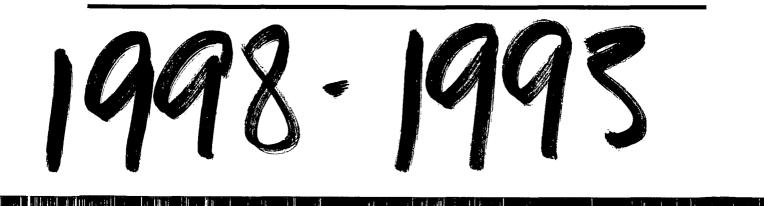
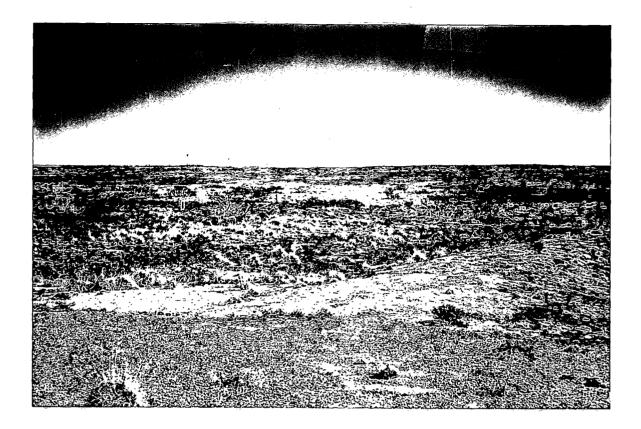
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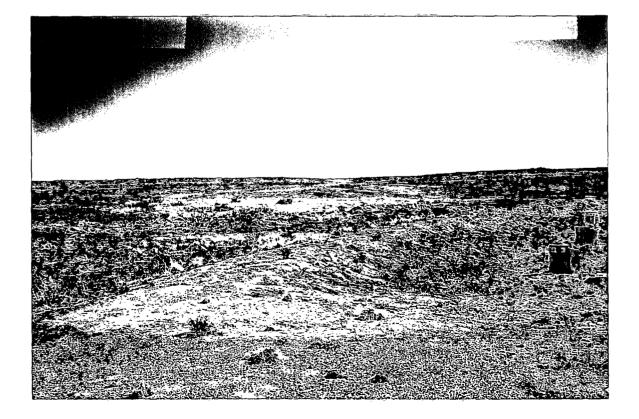
GENERAL CORRESPONDENCE

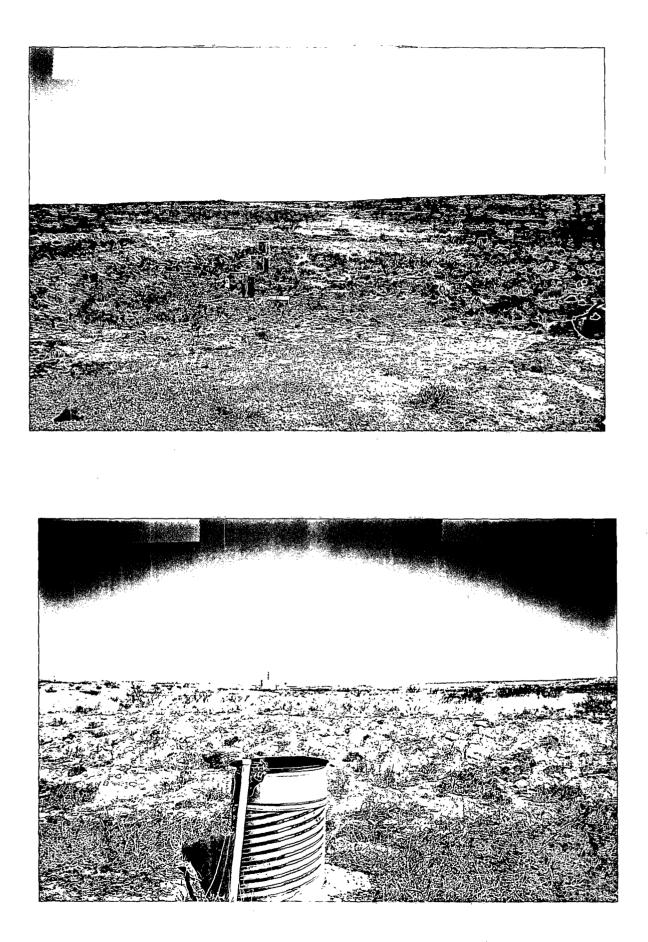
YEAR(S):

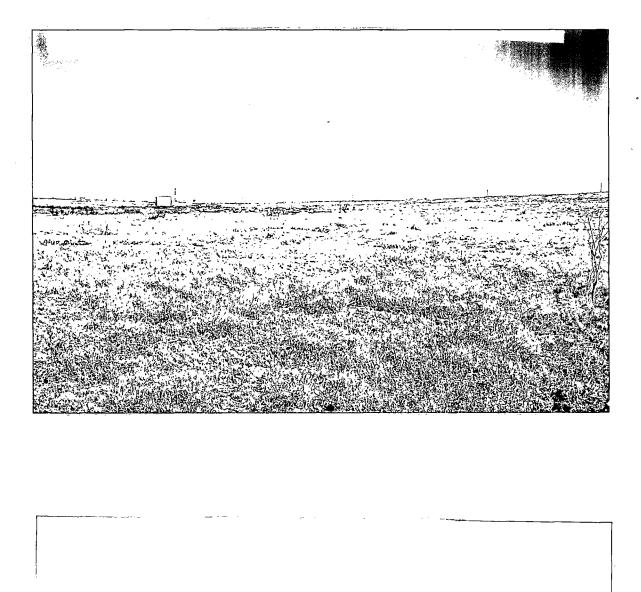


PROPOSED IRRIGATION ANEA 1998

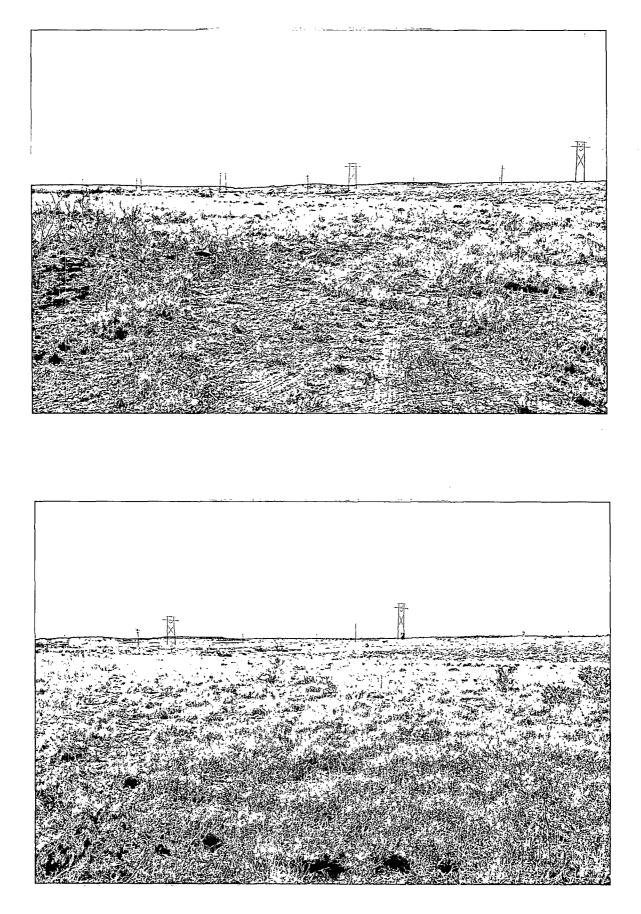


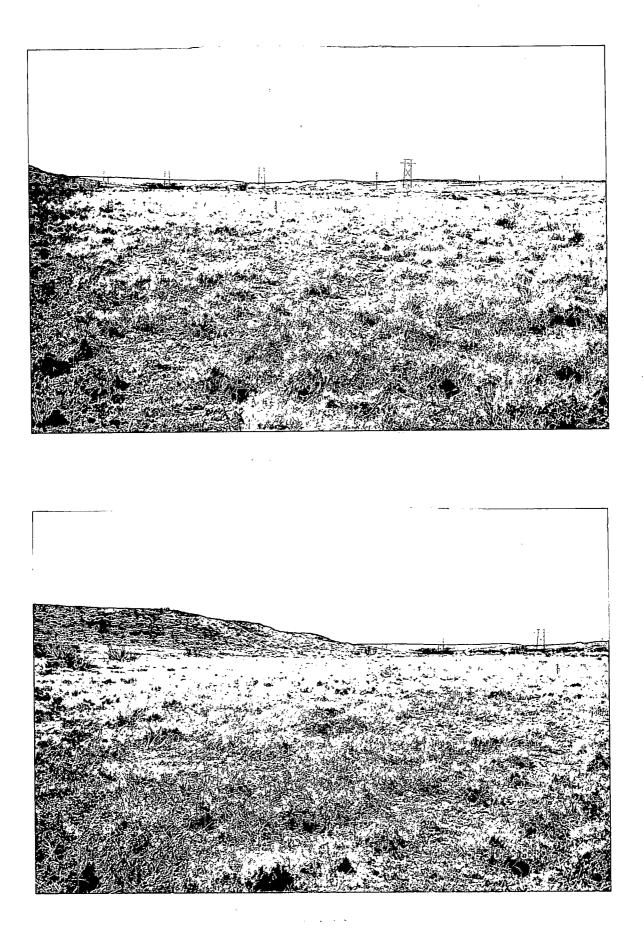


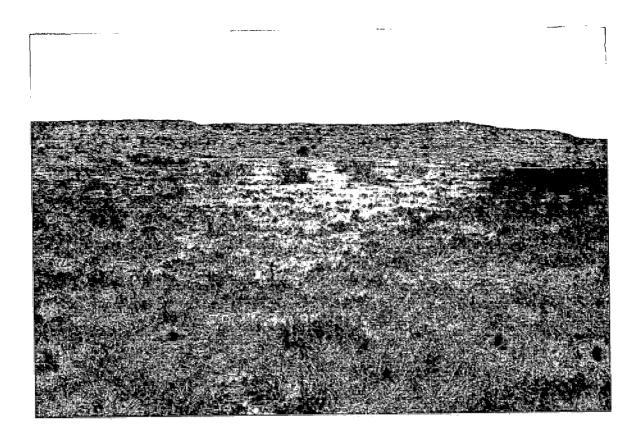












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	Postage	\$
	Certified Fee	
	Special Delivery Fee	
	Restricted Delivery Fee	
1995	Return Receipt Showing to Whom & Date Delivered	
, April	Return Receipt Showing to Whom, Date, & Addressee's Address	
SC	TOTAL Postage & Fees	\$
PS Form 38UU, April 1995	Postmark or Date	9W-022

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July 31, 1998

<u>CERTIFIED MAIL</u> <u>RETURN RECEIPT NO. Z-357-869-997</u>

Ms. Margaret Lowe ARCO Permian P.O. Box 1610 Midland, Texas 79702

RE: DISCHARGE PLAN (GW-022) MODIFICATION FOR DISCHARGE PLAN EMPIRE ABO NATURAL GAS PROCESSING PLANT

Dear Ms. Lowe:

The New Mexico Oil Conservation Division (OCD) has reviewed ARCO Permian's (ARCO) March, 1998 "MODIFICATION OF GROUND WATER DISCHARGE PLAN GW-022" which was submitted on behalf of ARCO by their consultant Environmental Services, Inc. This document contains ARCO's proposed modification of the natural gas processing plant discharge plan to include monitoring and removal of phase seperated hydrocarbons (PSH) from ground water and the use of non-hydrocarbon plant waste water for irrigation at a site owned by Bogle Farms, Ltd.

The above referenced requested modification of the previously approved ground water discharge plan, GW-022, for the ARCO Empire Abo Gasoline Plant located in the NE/4 SE/4 of Section 3, Township 18 South, Range 27 East (NMPM), Eddy County, New Mexico is approved with the following conditions:

- 1. The ground water monitoring will be conducted on an annual basis with annual reports submitted prior to the end of January of each year. Semi-annual monitoring will be conducted for wells MW-2 and MW-8 beginning January 1, 1999, for a period of one year.
- 2. Water will be applied during irrigation in such a manner that water does not pond on the surface.
- 3. ARCO Permian certifies that surface land owners have granted rights to apply plant waste water to landowner's ground surface for irrigation purposes.

Ms. Margaret Lowe Empire Abo Gasoline Plant GW-022 July 31, 1998 Page 2

- 4. ARCO must obtain the OCD's approval of ground water monitoring facilities at all areas of water application prior the commencement of such water application.
- 5. ARCO will notify the OCD at least 48 hours in advance of system start up so that the OCD has the opportunity to witness the event and split samples if requested.

The discharge plan (GW-022) was renewed effective December 13, 1994 with an expiry date of December 13, 1999. The proposed modification significantly alters the discharge streams, therefore, pursuant to WQCC Regulation 3108 public notice was issued on May 21 and May 26, 1998 in two newspaper publications. No comments to the modification proposals were received by the OCD.

The application for modification was submitted pursuant to Water Quality Control Commission (WQCC) Regulation 3107.C and is approved pursuant to WQCC Regulation 3109. Pursuant to (WQCC) Regulation 3114.3 an applicant for modification of a discharge plan is subject to payment of a filing fee of fifty dollars (\$50) plus a flat fee of one-half of the original flat fee required when significant change to the original discharge plan is approved. A flat fee of one thousand six hundred sixty seven dollars and fifty cents (\$1667.50) for significant modifications of discharge plans for natural gas processing plants may be paid in a single payment or in equal installments over the period of the discharge plan.

Please be advised that OCD approval does not relieve ARCO of liability should your operation result in actual pollution of surface waters, ground waters or the environment which may be actionable under other laws and/or regulations. In addition, this approval does not relieve ARCO of responsibility for compliance with other federal, state, tribal or local laws and regulations.

If you have any questions, please contact W. Jack Ford at (505) 827-7156.

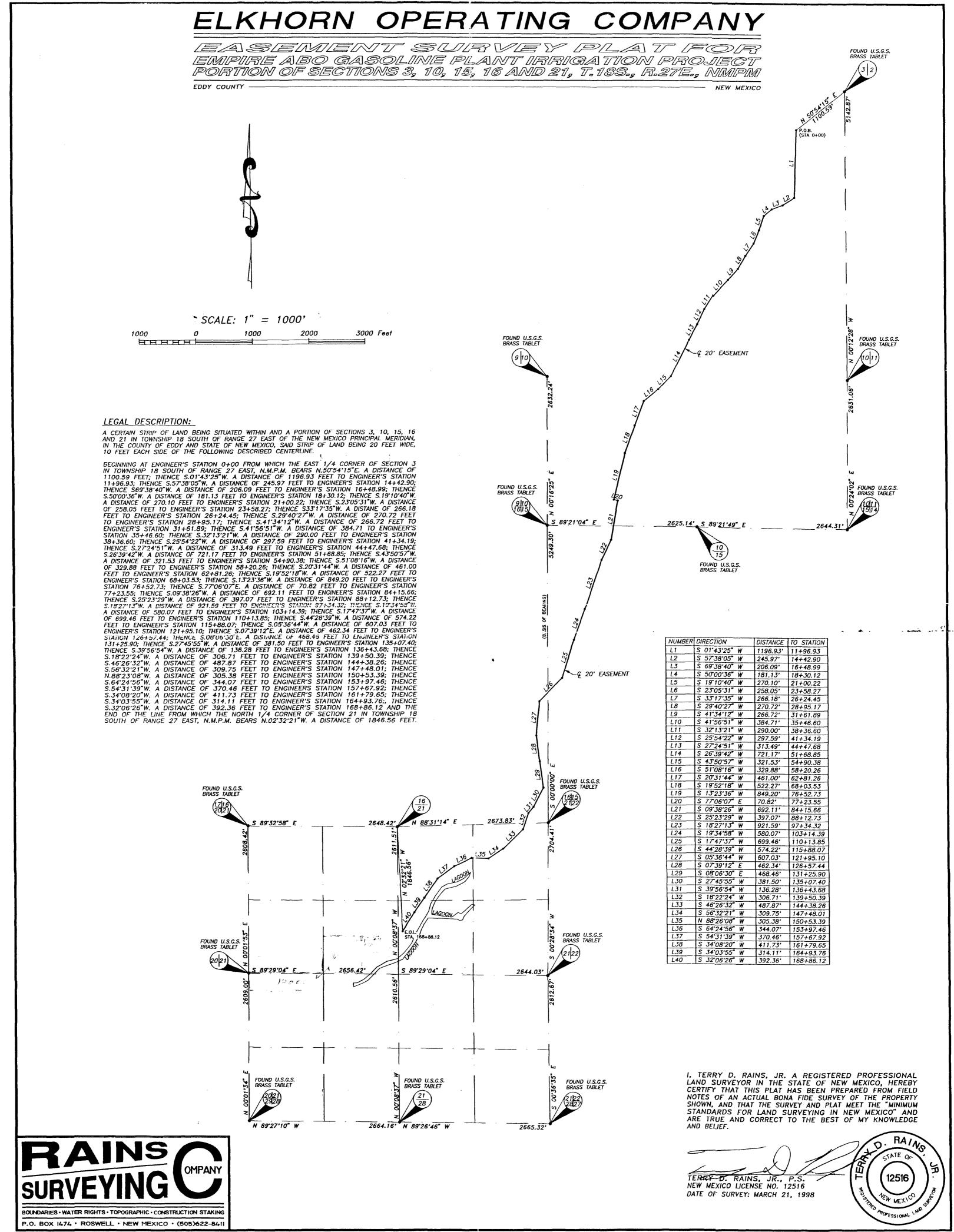
Sincerely,

Roger C. Anderson Chief, Environmental Bureau Oil Conservation Division

xc: OCD Artesia District Office R. C. Cudney, Environmental Services

PS Form 3	800	, Apri	199	5									
Postmark or Date GUU-02-2	TOTAL Postage & Fees \$	Return Receipt Showing to Whom, Date, & Addressee's Address	Return Receipt Showing to Whom & Date Delivered	Restricted Delivery Fee	Special Delivery Fee	Certified Fee	Postage	Post Office, State, & ZIP, Code	Street & Number APCFO	Sento Margaret Louse	No Insurance Coverage Provided. Do not use for International Mail (See reverse)	US Postat Service Receipt for Certified Mail	2 257 848 777 Z

environme April 30, 1998 Mr. Jack Ford Oil Conservation Division 2040 South Pacheco Street Santa Fe, New Mexico 87505 RE: ARCO Permian, Empire Abo Gasoline Plant Discharge Plan Dear Mr. Ford: Per your request Environmental Services, Inc. (ESI), is providing a survey map with the location of the proposed land application site. The map includes the location of the fresh water ponds near the proposed site. I have also included a summary table with the analytical results from the recent sampling of the PSH in the monitor wells 4665 INDIAN SCHOOL NE (MW-2-9, 2-10, 2-15, 3, 3-2, and 9). Please provide us guidance for the next step to keep this project on schedule. If you require any additional information for approval of our land application proposal, please call me or Margaret Lowe (915) 688-5799. SUITE 106 Sincerely, Rilende & Hunt Melinda G. Hunt ALBUQUERQUE cc (w/o enclosures): Margaret Lowe, ARCO Permian NEW MEXICO OCD Artesia Office 87110 PHO 505 266 6611



NAME: C. /EP./EPDWC/ELKHRNI2/ELKHRNI2.DWC DATE: APR 04, 1998 TME: 9:10 AM SCALE: 1000

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ARCO Permian—Empire Abo Gasoline Plant 1998 PSH Analytical Results	pire Abo Gasoli alytical Re	ne Plant S ults	· Discharge Plan				an a	MAY 8 1998
Table 1							e -	
Parameters Units mg/L	Monitor Well			API Gravity	Monitor Well			
	MW-2-10	MW-3	6-MW		MW-2-9	MW-2-10 MW-2-15		MW-3-2
Na	196	197	8	API Gravity @ 60 F	37.8	18.8	30.3	27.8
Ca	584	480	400					
Mg	216	63	80					
K	8.7	6.5	7.9					
CI	212	8	16					
SO4	2350	780	970					
CO3	0	0	0					
HCO3	49	1308	395					
TDS	4252	2581	2615					
ЬH								
(standard units) Conductiviry	7.02	7.11	7.74					
$(\mu \text{ omhs/cm})$	3763	3130	2861					
l otal Alkalinity (mgCaCO3/L)	40	1072	324					

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ARCO Permian—Empire Abo Gasoline Plant Discharg 1998 PSH Analytical Results

Table 2													
Parameters Unite mod	Monitor Well	_					Parameters Units mo/I	Monitor Well					
	MW-2-9	MW-2-10 MW-2-15 MW-3 MW-3-2 MW-9	MW-2-15	MW-3	MW-3-2	6-MW	300	MW-2-9	MW-2-10	MW-2-10 MW-2-15 MW-3 MW-3-2	MW-3	ИШ-3-2	6-WW
C-8 n-Octane	13300	<10	2380	<0.010	6210	<0.010	Naphthalene	219	12.1	246	<0.050	34.5	0.082
C-9 n-Nonane	5280	128	940	0.09	1140	<0.010	2-Methylnaphthalen	293	49.3	584	0.151	44.6	0.292
C-10 n-Decane	5560	164	1270	0.036	1110	0.125	1-Methylnaphthalene	248	75.3	673	0.098	61.8	0.216
C-11 n-Undecane	3670	200	1320	0.127	933	0.326	Acenaphthylene	<10	<10	<10	<0.050	$<\!10$	<0.050
C-12 n-Dodecane	1250	203	922	0.285	457	0.605	Acenaphthene	14.7	<10	53.8	<0.050	$<\!10$	<0.050
C-13 n-Tridecane	813	316	1180	0.611	318	1.17	Fluorene	28.8	17.6	74.7	<0.050	14.4	<0:050
C-14 n-Tetradecane	1130	783	2340	1.28	577	2.25	Phenanthrene	38.5	21.8	122	<0.050	16.5	<0:050
C-15 n-Pentadecane	793	350	1340	1.47	350	2.35	Anthracene	<10	<10	<10	<0.050	$^{<10}$	<0.050
C-16 n-Hexadecane	770	183	1410	1.28	392	1.99	Fluoranthene	<10	<10	<10	<0.050	$<\!10$	<0.050
C-17 n-Heptadecane	2120	362	1810	1.09	422	1.55	Pyrene	<10	<10	<10	<0.050	$<\!10$	<0.050
C-18 n-Octadecane	901	230	1660	0.734	470	1.12	Benzo(a)anthracene	<10	<10	<10	<0.050	$<\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	<0:050
C-19 n-Nonadecane	939	98	1770	0.551	578	1.08	Chryene	<10	<10	<10	<0.050	$<\!10$	<0.050
C-20 n-Eicosane	160	101	1140	0.286	300	0.581	Benzo(b)fluoranthene	<10	<10	<10	<0.050	$<\!10$	<0.050
C-21 n-Heneicosane	582	36	916	0.209	211	0.514	Benzo(k)fluoranthene	<10	<10	<10	<0.050	$^{<10}$	<0:050
C-22 n-Docosane	455	62	777	0.135	212	0.285	Benzo(a)pyrene	<10	<10	<10	<0.050	$^{<10}$	<0.050
C-23 n-Tricosane	532	98	711	0.116	224	0.211	Indeno(1,2,3-cd)pyrene	<10	<10	<10	<0.050	$<\!10$	<0:050
C-24 n-Tetracosane	641	171	1070	0.125	363	0.394	Dibenzo(a,h)anthracene	<10	<10	<10	<0.050	$<\!10$	<0.050
C-25 n-Pentacosane	838	332	1380	0.079	638	0.278	Benzo(g,h,i)perylene	<10	<10	<10	<0.050	$<\!10$	<0.050
C-26 n-Hexacosane	614	191	954	0.048	370	0.213							
C-27 n-Heptacosane	597	66	984	0.034	283	0.221							
C-28 n-Octacosane	411	122	670	< 0.010	186	0.137							
Total n-Alkanes	41400	4230	26900	8.59	15744	15.4							

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ARCO Permian—Empire Abo Gasoline Plant Discharge Plan 1998 PSH Analytical Results

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Parameters Units mg/L	Monitor Well	Π		Parameters Units mg/L	Monitor Well	7ell	
Volatiles - 8260	MW-2-9	MW-2-15	MW-3-2	Volatiles - 8260	MW-2-10	MW-3	6-WW
Methylene chloride	29.7	34.3	34.2	Carbon Disulfide	0.015	0.059	<0.002
2-Butanone	<250	282	<250	Methylene chloride	0.007	0.003	0.004
Benzene	341	38.5	106	2-Butanone	0.056	0.153	0.153
Toluene	2280	35.9	188	Benzene	0.159	2.41	0.463
Ethylbenzene	2860	196	243	Toluene	0.003	0.009	0.163
m, p - Xylene	4820	389	414	Ethylbenzene	0.084	0.14	0.324
Styrene	31.3	<10	<10	m, p - Xylene	0.186	0.225	0.736
o-Xylene	1150	74.3	100	Styrene	<0.002	<0.002	0.003
Isopropylbenzene	593	75.1	48.8	o-Xylene	0.008	0.007	0.12
n-propylbenzene	919	140	72	Isopropylbenzene	0.009	0.013	0.053
1,3,5-Trimethylbenzene	772	149	55.1	n-propylbenzene	0.007	0.014	0.062
tert-Butylbenzene	299	60	<10	1,3,5-Trimethylbenzene	0.025	0.023	0.119
1,2,4-Trimethylbenzene	1950	397	128	tert-Butylbenzene	<0.002	0.002	0.053
sec-Butylbenzene	303	64.7	23.4	1,2,4-Trimethylbenzene	0.071	0.055	0.464
4-Isopropyltoluene	154	33.8	<10	sec-Butylbenzene	0.004	0.005	0.025
n-Butylbenzene	331	89.8	21.8	4-Isopropyltoluene	0.004	0.004	0.014
Naphthalene	154	59.9	<50	n-Butylbenzene	0.007	0.005	0.033
1,4 Dichlorobenzene	<50	<50	<50	Naphthalene	0.017	0.012	0.104
2-Butanone	<250	<250	<250	1,4 Dichlorobenzene	<0.005	<0.005	<0.005
4-methyl-2-pentanone	<250	<250	<250	4-methyle-2-pentanone	<0.050	<0.050	<0.050
2-Hexanone	<250	<250	<250	2-Hexanone	<0.050	<0.050	<0.050
All others *	<10	<10	<10	All others *	<0.002	<0.002	<0.002

