

 **ENTERED**



GROUNDWATER SAMPLING AND ANALYSIS PLAN

GIANT REFINING COMPANY - BLOOMFIELD
NMD 089 416 416
MAY, 1997

GENERAL:

Giant Refining Company - Bloomfield (GRC) is currently operating according to the requirements of a RCRA Part B permit application, under authority of the New Mexico Environment Department (NMED), a 3008 (h) Administrative Order on Consent, under authority of the United States EPA (EPA), and a Groundwater Discharge Permit, GW-001, under authority of the New Mexico Oil Conservation Division (OCD).

GRC assumed the requirements of monitoring and remediation activities associated with the oily water ponds, the OCD permit and a hydrocarbon plume beneath the facility that was discovered and delineated by previous owners of the facility. The specific requirements include RCRA monitoring of two upgradient wells (MW-21 and RW-15) and three downgradient wells (MW-9, MW-20 and RW-18) associated with the oily water ponds, which are required by the TC rule of 1990, and two upgradient wells (MW-1 and MW-5) that are monitored in accordance with the OCD Groundwater Discharge Plan.

Monitor wells MW-9, MW-20, and MW-21 and recovery wells RW-15 and RW-18 are also monitored in association with the 3008 (h) Administrative Order on Consent which addresses, among other things, a hydrocarbon plume on the uppermost groundwater beneath the facility. The presence of the hydrocarbon on the groundwater affects the ability to detect whether or not a release from the oily water ponds has taken place, making that data questionable in practical use.

Nevertheless, those wells continue to be monitored until further changes in the sampling requirements are made.

A site plan showing the monitoring and recovery well locations is provided in Attachment I. Well data and measurements are provided in Attachment II.

Water quality of the affected wells is compared to the baseline background water quality that was established for the facility in 1991. Additional background values are found in

the "Final Report on Section 3013 Administrative Order Work Elements". The 1991 data will become the background values for statistical comparison of some indicator values as needed.

The baseline groundwater data, obtained in 1991, is provided in Attachment III.

SAMPLE COLLECTION:

Samples are collected on a semi-annual basis from each well in the following order:

- MW-5
- MW-1
- MW-21
- RW-15
- MW-20
- MW-9
- RW-18

This order is to minimize the possibility of cross contamination of wells.

PARAMETERS:

Sample parameters for the semi-annual monitoring of the wells is included as Attachment IV.

SAMPLE COLLECTION METHODS:

Groundwater elevation measurements of monitor wells will be taken prior to purging and will include depth to hydrocarbon (if present), depth to water, and total depth using an interface probe graduated in 1/100th of an inch. A log of all depth measurements will be kept in the log book. Depth measurements of recovery wells will be taken only when the recovery pump and hose assembly is removed from the well and sufficient time has been allowed for the groundwater to stabilize. The recovery wells shall be shut in, allowed to stabilize and depth measurements taken no less frequently than every three years.

Monitoring wells will be purged at least three well volumes using a down hole pump. Once purging is complete, samples will be collected either with the down hole pump or using a Teflon bail. Recovery wells will be sampled directly from the existing recovery pumps, with no requirements for purging three well volumes. Water from the purging activities will be directed into process wastewater drains or caught in drums for disposal in the process wastewater system.

Each sample will be collected in a manner to preclude floating hydrocarbon from affecting the water sample, generally by collecting the sample in a glass beaker and decanting the product off the sample.

During sampling, normal protocol to be followed includes the use of latex gloves that are discarded after each well's sample collection and by providing for a collection area that will not allow samples to be affected as they are collected. All samples will be collected into bottles supplied by the analytical laboratory. Samples will be collected in the following order for the RCRA wells:

- VOCs
- TOC
- TOX
- pH
- Specific Conductance

and the following order for OCD wells:

- VOCs
- pH
- General Chemistry
- Dissolved Metals

pH and conductivity will be determined in the field. Samples for determination of dissolved metals will be filtered in the GRC lab using appropriate filter media.

All sampling equipment, including the pump, will be decontaminated between wells by washing with Alconox (or equivalent) soap, followed by rinsing with propanol (if hydrocarbon is present), followed by a final rinse with distilled water. If hydrocarbon is present, water with Alconox soap will be pumped through the through the pump and hose assembly followed by pumping with clean water.

SAMPLE PRESERVATION AND SHIPMENT:

Samples will be immediately labeled, preserved and packed in coolers (with blue ice or equivalent), and immediately delivered to the analytical laboratory. Preservation requirements are provided in Attachment V.

ANALYTICAL PROCEDURES:

Analytical procedures are provided in Attachment IV.

