroethene-B	ND	0.030
108-90-7	Chlorobenzene	ND	0.30
541-73-1	1,3-Dichlorobenzene	ND	0.30
95-50-1	1,2-Dichlorobenzene	ND	0.50
106-46-7	1,4-Dichlorobenzene	ND	0.40
	SURROGATES		
74-97-5	Bromochloromethane	98	% Recovery
3017-95-6	2-Bromo-1-chloropropane	NA	% Recovery
110-56-5	1-4-Dichlorobutane	NA	% Recovery

SAMPLE ID R-2 FRACTION 03B TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

460-00-4 1-Bromo-4-fluorobenzene 103 % Recovery

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A= not available
Second column confirmation NOT performed unless otherwise noted.
A-Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. Quantitated as dibromochloromethane unless otherwise noted.
B-1,1,2,2-tetrachloroethane and tetrachloroethene co-elute. Quantitated as tetrachloroethene unless otherwise noted.

SAMPLE ID R-2 FRACTION 03D TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 07/06/88 Category

VERIFIED CL

ANALYST BM FILE #
INSTRMT D INJECTED 07/08/88 UNITS ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	ND	0.2
108-88-3	Toluene	ND	0.2
100-41-4	Ethylbenzene	ND	0.3
108-90-7	Chlorobenzene-A	ND	0.3
106-46-7	1,4-Dichlorobenzene	ND	0.3
541-73-1	1,3-Dichlorobenzene	ND	0.4
95-50-1	1,2-Dichlorobenzene	ND	0.4

SURROGATES

98-08-8	a,a,a-Trifluorotoluene	105% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A = not available
Second column confirmation NOT performed
unless otherwise noted.

SAMPLE ID R-2 FRACTION 03D TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 07/06/88 Category

A-Chlorobenzene and m-xylene co-elute.
Quantitated as chlorobenzene unless
otherwise noted.

SAMPLE ID R-2 FRACTION 03A TEST CODE TDS NAME Total dissolved solids
Date & Time Collected 07/06/88 Category

VERIFIED LM

ANALYST TBL
INSTRMT ANALYZED 07/11/88 UNITS mg/L

ANALYTE	RESULT	DET LIMIT
Filterable Residue (TDS)	6200	3.0

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A = not available

SAMPLE ID R-2 FRACTION 03D TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected 07/06/88 Category

VERIFIED CL

ANALYST BM FILE #
INSTRMT D INJECTD 07/08/88 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT
106-42-3	p-Xylene	ND,Q	0.2
108-38-3	m-Xylene-A	ND	0.2
95-47-6	o-Xylene	ND	0.1

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SAMPLE ID R-2 FRACTION 03D TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected 07/06/88 Category

SURROGATES

98-08-8 a,a,a-Trifluorotoluene 105% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A = not available
Second column confirmation NOT performed unless otherwise noted.
Q = daily EPA standard recovery outside 95% confidence interval.
Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

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SAMPLE ID R-3 FRACTION 04B TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

ANALYST BM VERIFIED CL
INSTRMT G INJECTD 07/08/88 FILE # UNITS ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
74-87-3	Chloromethane	ND	0.30
74-83-9	Bromomethane	ND	1.2
75-01-4	Vinyl chloride	ND	0.20
75-00-3	Chloroethane	ND	0.50
75-09-2	Methylene chloride	ND	0.30
75-69-4	Trichlorofluoromethane	ND	0.10
75-35-4	1,1-Dichloroethene	ND	0.10
75-34-3	1,1-Dichloroethane	ND	0.090
156-60-5	trans-1,2-Dichloroethene	ND	0.20
67-66-3	Chloroform	ND@	0.050
107-06-2	1,2-Dichloroethane	ND	0.030
71-55-6	1,1,1-Trichloroethane	ND	0.090
56-23-5	Carbon tetrachloride	ND	0.10
75-27-4	Bromodichloromethane	ND	0.10

SAMPLE ID R-3 FRACTION 04B TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