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*See analytical results

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST	ANALYSIS REQUEST		10				23 3 U			75-23	H H H n 10 2-AL 2-AL 2-AL 2-AL 2-AL 2-AL 2-AL 2-AL		2 2 2 2	77	2			n l			& a gablear to Be C mucsions		
HZHPP		BILL TO PO#:	Company: E/K/w/w/p.C	Luli Junk	Address: Praiver 20	Ì	te: N. Mt. Z. ZIp: \$\$211087	17-51	# 5255-6 77-515	PRES. SAMPLING	H H DATE CE / COOF /CID: /CID:	1 2/2/2	2/27/98 11:3	1276.011.5	5, 71 95/12/10	5.1.1 01. az-1	· ·	ritract or tort, shall be limited to the g and received by Candnal within 3	rterruptions, loss of use, or loss of profits incurred by client, it er such cheim is based upon any of the above stated reasons 7 Dhoma: Raset	Fax Result: REMARKS:	the staff	CHECKED BY: (Initials)	o 915-673-7020.
	11	1 Car Datchever		88211-0070 Attn:	Ado	Clty:	State:	Pho	1,00 Plant Fax#:	MATRIX	S) RAB OR (C) OMP. CONTRINERS SROUNDWATER VASTEWATER SOIL SLUDGE SLUDGE SLUDGE	D 5 5 7 7 7 7 7 7 7 7 7 7 7	7		7 7	2				We navianav	Received By: (Ample Condition Cool Intact Cool Intact X Yes O'Yes	lease fax written changes t
ARDINAL LABORATORIES, INC. 2111 Beechwood, Abilene, TX 79603 (915) 673-7001 Fax (915) 673-7020	IKhow Carsting	M	1 70	State: AMZID:	677-5118	617-5152	Project Owner:		ENVIN ALA GREEL		Sample I.D.	MW-3-2	MW - 9	7	MW - 3 -10	1-2 014		PLEABE NOTE. Llability and Dumope. Cardinal's lability and olerce cockarive remody for any cluba straing wholen he analyses. At plaims inducting those for neghence and any other cease wheteconer stref to doesned wathed unless made	e labe for incidentel or consequentel demages, l { or named to the performance of services hereu d.		Date	ele One) - Other: Juic L	Cardinal cannot accept verbal changes. Please fax written channes to 915-673-7020
ARDI	Company Name: 🖉	Project Manager:	Address: Drywer	CHY: AFTESIC	Phone #: 57/5-	Fax #: 505-	Project #:	Project Name:	Project Location: $\dot{\mathcal{L}}$	FOR LAB USE ONLY	LAB I.D.	H3491 1	<u>с</u>		1,1			PLEASE NOTE: Liability and Dama analyses. All oluime including those	service. Inno event shall Cardnel be labe for incidental or o affiliates or successors arising out of or related to the perform [Community = Dori Innovi i of hourds.]		Relinguished By:	Delivered By: (Circ Sampler - UPS - Bus	+ Cardinal canner

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152

Receiving Date: 02/27/98 Reporting Date: 03/12/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: HM/AH/BC

LAB NUMBER	SAMPLE ID	Na (mg/L)	Ca (mg/L)	Mg (mg/L)		Conductivity (<i>u</i> mhos/cm)	T-Alkalinity (mgCaCO₃/L)
ANALYSIS DA	TE:	03/05/98	03/02/98	03/02/98	03/02/98	03/02/98	03/02/98
H3491-2	MW-9	8	400	80	7.9	2861	324
H3491-4	MW-2-10	196	584	216	8.7	3763	40
H3491-5	MW-3	197	480	63	6.5	3130	1072
Quality Contro	1	NR	46	52	NR	1445	NR
True Value QC)	NR	50	50	NR	1413	NR
% Accuracy		NR	92	104	NR	102	NR
Relative Perce	ent Difference	NR	8.7	3.8	NR	0.3	NR
METHODS:		SM	3500-Ca-D	3500-Mg E	8049	120.1	310.1
		cı [–]	SO₄	CO3	HCO3	pН	TDS
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(s.u.)	(mg/L)

ANALYSIS E	DATE:	03/02/98	03/02/98	03/02/98	03/02/98	03/02/98	03/02/98
H3491-2	MW-9	16	970	0	395	7.74	2615
H3491-4	MW-2-10	212	2350	0	49	7.02	4252
H3491-5	MW-3	8	780	0	1308	7.11	2581
Quality Cont	trol	484	101	NR	NR	7.01	NR
True Value (20	500	100	NR	NR	7.00	NR
% Accuracy		96.4	101	NR	NR	100	NR
Relative Per	cent Difference	2.4	0	NR	NR	0.2	0.3
METHODS:		SM4500-CI-B	375.4	310.1	310.1	150.1	160.1

Gayle & Potter, Chemist

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PLEASE NOTE: Liability and Damages Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In Argument and be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiares, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152

Receiving Date: 02/27/98 Reporting Date: 03/11/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-9 Lab Number: H3491-6

Analysis Date: 03/05/98 Sampling Date: 02/27/98 Sample Type: OIL Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: GP

GRAVITY, API @ 60 F: 37.8 NO WATER RECOVERED

DISTILLATION SUMMARY (ASTM D86)

OBSERVED TEMP, F 148 170	CORRECTED TEMP, F* 154 176	VOLUME % RECOVERED 0.0 5.0	TOTAL RECOV., VOL % NAPHTHA FRACTION: GASOLINE FRACTION: KEROSINE FRACTION: FUEL OIL FRACTION	80.0 14.0 33.5 12.5 20.0
194	200	10.0	RESIDUE, VOL %:	19.2
220	227	15.0		
242	249	20.0	LOSS, VOL %:	0.8
266	273	25.0		
288	295	30.0	BAROMETRIC PRESS., mm Hg:	679
312	319	35.0	INITIAL BOILING POINT, F:	154
334	342	40.0	END POINT, F:	7 1 1
354	362	45.0		
438	447	50.0		
618	628	60.0		
680	691	70.0		

80.0

*Corrected to 760 mm Hg

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03/11/98 Date

H3491-60.XLS

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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152

Receiving Date: 02/27/98 Reporting Date: 03/11/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-10 Lab Number: H3491-4 Analysis Date: 03/05/98 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: GP

GRAVITY, API @ 60 F: 18.8 48% WATER RECOVERED

OBSERVED	CORRECTED	VOLUME %
TEMP, F	TEMP, F*	RECOVERED
206	212	0.0
208	214	5.0
208	214	10.0
208	214	15.0
208	214	20.0
208	214	25.0
208	214	30.0
212	218	35.0
212	218	40.0
214	220	45.0
214	220	50.0
492	501	60.0
640	651	70.0
690	701	80.0
700	711	82.0

TOTAL RECOV., VOL % 82.0 NAPHTHA FRACTION: 42.5 12.5 GASOLINE FRACTION: 13.5 **KEROSINE FRACTION:** FUEL OIL FRACTION 13.5 RESIDUE, VOL %: 14.7 LOSS, VOL %: 3.3 BAROMETRIC PRESS., mm Hg: 679 INITIAL BOILING POINT, F: 212

DISTILLATION SUMMARY

(ASTM D86)

END POINT, F:

*Corrected to 760 mm Hg

cu (AR Chemis

H3491-40.XLS

03/11/98

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PLEASE NOTE. Liability and Damages Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152

Receiving Date: 02/27/98 Reporting Date: 03/11/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-15 Lab Number: H3491-3 Analysis Date: 03/05/98 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: GP

GRAVITY, API @ 60 F: 30.3 <2% WATER RECOVERED

OBSERVED	CORRECTED	VOLUME %
TEMP, F	TEMP, F*	RECOVERED
198	204	0.0
288	295	5.0
350	358	10.0
418	426	15.0
466	475	20.0
500	509	25.0
528	537	30.0
558	568	35.0
584	594	40.0
612	622	45.0
630	640	50.0
664	675	60.0
684	695	70.0
690	701	80.0
700	711	82.0

TOTAL RECOV., VOL %	82.0
NAPHTHA FRACTION:	0.5
GASOLINE FRACTION:	13.0
KEROSINE FRACTION:	32.5
FUEL OIL FRACTION	36.0
RESIDUE, VOL %:	17.0
LOSS, VOL %:	1.0
BAROMETRIC PRESS., mm Hg:	679
INITIAL BOILING POINT, F:	204
END POINT, F:	711

DISTILLATION SUMMARY

(ASTM D86)

*Corrected to 760 mm Hg

03/11/98 Date

H3491-30.XLS



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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152

Receiving Date: 02/27/98 Reporting Date: 03/11/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-3-2 Lab Number: H3491-1 Analysis Date: 03/05/98 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: GP

GRAVITY, API @ 60 F: 27.8 15% WATER RECOVERED

OBSERVED	CORRECTED	VOLUME %
TEMP, F	TEMP, F*	RECOVERED
180	186	0.0
194	200	5.0
202	208	10.0
210	216	15.0
218	225	20.0
224	231	25.0
370	378	. 30.0
496	505	35.0
534	544	40.0
572	582	45.0
596	606	50.0
618	628	60.0
632	642	70.0
690	701	80.0
700	711	82.0

TOTAL RECOV., VOL % NAPHTHA FRACTION: GASOLINE FRACTION: KEROSINE FRACTION: FUEL OIL FRACTION	82.0 17.0 14.0 27.0 24.0
RESIDUE, VOL %:	17.8
LOSS, VOL %:	0.2
BAROMETRIC PRESS., mm Hg: INITIAL BOILING POINT, F:	679 186

DISTILLATION SUMMARY

(ASTM D86)

INITIAL BOILING POINT, F: 186 END POINT, F: 711

*Corrected to 760 mm Hg

03/11/98 Date

H3491-10.XLS



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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152 An

Receiving Date: 02/27/98 FAX TO: 50 Reporting Date: 03/11/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-9 Lab Number: H3491-6 Analysis Date: 03/07/98 Sampling Date: 02/27/98 Sample Type: OIL Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

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POLYNUCLEAR AROMATIC

HYE	ROCARBONS - 8270 (mg/L)	Sample Result	Method			True Value
		H3491-4	Blank	QC	% Recov.	<u>QC</u>
1	Naphthalene	219	<10.0	47.4	95	50.0
2	2-Methylnaphthalene	293	<10.0	51.1	102	50.0
3	1-Methylnaphthalene	248	<10.0	NR	NR	NR
4	Acenaphthylene	<10.0	<10.0	52.6	105	50.0
5	Acenaphthene	14.7	<10.0	49.6	99	50.0
6	Fluorene	28.8	<10.0	51.5	103	50.0
7	Phenanthrene	38.5	<10.0	51.8	104	50.0
8	Anthracene	<10.0	<10.0	48.2	96	50.0
9	Fluoranthene	<10.0	<10.0	51.2	102	50.0
10	Pyrene	<10.0	<10.0	46.1	92	50.0
11	Benzo(a)anthracene	<10.0	<10.0	. 49.7	99	
12	Chrysene	<10.0	<10.0	46.5	93	
13	Benzo(b)fluoranthene	<10.0	<10.0	47.8	96	L
14	Benzo(k)fluoranthene	<10.0	<10.0	56.6	113	50.0
15	Benzo(a)pyrene	<10.0	<10.0	53.9	108	50.0
16	Indeno(1,2,3-cd)pyrene	<10.0	<10.0	55.2	110	
17	Dibenzo(a,h,)anthracene	<10.0	<10.0	57.9	116	+
18	Benzo(g,h,i)perylene	<10.0	<10.0	56.3	113	50.0

19 Nitrobenzene-d5	81
20 2-Fluorobiphenyl	80
21 Terphenyl-d14	95

METHODS: EPA SW-846 8270, 3580

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Date



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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152 An

Receiving Date: 02/27/98 FAX TO: 50 Reporting Date: 03/11/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-10 Lab Number: H3491-4 Analysis Date: 03/07/98 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

POLYNUCLEAR AROMATIC

HYE	ROCARBONS - 8270 (mg/L)	Sample Result	Method			True Value
		H3491-4	Blank	QC	% Recov.	QC
1	Naphthalene	12.1	<10.0	47.4	95	50.0
2	2-Methylnaphthalene	49.3	<10.0	51.1	102	50.0
3	1-Methylnaphthalene	75.3	<10.0	NR	NR	NR
4	Acenaphthylene	<10.0	<10.0	52.6	105	50.0
5	Acenaphthene	<10.0	<10.0	49.6	99	50.0
6	Fluorene	17.6	<10.0	51.5	103	50.0
7	Phenanthrene	21.8	<10.0	51.8	104	50.0
8	Anthracene	<10.0	<10.0	48.2	96	50.0
9	Fluoranthene	<10.0	<10.0	51.2	102	50.0
10	Pyrene	<10.0	<10.0	46.1	92	50.0
11	Benzo(a)anthracene	<10.0	<10.0	49.7	99	50.0
12	Chrysene	<10.0	<10.0	46.5	93	50.0
13	Benzo(b)fluoranthene	<10.0	<10.0	47.8	96	50.0
14	Benzo(k)fluoranthene	<10.0	<10.0	56.6	113	50.0
15	Benzo(a)pyrene	<10.0	<10.0	53.9	108	50.0
16	Indeno(1,2,3-cd)pyrene	<10.0	<10.0	55.2	110	50.0
17	Dibenzo(a,h,)anthracene	<10.0	<10.0	57.9	116	50.0
18	Benzo(g,h,i)perylene	<10.0	<10.0	56.3	113	50.0

19 Nitrobenzene-d5	64
20 2-Fluorobiphenyl	64
21 Terphenyl-d14	69

METHODS: EPA SW-846 8270, 3580

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152 An

Receiving Date: 02/27/98 FAX TO: 50 Reporting Date: 03/11/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-15 Lab Number: H3491-3 Analysis Date: 03/07/98 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

POLYNUCLEAR AROMATIC

HYE	ROCARBONS - 8270 (mg/L)	Sample Result	Method			True Value
-	· · · · ·	H3491-3	Blank	QC	% Recov.	QC
1	Naphthalene	246	<10.0	47.4	95	50.0
2	2-Methylnaphthalene	584	<10.0	51.1	102	50.0
3	1-Methylnaphthalene	673	<10.0	NR	NR	NR
4	Acenaphthylene	<10.0	<10.0	52.6	105	50.0
5	Acenaphthene	53.8	<10.0	49.6	99	50.0
6	Fluorene	74.7	<10.0	51.5	103	50.0
7	Phenanthrene	122	<10.0	51.8	104	50.0
8	Anthracene	<10.0	<10.0	48.2	96	50.0
9	Fluoranthene	<10.0	<10.0	51.2	102	50.0
10	Pyrene	<10.0	<10.0	46.1	92	50.0
11	Benzo(a)anthracene	<10.0	<10.0	49.7	99	50.0
12	Chrysene	<10.0	<10.0	46.5	93	50.0
13	Benzo(b)fluoranthene	<10.0	<10.0	47.8	96	50.0
14	Benzo(k)fluoranthene	<10.0	<10.0	56.6	113	50.0
15	Benzo(a)pyrene	<10.0	<10.0	53.9	108	50.0
16	Indeno(1,2,3-cd)pyrene	<10.0	<10.0	55.2	110	50.0
17	Dibenzo(a,h,)anthracene	<10.0	<10.0	57.9	116	50.0
18	Benzo(g,h,i)perylene	<10.0	<10.0	56.3	113	50.0

19	Nitrobenzene-d5	54	
20	2-Fluorobiphenyl	74	
21	Terphenyl-d14	86	

METHODS: EPA SW-846 8270, 3580

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152 An

Receiving Date: 02/27/98 FAX TO: 50 Reporting Date: 03/11/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-3 Lab Number: H3491-5 Analysis Date: 03/07/98 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

POLYNUCLEAR AROMATIC

HYC	ROCARBONS - 8270 (mg/L)	Sample Result	Method			⊤rue Value
		H3491-5	Blank	QC	% Recov.	QC
1	Naphthalene	<0. 050	<0.005	0.028	56	0.050
2	2-Methylnaphthalene	0.151	<0.005	0.039	78	0.050
3	1-Methylnaphthalene	0.098	<0.005	NR	NR	NR
4	Acenaphthylene	<0.050	<0.005	0.046	92	0.050
5	Acenaphthene	<0.050	<0.005	0.041	82	0.050
6	Fluorene	<0.050	<0.005	0.042	84	0.050
7	Phenanthrene	<0.050	<0.005	0.043	86	0.050
8	Anthracene	< 0.050	<0.005	0.042	84	0.050
9	Fluoranthene	< 0.050	<0.005	0.047	94	0.050
10	Pyrene	< 0.050	<0.005	0.034	68	0.050
11	Benzo(a)anthracene	< 0.050	<0.005	0.040	80	0.050
12	Chrysene	< 0.050	<0.005	0.040	80	0.050
13	Benzo(b)fluoranthene	<0.050	<0.005	0.046	92	0.050
14	Benzo(k)fluoranthene	<0.050	<0.005	0.050	100	0.050
15	Benzo(a)pyrene	< 0.050	<0.005	0.047	94	0.050
16	Indeno(1,2,3-cd)pyrene	<0.050	<0.005	0.035	70	0.050
17	Dibenzo(a,h,)anthracene	<0.050	<0.005	0.029	58	0.050
18	Benzo(g,h,i)perylene	<0.050	<0.005	0.027	54	0.050

	% Recovery
19 Nitrobenzene-d5	65
20 2-Fluorobiphenyl	61
21 Terphenyl-d14	77

METHODS: EPA SW-846 8270, 3510

PLEASE NOTE. Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be seemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service in article service in article service in a second service in a second waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service in article service in a second services intervation, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152 An

Receiving Date: 02/27/98 FAX TO: 50 Reporting Date: 03/11/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-3-2 Lab Number: H3491-1 Analysis Date: 03/07/98 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

POLYNUCLEAR AROMATIC

HYC	ROCARBONS - 8270 (mg/L)	Sample Result	Method			True Value
		H3491-1	Blank	QC	% Recov.	QC
1	Naphthalene	34.5	<10.0	47.4	95	50.0
2	2-Methylnaphthalene	44.6	<10.0	51.1	102	50.0
3	1-Methylnaphthalene	61.8	<10.0	NR	NR	NR
4	Acenaphthylene	<10.0	<10.0	52.6	105	50.0
5	Acenaphthene	<10.0	<10.0	49.6	99	50.0
6	Fluorene	14.4	<10.0	51.5	103	50.0
7	Phenanthrene	16.5	<10.0	51.8	104	50.0
8	Anthracene	<10.0	<10.0	48.2	96	50.0
9	Fluoranthene	<10.0	<10.0	51.2	102	50.0
10	Pyrene	<10.0	<10.0	46.1	92	50.0
11	Benzo(a)anthracene	<10.0	<10.0	49.7	99	50.0
12	Chrysene	<10.0	<10.0	46.5	93	50.0
13	Benzo(b)fluoranthene	<10.0	<10.0	47.8	96	50.0
14	Benzo(k)fluoranthene	<10.0	<10.0	56.6	113	50.0
15	Benzo(a)pyrene	<10.0	<10.0	53.9	108	50.0
16	Indeno(1,2,3-cd)pyrene	<10.0	<10.0	55.2	110	50.0
17	Dibenzo(a,h,)anthracene	<10.0	<10.0	57.9	116	50.0
18	Benzo(g,h,i)perylene	<10.0	<10.0	56.3	113	50.0

	% Recovery
19 Nitrobenzene-d5	90
20 2-Fluorobiphenyl	70
21 Terphenyl-d14	83

METHODS: EPA SW-846 8270, 3580

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152 An

Receiving Date: 02/27/98 FAX TO: 50 Reporting Date: 03/11/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-9 Lab Number: H3491-2 Analysis Date: 03/07/98 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: CCOL & INTACT Sample Received By: JS Analyzed By: BC

POLYNUCLEAR AROMATIC

HYE	ROCARBONS - 8270 (mg/L)	Sample Result	Method			True Value
		·	Blank	QC	% Recov.	QC
1	Naphthalene	0.082	<0.005	0.028	56	0.050
2	2-Methylnaphthalene	0.292	<0.005	0.039	78	0.050
3	1-Methylnaphthalene	0.216	<0.005	NR	NR	NR
4	Acenaphthylene	< 0.050	<0.005	0.046	92	0.050
5	Acenaphthene	< 0.050	<0.005	0.041	82	0.050
6	Fluorene	<0.050	<0.005	0.042	84	0.050
7	Phenanthrene	<0.050	<0.005	0.043	86	0.050
8	Anthracene	<0.050	<0.005	0.042	84	0.050
9	Fluoranthene	<0.050	<0.005	0.047	94	0.050
10	Pyrene	<0.050	<0.005	0.034	68	0.050
11	Benzo(a)anthracene	< 0.050	<0.005	0.040	80	0.050
12	Chrysene	< 0.050	<0.005	0.040	80	0.050
13	Benzo(b)fluoranthene	<0.050	<0.005	0.046	92	0.050
14	Benzo(k)fluoranthene	<0.050	<0.005	0.050	100	0.050
15	Benzo(a)pyrene	<0.050	<0.005	0.047	94	0.050
16	Indeno(1,2,3-cd)pyrene	<0.050	<0.005	0.035	70	0.050
17	Dibenzo(a,h,)anthracene	<0.050	<0.005	0.029	58	0.050
18	Benzo(g,h,i)perylene	<0.050	<0.005	0.027	54	0.050

	% Recovery	
19 Nitrobenzene-d5	78	
20 2-Fluorobiphenyl	63	
21 Terphenyl-d14	82	

METHODS: EPA SW-846 8270, 3510

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H3491-2S.XLS



Reporting Date: 03/10/98

Project Number: NOT GIVEN

Project Location: EMPIRE ABO GASOLINE PLANT

Project Name: NOT GIVEN

Sample ID: MW-2-9

Lab Number: H3491-6

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152 Sampling Sample

Analysis Date: 03/08/98 Sampling Date: 02/27/98 Sample Type: OIL Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

EPA 8015M - (mg/L)	Sample Result	Method			⊤rue Value
	H3491-6	Blank	QC	%IA	QC
C-8 n-Octane	13300	<10.0	83.3	83	100
C-9 n-Nonane	5280	<10.0	96.1	96	100
C-10 n-Decane	5560	<10.0	106	106	100
C-11 n-Undecane	3670	<10.0	108	108	100
C-12 n-Dodecane	1250	<10.0	103	103	100
C-13 n-Tridecane	813	<10.0	90.9	91	100
C-14 n-Tetradecane	1130	<10.0	85.3	85	100
C-15 n-Pentadecane	793	<10.0	82.6	83	100
C-16 n-Hexadecane	770	<10.0	93.1	93	100
C-17_n-Heptadecane	2120	<10.0	88.0	88	100
C-18 n-Octadecane	901	<10.0	86.1	86	100
C-19 n-Nonadecane	939	<10.0	90.7	91	100
C-20 n-Eicosane	160	<10.0	93.4	93	100
C-21 n-Heneicosane	582	<10.0	87.5	88	100
C-22 n-Docosane	455	<10.0	96.2	96	100
C-23 n-Tricosane	532	<10.0	89.3	89	100
C-24 n-Tetracosane	641	<10.0	107	107	100
C-25 n-Pentacosane	838	<10.0	95.8	96	100
C-26 n-Hexacosane	614	<10.0	107	107	100
C-27 n-Heptacosane	597	<10.0	92.3	92	100
C-28 n-Octacosane	411	<10.0	102	102	100
Total n-Alkanes	41400	<10.0	1984	94	2100
Diesel Range Organics	255000	<100			

METHOD: EPA SW 846-8015 M (gc/ms)

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H3491-6T.XLS



Reporting Date: 03/10/98

Sample ID: MW-2-10

Lab Number: H3491-4

Project Location: EMPIRE ABO GASOLINE PLANT

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152 Project Number: NOT GIVEN Project Name: NOT GIVEN