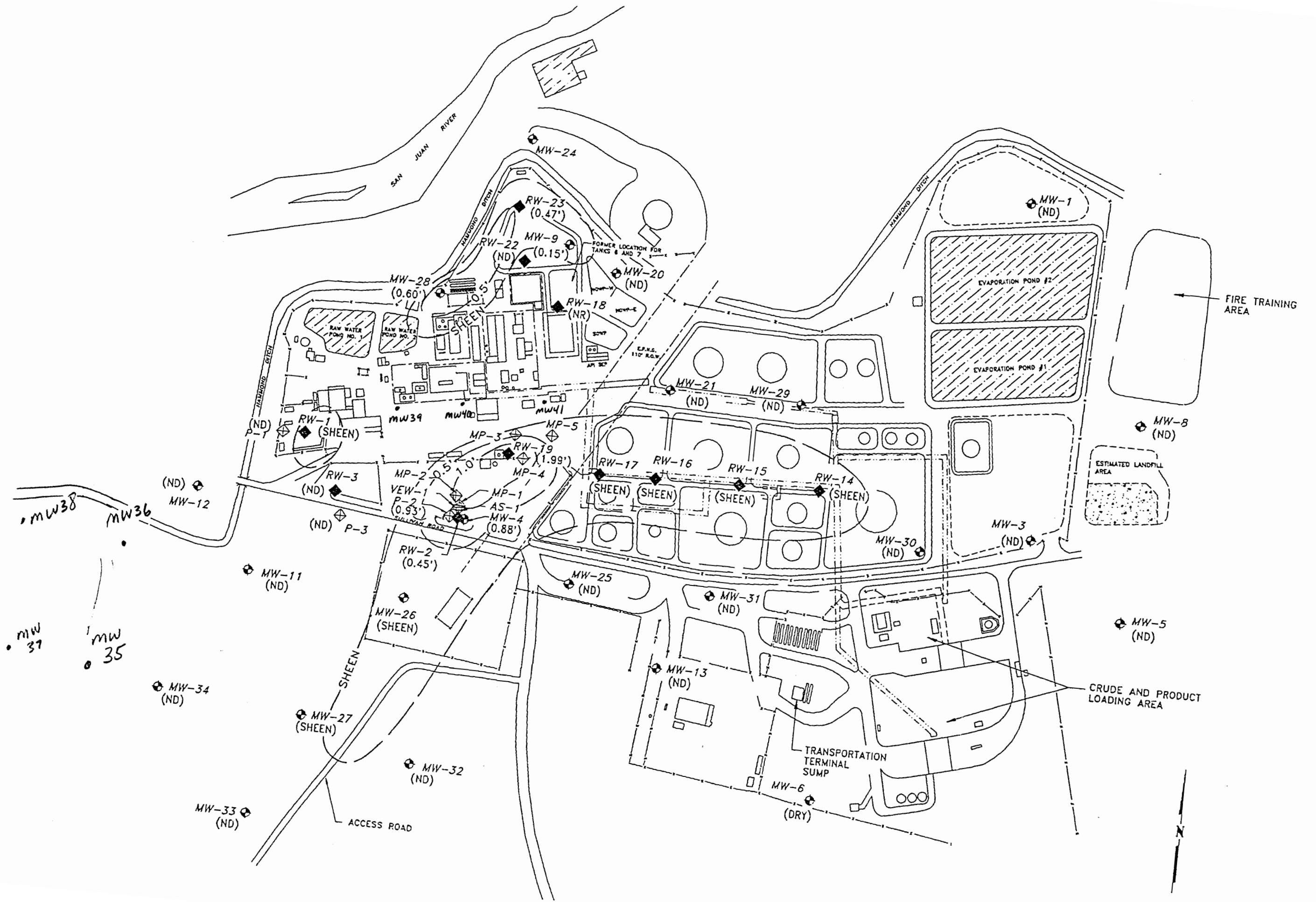
CHAIN OF CUSTODY CONTROL:

Chain of custody control will be utilized. A sample of a chain of custody form is provided in Attachment VI.

SAMPLE DISPOSAL:

Arrangements may be made with GRC and the analytical lab to dispose of excess sample material by returning the material to the process wastewater system at this facility.

ATTACHMENT I.



ATTACHMENT II.

GIANT REFINING COMPANY - BLOOMFIELD

MONITOR AND RECOVERY WELL DATA AND ELEVATIONS

APRIL, 1997

WELL #	DATE INSTALLED	ELEV. T.O.P. (FT)	ELEV. GRADE (FT)	STICKUP (FT)	DEPTH OF CASING FR T.O.P. (FT)	ELEV. TOP OF SCREEN (FT)	SCREEN INTERVAL (FT)	ELEV. BTM OF SCREEN (FT)	ELEV. TOP OF GRAVEL (FT)	ELEV. TOP OF NACIMTO (FT)	AQUIFER THKNNESS (FT)	GRAVEL THKNNESS (FT)
MW-1	2/9/84	5515.78	5514.08	1.70	24.65	5511.13	20.00	5491.13	5509.08	5492.08	6.81	17.00
MW-5	2/6/84	5545.13	5544.13	1.00	51.61	5513.52	20.00	5493.52	5509.13	5497.13	4.27	12.00
MW-9*	3/3/86	5519.77	5518.07	1.70	33.99	5507.78	20.00	5487.78	5503.07	5489.77	7.81	13.30
RW-15*	8/7/90	5533.44	5531.74	1.70	43.40	5510.04	18.00	5492.04	5512.74	5496.74	2.98	16.00
RW-18*	8/8/90	5526.08	5523.48	2.60	39.95	5506.13	18.00	5488.13	5504.48	5494.48	5.59	10.00
MW-20*	9/13/91	5516.46	5514.66	1.80	27.18	5506.28	15.00	5491.28	5504.16	5490.66	7.23	13.50
MW-21*	9/16/91	5518.62	5517.02	1.60	30.93	5504.69	15.00	5489.69	5505.02	5492.52	6.01	12.50