CAS#	COMPOUND	RESULT	DET LIMIT
78-87-5	1,2-Dichloropropane	ND	0.10
10061-02-6	trans-1,3-Dichloropropene	ND	0.30
79-01-6	Trichloroethene	ND	0.20
124-48-1	Dibromochloromethane-A	ND@	0.20
79-00-5	1,1,2-Trichloroethane-A	ND	0.070
10061-01-5	cis-1,3-Dichloropropene-A	ND	N\A
110-75-8	2-Chloroethylvinyl ether	ND	0.20
75-25-2	Bromoform	ND	0.30
79-34-5	1,1,2,2-Tetrachloroethane-B	ND	0.12
127-18-4	Tetrachloroethene-B	ND	0.030
108-90-7	Chlorobenzene	ND	0.30
541-73-1	1,3-Dichlorobenzene	ND	0.30
95-50-1	1,2-Dichlorobenzene	ND	0.50
106-46-7	1,4-Dichlorobenzene	ND	0.40
	SURROGATES		
74-97-5	Bromochloromethane	92 % Recovery	
3017-95-6	2-Bromo-1-chloropropane	NA % Recovery	
110-56-5	1-4-Dichlorobutane	NA % Recovery	

SAMPLE ID R-3 FRACTION 04B TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

460-00-4 1-Bromo-4-fluorobenzene 102 % Recovery

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A= not available
Second column confirmation NOT performed unless otherwise noted.
A-Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. Quantitated as dibromochloromethane unless otherwise noted.
B-1,1,2,2-tetrachloroethane and tetrachloroethene co-elute. Quantitated as tetrachloroethene unless otherwise noted.

SAMPLE ID R-3 FRACTION 04D TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 07/06/88 Category

VERIFIED CL

ANALYST RP
INSTRMT D INJECTED 07/13/88 FILE # UNITS ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	2.5	0.2
108-88-3	Toluene	0.5*	0.2
100-41-4	Ethylbenzene	ND	0.3
108-90-7	Chlorobenzene-A	ND	0.3
106-46-7	1,4-Dichlorobenzene	ND	0.3
541-73-1	1,3-Dichlorobenzene	ND	0.4
95-50-1	1,2-Dichlorobenzene	ND	0.4

SURROGATES

98-08-8	a,a,a-Trifluorotoluene	100% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
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N\A = not available
Second column confirmation NOT performed
unless otherwise noted.

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SAMPLE ID R-3

FRACTION 04D TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 07/06/88 Category

A-Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

SAMPLE ID R-3 FRACTION 04A TEST CODE TDS NAME Total dissolved solids
Date & Time Collected 07/06/88 Category

VERIFIED LM

ANALYST TBL
INSTRMT ANALYZED 07/11/88 UNITS mg/L

ANALYTE	RESULT	DET LIMIT
Filterable Residue (TDS)	6100	3.0

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A = not available

SAMPLE ID R-3 FRACTION 04D TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected 07/06/88 Category

VERIFIED CL

ANALYST RP FILE #
INSTRMT D INJECTD 07/13/88 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT
106-42-3	p-Xylene	0.2*Q	0.2
108-38-3	m-Xylene-A	0.4*	0.2
95-47-6	o-Xylene	0.5	0.1

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SAMPLE ID R-3 FRACTION 04D TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected 07/06/88 Category

SURROGATES

98-08-8 a,a,a-Trifluorotoluene 100% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A = not available
Second column confirmation NOT performed unless otherwise noted.
Q = daily EPA standard recovery outside 95% confidence interval.
Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

SAMPLE ID R-4 FRACTION 05B TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

ANALYST BM VERIFIED CL
INSTRMT G INJECTD 07/08/88 FILE # UNITS ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
74-87-3	Chloromethane	ND	0.30
74-83-9	Bromomethane	ND	1.2
75-01-4	Vinyl chloride	ND	0.20
75-00-3	Chloroethane	ND	0.50
75-09-2	Methylene chloride	ND	0.30
75-69-4	Trichlorofluoromethane	ND	0.10
75-35-4	1,1-Dichloroethene	ND	0.10
75-34-3	1,1-Dichloroethane	ND	0.090
156-60-5	trans-1,2-Dichloroethene	ND	0.20
67-66-3	Chloroform	ND	0.050
107-06-2	1,2-Dichloroethane	ND	0.030
71-55-6	1,1,1-Trichloroethane	ND	0.090
56-23-5	Carbon tetrachloride	ND	0.10
75-27-4	Bromodichloromethane	ND	0.10

SAMPLE ID R-4 FRACTION 05B TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