Analysis Date: 03/08/98 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

EPA 8015M - (mg/L)	Sample Result	Method			True Value
	H3491-4	Blank	QC	%IA	QC
		110.0		0.01	100
C-8 n-Octane	<10.0	<10.0	83.3	83	
C-9 n-Nonane	128	<10.0	96.1	96	
C-10 n-Decane	164	<10.0	106	106	
C-11 n-Undecane	200	<10.0	108	108	
C-12 n-Dodecane	203	<10.0	103	103	100
C-13 n-Tridecane	316	<10.0	90.9	91	100
C-14 n-Tetradecane	783	<10.0	85.3	85	100
C-15 n-Pentadecane	350	<10.0	82.6	83	100
C-16 n-Hexadecane	183	<10.0	93.1	93	100
C-17 n-Heptadecane	362	<10.0	88.0	88	100
C-18 n-Octadecane	230	<10.0	86.1	86	100
C-19 n-Nonadecane	98	<10.0	90.7	91	100
C-20 n-Eicosane	101	<10.0	93.4	93	100
C-21 n-Heneicosane	36	<10.0	87.5	88	100
C-22 n-Docosane	62	<10.0	96.2	96	100
C-23 n-Tricosane	98	<10.0	89.3	89	100
C-24 n-Tetracosane	171	<10.0	107	107	100
C-25 n-Pentacosane	332	<10.0	95.8	96	100
C-26 n-Hexacosane	191	<10.0	107	107	100
C-27 n-Heptacosane	99	<10.0	92.3	92	100
C-28 n-Octacosane	122	<10.0	102	102	100
Total n-Alkanes	4230	<10.0	1984	94	2100
	400000	<400			
Diesel Range Organics	106000	<100			

METHOD: EPA SW 846-8015 M (gc/ms)

Chemist

Date

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Reporting Date: 03/10/98

Project Number: NOT GIVEN

Project Name: NOT GIVEN

Sample ID: MW-2-15

Lab Number: H3491-3

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152 Project Location: EMPIRE ABO GASOLINE PLANT

Analysis Date: 03/08/98 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

EPA 8015M - (mg/L)	Sample Result	Method			True Value
,	H3491-3	Blank	QC	%IA	QC
C-8 n-Octane	2380	<10.0	83.3	83	100
C-9 n-Nonane	940	<10.0	96.1	96	100
C-10 n-Decane	1270	<10.0	106	106	100
C-11 n-Undecane	1320	<10.0	108	108	100
C-12 n-Dodecane	922	<10.0	103	103	100
C-13 n-Tridecane	1180	<10.0	90.9	91	100
C-14 n-Tetradecane	2340	<10.0	85.3	85	100
C-15 n-Pentadecane	1340	<10.0	82.6	83	100
C-16 n-Hexadecane	1410	<10.0	93.1	93	100
C-17 n-Heptadecane	1810	<10.0	88.0	88	100
C-18 n-Octadecane	1660	<10.0	86.1	86	100
C-19 n-Nonadecane	1770	<10.0	90.7	91	100
C-20 n-Eicosane	1140	<10.0	93.4	93	100
C-21 n-Heneicosane	916	<10.0	87.5	88	100
C-22 n-Docosane	777	<10.0	96.2	96	100
C-23 n-Tricosane	711	<10.0	89.3	89	100
C-24 n-Tetracosane	1070	<10.0	107	107	100
C-25 n-Pentacosane	1380	<10.0	95.8	96	100
C-26 n-Hexacosane	954	<10.0	107	107	100
C-27 n-Heptacosane	984;	<10.0	92.3	92	100
C-28 n-Octacosane	670	<10.0	102	102	100
Total n-Alkanes	26900	<10.0	1984	94	2100
Diesel Range Organics	363000	<100			

METHOD: EPA SW 846-8015 M (gc/ms)

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Sample ID: MW-3

Lab Number: H3491-5

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 Receiving Date: 02/27/98 Reporting Date: 03/10/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT

Analysis Date: 03/08/98 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

EPA 8015M - (mg/L)	Sample Result	Method			True Value
	H3491-5	Blank	QC	%IA	QC
C-8 n-Octane	< 0.010	<0.010	0.083	83	0.100
C-9 n-Nonane	0.090	<0.010	0.096	96	0.100
C-10 n-Decane	0.036	<0.010	0.106	106	0.100
C-11 n-Undecane	0.127	<0.010	0.108	108	0.100
C-12 n-Dodecane	0.285	<0.010	0.103	103	0.100
C-13 n-Tridecane	0.611	<0.010	0.091	91	0.100
C-14 n-Tetradecane	1.28	<0.010	0.085	85	
C-15 n-Pentadecane	1.47	<0.010	0.083	83	0.100
C-16 n-Hexadecane	1.28	<0.010	0.093	93	0.100
C-17 n-Heptadecane	1.09	<0.010	0.088	88	0.100
C-18 n-Octadecane	0.734	<0.010	0.086	86	0.100
C-19 n-Nonadecane	0.551	<0.010	0.091	91	0.100
C-20 n-Eicosane	0.286	<0.010	0.093	93	0.100
C-21 n-Heneicosane	0.209	<0.010	0.088	88	0.100
C-22 n-Docosane	0.135	<0.010	0.096	96	0.100
C-23 n-Tricosane	0.116	<0.010	0.089	89	0.100
C-24 n-Tetracosane	0.125	< 0.010	0.107	107	0.100
C-25 n-Pentacosane	0.079	<0.010	0.096	96	0.100
C-26 n-Hexacosane	0.048	<0.010	0.107	107	0.100
C-27 n-Heptacosane	0.034	<0.010	0.092	92	0.100
C-28 n-Octacosane	<0.010	<0.010	0,102	102	0.100
Total n-Alkanes	8.59	<0.010	1.984	94	2.100
Diesel Range Organics	131	<0.100			

METHOD: EPA SW 846-8015 M (gc/ms)

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Sample ID: MW-3-2

Lab Number: H3491-1

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 Receiving Date: 02/27/98 Reporting Date: 03/10/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT

Analysis Date: 03/08/98 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

EPA 8015M - (mg/L)	Sample Result	Method			True Value
	H3491-1	Blank	QC	%IA	QC
C-8 n-Octane	6210	<10.0	83.3	83	100
C-9 n-Nonane	1140	<10.0	96.1	96	100
C-10 n-Decane	1110	<10.0	106	106	100
C-11 n-Undecane	933	<10.0	108	108	
C-12 n-Dodecane	457	<10.0	103	103	100
C-13 n-Tridecane	318	<10.0	90.9	91	100
C-14 n-Tetradecane	577	<10.0	85.3	85	100
C-15 n-Pentadecane	350	<10.0	82.6	83	100
C-16 n-Hexadecane	392	<10.0	93.1	93	100
C-17 n-Heptadecane	422	<10.0	88.0	88	100
C-18 n-Octadecane	470	<10.0	86.1	86	100
C-19 n-Nonadecane	578	<10.0	90.7	91	100
C-20 n-Eicosane	300	<10.0	93.4	93	100
C-21 n-Heneicosane	211	<10.0	87.5	88	100
C-22 n-Docosane	212	<10.0	96.2	96	100
C-23 n-Tricosane	224	<10.0	89.3	89	100
C-24 n-Tetracosane	363	<10.0	107	107	100
C-25 n-Pentacosane	638	<10.0	95.8	96	100
C-26 n-Hexacosane	370	<10.0	107	107	100
C-27 n-Heptacosane	283	<10.0	92.3	92	100
C-28 n-Octacosane	186	<10.0	102	102	100
Total n-Alkanes	15744	<10.0	1984	94	2100
Diesel Range Organics	216000	<100			

METHOD: EPA SW 846-8015 M (gc/ms)

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H3491-1T.XLS



Reporting Date: 03/10/98

Sample ID: MW-9

Lab Number: H3491-2

Project Location: EMPIRE ABO GASOLINE PLANT

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152 Project Number: NOT GIVEN Project Name: NOT GIVEN

Analysis Date: 03/08/98 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

EPA 8015M - (mg/L)	Sample Result	Method			⊤rue Value
	H3491-2	Blank	QC	%IA	QC
C-8 n-Octane	<0.010	<0.010	0.083	83	0.100
C-9 n-Nonane	< 0.010	< 0.010	0.096	96	0.100
C-10 n-Decane	0.125	< 0.010	0.106	106	0.100
C-11 n-Undecane	0.326	<0.010	0.108	108	0.100
C-12 n-Dodecane	0.605	<0.010	0.103	103	0.100
C-13 n-Tridecane	1.17	<0.010	0.091	91	0.100
C-14 n-Tetradecane	2.25	<0.010	0.085	85	0.100
C-15 n-Pentadecane	2.35	<0.010	0.083	83	0.100
C-16 n-Hexadecane	1.99	<0.010	0.093	93	0.100
C-17 n-Heptadecane	1.55	<0.010	0.088	88	0.100
C-18 n-Octadecane	1.12	<0.010	0.086	86	0.100
C-19 n-Nonadecane	1.08	<0.010	0.091	91	0.100
C-20 n-Eicosane	0.581	<0.010	0.093	93	0.100
C-21 n-Heneicosane	0.514	<0.010	0.088	88	0.100
C-22 n-Docosane	0.285	<0.010	0.096	96	0.100
C-23 n-Tricosane	0.211	<0.010	0.089	89	0.100
C-24 n-Tetracosane	0.394	<0.010	0.107	107	0.100
C-25 n-Pentacosane	0.278	<0.010	0.096	96	0.100
C-26 n-Hexacosane	0.213	<0.010	0.107	107	0.100
C-27 n-Heptacosane	0.221	<0.010	0.092	92	0.100
C-28 n-Octacosane	0.137	<0.010	0.102	102	0.100
Total n-Alkanes	15.4	<0.010	1.984	94	2.100
Diesel Range Organics	131	<0.100			

METHOD: EPA SW 846-8015 M (gc/ms)

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<u>______</u> Date

H3491-2T.XLS



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Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-9 Lab Number: H3491-6 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: OIL Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result H3491-6	Method Blank	QC	%Recov.	True Value QC
1	Dichlorodifluoromethane	<10.0	<10.0	0.085	85	0.100
2	Chloromethane	<10.0	<10.0	0.095	95	0.100
3	Vinyl chloride	<10.0	<10.01	0.093	93	0.100
4	Bromomethane	<10.0	<10.0	0.093	93	0.100
5	Chloroethane	<10.0	<10.0	0.086	86	0.100
6	lodomethane	<10.0	<10.0	0.095	95	0.100
7	1,1-Dichloroethene	<10.0	<10.0	0.104	104	0.100
8	Trichlorofluoromethane	<10.0	<10.0	0.090	90	0.100
9	Carbon Disulfide	<10.0	<10.0	0.080	80	0.100
10	Methylene chloride	29.7	30.0	0.089	89	0.100
11	trans-1,2-Dichloroethene	<10.0	<10.0	0.107	107	0.100
12	1,1-Dichloroethane	<10.0	<10.0	0.089	89	0.100
13	2-Butanone	<250	<250	0.118	118	0.100
14	cis-1,2-Dichloroethene	<10.0	<10.0	0.106	106	0.100
15	2,2-Dichloropropane	<10.0	<10.0	0.095	95	0.100
16	Chloroform	<10.0	<10.0	0,105	105	0.100
17	Bromochloromethane	<10.0	<10.0	0.103	103	0.100
18	1,1,1-Trichloroethane	<10.0	<10.0	0.105	105	0.100
19	1,2-Dichloroethane	<10.0	<10.0	0.101	101	0.100
20	1,1-Dichloropropene	<10.0	<10.0	0.099	99	0.100
21	Benzene	341	<10.0	0.094	94	0.100
22	Carbon tetrachloride	<10.0	<10.0	0.093	93	0.100
23	Trichloroethene	<10.0	<10.0	0.095	95	0.100
24	Dibromomethane	<10.0	<10.0	0.102	102	0.100
25	Bromodichloromethane	<10.0	<10.0	0.097	97	0.100
26	(2-Chloroethoxy)ethene	<10.0	<10.0	0.087	87	0.100
27	trans-1,3-Dichloropropene	<10.0	<10.0	0.090	90	0.100
28	4-methyl-2-pentanone	<250	<250	0.086	86	0.100
29	1,2-Dichloropropane	<10.0	<10.0	0.089	89	0.100
30	cis-1,3-Dichloropropene	<10.0	<10.0	0.094	94	0,100
31	Toluene	2280	<10.0	0.100	100	0.100

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Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-9 Lab Number: H3491-6 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: OIL Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result H3491-6	Method Blank	QC	%Recov.	True Value QC
32	1,1,2-Trichloroethane	<10.0	<10.0	0.098	98	0.100
33	1,3-Dichloropropane	<10.0	<10.0	0.098	98	0.100
34	2-Нехалопе	<250	<250	0.086	86	0.100
35	Dibromochloromethane	<10.0	<10.0	0.093	93	0.100
36	1,2-Dibromoethane	<10.0	<10.0	0.099	99	0.100
37	Tetrachloroethene	<10.0	<10.0	0.104	104	0.100
38	Chlorobenzene	<10.0	<10.0	0.103	103	0.100
39	1,1,1,2-Tetrachloroethane	<10.0	<10.0	0.091	91	0.100
40	Ethylbenzene	2860	<10.0	0.103	103	0.100
41	m, p - Xylene	4820	<20.0	0.202	101	0.200
42	Bromoform	<10.0	<10.0	0.098	98	0.100
43	Styrene	31.3	<10.0	0.099	99	0.100
44	o-Xylene	1150	<10.0	0.096	96	0.100
45	1,1,2,2-Tetrachloroethane	<10.0	<10.0	0.096	96	0.100
46	1,2,3-Trichloropropane	<10.0	<10.0	0.100	100	0.100
47	Isopropylbenzene	593	<10.0	0.100	100	0.100
48	Bromobenzene	<10.0	<10.0	0.100	100	0.100
49	2-Chlorotoluene	<10.0	<10.0	0.097	97	0.100
50	n-propylbenzene	919	<10.0	0.101	101	0.100
51	4-Chlorotoluene	<10.0	<10.0	0.100	100	0.100
52	1,3,5-Trimethylbenzene	772	<10.0	0.100	100	0,100
53	tert-Butylbenzene	299	<10.0	0.100	100	0.100
54	1,2,4-Trimethylbenzene	1950	<10.0	0.108	108	0.100
55	1,3-Dichlorobenzene	<10.0	<10.0	0.090	90	0.100
56	sec-Butylbenzene	303	<10.0	0.102	102	0.100
57	1,4 Dichlorobenzene	<50.0	<50.0	0.093	93	0.100
58	4-Isopropyltoluene	154	<10.0	0.096	96	0.100
59	1,2-Dichlorobenzene	<10.0	<10.0	0.090	90	0.100
60	n-Butylbenzene	331	<10.0	0.103	103	0,100
61	1,2-dibromo-3-chloropropane	<10.0	<10.0	0.088	88	0.100
62	1,2,3-Trichlorobenzene	<10.0	<10.0	0.120	120	0.100

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152

Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-9 Lab Number: H3491-6

Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: OIL Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VC	DLATILES - 8260 (ppm)	Sample Result H3491-6	Method Blank	QC	%Recov.	True Value QC
63	Hexachlorobutadiene	<10.0	<10.0	0.101.	101	0.100
64	Naphthalene	154	<50.0	0.100	100	0.100
65	1,2,4-Trichlorobenzene	<10.0	<10.0	0.120	120	0.100

		% Recovery
66	Dibromofluoromethane	94
67	Toluene-D8	89
68	4-Bromofluorobenzene	93

METHODS: EPA SW-846-8260.

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Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-10 Lab Number: H3491-4 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result H3491-4	Method Blank	QC	%Recov.	True Value QC
1	Dichlorodifluoromethane	< 0.002	<0.002	0.085	85	0.100
2	Chloromethane	< 0.002	<0.002	0.095	95	0.100
3	Vinyl chloride	< 0.002	<0.002	0.093	93	0.100
4	Bromomethane	< 0.002	<0.002	0.093	93	0.100
5	Chloroethane	< 0.002	<0.002	0.086	86	0.100
6	lodomethane	< 0.002	<0.002	0.095	95	0.100
7	1,1-Dichloroethene	<0.002	<0.002	0.104	104	0.100
8	Trichlorofluoromethane	< 0.002	< 0.002	0.090	90	0.100
9	Carbon Disulfide	0.015	<0.002	0.080	80	0.100
10	Methylene chloride	0.007	0.006	0.089	89	0.100
11	trans-1,2-Dichloroethene	< 0.002	< 0.002	0.107	107	0.100
12	1,1-Dichloroethane	< 0.002	<0.002	0.089	89	0.100
13	2-Butanone	0.056	<0.050	0.118	118	0.100
14	cis-1,2-Dichloroethene	<0.002	<0.002	0.106	106	0.100
15	2,2-Dichloropropane	< 0.002	<0.002	0.095	95	0.100
16	Chloroform	< 0.002	<0.002	0.105	105	0.100
17	Bromochloromethane	<0.002	<0.002	0.103	103	0.100
18	1,1,1-Trichloroethane	< 0.002	<0.002	0.105	105	0.100
19	1,2-Dichloroethane	<0.002	<0.002	0.101	101	0.100
20	1,1-Dichloropropene	< 0.002	<0.002	0.099	99	0.100
21	Benzene	0.159	<0.002	0.094	94	0.100
22	Carpon tetrachloride	< 0.002	<0.002	0.093	93	0.100
23	Trichloroethene	<0.002	<0.002	0.095	95	0.100
24	Dibromomethane	< 0.002	<0.002	0.102	102	0.100
25	Bromodichloromethane	< 0.002	<0.002	0.097	97	0.100
26	(2-Chloroethoxy)ethene	<0.002	<0.002	0.087	87	0.100
27	trans-1,3-Dichloropropene	< 0.002	<0.002	0.090	90	0.100
28	4-methyl-2-pentanone	<0.050	<0.050	0.086	86	0.100
29	1,2-Dichloropropane	<0.002	<0.002	0.089	89	0.100
30	cis-1,3-Dichloropropene	<0.002	<0.002	0.094	94	0.100
31	Toluene	0.003	<0.002	0.100	100	0.100

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152

Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-10 Lab Number: H3491-4 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result H3491-4	Method Blank	QC	%Recov.	True Value QC
32	1,1,2-Trichloroethane	< 0.002	<0.002	0.098	98	0.100
33	1,3-Dichtoropropane	<0.002	<0.002	0.098	98	0.100
34	2-Hexanone	<0.050	<0.050	0.086	86	0.100
35	Dibromochloromethane	< 0.002	<0.002	0.093	93	0.100
36	1,2-Dibromoethane	< 0.002	<0.002	0.099	99	0.100
37	Tetrachloroethene	< 0.002	<0.002	0.104	104	0.100
38	Chlorobenzene	< 0.002	<0.002	0.103	103	0.100
39	1,1,1,2-Tetrachloroethane	< 0.002	<0.002	0.091	91	0.100
40	Ethylbenzene	0.084	<0.002	0.103	103	0.100
41	m, p - Xylene	0.186	<0.004	0.202	101	0.200
42	Bromoform	< 0.002	<0.002	0.098	98	0.100
43	Styrene	< 0.002	<0.002	0.099	99	0.100
44	o-Xylene	0.008	<0.002	0.096	96	0.100
45	1,1,2,2-Tetrachioroethane	< 0.002	<0.002	0.096	96	0.100
46	1,2,3-Trichloropropane	< 0.002	<0.002	0.100	100	0.100
47	Isopropylbenzene	0.009	<0.002	0.100	100	0.100
48	Bromobenzene	< 0.002	<0.002	0.100	100	0.100
49	2-Chlorotoluene	< 0.002	< 0.002	0.097	97	0.100
50	n-propylbenzene	0.007	<0.002	0.101	101	0.100
51	4-Chlorotoluene	< 0.002	<0.002	0.100	100	0.100
52	1,3,5-Trimethylbenzene	0.025	<0.002	0.100	100	0.100
53	tert-Butylbenzene	< 0.002	<0.002	0.100	100	0.100
54	1,2,4-Trimethylbenzene	0.071	<0.002	0.108	108	0.100
55	1,3-Dichlorobenzene	< 0.002	<0.002	0.090	90	0.100
56	sec-Butylbenzene	0.004	<0.002	0.102	102	0.100
57	1,4 Dichlorobenzene	< 0.005	<0.005	0.093	93	0.100
58	4-Isopropyltoluene	0.004	<0.002	0.096	96	0.100
59	1,2-Dichlorobenzene	< 0.002	<0.002	0.090	90	0.100
60	n-Butylbenzene	0.007	<0.002	0.103	103	0.100
61	1,2-dibromo-3-chloropropane	< 0.002	<0.002	0.088	88	0.100
62	1,2,3-Trichlorobenzene	< 0.002	<0.002	0.120	120	0.100

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152

Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-10 Lab Number: H3491-4 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VC	DLATILES - 8260 (ppm)	Sample Result H3491-4	Method Blank	QC %	6Recov.	True Value QC
63	Hexachlorobutadiene	<0.002	<0.002	0.101	101,	0.100
64	Naphthalene	0.017	<0.005	0.100	100	0.100
65	1,2,4-Trichlorobenzene	<0.002	<0.002	0.120	120	0.100

		% Recovery	
66	Dibromofluoromethane	97	
67	Toluene-D8	91	
68	4-Bromofluorobenzene	95	

METHODS: EPA SW-846-8260.

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<u>3/4/98</u> Date

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Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-15 Lab Number: H3491-3 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result H3491-3	Method Blank	QC	%Recov.	True Value QC
1	Dichlorodifluoromethane	<10.0	<10.0	0.085	85;	0.100
2	Chloromethane	<10.0	<10.0	0.095	95	0.100
3	Vinyl chloride	<10.0	<10.0	0.093	93	0.100
4	Bromomethane	<10.0	<10.0	0.093	93	0.100
5	Chloroethane	<10.0	<10.0	0.086	86	0.100
6	lodomethane	<10.0	<10.0	0.095	95	0.100
7	1,1-Dichloroethene	<10.0	<10.0	0.104	104	0.100
8	Trichlorofluoromethane	<10.0	<10.0	0.090	90	0.100
9	Carbon Disulfide	<10.0	<10.0	0.080	80	0.100
10	Methylene chloride	34.3	30.0	0.089	89	0.100
11	trans-1,2-Dichloroethene	<10.0	<10.0	0.107	107	0.100
12	1,1-Dichloroethane	<10.0	<10.0	0.089	89	0.100
13	2-Butanone	282	<_50	0.118	118	0.100
14	cis-1,2-Dichloroethene	<10.0	<10.0	0.106	106	0.100
15	2,2-Dichloropropane	<10.0	<10.0	0.095	95	0.100
16	Chloroform	<10.0	<10.0	0.105	105	0.100
17	Bromochloromethane	<10.0	<10.0	0.103	. 103	0.100
18	1,1,1-Trichloroethane	<10.0	<10.0	0.105	105	0.100
19	1,2-Dichloroethane	<10.0	<10.0	0.101	101	0.100
20	1,1-Dichloropropene	<10.0	<10.0	0.099	99	0.100
21	Benzene	38.5	<10.0	0.094	94	0.100
22	Carbon tetrachloride	<10.0	<10.0	0.093	93	0.100
23	Trichloroethene	<10.0	<10.0	0.095	95	0.100
24	Dibromomethane	<10.0	<10.0	0.102	102	0.100
25	Bromodichloromethane	<10.0	<10.0	0.097	97	0.100
26	(2-Chloroethoxy)ethene	<10.0	<10.0	0.087	87	0.100
27	trans-1,3-Dichloropropene	<10.0	<10.0	0.090	90	0.100
28	4-methyl-2-pentanone	<250	<250	0.086	86	0.100
29	1,2-Dichloropropane	<10.0	<10.0	0.089	89	0.100
30	cis-1,3-Dichloropropene	<10.0	<10.0	0.094	94	0.100
31	Toluene	35.9	<10.0	0.100	100	0.100

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Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-15 Lab Number: H3491-3 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result	Method			True Value
		H3491-3	Blank	QC	%Recov.	QC
32	1,1,2-Trichloroethane	<10.0	<10.0	0.098	98	0.100
33	1,3-Dichloropropane	<10.0	<10.0	0.098	98	0.100
34	2-Hexanone	<250	<250	0.086	86	0.100
35	Dibromochloromethane	<10.0	<10.0	0.093	93	0.100
36	1,2-Dibromoethane	<10.0	<10.0	0.099	99	0.100
37	Tetrachloroethene	<10.0	<10.0	0.104	104	0.100
38	Chlorobenzene	<10.0	<10.0	0.103	103	0.100
39	1,1,1,2-Tetrachloroethane	<10.0	<10.0	0.091	91	0.100
40	Ethylbenzene	196	<10.0	0.103	103	0.100
41	m, p - Xylene	389	<20.0	0.202	101	0.200
42	Bromoform	<10.0	<10.0	0.098	98	0.100
43	Styrene	<10.0	<10.0	0.099	99	0.100
44	o-Xylene	74.3	<10.0	0.096	96	0.100
45	1,1,2,2-Tetrachloroethane	<10.0	<10.0	0.096	96	0.100
46	1,2,3-Trichloropropane	<10.0	<10.0	0.100	100	0.100
47	Isopropylbenzene	75.1	<10.0	0.100	100	0.100
48	Bromobenzene	<10.0	<10.0	0.100	100	0.100
49	2-Chlorotoluene	<10.0	<10.0	0.097	97	0.100
50	n-propylbenzene	140	<10.0	0.101	101	0.100
51	4-Chlorotoluene	<10.0	<10.0	0.100	100	0.100
52	1,3,5-Trimethylbenzene	149	<10.0	0.100	100	0.100
53	tert-Butylbenzene	60.0	<10.0	0.100	100	0.100
54	1,2,4-Trimethylbenzene	397	<10.0	0.108	108	0.100
55	1,3-Dichlorobenzene	<10.0	<10.0	0.090	90	0.100
56	sec-Butylbenzene	64.7	<10.0	0.102	102	0.100
57	1,4 Dichlorobenzene	<50.0	<50.0	0.093	93	0.100
58	4-Isopropyltoluene	33.8	<10.0	0.096	96	0.100
59	1,2-Dichlorobenzene	<10.0	<10.0	0.090	90	0,100
60	n-Butylbenzene	89.8	<10.0	0.103	103	0.100
61	1,2-dibromo-3-chloropropane	<10.0	<10.0	0.088	88	0.100
62	1,2,3-Trichlorobenzene	<10.0	<10.0	0.120	120	0.100

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Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-2-15 Lab Number: H3491-3 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result H3491-3	Method Blank	QC (%Recov.	True Value QC
63	Hexachlorobutadiene	<10.0	<10.0	0.101	101	0.100
64	Naphthalene	59.9	<50.0	0.100	100	0.100
65	1,2,4-Trichlorobenzene	<10.0	<10.0	0.120	120	0.100

		% Recovery	
66	Dibromofluoromethane	93	
67	Toluene-D8	88	
68	4-Bromofluorobenzene	103	

METHODS: EPA SW-846-8260.