* RCRA Wells

GIANT REFINING COMPANY BLOOMFIELD

MONITOR AND RECOVERY WELL DATA AND ELEVATIONS

APRIL, 1997

WELL #	DATE INSTALLED	ELEV. T.O.P. (FT)	ELEV. GRADE (FT)	STICKUP (FT)	DEPTH OF CASING FR T.O.P. (FT)	ELEV. TOP OF SCREEN (FT)	SCREEN INTERVAL (FT)	ELEV. BTM OF SCREEN (FT)	ELEV. TOP OF GRAVEL (FT)	ELEV. TOP OF NACIMTO (FT)	AQUIFER THKNNESS (FT)	GRAVEL THKNNESS (FT)
MW-1	2/9/84	5515.78	5514.08	1.70	24.65	5511.13	20.00	5491.13	5509.08	5492.08	6.81	17.00
MW-3	2/9/84	5535.88	5534.88	1.00	39.35	5516.53	20.00	5496.53	5507.88	5494.88	6.54	13.00
MW-4	2/9/84	5524.46	5523.06	1.40	32.50	5511.96	20.00	5491.96	5508.06	5491.06	8.13	17.00
MW-5	2/6/84	5545.13	5544.13	1.00	51.61	5513.52	20.00	5493.52	5509.13	5497.13	4.27	12.00
MW-6	2/7/84	5551.20	5549.60	1.60	49.63	5521.57	20.00	5501.57	5508.60	5500.60	0.00	8.00
MW-7	2/25/86	5524.25	5523.15	1.10	62.11	5474.14	10.00	5464.14	5506.15	5491.15	7.73	15.00
MW-8	2/28/86	5531.17	5530.17	1.00	34.94	5518.23	20.00	5498.23	5510.17	5496.17	5.26	14.00
MW-9	3/3/86	5519.77	5518.07	1.70	33.99	5507.78	20.00	5487.78	5503.07	5489.77	7.81	13.30
RW-1	8/31/88	5526.01	5524.61	1.40	40.98	5507.21	15.60	5491.61	5506.61	5492.01	6.01	14.60
P-1	8/30/88	5524.49	5523.69	0.80	42.45	5503.19	16.00	5487.19	5503.69	5487.19	10.59	16.50
RW-2	8/29/88	5523.61	5523.11	0.50	38.03	5506.58	15.70	5490.88	5508.11	5491.11	7.10	17.00
P-2	8/29/88	5523.86	5523.06	0.80	38.33	5506.13	15.30	5490.83	5510.06	5491.56	7.51	18.50
RW-3	3/4/86	5516.96	5515.56	1.40	33.93	5505.03	20.00	5485.03	5505.56	5492.56	5.25	13.00
P-3	9/1/88	5507.31	5506.51	0.80	22.80	5500.36	10.40	5489.96	5506.51	5492.51	5.40	14.00
MW-11	7/31/87	5506.89	5503.29	3.60	24.73	5497.16	10.00	5487.16	5503.29	5493.29	3.26	10.00
MW-12	8/1/87	5498.42	5495.92	2.50	14.22	5494.20	10.00	5484.20	5495.92	5485.92	3.10	10.00
MW-13	9/3/88	5538.54	5535.24	3.30	53.00	5506.51	15.80	5490.71	5508.24	5490.24	9.43	18.00
RW-14	8/6/90	5534.13	5532.23	1.90	43.00	5511.13	18.00	5493.13	5508.23	5493.73	6.28	14.50
RW-15	8/7/90	5533.44	5531.74	1.70	43.40	5510.04	18.00	5492.04	5512.74	5496.74	2.98	16.00
RW-16	8/7/90	5532.09	5530.29	1.80	43.10	5508.99	18.00	5490.99	5511.29	5492.79	5.95	18.50
RW-17	8/7/90	5530.46	5528.86	1.60	41.55	5508.91	18.00	5490.91	5503.86	5493.56	5.10	10.30
RW-18	8/8/90	5526.08	5523.48	2.60	39.95	5506.13	18.00	5488.13	5504.48	5494.48	5.59	10.00
RW-19	8/8/90	5527.27	5525.77	1.50	36.70	5510.57	18.00	5492.57	5505.77	5492.77	6.36	13.00
MW-20	9/13/91	5516.46	5514.66	1.80	27.18	5506.28	15.00	5491.28	5504.16	5490.66	7.23	13.50
MW-21	9/16/91	5518.62	5517.02	1.60	30.93	5504.69	15.00	5489.69	5505.02	5492.52	6.01	12.50
RW-22	7/19/93	5521.05	5518.05	3.00	35.73	5503.32	16.00	5487.32	5503.05	5491.05	6.87	12.00
RW-23	7/19/93	5517.74	5515.74	2.00	35.39	5500.35	16.00	5484.35	5508.74	5486.74	10.42	22.00
MW-24	9/15/93	5508.23	5505.23	3.00	14.85	5493.38	0.00	5493.38	5503.23	5492.88	0.50	10.35
MW-25	5/11/94	5530.45	5527.35	3.10	41.24	5505.21	14.00	5491.21	5502.85	5492.35	6.93	10.50
MW-26	5/12/94	5514.54	5512.44	2.10	25.25	5505.29	14.00	5491.29	5504.44	5492.44	6.02	12.00
MW-27	5/18/94	5515.26	5512.46	2.80	24.49	5507.77	15.00	5492.77	5505.46	5494.46	3.21	11.00
MW-28	5/13/94	5524.52	5522.52	2.00	37.15	5504.37	15.00	5489.37	5505.52	5490.52	7.71	15.00
MW-29	5/12/94	5521.55	5518.55	3.00	28.74	5508.81	14.00	5494.81	5506.55	5495.55	4.45	11.00
MW-30	5/13/94	5533.42	5531.42	2.00	40.16	5510.26	15.00	5495.26	5509.42	5496.42	4.83	13.00
MW-31	5/12/94	5532.17	5530.57	1.60	39.22	5508.95	14.00	5494.95	5504.57	5496.57	2.95	8.00
MW-32	2/23/95	5522.22	5521.42	0.80	27.54	5510.68	14.00	5496.68	5511.42	5496.42	1.79	15.00
MW-33	2/23/95	5518.46	5515.86	2.60	25.55	5508.91	14.00	5494.91	5508.86	5485.86	0.00	23.00
MW-34	2/23/95	5508.23	5505.53	2.70	21.02	5503.21	14.00	5489.21	5496.53	5491.53	2.99	5.00
MW-35	4/30/97											
MW-36	4/30/97											
MW-37	4/30/97											
MW-38	5/1/97											
MW-39	3/3/97											
MW-40	3/3/97											
MW-41	3/4/97											

This data not available 5/97.

ATTACHMENT III.

