

GW - 32

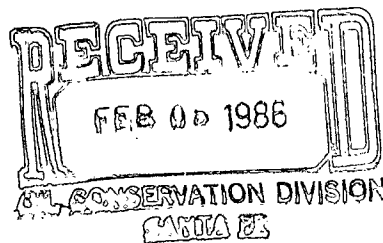
2/86

**PERMITS,
RENEWALS,
& MODS**

Application

ATTACHMENTS B-6 AND B-7

REPLY TO NMCD COMMENTS RE:
DISCHARGE PLAN APPLICATION (GW-32)
GIANT CINIZA REFINERY



ATTACHMENT B-6
GIANT REFINING COMPANY
CINIZA REFINERY

WASTEWATER AND GROUND WATER
MONITORING DATA

TABLE OF CONTENTS

- 1.0 EID ANALYSES - WASTEWATERS AND SLUDGES
- 2.0 ASSAIGAI ANALYTICAL LABORATORY ANALYSES - WATEWATERS AND SLUDGE
- 3.0 TABULATION OF SELECTED ANALYTICAL DATA
- 4.0 MW SERIES MONITORING WELLS - RCRA GROUND WATER MONITORING DATA
- 5.0 SMW SERIES SHALLOW MONITORING DATA - 1st QUARTER ANALYSES
- 6.0 SMW SERIES WELLS - COMPLETION DIAGRAMS

EFFLUENT SOURCE AND CONVEYANCE TYPE

<u>Effluent Source</u>	<u>Type of Conveyance</u>
API Separator	Steel Pipe Into Pond #1
Neutralization Tank	Unlined Ditch Into PVC Pipe
Sewage	PVC Pipe
Asphalt Pit	Unlined Ditch
Railroad Lagoon	Steel Pipe

EID ANALYSES
(FEBRUARY 1984)

SAMPLE

AREA

GR-01
GR-02A
GR-02B
GR-05
GR-06

Neutralization Tank
Railroad Catch Basin Water
Railroad Catch Basin Sludge
API Separator Effluent
API Separator Sludge

		A	B	A	B	A	B	EID 2/84 ADT BIF	EID 2/84 ADT Sample			
PALAMITRIS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Trichloroethylene	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND
1,1,1-trichloroethane	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND
Chlorobenzene	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND
0, dichlorobenzene	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND
Trichlorofluoro- methane	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND
003 FWASTES												
Xylene (total o,p,m)	NR	ND	NR	0.38	NR	0.75	NR	1.9	NR	ND	ND	ND
Ethyl benzene	NR	ND	NR	0.07	NR	0.11	NR	0.17	NR	ND	ND	ND
F005 WASTES												
Toluene	NR	ND	NR	0.93	NR	0.94	NR	8.9	NR	ND	ND	ND
OTHER WASTES												
Benzene	NR	0.003	NR	0.34	NR	0.54	NR	3.3	NR	ND	ND	ND
TOX	NR	NR	NR	NR	NR	NR	NR	NR	NR	LNA	LNA	LNA
DOC	NR	NR	NR	NR	NR	NR	NR	NR	NR	47	1.7	24

NR ANALYSIS NOT REQUESTED
 ND NOT DETECTED
 LNA LAB NOT ABLE TO RUN ANALYSIS
 NS SAMPLE NOT SUITABLE FOR ANALYSIS

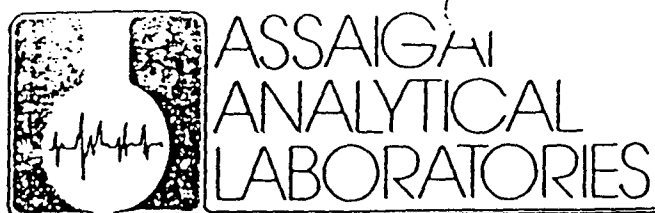
PARAMETERS	GIR-01		GIR-02		GIR-03		GIR-04		GIR-05	GIR-06	GIR-07	GIR-08	GIR-09	GIR-10
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm						
Chromium	ND	ND	<0.25	ND	<0.25	ND	<0.25	ND	ND	<0.25	<0.10	<0.10	<0.10	<0.10
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.0005	0.013	0.005	<0.10
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.10	<0.10	<0.10	<0.10
REACTIVE WASTES														
Sulfides	ND	NR	NR	35.6	NR	180.0	NR	402.0	15,200	NR	NR	NR	NR	NR
Cyanides	ND	NR	NR	ND	NR	ND	NR	ND	NS	NR	NR	NR	NR	NR
LISTED WASTES														
FOU1 WASTES														
Tetrachloroethylene	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND	ND	ND
Trichloroethylene	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND	ND	ND
1,1,1-trichloroethane	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND	ND	ND
Carbon tetrachloride	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND	ND	ND
Chlorinated fluoro-carbons	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND	ND	ND
FOU2 WASTES														
Methylene chloride	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND	ND	ND
1,1,2-trichloro-1,2,2-trifluoroethane	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND	ND	ND
Tetrachloro-ethylene	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	ND	ND	ND	ND

PARAMETERS	TRUCK	A	B	A	B	A	B	EXPLUENT	ANT SEP	MW. 4	MW. 1	MW. 2	MW. 3
FIELD DATA													
SAMPLE TYPE	liq	liq	sed	liq	sed	liq	sed	liq	liq	liq	liq	liq	liq
pH	3.65	ND	ND	9.18	ND	9.3	ND		8.85	8.56	8.73	8.88	8.70
CONDUCTIVITY	ND	ND	ND	2780	ND	2780	ND		8500	850	800	830	830
TEMPERATURE	ND	ND	ND	8°C	ND	18°C	ND		35°C	10°C	9.5°C	10.5°C	10.5°C
TRAIL METALS	EID Testing - 2/8/81 - Summary.												
ALUMINUM	<0.10	0.46	17,600	1.6	20,000	3.8	6250	3.2	4800	2.4	0.24	1.5	0.11
Barium	<0.10	<0.10	200.	0.14	180.	0.45	73.	0.12	34	<0.10	<0.10	<0.10	<0.10
Beryllium	<0.10	<0.10	<2.0	<0.10	<2.0	<0.10	2.1	<0.10	3.9	<0.10	<0.10	<0.10	<0.10
Boron	<0.10	0.24	<2.0	2.4	16.0	4.2	37.5	5.2	33.	0.46	0.76	.76	1.2
Cadmium	<0.10	<0.10	<2.0	<0.10	3.6	<0.10	3.13	<0.10	4.7	<0.10	<0.10	<0.10	<0.10
Calcium	790.	50	10,000.	36.	44,500	37.	3300	25.	19,000.	3.0	2.8	2.2	3.2
Chromium	<0.10	<0.10	10.9	0.74	180.	0.8	896.	0.5	1,109.	<0.10	<0.10	<0.10	<0.10
Cobalt	<0.10	<0.10	<2.0	<0.10	6.6	<0.10	9.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Copper	<0.10	<0.10	2.0	<0.10	18.0	<0.10	104.	<0.10	188.	<0.10	<0.10	<0.10	<0.10
Iron	0.50	0.59	9200.	2.8	9800.	4.4	12,500	3.8	24,400	0.86	0.15	0.50	0.11
Lead	<0.10	<0.10	16.7	0.2	16.2	0.3	92.	0.25	97.	<0.10	<0.10	<0.10	<0.10
Magnesium	100.	7.7	4350.	11.0	6,000	11.	4,000.	9.0	4,000.	0.80	0.53	0.46	0.61
Manganese	<0.10	0.25	225.	<0.10	250.	<0.10	83.	<0.10	148.	<0.10	<0.10	<0.10	<0.10

* Feb 11, 03, A. Q.3

ASSAIGAI ANALYTICAL LABORATORIES ANALYSES

<u>DATE</u>	<u>AREA (SAMPLE NUMBER)</u>
March 13, 1985	API Separator Sludge (85-8)
August 14, 1985	API Separator Effluent Neutralizer Tank Effluent Sewage Lagoon Water
November 13, 1985	Asphalt Pond Water (8510110930) Railroad Pond Water (8510111615) Pond #9 Water (8510111706)



TO: Giant Refining
St. Rt. 3 Box 7
Gallup, NM 87301

0300

SAMPLE ID: 3/13/85, API Separator sludge taken from bottom w/scoop
Sample # 85-8

ANALYTE	ANALYTICAL RESULTS	NOMINAL DETECTION LIMIT
Sb	16.0 ug/g	0.002 ug/g
As	90.0 ug/g	0.002 ug/g
Ba	720.0 ug/g	0.005 ug/g
Be	0.20 ug/g	0.001 ug/g
Cd	30.0 ug/g	0.002 ug/g
Cr	6100.0 ug/g	0.005 ug/g
Cu	830.0 ug/g	0.002 ug/g
Pb	530.0 ug/g	0.001 ug/g
Ni	358.0 ug/g	0.01 ug/g
Se	11.0 ug/g	0.002 ug/g
Ag	53.0 ug/g	0.003 ug/g
Tl	<0.1 ug/g	0.1 ug/g
Zn	13900.0 ug/g	0.004 ug/g
EC	NA	
pH	8.0	0.01
Bulk Density	1.34	
Solids weight fraction	95.3 %	
Oil weight fraction	4.7 %	
Water weight fraction	<1 %	
Ignitability	20 °C	
Benzylchloride	<0.01 ug/g	0.01 ug/g
bis (2-chloroethyl) ether	<0.01 ug/g	0.01 ug/g
bis (2-chloroisopropyl) ether	<0.01 ug/g	0.01 ug/g
bis (chloroethyl) ether	<0.01 ug/g	0.01 ug/g
dichloromethane	<0.01 ug/g	0.01 ug/g
dichloropropanol	<0.01 ug/g	0.01 ug/g
trichlorobenzenes	<0.01 ug/g	0.01 ug/g
1,2 dibromoethane	<0.01 ug/g	0.01 ug/g
2-chlorophenol	946.0 ug/g	0.01 ug/g
2,4-dichlorophenol	<0.1 ug/g	0.1 ug/g
2,4,6-trichlorophenols	<0.1 ug/g	0.1 ug/g
tetrachlorophenol	<0.1 ug/g	0.1 ug/g
pentaachlorophenol	<0.1 ug/g	0.1 ug/g
benzo(b)fluoranthene	59.0 ug/g	0.1 ug/g
benzo(j)fluoranthene	60.1 ug/g	0.1 ug/g
chloronapthalene	<0.1 ug/g	0.1 ug/g
fluoranthene	10.2 ug/g	0.1 ug/g
chloromethane	0.015 ug/g	0.01 ug/g
bromomethane	<0.01 ug/g	0.01 ug/g
vinylchloride	<0.01 ug/g	0.01 ug/g

TO: Giant Refining
St. Rt. 3 Box 7
Gallup, NM 87301

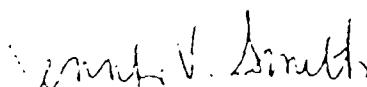
0300

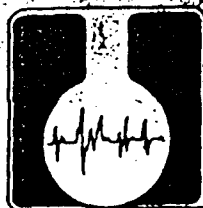
ANALYTE	ANALYTICAL RESULTS	NOMINAL DETECTION LIMIT
chloroethane	<0.01 ug/g	0.01 ug/g
methylene chloride	0.022 ug/g	0.01 ug/g
trichlorofluoromethane	<0.01 ug/g	0.01 ug/g
1,1-dichloroethene	8.5 ug/g	0.01 ug/g
1,1-dichloroethane	0.2 ug/g	0.01 ug/g
trans-1,2-dichloroethene	0.1 ug/g	0.01 ug/g
chloroform	0.5 ug/g	0.01 ug/g
1,2-dichloroethane	0.7 ug/g	0.01 ug/g
1,1,1-trichloroethane	56.2 ug/g	0.01 ug/g
carbon tetrachloride	<0.1 ug/g	0.1 ug/g
bromodichloromethane	<0.1 ug/g	0.1 ug/g
1,2-dichloropropane	<0.1 ug/g	0.1 ug/g
trans 1,3-dichloropropene	<0.1 ug/g	0.1 ug/g
trichloroethene	0.4 ug/g	0.1 ug/g
benzene	100.2 ug/g	0.1 ug/g
dibromochloromethane	<0.1 ug/g	0.1 ug/g
1,1,2-trichloroethane	<0.1 ug/g	0.1 ug/g
cis-1,3-dichloropropene	<0.1 ug/g	0.1 ug/g
2-chloroethylvinyl ether	<0.1 ug/g	0.1 ug/g
bromoform	<0.1 ug/g	0.1 ug/g
1,1,2,2-tetrachloroethane	0.3 ug/g	0.1 ug/g
tetrachloroethene	10.2 ug/g	0.1 ug/g
toluene	76.0 ug/g	0.1 ug/g
chlorobenzene	3.1 ug/g	0.1 ug/g
ethyl benzene	47.0 ug/g	0.1 ug/g
1,3-dichlorobenzene	0.1 ug/g	0.1 ug/g
1,2-dichlorobenzene	0.1 ug/g	0.1 ug/g
1,4-dichlorobenzene	0.1 ug/g	0.1 ug/g

REFERENCE: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", USEPA, SW 846, EMSL- Cincinnati, 1982.

An invoice for services is enclosed. Thank you for contacting Assaigal Laboratories.

Sincerely,


Jennifer V. Smith, Ph.D.
Laboratory Director



ASSAIGAI ANALYTICAL LABORATORIES

TO: Geoscience Consultants, Ltd.
500 Copper N.W. Suite 325
Albuquerque, NM 87102

DATE: 13 November 1985
1498

ANALYTE

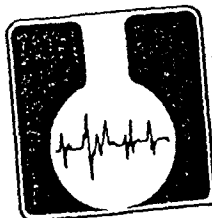
SAMPLE ID/ANALYTICAL RESULTS

Asphalt Pit
8510110930

Railroad Road
8510111615

Period #9
8510111706

As	<0.080 mg/l	<0.050 mg/l	1.76 mg/l
Ba	1.8 mg/l	<1.0 mg/l	16.0 mg/l
Cr	<0.050 mg/l	<0.050 mg/l	0.18 mg/l
Cd	<0.010 mg/l	<0.010 mg/l	11.5 mg/l
Pb	<0.050 mg/l	<0.050 mg/l	6.9 mg/l
Se	<0.010 mg/l	<0.010 mg/l	1.06 mg/l
Ag	<0.050 mg/l	<0.050 mg/l	0.60 mg/l
Fe	0.34 mg/l	0.35 mg/l	3.3 mg/l
TDS	184.0 mg/l	620.0 mg/l	205152.0 mg/l
pH	8.3	7.8	6.5
EC	310 umhos/cm	510 umhos/cm	280000 umhos/cm
NO 3	0.1 mg/l	<0.01 mg/l	0.2 mg/l
TKN	3.9 mg/l	4.9 mg/l	245.0 mg/l
SO 4	<0.01 mg/l	138.0 mg/l	2381.0 mg/l
Cl	30.0 mg/l	10.0 mg/l	120600.0 mg/l
TOC		240.0 mg/l	
TOX	<0.01 mg/l	<0.01 mg/l	
Phenols	<0.01 mg/l	0.07 mg/l	0.15 mg/l
Organic Scan	<0.01 mg/l	<0.01 mg/l	



ASSAIGAI ANALYTICAL LABORATORIES

DATE: 14 August 1985
1018

TO: GeoScience Consultants
Attn: Randy Hicks
500 Copper N.W. Suite 325
Albuquerque, NM 87102