<u>3/4/44</u> Date

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Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-3-2 Lab Number: H3491-1 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result	Method			True Value
		H3491-1	Blank	QC	%Recov.	QC
1	Dichlorodifluoromethane	<10.0	<10.0	0.085	85	0.100
2	Chloromethane	<10.0	<10.0	0.095	95	0.100
3	Vinyl chloride	<10.0	<10.0	0.093	93	0.100
4	Bromomethane	<10.0	<10.0	0.093	93	0.100
5	Chioroethane	<10.0	<10.0	0.086	86	0.100
6	lodomethane	<10.0	<10.0	0.095	95	0.100
7	1,1-Dichloroethene	<10.0	<10.0	0.104	104	0.100
8	Trichlorofluoromethane	<10.0	<10.0	0.090	90	0.100
9	Carbon Disulfide	<10.0	<10.0	0.080	80	0.100
10	Methylene chloride	34.2	30.0	0.089	89	0.100
11	trans-1,2-Dichloroethene	<10.0	<10.0	0.107	107	0.100
12	1,1-Dichloroethane	<10.0	<10.0	0.089	89	0.100
13	2-Butanone	<250	<250	0.118	118	0.100
14	cis-1,2-Dichloroethene	<10.0	<10.0	0.106	106	0.100
15	2,2-Dichloropropane	<10.0	<10.0	0.095	95	0.100
16	Chloroform	<10.0	<10.0	0.105	105	0.100
17	Bromochloromethane	<10.0	<10.0	0.103	103	0.100
18	1,1,1-Trichloroethane	<10.0	<10.0	0.105	105	0.100
19	1,2-Dichloroethane	<10.0	<10.0	0.101	101	0.100
20	1,1-Dichloropropene	<10.0	<10.0	0.099	99	0.100
21	Benzene	106	<10.0	0.094	94	0.100
22	Carbon tetrachloride	<10.0	<10.0	0.093	93	0.100
23	Trichloroethene	<10.0	<10.0	0.095	95	0.100
24	Dibromomethane	<10.0	<10.0	0.102	102	0.100
25	Bromodichloromethane	<10.0	<10.0	0.097	97	0.100
26	(2-Chloroethoxy)ethene	<10.0	<10.0	0.087	87	0.100
27	trans-1,3-Dichloropropene	<10.0	<10.0	0.090		0.100
28	4-methyl-2-pentanone	<250	<250	0.086	86	0.100
29	1,2-Dichloropropane	<10.0	<10.0	0.089	89	0.100
30	cis-1,3-Dichloropropene	<10.0	<10.0	0.094	94	0.100
31	Toluene	188	<10.0	0.100	100	0.100

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152

Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-3-2 Lab Number: H3491-1 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result H3491-1	Method Blank	QC	%Recov.	True Value QC
32	1,1,2-Trichloroethane	<10.0	<10.0	0.098	98	0.100
33	1,3-Dichloropropane	<10.0	<10.0	0.098	98	0.100
34	2-Hexanone	<2501	<250	0.086	86	0.100
35	Dibromochloromethane	<10.0	<10.0	0.093	93	0.100
36	1,2-Dibromoethane	<10.0	<10.0	0.099	99	0.100
37	Tetrachloroethene	<10.0	<10.0	0.104	104	0.100
38	Chlorobenzene	<10.0	<10.0	0.103	103	0.100
39	1,1,1,2-Tetrachloroethane	<10.0	<10.0	0.091	91	0.100
40	Ethylbenzene	243	<10.0	0.103	103	0.100
41	m, p - Xylene	414	<20.0	0.202	101	0.200
42	Bromoform	<10.0	<10.0	0.098	98	0.100
43	Styrene	<10.0	<10.0	0.099	99	0.100
44	o-Xylene	100	<10.0	0.096	96	0.100
45	1,1,2,2-Tetrachloroethane	<10.0	<10.0	0.096	96	0.100
46	1,2,3-Trichloropropane	<10.0	<10.0	0.100	100	0.100
47	lsopropylbenzene	48.8	<10.0	0.100	100	0.100
48	Bromobenzene	<10.0	<10.0	0.100	100	0.100
49	2-Chlorotoluene	<10.0	<10.0	0.097	97	0.100
50	n-propylbenzene	72.0	<10.0	0.101	101	0.100
51	4-Chlorotoluene	<10.0	<10.0	0.100	100	0.100
52	1,3,5-Trimethylbenzene	55.1	<10.0	0.100	100	0.100
53	tert-Butylbenzene	<10.0	<10.0	0.100	100	0.100
54	1,2,4-Trimethylbenzene	128	<10.0	0.108	108	0.100
55	1,3-Dichlorobenzene	<10.0	<10.0	0.090	90	0.100
56	sec-Butylbenzene	23.4	<10.0	0.102	102	0.100
57	1,4 Dichlorobenzene	<50.0	<50.0	0.093	93	0.100
58	4-isopropyltoluene	<10.0	<10.0	0.096	96	0.100
59	1,2-Dichlorobenzene	<10.0	<10.0	0.090	90	0.100
60	n-Butylbenzene	21.8	<10.0	0.103	103	0.100
61	1,2-dibromo-3-chloropropane	<10.0	<10.0	0.088	88	0.100
62	1,2,3-Trichlorobenzene	<10.0	<10.0	0.120	120	0.100

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152

Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-3-2 Lab Number: H3491-1 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: OIL/WATER EMULSION Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VOLATILES - 8260 (ppm)	Sample Result H3491-1	Method Blank	QC	%Recov.	True Value QC
63 Hexachlorobutadiene	<10.0	<10.0	0.101	101	0.100
64 Naphthalene	<50.0	<50.0	0.100	100	0.100
65 1,2,4-Trichlorobenzene	<10.0	<10.0	0.120	120	0.100

		% Recovery	
66	Dibromofluoromethane	99	
67	Toluene-D8	96	
68	4-Bromofluorobenzene	100	

METHODS: EPA SW-846-8260.

Butgess J. A. Cooke, Ph. D

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Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-3 Lab Number: H3491-5 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result H3491-5	Method Blank	QC	%Recov.	True Value QC
1	Dichlorodifluoromethane	< 0.002	<0.002	0.085	85	0.100
2	Chloromethane	<0.002	<0.002	0.095	95	0.100
3	Vinyl chloride	< 0.002	<0.002	0.093	93	0.100
4	Bromomethane	< 0.002	<0.002	0.093	93	0.100
5	Chloroethane	< 0.002	<0.002	0.086	86	0.100
6	lodomethane	< 0.002	<0.002	0.095	95	0.100
7	1,1-Dichloroethene	< 0.002	<0.002	0.104	104	0.100
8	Trichlorofluoromethane	< 0.002	<0.002	0.090	90	0.100
9	Carbon Disulfide	0.059	<0.002	0.080	80	0.100
10	Methylene chloride	0.003	0.006	0.089	89	0.100
11	trans-1,2-Dichloroethene	< 0.002	<0.002	0.107	107	0.100
12	1,1-Dichloroethane	< 0.002	<0.002	0.089	89	0.100
13	2-Butanone	0.153	<0.050	0.118	118	0.100
14	cis-1,2-Dichloroethene	< 0.002	<0.002	0.106	106	0.100
15	2,2-Dichloropropane	< 0.002	<0.002	0.095	95	0.100
16	Chloroform	< 0.002	<0.002	0.105	105	0.100
17	Bromochloromethane	<0.002	<0.002	0.103	103	0.100
18	1,1,1-Trichloroethane	< 0.002	<0.002	0.105	105	0.100
19	1,2-Dichloroethane	< 0.002	<0.002	0,101	101	0.100
20	1,1-Dichloropropene	< 0.002	<0.002	0.099	99	0.100
21	Benzene	2.41	<0.002	0.094	94	0.100
22	Carbon tetrachloride	< 0.002	<0.002	0.093	93	0.100
23	Trichloroethene	< 0.002	<0.002	0.095	95	0.100
24	Dibromomethane	< 0.002	<0.002	0.102	102	0.100
25	Bromodichloromethane	< 0.002	<0.002	0.097	97	0.100
26	(2-Chloroethoxy)ethene	< 0.002	<0.002	0.087	87	0.100
27	trans-1,3-Dichloropropene	< 0.002	<0.002	0.090	90	0.100
28	4-methyl-2-pentanone	<0.050	<0.050	0.086	86	0.100
29	1,2-Dichloropropane	< 0.002	<0.002	0.089	89	0.100
30	cis-1,3-Dichloropropene	< 0.002	<0.002	0.094	94	0.100
31	Toluene	0.009	<0.002	0.100	100	0.100

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Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-3 Lab Number: H3491-5 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result H3491-5	Method Blank	QC	%Recov.	True Value QC
32	1,1,2-Trichloroethane	< 0.002	<0.002	0.098	98	0.100
33	1,3-Dichloropropane	< 0.002	<0.002	0.098	98	0.100
34	2-Hexanone	< 0.050	<0.050	0.086	86	0.100
35	Dibromochloromethane	< 0.002	<0.002	0.093	93	0.100
36	1,2-Dibromoethane	<0.002	<0.002	0.099	99	0.100
37	Tetrachloroethene	< 0.002	<0.002	0.104	104	0.100
38	Chlorobenzene	<0.002	<0.002	0.103	103	0.100
39	1,1,1,2-Tetrachloroethane	<0.002	<0.002	0.091	91	0.100
40	Ethylbenzene	0.140	<0.002	0.103	103	0.100
41	m, p - Xylene	0.225	<0.004	0.202	101	0.200
42	Bromoform	<0.002	<0.002	0.098	98	0.100
43	Styrene	< 0.002	<0.002	0.099	99	0.100
44	o-Xylene	0.007	<0.002	0.096	96	0.100
45	1,1,2,2-Tetrachloroethane	< 0.002	<0.002	0.096	96	0.100
46	1,2,3-Trichloropropane	< 0.002	< 0.002	0.100	100	0.100
47	Isopropylbenzene	0.013	<0.002	0.100	100	0.100
48	Bromobenzene	<0.002	<0.002	0.100	100	0.100
49	2-Chlorotoluene	<0.002	<0.002	0.097	97	0.100
50	n-propylbenzene	0.014	<0.002	0.101	101	0.100
51	4-Chiorotoluene	<0.002	<0.002	0.100		0.100
52	1,3,5-Trimethylbenzene	0.023	<0.002	0.100	100	0.100
53	tert-Butylbenzene	0.002	<0.002	0.100		0.100
54	1,2,4-Trimethylbenzene	0.055	<0.002	0.108		0.100
55	1,3-Dichlorobenzene	< 0.002	<0.002	0.090		0.100
56	sec-Butylbenzene	0.005	<0.002	0.102	<u> </u>	0.100
57	1,4 Dichlorobenzene	< 0.005	<0.005	0.093	93	0.100
58	4-Isopropyitoluene	0.004	<0.002	0.096	96	0.100
59	1,2-Dichlorobenzene	<0.002	<0.002	0.090		0.100
60	n-Butylbenzene	0.005	<0.002	0.103	103	0.100
61	1,2-dibromo-3-chloropropane	< 0.002	<0.002	0.088	88	0.100
62	1,2,3-Trichlorobenzene	< 0.002	<0.002	0.120	120	0.100

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152

Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-3 Lab Number: H3491-5 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VOLATILES - 8260 (ppm)		Sample Result H3491-5	Method Blank	QC	%Recov.	True Value QC
63	Hexachlorobutadiene	<0.002	<0.002	0.101	101	0.100
64	Naphthalene	0.012	<0.005	0.100	100	0.100
65	1,2,4-Trichlorobenzene	<0.002	<0.002	0.120	120	0.100

		% Recovery	
66	Dibromofluoromethane	108	
67	Toluene-D8	106	
68	4-Bromofluorobenzene	104	

METHODS: EPA SW-846-8260.

Date

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Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-9 Lab Number: H3491-2 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result H3491-2	Method Blank	QC	%Recov.	True Value QC
1	Dichlorodifluoromethane	<0.002	<0.002	0.085	85	0.100
2	Chloromethane	<0.002	< 0.002	0.095	95	0.100
3	Vinyl chloride	<0.002	<0.002	0.093	93	0.100
4	Bromometnane	<0.002	<0.002	0.093	93	0.100
5	Chloroethane	<0.002	< 0.002	0.086	86	0.100
6	lodomethane	<0.002	<0.002	0.095	95	0.100
7	1,1-Dichloroethene	<0.002	<0.002	0.104	104	0.100
8	Trichlorofluoromethane	<0.002	<0.002	0.090	90	0.100
9	Carbon Disulfide	<0.002	< 0.002	0.080	80	0.100
10	Methylene chloride	0.004	0.006	0.089	89	0.100
11	trans-1,2-Dichloroethene	<0.002	<0.002	0.107	107	0.100
12	1,1-Dichloroethane	<0.002	<0.002	0.089	89	0.100
13	2-Butanone	< 0.050	<0.050	0.118	118	0.100
14	cis-1,2-Dichloroethene	< 0.002	<0.002	0.106	106	0.100
15	2,2-Dichloropropane	< 0.002	<0.002	0.095	95	0.100
16	Chloroform	<0.002	<0.002	0.105	105	0.100
17	Bromochloromethane	<0.002	<0.002	0.103	103	0.100
18	1,1,1-Trichloroethane	<0.002	< 0.002	0.105	105	0.100
19	1,2-Dichloroethane	< 0.002	<0.002	0.101	101	0.100
20	1,1-Dichloropropene	< 0.002	<0.002	0.099	99	0.100
21	Benzene	0.463	<0.002	0.094	94	0.100
22	Carbon tetrachloride	< 0.002	<0.002	0.093	93	0.100
23	Trichloroethene	< 0.002	<0.002	0.095	95	0.100
24	Dibromomethane	<0.002	<0.002	0.102	102	0.100
25	Bromodichloromethane	< 0.002	<0.002	0.097	97	0.100
26	(2-Chloroethoxy)ethene	< 0.002	<0.002	0.087	87	0.100
27	trans-1,3-Dichloropropene	<0.002	<0.002	0.090	90	0.100
28	4-methyl-2-pentanone	<0.050	<0.050	0.086	86	0.100
29	1,2-Dichloropropane	<0.002	<0.002	0.089	89	0.100
30	cis-1,3-Dichloropropene	< 0.002	<0.002	0.094	94	0.100
31	Toluene	0.163	<0.002	0.100	100	0.100

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Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-9 Lab Number: H3491-2 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result	Method			True Value
		H3491-2	Blank	QC	%Recov.	QC
32	1,1,2-Trichloroethane	<0.002	<0.002	0.098	98	0.100
33	1,3-Dichloropropane	< 0.002	<0.002	0.098	98	0.100
34	2-Hexanone	< 0.050	<0.050	0.086	86	0.100
35	Dibromochloromethane	< 0.002	<0.002	0.093	93	0.100
36	1,2-Dibromoethane	< 0.002	<0.002	0.099	99	0.100
37	Tetrachloroethene	< 0.002	<0.002	0.104	104	0.100
38	Chlorobenzene	<0.002	<0.002	0,103	103	0.100
39	1,1,1,2-Tetrachloroethane	< 0.002	<0.002	0.091	91	0.100
40	Ethylbenzene	0.324	<0.002	0.103	103	0.100
41	m, p - Xylene	0.736	<0.004	0.202	101	0.200
42	Bromoform	< 0.002	<0.002	0.098	98	0.100
43	Styrene	0.003	<0.002	0.099	99	0.100
44	o-Xylene	0.120	<0.002	0.096	96	0.100
45	1,1,2,2-Tetrachloroethane	<0.002	<0.002	0.096	96	0.100
46	1,2,3-Trichloropropane	<0.002	<0.002	0.100	100	0.100
47	Isopropylbenzene	0.053	<0.002	0.100	100	0.100
48	Bromobenzene	< 0.002	<0.002	0.100	100	0.100
49	2-Chlorotoluene	<0.002	<0.002	0.097	97	0.100
50	n-propylbenzene	0.062	<0.002	0.101	101	0.100
51	4-Chlorotoluene	< 0.002	<0.002	0.100	100	0.100
52	1,3,5-Trimethylbenzene	0.119	<0.002	0.100		0.100
53	tert-Butylbenzene	0.053	<0.002	0.100	100	0.100
54	1,2,4-Trimethylbenzene	0.464	<0.002	0.108	108	0.100
55	1,3-Dichlorobenzene	< 0.002	<0.002	0.090	90	0.100
56	sec-Butylbenzene	0.025	<0.002	0.102	102	0.100
57	1,4 Dichlorobenzene	< 0.005	<0.005	0.093	93	0.100
58	4-isopropyltoluene	0.014	<0.002	0.096	96	0.100
59	1,2-Dichlorobenzene	<0.002	<0.002	0.090	90	0.100
60	n-Butylbenzene	0.033	<0.002	0.103	103	0.100
61	1,2-dibromo-3-chloropropane	<0.002	<0.002	0.088	88	0.100
62	1,2,3-Trichlorobenzene	< 0.002	<0.002	0.120	120	0.100

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ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: LALO JUAREZ/RON DUTCHOVER P.O. DRAWER 70 ARTESIA, NM 88211-0070 FAX TO: 505-677-5152

Receiving Date: 02/27/98 Reporting Date: 03/04/98 Project Number: NOT GIVEN Project Name: NOT GIVEN Project Location: EMPIRE ABO GASOLINE PLANT Sample ID: MW-9 Lab Number: H3491-2 Analysis Date: 02/27/97 Sampling Date: 02/27/98 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: JS Analyzed By: BC

VO	LATILES - 8260 (ppm)	Sample Result H3491-2	Method Blank	QC	%Recov.	True Value QC
63	Hexachlorobutadiene	<0.002	<0.002	0.101	101	0.100
64	Naphthalene	0.104	<0.005	0.100	100	0.100
65	1,2,4-Trichlorobenzene	<0.002	<0.002	0.120	120	0.100

		% Recovery	
66	Dibromofluoromethane	92	
67	Toluene-D8	92	
68	4-Bromofluorobenzene	90	

METHODS: EPA SW-846-8260.

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Date

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ARCO Permian 600 N Marienfeld Midland TX 79701 Post Office Box 1610 Midland TX 79702 Telephone 915 688 5200

March 17, 1998

Mr. Jack Ford Oil Conservation Division 2040 South Pacheco Street Santa Fe, New Mexico 87505

Re: ARCO Empire Abo Gasoline Plant Discharge Plan

Dear Mr. Ford:

Thank you for meeting with us in January to discuss our recent submission: *Environmental Site* Assessment and Notice of Intent to Discharge for the Empire Abo Gasoline Plant (January, 1998). In our meeting, you informed us that the Director of the NMOCD has determined that a discharge plan is required for the facility. This letter amends our previous submission to create a complete discharge plan for the facility.

We agree that a discharge plan is required under WQCC regulations for the land application site. However, we believe the evidence presented in our January, 1988 report clearly shows that activities within the plant boundaries will not impact ground water at a place of reasonable present or future use. Nevertheless, we commit to removal of phase separated hydrocarbon (PSH) at the plant site. The PSH removal program discussed in this letter is a voluntary action and is commensurate with the risks posed by PSH beneath the site. We understand that these voluntary PSH recovery actions are governed by the discharge plan process.

When the Empire Abo plant is closed or shut-down and discharge of wastewater is no longer required, we will allow this discharge permit to lapse. At this same time, we will also cease our voluntary PSH recovery program. We are confident that the data presented in our January, 1998 submission combined with future data collected at the site over the course of the next few years will fully support our decision to cease PSH recovery upon plant shut-down or closure. In the meantime, you will find our proposed program meets the requirements of the WQCC regulations and is fully consistent with the environmental setting and risk profile of the plant.

This submittal presents the 1997 annual ground water sampling event for the plant. The wells were measured and sampled on December 18, 1997. The sampling results are summarized in Table 6.

We also attach a proposed schedule for construction of the land application site. If you require any additional information for the public notice or for approval of our land application proposal, please call me immediately. We would like to maintain our schedule to permit planting in the early spring.

Sincerely,

pargaret fam

Margaret Lowe Environmental Engineer

ML:cv xc: (w/enclosures) Bogle Farms Ltd. Elkhorn Operating Company

OCD Artesia Office U.S. D Environmental Services, Inc.

U.S. Department of Agriculture

A and of Atlantic Bonford Company.

03/16/98		VOUCHER R404c 0398 RGE PLAN	SOURCE ID Pak	Datg _{3/1} Pay Enti GROSS 50.00		00008037200
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	O. Box 1610, Attn. Disburseme			50.00		50.00

EIFTY DOLLARS AND NO CENTS To the order of:

NHED WATER QUALITY MANAGEMENT FUND 2040 SOUTH PACHECO ST SANTA FE NH 87505

Date 03-16-98

1

Amount

*****************50.00* Void after 90 days Penge SI GD014

ARCO Permian—Empire Abo Gasoline Plant Discharge Plan **Project Timeline**

-

	Feb	March	March	March	March	March/April	April	April	May
Year 1998	2/23 - 2/27	3/6 - 3/6	3/9 • 3/13	3/16 - 3/20	3/23 - 3/27	3/30 - 4/3	4/6 - 4/10	4/13 - 4/17	5/11 - 5/15
Response to OCD									
comments					;			A	
(ESI, ARCO Permian)									
NMOCD Review and Comment (NMOCD)									
NMOCD Public Notice (NMOCD, ESI)									
Plans & Specs for Land Application Site (NRCS, ARCO Permian, ESI)			28.						
Land Application Area Survey (Elkhom, ESI)			4		X.				
Land Owner Agreements (ARCO Permian, Bogle Farms, NRCS, ESI)	2.447.22 20				Polya di S				
Construction of Irrigation System (ARCO Permian, Pete & Son's, NRCS, ESI)									
Final Permission to Discharge (NMOCD, ARCO Permian, ESI)									



ASSAIGAI ANALYTICAL LABORATORIES, INC.

7300 Jefferson, N.E. • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259

3332 Wedgewood, E-5 • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820

ENVIRONMENTAL SERVICES, INC. attn: ROBIN DELAPP **4665 INDIAN SCHOOL NE STE** ALBQ., NM. 87110

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

ENVIRONMENTAL SERVICES, INC. Client: Project: 9712191 **EMPIRE ABO ARCO**

E ABO 2-16

realt , P. med William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Sample WAATER CRAB

Sample.