GIANT REFINING COMPANY - BLOOMFIELD

BASELINE GROUNDWATER DATA

1991

PARAMETER	UNITS	MW-21	MW-20	MW-9	RW-18	RW-15
Benzene	mg/l	0.001	0.002	16.200	3.830	16.100
Ethyl Benzene	mg/l	0.011	0.000	0.309	0.000	1.780
Toluene	mg/l	0.000	0.000	8.700	0.000	23.700
Xylenes (total)	mg/l	0.001	0.004	10.820	0.000	18.760
Arsenic	mg/l	0.000	0.005	0.013	0.000	0.000
Barium	mg/l	0.000	0.000	1.600	1.100	0.800
Cadmium	mg/l	0.000	0.000	0.000	0.000	0.000
Chromium	mg/l	0.000	0.020	0.000	0.000	0.000
Lead	mg/l	0.000	0.000	0.000	0.000	0.000
Mercury	mg/l	0.000	0.000	0.000	0.000	0.000
Selenium	mg/l	0.000	0.000	0.000	0.000	0.000
Silver	mg/l	0.010	0.000	0.000	0.000	0.000
Nitrate (as N)	mg/l	0.000	0.000	0.000	0.000	0.000
Fluoride	mg/l	0.480	0.270	0.330	0.330	0.290
Iron	mg/l	0.810	0.590	5.380	0.060	2.610
Manganese	mg/l	6.230	3.860	3.220	4.690	4.590
Chloride	mg/l	481	193	123	228	730
Phenol	mg/l	0.000	0.000	0.115	0.044	0.059
Sodium	mg/l	604	398	471	492	750
Sulfate	mg/l	416	20	12	24	2
ph	s.u.	7.2	7.2	7.0	7.1	7.3
ph	s.u.	7.2	7.2	7.0	7.1	7.3
ph	s.u.	7.2	7.2	7.0	7.1	7.3
ph	s.u.	7.2	7.2	7.0	7.1	7.3
ph Average	s.u.	7.2	7.2	7.0	7.1	7.3
Specific Conductance		3600	2500	2300	2600	4000
Specific Conductance		3600	2500	2300	2600	4000
Specific Conductance		3600	2500	2300	2600	4000
Specific Conductance		3600	2500	2300	2600	4000
Spec. Cond. Average		3600	2500	2300	2600	4000
Total Organic Carbon	mg/l	12.1	19.6	58.7	50.9	27.6
Total Organic Carbon	mg/l	12.2	19.9	59.8	48.1	27.1
Total Organic Carbon	mg/l	12.3	19.6	66.6	48.4	26.9
Total Organic Carbon	mg/l	12.0	19.6	68.2	48.3	27.3
T.O.C. Average	mg/l	12.2	19.7	63.3	48.9	27.2
Total Organic Halogen	mg/l	0.068	0.035	0.041	0.038	0.206
Total Organic Halogen	mg/l	0.066	0.039	0.044	0.036	0.202
Total Organic Halogen	mg/l	0.056	0.033	0.037	0.052	0.215
Total Organic Halogen	mg/l	0.069	0.041	0.041	0.034	0.194
T.O.X. Average	mg/l	0.065	0.037	0.041	0.040	0.204

ATTACHMENT IV.

GIANT REFINING COMPANY - BLOOMFIELD

ANALYTICAL REQUIREMENTS

RCRA		(5 wells - MW-21, RW-15, MW-20, MW-9, RW-18)		Semi-Annually
<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>	<u>Comments</u>	
Benzene	8020	0.2 ug/L	No MTBE	
Ethylbenzene	8020	0.2 ug/L		
Toluene	8020	0.2 ug/L		
Total Xylenes	8020	0.2 ug/L		
pH			4 Replicates	
Specific Conductance			4 Replicates	
TOC	505	0.01	If no hydrocarbon present	
TOX	9020	0.01	“	
OCD Groundwater (GW001)		(2 wells - MW-1, MW-5)		Semi-Annually
<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>	<u>Comments</u>	
Benzene	8020	0.2 ug/L	No MTBE	
Ethylbenzene	8020	0.2 ug/L		
Toluene	8020	0.2 ug/L		
Total Xylenes	8020	0.2 ug/L		
pH	----	-----		
Dissolved Metals:				
Arsenic	7060/7040	0.005 mg/L		
Barium	6010 ICAP	0.500 mg/L		
Cadmium	6010 ICAP	0.002 mg/L		
Chromium	6010 ICAP	0.020 mg/L		
Lead	6010 ICAP	0.005 mg/L		
Boron	6010 ICAP	0.010 mg/L		
Iron	6010 ICAP	0.050 mg/L		
Manganese	6010 ICAP	0.020 mg/L		
General Chemistry:				
TDS	----	1.000 mg/L		
Chloride	325.3	1.000 mg/L		
Sulfate	375.3	1.000 mg/L		
Phenols	420.1	0.005 mg/L		
Cyanide	9010	0.010 mg/L		
Nitrate, Nitrite as N	353.3	0.020 mg/L		
Ammonia	350.2	0.010 mg/L		
TKN	351.4	0.100 mg/L		

NOTE: Detection limits may vary slightly by individual laboratory.

ATTACHMENT V.

GIANT REFINING COMPANY - BLOOMFIELD

SAMPLE PRESERVATION REQUIREMENTS

May-97

PARAMETER	METHOD
VOCs	HCl
Dissolved Metals	HNO ₃
TOC	H ₂ SO ₄
TOX	H ₂ SO ₄
Chloride	cool
Sulfate	cool
Sodium	cool
TDS	cool
Nitrate (as N)	H ₂ SO ₄
Ammonia	H ₂ SO ₄
TKN	H ₂ SO ₄
Phenols	H ₂ SO ₄

ATTACHMENT VI.



Chain of Custody Record

7300 JEFFERSON, N.E.
ALBUQUERQUE, NEW MEXICO 87109
(505) 345-8964

Lab job no.: _____ Date 5/97

3332 WEDGEWOOD
EL PASO, TEXAS 79925
(915) 593-6000

1910 N. BIG SPRING
MIDLAND, TEXAS 79705
(915) 570-1116

Page 1 of 2

MELQUIADES ALANIS
6411 LOCAL UNO
CIUDAD JUAREZ, CHIHUAHUA MEXICO 32320

Client GIANT REFINING CO - BLOOMFIELD Project Manager / Contact LYNN SHELTON

Address #5D CR 4990 Telephone No. (505) 632 8013

City / State / Zip BLOOMFIELD, NM 87413 Fax No. (505) 632 3911

Project Name / Number SEMI-ANNUAL GROWTR Samplers: (Signature) _____

Contract / Purchase Order / Quote _____

No. of Containers	Analysis Required										Remarks	
	BTEX	PH & EC	DISSOLVED METALS	GEN. CHEMISTRY	TOC	TOX						
	X	X*	X	X								
	X	X*	X	X								SEE ATTACHED
	X	X			X	X						PARAMETER LIST
	X	X			X	X						
	X	X			X	X						* PH ONLY

AAL FRACTION NUMBER	Field Sample Number / Location	Date	Time	Sample Type	Type / Size of Container	Preservation																	
						Temp.	Chemical																
	MW-1	5/97		H ₂ O	8	X	X																
	MW-5	5/97		H ₂ O	8	X	X																
	MW-9	5/97		H ₂ O	5	X	X																
	MW-20	5/97		H ₂ O	5	X	X																
	MW-21	5/97		H ₂ O	5	X	X																
	RW-15	5/97		H ₂ O	5	X	X																
	RW-18	5/97		H ₂ O	5	X	X																

SAMPLE COC

Relinquished by: Lynn Shelton
Signature: _____
Printed: LYNN SHELTON
Company: GIANT
Reason: FOR ANALYSIS

Date: 5/97
Time: 1200

Received by: _____
Signature: _____
Printed: _____
Company: _____
Reason: _____

Relinquished by: _____
Signature: _____
Printed: _____
Company: _____
Reason: _____

Date: _____
Time: _____

Received by: _____
Signature: _____
Printed: _____
Company: _____
Reason: _____

Method of Shipment: HAND DELIVERED
Shipment No. _____
Special Instructions: _____

Comments: STANDARD TURNAROUND.