SAMPLE ID/ANALYTICAL RESULTS

ANALYTE

API

Neutralizer Tank

Sewage Lagoon

TSS	52.0 mg/l	<1.0 mg/l	28.0 mg/l
TDS	2490.0 mg/l	2324.0 mg/l	1124.0 mg/l
Oil & Grease	75.4 mg/l	<0.1 mg/l	48.2 mg/l
Phenols	52.6 mg/l	<0.01 mg/l	<0.01 mg/l
Benzene	9.9 mg/l	<0.001 mg/l	<0.001 mg/l
BOD	567.4 mg/l	2.8 mg/l	9.6 mg/l
COD	1206.4 mg/l	64.9 mg/l	245.9 mg/l
Na	1275.0 mg/l	1296.0 mg/l	636.0 mg/l
K	9.0 mg/l	4.0 mg/l	7.0 mg/l
Ca	89.0 mg/l	90.0 mg/l	19.0 mg/l
Cr	1.44 mg/l	<0.050 mg/l	<0.050 mg/l
Mg	10.0 mg/l	14.0 mg/l	8.0 mg/l
P Total	<0.01 mg/l	0.03 mg/l	0.35 mg/l
Cl	588.0 mg/l	710.0 mg/l	61.0 mg/l
SO ₄	1812.0 mg/l	600.0 mg/l	489.0 mg/l
S Total	7045.0 mg/l	278.0 mg/l	241.0 mg/l
HCO ₃	512.0 mg/l	232.0 mg/l	308.0 mg/l
Fe	0.5 mg/l	0.10 mg/l	0.12 mg/l
Cu	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l
Mn	0.2 mg/l	0.03 mg/l	0.2 mg/l
Zn	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l
Mo	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l
Al	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l
B	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l
NO ₃ as N	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l
NH ₄	477.0 mg/l	<0.01 mg/l	0.2 mg/l
TKN	479.0 mg/l	1.8 mg/l	2.8 mg/l
CN	6.0 mg/l	<0.01 mg/l	<0.01 mg/l

TABULATION OF WASTE ANALYSES

Sample 2
2/84
- EID
AAL

PARAMETERS FIELD DATA SAMPLE TYPE pH CONDUCTIVITY TEMPERATURE TOTAL METALS CAP SCREEN	Neutralization Tank		Railroad Pond				Ponds (All EID)				API Effluent		API Sludge		Pond 9	
	EID AAL		EID A B		AAL		Pond 2		Pond 1		EID AAL		EID AAL		AAL	
	ppm		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm		
Aluminum	<0.10	<.01	0.46	17600	NR	1.6	20000	3.8	6250	3.2	<.01	NR	4800	NR	NR	NR
Barium	<0.10	NR	<0.10	200	<1.0	0.14	180	0.45	73	0.12	NR	8.85	34	NR	8.0	6.5
Beryllium	<0.10	NR	<0.10	<2.0	<0.10	2.1	<0.10	NR	3.9	0.25	NR	8500	NR	NR	NR	280,000
Boron	<0.10	<.01	0.24	<2.0	NA	2.4	16.0	4.2	37.5	5.2	<.01	350C	33	NR	NR	90C
Cadium	<0.10	NR	<0.10	<2.0	<.01	<0.10	3.6	<0.10	3.13	<0.10	NR	4.7	19000	NR	30.0	11.5
Calcium	790	90.0	50	10000	NR	36	44500	37	3300	25	89.0	47	1109	NR	NR	NR
Chromium	<0.10	<.05	<0.10	10.9	<.05	0.74	180	0.8	896	0.5	1.44	188	<0.10	6100	NR	.18
Cobalt	<0.10	NR	<0.10	<2.0	NR	<0.10	6.6	<0.10	9.0	<0.10	NR	188	NR	NR	NR	NR
Copper	<0.10	<.03	<0.10	2.0	NR	<0.10	18.0	<0.10	104	<0.10	<.03	24400	830	NR	3.3	NR
Iron	0.50	.10	0.59	9200	.35	2.8	9800	4.4	12500	3.8	.5	97	NA	NR	6.9	NR
Lead	<0.10	NR	<0.10	16.7	<.05	0.2	16.2	0.3	92	0.25	NR	4000	530	NR	NR	NR
Magnesium	100	14.0	7.7	4350	NR	11.0	6000	11	4000	9.0	10.0	148	NR	NR	NR	NR
Manganese	<0.10	.03	0.25	225	NR	<0.10	250	<0.10	83	<0.10	.2					

TABULATION OF WASTE ANALYSES

PARAMETERS	Neutralization Tank		Railroad Pond		Ponds (All EID)				API Effluent		API Sludge		Pond 9	
	EID AAL		EID AAL		Pond 2		Pond 1		EID AAL		EID AAL		AAL	
	ppm		ppm		ppm	ppm	ppm	ppm	ppm		ppm			
Molybdenum	<0.10	<.01	<0.10	4.4	<0.10	18	<0.10	12	<0.10	<.01	14	NR	NR	NR
Nickel	<0.10	NR	<0.10	2.3	<0.10	11	<0.10	25	<0.10	NR	75	358.0	NR	NR
Silicon	5.1	NR	3.5	<2.0	35	32	76	7.1	62	NR	19	NR	NR	NR
Silver	<0.10	NR	<0.10	<2.0	<0.10	<2.0	<0.10	<2.0	<0.10	NR	1.7	53	.60	NR
Strontium	6.2	NR	0.58	84	0.90	360	0.84	396	0.77	NR	280	NR	NR	NR
Tin	0.10	NR	<0.10	6.0	<0.10	27	0.4	17	0.11	NR	<0.10	NR	NR	NR
Vanadium	<0.10	NR	<0.10	3.2	<0.10	21	<0.10	10	<0.10	NR	11	NR	NR	NR
Yttrium	<0.10	NR	<0.10	<2.0	<0.10	3.6	<0.10	<2.0	<0.10	NR	<2.0	NR	NR	NR
Zinc	<0.10	<.01	<0.10	6.7	0.74	340	0.76	2080	0.68	<.01	4700	13900	NR	NR
TOTAL METALS AA														
Arsenic	0.030	NR	<0.005	16.7	0.012	11.6	0.24	22.5	0.26	NR	24.0	90.0	1.76	NR
Mercury	<0.0005	NR	<0.0005	<0.01	<0.0005	<0.01	<0.0005	<0.20	<0.0005	NR	<0.10	NR	NR	NR
Selenium	0.032	NR	<0.005	1.91	0.032	3.2	0.041	10.6	0.020	NR	1.4	11.0	1.06	NR
TOX METALS														
Arsenic	ND	NR	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR
Barium	ND	NR	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR
Cadmium	ND	NR	ND	<0.10	ND	<0.10	ND	<0.10	ND	<0.1	<0.1	NR	NR	NR
Lead	ND	NR	ND	<0.50	ND	<0.5	ND	<0.5	ND	<0.5	<0.5	NR	NR	NR
Mercury	ND	NR	ND	ND	ND	ND	ND	ND	ND	NR	ND	NR	NR	NR

TABULATION OF WASTE ANALYSES

PARAMETERS	Neutralization Tank		Railroad Pond				Ponds (All EID)				API Effluent		API Sludge		Pond 9	
	EID AAL		EID		AAL		Pond 2		Pond 1		EID AAL		EID AAL		AAL	
	A	B	A	B	A	B	A	B	A	B	EID	AAL	EID	AAL	AAL	AAL
Chromium	ND	NR	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	NR	ppm	NR	NR	NR
Selenium	ND	NR	ND	<0.25	NR	NR	ND	<0.25	ND	<0.25	ND	NR	<0.25	NR	NR	NR
Silver	ND	NR	ND	ND	NR	NR	ND	ND	ND	ND	ND	NR	ND	NR	NR	NR
REACTIVE WASTES																
Sulfides	ND	NR	NR	NR	NR	NR	35.6	NR	180.0	NR	402.0	NR	15,200	NR	NR	NR
Cyanides	ND	<.01	NR	NR	NR	NR	ND	NR	ND	NR	ND	6.0	NS	NR	NR	NR
LISTED WASTES																
F001 WASTES																
Tetrachloroethylene	NR	NR	ND	NR	NR	NR	ND	NR	ND	ND	NR	NR	NR	10.2	NR	NR
Trichloroethylene	NR	NR	ND	NR	NR	NR	ND	NR	ND	NR	ND	NR	NR	0.4	NR	NR
1,1,1-trichloroethane	NR	NR	ND	NR	NR	NR	ND	NR	ND	NR	ND	NR	NR	56.2	NR	NR
Carbon tetrachloride	NR	NR	ND	NR	NR	NR	ND	NR	ND	NR	ND	NR	NR	<.1	NR	NR
Chlorinated flourocarbons	NR	NR	ND	NR	NR	NR	ND	NR	ND	NR	ND	NR	NR	NR	NR	NR
F002 WASTES																
Methylene chloride	NR	NR	ND	NR	NR	NR	ND	NR	ND	NR	ND	NR	NR	.022	NR	NR
1,1,2-trichloro-1,2,2-triflouroethane	NR	NR	ND	NR	NR	NR	ND	NR	ND	NR	ND	NR	NR	NR	NR	NR
Tetrachloroethylene	NR	NR	ND	NR	NR	NR	ND	NR	ND	NR	ND	NR	NR	10.2	NR	NR

TABULATION OF WASTE ANALYSES

PARAMETERS	Neutralization Tank		Railroad Lagoon				Pond 2		Pond 1		API Effluent		API Sludge		Pond 9	
	EID AAL		AAL				A B		A B		EID AAL		EID AAL		AAL	
	ppm	NR	ppm	NR	ppm	NR	ppm	NR	ppm	NR	ppm	NR	ppm	NR	ppm	NR
Trichloroethylene	NR	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	NR	NR	NR	NR	NR
1,1,1-trichloroethane	NR	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	NR	NR	NR	NR	NR
Chlorobenzene	NR	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	NR	NR	NR	NR	NR
0,dichlorobenzene	NR	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	NR	NR	NR	NR	NR
Trichloroflouromethane	NR	NR	ND	NR	ND	NR	ND	NR	ND	NR	ND	NR	NR	NR	NR	NR
003 FWASTES																
Xylene (total o,p,m)	NR	NR	ND	NR	0.38	NR	0.75	NR	0.11	NR	1.9	NR	NR	NR	NR	NR
Ethylbenzene	NR	NR	ND	NR	0.07	NR	0.11	NR	0.11	NR	0.17	NR	NR	NR	NR	NR
F005 WASTES																
Toluene	NR	NR	ND	NR	0.93	NR	0.94	NR	0.94	NR	8.9	NR	NR	NR	NR	NR
OTHER WASTES																
Benzene	NR	NR	0.003	NR	0.34	NR	0.54	NR	0.54	NR	3.3	NR	NR	NR	NR	NR
TOX	NR	NR	NR	NR	<.01	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
TOC	NR	NR	NR	NR	240.0	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

NR ANALYSIS NOT REQUESTED
 ND NOT DETECTED
 LNA LAB NOT ABLE TO RUN ANALYSIS
 NS SAMPLE NOT SUITABLE FOR ANALYSIS

API EFFLUENT ANALYSES

	9/70	8/4/71	8/18/71	9/3/71	11/29/71	12/16/76	1/30/78	7/17/80	7/19/80	7/23/80	11/8/84	11/8/84	11/8/84	11/8/84	No Dt. #1	No Dt. #2	No Dt. #3
Chlorine						<0.01											
Molybdenum						0.003											<0.10
Nickel						0.02											<0.10
Silicon																	62.
Silver								0.006	0.012	0.005							<0.10
Strontium																	0.77
Tin																	0.11
Vanadium						0.02											<0.10
Yttrium																	<0.10
Zinc						0.106											0.68
Arsenic						0.05		0.004	0.005	0.015							0.26
Mercury						0.0009											<0.0005
Selenium						0.06		0.015	0.018	0.024							0.020
Chromium		ND	ND			0.7		0.91	0.64	1.2	2.71	0.89	1.27	1.0		ND	ND
Chloride	50	700	260		18	93.6					735.0	689.0	750.0	628.0			
Chromate	ND																
Barium						0.5		0.22	0.094	0.105							
Cadmium						<0.001		<0.001	<0.001	<0.001							
Fluoride						35.9					39.2	52.8	35.8	44.3			
Iron						1.77					9.30	1.13	2.37	1.09			
Lead						0.005		<0.0001	<0.001	<0.001							
Manganese						0.06											
Copper						0.001											
Boron						0.3											
Magnesium											38.0	16.0	20.0	25.0			
Sodium											1012.0	478.0	1174.0	993.0			
Potassium											8.0	4.0	10.0	11.0			
Silica											13.52	7.95	8.72	8.80			
Aluminum						1.0											
Cobalt						0.008											
Lithium						0.035											
Calcium						31.8					1040.0	1094.0	996.0	1054.0			
COD											790.0	948.0	2094.0	2332.0			
BOD											615.0	607.0	990.0	1170.0			
TOC											1889.0	2103.2	2007.1	2362.4			
TSS											<4.0	<4.0	<4.0	<4.0			
TDS	4200.	2735		4389.	2211	1575					3112.0	2392.0	2380.0	2404.0			
pH	10.2	9.6	8.5	12.0	7.5	9.19											
Hardness	28	36	140	517													
P-Alkalinity	500																
M-Alkalinity	624																
Sulfides																	
Sulfate	28	22.0	16.5			214											
Sulfate						70	2470				2010.0	420.0	500.0	660.0			

EID
2/84

9 A.M. 10 A.M. NOON 2 P.M.

11/8/84 11/8/84 11/8/84 11/8/84

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

No Dt. #1 No Dt. #2 No Dt. #3

API EFFLUENT ANALYSES

Total Kjeldahl Nitrogen	610						
Nitrate		<1.0	<1.0	<1.0	<1.0		
Ammonia Nitrogen as N	292						
Nitrite as N	<0.1						
Dissolved Oxygen	<1						
Oil & Grease		29.3	9.10	19.3	12.0		
Ammonium		195.0	390.0	275.0	185.0		
Phosphate		<0.10	<0.10	<0.10	<0.10		
Cyanides	38.4						
Trichloroethylene						ND	
Tetrachloroethylene						ND	ND
1,1,1-trichloroethane						ND	ND
Carbon Tetrachloride						ND	
Chlorinated Fluorocarbons						ND	
Methylene Chloride						ND	
1,1,2-Trichloro-1,2,2-Trifluoroethane						ND	
Chlorobenzene							ND
Dichlorobenzene							ND
Trichlorofluoromethane							ND
Xylene (total o,p,m)							1.9
Ethylbenzene							0.17
Toluene							8.9
Benzene							3.3
Phenols	<0.001						

↑
 E10 2/84
 (See "Tabulation"
 for others)

POND #1 WATER ANALYSES

CONSTITUENTS:	DATE: 9/70	8/4/71	8/18/71	9/3/71	11/29/71	1/28/72	9/29/72	#1-A	#2-A	#3-A	#2-B
Arsenic								0.24			
Chloride	ND	400.0	50.0			178	150				
Chromium						70.8					
Cl					40				ND		<0.25
COD											
Hardness	20	56	130				1560				
Mercury						158	70				
Molybdenum								<0.0005			
M-Alkalinity	674							<0.10			
P-Alkalinity	464						130				
Nickel											
pH	10.7	8.9	8.2	9.8	5.6	8.9	ND	<0.10			
Selenium											
Silicon								0.041	ND		ND
Silver								76			
Strontium								<0.10	ND		ND
Sulfides								0.84			
Sulfite	30	23.5	13.5						180.0		
TDS	5,000	2,960									
Tin				3,644	3,155	3,000	ND				
Vanadium								0.4			
Yttrium								<0.10			
Zinc								<0.10			
								0.76			
Cyanides											
Tetrachloroethylene									ND		
Trichloroethane									ND		
1,1,1-trichloroethane									ND	ND	
Carbon Tetrachloride									ND	ND	
Chlorinated Fluorocarbons									ND		
Methylene Chloride									ND		
1,1,2-Trichloro-									ND		
1,2,2-Trifluoroethane											
Chlorobenzene									ND		
Dichlorobenzene									ND		
Trichlorofluoroethane										ND	
Xylene (total o,p,m)										ND	
Ethylbenzene										0.75	
Toluene										0.11	
Benzene										0.94	
										0.54	

E1D Pond L'g.
2/84

Sudge

TABLE 1.0	GIANT REFINERY GROUNDWATER QUALITY DATA INVENTORY
TABLE 2.0	GROUP 3 BACKGROUND WATER QUALITY WELLS MW-1, MW-2, MW-3 AND MW-4
TABLE 3.0	GROUP 3 WELLS MW-1, MW-2, MW-3 AND MW-4 WATER QUALITY
TABLE 4.0	GROUP 3 STUDENT T-TEST COMPARISON WITH MW-4 UPGRADE BACKGROUND WELL
TABLE 5.0	GROUP 1 EPA INTERIM PRIMARY DRINKING WATER PARAMETERS
TABLE 6.0	GROUP 2 GROUNDWATER QUALITY ASSESSMENT, PARAMETERS AS PER NM HAZARDOUS WASTE REGULATIONS 206.C.1.c.(2)(b)
TABLE 7.0	MONITORING WELL STATIC WATER LEVELS: 4/82 THRU 4/84

TABLE 1.0

GIANT REFINERY GROUNDWATER QUALITY DATA INVENTORY

Quarter	Month	Year	Water Quality	Static Water Level
1	12	81	X	
	1	82		
	2	82		
2	3	82	X	
	4	82		X
	5	82		
3	6	82	X	X
	7	82		
	8	82		
4	9	82	X	X
	10	82		
	11	82		
5	12	82		X
	1	83		
	2	83		
6	3	83		
	4	83		
	5	83		
7	6	83		X
	7	83	X	
	8	83		
8	9	83		
	10	83		
	11	83	X	X
9	12	83	X	X
	1	84	X	X
	2	84	X	X
10	3	84	X	X
	4	84	X	

X indicates data available

* Controls for Environmental Pollution, Inc. Santa Fe, NM; other data by Ford Chemical Laboratory, Inc., Salt Lake City, UT.