CAS#	COMPOUND	RESULT	DET LIMIT
78-87-5	1,2-Dichloropropane	ND	0.10
10061-02-6	trans-1,3-Dichloropropene	ND	0.30
79-01-6	Trichloroethene	ND	0.20
124-48-1	Dibromochloromethane-A	ND	0.20
79-00-5	1,1,2-Trichloroethane-A	ND	0.070
10061-01-5	cis-1,3-Dichloropropene-A	ND	N\A
110-75-8	2-Chloroethylvinyl ether	ND	0.20
75-25-2	Bromoform	ND	0.30
79-34-5	1,1,2,2-Tetrachloroethane-B	ND	0.12
127-18-4	Tetrachloroethene-B	ND	0.030
108-90-7	Chlorobenzene	ND	0.30
541-73-1	1,3-Dichlorobenzene	ND	0.30
95-50-1	1,2-Dichlorobenzene	ND	0.50
106-46-7	1,4-Dichlorobenzene	ND	0.40
	SURROGATES		
74-97-5	Bromochloromethane	89	% Recovery
3017-95-6	2-Bromo-1-chloropropane	NA	% Recovery
110-56-5	1-4-Dichlorobutane	NA	% Recovery

SAMPLE ID R-4 FRACTION 05B TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

460-00-4 1-Bromo-4-fluorobenzene 96 % Recovery

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A= not available
Second column confirmation NOT performed unless otherwise noted.
A-Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. Quantitated as dibromochloromethane unless otherwise noted.
B-1,1,2,2-tetrachloroethane and tetrachloroethene co-elute. Quantitated as tetrachloroethene unless otherwise noted.

RADIAN CORPORATION

Received: 07/08/88
Results by Sample

SAMPLE ID R-4 FRACTION 05D TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 07/06/88 Category

VERIFIED CL

ANALYST RP
INSTRMT D INJECTED 07/13/88 FILE # UNITS ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	ND	0.2
108-88-3	Toluene	1.1	0.2
100-41-4	Ethylbenzene	ND	0.3
108-90-7	Chlorobenzene-A	ND	0.3
106-46-7	1,4-Dichlorobenzene	ND	0.3
541-73-1	1,3-Dichlorobenzene	ND	0.4
95-50-1	1,2-Dichlorobenzene	ND	0.4

SURROGATES

98-08-8	a,a,a-Trifluorotoluene	106% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A = not available
Second column confirmation NOT performed
unless otherwise noted.

SAMPLE ID R-4 FRACTION 05D TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 07/06/88 Category

A-Chlorobenzene and m-xylene co-elute.
Quantitated as chlorobenzene unless
otherwise noted.

SAMPLE ID R-4 FRACTION 05A TEST CODE TDS NAME Total dissolved solids
Date & Time Collected 07/06/88 Category

VERIFIED LM

ANALYST TBL
INSTRMT

ANALYZED 07/11/88 UNITS mg/L

ANALYTE	RESULT	DET LIMIT
Filterable Residue (TDS)	10300	3.0

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A = not available

SAMPLE ID R-4 FRACTION 05D TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected 07/06/88 Category

VERIFIED CL

ANALYST RP
INSTRMT D

FILE #

INJECTD 07/13/88 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT
106-42-3	p-Xylene	0.4*Q	0.2
108-38-3	m-Xylene-A	0.6*	0.2
95-47-6	o-Xylene	0.9	0.1

RADIAN CORPORATION

Received: 07/08/88

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SAMPLE ID R-4 FRACTION 05D TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected 07/06/88 Category

SURROGATES

98-08-8	a,a,a-Trifluorotoluene	106% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A = not available
Second column confirmation NOT performed unless otherwise noted.
Q = daily EPA standard recovery outside 95% confidence interval.
Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

RADIAN CORPORATION

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Received: 07/08/88 Results by Sample

SAMPLE ID reagent blank FRACTION 06A TEST CODE EPA601 NAME EPA method 601
Date & Time Collected not specified Category