After analysis, samples are to be:

- Disposed of (additional fee)
- Stored (30 days max)
- Stored over 30 days (additional fee)
- Returned to customer

TABLE 3.3
WELL LOG FOR MONITORING WELL NUMBER 9

Drilling Date: March 3, 1986

<u>Depth in Feet</u>	<u>Description</u>
0-5	Fill material, some rock
5-10	Sticky reddish brown silty clay
10-15	Lighter color silty clay, some pebbles
15-20	Lighter color silty clay, some pebbles
20-25	Cobbles, pebbles, sand
25-30	Cobbles, greenish clay, top of Nacimiento

Elevation of Top of Casing: 5519.70 feet

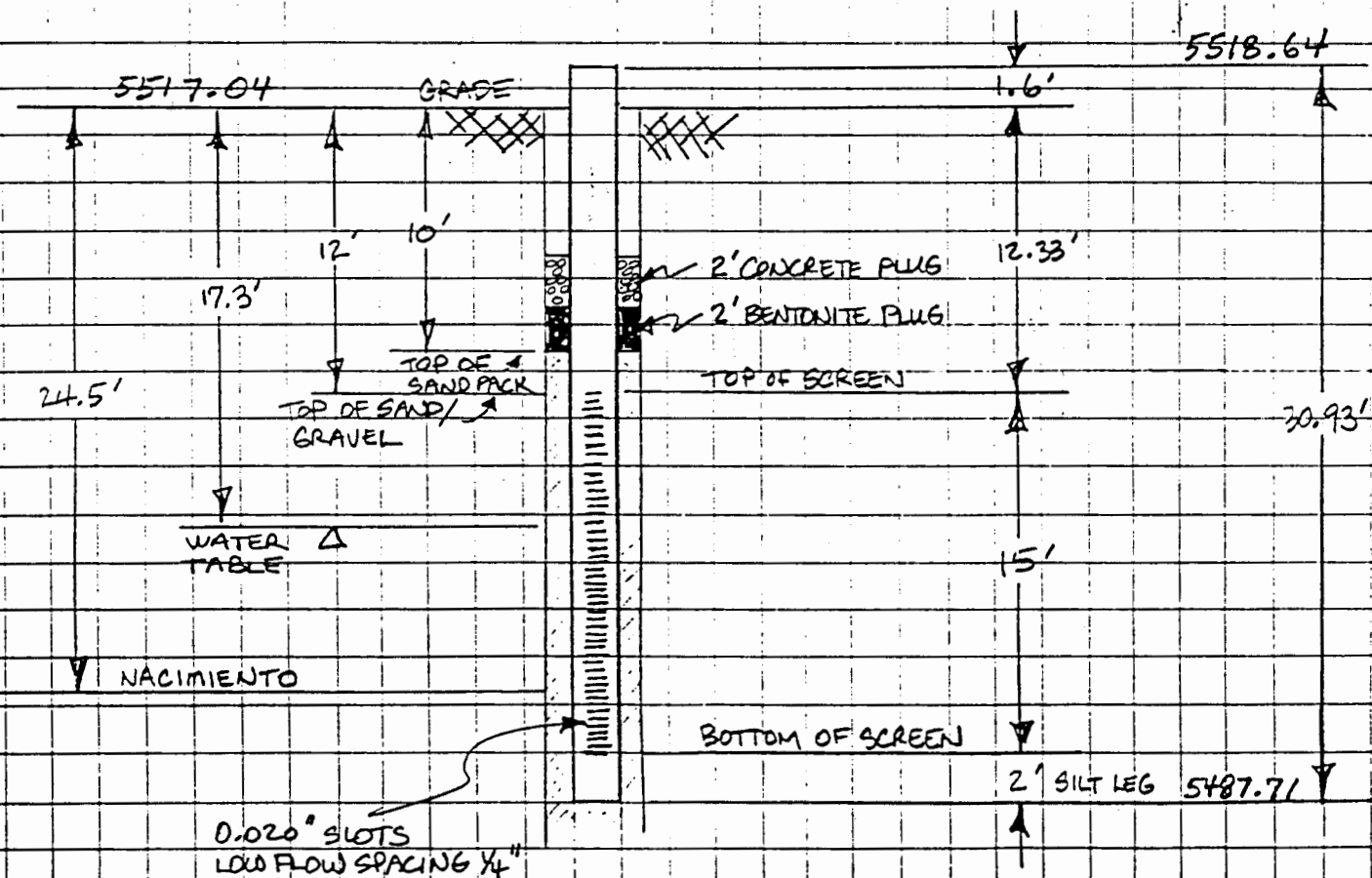
Total Depth of Casing: 33.99 feet

Description of Casing: Bottom of casing has a 2 foot stainless steel blank section for a silt trap followed by 20 feet of 6" I.D. stainless steel screen, followed by 6" I.D. schedule 40 PVC to the surface. The screened section of the hole was sanded to within 7 feet of the surface, a bentonite seal (1/2 bucket) was added and concrete was used for a surface seal.

CONSTRUCTION COMMENTS: DRILLED BY CASING DRIVER, 8" BIT, 4.5" O.D. FIBERGLASS CASING SET TO DEPTH INSIDE DRIVEN CASING; ANNULAR SPACE FILLED WITH 30/40 SAND AS DRIVEN CASING REMOVED; 50 LBS OF BENTONITE DRILLING MUD & 100 LBS OF CONCRETE PLACED ON TOP OF SAND PACK; BACKFILLED WITH DIRT TO SURFACE.