TABLE 2.0

GROUP 3 BACKGROUND WATER QUALITY
DOWNGRADIENT WELL MW-1

Quarter	Conductivity	TOC mg/l	TOX mg/l	pH
First	930	8.80	2.80	8.60
Second	1021	5.35	2.60	8.80
Third	1100	2.50	1.65	8.80
Fourth	995	5.90	1.77	8.80
x	1012	5.64	2.20	8.75
S ²	4946	6.66	0.34	0.01
S	70	2.58	0.58	0.10

TABLE 2.0

GROUP 3 BACKGROUND WATER QUALITY
DOWNGRADIENT WELL MW-2

Quarter	Conductivity	TOC mg/l	TOX mg/l	pH
First	1000	6.30	1.90	8.70
Second	1012	9.00	2.30	8.90
Third	1000	3.30	2.71	8.90
Fourth	1000	7.50	1.90	8.90
x	1003	6.52	2.20	8.85
s ²	36	5.804	0.15	0.01
S	6	2.42	0.39	0.10

TABLE 2.0

GROUP 3 BACKGROUND WATER QUALITY
DOWNGRADIENT WELL MW-3

Quarter	Conductivity	TOC mg/l	TOX mg/l	pH
First	950	5.00	2.10	8.60
Second	1008	7.50	1.90	8.40
Third	995	4.50	2.22	8.40
Fourth	980	9.30	2.05	8.40
x	983	6.58	2.07	8.45
s ²	625	5.02	0.018	0.01
s	25	2.25	0.132	0.10

TABLE 2.0

GROUP 3 BACKGROUND WATER QUALITY
UPGRADIENT WELL MW-4

=====

Parameter: pH

Quarter	Measurement	Mean	Difference	Squared Difference
=====				
First	8.60	8.49	0.11	0.012

Second	8.60	8.49	0.11	0.012
	8.62	8.49	0.13	0.017
	8.65	8.49	0.16	0.026
	8.60	8.49	0.11	0.012

Third	8.50	8.49	0.01	0.000
	8.50	8.49	0.01	0.000
	8.45	8.49	-0.04	0.002
	8.50	8.49	0.01	0.000

Fourth	8.30	8.49	-0.19	0.036
	8.30	8.49	-0.19	0.036
	8.35	8.49	-0.14	0.020
	8.40	8.49	-0.09	0.008

TOTALS	110.37			0.181

$$S^2 = 0.181/(13-1) = 0.015, \text{ variance}$$

$$S = 0.12, \text{ standard deviation}$$

TABLE 2.8

GROUP 3 BACKGROUND WATER QUALITY
UPGRADIENT WELL MW-4

=====

Parameter: Specify Conductivity, micromhos/cm

=====

Quarter Measurement Mean Difference Squared Difference

=====

First 900 961 -61 3721

 950 961 -11 121

Second 940 961 -21 441

 950 961 -11 121

 950 961 -11 121

 955 961 -6 36

Third 950 961 -11 121

 960 961 0 0

 950 961 -11 121

 1000 961 39 1521

Fourth 990 961 29 841

 995 961 34 1156

 1000 961 39 1521

TOTALS 12490 9842

$$S^2 = 9842 / (13-1) = 820, \text{ variance}$$

$$S = 29, \text{ standard deviation}$$

TABLE 2.0

GROUP 3 BACKGROUND WATER QUALITY
UPGRADIENT WELL MW-4

=====				
Parameter: Total Organic Carbon, mg/l				
Quarter	Measurement	Mean	Difference	Squared Difference
=====				
First	8.30	7.20	1.1	1.21

Second	6.50	7.20	-0.7	0.49
	6.30	7.20	-0.9	0.81
	6.50	7.20	-0.7	0.49
	6.30	7.20	-0.9	0.81

Third	5.00	7.20	-2.2	4.84
	5.50	7.20	-1.7	2.89
	5.00	7.20	-2.2	4.84
	6.00	7.20	-1.2	1.44

Fourth	9.60	7.20	2.4	5.76
	9.60	7.20	2.4	5.76
	9.45	7.20	2.2	5.06
	9.50	7.20	2.3	5.29

TOTALS	93.55			39.69

$$s^2 = 39.69/(13-1) = 3.31, \text{ variance}$$

$$s = 1.82, \text{ standard deviation}$$

TABLE 2.8

GROUP 3 BACKGROUND WATER QUALITY
UPGRADIENT WELL MW-4

=====

Parameter: Total Organic Halogens, mg/l

Quarter	Measurement	Mean	Difference	Squared Difference
=====				
First	2.50	2.51	-0.01	0.000

Second	2.10	2.51	-0.41	0.168
	2.00	2.51	-0.51	0.260
	2.10	2.51	-0.41	0.168
	2.15	2.51	-0.36	0.130

Third	2.51	2.51	0.00	0.000
	2.60	2.51	0.09	0.008
	2.54	2.51	0.03	0.001
	2.60	2.51	0.09	0.008

Fourth	2.85	2.51	0.34	0.116
	2.90	2.51	0.39	0.152
	2.80	2.51	0.29	0.084
	2.95	2.51	0.44	0.194

TOTALS	32.60			1.289

$$s^2 = 1.289 / (13-1) = 0.107, \text{ variance}$$

$$s = 0.33, \text{ standard deviation}$$

TABLE 3.0
GROUP 3 WELL MW-1
WATER QUALITY

Parameter: pH

Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	8.60	8.41	0.19	0.036
Eighth	8.50	8.41	0.09	0.008
	8.30	8.41	-0.11	0.012
	8.25	8.41	-0.16	0.026
	8.40	8.41	-0.01	0.000
TOTALS	42.05			0.082

$$S^2 = 0.082/(5-1) = 0.020, \text{ variance}$$

$$S = 0.14, \text{ standard deviation}$$

Ninth 12/83	8.50	8.50	0.00	0.000
	8.40	8.50	-0.10	0.010
	8.45	8.50	-0.05	0.002
	8.55	8.50	0.05	0.002

Ninth 1/84	8.60	8.50	0.10	0.010
	8.50	8.50	0.00	0.000
	8.40	8.50	-0.10	0.010
	8.50	8.50	0.00	0.000

Ninth 2/84	8.80	8.50	0.30	0.090
	8.70	8.50	0.20	0.040
	8.80	8.50	0.30	0.090
	8.90	8.50	0.40	0.160

Tenth	8.30	8.50	-0.20	0.040
	8.20	8.50	-0.30	0.090
	8.20	8.50	-0.30	0.090
	8.20	8.50	-0.30	0.090

TOTALS	136.00			0.725
--------	--------	--	--	-------

$$S^2 = 0.725/(16-1) = 0.048, \text{ variance}$$

$$S = 0.21, \text{ standard deviation}$$

Tenth 4/84	8.79	8.84	-0.05	0.002
	8.85	8.84	0.01	0.000
	8.87	8.84	0.03	0.001
	8.88	8.84	0.04	0.002

0.005

$$S^2 = 0.005/(4-1) = 0.002, \text{ variance}$$

$$S = 0.04, \text{ standard deviation}$$

TABLE 3.0
GROUP 3 WELL MW-1
WATER QUALITY

Parameter: Total Organic Carbon, mg/l				
Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	1.25	1.33	0.17	0.029
Eighth	1.25	1.33	-0.08	0.006
	1.30	1.33	-0.03	0.001
	1.40	1.33	-0.07	0.005
	1.20	1.33	-0.13	0.017
TOTALS	6.65			0.058
$S^2 = 0.058/(5-1) = 0.014$, variance $S = 0.12$, standard deviation				
Ninth 12/83	5.80	5.56	0.24	0.058
	5.60	5.56	0.04	0.002
	5.70	5.56	0.14	0.020
	5.80	5.56	0.24	0.058
Ninth 1/84	5.50	5.56	-0.06	0.004
	5.60	5.56	0.04	0.002
	5.80	5.56	0.24	0.058
	5.70	5.56	0.14	0.020
Ninth 2/84	6.10	5.56	0.54	0.292
	5.90	5.56	0.34	0.115
	5.95	5.56	0.39	0.152
	5.90	5.56	0.34	0.116
Tenth 3/84	4.90	5.56	-0.66	0.436
	4.80	5.56	-0.76	0.578
	5.10	5.56	-0.46	0.212
	4.90	5.56	-0.66	0.436
TOTALS	89.05			2.554
$S^2 = 2.554/(16-1) = 0.170$, variance $S = 0.41$, standard deviation				
Tenth 4/84	87	86.75	0.25	0.062
	87	86.75	0.25	0.062
	87	86.75	0.25	0.062
	86	86.75	-0.75	0.562
				0.748
$S^2 = 0.748/(4-1) = 0.250$ $S = 0.06$				

TABLE 3.0
GROUP 3 WELL MW-1
WATER QUALITY

Parameter: Total Organic Halogens, mg/l

Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	1.50	1.19	0.31	0.096
Eighth	1.10	1.19	-0.09	0.008
	0.95	1.19	-0.24	0.058
	1.20	1.19	0.01	0.000
	1.20	1.19	0.01	0.000
TOTALS	5.95			0.162

$$S^2 = 0.162/(5-1) = 0.040, \text{ variance}$$

$$S = 0.20, \text{ standard deviation}$$

Ninth 12/83	1.10	0.87	0.23	0.053
	0.95	0.87	0.08	0.006
	1.20	0.87	0.33	0.109
	1.20	0.87	0.33	0.109
Ninth 1/84	1.90	0.87	0.03	0.001
	1.80	0.87	0.07	0.005
	1.10	0.87	0.23	0.053
	1.00	0.87	0.13	0.017

Ninth 2/84	0.70	0.87	-0.17	0.029
	0.60	0.87	-0.27	0.073
	0.80	0.87	-0.07	0.005
	0.80	0.87	-0.07	0.005

Tenth 3/84	0.70	0.87	-0.17	0.029
	0.80	0.87	-0.07	0.005
	0.60	0.87	-0.27	0.073
	0.60	0.87	-0.27	0.073

TOTALS	13.85			0.644
--------	-------	--	--	-------

$$S^2 = 0.644/(16-1) = 0.043, \text{ variance}$$

$$S = 0.21, \text{ standard deviation}$$

Tenth 4/84	<0.03
	<0.03
	<0.03
	<0.03

TABLE 3.0
GROUP 3 WELL MW-1
WATER QUALITY

Parameter: Conductivity, micromhos/cm

Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	1050	1044	6	36

	1041	1044	-3	9
Eighth	1050	1044	6	36
	1036	1044	-8	64
	1041	1044	-3	9
TOTALS	5218			153

$S^2 = 153/(5-1) = 38.3$, variance
 $S = 6.19$, standard deviation

	980	1005	-25	625
Ninth	990	1005	-15	225
12/83	980	1005	-25	625
	970	1005	-35	1225

	990	1005	-15	225
Ninth	1000	1005	-5	25
1/84	980	1005	-25	625
	1000	1005	-5	25

	1020	1005	15	225
Ninth	1050	1005	45	2025
2/84	1030	1005	25	625
	1050	1005	45	2025

	1000	1005	-5	25
Tenth	990	1005	-15	225
3/84	1020	1005	15	225
	1030	1005	25	625

TOTALS	16080			9600
--------	-------	--	--	------

$S^2 = 9600/(16-1) = 640$, variance
 $S = 25.3$, standard deviation

Tenth	1040	1068	-28	784
4/84	1070	1068	2	4
	1090	1068	22	484
	1070	1068	2	4

$S^2 = 1276/(4-1) = 425$
 $S = 20.6$

1276

TABLE 3.0
GROUP 3 WELL MW-2
WATER QUALITY

Parameter: pH

Quarter	Measurement	Mean	Difference	Squared Difference
---------	-------------	------	------------	--------------------

Seventh	8.70	8.53	0.17	0.029
---------	------	------	------	-------

Eighth	8.60	8.53	0.07	0.005
	8.40	8.53	-0.13	0.017
	8.44	8.53	-0.09	0.008
	8.50	8.53	-0.03	0.001

TOTALS	42.64			0.060
--------	-------	--	--	-------

$$S^2 = 0.060 / (5-1) = 0.015, \text{ variance}$$

$$S = 0.12, \text{ standard deviation}$$

Ninth 12/83	8.60	8.65	-0.05	0.002
	8.50	8.65	-0.15	0.022
	8.40	8.65	-0.25	0.062
	8.60	8.65	-0.05	0.002

Ninth 1/84	8.80	8.65	0.15	0.022
	8.70	8.65	0.05	0.002
	8.60	8.65	-0.05	0.002
	8.60	8.65	-0.05	0.002

Ninth 2/84	8.85	8.65	0.20	0.040
	8.90	8.65	0.25	0.062
	8.90	8.65	0.25	0.062
	8.70	8.65	0.05	0.002

Tenth 3/84	8.60	8.65	-0.05	0.002
	8.60	8.65	-0.05	0.002
	8.50	8.65	-0.15	0.022
	8.50	8.65	-0.15	0.022