Matrix

WATER GRAB

Sample ID		0 2=10			Matnx	VAIEN_		-4
Collect	<u>Fraction</u>	<u>QC Group</u>	Analyte	Result	Units	Limit *	<u>Run Group - #</u> H	Run Date
				EPA-160 series		<u> </u>		
12/18/97	9712191-01A	WTDS-436	Total Dissolved Solids	3540	mg / L	10	MT.1997.514 - 4	12/23/97
			SW	846-8020 Volatiles	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1		
12/18/97	9712191-01B	X97482	Benzene	4.5	ug / L	1	XG.1997.392 - 8	12/29/97
		X97482	Ethylbenzene	< 1.0	ug / L	1	XG.1997.392 - 8	
		X97482	o-Xylene	< 1.0	ug / L	1	XG.1997.392 - 8	
		X97482	p/m Xylenes	7.2	· ug / L	2	XG.1997.392 - 8	
		X97482	Toluene	< 1.0	ug / L	1	XG.1997.392 - 8	

Client E ABO 2-5

Client

Sample ID **Collect** Fraction QC Group Analyte Result Units Limit Run Group - # Run Date EPA-160 series 1.1 12/18/97 9712191-02A WTDS-438 567.000 MT.1997.544 - 4 12/30/97 ma / L 10 ΙE Total Dissolved Solids EPA-200 series AA-FL Ċс., ; 12/18/97 9712191-02B M97930 717 MW.1998.18 - 14 01/06/98 Calcium mg / L 1 < 0.05 mg / L 0.05 MW.1998.8 - 12 01/05/98 M97930 Iron M97930 122 mg / L MW.1998.19 - 14 01/06/98 Magnesium 1 M97930 9.1 MW.1998.17 - 15 Potassium mg / L 1 M97930 Sodium 24200 mg / L 1 MW.1998.9 - 12 01/05/98 EPA-300.0 anions 67A ЗČ, 12/18/97 9712191-02B MW.1998.5 - 22 12/26/97 W97556 Bromide < 25.0 mg / L 0.5 W97556 14000 0.5 MW.1998.5 - 11 Chloride mg / L < 25.0 0.5 MW.1998.5 - 22 W97556 ma / L Fluoride W97556 Nitrate, Nitrogen < 10.0 mg N/L 0.2 E MW.1998.5 - 22 W97556 Nitrite, Nitrogen 11.0 mg N/ L 0.2 Е MW.1998.5 - 22 < 20.0 mg P/ L E MW.1998.5 - 22 W97556 Phosphate 0.4 W97556 234000 MW.1998.5 - 24 Sulfate mg / L 0.5 ver 1.0 / 971212 Report Date Coyote Reports

Page 1 of 4

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Client: ENVIRONMENTAL SERVICES, INC. Project: 9712191 EMPIRE ABO ARCO

		S	W846-8020 Volatiles				
12/18/97 9712191-02C	X97494	Benzene	1.1	ug / L	1	XG.1997.394 - 4	12/30/97
	X97494	Ethylbenzene	< 1.0	ug / L	1	XG.1997.394 - 4	
	X97494	o-Xylene	< 1.0	ug / L	1	XG.1997.394 - 4	
	X97494	p/m Xylenes	< 2.0	ug / L	2	XG.1997.394 - 4	
	X97494	Toluene	< 1.0	ug / L	1	XG.1997.394 - 4	

Client EABO 3-4

Sample WATER_GRAB

Collect	<u>Fraction</u>	QC Group	Analyte	Result	Units	Limit	* <u>Run Group - #</u> <u>Ru</u>	un Date
			inter and the second	EPA-160 series				
12/18/97	9712191-03A	WTDS-436	Total Dissolved Solids	3120	mg / L	10	MT.1997.514 - 5 1	12/23/97
			EP.	A-200 series AA-FL				
12/18/97	9712191-03B	M97930	Calcium	733	mg / L	1	MW.1998.18 - 15 0	01/06/98
		M97930	Iron	< 0.05	mg / L	0.05	MW.1998.8 - 13 0	01/05/98
		M97930	Magnesium	123	mg / L	1	MW.1998.19 - 15 0	01/06/98
		M97930	Potassium	4.2	mg / L	1	MW.1998.17 - 16	
		M97930	Sodium	85.4	mg / L	1	MW.1998.9 - 13 0	01/05/98
			en e	PA-300.0 anions				
12/18/97	9712191-03B	W97556	Bromide	< 0.5	mg / L	0.5	MW.1998.5 - 7 1	12/26/97
		W97556	Chloride	126	mg / L	0.5	MW.1998.5 - 9	
		W97556	Fluoride	0.6	mg / L	0.5	MW.1998.5 - 7	
		W97556	Nitrate, Nitrogen	0.5	mg N/ L	0.2	E MW.1998.5 - 7	
		W97556	Nitrite, Nitrogen	< 0.2	mg N/ L	0.2	E MW.1998.5 - 7	
		W97556	Phosphate	< 0.4	mg P/ L	0.4	E MW.1998.5 - 7	
		W97556	Sulfate	1800	mg / L	0.5	MW.1998.5 - 9	
			SW	/846-8020 Volatiles		ata dala		
12/18/97	9712191-03C	X97482	Benzene	< 1.0	ug / L	1	XG.1997.392 - 9	12/29/97
		X97482	Ethylbenzene	< 1.0	ug / L	1	XG.1997.392 - 9	
		X97482	o-Xylene	< 1.0	ug / L	1	XG.1997.392 - 9	
		X97482	p/m Xylenes	< 2.0	ug / L	2	XG.1997.392 - 9	
		X97482	Toluene	< 1.0	ug / L	1	XG.1997.392 - 9	

Client E ABO 2-4

Sample WATER_GRAB

STORAGE MARKEN & C		teleganitation (Constant)	And a straight of the state of the	and the second secon	Cargensee workeese	1212 Tel 191 (191 (191 (191 (191 (191 (191 (191	
<u>Collect</u>	<u>Fraction</u>	<u>QC Group</u>	Analyte	Result	Units	Limit *	<u>Run Group - # Run Date</u>
			SW	/846-8020 Volatiles			
12/18/97	9712191-04A	X97482	Benzene	210	ug / L	1	XG.1997.392 - 10 12/29/97
		X97482	Ethylbenzene	9.1	ug / L	1	XG.1997.392 - 14 12/30/97
		X97482	o-Xylene	< 5.0	ug / L	1	XG.1997.392 - 14
		X97482	p/m Xylenes	< 10	ug / L	2	XG.1997.392 - 14
		X97482	Toluene	< 5.0	ug / L	1	XG.1997.392 - 14
			No				-

Client E ABO #8

Sample WATER_GRAB

SCORESSILL: CONS.			and the second secon		eren anderen er store			NAMES AND ADDRESS OF A DESCRIPTION OF A
<u>Collect</u>	<u>Fraction</u>	<u>QC Group</u>	Analyte	Result	Units	Limit *	<u>Run Group - #</u>	<u>Run Date</u>
				EPA-160 series				
12/18/97	9712191-05A	WTDS-436	Total Dissolved Solids	3370	mg / L	10	MT.1997.514 - 6	12/23/97
			EP/	A-200 series AA-FL	i di second			
12/18/97	9712191-05 B	M97930	Calcium	622	mg / L	1	MW.1998.18 - 16	01/06/98
			h			······································		

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Report Date

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Client: ENVIRONMENTAL SERVICES, INC. Project: 9712191 EMPIRE ABO ARCO

2/18/97 9712191-05	B M97930	Iron	< 0.05	, mg/L	0.05		MW.1998.8 - 14	01/05/98
	M97930	Magnesium	107	. mg/L	1		MW.1998.19 - 16	01/06/98
	M97930	Potassium	4.4	mg / L	1		MW.1998.17 - 17	
	M97930	Sodium	300	. mg / L ;	1		MW.1998.9 - 14	01/05/98
			EPA-300.0 anions	. Seat	- 19 - 19 - 19 - 19 - 19 - 19 - 19 - 19			
2/18/97 9712191-05	B W97556	Bromide	< 0.5	; mg/L	0.5	0.3252.1	MW.1998.5 - 8	12/26/97
	W97556	Chloride	224	mg / L	0.5		MW.1998.5 - 10	
	W97556	Fluoride	< 0.5	mg / L	0.5		MW.1998.5 - 8	
	W97556	Nitrate, Nitrogen	< 0.2	mg N/ L	0.2	E	MW.1998.5 - 8	
	W97556	Nitrite, Nitrogen	< 0.2	mg N/L	0.2	E	MW.1998.5 - 8	
	W97556	Phosphate	< 0.4	, mg P/L	0.4	E	MW.1998.5 - 8	
	W97556	Sulfate	1540	mg/L	0.5		MW.1998.5 - 10	
		THE SI	N846-8020 Volatiles		- 27			
12/18/97 9712191-05	C X97482	Benzene	< 1.0	ug / L	1		XG.1997.392 - 11	12/29/97
	X97482	Ethylbenzene	< 1.0	ug / L	1		XG.1997.392 - 11	
	X97482	o-Xylene	< 1.0	ug / L	1		XG.1997.392 - 11	
	X97482	p/m Xylenes	< 2.0	ug / L	2		XG.1997.392 - 11	
	X97482	Toluene	< 1.0	ug / L	1		XG.1997.392 - 11	

Client E ABO 2-3

Sample WATER_GRAB

Collect	Fraction	<u>QC Group</u>	Analyte	Result	Units	Limit *	<u>Run Group - #</u> Run Date
				EPA-160 series			
12/18/97	9712191-06A	WTDS-436	Total Dissolved Solids	3180	mg / L	10	MT.1997.514 - 7 12/23/97
			SW	846-8020 Volatiles	E.		
12/18/97	9712191-06B	X97482	Benzene	< 1.0	ug / L	1	XG.1997.392 - 12 12/29/97
		X97482	Ethylbenzene	< 1.0	ug / L	1	XG.1997.392 - 12
		X97482	o-Xylene	< 1.0	ug / L	1	XG.1997.392 - 12
		X97482	p/m Xylenes	< 2.0	ug / L	2	XG.1997.392 - 12
		X97482	Toluene	< 1.0	ug / L	1	XG.1997.392 - 12

Client EABO #2

E ABO 2-2

Sample WATER GRAB

Second Second		1	the state of the s	2 12 12 13 N	- 16 0 0	1	da na standarda a sa
<u>Collect</u>	<u>Fraction</u>	<u>QC Group</u>	Analyte	Result	Units	Limit *	Run Group - # Run Date
			· · · · · · · · · · · · · · · · · · ·	EPA-160 series	Σ.		
12/18/97	9712191-07A	WTDS-436	Total Dissolved Solids	3100	mg / L	10	MT.1997.514 - 8 12/23/97
			SW	846-8020 Volatiles			
12/18/97	9712191-07B	X97482	Benzene	< 1.0	ug / L	1	XG.1997.392 - 13 12/29/97
		X97482	Ethylbenzene	< 1.0	ug / L	1	XG.1997.392 - 13
		X97482	o-Xylene	< 1.0	ug / L	1	XG.1997.392 - 13
		X97482	p/m Xylenes	< 2.0	ug / L	2	XG.1997.392 - 13
		X97482	Toluene	< 1.0	ug / L.	1	XG.1997.392 - 13

Sample Matrix		

<u>Collect</u>	<u>Fraction</u>	<u>QC Group</u>	Analyte	Result	Units	Limit	*	<u>Run Group - #</u>	<u>Run_Date</u>
				EPA-160 series	- Electrical de la companya de la compan				
12/18/97	9712191-08A	WTDS-438	Total Dissolved Solids	555,000	mg / L	10	E	MT.1997.544 - 6	12/30/97
			SN	846-8020 Volatiles	14 · · · · · · · · · · · · · · · · · · ·				
12/18/97	9712191-08B	X97494	Benzene	1.0	ug / L	1	;	XG.1997.394 - 5	12.30/97
		•		1 0 / 07/0/0			<u>.</u>	D-1- 1/16001	DE DE DU

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Client Sample ID

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Client:ENVIRONMENTAL SERVICES, INC.Project:9712191EMPIRE ABO ARCO

12/18/97 9712191-08B	X97494	Ethylbenzene	< 1.0	ug / L	1	XG.1997.394 - 5	12/30/97
	X97494	o-Xylene	< 1.0	ug / L	1	XG.1997.394 - 5	
	X97494	p/m Xylenes	< 2.0	ug / L	2	XG.1997.394 - 5	
	X97494	Toluene	< 1.0	ug / L	1	XG.1997.394 - 5	

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P. O. Hobl Dist 811 Artes Dist Azteo	Box 198 bs, NM 8 rict II - (S. First sia, NM 8 rict III -) Rio Bra c, NM 87	Energy Minerals and Natural Resources Departmen 505) 748-1283 505) 748-1283 505) 748-1283 505) 748-1283 505) 748-1283 505] Conservation Division 2040 South Pacheco Street 505) 334-6178 505 Santa Fe, New Mexico 87505 505 Santa Fe, New Mexico 875	t Revised 12/1/95 Submit Original Plus 1 Copies to Santa Fe 1 Copy to appropriate District Office
		DISCHARGE PLAN APPLICATION FOR SERVICE COMPANIES GAS PLANTS, REFINERIES, COMPRESSOR, AND CRUDE OIL PUMP S (Refer to the OCD Guidelines for assistance in completing the application)	STATIONS
		X Notice of Intent to Discharge	dification
	1.	Type: _ Empire Abo Gas Plant	
	2.	Operator: Elkhorn Operating Company, Empire Abo Gas Plant, Artesi	ia.NM 88210
		Legally Responsible Party: Address: <u>ARCO Permian, 600 Marienfeld, Midland, TX 79701</u>	
		Contact Person: <u>Margaret Lowe</u> Phone: <u>(915) 688-</u>	-5799
	3.	Location: <u>NE /4</u> <u>SF /4</u> Section <u>3</u> Township <u>185</u> Submit large scale topographic map showing exact location	
	4.	Attach the name, telephone number and address of the landowner of the facility site	· See attached item 4
_	5.	Attach the description of the facility with a diagram indicating location of fences, pits, o	dikes and tanks on the facility. See attached item 5
	6.	Attach a description of all materials stored or used at the facility. See attached i	
	7.	Attach a description of present sources of effluent and waste solids. Average qual water must be included. See attached item 7.	ity and daily volume of waste
	8.	Attach a description of current liquid and solid waste collection/treatment/disposal p	rocedures. See attached item 8.
	9.	Attach a description of proposed modifications to existing collection/treatment/dispo	salsystems. See attached item 9.
	10.	Attach a routine inspection and maintenance plan to ensure permit compliance.	See attached item 10.
	11.	Attach a contingency plan for reporting and clean-up of spills or releases.	See attached item 10.
	12.	Attach geological/hydrological information for the facility. Depth to and quality of gro	
	13.	Attach a facility closure plan, and other information as is necessary to demonstrate c rules, regulations and/or orders.	•
	14.	CERTIFICATION	See attached item 13.
)	I herby certify that the information submitted with this application is true and correct and belief.	t to the best of my knowledge
	I	NAME: <u>Margaret Lowe</u> Title: <u>Environmental</u> Engi	neer
		Signature: Marganel for Date: 116198	

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ltem 1	Purpose of Facility	
ltem 2	Operator or Legally Responsible Party	
ltem 3	Legal Description	1-2
ltem 4	Landowner	
ltem 5	Description of Facility	
	Land Application Design Requirements	1-
	Monitoring Requirements	
ltem 6	Description of Materials Stored or Used at Facility	
ltem 7	Present Sources of Effluent and Waste Solids	
ltem 8	Current Liquid and Solid Waste Procedures	
	Collection and Storage Systems	
	Existing Effluent and Solids Disposal	
ltem 9	Proposed Modifications	
ltem 10	Routine Inspection and Maintenance Plan	
	Routine Inspections	
	Ground Water Monitoring	
	Precipitation Runoff Control	
ltem 11	Contingency Plan	
ltem 12	Geological/Hydrological Information	
	Sources of Water Within One Mile	
	Ground Water Quality and Depth to Ground Water	
	Subsurface Lithology	
	Flooding Potential	
	Additional Information	
	Stratigraphic Information	
	Maps and Cross-Sections	
	Hydrologic Parameters	
	Water Quality	
	Alteration of Contaminants	
	Conclusions	
ltem 13	Facility Closure Plan	
	,	•
	History of Ownership	1-
List of Tabl		1
	Table 1–Material Stored and Used at the Facility (Item 6) Table 2–Source Effluents and Waste Solids (Item 7)	
	Table 3—Quality of Waste Liquids (Item 7)	1-
	Table 4—Summary of Current Liquid and	1 1
	Solid Waste Handling Procedures (Item 8)	
	Table 5—Proposed Modifications to Ground Water	
	Monitoring Program (Item 10)	1-14
	Table 6—Comparison of Screened Interval and Depth to	

Water or Product in Selected Wells (Item 12).....1-16

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Appendix 1 Figures & Plates

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	Figure 1–Location of Facility
	Figure 2–Soil Survey
	Figure 3–Process Flow Diagram
	Figure 4–Structure Contour Map
	Figure 5–Regional Ground Water Map
	Figure 6–Geologic Map
	Key to Figure 6–Geologic Map
	Figure 7–Stratigraphy of the Pecos Country
	Figure 8–Correlation of Geologic Formations
	Plate I–Ground Water Cross-Section A A'
	Plate II–Ground Water Cross-Section B B'
	Plate III–Ground Water Cross-Section C C'
	Plate III-b—Expanded Cross-Section C C'
	Plate IV–Ground Water Cross-Section D D' and E E'
	Plate V—Hydrologic Cross-Section
_	
Appendix 2	Engineering Drawings
	Monitor Well Location Map
Appendix 3	Analytical Results from the Evaporation Pond Department of Agriculture Correspondence
Appendix 3 Appendix 4	•
	Department of Agriculture Correspondence SPCC Plan Rule 116 Release Notification and Corrective Action
Appendix 4	Department of Agriculture Correspondence SPCC Plan Rule 116 Release Notification and Corrective Action WQCC 1203 Notification of Discharge–Removal 1996 Ground Water Sampling Results
Appendix 4 Appendix 5	Department of Agriculture Correspondence SPCC Plan Rule 116 Release Notification and Corrective Action WQCC 1203 Notification of Discharge–Removal 1996 Ground Water Sampling Results Amoco Ground Water Monitoring Report
Appendix 4 Appendix 5 Appendix 6	Department of Agriculture Correspondence SPCC Plan Rule 116 Release Notification and Corrective Action WQCC 1203 Notification of Discharge–Removal 1996 Ground Water Sampling Results Amoco Ground Water Monitoring Report Sample Laboratory Sheet

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ARCO Permian-Empire Abo Gasoline Plant Environmental Site Assessment and Notice of Intent to Discharge

Executive Summary

ARCO Permian intends to discharge process waste water from their Empire Abo Gasoline Plant near Artesia, New Mexico, to a land application site while continuing to discharge to the evaporation pond and two Class II injection wells. ARCO Permian also intends to cease ground water restoration activities (hydrocarbon recovery) and plug and abandon most of the existing monitor wells at the plant. In this document the Empire Abo Gasoline Plant will be called either the "Empire Abo plant" or "the plant."

The Empire Abo plant currently operates under ground water discharge plan GW-22.

This environmental assessment and notice of intent to discharge will demonstrate that ground water beneath the plant site was created by activities at the plant. It will also demonstrate that ground water beneath the plant will not move directly or indirectly into ground water that could be used in the foreseeable future. Therefore, ARCO Permian intends to allow expiration of the plant's existing discharge plan because new site data demonstrates that a discharge plan is not required for this location.

The proposed land application site overlays a plume which emanates from the Amoco Pipeline Station approximately 1500 feet from the site and terminates at the Amoco remediation system approximately 1000 feet from the site. Please refer to appendix 9 for a copy of the Remediation System Operations Report, Amoco Pipeline Station, submitted to NMOCD for more information regarding this system. The design of the irrigation system will minimize infiltration and maximize surface area irrigation. If any infiltration occurs at the proposed land application site, the water will be rich in oxygen and nutrients thereby benefiting biodegradation of the hydrocarbons. Any infiltrated water from the irrigation system will improve the overall ground water quality of the area.

If required by NMOCD a discharge plan for the proposed land application site will be submitted under a separate cover.

ARCO Permian desires to construct a land application site after freezing conditions of January and February.

Item 1

Indicate the major operational purpose of the facility.

ARCO Permian's Empire Abo plant uses a cryogenic process to remove ethane, propanes, butanes, pentanes and hexanes from natural gas. The process uses scrubbers, exchangers, separators, chillers, flash tanks and compressors. The plant has a design

capacity of 56 MMscfd and currently processes approximately 40 MMscfd. Residue gas and natural gas liquids (NGL) are sold via pipeline from the plant. NGL and sulfur are also trucked from the plant.

Item 2

Name of operator or legally responsible party and local representative.

Legally Responsible Party	ARCO Permian Attn: Margaret Lowe 600 North Marienfeld Midland, TX 79701-4373 915-688-5799 915-688-5620 (fax)
Local Representative	ARCO Permian Attn: Dave Klenk Plant Engineer 600 North Marienfeld Midland, TX 79701-4373 915-688-5525 915-688-5620 (fax)

Operator

Elkhorn Operating Company Empire Abo Plant Attn: Randy McCollum Artesia, NM 88210 505-677-5117 505-677-5152 (fax)

Item 3

Give a legal description of the location and county. Attach a large scale topographic map.

The Empire Abo plant is located in Eddy County, New Mexico, Township 18 South, Range 27 East, NE/4 SE/4 Sec. 3.

Plant waste water from the cooling tower, reverse osmosis unit and other minor nonhydrocarbon waste streams will be land applied in Eddy County, New Mexico, Township 18 South, Range 27E, SW/4 SE/4 Section 10 and NW/4 NE/4 Section 15.

Other waste water exempt from RCRA regulation that is generated by the facility is discharged to ARCO C-49 or Walter Solt State Well #1—Class II injection wells located in

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Eddy County, New Mexico. ARCO C-49 is located in Township 17 South, Range 29 East, Center NW Sec. 29. Walter Solt is located in Township 18 South, Range 28 East, Section 5.

See topographic map (figure 1) and soil survey (figure 2). All figures are in appendix 1 with the exception of engineering drawings which are in appendix 2.

Item 4

Attach the name, telephone number and address of the landowner of the facility site.

ARCO Permian Attn: Margaret Lowe 600 North Marienfeld Midland, TX 79701-4373 915-688-5799 Fax: 915-688-5620

Attach the name, telephone number and address of the surface leaseholder of land application site.

Bogle Farms, Ltd. Attn: Lewis Derrick c/o Bogle Ltd. P.O. Box 460 Dexter, New Mexico 88230-0460 505-734-5442 Fax: 505-734-5751 Mobile: 505-365-6927

Attach the name, telephone number and address of the landowner of land application site. New Mexico State Land Office

Records Management Division PO Box 1148 Santa Fe, NM 87504-1148 505-827-5721

ltem 5

Attach the description of the facility with a diagram indicating location of fences, pits, dikes and tanks on the facility.

The Empire Abo plant has a design capacity of 56 MMscfd and currently processes approximately 40 MMscfd of natural gas. Major plant processes include refrigeration,

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compression, dehydration and cryogenic recovery. Residue gas and NGL are sold via pipeline from the plant. NGL and sulfur are also trucked from the plant. The process flow diagram in figure 3 supplies additional details.

Below are descriptions of the waste generation processes for this facility.

The closed drain system (figure 3) collects all process hydrocarbon liquids from drains and vents. The collected hydrocarbon liquids are transferred to the closed drain header tank (sump tank). Any gases released in the tank are either vented to the flare system or vented back to the #2 inlet scrubber. The liquids are pumped to the north slop oil tank and then trucked to ARCO's M-9 tank battery where the hydrocarbons and water are separated. Hydrocarbons go to the oil storage tanks. Water goes to ARCO C-49 Injection Well. The mechanical flow diagrams for this system are provided in appendix 2, drawing D-60630-207 and 208.

The open drain system (figure 3) collects plant process nonhydrocarbon liquids from blowdowns and drains in the caustic, amine and glycol systems. The collected liquids flow through the open drain sump which is then pumped to the process drain tanks for disposal. Waste water is trucked to Walter Solt State Well #1. Being a below grade atmospheric system, all drain lines have the capability for mechanical integrity testing. The mechanical flow diagram for this system is provided in appendix 2, drawing D-63630-203.

The amine drain system (figure 3) collects all waste amine from plant #1 and #2 amine systems in underground sumps. The collected liquids are stored in the amine sumps and pressurized back to the amine system or to the open drain system. The open drain system goes to the process drain storage tanks for disposal. Waste water is trucked to Walter Solt State Well #1. A new underground sump was installed for the #1 amine system. Collection is by gravity drain. All underground piping can be tested for mechanical integrity. The mechanical flow diagram for the system is provided in appendix 2, drawing D-63630-206.

The blowdown system (figure 3) collects blowdown from five main boilers, the waste heat boiler and the condenser located at the sulfur plant. The collection line from the sulfur plant drains into the north end of the evaporation pond. The main boiler blowdown collection line ties into the backwash collection line. This line drains into the east end of the evaporation pond. All underground lines can be tested for mechanical integrity. The water from the evaporation pond is disposed of in ARCO C-49 Injection Well, Walter Solt State Well #1 or if approved piped to the land application site. The mechanical flow diagram for the system is provided in appendix 2, drawing D-63630-201.

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The north slop oil system (figure 3), also referred to as the clean slop oil system, is a continuation of the closed drain system. The system collects liquids from the closed drain header tank (sump tank); #1, #2, and #9 inlet scrubbers; and the flare knockout tank and stores these liquids in the north slop oil tank. These liquids are routed via pipeline to ARCO's M-9 battery where the hydrocarbons and water are separated. Hydrocarbons flow to the oil storage tanks. Water goes to ARCO C-49. The line from the closed drain header tank is above grade and can be tested for mechanical integrity. New pumps were installed for liquid transfer at the flare knockout tank and closed drain header tank. At #9 inlet scrubber an existing pump was reused. The mechanical flow diagram for this system is provided in appendix 2, drawing D-63630-204.

The south slop oil system (figure 3), also referred to as the dirty slop oil system, collects plant compressor pit fluids, synthetic oil from the starting air system, and oils from the containment at the product storage area. Numerous air diaphragm pumps were installed to transfer these liquids to the south slop oil tank for disposal. The compressor crankcase vent drip legs for compressors E4-301 through 308 were routed to 30" steel pits inside the compressor buildings (one for each compressor) which are connected to the suction of the air pumps. These liquids are pumped to the south slop oil tank for truck disposal. The mechanical flow diagram for this system is provided in appendix 2, drawing D-63630-202.

The backwash system collects discharge fluids from backwashing water coolers and condensers. The backwash collection lines on the west side of the compressor building drain into the evaporation pond. The lines on the east side of the building drain into the compressor pits for disposal through the south slop oil system. All backwash lines are provided with a small section of clear PVC pipe so that backwash water can be inspected for clarity. This is a below grade drain system. All underground piping can be tested for mechanical integrity. Plans are being made to route the lines on the east side of the compressor buildings to the evaporation pond. The mechanical flow diagram for this system is provided in appendix 2, drawing D-63630-205.

All equipment (i.e., pumps, filters) that has the potential for leaking fluids is surrounded by concrete containment. The containment areas have 6" walls above and below grade. Accumulated fluids are pumped to an open drain auxiliary hub.

Cooling tower blowdown water, boiler blowdown water and backwash water from the reverse osmosis (RO) unit, used to create soft water for the boilers, is sent to the evaporation pond (figure 3).