LOCATION: ALONG PIPERACK SW FROM TK 11

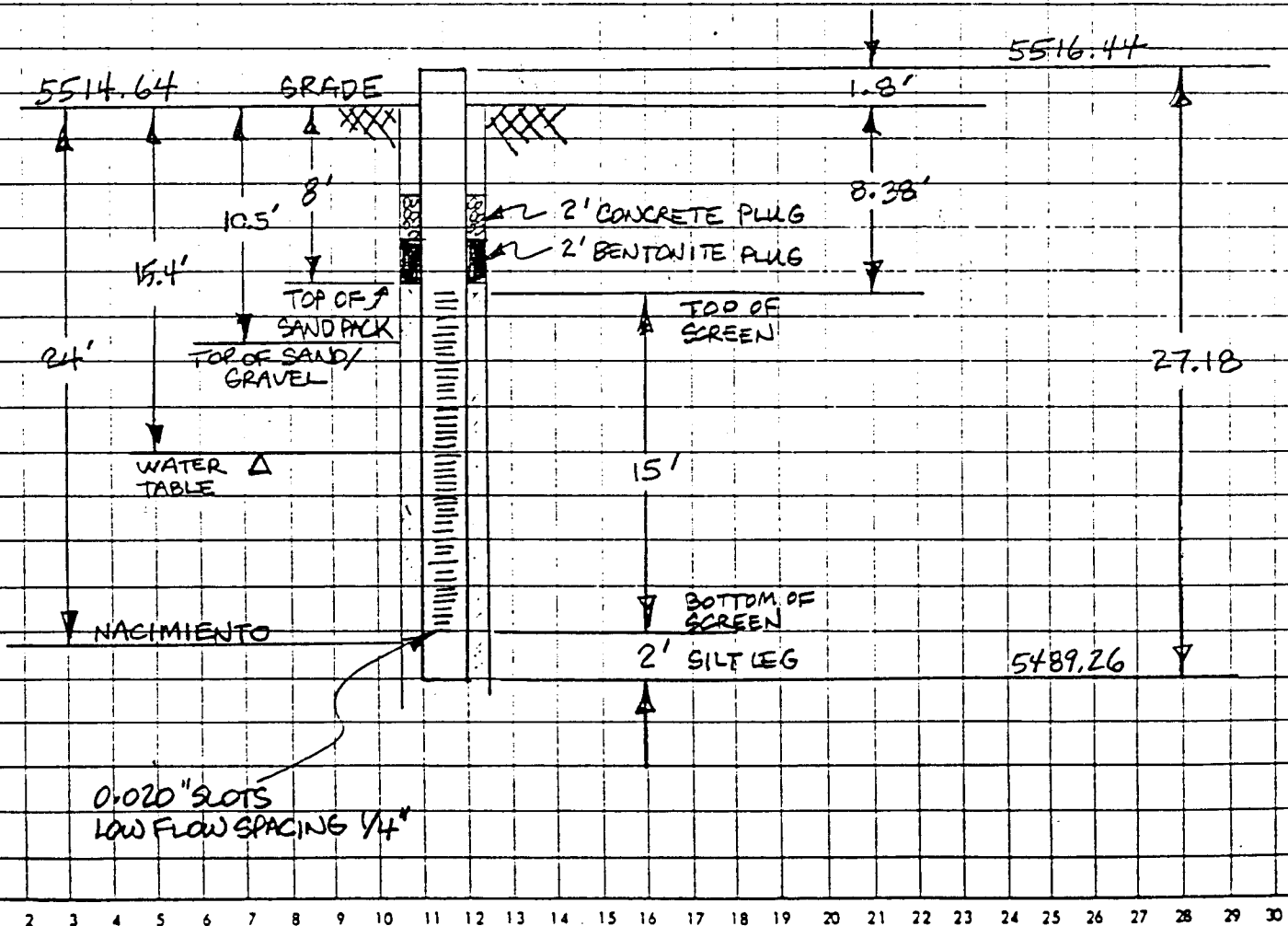
CONCRETE PAD SURFACE SEAL (NOT SHOWN)



INITIALS CJA PROJECT NO. GROUNDWATER MONITORING - SOWP & NOWP
 DATE 9-16-91 SUBJECT MW-21, UPGRADE FROM SOWP & NOWP
 DATE OF INSTALLATION: 9-16-91 SHEET 2 OF 2

CONSTRUCTION COMMENTS: DRILLED BY CASING DRIVER 8" BIT. 4.5" O.D. FIBERGLASS CASING SET TO DEPTH INSIDE DRIVER CASING; ANNULAR SPACE FILLED WITH 30/40 SAND AS DRIVEN CASING REMOVED; 50 LBS. OF BENTONITE DRILLING MUD & 100 LBS OF CONCRETE PLACED ON TOP OF SAND PACK; BACKFILLED WITH DIRT TO SURFACE.