ANALYST CL VERIFIED CL
INSTRMT G INJECTD 07/08/88 FILE # UNITS ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
74-87-3	Chloromethane	ND	0.30
74-83-9	Bromomethane	ND	1.2
75-01-4	Vinyl chloride	ND	0.20
75-00-3	Chloroethane	ND	0.50
75-09-2	Methylene chloride	ND	0.30
75-69-4	Trichlorofluoromethane	ND	0.10
75-35-4	1,1-Dichloroethene	ND	0.10
75-34-3	1,1-Dichloroethane	ND	0.090
156-60-5	trans-1,2-Dichloroethene	ND	0.20
67-66-3	Chloroform	ND	0.050
107-06-2	1,2-Dichloroethane	ND	0.030
71-55-6	1,1,1-Trichloroethane	ND	0.090
56-23-5	Carbon tetrachloride	ND	0.10
75-27-4	Bromodichloromethane	ND	0.10

SAMPLE ID reagent blank FRACTION 06A TEST CODE EPA601 NAME EPA method 601
Date & Time Collected not specified Category

CAS#	COMPOUND	RESULT	DET LIMIT
78-87-5	1,2-Dichloropropane	ND	0.10
10061-02-6	trans-1,3-Dichloropropene	ND	0.30
79-01-6	Trichloroethene	ND	0.20
124-48-1	Dibromochloromethane-A	ND	0.20
79-00-5	1,1,2-Trichloroethane-A	ND	0.070
10061-01-5	cis-1,3-Dichloropropene-A	ND	N\A
110-75-8	2-Chloroethylvinyl ether	ND	0.20
75-25-2	Bromoform	ND	0.30
79-34-5	1,1,2,2-Tetrachloroethane-B	ND	0.12
127-18-4	Tetrachloroethene-B	ND	0.030
108-90-7	Chlorobenzene	ND	0.30
541-73-1	1,3-Dichlorobenzene	ND	0.30
95-50-1	1,2-Dichlorobenzene	ND	0.50
106-46-7	1,4-Dichlorobenzene	ND	0.40
	SURROGATES		
74-97-5	Bromochloromethane	NA	% Recovery
3017-95-6	2-Bromo-1-chloropropane	NA	% Recovery
110-56-5	1-4-Dichlorobutane	NA	% Recovery

SAMPLE ID reagent blank FRACTION 06A TEST CODE EPA601 NAME EPA method 601
Date & Time Collected not specified Category

460-00-4 1-Bromo-4-fluorobenzene NA % Recovery

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A= not available
Second column confirmation NOT performed unless otherwise noted.
A-Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. Quantitated as dibromochloromethane unless otherwise noted.
B-1,1,2,2-tetrachloroethane and tetrachloroethene co-elute. Quantitated as tetrachloroethene unless otherwise noted.

RADIAN CORPORATION

Received: 07/08/88
Results by Sample

SAMPLE ID reagent blank FRACTION 06A TEST CODE EPA602 NAME EPA method 602
Date & Time Collected not specified Category

VERIFIED CL

ANALYST CL
INSTRMT D INJECTED 07/08/88 FILE # UNITS ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	ND	0.2
108-88-3	Toluene	ND	0.2
100-41-4	Ethylbenzene	ND	0.3
108-90-7	Chlorobenzene-A	ND	0.3
106-46-7	1,4-Dichlorobenzene	ND	0.3
541-73-1	1,3-Dichlorobenzene	ND	0.4
95-50-1	1,2-Dichlorobenzene	ND	0.4

SURROGATES

98-08-8	a,a,a-Trifluorotoluene	NA% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit
NA = not analyzed
* = less than 5 times the detection limit
N\A = not available
Second column confirmation NOT performed
unless otherwise noted.

SAMPLE ID reagent blank FRACTION 06A TEST CODE EPA602 NAME EPA method 602
Date & Time Collected not specified Category

A-Chlorobenzene and m-xylene co-elute.
Quantitated as chlorobenzene unless
otherwise noted.

RADIAN CORPORATION

Received: 07/08/88
Results by Sample

SAMPLE ID reagent blank FRACTION 06A TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected not specified Category

VERIFIED CL

ANALYST CL FILE #
INSTRMT D INJECTD 07/08/88 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT
106-42-3	p-Xylene	ND, Q	0.2
108-38-3	m-Xylene-A	ND	0.2
95-47-6	o-Xylene	ND	0.1

SURROGATES

98-08-8 a,a,a-Trifluorotoluene NA% recovery

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* = less than 5 times the detection limit
N\A = not available
Second column confirmation NOT performed unless otherwise noted.
Q = daily EPA standard recovery outside 95% confidence interval.
Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