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ARCO Permian-Empire Abo Gasoline Plant Environmental Site Assessment and Notice of Intent to Discharge

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Land Application Design Requirements

ARCO Permian proposes to discharge water from the evaporation pond to the proposed land application site. Plant waste water in the evaporation pond is derived from the cooling tower, reverse osmosis unit, boilers and other minor nonhydrocarbon waste streams. The land application site is owned by the state of New Mexico Land Office, and the surface lease holder of the land application site is Bogle Farms, Ltd. ARCO Permian obtained guidance from the United States Department of Agriculture, Natural Resources Conservation Service, which suggested the following.

- Use approximately 21 acres
- Apply no more than 1.5 acre feet per year of discharge water to native vegetation
- Irrigate between 6:00 pm and 6:00 am from March through October, due to chloride concentrations
- Irrigate between 8:00 am and 8:00 pm from November through February, due to freezing temperatures
- Apply at least 4 inches of discharge water per irrigation event
- Land application area should have at least a depth of 30 inches of silt loam soils
- Plant Alkali Sacaton as the native grass and apply one pound of seed per acre
- Initially fence the area to allow the grass to grow, then allow grazing in heavy, short periods for weed control
- Install an irrigation control system to make efficient use of discharge water

The design of the irrigation unit will be submitted after a detailed site inspection by the U.S. Department of Agriculture. Enclosed is the recent letter from the Department of Agriculture outlining their initial thoughts on the project in appendix 2.

The proposed land application site overlays a plume which emanates from the Amoco Pipeline Station approximately 1500 feet from the site and terminates at the Amoco remediation system approximately 1000 feet from the site. Please refer to appendix 9 for a copy of the Remediation System Operations Report, Amoco Pipeline Station, submitted to NMOCD for more information regarding this system. The design of the irrigation system will minimize infiltration and maximize surface area irrigation. If any infiltration occurs at the proposed land application site, the water will be rich in oxygen and nutrients thereby benefiting biodegradation of the hydrocarbons. Any infiltrated water from the irrigation system will improve the overall ground water quality of the area.

If required by NMOCD a discharge plan for the land application site will be submitted under a separate cover.

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ARCO Permian-Empire Abo Gasoline Plant Environmental Site Assessment and Notice of Intent to Discharge

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Monitoring Requirements

On a voluntary basis ARCO Permian will monitor as follows.

- One time—collect a grab sample from the evaporation pond for analysis of all applicable WQCC standards. A sample was taken on June 5, 1997 and the results are in appendix 3.
- Semi-annually—collect a grab sample from the evaporation pond. All parameters of concern in the previous grab sample will be analyzed. The Department of Agriculture is most concerned about conductivity, sodium, calcium, chloride, sulfate concentrations and total dissolved solids (TDS). These chemicals will be included in each sampling event.
- Monthly-test conductivity of the evaporation pond.
- Monthly—monitor the volume of applied water (after irrigation begins).

ARCO Permian will submit annual reports in January of each year which will include sample results and application volume amounts.

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Attach a description of all materials stored or used at the facility.

Table 1 Container	Material	Form	Location	Containment
				Comment
Tank	Amine	liquid	Near evaporation pond	Concrete berm
Cloth bags	Dry Soda Ash	powder	Center of plant	Pad
Tank	Unichem 3141	liquid	Near boilers	Concrete berm
Tank	Unichem 3270	liquid	Near boilers	Concrete berm
Tank	Unichem 3030	liquid	Near boilers	Concrete berm
Tank	Unichem 3941	liquid	Near boilers	Concrete berm
Tank	Unichem 1700	liquid	Near cooling towers	Concrete berm
Tank	Unichem 1714	liquid	Near cooling towers	Concrete berm
Tank	Unichem Alpha 570	liquid	Near cooling towers	Concrete berm
Tank	Am. Sales Degreasers	liquid	Compressor bldg	Concrete berm
Tank	Unichem (Inhibitors)	liquid	Near cooling tower	Concrete berm
Vats	Safety Kleen	liquid	Welding, compressor buildings & warehouse	
Tank	Ethyl mercaptan (ethanethiol)	liquid	Near loading rack	Enclosed system, concrete berm
Tank	Varsol	liquid	NW of product tanks	Earthen berm
Tank	Gasoline	liquid	NW of product tanks	Earthen berm
Tank	Diesel	liquid	NW of product tanks	Earthen berm
Tank	Lubricating Oil	liquid	NW of product tanks	Earthen berm
Drums	Lubricating Oil	liquid	East of inlet gas	Concrete berm
			compressor building	
Tank	Y Grade	liquid	East side of plant	Earthen berm
Tank	Butane	liquid	East side of plant	Earthen berm
Tank	Propane	liquid	East side of plant	Earthen berm
Tank	Gasoline	liquid	East side of plant	Earthen berm

Material Stored and Used at the Facility

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item 7

Attach a description of present sources of effluent and waste solids. Average quality and daily volume of waste water must be included.

Source	Type of Waste	Volume (GPD)	Quality/Additives
Separators/	Water, hydrocarbon	3360	No additives
Scrubbers	liquids		
Boiler/	Low TDS	2200	Unichem 3141, 3270, 3030, and 3941
Condensate	water		RO water
Cooling Towers	High TDS water	10500	Unichem Alpha 570, Unichem 1700 and 1714 raw water
Equipment	Water, soap, oil	33	No additives
Washdown	American sales		
Solvents/Degreasers	Soap	0.7	No additives
	American sales		
Caustic	Soda ash, water	200 gal/4 months	Soda Ash, water
Engine	Water, oil	420	Unichem 2310, water, and oil
Cooling	hydrocarbon		
Systems	liquids		
Waste Lubrication/	Oil	less than	Drippings from piping on compressors
Motor Oil		60 gal/day	
Used Filters	Amine, charcoal, oil, regen gas	varies	None
Painting Waste *	none	none	None
Sewage	Water from sinks,	less than	None
	showers, etc	100 bbl/day	
Lab Wastes	Amine, mild sulfuric acid	2-5 gal/mo	Water
Miscellaneous	Trash (Solid Waste)	varies	None
Drains	Oily water, caustic amine	840	Water, oil, amine, and caustic

*All painting is contracted out.

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Quality of Waste Liquids Table 3

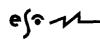
Source	Type of Waste	Analysis	Final Disposal
Evaporation	Nonhydrocarbon waste water	WQCC	ARCO C-49 Injection well,
Pond	Moderate TDS	Table 1	Walter Solt State Well #1, or Land Application
South slop oil system or Dirty slop oil system	Hydrocarbon tank bottom solids, recovered hydrocarbons from recovery wells, hydrocarbons	None	Walter Solt State Well #1 (Class II well)
North slop oil system or Clean slop oil system	Natural gas condensate/other hydrocarbon liquids suitable for resale	None	ARCO M-9 battery via pipeline, hydrocarbons separated from water. Hydrocarbons go to oil storage tank. Water goes to ARCO C-49 (Class II well)
Process Drain		None	Walter Solt State Well #1
Storage Tanks			(Class II well)

There are no toxic pollutants (WQCC 1101.TT) in the waste streams.

A grab sample of the evaporation pond was taken in accordance with OCD sampling procedures. Sampling was done at the northeast end of the pond below the inlet pipe. Analyses was performed for all contaminants listed in WQCC 3103 ABC the results are included in appendix 3.

Variations in the evaporation pond could produce higher or lower values due to flow rate variations and process upsets. We believe that no major variations will occur.

There is no commingling of waste streams.



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Item 8

Attach a description of current liquid and solid waste collection/treatment/disposal procedures.

Type of Waste	Collection	Storage	Hauled by	Disposal
Separators/	Drain pipes	Clean Slop	Pipeline	ARCO M-9 Battery
Scrubbers		Tank		for separation.
				Water is injected
				in ARCO C-49.
Boilers	Drain pipes	Evaporation	I&W Inc. or OK Hauling	Walter Solt State Well #1,
		Pond		Proposed land application or ARCO C-49
Cooling Towers	Drain pipes	Evaporation	I&W Inc. or OK Hauling	Walter Solt State Well #1
		Pond		Proposed land application
				ARCO C-49
Equipment	Sump	Dirty Slop	I&W Inc. or OK Hauling	Walter Solt State Well #1
Washdown		Tank		
Soaps	Sump	Dirty Slop	I&W Inc. or OK Hauling	Walter Solt State Well #1
		Tank		
Soda Ash 	Process Drain	Process Drain	I&W Inc. or OK Hauling	Walter Solt State Well #1
Water	0	Tank		W-1
Engine Cooling Systems	Sump	Dirty Slop Tank	I&W Inc. or OK Hauling	Walter Solt State Well #1
Cooling Systems Waste Lubrication/	Sump	Dirty Slop	I&W Inc. or OK Hauling	Walter Solt State Well #1
	Sump	Tank	IX W INC. OF OK HAUMING	walter soit state well #1
Motor Oil Used Filters		Collection Bin		Procycle Metals, Inc or WesTex
		Concentration Din		
Painting Wastes			ni li	Contract out all painting
Sewage	Pipeline	Septic Tank	Pipeline	Leach fields
Amine, Low-grade	Process Drain	Process Drain	I&W Inc. or OK Hauling	Walter Solt State Well #1
Sulfuric Acid		Tank		
Miscellaneous	Trash cans	Dumpster	Waste Management	City of Roswell Landfill
Drains	Pipeline	Dirty Slop	I&W Inc. or OK Hauling	Walter Solt State Well #1
		Tank		

Summary of Current Liquid and Solid Waste Handling Procedures Table 4

Collection and Storage Systems

Refer to item 5 for a detailed discussion on collection and storage systems and integrity of buried piping. All storage facilities listed in item 6 are bermed appropriately.

Existing Effluent and Solids Disposal

The evaporation pond was constructed in the mid-1980s. The pond is constructed of concrete with a volume capacity of 55,125 ft³. Refer to item 3 above for location of Class II injection wells.

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Off-Site Disposal Contractors and Disposal Facilities

Waste Management hauls general refuse to the Roswell Municipal Landfill (NMED 03374).

Waste Management 2608 Lovington Hwy, Hobbs, NM 800-634-8760

I & W Inc. hauls to the Walter Solt State Well #1 (NMOCD Order SWD-318) and ARCO's Empire Abo Unit C-49 Injection Well (NMOCD PMX58).

I. & W. Inc. PO Box 98, Loco Hills, NM 505-677-2111

OK Hauling, hauls to the Walter Solt State Well #1 (NMOCD Order SWD-318) and ARCO's Empire Abo Unit C-49 Injection Well (NMOCD PMX58).

OK Hauling

PO Box 146, Loco Hills, NM 505-677-2262

Filters are picked up by Procycle Metals (EPA ID TX 0988036026; TWC 41814; TNRCC 20903) or WesTex (EPA ID TX D003891231).

Procycle Metals, Inc 320 Scoggins Rd. Springtown, TX 76082 817-523-4938

WesTex

8220 West Hwy 80 Midland, TX 79706 817-523-4938

Item 9

Attach a description of proposed modifications to existing collection/treatment/disposal systems.

The systems described herein adequately protect ground water quality. Therefore, no modifications are proposed.

Item 10

Attach a routine inspection and maintenance plan to ensure permit compliance.

Routine Inspections

On a monthly basis, plant personnel will visually inspect all storage tanks, the evaporation pond, the land application site and above ground piping for leaks or other signs of distress. Plant personnel will employ the inspection form presented in appendix

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4 and maintain these forms on site. If visual inspection suggests that any waste management vessel is leaking, excavation or additional testing (e.g., tank integrity testing) may be required to confirm a release. Plant personnel will first notify NMOCD by telephone of the potential leak and discuss the proposed confirmation testing procedure and schedule. NMOCD will receive the results of the testing program within 5 days of receipt of results. We do not propose ground water monitoring as a form of leak detection.

Spill and leak reporting are discussed in more detail in the following section.

Ground Water Monitoring

Under a separate set of letter agreements with the NMOCD, the previous owner of the plant (Amoco) installed 30 ground water monitoring wells and implemented a monitoring program for 27 of these wells. Three of the original wells are plugged and abandoned. One well (2-8) was drilled but never completed, raising the total number of borings on site to 31. After a thorough review of regional and site hydrogeology, we propose a new ground water monitoring program. We discuss the technical justification for these proposed changes in section 12 of this document.

Table 5 outlines these proposed changes and provides a synopsis of our justification for the changes. We propose to immediately plug and abandon 21 wells because of their minimal value as hydrocarbon recovery wells and because the density of present monitoring wells is not justified. We propose to plug and abandon one additional well after one more sampling event. Most wells have shown no change in the character of ground water over the past five years of monitoring. The data of the past five years clearly shows where phase-separated hydrocarbons (PSH) exist. Continued monitoring of these wells will continue to define what is already well established. We recommend that only five monitoring wells remain operational at the site. As explained later in this report, these wells (2-8, 2-14, 3-2 and 3-3) create an effective network to detect movement of hydrocarbons from the plant site.

On an annual basis, any of the five wells that does not exhibits PSH will be tested for the following.

- Total dissolved solids
- BTEX
- Depth to water, depth to PSH and total depth

The NMOCD will receive results of the monitoring program in January of each year.

As discussed in more detail in section 12 of this submission, we see little benefit derived

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from removal of PSH at the site. We will show that continued product recovery efforts create a larger environmental threat than leaving the hydrocarbons in the subsurface. Plugging and abandoning these wells is appropriate.

Precipitation Runoff Control

Stormwater control levees on the southwest and southeast borders of the plant capture and contain all runoff. The levees act as tertiary containment for oil, other hydrocarbon liquids, and chemicals. Any oil fluid that accumulates in this area is recovered with vacuum trucks and portable pumps. It is either disposed of at an approved offsite facility or it is reused in the production stream.

The operation of the land application site adequately prevents runoff from the facility. Water from the evaporation/storage pond is not applied to the surface of the ground after precipitation events saturate the soil. Visual inspection of the soil in the plant area is sufficient to determine if the irrigation system must be temporarily shut down to permit soil drainage. Runoff of natural precipitation from the land application site will occur after significant precipitation events. Runoff of natural precipitation may also occur when precipitation occurs after irrigation. Discharge of natural precipitation is not an environmental hazard at this site and is not regulated by WQCC or other state or federal regulations.

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Proposed Modifications to Ground Water Monitoring Program

Table 5

/ell #	Proposed Modification	Rationale
1	Ensure proper plug and abandonment	Previous reports indicate well is abandoned
2	Two additional quarterly monitoring events, then annual monitoring	1996 results are significantly different from previous analyses. Well i at northwest edge of property *
3	Plug and abandon	Center of property, consistently showing PSH
4	Plug and abandon	Center of property, consistently showing PSH and/or high BTEX concentration
5	Plug and abandon	Center of property, consistently showing PSH
6	Plug and abandon	Center of property, consistently showing PSH
7	Plug and abandon	Center of property, consistently showing PSH and/or high BTEX concentration
8	Two additional quarterly monitoring events, then annual monitoring	1996 results are significantly different from previous analyses, well is on west edge of property
9	[_]	Consistently shows PSH. MW-2, MW 2-14 and MW-8 can effectively monitor western property line
<u> </u>	Plug and abandon Ensure proper plugging and abandonment	Previous reports indicate well is abandoned
2-1	Insure proper progening and abareonment	
2-2	Plug and abandon	Data demonstrate BTEX below WQCC standards
2-3	One more monitoring event, then plug and abandon	1996 results are significantly different from previous analyses, well is on central portion of property
2-4	Plug and abandon	Center of property, consistently shows high BTEX
2-5	Plug and abandon	Data demonstrate BTEX below WQCC standards
2-6	Plug and abandon	Center of property, consistently showing PSH
2-7	Plug and abandon	Consistently shows PSH. MW-2, MW 2-14 and MW-8 can effectively monitor western property line
2-8	no change	Well was never completed
2-9	Plug and abandon	Center of property, consistently showing PSH
2-10	Plug and abandon	Center of property, consistently showing PSH
2-11	Plug and abandon	Center of property, consistently showing PSH
2-12	Plug and abandon	Center of property, consistently showing PSH
2-13	Plug and abandon	Center of property, consistently showing PSH
2-14	Annual monitoring	Located on western edge of property
2-15	Plug and abandon	Center of property, consistently showing PSH
		Center of property, consistently showing PSH and/or high BTEX
2-16	Plug and abandon	concentration
2-17	Ensure proper plugging and abandonment	Previous reports indicate well is abandoned
2-18	Plug and abandon	Center of property, consistently showing PSH and/or high BTEX concentration
3-1	Plug and abandon	Consistently shows PSH. MW-2, MW 2-14 and MW-8 can effectively monitor western property line
3-2	Annual monitoring	Located on southern edge of process area
	Annual monitoring	Located on eastern edge of property
3-3		

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Item 11

Attach a contingency plan for reporting and clean-up of spills or releases.

Elkhorn (the operating company) will handle all spills and leaks immediately in accordance with the current SPCC plan for the Empire Abo plant (appendix 4). They will report all spills and leaks according to the requirements of NMOCD Rule 116 and WQCC Section 1203. Copies of these regulations are attached in appendix 4. Elkhorn will notify ARCO Permian of any and all spills and or releases.

Item 12

Attach geological/bydrological information for the facility. Depth to and quality of ground water must be included.

Sources of Water Within One Mile

Figure 1 clearly shows the plant and the proposed land application site relative to Scoggin Draw and its unnamed tributaries. Scoggin Draw is an intermittent stream and was dry during the June 4-5, 1997, site visit despite recent heavy rains in the area. Figure 1 shows that the headwaters of Scoggin Draw lie less than two miles from the plant.

Figure 1 does not show any seeps, springs, wetlands or other signs of near-surface water and none were observed during the site visit. The ground water data, provided later in this report, shows that perched ground water exists well below the surface. Therefore, springs, seeps and other nearby ground water discharges were not expected. Aerial photographs in the 1971 Soil Conservation Service Soil Survey of Eddy Area, New Mexico, show only small depressions 3 miles east of the plant where water may temporarily pond.

When compared with grazing land in other parts of New Mexico, operational water wells in the general area are rare. Caprock Irrigation Company supplies water to the plant. The pipeline draws from wells in the Ogallala aquifer, about 30 miles east of the site. The 1975 topographic map (figure 1) does not show any nearby water wells nor windmills. The aerial photographs in the soil survey confirm the lack of wells. The New Mexico State Engineer's Roswell office found records for three water wells in the general area.

RA 2996	NE SE NW	Section 2	T18S	R27E
RA 3917	SE NW NE	Section 10	T18S	R27E
RA 3647	NW SE	Section 11	T18S	R27E

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The State Engineer's Office maintains detailed information for only well RA-3917. The well log for this well (dated July 31, 1958) is in appendix 8. SEO records identify well RA-3647 as an oil well converted to use as a water supply well. The well numbers suggest that these three wells were completed before 1959. Based upon our field observations and the lack of dwellings or windmills on published maps, we believe these wells, if they still exist, provide water for oil field drilling operations and possibly livestock. All of these wells are outside of the 1/4 mile radius of interest established in the 1995 NMOCD guidance document for discharge plan preparation.

There are 27 monitoring wells at the plant site. Hydrocarbon recovery systems pump recovered water and floating hydrocarbons from about 15 of these wells. Monitoring wells and a hydrocarbon recovery system (operated by others) are also present in Sections 10 and 15 of T18S, R27E.

Ground Water Quality and Depth to Ground Water

Before discussing the ground water quality and depth to water at the site, we provide a brief discussion of our understanding of monitor well drilling practices at the site. Amoco employed air rotary methods for all wells. With air rotary, especially within the consolidated rock beneath the site, saturated strata are relatively easy to discern. Based upon the lithologic and well completion records submitted in earlier reports to the NMOCD, the on-site geologist encountered first water at different depths in different borings. According to standard industry protocol, the monitor wells are screened across the uppermost water-bearing unit at each location.

The table below compares screened intervals to the depths of water and phaseseparated liquids (PSL) in selected wells. Clearly, the on-site geologist correctly identified first water because the screened intervals correlate with the depths to PSL in many wells. If the screened unit was not the uppermost saturated unit, we would not observe floating PSL. Evaluation of the screened interval with well lithology (see plates I-IV) also suggests that the on-site geologist correctly constructed the monitor wells. We conclude that the monitor wells accurately depict head and water quality in the uppermost water-bearing zone at each well location.



Table 6	able 6											
Well	2	3	5	6	7	8	2-3	2-6	2-10	2-15	3-2	3-3
Top of Screen	22.5	71.5	74	33	13.5	72	98	14	68	63	63	58
Bottom of Screen	37.5	91.5	99	53	28.5	92	108	24	78	73	103	83
PSH	na	72.27	69.19	39.29	na	na	na	21.81	68.98	62.7	69.72	na
Water	33.62	77.6	69.79	45.51	8.78	68.05	82.32	22.22	73.75	65.44	71.1	73.46

Comparison of screened interval and depth to water or product in selected wells. (Fluid level data from Philip Environmental, November 1996.)

For the past several years, the previous owner and operator of the plant, Amoco Production Company, submitted reports to NMOCD describing the ground water quality beneath the plant site. Appendix 5 presents the most recent ground water monitoring report (1996) as well as data from previous sampling events. During our site visit, we conducted a specific conductance survey of various wells to supplement the results presented in previous reports.

With respect to benzene, ethyl benzene, toluene and xylene, the data in appendix 5 is bimodal. Analyses either approach the WQCC ground water standards or are well above standards and often show free-phase hydrocarbons.

For reasons we do not fully understand, the laboratory detects MTBE in several wells in concentrations exceeding 1 mg/l. Analyses for MTBE appear to occur before 1994 and several recently published reports discuss problems with MTBE analysis of samples with relatively high levels of hydrocarbons. The plant does not manufacture nor use MTBE. We assume MTBE detection is due to laboratory error.

The plant uses solvents sparingly. Amoco has reported detection of volatile and semivolatile compounds in certain wells. Appendix 6 is a sample laboratory sheet from a 1993 monitoring campaign. This laboratory report shows that the terms volatile and semivolatile are associated with EPA Method 8015 for TPH, not 8020 or 8030. Thus the report of volatiles or semivolatiles actually refers to low-boiling point or high-boiling point hydrocarbon compounds.

The sum of the anions (chloride and sulfate) appears to range between 3000 and 4000 mg/l. Our limited specific conductance survey resulted in the following data.

Well 53300 micromhos/meterWell 2-144600 micromhos/meterWell 2-123900 micromhos/meter

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ARCO Permian-Empire Abo Gasaline Plant Environmental Site Assessment and Notice of Intent to Discharge

Assuming that anions and cations will balance in a complete ground water analysis and carbonate species are present in this ground water, the total dissolved solids content of the perched ground water beneath the site may approach 8000 mg/l (4000 x 2). Our specific conductance survey suggests that the TDS may be as low as 2100 mg/l (65% of specific conductance). As indicated in section 10 of this document, we plan to sample selected wells for total dissolved solids during the next sampling event.

The data in appendix 5 and table 6 also demonstrate that the depth to ground water in the uppermost water-bearing zone at the plant site is highly variable. In well 7, the depth to water ranges from 7.5 to 16 feet below casing, resulting in a ground water elevation of 3539 to 3530 above mean sea level. In contrast, well 2-3 shows depth to water measurements from 97 to 83 feet below casing and, according to the well log, 2-1 is dry to a depth of 160 feet. These wells are about 300 feet apart. As explained more fully below, we expect highly localized perched ground water bodies beneath the plant.

Subsurface Lithology

At the plant, roads, buildings or gravel cover the majority of the ground surface and there is little or no undisturbed soil. The Soil Conservation Service maps the plant area as Reeves-Gypsum Land Complex. The permeability of this unit ranges between 0.8 and 2.5 inches/hour. We observed numerous fractures in the caliche that caps much of the hill upon which the plant sits. Appendix 7 contains information from the SCS soil survey concerning this soil.

The proposed land application site lies on Gypsum Land–Cottonwood Complex. The SCS description of this unit is similar to the Reeves–Gypsum Land Complex. Permeability is recorded as 0.8 to 2.5 inches/hour in the SCS Soil Survey. Appendix 7 presents additional information.

As mentioned previously in this section, water supply wells are rare in the area of the plant and proposed land application area. The scarcity of water supply wells is due to the geology and, to a lesser extent, geologic structures within the area. As figure 4 illustrates, the plant and land application site lie on the southeastern edge of the axis of the Artesia-Vacuum Arch. North of the plant, bedrock dips to the north or west. At the plant site, rocks dip southeast. Because of this fold, intermittent water in Scoggin Draw would preferentially flow southeast, with the bedding planes of the bedrock. Water infiltrating from Logan Draw, to the north of the plant, will also flow preferentially with bedding planes—to the northeast or due east. As figure 5 suggests, the Pecos River is a gaining stream in this area; therefore we expect little or no infiltration from the Pecos River.

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Not only does the geologic structure of the area limit recharge, the lithology of the subsurface units is neither conducive to recharge nor conducive to transmission and storage of ground water. Figure 6 is a geologic map of the area. The plant and land application site lie essentially at the top of the evaporate facies of the Yates Formation; alluvium is neither shown on figure 6 nor observed at the site. The Yates is about 400 feet thick in the area (Kelley, 1971). Gypsum dominates the lithology north of Lake McMillian, however Kelley also observed some thin (1-2 feet) dolomite and siltstone beds. Most of the dolomite and siltstone units are discontinuous. This description of the Yates, which is consistent with the lithology observed in on-site monitor wells, is similar to an aquitard, not an aquifer. Site specific hydrogeologic data are presented in the next section.