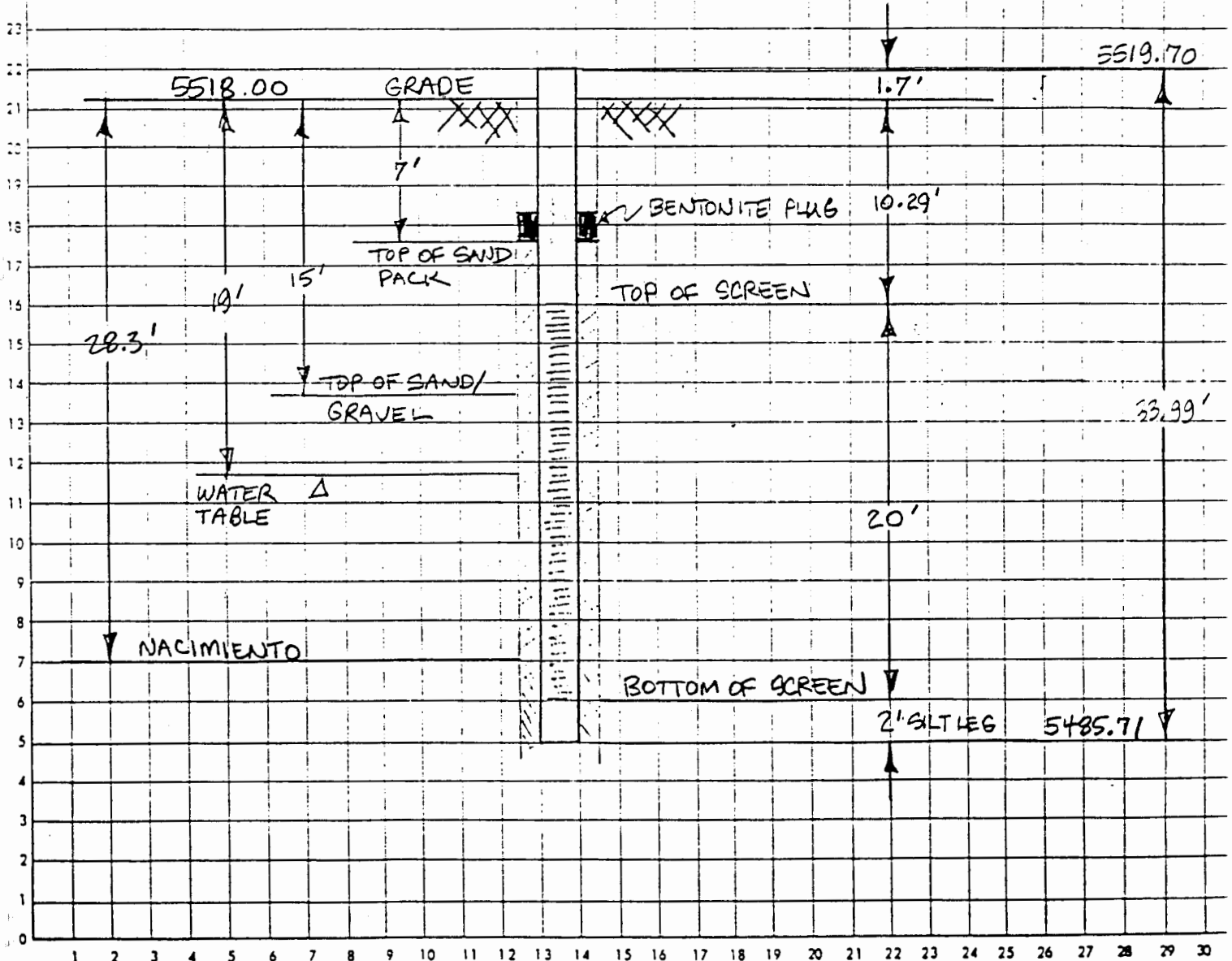
CONCRETE PAD SURFACE SEAL (NOT SHOWN)



INITIALS CH PROJECT No. GROUNDWATER MONITORING - SOWP & NOWP
 DATE 9-16-91 SUBJECT MW-20
 DATE OF INSTALLATION: 9-13-91 SHEET 1 OF 2

CONSTRUCTION COMMENTS: DRILLED UTILIZING DRILLING MUD THEN THOROUGHLY DEVELOPED. BOTTOM OF CASING TO THE TOP OF SCREEN IS 6" I.D. STAINLESS STEEL, REST OF CASING TO SURFACE IS 6" SCH. 40 PVC. TOP OF CASING HAS CONCRETE SURFACE SEAL AND STEEL PIPE WITH LOCKING HD, CASING PROTECTOR (NOT SHOWN).

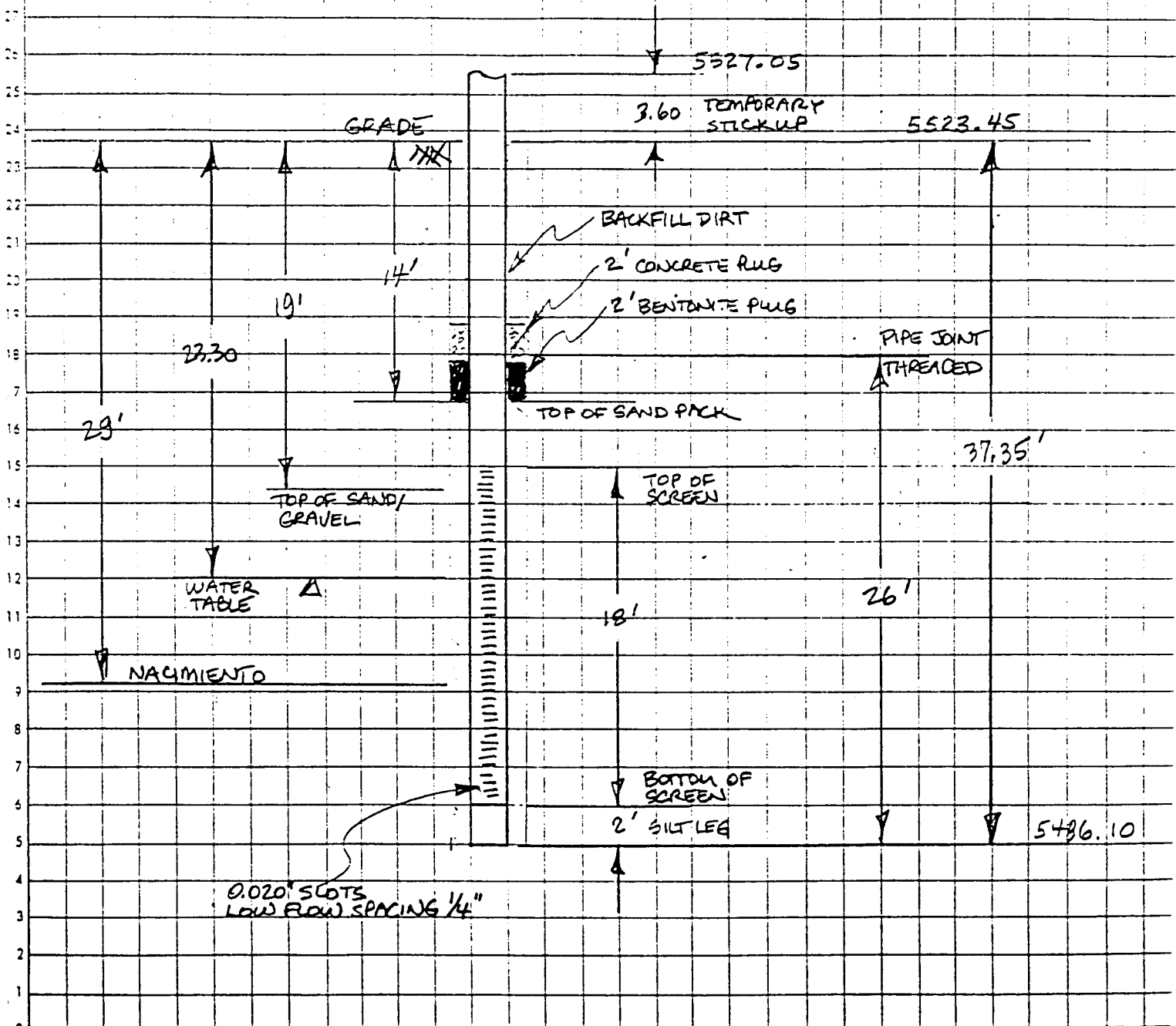
LOCATION: NEAR TANK 5, NORTHWEST OF NOWP.