01C	SPR601	01E	SPR602					
02C	SPR601	02E	SPR602					
03C	SPR601	03E	SPR602	03F	SPR602	03G	SPR602	
04C	SPR601	04E	SPR602	04F	SPR602	04G	SPR602	
05C	SPR601	05E	SPR602					

SAMPLE ID equipment rinse FRACTION 06A TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

ANALYST BM VERIFIED CL
INSTRMT B INJECTD 07/08/88 FILE # UNITS ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
74-87-3	Chloromethane	ND	0.30
74-83-9	Bromomethane	ND	1.2
75-01-4	Vinyl chloride	ND	0.20
75-00-3	Chloroethane	ND	0.50
75-09-2	Methylene chloride	ND	0.30
75-69-4	Trichlorofluoromethane	ND	0.10
75-35-4	1,1-Dichloroethene	ND	0.10
75-34-3	1,1-Dichloroethane	ND	0.090
156-60-5	trans-1,2-Dichloroethene	ND	0.20
67-66-3	Chloroform	ND	0.050
107-06-2	1,2-Dichloroethane	ND	0.030
71-55-6	1,1,1-Trichloroethane	ND	0.090
56-23-5	Carbon tetrachloride	ND	0.10
75-27-4	Bromodichloromethane	ND	0.10

SAMPLE ID equipment rinse FRACTION 06A TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

CAS#	COMPOUND	RESULT	DET LIMIT
78-87-5	1,2-Dichloropropane	ND	0.10
10061-02-6	trans-1,3-Dichloropropene	ND	0.30
79-01-6	Trichloroethene	ND	0.20
124-48-1	Dibromochloromethane-A	ND	0.20
79-00-5	1,1,2-Trichloroethane-A	ND	0.070
10061-01-5	cis-1,3-Dichloropropene-A	ND	N\A
110-75-8	2-Chloroethylvinyl ether	ND	0.20
75-25-2	Bromoform	ND	0.30
79-34-5	1,1,2,2-Tetrachloroethane-B	ND	0.12
127-18-4	Tetrachloroethene-B	ND	0.030
108-90-7	Chlorobenzene	ND	0.30
541-73-1	1,3-Dichlorobenzene	ND	0.30
95-50-1	1,2-Dichlorobenzene	ND	0.50
106-46-7	1,4-Dichlorobenzene	ND	0.40
	SURROGATES		
74-97-5	Bromochloromethane	97 % Recovery	
3017-95-6	2-Bromo-1-chloropropane	NA % Recovery	
110-56-5	1-4-Dichlorobutane	NA % Recovery	

SAMPLE ID equipment rinse FRACTION 06A TEST CODE EPA601 NAME EPA method 601
Date & Time Collected 07/06/88 Category

460-00-4 1-Bromo-4-fluorobenzene 105 % Recovery

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A-Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. Quantitated as dibromochloromethane unless otherwise noted.
B-1,1,2,2-tetrachloroethane and tetrachloroethene co-elute. Quantitated as tetrachloroethene unless otherwise noted.

SAMPLE ID equipment rinse FRACTION 06B TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 07/06/88 Category

VERIFIED CL

ANALYST BM FILE #
INSTRMT D INJECTED 07/13/88 UNITS ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	ND	0.2
108-88-3	Toluene	37	1
100-41-4	Ethylbenzene	8.8	0.3
108-90-7	Chlorobenzene-A	ND	0.3
106-46-7	1,4-Dichlorobenzene	ND	0.3
541-73-1	1,3-Dichlorobenzene	ND	0.4
95-50-1	1,2-Dichlorobenzene	ND	0.4

SURROGATES

98-08-8	a,a,a-Trifluorotoluene	115% recovery

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Second column confirmation NOT performed
unless otherwise noted.

SAMPLE ID equipment rinse FRACTION 06B TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 07/06/88 Category

A-Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

RADIAN CORPORATION

Received: 07/08/88 Results by Sample

SAMPLE ID equipment rinse FRACTION 06B TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected 07/06/88 Category

VERIFIED CL

ANALYST BM FILE #
INSTRMT D INJECTD 07/13/88 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT
106-42-3	p-Xylene	3.4Q	0.2
108-38-3	m-Xylene-A	ND	0.2
95-47-6	o-Xylene	58	0.5

SURROGATES

98-08-8	a,a,a-Trifluorotoluene	115% recovery

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Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.