Flooding Potential

Figure 1 shows that the plant is near the crest of the hill that defines the Artesia-Vacuum Arch. Any impact from flash flood events in Scoggin Draw or the south-flowing unnamed arroyos near the site is unlikely. On our site visit we saw no evidence of erosion or high water near the plant.

There is potential for flooding near the proposed land application site. If required by NMOCD a discharge plan will be submitted under a separate cover which will address the potential for flooding at the land application site.

Berms surround all waste water storage tanks. Whereas these berms are designed to retain fluids in case of a catastrophic failure, they can also serve to protect these structures from sheet flow during unusual precipitation events.

Additional Information

We believe the evidence presented in earlier sections of this report and the discussion presented below "demonstrates that approval of the discharge plan will not result in either concentrations in excess of the standards of Section 3103 or the presence of any toxic pollutant at any place of withdrawal of water for present or reasonably foreseeable future use." (WQCC 3109.C.2)

However, this section also discusses evidence that the perched ground waters beneath the site are "private waters that do not combine with other surface or subsurface water."(WQCC 1101.WW)

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We also maintain that the evidence presented in this submission will show that the perched water beneath the plant, other planned discharges (e.g., land application) or unplanned discharges from the plant will not "move directly or indirectly into ground water." (WQCC 3104)

The evidence in this plan should be sufficient for NMOCD to find that neither a discharge plan nor an abatement plan are required for the Empire Abo plant.

Stratigraphic Information Figure 7 shows the stratigraphic position of the Artesia Group after Kelley (1971) and figure 8 shows a similar stratigraphic column from the work of Hendrickson and Jones (1952). According to Hendrickson and Jones, the Yates, Seven Rivers and Queen Formations (their Chalk Bluff Formation) yield water to wells in sufficient quantities for domestic or stock watering. The quality of the water degrades from south to north as these units change from a carbonate facies (south of Lake McMillian) to an evaporate facies (north, including the plant site).

Maps and Cross-Sections Plates I-IV are cross-sections previously submitted by the former plant owner, Amoco. Careful examination of these cross-sections reveals the hydrogeologic framework of the plant site. Please note that each well is screened across the uppermost water-bearing zone at the site.

Cross-section A-A' (plate I) shows the variegated evaporate facies of the Yates (or lower Tonsil) Formation. The units described as clay and rock (unit #6) dominate the subsurface lithology. The term "rock" probably refers to gypsum. Sand and clay (unit #5) is also a common lithology, as is clay (unit #3). Surface exposures of gypsum and other rock exhibit significant fracturing. Fractures are probably very common in the subsurface as well.

Ground water elevations in wells comprising section A-A' demonstrate that a continuous water-bearing unit does not exist under the plant. The highest ground water elevation is in wells 2-2 and 2-5 suggesting a mound of water beneath the plant at this location. Not shown in section A-A' are wells 1 and 2-1. These wells, drilled to 200 and 160 feet respectively, encountered no ground water and are only 100 to 200 feet north of cross-section A-A'. Data from these two dry holes define an isolated mound of ground water beneath the plant. Wells 2-11 and 2-18 define a second mound that is more clearly shown in plate V. Historic water leakage from the old water softener unit and cooling tower could be the source of the water near wells 2-2 and 2-5. The source of water in the area near wells 2-11 and 2-18 may be temporary ponding associated with precipitation events.

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Cross-section B-B' (plate II) is very similar to section A-A'. The water level in well 7 is about 3537 feet above sea level, 12 feet higher than water in wells 2-2 or 2-5.

The symmetry of a ground water mound composed of discontinuous perched water bodies is more obvious in this east-west cross-section. Well 7 is adjacent to a leach field at the plant.

The northern terminus of the previously submitted Amoco cross-section C-C' is well 2-2 and the southern terminus is well 2-12 (plate III). We have extended this cross-section to include well 1 as the northern terminus and well 2-17 as the southern terminus. The mound of discontinuous water bodies is clearly displayed when these dry holes are added to the cross-section. Note that the elevation of ground water in the southern portion of the site is well below the elevation of Scoggin Draw (see plate III).

Plate IV presents two Amoco cross-sections. Again, these sections reflect the lithologic and hydrologic relationships observed in other sections.

Plate V is a simplified cross-section showing only water levels across the plant site near section B-B'. In this section the two ground water mounds beneath the plant are defined. One mound is near well 2-9 and the second mound includes wells 2-11 and 2-18.

The cross-sections show little relationship between the lithology and the depth of the first water-bearing unit. In some wells, the uppermost water-bearing unit is clay (e.g. well 2-4) and a well less than 150 feet distant exhibits sand as the uppermost unit (e.g. well 3). When adjacent wells penetrate similar lithology, water levels can be significantly different (compare wells 4 and 2-10 on plate III).

We maintain that the data demonstrate that the underlying Yates Formation is not a complex aquifer composed of numerous interconnected water-bearing zones. Instead, the Yates behaves as a simple, unconfined aquiclude. The dominant clay in the unit limits vertical and lateral flow. In any given boring, a clay unit can behave as an aquitard and cause a perched ground water body. Where water does not infiltrate from the surface, the unit is dry.

Mapping a single potentiometric surface at this site makes little sense. Such a map would only show a relatively symmetric ground water mound surrounded by unsaturated material. Similarly, mapping hydrocarbon thickness is equally futile.

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Hydrologic Parameters No data are available concerning the hydrologic parameters of the water-bearing units beneath the site.

Water Quality Hendrickson and Jones report highly mineralized ground water within the evaporate facies in this area. Data in a appendix 5 show that all 17 analyses for sulfate exceed the 600 mg/l standard and 9 of 17 analyses are more than four times the 600 mg/l limit. All valid analyses for chloride exceed the 250 mg/l standard and half of the 16 analyses exceed 1000 mg/l. If we assume that carbonate concentration is relatively low and that anions are balanced by cations, we expect a total dissolved solids concentration of about 8000 mg/l. Recent data support this expectation.

As appendix 3 shows, the chemistry of the evaporation/storage pond is remarkably similar to ground water with respect to chlorides. As expected, ground water within the gypsiferous Yates Formation shows high sulfates.

Alteration of Contaminants The clay-rich subsurface will retard any movement of hydrocarbons from the site. The clay has also inhibited meaningful recovery of hydrocarbons from the existing PSL recovery system.

Since April 1995 when PSL recovery operations began, PSL thickness in most wells remained constant. In some locations, the stress to the water-bearing unit caused by pumping resulted in some wells exhibiting PSL that did not show PSL before recovery pumping. At this site, the state-of-the-art PSL recovery system has not removed significant PSL and has caused an expansion of the zone of PSL. Given the clay-rich nature of the unit combined with the heterogeneity, such a response is not unexpected.

Over time (decades), the hydrocarbons observed beneath the plant site will biodegrade or volatilize. If spills and leaks at the plant site are adequately controlled, as proposed herein, the observed ground water mound beneath the site will also dissipate, albeit slowly. If the PSL system closes, PSL will not continue to migrate toward pumping wells, creating a larger area of hydrocarbons in the subsurface. If the PSL system closes, the potential for surface spills of stored PSL or ground water is reduced. If the PSL system closes, the hydrogeology of the site will cause the hydrocarbons beneath the site to remain static.

Conclusions

- Leakage of water from a variety of sources at the plant site has created saturated conditions below the plant site.
- The subsurface is devoid of ground water except in areas near natural or man-made recharge. Water wells down dip (south) of Scoggin Draw may contain usable volumes

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of relatively fresh water. Dry holes on the edges of the processing areas demonstrate that the Yates does not contain ground water as defined by the WQCC regulations.

- The elevation of ground water on the south side of the plant site is below the elevation of Scoggin Draw. Therefore, perched water from plant cannot enter the draw.
- Natural recharge of ground water does not occur at the plant site.
- Withdrawal of perched water and entrained hydrocarbons creates no environmental benefit. The process only moves hydrocarbons from subsurface (where they do not pose a threat to human health or the environment) to the surface where transportation or storage accidents can cause an environmental impact.

We believe the evidence is sufficient to define the perched ground water beneath the site as private water. The activities at the plant created the observed ground water. The lining of the evaporation pond, repair of pipe leaks and other environmental protection measures implemented during the past 10-20 years have decreased the flux of water from the plant to the subsurface. Over time the ground water beneath the site will dissipate as a result of these process changes. Over time the observed hydrocarbons will volatilize or biodegrade. The addition of water to the subsurface via on site leach fields will only speed natural biodegradation of petroleum hydrocarbons.

We believe the evidence is sufficient to conclude that ground waters of the state will exist in the Yates and Queen Formations only near sites of natural recharge. Water derived from plant operations (land applied or the perched ground water) will not move directly or indirectly into ground water because there is no natural ground water in this area.

We believe the evidence is sufficient to conclude that neither a discharge plan nor an abatement plan is required for this site.

Item 13

Attach a facility closure plan, and other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.

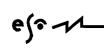
All reasonable and necessary measures will be taken to prevent the exceedance of 20 NMAC 6.2.3103 quality standards should ARCO Permian choose to permanently close the facility. Closure measures will include removal or closure in place of all underground piping and equipment. All tanks will be emptied. No potentially toxic materials or effluents will remain on the site. All potential sources of toxic pollutants will be inspected. Should contaminated soil be discovered, any necessary reporting under NMOCD Rule 116 and 20 NMAC 6.2.1203 will be made and clean-up activities will

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commence. Post-closure maintenance and monitoring plans would not be necessary unless contamination is encountered.

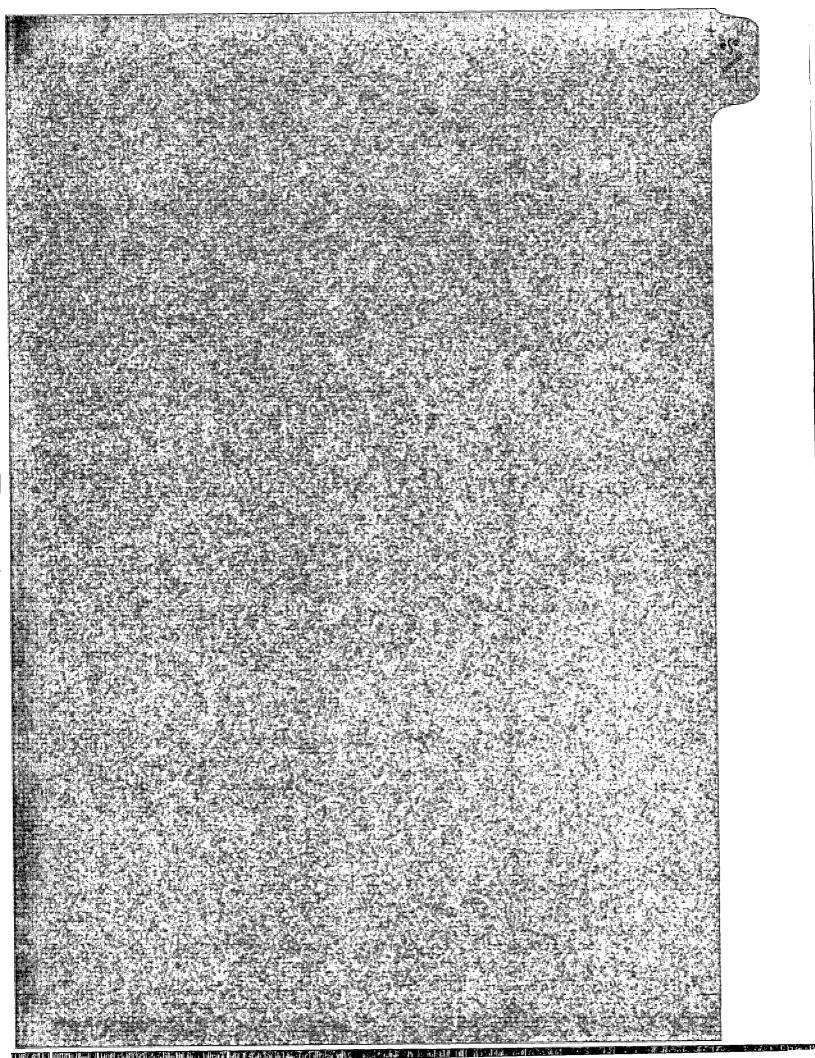
History of Ownership

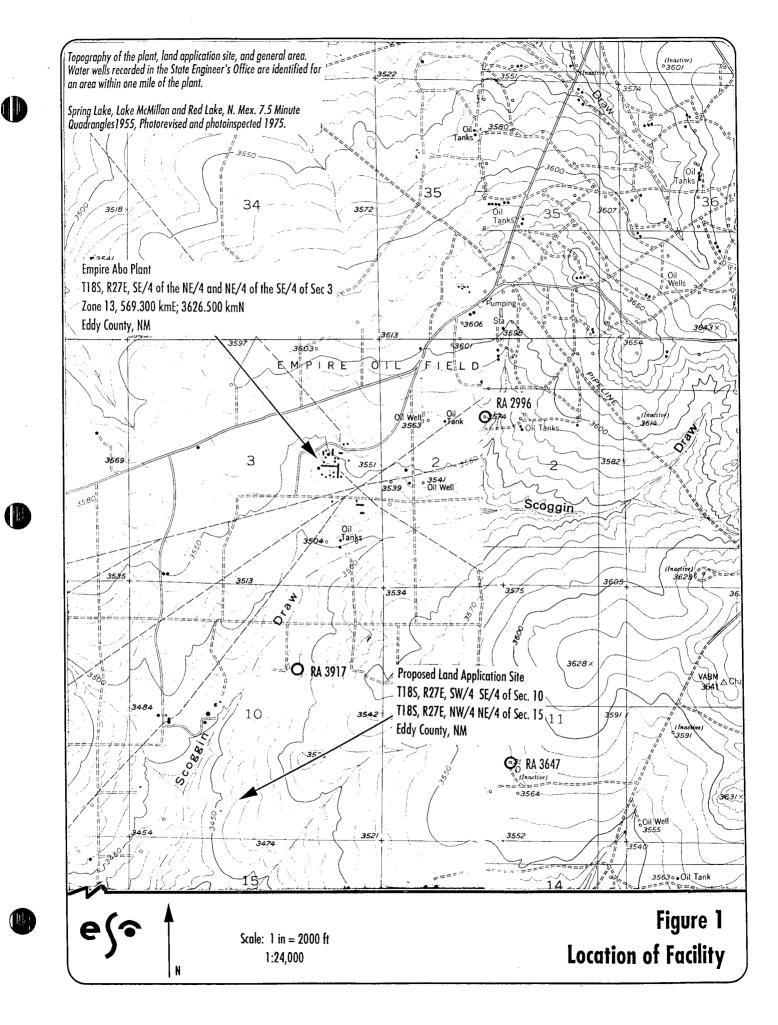
The facility was purchased by ARCO Permian on July 1, 1996, and has been operated by Elkhorn since September 1, 1996.

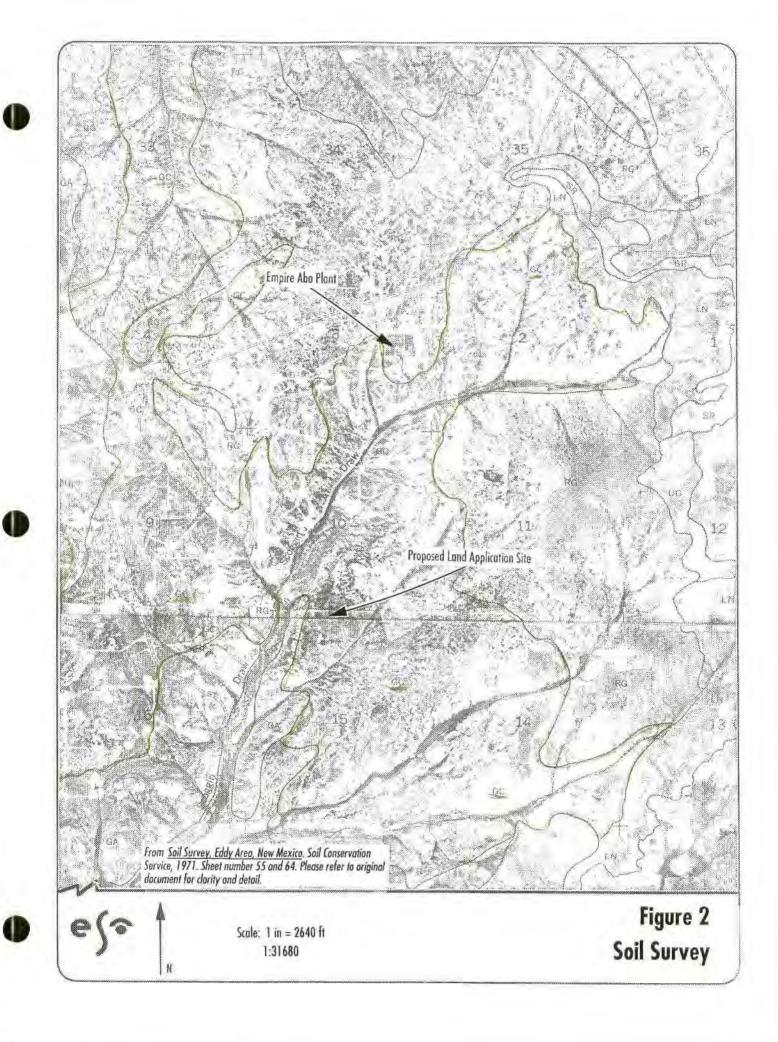


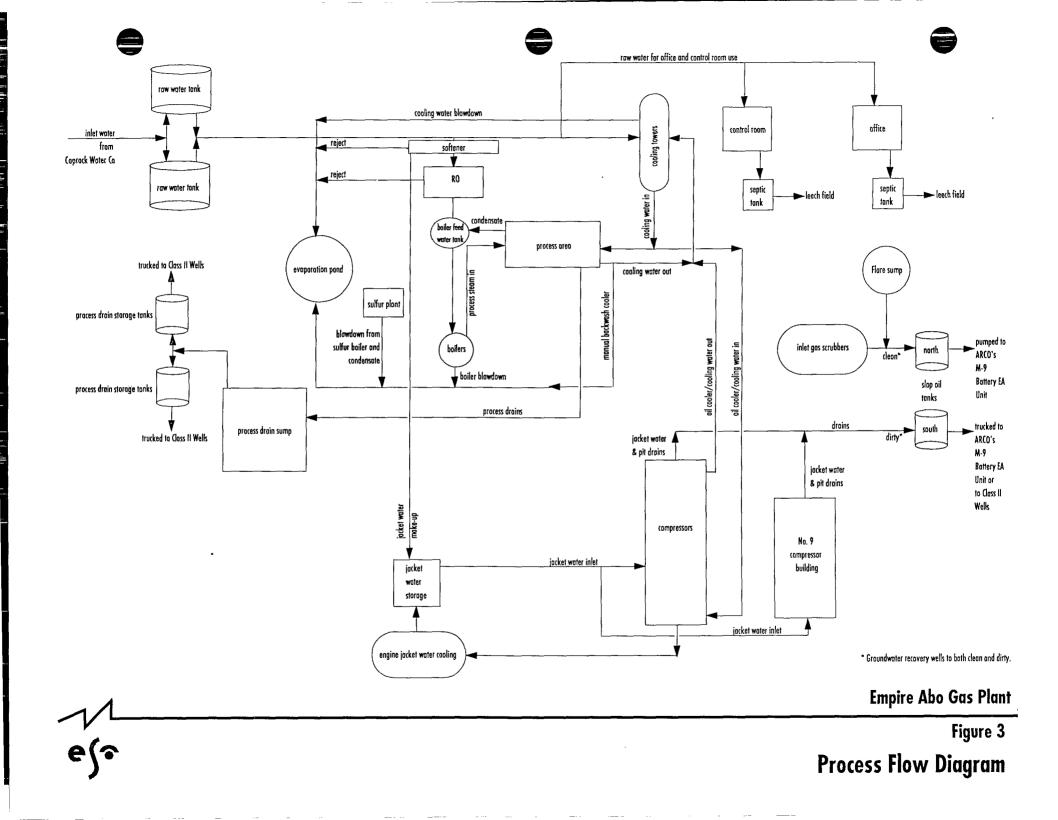
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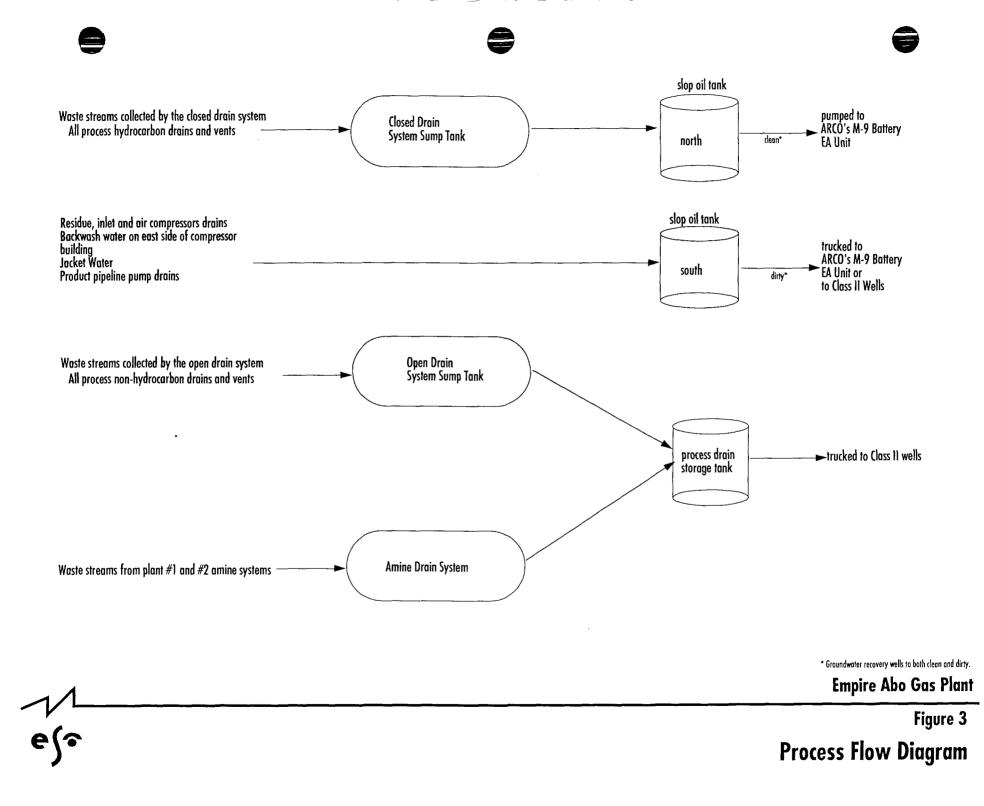
ARCO Permian-Empire Abo Gasoline Plant Environmental Site Assessment and Notice of Intent to Discharge