TOTALS	138.35			0.330
--------	--------	--	--	-------

$$S^2 = 0.330 / (16-1) = 0.022, \text{ variance}$$

$$S = 0.15, \text{ standard deviation}$$

Tenth 4/84	8.92	8.92	0.00	0.000
	8.93	8.92	0.01	0.000
	8.93	8.92	0.01	0.000
	8.92	8.92	0.00	0.000

$$S^2 = 0.000$$

$$S = 0.00$$

TABLE 3.0
GROUP 3 WELL MW-2
WATER QUALITY

Parameter: Total Organic Carbon, mg/l				
Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	6.80	6.14	0.66	0.436
Eighth	6.20	6.14	0.06	0.004
	6.50	6.14	0.36	0.130
	5.90	6.14	-0.24	0.058
	5.30	6.14	-0.84	0.706
TOTALS	30.70			1.332
$S^2 = 1.332/(5-1) = 0.333$, variance $S = 0.58$, standard deviation				
Ninth 12/83	3.30	3.29	0.01	0.000
	3.50	3.29	0.21	0.044
	3.20	3.29	-0.09	0.008
	3.45	3.29	-0.16	0.026
Ninth 1/84	3.01	3.29	-0.28	0.078
	3.50	3.29	0.21	0.044
	3.60	3.29	0.31	0.096
	3.20	3.29	-0.09	0.008
Ninth 2/84	3.50	3.29	0.21	0.044
	3.40	3.29	0.11	0.012
	3.60	3.29	0.31	0.096
	3.30	3.29	0.01	0.000
Tenth 3/84	2.90	3.29	0.21	0.044
	3.00	3.29	-0.29	0.084
	3.20	3.29	-0.09	0.008
	3.00	3.29	-0.29	0.084
TOTALS	52.66			0.785
$S^2 = 0.785/(16-1) = 0.052$, variance $S = 0.23$, standard deviation				
Tenth 4/84	84	85	-1	1
	85	85	0	0
	86	85	1	1
	85	85	0	0
				2
$S^2 = 0.785/(16-1) = 0.052$, variance $S = 0.81$				

TABLE 3.0
GROUP 3 WELL MW-2
WATER QUALITY

Parameter: Total Organic Halogens, mg/l				
Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	1.70	1.48	0.22	0.048
Eighth	1.59	1.48	0.11	0.012
	0.33	1.48	-0.15	0.022
	1.50	1.48	0.02	0.000
	1.30	1.48	-0.18	0.032
TOTALS	7.42			0.116
$S^2 = 0.116/(5-1) = 0.029$, variance $S = 0.17$, standard deviation				
Ninth 12/83	1.40	1.08	0.32	0.102
	1.20	1.08	0.12	0.014
	1.25	1.08	0.17	0.029
	1.30	1.08	0.22	0.048
Ninth 1/84	1.10	1.08	0.02	0.000
	1.20	1.08	0.12	0.014
	1.30	1.08	0.22	0.048
	1.40	1.08	0.32	0.102
Ninth 2/84	1.00	1.08	-0.08	0.006
	0.90	1.08	-0.18	0.032
	0.85	1.08	-0.23	0.053
	0.90	1.08	-0.18	0.032
Tenth 3/84	0.90	1.08	-0.18	0.032
	0.90	1.08	-0.18	0.032
	0.90	1.08	-0.18	0.032
	0.80	1.08	-0.28	0.078
TOTALS	17.30			0.654
$S^2 = 0.654/(16-1) = 0.044$, variance $S = 0.21$, standard deviation				
Tenth 4/84	<0.030			
	<0.030			
	<0.030			
	<0.030			

TABLE 3.0
GROUP 3 WELL MW-2
WATER QUALITY

Parameter: Conductivity, micromhos/cm

Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	995	1065	-70	4900

	1145	1065	80	6400
Eighth	1064	1065	-1	1
	1056	1065	-9	81
	1066	1065	1	1

TOTALS	5326			11383
--------	------	--	--	-------

$S^2 = 11383/(5-1) = 2846$, variance
 $S = 53$, standard deviation

	1020	1031	-11	121
Ninth	1030	1031	-1	1
12/83	1070	1031	39	1521
	1020	1031	-11	121

	1040	1031	9	81
Ninth	1050	1031	19	361
1/84	1030	1031	-1	1
	1020	1031	-11	121

	1040	1031	9	81
Ninth	1050	1031	19	361
2/84	1050	1031	19	361
	1050	1031	19	361

	1000	1031	-31	961
Tenth	1020	1031	-11	121
3/84	1010	1031	-21	441
	990	1031	-41	1681

TOTALS	16490			6694
--------	-------	--	--	------

$S^2 = 6694/(16-1) = 446.3$, variance
 $S = 21.1$, standard deviation

Tenth	1170	1158	12	144
4/84	1150	1158	-8	64
	1160	1158	2	4
	1150	1158	-8	64

276

$S^2 = 276/(4-1) = 92$
 $S = 9.6$

TABLE 3.0
GROUP 3 WELL MW-3
WATER QUALITY

Parameter: pH				
Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	8.50	8.41	0.09	0.008
Eighth	8.50	8.41	0.09	0.008
	8.40	8.41	-0.01	0.000
	8.30	8.41	-0.11	0.012
	8.35	8.41	-0.06	0.004
TOTALS	42.05			0.032
$S^2 = 0.032/(5-1) = 0.008$, variance $S = 0.09$, standard deviation				
Ninth 12/83	8.50	8.43	0.07	0.005
	8.60	8.43	0.17	0.029
	8.55	8.43	0.12	0.014
	8.50	8.43	0.07	0.005
Ninth 1/84	8.20	8.43	-0.23	0.053
	8.30	8.43	-0.13	0.017
	8.40	8.43	-0.03	0.001
	8.35	8.43	-0.08	0.006
Ninth 2/84	8.40	8.43	-0.03	0.001
	8.30	8.43	-0.13	0.017
	8.50	8.43	0.07	0.005
	8.50	8.43	0.07	0.005
Tenth 3/84	8.50	8.43	0.07	0.005
	8.40	8.43	-0.03	0.001
	8.30	8.43	-0.13	0.017
	8.60	8.43	0.17	0.029
TOTALS	134.90			0.210
$S^2 = 0.210/(16-1) = 0.014$, variance $S = 0.12$, standard deviation				
Tenth	8.74	8.80	-0.06	0.004
	8.82	8.80	0.02	0.000
	8.83	8.80	0.03	0.001
	8.81	8.80	0.01	0.000
$S^2 = 0.005/(4-1) = 0.017$ $S = 0.13$				

TABLE 3.0
GROUP 3 WELL MW-3
WATER QUALITY

Parameter: Total Organic Carbon, mg/l

Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	4.70	4.10	0.6	0.360
Eighth	4.25	4.10	0.0	0.000
	3.80	4.10	-0.3	0.090
	3.50	4.10	-0.6	0.360
	4.40	4.10	0.3	0.090
TOTALS	20.50			0.900

$$S^2 = 0.900 / (5-1) = 0.22, \text{ variance}$$

$$S = 0.47, \text{ standard deviation}$$

Ninth 12/83	1.04	1.29	-0.25	0.062
	1.50	1.29	0.21	0.044
	1.65	1.29	0.36	0.130
	1.50	1.29	0.21	0.044

Ninth 1/84	1.20	1.29	-0.09	0.008
	1.40	1.29	0.11	0.012
	1.30	1.29	0.01	0.000
	1.20	1.29	-0.09	0.008

Ninth 2/84	1.50	1.29	0.21	0.044
	1.10	1.29	-0.19	0.036
	1.30	1.29	0.01	0.000
	1.20	1.29	0.09	0.008

Tenth 3/84	1.20	1.29	-0.09	0.008
	1.10	1.29	-0.19	0.036
	1.30	1.29	0.01	0.000
	1.10	1.29	-0.19	0.036

TOTALS	20.59			0.476
--------	-------	--	--	-------

$$S^2 = 0.476 / (16-1) = 0.032, \text{ variance}$$

$$S = 0.018, \text{ standard deviation}$$

Tenth 4/84	88	88	0	0
	88	88	0	0
	89	88	1	1
	88	88	0	0

$$S^2 = 1 / (4-1) = 0.33$$

$$S = 0.57$$

TABLE 3.0
GROUP 3 WELL MW-3
WATER QUALITY

Parameter: Total Organic Halogens, mg/l				
Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	1.95	1.59	0.36	0.130
Eighth	1.74	1.59	0.15	0.022
	1.55	1.59	-0.04	0.002
	1.50	1.59	-0.09	0.008
	1.20	1.59	-0.39	0.152
TOTALS	7.94			0.314
$S^2 = 0.314/(5-1) = 0.078$, variance $S = 0.28$, standard deviation				
Ninth 12/83	1.50	1.17	0.33	0.109
	1.30	1.17	0.13	0.017
	1.35	1.17	0.18	0.032
	1.45	1.17	0.28	0.078
Ninth 1/84	1.40	1.17	0.23	0.053
	1.20	1.17	0.03	0.001
	1.10	1.17	-0.07	0.005
	1.20	1.17	0.03	0.001
Ninth 2/84	1.30	1.17	0.13	0.017
	1.25	1.17	0.08	0.006
	1.20	1.17	0.03	0.001
	1.20	1.17	0.03	0.001
Tenth 3/84	0.50	1.17	-0.67	0.449
	0.70	1.17	-0.47	0.221
	1.20	1.17	0.03	0.001
	0.85	1.17	-0.32	0.102
TOTALS	18.70			1.094
$S^2 = 1.094/(16-1) = 0.073$, variance $S = 0.27$, standard deviation				
Tenth 4/84	<0.030			
	<0.030			
	<0.03			
	<0.03			

TABLE 3.0
GROUP 3 WELL MW-3
WATER QUALITY

Parameter: Conductivity, micromhos/cm				
Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	1080	1053	27	729
Eighth	1040	1053	-13	169
	1036	1053	-17	289
	1044	1053	-9	81
	1066	1053	13	169
TOTALS	5266			1437

$$S^2 = 1437/(5-1) = 359, \text{ variance}$$

$$S = 19, \text{ standard deviation}$$

Ninth 12/83	985	1006	-21	441
	990	1006	-16	256
	975	1006	-31	961
	990	1006	-16	256
Ninth 1/84	980	1006	-26	676
	990	1006	-16	256
	1000	1006	-6	36
	990	1006	-16	256
Ninth 2/84	1060	1006	54	2916
	1070	1006	64	4096
	1060	1006	54	2916
	1050	1006	44	1936
Tenth 3/84	990	1006	-16	256
	995	1006	-11	121
	980	1006	-26	676
	995	1006	-11	121
TOTALS	16100			16176

$$S^2 = 16176/(16-1) = 1078, \text{ variance}$$

$$S = 33, \text{ standard deviation}$$

Tenth 4/84	1130	1148	-18	324
	1150	1148	2	4
	1160	1148	12	144
	1150	1148	2	4
				476

$$S^2 = 476/(4-1) = 159$$

$$S = 13$$

TABLE 3.0
GROUP 3 WELL MW-4
WATER QUALITY

Parameter: pH				
Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	8.40	8.36	0.04	0.002
	8.44	8.36	0.08	0.006
	8.41	8.36	0.05	0.002
	8.43	8.36	0.07	0.005
Eighth	8.35	8.36	-0.01	0.000
	8.25	8.36	-0.11	0.012
	8.20	8.36	-0.16	0.026
	8.40	8.36	-0.04	0.002
TOTALS	66.88			0.055
$S^2 = 0.055/(8-1) = 0.008$, variance $S = 0.09$, standard deviation				
Ninth 12/83	8.60	8.54	0.06	0.004
	8.60	8.54	0.06	0.004
	8.50	8.54	-0.04	0.002
	8.45	8.54	-0.09	0.008
Ninth 1/84	8.40	8.54	-0.14	0.020
	8.50	8.54	-0.04	0.002
	8.60	8.54	-0.04	0.002
	8.45	8.54	-0.09	0.008
Ninth 2/84	8.80	8.54	0.26	0.068
	8.70	8.54	0.16	0.026
	8.65	8.54	0.11	0.012
	8.60	8.54	0.06	0.004
Tenth	8.40	8.54	-0.14	0.020
	8.50	8.54	-0.04	0.002
	8.40	8.54	-0.14	0.020
	8.50	8.54	-0.04	0.002
TOTALS	136.70			0.200
$S^2 = 0.200/(16-1) = 0.013$, variance $S = 0.12$, standard deviation				
Tenth 4/84	8.73	8.74	-0.01	0
	8.74	8.74	0	0
	8.74	8.74	0	0
	8.73	8.74	-0.01	0

TABLE 3.0

GROUP 3 WELL MW-4
WATER QUALITY

Parameter: Total Organic Carbon, mg/l

Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	8.20	7.49	0.71	0.504
	8.80	7.49	1.31	1.716
	8.80	7.49	1.31	1.716
	8.50	7.49	1.01	1.020
Eighth	6.20	7.49	-1.29	1.664
	6.10	7.49	-1.39	1.932
	6.60	7.49	-0.89	0.792
	6.70	7.49	-0.79	0.624
TOTALS	59.90			9.968

$$S^2 = 9.968/(8-1) = 1.424, \text{ variance}$$

$$S = 1.19, \text{ standard deviation}$$

Ninth 12/83	5.20	5.01	0.19	0.036
	5.50	5.01	0.49	0.240
	5.30	5.01	0.29	0.084
	5.35	5.01	0.34	0.116

Ninth 1/84	4.90	5.01	-0.11	0.012
	4.90	5.01	-0.11	0.012
	5.10	5.01	0.09	0.008
	5.10	5.01	0.09	0.008

Ninth 2/84	5.00	5.01	-0.01	0.000
	5.30	5.01	0.29	0.084
	4.80	5.01	-0.21	0.044
	4.90	5.01	-0.11	0.012

Tenth 3/84	5.00	5.01	-0.01	0.000
	4.60	5.01	-0.41	0.168
	4.80	5.01	-0.21	0.044
	4.40	5.01	-0.61	0.372

TOTALS	80.15			1.240
--------	-------	--	--	-------

$$S^2 = 1.240/(16-1) = 0.083, \text{ variance}$$

$$S = 0.29, \text{ standard deviation}$$

Tenth* 4/84	120	115	5	25
	110	115	-5	25
	110	115	-5	25
	120	115	5	25
				100

$$S^2 = 100/(4-1) = 33.3, S = 5.7$$

TABLE 3.0
GROUP 3 WELL MW-4
WATER QUALITY

Parameter: Total Organic Halogens, mg/l				
Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	1.85	1.72	0.13	0.017
	1.90	1.72	0.18	0.032
	1.88	1.72	0.16	0.026
	1.87	1.72	0.15	0.022
Eighth	1.66	1.72	-0.06	0.004
	1.34	1.72	-0.38	0.144
	1.70	1.72	-0.02	0.000
	1.60	1.72	-0.12	0.014
TOTALS	13.80			0.259
$S^2 = 0.259/(8-1) = 0.037$, variance $S = 0.19$, standard deviation				
Ninth 12/83	1.20	1.24	-0.04	0.002
	1.25	1.24	0.01	0.000
	1.30	1.24	0.06	0.004
	1.15	1.24	-0.09	0.008
Ninth 1/84	1.30	1.24	0.06	0.004
	1.40	1.24	0.16	0.026
	1.50	1.24	0.26	0.068
	1.20	1.24	-0.04	0.002
Ninth 2/84	1.10	1.24	-0.14	0.020
	1.40	1.24	0.16	0.026
	1.40	1.24	0.16	0.026
	1.50	1.24	0.26	0.068
Tenth 3/84	1.10	1.24	-0.14	0.020
	1.00	1.24	-0.24	0.058
	1.10	1.24	-0.14	0.020
	0.96	1.24	-0.28	0.078
TOTALS	19.86			0.430
$S^2 = 0.430/(16-1) = 0.029$, variance $S = 0.17$, standard deviation				
Tenth 4/84	<0.030			
	<0.030			
	<0.030			
	<0.030			