INITIALS CA PROJECT No. GROUNDWATER MONITORING - SOWP & NOWP
 DATE 9-17-91 SUBJECT MW-9
 DATE OF INSTALLATION: 3-3-86 SHEET 1 OF 1

CONSTRUCTION COMMENTS: DRILLED BY CASING DRIVER, 8" BIT; 4.5" O.D. FIBERGLASS CASING SET TO DEPTH INSIDE DRIVEN CASING; ANNUAL SPACE FILLED WITH 10/20 SAND AS DRIVER CASING REMOVED; 50 LBS OF BENTONITE DRILLING MUD & 100 LBS OF CONCRETE PLACED ON TOP OF SAND PACK; BACKFILLED WITH DIRT TO SURFACE CONCRETE PAD SURFACE SEAL (NOT SHOWN)

LOCATION: WEST OF SOWP & NOWP, NORTH OF CAT/POLY

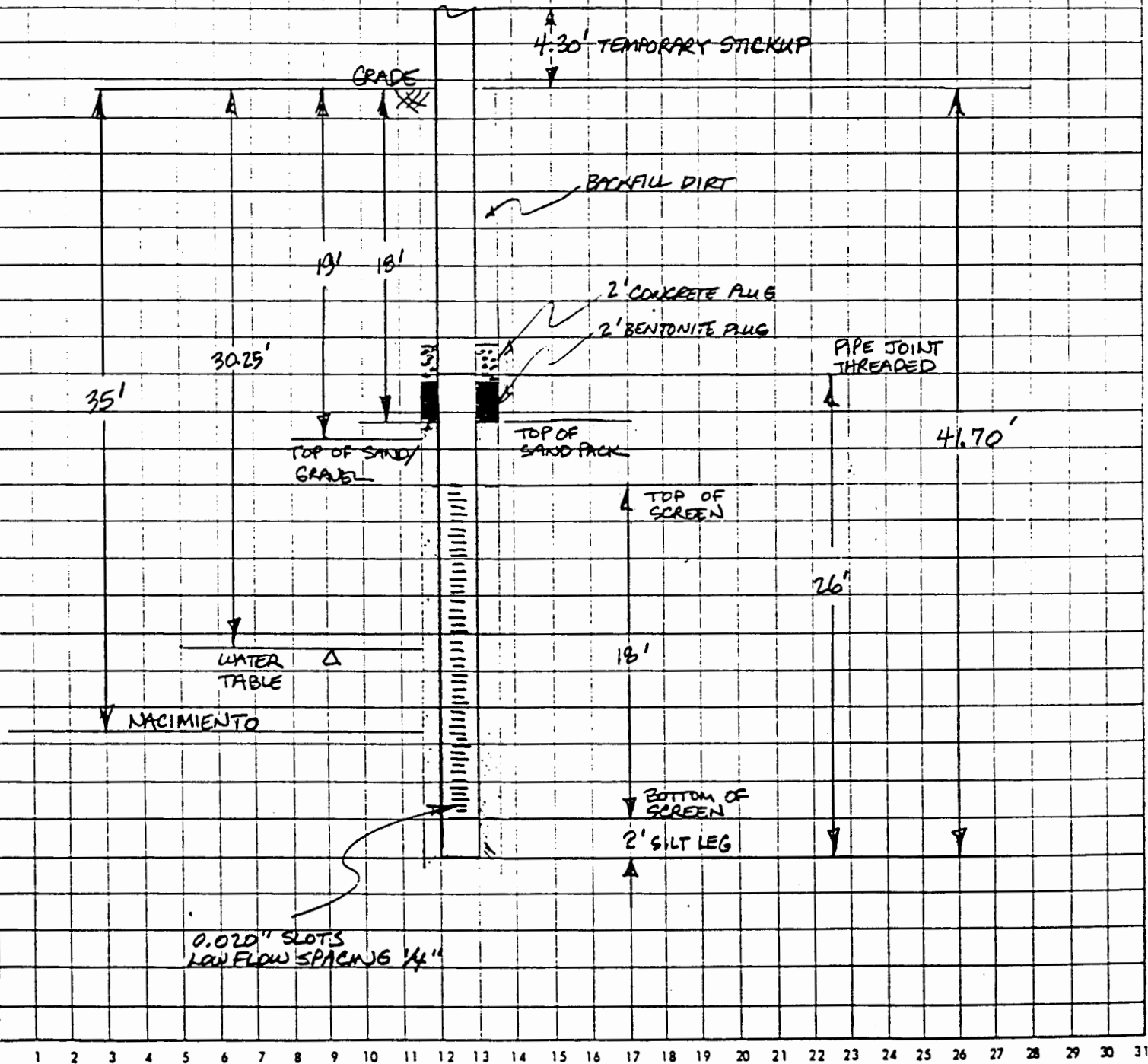


INITIALS CA PROJECT No. GROUNDWATER MONITORING - SOWP & NOWP
 DATE 8-9-90 SUBJECT GROUNDWATER RECOVERY - OVERALL FACILITY
 DATE OF INSTALLATION: 8-8-90 SHEET 5 OF 6

CALCULATION SHEET

CONSTRUCTION COMMENTS : SAME AS RW-14

LOCATION : ROADWAY BETWEEN TANKS 18 & 28



INITIALS CH PROJECT NO. GROUNDWATER RECOVERY-PHASE II, AFE 9146
 DATE 8-9-90 SUBJECT RECOVERY WELL 15
 DATE OF INSTALLATION: 8-7-90 SHEET 2 OF 6