TABLE 3.0
GROUP 3 WELL MW-4
WATER QUALITY

Parameter: Conductivity, micromhos/cm				
Quarter	Measurement	Mean	Difference	Squared Difference
Seventh	1130	1131	-1	1
	1100	1131	-31	961
	1135	1131	4	16
	1140	1131	9	81
Eighth	1130	1131	-1	1
	1145	1131	14	196
	1125	1131	-6	36
	1140	1131	9	81
TOTALS	9045			1373
$S^2 = 1373/(8-1) = 196$, variance $S = 14$, standard deviation				
Ninth 12/83	1140	1081	59	3481
	1120	1081	39	1521
	1140	1081	59	3481
	1140	1081	59	3481
Ninth 1/84	1120	1081	39	1521
	1110	1081	29	841
	1120	1081	39	1521
	1090	1081	9	81
Ninth 2/84	1050	1081	-31	961
	1060	1081	-21	441
	1060	1081	-21	441
	1060	1081	-21	441
Tenth 3/84	1010	1081	-71	5041
	1050	1081	-31	961
	1000	1081	-81	6561
	1020	1081	-61	3721
TOTALS	17290			34496
$S^2 = 34496/(16-1) = 2300$, variance $S = 48$, standard deviation				
Tenth 4/84	1210	1225	-15	225
	1230	1225	5	25
	1240	1225	15	225
	1220	1225	-5	25
				500
$S^2 = 500/(4-1) = 167$ $S = 13$				

(

[illegible]

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840.

| | | | | | | | | |
|----------------|-------|-------|-------|-------|-------|-------|--------|-------|
| x | 1044 | 1005 | 1065 | 1031 | 1053 | 1006 | 1131 | 1081 |
| S ² | 38.3 | 640 | 2346 | 446 | 359 | 1078 | 196 | 2300 |
| t [*] | 9.868 | 4.330 | 4.136 | 7.340 | 7.922 | 3.940 | 16.809 | 8.344 |
| t _c | 2.727 | 2.624 | 3.294 | 2.629 | 2.614 | 2.615 | 2.924 | 2.603 |
| | I | I | I | I | I | I | I | I |

| | | | | | | | | |
|----------------|---------|--------|--------|--------|--------|--------|-------|--------|
| x | 1.33 | 5.56 | 6.14 | 3.29 | 4.10 | 1.29 | 7.49 | 5.01 |
| S ² | 0.014 | 0.170 | 0.333 | 0.052 | 0.220 | 0.032 | 1.424 | 0.083 |
| t* | -11.570 | -3.180 | -1.870 | -7.700 | -5.673 | -11.67 | 0.395 | -3.960 |
| t _c | 2.658 | 2.647 | - | - | - | - | 1.200 | - |
| | NSD | NSD | NSD | NSD | NSD | NSD | NSD | NSD |

TABLE 4.0 (continued)

| WELL
QRTS | MW-1 | | MW-2 | | MW-3 | | MW-4 | |
|----------------|---------|---------|--------|---------|--------|---------|--------|--------|
| | 7,8 | 9,10 | 7,8 | 9,10 | 7,8 | 9,10 | 7,8 | 9,10 |
| TOX, mg/l | | | | | | | | |
| x | 1.19 | 0.87 | 1.48 | 1.08 | 1.59 | 1.17 | 1.72 | 1.24 |
| S ² | 0.040 | 0.043 | 0.029 | 0.044 | 0.078 | 0.073 | 0.037 | 0.029 |
| t* | -10.436 | -15.864 | -9.768 | -13.792 | -5.999 | -11.848 | -6.371 | -127.2 |
| t _c | - | - | - | - | - | - | - | - |
| | NSD | NSD | NSD | NSD | NSD | NSD | NSD | NSD |
| pH | | | | | | | | |
| x | 8.41 | 8.50 | 8.53 | 8.65 | 8.41 | 8.43 | 8.36 | 8.54 |
| S ² | 0.020 | 0.048 | 0.015 | 0.022 | 0.008 | 0.014 | 0.008 | 0.013 |
| t* | -1.114 | 0.155 | 0.621 | 3.184 | -1.524 | -1.111 | -2.477 | 1.128 |
| t _c | 3.230 | 2.965 | 3.749 | 2.962 | 3.605 | 0.608 | 3.604 | 2.974 |
| | NC | NC | NC | I | NC | NC | NC | NC |

a Upgradient background well, MW-4, data obtained during quarters 1, 2, 3, 4 (12/81 through 11/82);

Monitoring quarters 7 and 8 (6/83 through 11/83) and quarters 9 and 10 (12/83 through 5/84);

NSD = no significant difference;

I = increase;

NC = no change.

TABLE 5.0

GROUP 1 EPA INTERIM PRIMARY DRINKING WATER PARAMETERS

| FIRST QUARTER | MW-1 | MW-2 | MW-3 | MW-4 |
|----------------------------|--------|---------|---------|--------|
| 2,4,D mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| 2,4,5, -TP mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Asenic mg/l (0.05) | .003 | .001 | .001 | .002 |
| Barium mg/l (1.0) | .030 | .020 | .015 | .025 |
| Cadmium mg/l (0.01) | .002 | .003 | .007 | .003 |
| Chromium mg/l (0.05) | .030 | <.001 | <.001 | <.001 |
| Endrin mg/l (0.0002) | <.0001 | <.0001 | <.0001 | <.0001 |
| Fluoride mg/l (1.4-2.4) | .86 | .87 | 2.31 | .64 |
| Gross Alpha pCi/l (15) | <2.0 | <2.0 | <2.0 | <2.0 |
| Gross Beta pCi/l | <2.0 | 3.0 | 3.0 | <3.0 |
| Lead mg/l (0.05) | .05 | .020 | .020 | .030 |
| Lindane mg/l (0.004) | <.001 | <.001 | <.001 | <.001 |
| Total Coliform MPN/100 (1) | <1 | <1 | <1 | <1 |
| Mercury mg/l (0.002) | .00030 | <.00020 | <.00020 | .00030 |
| Methoxychlor mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| Nitrate mg/l (10) | .32 | .36 | .32 | .33 |
| Radium 226 pCi/l | <.05 | <.05 | <.05 | <.01 |
| Radium 228 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Selenium mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Silver mg/l (0.05) | <.001 | <.001 | <.001 | <.001 |
| Toxaphene mg/l (0.005) | <.001 | <.001 | <.001 | <.001 |

^a EPA IPDWP, Part 265, App. III

TABLE 5.0

GROUP 1 EPA INTERIM PRIMARY DRINKING WATER PARAMETERS^a

| SECOND QUARTER | MW-1 | MW-2 | MW-3 | MW-4 |
|----------------------------|---------|---------|---------|--------|
| 2,4,D mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| 2,4,5, -TP mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Arsenic mg/l (0.05) | .003 | .002 | .003 | .002 |
| Barium mg/l (1.0) | .010 | .030 | .010 | .026 |
| Cadmium mg/l (0.01) | <.001 | <.001 | <.001 | .005 |
| Chromium mg/l (0.05) | <.001 | <.001 | <.001 | <.001 |
| Endrin mg/l (0.0002) | <.0001 | <.0001 | <.0001 | <.0001 |
| Fluoride mg/l (1.4-2.4) | .80 | .79 | 1.73 | .42 |
| Gross Alpha pCi/l (15) | <2.0 | <2.0 | <2.0 | <2.0 |
| Gross Beta pCi/l | <.1 | 1.3 | 1.5 | <.1 |
| Lead mg/l (0.05) | .006 | .005 | .002 | .022 |
| Lindane mg/l (0.004) | <.001 | <.001 | <.001 | <.001 |
| Total Coliform MPN/100 (1) | 8.0 | <2.0 | <2.0 | <2.0 |
| Mercury mg/l (0.002) | <.00020 | <.00020 | <.00020 | .00020 |
| Methoxychlor mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| Nitrate mg/l (10) | .04 | .05 | .30 | .08 |
| Radium 226 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Radium 228 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Selenium mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Silver mg/l (0.05) | <.001 | <.001 | <.001 | <.001 |
| Toxaphene mg/l (0.005) | <.001 | <.001 | <.001 | <.001 |

^a EPA IPDWP, Part 265, App. III

TABLE 5.0

GROUP 1 EPA INTERIM PRIMARY DRINKING WATER PARAMETERS^a

| THIRD QUARTER | MW-1 | MW-2 | MW-3 | MW-4 |
|----------------------------|--------|--------|--------|--------|
| 2,4,D mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| 2,4,5, -TP mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Asenic mg/l (0.05) | <.001 | <.001 | <.001 | <.001 |
| Barium mg/l (1.0) | .013 | .017 | .011 | .015 |
| Cadmium mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Chromium mg/l (0.05) | <.001 | <.001 | <.001 | <.001 |
| Endrin mg/l (0.0002) | <.0001 | <.0001 | <.0001 | <.0001 |
| Fluoride mg/l (1.4-2.4) | .90 | .89 | 1.82 | .53 |
| Gross Alpha pCi/l (15) | <2.0 | <2.0 | <2.0 | <2.0 |
| Gross Beta pCi/l | <.1 | <.1 | <.1 | <.1 |
| Lead mg/l (0.05) | .011 | .003 | .005 | .003 |
| Lindane mg/l (0.004) | <.001 | <.001 | <.001 | <.001 |
| Total Coliform MPN/100 (1) | <2.0 | <2.0 | 2.0 | 7.0* |
| Mercury mg/l (0.002) | .0003 | <.0002 | <.0002 | .0002 |
| Methoxychlor mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| Nitrate mg/l (10) | .34 | .38 | .47 | .34 |
| Radium 226 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Radium 228 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Selenium mg/l (0.01) | <.001 | .002 | <.001 | <.001 |
| Silver mg/l (0.05) | <.001 | <.001 | <.001 | <.001 |
| Toxaphene mg/l (0.005) | <.001 | <.001 | <.001 | <.001 |

^aEPA IPDWP, Part 265, App. III

TABLE 5.0

GROUP 1 EPA INTERIM PRIMARY DRINKING WATER PARAMETERS^a

| FOURTH QUARTER | MW-1 | MW-2 | MW-3 | MW-4 |
|----------------------------|--------|--------|--------|--------|
| 2,4,D mg/l (0.4) | <.001 | <.001 | <.001 | <.001 |
| 2,4,5, -TP mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Arsenic mg/l (0.05) | .002 | <.001 | .003 | .002 |
| Barium mg/l (1.0) | .008 | .025 | .035 | .025 |
| Cadmium mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Chromium mg/l (0.05) | .002 | .002 | .002 | <.001 |
| Endrin mg/l (0.0002) | <.0001 | <.0001 | <.0001 | <.0001 |
| Fluoride mg/l (1.4-2.4) | .89 | .88 | .87 | 1.61 |
| Gross Alpha pCi/l (15) | <2.0 | <2.0 | <2.0 | <2.0 |
| Gross Beta pCi/l | <.1 | <.1 | <.1 | <.1 |
| Lead mg/l (0.05) | <.001 | <.001 | .002 | <.001 |
| Lindane mg/l (0.004) | <.001 | <.001 | <.001 | <.001 |
| Total Coliform MPN/100 (1) | <2.0 | <2.0 | <2.0 | <2.0 |
| Mercury mg/l (0.002) | <.0002 | <.0002 | <.0002 | <.0002 |
| Methoxychlor mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| Nitrate mg/l (10) | .10 | .09 | .12 | .07 |
| Radium 226 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Radium 228 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Selenium mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Silver mg/l (0.05) | <.001 | <.001 | <.001 | <.001 |
| Toxaphene mg/l (0.005) | <.001 | <.001 | <.001 | <.001 |

^aEPA IPDWP, Part 265, App. III

TABLE 5.0

GROUP 3 EPA INTERIM PRIMARY DRINKING WATER PARAMETERS^a

| SEVENTH QUARTER | MW-1 | MW-2 | MW-3 | MW-4 |
|----------------------------|--------|--------|--------|--------|
| 2,4,D mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| 2,4,5, -TP mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Arsenic mg/l (0.05) | .004 | .004 | .005 | .003 |
| Barium mg/l (1.0) | .020 | .020 | .010 | .040 |
| Cadmium mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Chromium mg/l (0.05) | <.001 | <.001 | <.001 | <.001 |
| Endrin mg/l (0.0002) | <.0001 | <.0001 | <.0001 | <.0001 |
| Fluoride mg/l (1.4-2.4) | .93 | .84 | 1.23 | .41 |
| Gross Alpha pCi/l (15) | <2.0 | <2.0 | <2.0 | <2.0 |
| Gross Beta pCi/l | <.1 | <.1 | <.1 | <.1 |
| Lead mg/l (0.05) | .005 | .005 | .002 | .002 |
| Lindane mg/l (0.004) | <.001 | <.001 | <.001 | <.001 |
| Total Coliform MPN/100 (1) | <2.0 | <2.0 | <2.0 | <2.0 |
| Mercury mg/l (0.002) | <.0002 | <.0002 | <.0002 | <.0002 |
| Methoxychlor mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| Nitrate mg/l (10) | <.02 | <.02 | <.02 | <.02 |
| Radium 226 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Radium 228 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Selenium mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Silver mg/l (0.05) | <.001 | <.001 | <.001 | <.001 |
| Toxaphene mg/l (0.005) | <.001 | <.001 | <.001 | <.001 |

^aEPA IPDWP, Part 265, App. III

TABLE 5.0

GROUP 1 EPA INTERIM PRIMARY DRINKING WATER PARAMETERS^a

| EIGHTH QUARTER | MW-1 | MW-2 | MW-3 | MW-4 |
|----------------------------|--------|--------|--------|--------|
| 2,4,D mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| 2,4,5, -TP mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Arsenic mg/l (0.05) | .003 | .005 | .004 | .003 |
| Barium mg/l (1.0) | .021 | .025 | .018 | .055 |
| Cadmium mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Chromium mg/l (0.05) | <.001 | <.001 | <.001 | <.001 |
| Endrin mg/l (0.002) | <.0001 | <.0001 | <.0001 | <.0001 |
| Fluoride mg/l (1.4-2.4) | .95 | .80 | 1.35 | .50 |
| Gross Alpha pCi/l (15) | <2.5 | <2.5 | <2.5 | <2.5 |
| Gross Beta pCi/l | <.10 | <.10 | <.10 | <.10 |
| Lead mg/l (0.05) | .006 | .005 | .004 | .003 |
| Lindane mg/l (0.004) | <.001 | <.001 | <.001 | <.001 |
| Total Coliform MPN/100 (1) | <2.0 | <2.0 | <2.0 | <2.0 |
| Mercury mg/l (0.002) | <.0002 | <.0002 | <.0002 | <.0002 |
| Methoxychlor mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| Nitrate mg/l (10) | <.02 | <.02 | <.02 | <.02 |
| Radium 226 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Radium 228 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Selenium mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Silver mg/l (0.05) | <.001 | <.001 | <.001 | <.001 |
| Toxaphene mg/l (0.005) | <.001 | <.001 | <.001 | <.001 |

EPA IPDWP, Part 265, App. III

TABLE 5.0

GROUP 1 EPA INTERIM PRIMARY DRINKING WATER PARAMETERS^a

| NINTH QUARTER (2/84) | MW-1 | MW-2 | MW-3 | MW-4 |
|----------------------------|--------|--------|--------|--------|
| 2,4,D mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| 2,4,5, -TP mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Arsenic mg/l (0.05) | <.001 | .002 | .002 | .002 |
| Barium mg/l (1.0) | .01 | .02 | .02 | .01 |
| Cadmium mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Chromium mg/l (0.05) | <.001 | .003 | .002 | .002 |
| Endrin mg/l (0.002) | <.0001 | <.0001 | <.0001 | <.0001 |
| Fluoride mg/l (1.4-2.4) | .90 | .76 | 1.40 | .50 |
| Gross Alpha pCi/l (15) | <2.0 | <2.0 | <2.0 | <2.0 |
| Gross Beta pCi/l | <3.0 | <3.0 | <3.0 | <3.0 |
| Lead mg/l (0.05) | <.001 | .050 | .022 | .020 |
| Lindane mg/l (0.004) | <.0010 | <.0010 | <.0010 | <.0010 |
| Total Coliform MPN/100 (1) | <2.0 | <2.0 | <2.0 | <2.0 |
| Mercury mg/l (0.002) | <.0002 | <.0002 | <.0002 | <.0002 |
| Methoxychlor mg/l (0.1) | <.001 | <.001 | <.001 | <.001 |
| Nitrate mg/l (10) | .07 | <.02 | .03 | .03 |
| Radium 226 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Radium 228 pCi/l | <.05 | <.05 | <.05 | <.05 |
| Selenium mg/l (0.01) | <.001 | <.001 | <.001 | <.001 |
| Silver mg/l (0.05) | <.0010 | <.0010 | <.0010 | <.0010 |
| Toxaphene mg/l (0.005) | <.001 | <.001 | <.001 | <.001 |

^aEPA IPDWP, Part 265, App. III

TABLE 6.0

(GROUP 2 GROUNDWATER QUALITY ASSESSMENT PARAMETERS AS PER
NEW MEXICO HAZARDOUS WASTE REGULATIONS 206.C.1.c (2) (b)

| FIRST QUARTER 12/81 | MW-1 | MW-2 | MW-3 | MW-4 |
|---------------------|--------|--------|--------|--------|
| Chloride mg/l | 51.00 | 57.80 | 68.50 | 16.90 |
| Iron mg/l | 1.050 | 0.680 | 0.23 | 1.650 |
| Manganese mg/l | 0.060 | 0.020 | 0.030 | 0.035 |
| Phenol mg/l | 0.034 | 0.026 | 0.029 | 0.020 |
| Sodium mg/l | 235 | 240 | 230 | 270 |
| Sulfate mg/l | 171 | 174 | 150 | 153 |
| SECOND QUARTER 3/82 | MW-1 | MW-2 | MW-3 | MW-4 |
| Chloride mg/l | 51.80 | 57.90 | 55.40 | 16.90 |
| Iron mg/l | 0.400 | 0.950 | 0.200 | 1.154 |
| Manganese mg/l | 0.050 | 0.050 | 0.020 | 0.060 |
| Phenol mg/l | 0.058 | 0.005 | 0.043 | 0.043 |
| Sodium mg/l | 260 | 265 | 240 | 280 |
| Sulfate mg/l | 135 | 165 | 174 | 300 |
| THIRD QUARTER 6/82 | MW-1 | MW-2 | MW-3 | MW-4 |
| Chloride mg/l | 48.80 | 67.40 | 56.20 | 15.60 |
| Iron mg/l | 0.140 | 0.110 | 0.100 | 0.210 |
| Manganese mg/l | 0.035 | 0.010 | 0.020 | 0.045 |
| Phenol mg/l | <0.001 | <0.001 | <0.001 | <0.001 |
| Sodium mg/l | 255 | 260 | 240 | 260 |
| Sulfate mg/l | 171 | 189 | 198 | 183 |
| FOURTH QUARTER 9/82 | MW-1 | MW-2 | MW-3 | MW-4 |
| Chloride mg/l | 33.60 | 51.70 | 46.50 | 20.80 |
| Iron mg/l | 0.130 | 0.220 | 0.360 | 0.210 |
| Manganese mg/l | 0.030 | 0.020 | 0.035 | 0.035 |
| Phenol mg/l | <0.001 | <0.001 | <0.001 | <0.001 |
| Sodium mg/l | 255 | 260 | 250 | 290 |
| Sulfate mg/l | 129 | 129 | 126 | 102 |

TABLE 6.0

**GROUP 2 GROUNDWATER QUALITY ASSESSMENT PARAMETERS AS PER
NEW MEXICO HAZARDOUS WASTE REGULATIONS 206.C.1.c (2) (b)**

| SEVENTH QUARTER 7/83 | MW-1 | MW-2 | MW-3 | MW-4 |
|------------------------|--------|--------|--------|--------|
| Chloride mg/l | 58.00 | 60.00 | 58.00 | 22.00 |
| Iron mg/l | 0.130 | 0.160 | 0.180 | 0.110 |
| Manganese mg/l | 0.025 | 0.023 | 0.030 | 0.012 |
| Phenol mg/l | <0.001 | <0.001 | <0.001 | <0.001 |
| Sodium mg/l | 250 | 270 | 250 | 255 |
| Sulfate mg/l | 172 | 172 | 148 | 138 |
| EIGHTH QUARTER 11/83 | MW-1 | MW-2 | MW-3 | MW-4 |
| Chloride mg/l | 50.00 | 56.00 | 60.00 | 16.00 |
| Iron mg/l | 0.140 | 0.172 | 0.169 | 0.120 |
| Manganese mg/l | 0.029 | 0.022 | 0.035 | 0.015 |
| Phenol mg/l | <0.001 | <0.001 | <0.001 | <0.001 |
| Sodium mg/l | 249 | 232 | 241 | 273 |
| Sulfate mg/l | 179 | 168 | 150 | 142 |
| NINTH QUARTER (2/84) | MW-1 | MW-2 | MW-3 | MW-4 |
| Chloride mg/l | 54.00 | 57.00 | 23.00 | 60.00 |
| Iron mg/l | 0.05 | 0.21 | 0.37 | 0.14 |
| Manganese mg/l | 0.02 | 0.01 | 0.02 | 0.01 |
| Phenol mg/l | <0.001 | <0.001 | <0.001 | 0.038 |
| Sodium mg/l | 256 | 260 | 284 | 258 |
| Sulfate mg/l | 135 | 141 | 129 | 126 |
| TENTH QUARTER (4/84) * | MW-1 | MW-2 | MW-3 | MW-4 |
| Chloride mg/l | 55 | 63 | 63 | 19 |
| Iron mg/l | 0.08 | 0.09 | 0.07 | 0.20 |
| Manganese mg/l | 0.09 | 0.002 | 0.002 | 0.003 |
| Phenol mg/l | 0.010 | 0.013 | 0.025 | 0.022 |
| Sodium mg/l | 270 | 270 | 270 | 300 |
| Sulfate mg/l | 170 | 170 | 160 | 150 |

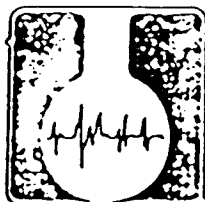
* Controls for Environmental Pollution, Inc., Santa Fe, NM 87501

TABLE 7.0

MONITORING WELL STATIC WATER LEVEL

| DATE | MW-1 | MW-2 | MW-3 | MW-4 |
|-------------------------------|---------|---------|---------|---------|
| 04-30-84 | 6871.6 | 6870.4 | 6856.3 | 6873.8 |
| 03-08-84 | 6870.9 | 6870.5 | 6855.1 | 6873.6 |
| 02-16-84 | 6870.9 | 6870.6 | 6855.3 | 6871.4 |
| 01-12-84 | 6870.9 | 6870.3 | 6855.3 | 6871.4 |
| 12-16-83 | 6871.1 | 6870.4 | 6855.3 | 6874.1 |
| 11-07-83 | 6870.0 | 6869.8 | 6854.2 | 6873.4 |
| 06-30-83 | 6869.9 | 6869.9 | 6854.3 | 6873.4 |
| 12-11-82 | 6869.7 | 6869.5 | 6851.2 | 6873.6 |
| 09-21-82 | 6870.8 | 6871.3 | 6855.1 | 6873.3 |
| 06-17-82 | 6871.0 | 6870.3 | 6855.5 | 6873.9 |
| 04-07-82 | 6870.2 | 6871.5 | 6854.1 | 6873.0 |
| BOTTOM
ELEVATION | 6746.5 | 6740.6 | 6752.3 | 6760.42 |
| TOP OF
CASING
ELEVATION | 6876.90 | 6878.61 | 6881.30 | 6880.42 |

MW-SERIES GROUND WATER MONITORING DATA (DECEMBER 1984)



ASSAIGAI ANALYTICAL LABORATORIES

TO: Giant Refinery
Attn: Bob Anderson
Route 3 Box 7
Gallup, NM 87301

DATE: 10 January 1985
1183

ANALYTE

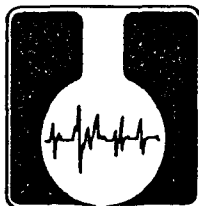
SAMPLE ID/ANALYTICAL RESULTS

| | | | | |
|-----|-----------------------|---------------|--------------------------|-------------------|
| | MW-1B
(Cubitaizer) | MW-2 52 | MW-3 52 | MW-4 52 |
| pH | 8.3 | 8.95 | 8.85 | 8.60 |
| EC | 10 umhos/cm | 1100 umhos/cm | 1100 umhos/cm | 1200 umhos/cm |
| | OW-2 | OW-7 | OW-24 52 | #1 Pond
Outlet |
| pH | 8.1 | 8.7 | 8.0 | 9.1 |
| EC | 1300 umhos/cm | 1200 umhos/cm | 1100 umhos/cm | 5600 umhos/cm |
| | Blank | MW-1 52 | NOMINAL DETECTION LIMIT | |
| pH | 7.4 | 8.7 | 0.01 | |
| EC | 1100 umhos/cm | 1180 umhos/cm | 0.1 umhos/cm | |
| | MW-1 52 Vial | MW-2 52 | MW-3 52 | MW-4 52 |
| DOC | 8.0 mg/l | 7.0 mg/l | 5.0 mg/l | 6.0 mg/l |
| DOC | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| | OW-2 | OW-7 | OW-24 52 | #1 Pond |
| DOC | 11.0 mg/l | 5.0 mg/l | 12.0 mg/l | 1560.0 mg/l |
| DOC | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| | Blank | MW 1B | NOMINAL DETECTION LIMIT: | |
| DOC | 4.0 mg/l | 4.0 mg/l | 0.1 mg/l | |
| DOC | <0.01 mg/l | <0.01 mg/l | 0.01 mg/l | |

REFERENCES: 1. "Standard Methods for the Examination of Water and Wastewater",
15th Edition, APHA, N.Y., 1980.

2. EPA-SW 846

MW-SERIES GROUND WATER MONITORING DATA (1985)



ASSAIGAI ANALYTICAL LABORATORIES

TO: GeoScience
Attn: Randy Hicks
500 Copper Ave. N.W.
Suite 501
Albuquerque, NM 87102

DATE: 22 February 1985
0160

| ANALYTE | SAMPLE ID/ ANALYTICAL RESULTS | | |
|-----------------|-------------------------------|-----------------|--------------------------|
| | #1
MW-3 | #2
MW-1 | #3
Blank, Pb/Hg Spike |
| pH | 8.7 | 8.8 | 8.9 |
| EC | 1100.0 umhos/cm | 1100.0 umhos/cm | 5 umhos/cm |
| TOC | 8.2 mg/l | 7.4 mg/l | 4.0 mg/l |
| TOX | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| Cl | 57.0 mg/l | 47.0 mg/l | 1.0 mg/l |
| Fe | 0.020 mg/l | 0.077 mg/l | <0.05 mg/l |
| Mn | 0.029 mg/l | 0.024 mg/l | <0.005 mg/l |
| Pb | 0.010 mg/l | 0.009 mg/l | 0.039 mg/l |
| Hg | <0.002 mg/l | <0.002 mg/l | 0.037 mg/l (duplicate) |
| Phenols | <1.0 mg/l | <1.0 mg/l | 0.002 mg/l |
| SO ₄ | 120.0 mg/l | 150.0 mg/l | <1.0 mg/l |
| | 130.0 mg/l (duplicate) | | |
| Na | 140.0 mg/l | 234.0 mg/l | <1.0 mg/l |
| | | | |
| | #4
MW-2 | #5
MW-4 | |
| pH | 8.8 | 8.6 | |
| EC | 1180.0 umhos/cm | 1200.0 umhos/cm | |
| TOC | 5.8 mg/l | 10.8 mg/l | |
| TOX | <0.01 mg/l | <0.01 mg/l | |
| Cl | 56.0 mg/l | 16.0 mg/l | |
| Fe | 0.037 mg/l | 0.086 mg/l | |
| Mn | 0.017 mg/l | 0.038 mg/l | |
| | 0.0169 mg/l (duplicate) | | |
| Pb | 0.010 mg/l | 0.006 mg/l | |
| Hg | <0.002 mg/l | <0.002 mg/l | |
| Phenols | <1.0 mg/l | | |
| SO ₄ | 157.0 mg/l | 120.0 mg/l | |
| Na | 195.0 mg/l | 277.0 mg/l | |
| | | | |
| | Spike | | |
| Pb | 0.042 mg/l | | |
| Hg | 0.002 mg/l | | |

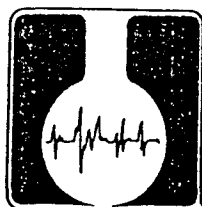
FIRST QUARTER ANALYSES
SMW-SERIES SHALLOW MONITORING WELLS

SAMPLE NO.

WELL NO.

851010093
8510101430
8510101235
8510101045
8510101140
8510101325

SMW-1
SMW-2
SMW-3
SMW-4
SMW-5
SMW-6



ASSAIGAI ANALYTICAL LABORATORIES

TO: Geoscience Consultants, Ltd.
500 Copper N.W. Suite 325
Albuquerque, NM 87102

DATE: 5 November 1985
1485
Page 1 of 4

| ANALYTE | SAMPLE ID/ANALYTICAL RESULTS | | |
|--------------|------------------------------|----------------------------|----------------------------|
| | 8510100930
<i>SMW-1</i> | 8510101045
<i>SMW-4</i> | 8510101140
<i>SMW-5</i> |
| As | 0.080 mg/l | <0.050 mg/l | 0.064 mg/l |
| Ba | 6.0 mg/l | <1.0 mg/l | <1.0 mg/l |
| Cr | <0.050 mg/l | <0.050 mg/l | <0.050 mg/l |
| Cd | 0.060 mg/l | <0.010 mg/l | <0.010 mg/l |
| Hg | <0.002 mg/l | <0.002 mg/l | <0.002 mg/l |
| Se | 0.066 mg/l | 0.026 mg/l | 0.022 mg/l |
| Ag | <0.050 mg/l | <0.050 mg/l | <0.050 mg/l |
| Pb | 0.116 mg/l | <0.050 mg/l | <0.050 mg/l |
| F | 0.28 mg/l | 0.61 mg/l | 0.69 mg/l |
| NO 3 as N | 0.1 mg/l | 0.1 mg/l | 0.1 mg/l |
| Endrin | <0.0002 mg/l | <0.0002 mg/l | <0.0002 mg/l |
| Methoxychlor | <0.1 mg/l | <0.1 mg/l | <0.1 mg/l |
| Lindane | <0.004 mg/l | <0.004 mg/l | <0.004 mg/l |
| Cl | 1489.0 mg/l | 51.0 mg/l | 54.0 mg/l |
| Fe | 0.45 mg/l | 1.2 mg/l | 1.8 mg/l |
| Mn | 0.16 mg/l | 0.08 mg/l | 0.05 mg/l |
| Phenols | <0.001 mg/l | <0.001 mg/l | <0.001 mg/l |
| Na | 2438.0 mg/l | 320.0 mg/l | 342.0 mg/l |
| SO 4 | 2833.0 mg/l | 192.0 mg/l | 189.0 mg/l |
| pH | 7.6 | 8.4 | 8.7 |
| | 7.6 | 8.4 | 8.7 |
| | 7.6 | 8.4 | 8.7 |
| | 7.6 | 8.4 | 8.7 |
| EC | 5600 umhos/cm | 1200 umhos/cm | 1150 umhos/cm |
| | 5600 umhos/cm | 1200 umhos/cm | 1150 umhos/cm |
| | 5600 umhos/cm | 1200 umhos/cm | 1150 umhos/cm |
| | 5600 umhos/cm | 1200 umhos/cm | 1150 umhos/cm |
| TOC | 7.8 mg/l | 1.0 mg/l | 6.0 mg/l |
| | 7.9 mg/l | 1.5 mg/l | 6.0 mg/l |
| | 8.0 mg/l | 2.0 mg/l | 5.5 mg/l |
| | 8.2 mg/l | 1.0 mg/l | 5.9 mg/l |
| TOX | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| Toxaphene | <0.005 mg/l | <0.005 mg/l | <0.005 mg/l |
| 2,4,-D | <0.1 mg/l | <0.1 mg/l | <0.1 mg/l |
| 2,4,5-TP | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| Gross Alpha | 0 ± 187 pCi/l | 0 ± 48 pCi/l | 0 ± 51 pCi/l |
| Gross Beta | 0 ± 1097 pCi/l | 72 ± 281 pCi/l | 0 ± 273 pCi/l |
| Turbidity | 78 FTU | 86 FTU | 66 FTU |
| Radium | <5 pCi/l | <5 pCi/l | <5 pCi/l |

ANALYTE

SAMPLE ID/ANALYTICAL RESULTS

| | 8510101235
SMW-3 | 8510101325
SMW-6 | 8510101430
SMW-2 |
|--------------|----------------------------|----------------------------|----------------------------|
| As | 0.063 mg/l | <0.050 mg/l | 0.10 mg/l |
| Ba | 1.7 mg/l | <1.0 mg/l | 4.0 mg/l |
| Cr | <0.050 mg/l | <0.050 mg/l | <0.050 mg/l |
| Cd | <0.010 mg/l | <0.010 mg/l | 0.10 mg/l |
| Hg | <0.002 mg/l | <0.002 mg/l | <0.002 mg/l |
| Se | 0.10 mg/l | 0.020 mg/l | 0.13 mg/l |
| Ag | <0.050 mg/l | <0.050 mg/l | <0.050 mg/l |
| Pb | <0.050 mg/l | <0.050 mg/l | 0.19 mg/l |
| F | 0.43 mg/l | 0.63 mg/l | 0.34 mg/l |
| NO 3 as N | 0.2 mg/l | 0.2 mg/l | 2.0 mg/l |
| Endrin | <0.0002 mg/l | <0.0002 mg/l | <0.0002 mg/l |
| Methoxychlor | <0.1 mg/l | <0.1 mg/l | <0.1 mg/l |
| Lindane | <0.004 mg/l | <0.004 mg/l | <0.004 mg/l |
| Cl | 42.0 mg/l | 70.0 mg/l | 1985.0 mg/l |
| Fe | 0.04 mg/l | 0.62 mg/l | 0.62 mg/l |
| Mn | 0.02 mg/l | 0.17 mg/l | 2.0 mg/l |
| Phenols | <0.001 mg/l | <0.001 mg/l | <0.001 mg/l |
| Na | 440.0 mg/l | 348.0 mg/l | 2660.0 mg/l |
| SO 4 | 1784.0 mg/l | 261.0 mg/l | 3473.0 mg/l |
| pH | 8.0 | 8.4 | 7.7 |
| | 8.0 | 8.4 | 7.7 |
| | 8.0 | 8.4 | 7.7 |
| | 8.0 | 8.4 | 7.7 |
| EC | 3075 umhos/cm | 1275 umhos/cm | 6900 umhos/cm |
| | 3075 umhos/cm | 1275 umhos/cm | 6900 umhos/cm |
| | 3075 umhos/cm | 1275 umhos/cm | 6900 umhos/cm |
| | 3075 umhos/cm | 1275 umhos/cm | 6900 umhos/cm |
| TOC | 6.0 mg/l | 5.0 mg/l | 9.0 mg/l |
| | 6.1 mg/l | 5.5 mg/l | 9.0 mg/l |
| | 6.0 mg/l | 5.1 mg/l | 9.2 mg/l |
| | 6.5 mg/l | 5.0 mg/l | 8.9 mg/l |
| TOX | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| Toxaphene | <0.005 mg/l | <0.005 mg/l | <0.005 mg/l |
| 2,4,-D | <0.1 mg/l | <0.1 mg/l | <0.1 mg/l |
| 2,4,5-TP | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| Gross Alpha | 97 ± 225 pCi/l | 4.8 ± 53 pCi/l | 0 ± 206 pCi/l |
| Gross Beta | 43 ± 1130 pCi/l | 153 ± 283 pCi/l | 1010 ± 1148 pCi/l |
| Turbidity | 7.5 FTU | 51 FTU | 27 FTU |
| Radium | <5 pCi/l | <5 pCi/l | <5 pCi/l |

TO: Geoscience Consultants, Ltd.

1485

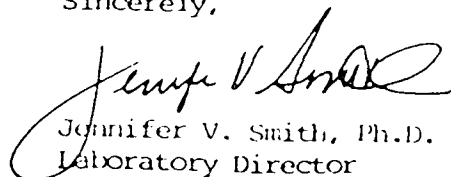
Page 3 of 4

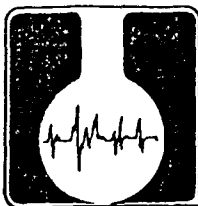
| ANALYTE | NOMINAL DETECTION LIMITS |
|--------------|--------------------------|
| As | 0.050 mg/l |
| Ba | 1.0 mg/l |
| Cr | 0.050 mg/l |
| Cd | 0.010 mg/l |
| Hg | 0.002 mg/l |
| Se | 0.002 mg/l |
| Ag | 0.050 mg/l |
| Pb | 0.050 mg/l |
| F | 0.1 mg/l |
| NO 3 as N | 0.01 mg/l |
| Endrin | 0.0002 mg/l |
| Methoxychlor | 0.1 mg/l |
| Lindane | 0.004 mg/l |
| Cl | 1.0 mg/l |
| Fe | 0.05 mg/l |
| Mn | 0.005 mg/l |
| Phenols | 0.001 mg/l |
| Na | 0.1 mg/l |
| SO 4 | 1.0 mg/l |
| pH | 0.01 |
| EC | 0.1 umhps/cm |
| TOC | 0.1 mg/l |
| TOX | 0.01 mg/l |
| Toxaphene | 0.005 mg/l |
| 2,4,-D | 0.1 mg/l |
| 2,4,5-TP | 0.01 mg/l |
| Gross Alpha | 0.1 pCi/l |
| Gross Beta | 0.1 pCi/l |
| Turbidity | 0.1 FTU/NTU |
| Radium | 5 pCi/l |

REFERENCE: "Standard Methods for the Examination of Water and Wastewater",
15th Edition, APHA, N.Y., 1980.

An invoice for services is enclosed. Thank you for contacting Assaigai Laboratories.

Sincerely,


Jennifer V. Smith, Ph.D.
Laboratory Director



ASSAIGAI ANALYTICAL LABORATORIES

TO: GeoScience Consultants
500 Copper N.W.
Albuquerque, NM 87102

DATE: 5 November 1985
1485

SAMPLE IDENTIFICATION

8510100930
8510101045
8510101140
8510101235
8510101325
8510101430

ANALYTICAL RESULTS

<1 Coliform Colonies/100 ml
<1 Coliform Colonies/100 ml
<1 Coliform Colonies/100 ml
<1 Coliform Colonies/100 ml
<1 Coliform Colonies/100 ml
<1 Coliform Colonies/100 ml

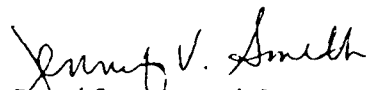
NOMINAL DETECTION LIMIT: 1

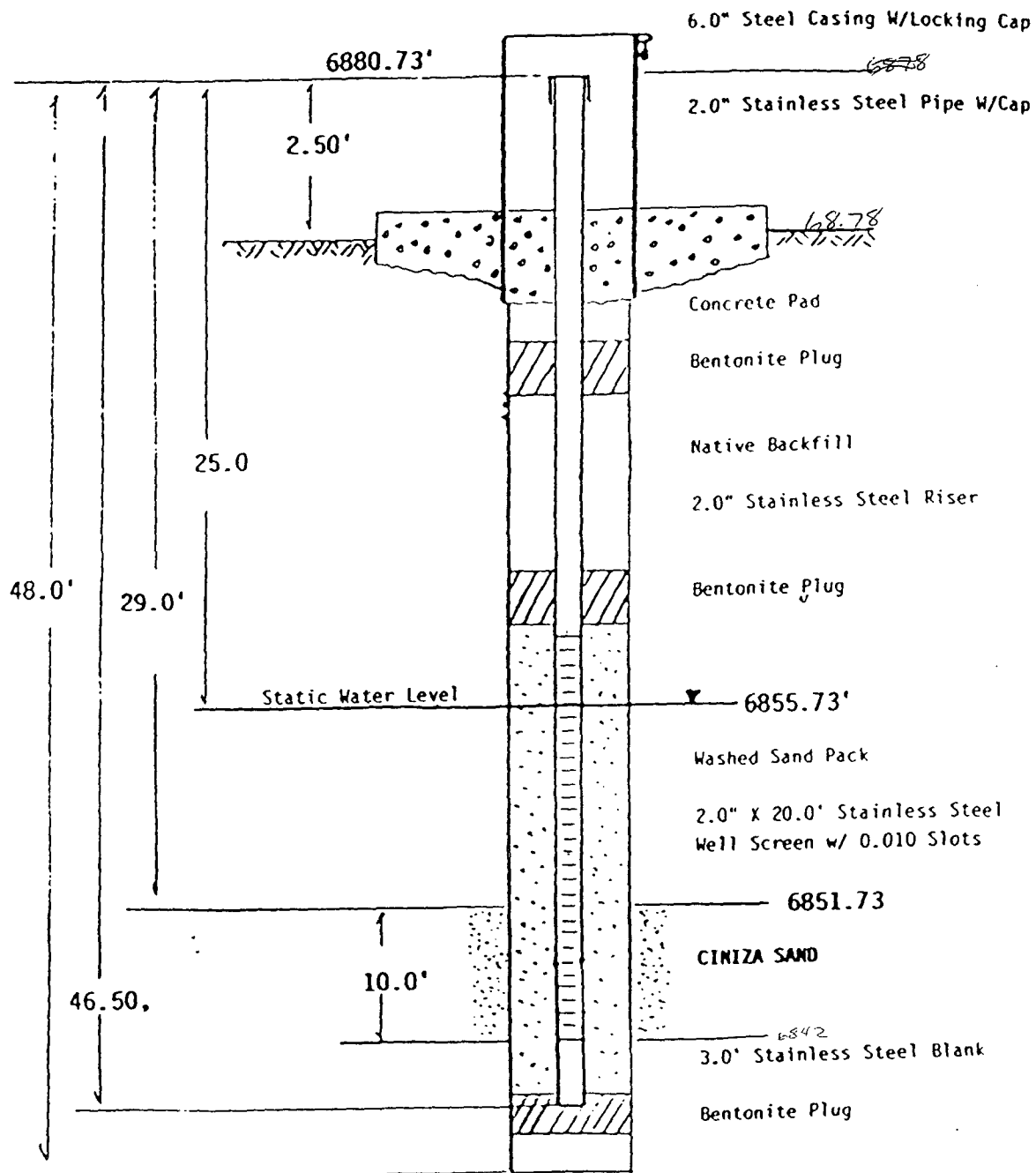
Coliforms were confirmed according to the procedures in the Water Supply Laboratory Certification Manual , NMED-EID.

REFERENCE: "Standard Methods for the Examination of Water and Wastewater",
15th Edition, APHA, N.Y., 1980.

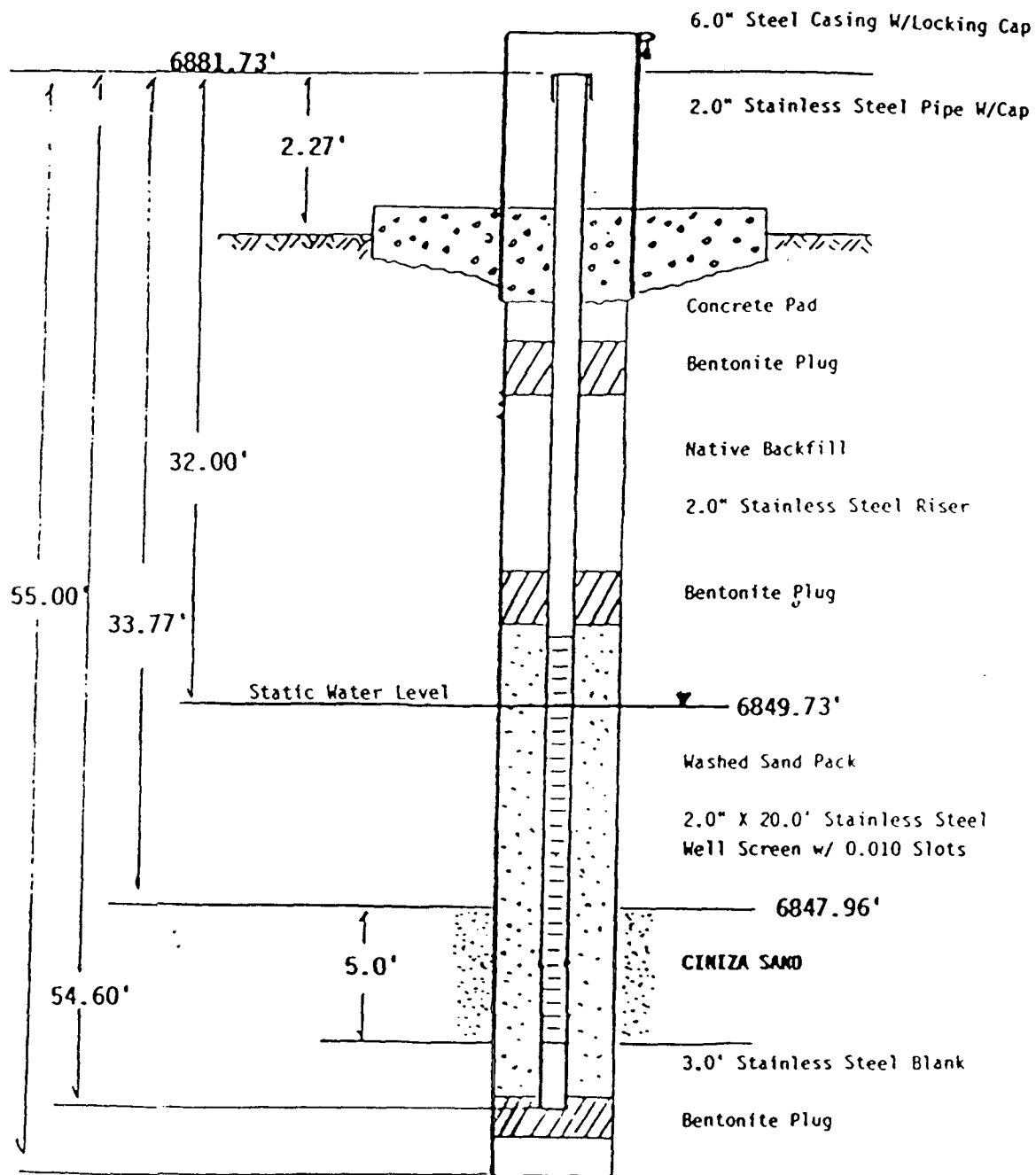
An invoice for services is enclosed. Thank you for contacting Assaigai Laboratories.

Sincerely,

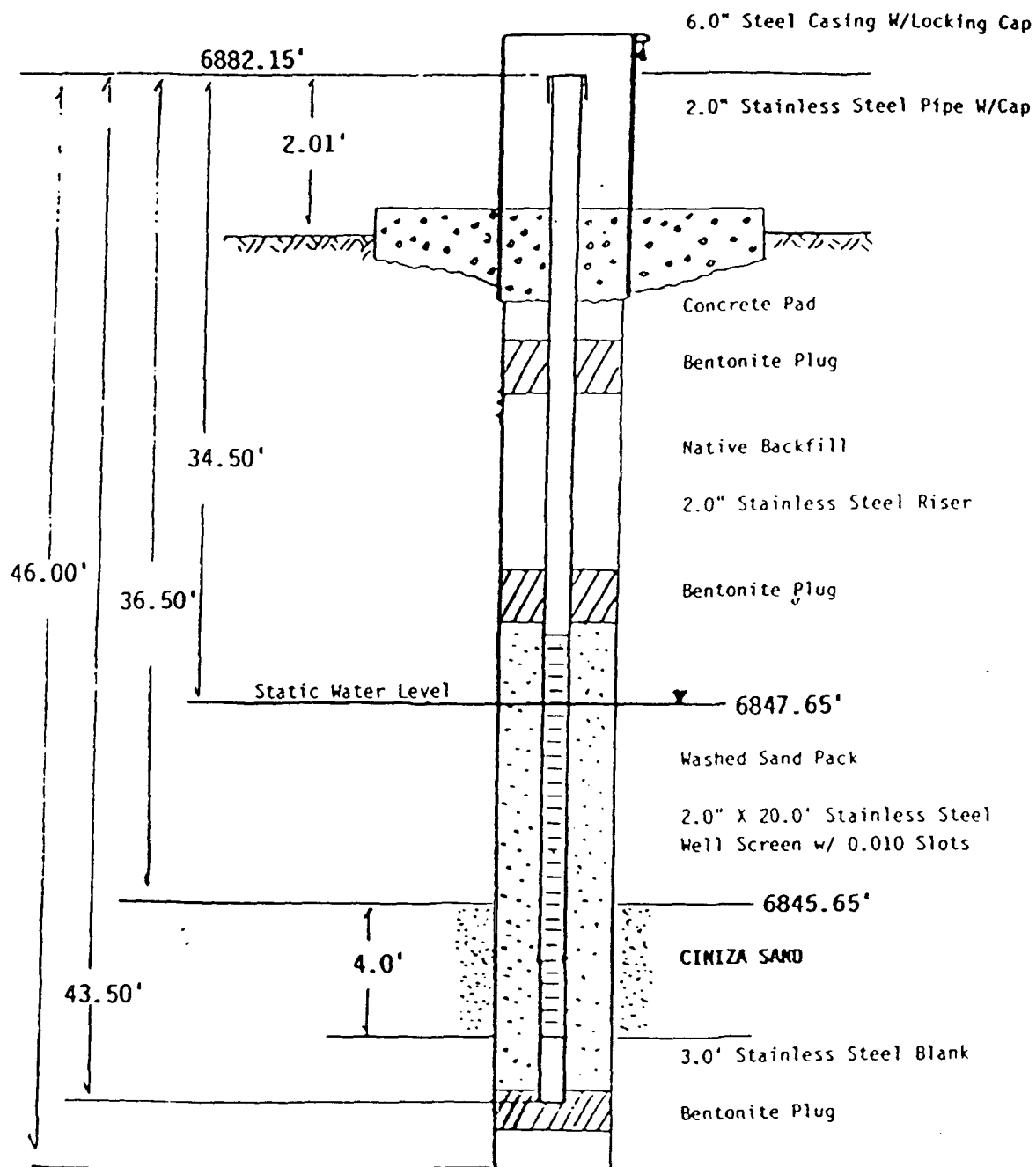

Jennifer V. Smith, Ph.D.
Laboratory Director



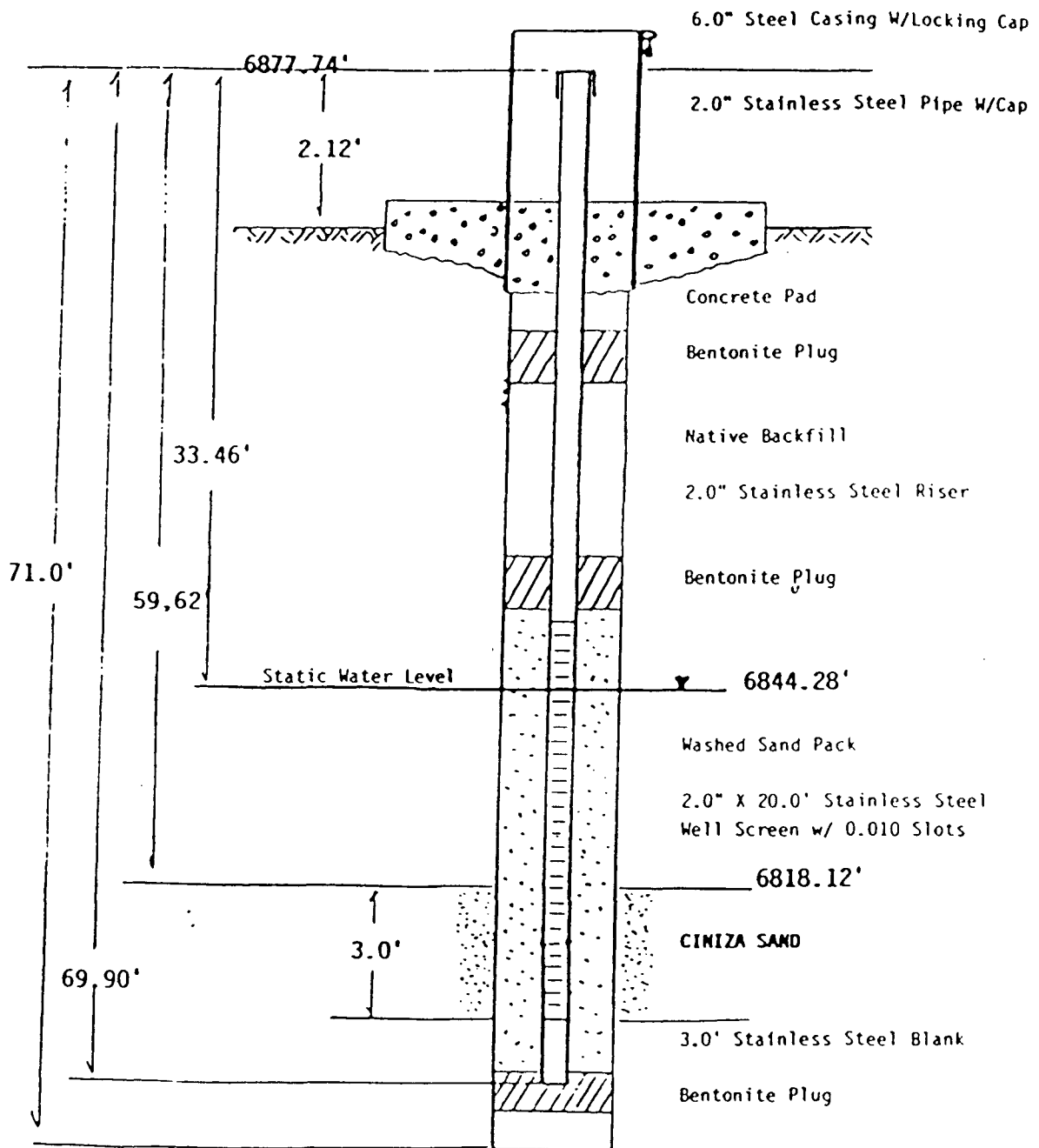
COMPLETION DIAGRAM FOR WELL SMW-1



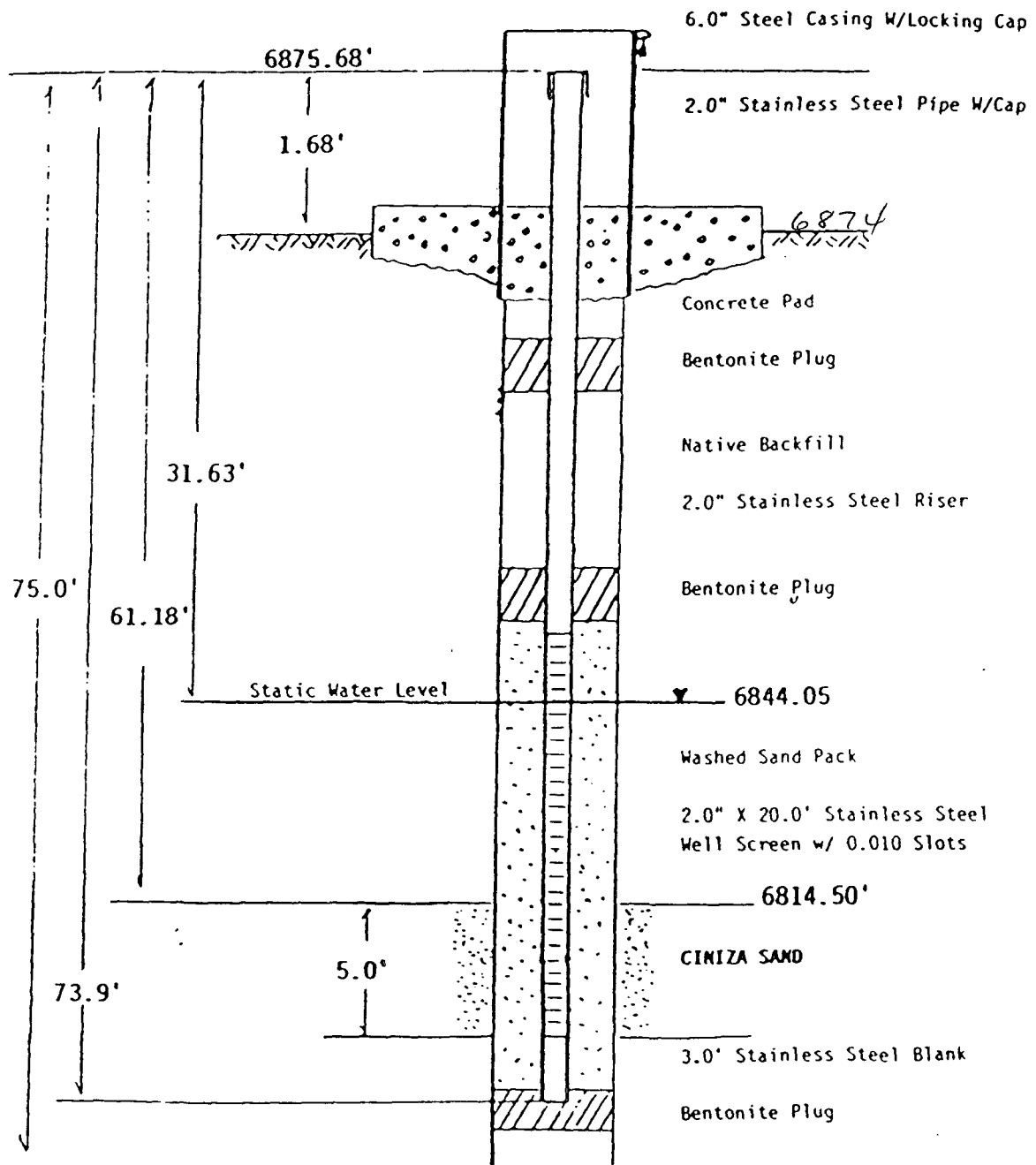
COMPLETION DIAGRAM FOR WELL SMW-2



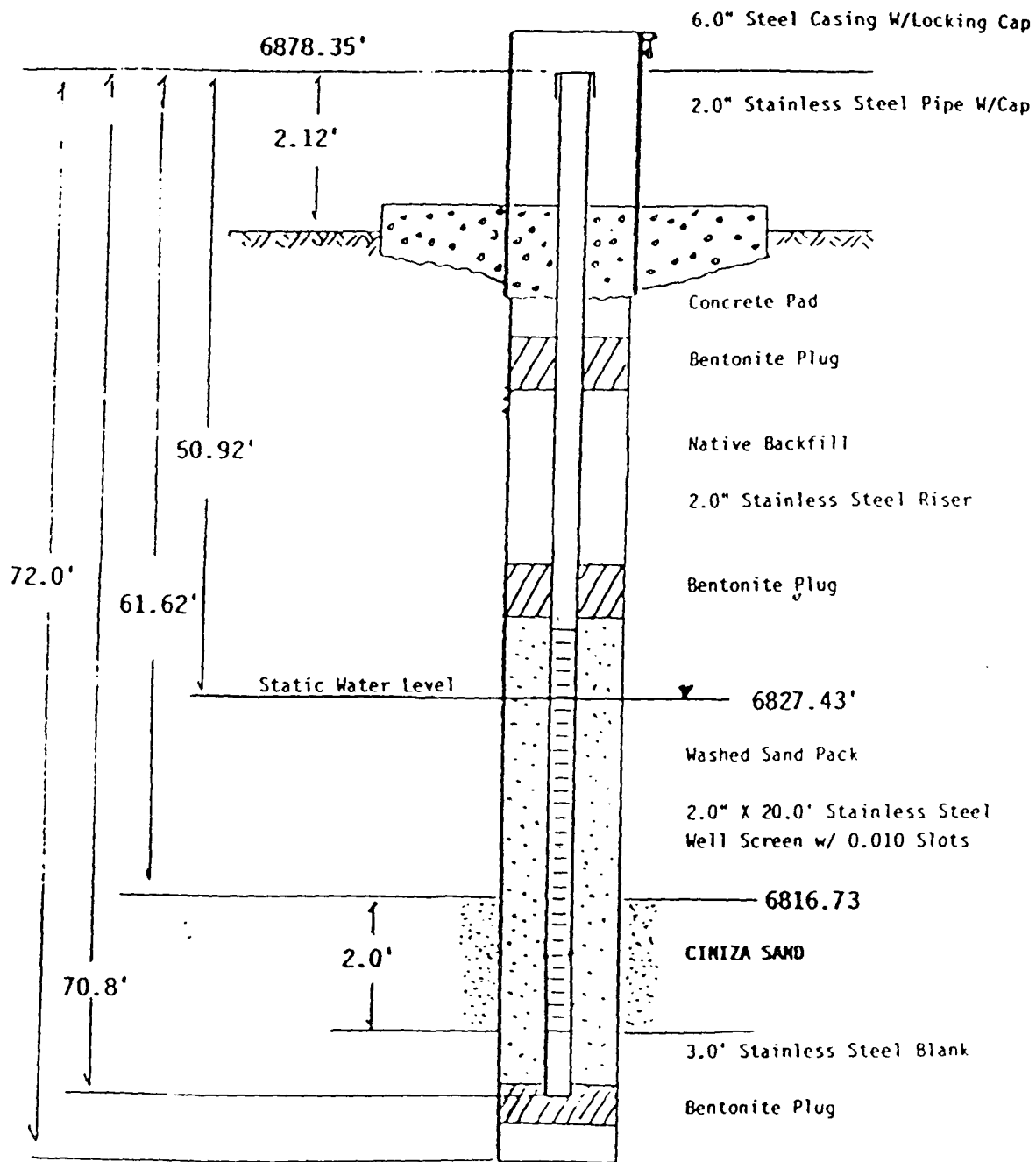
COMPLETION DIAGRAM FOR WELL SMW-3



COMPLETION DIAGRAM FOR WELL SMW-4



COMPLETION DIAGRAM FOR WELL SMW-5



COMPLETION DIAGRAM FOR WELL SMW-6