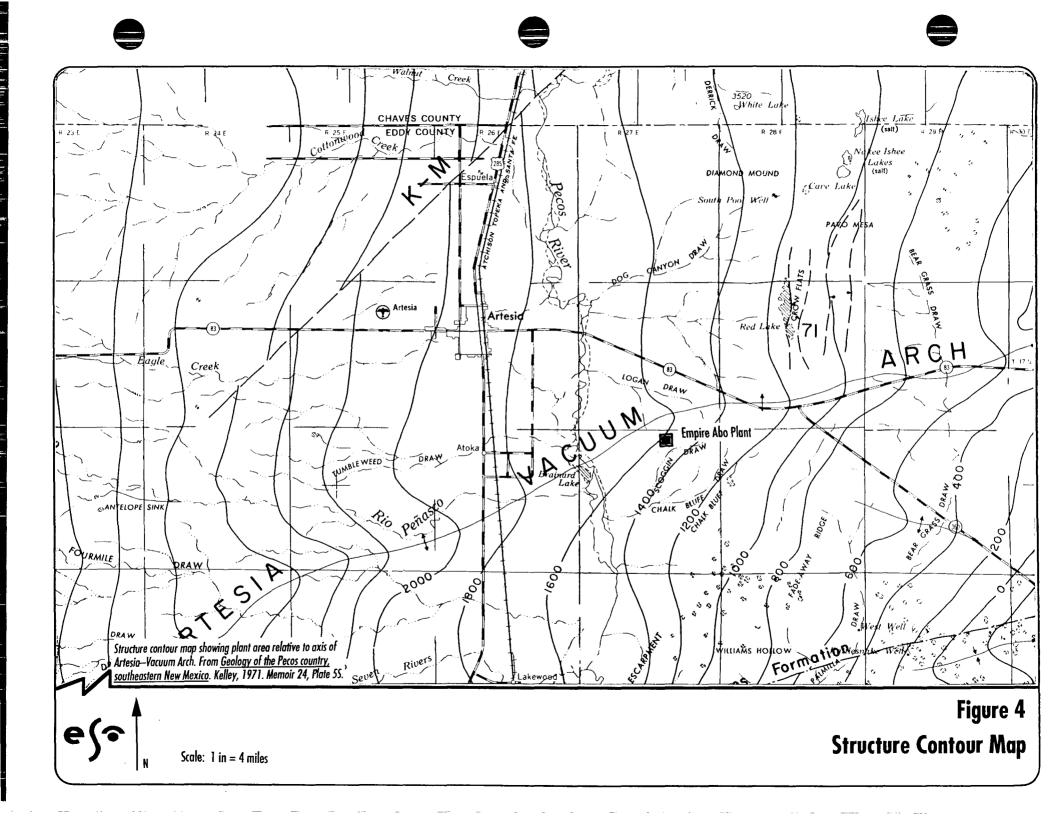




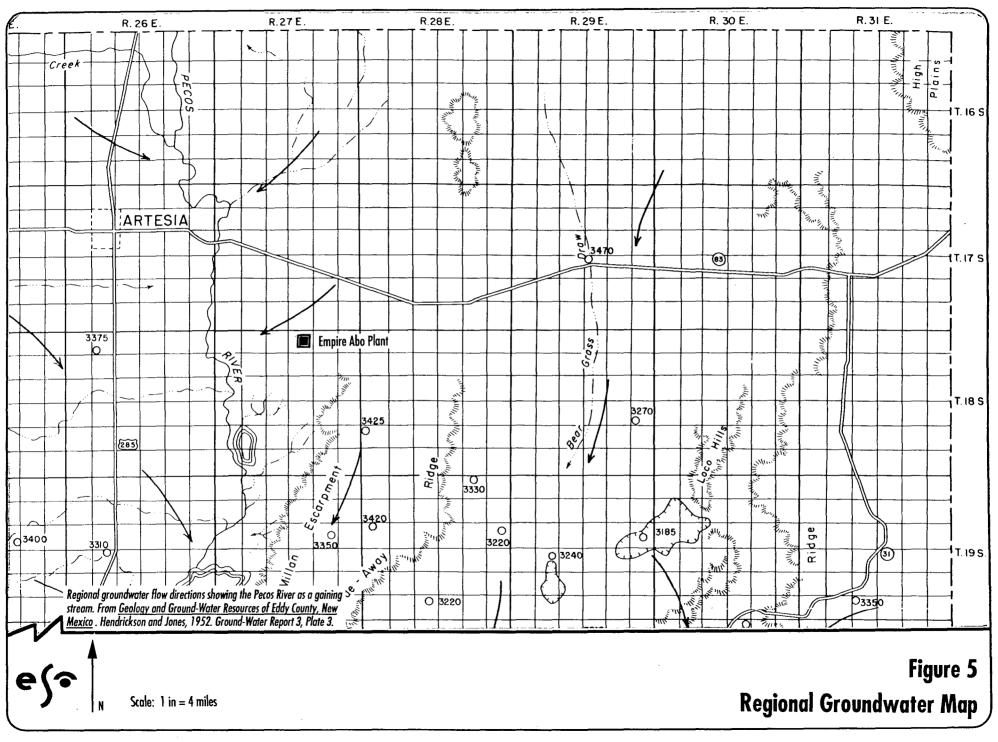


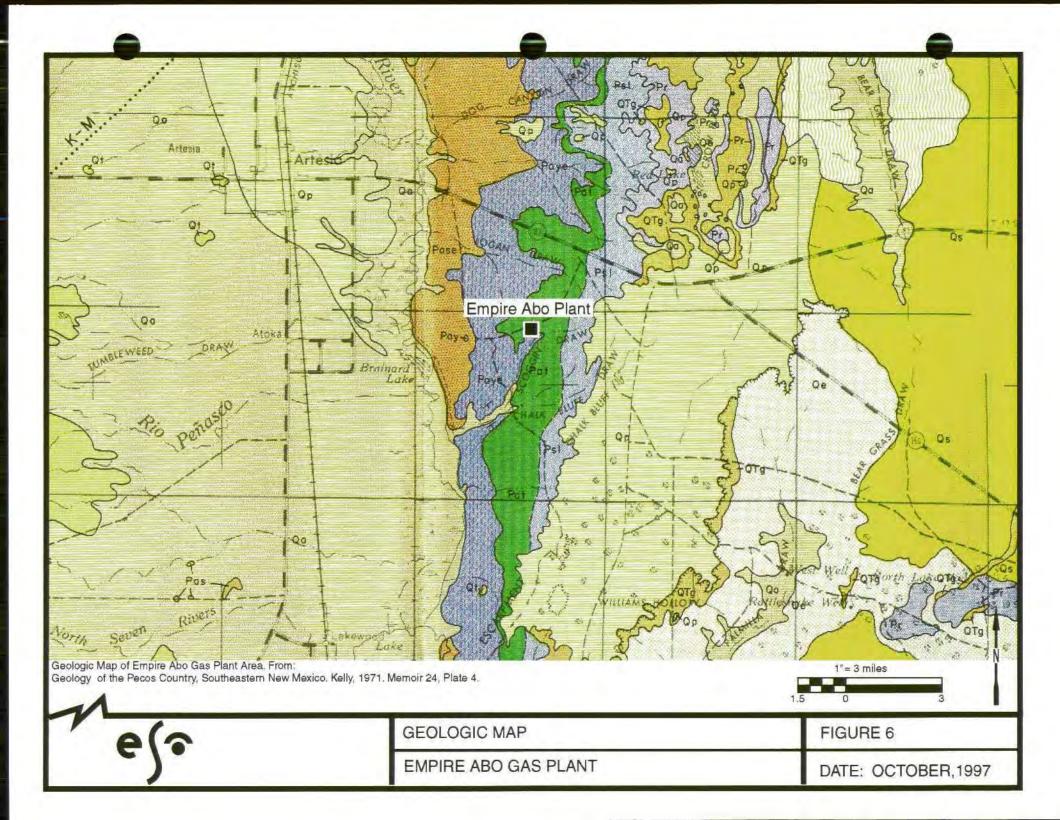












Od Os Os Od Od Otr Ot O	Qa: alluvium of stream and Qs: caliche soil Qe: blow sand and dunes Qt: terrace gravel Qp: pediment gravel	l valley bottoms
	Gatuna Formation	
Pr	Rustler Formation	
	Psi Salado Formation	
	Pat Tansill Formation	
Pay	Pays Yates Formation	
Pas	Seven Rivers Formation	on
0 00	EMPIRE ABO GAS PLANT	FIGURE 6
د).	GEOLOGIC MAP KEY	OCTOBER, 1997

sorted surficial posits ituna Formation erra Blanca olcanics ib Mountain ermation esaverde Formation ancos Shale kota Sandstone inle Shale			0- 300 0- 200 700- 4,000 500- 2,000	Valley alluvium, terrace and pediment gravel, caliche soils, aeolian sand travertine Sandstone, sand gravel, siltstone, limestone, red, brown, tan, gray, yellowish Andesite breccia and tuff; some flows Sandstone, mudstone, conglomerate, arkose; white, buff, lavender, purple				
erra Blanca olcanics ib Mountain rmation esaverde Formation ancos Shale kota Sandstone			200 700- 4,000 500-	Andesite breccia and tuff; some flows				
olcanics th Mountain rmation esaverde Formation ancos Shale kota Sandstone			4,000 500-	·				
rmation esaverde Formation ancos Shale kota Sandstone				Sandstone, mudstone, conglomerate, arkose; white Buff lavender purple				
ancos Shale kota Sandstone				maroon				
kota Sandstone			500- 1,500	Sandstone, shale, coal, conglomerate; buff, gray, black				
			400- 700	Shale, siltstone, with local thin sandstone and limestone; black, grayish-blac				
inle Shale	kota Sandstone				Sandstone, conglomerate, black shale; gray to tan			
			0- 300	Mudstone with some claystone and thin sandstone; reddish brown				
nta Rosa Sandstone			0- 300	Sandstone, conglomerate, mudstone; brown, buff, lavender				
Dewey Lake Formation				Dewey Lake Formation			200- 250	Sandstone, siltstone; orange-brown; commonly laminated
Rustler Formation: Upper Member			150- 200	Dolomite, gypsum, mudstone, white, red-brown, green, gray, deep orange Magenta dolomite at base				
Lower Member				Dolomite, gypsum, mudstone, sandstone; white, red-brown, gray, green; sa in subsurface; Culebra dolomite at base.				
lado Formation	ormation			Gypsum, mudstone, thin local dolomite; white, red, brown, green, dee orange; breccia residue at surface, thick salt, potash in subsurface				
stile Formation Upper Member* (surface)			1,000±	Gypsum (anhydrite), salt; white, gray				
Lower Member (surface)			1,000±	Laminated gypsum (anhydrite) and limestone, laminated limestone, laminate gypsum; gray, black, white				
nsill Formation		Bell Canyon Fm. *	200- 300	Dolomite and siltstone (south); dolomite, gypsum, and anhydrite (north) Ocotillo siltstone tongue near exposed top				
tes Formation	Japitan Ls.†		250- 350	Siltstone, sandstone, dolomite, limestone and gypsum (south); gypsum, sil stone and thin dolomite (north)				
ven Rivers Formation	0		450- 600	Dolomite, siltstone (south); gypsum and siltstone (north)				
een Formation	<u>- מ+ </u>		200- 400	Dolomite and sandstone (south); gypsum, red mudstone, dolomite (north) Shattuck member near top				
ayburg Formation	Des	S S S	250-	Dolomite and sandstone (south); gypsum, mudstone, dolomite (north)				
n Andres Formation: Fourmile Draw Membe	er		0-	Dolomite, gypsum, reddish mudstone; sandstone locally at top; thin-bedded				
Bonney Canyon Member			0- 300	Dolomite, local limestone; gray, light-gray, local black; thin-bedded				
Rio Bonito Member			250- 350	Dolomite, limestone, sandstone (Glorieta); gray, brownish gray; thick-bedded				
so Formation			0-	Sandstone, siltstone, dolomite, gypsum; tan, red-yellow, gray, white				
	se		-,					
	tler Formation: Ipper Member ower Member ado Formation tile Formation Upper Member* surface) ower Member surface) isill Formation en Rivers Formation en Rivers Formation yburg Formation Andres Formation: fourmile Draw Member Sonney Canyon Member to Formation	tler Formation: Ipper Member ado Formation atile Formation atile Formation byper Member surface) ower Member surface) asill Formation en Rivers Formation en Rivers Formation byburg Formation courmile Draw Member Bonney Canyon Member Bonney Canyon Member Bonney Canyon Member bo Formation mite, gneiss, and diabase facies only	tler Formation: Ipper Member cower Member ado Formation stile Formation upper Member* surface) surface) sill Formation es Formation en Rivers Formation g g g g g g g g g g g g g g g g g g g	250ttler Formation :150-Ipper Member200.ower Member100ado Formation0stile Formation0pper Member*1,000 ±.surface)1,000 ±.surface)1,000 ±.surface)1,000 ±.surface)1,000 ±.surface)1,000 ±.surface)1,000 ±.surface)1,000 ±.surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface)surface) <t< td=""></t<>				

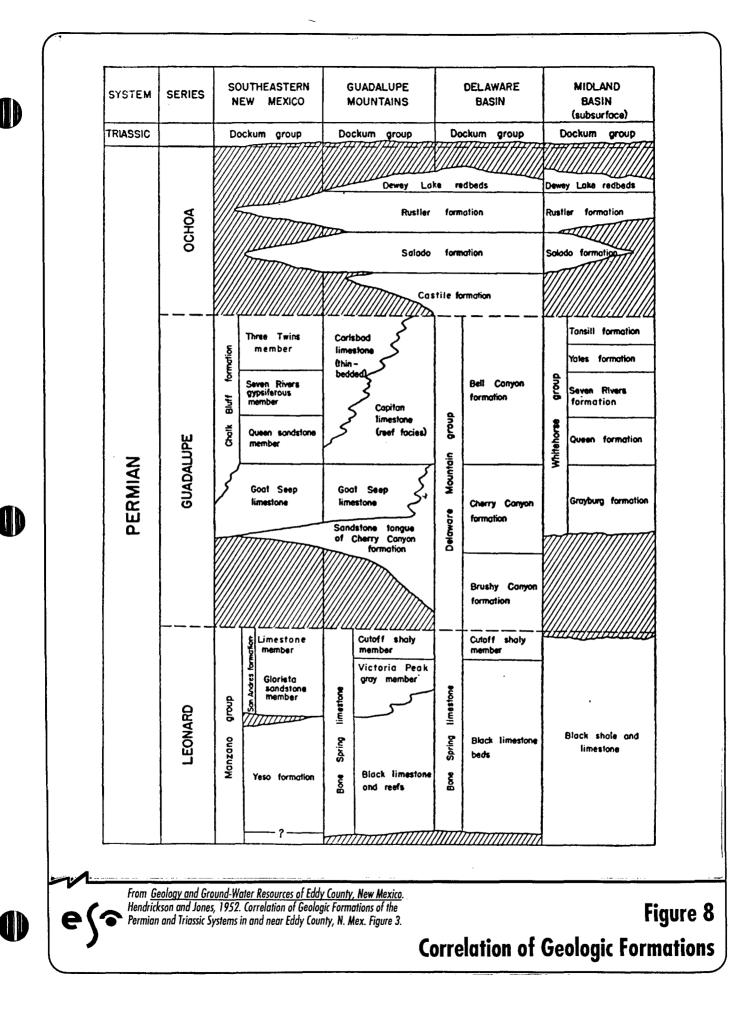


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Stratigraphy of the Pecos Country



APPENDIX A-1

GROUNDWATER CROSS SECTION LEGEND

COLOR OF FORMATION	TYPE OF MATERIAL
CALICHE	1. SAND
	2. ROCK
COLOR OF MATERIAL	3. CLAY
LIGHT BROWN	4. SAND & ROCK
	5. SAND & CLAY
	6. CLAY & ROCK
RED	7. SANDSTONE
	8. CLAY & SANDSTONE
WHITE	
GRAY	
YELLOW	
EXAM	MPLES
	LIGHT BROWN CLAY
6	> WHITE CLAY & ROCK
	- GRAY CLAY & ROCK / GRAY CLAY
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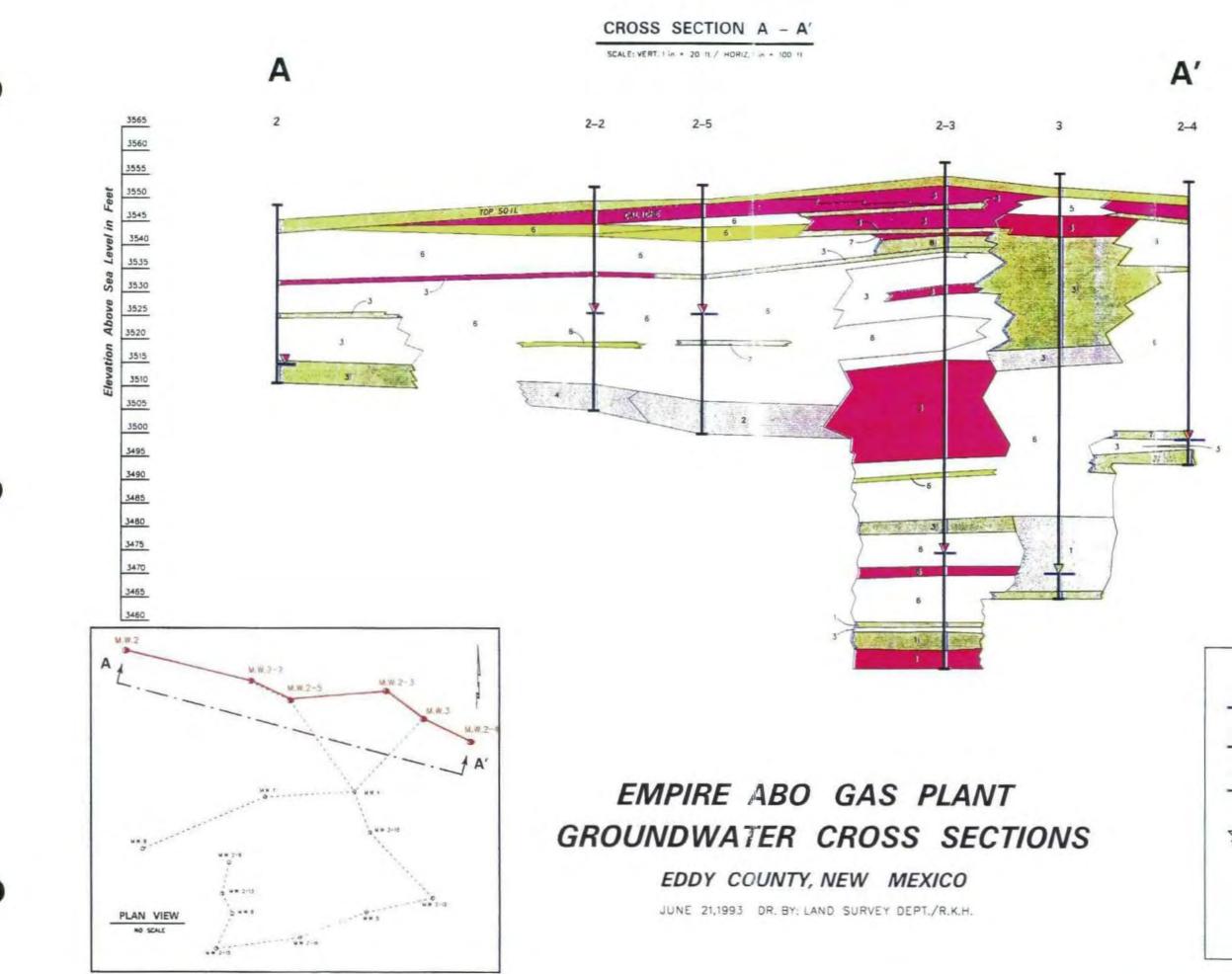
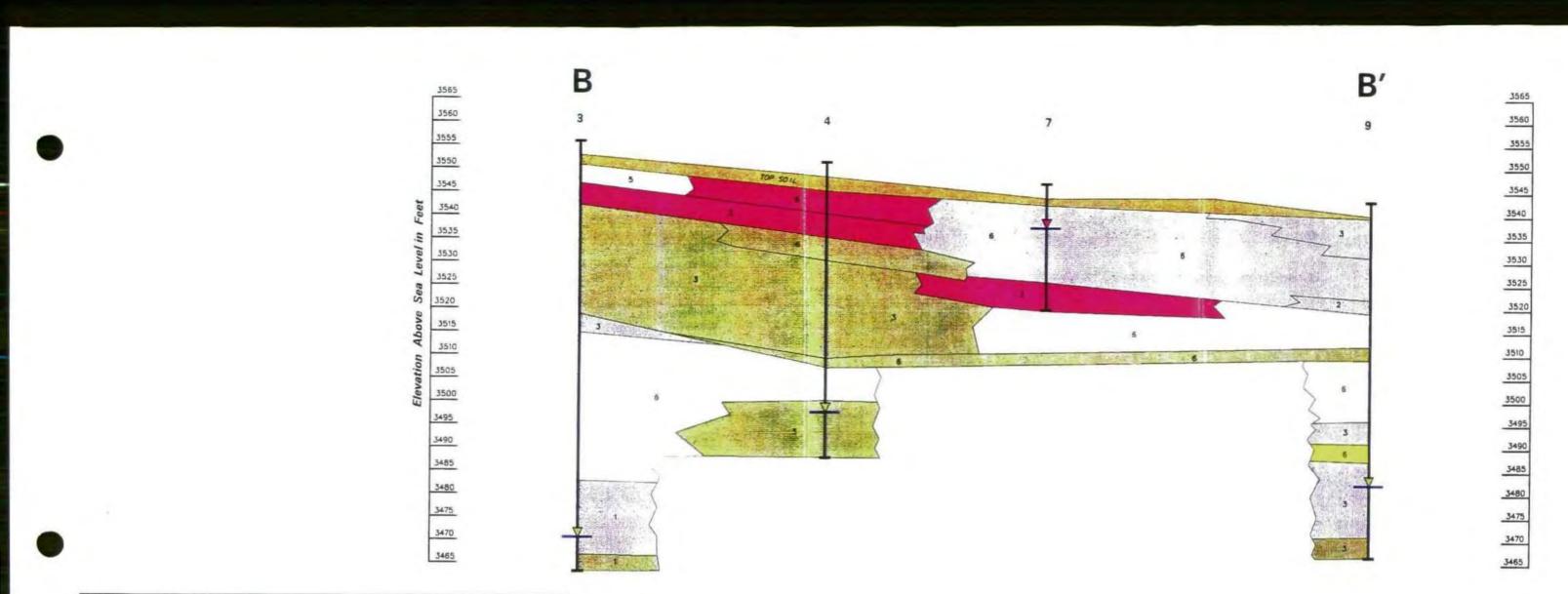
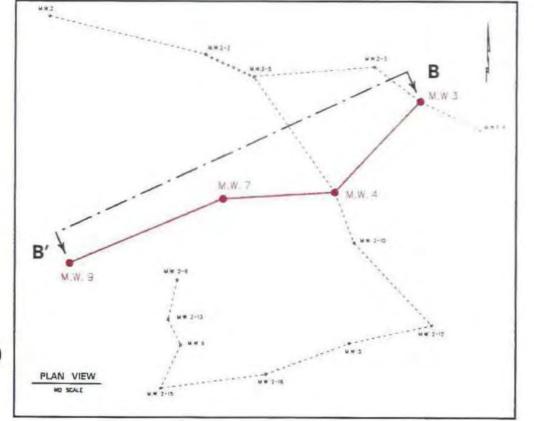


Plate I

Leg	end
- Ground Wat	er Table
	er Table with lved hydrocarbons) on
- Ground Wat Free Phase	er Table with Hydrocarbons
- Facies Chan	ge
1. Sand	5. Sand & Clay
2. Rock	6. Clay & Rock
3. Clay	7. Sandstone
4. Sand & Rock	8. Clay & Sandstone





CROSS SECTION B - B'

SCALE: VERT. 1 in = 20 11 / HORIZ 1 in = 100 11

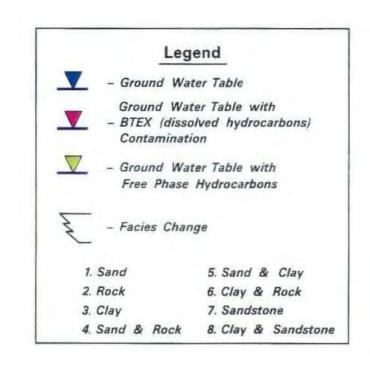
EMPIRE ABO GAS PLANT GROUNDWATER CROSS SECTIONS

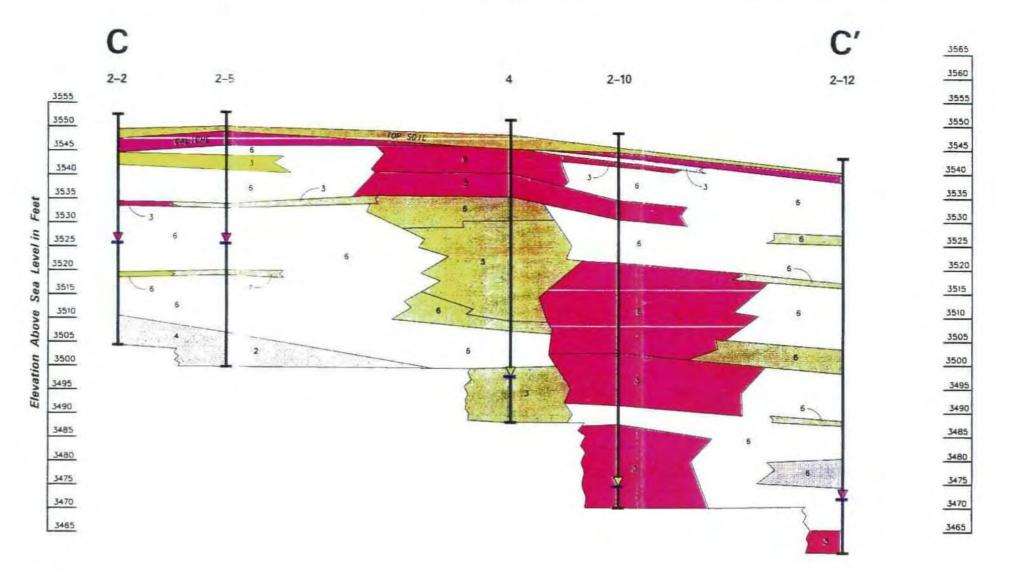
EDDY COUNTY, NEW MEXICO

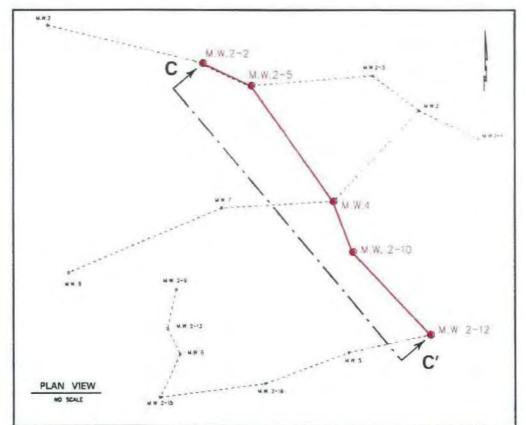
JUNE 21,1995 DR. BY: LAND SURVEY DEPT./R.K.H.

Plate II

Leg	end
Ground Wa	ter Table
	ter Table with Ived hydrocarbons) on
– Ground Wat Free Phase	ter Table with Hydrocarbons
- Facies Chan	ge
1. Sand	5. Sand & Clay
2. Rock	6. Clay & Rock
3. Clay	7. Sandstone
4. Sand & Rock	8. Clay & Sandstone







CROSS SECTION C - C' SCALE: VERT. 1 in + 20 11 / HORIZ. 1 in + 100 11

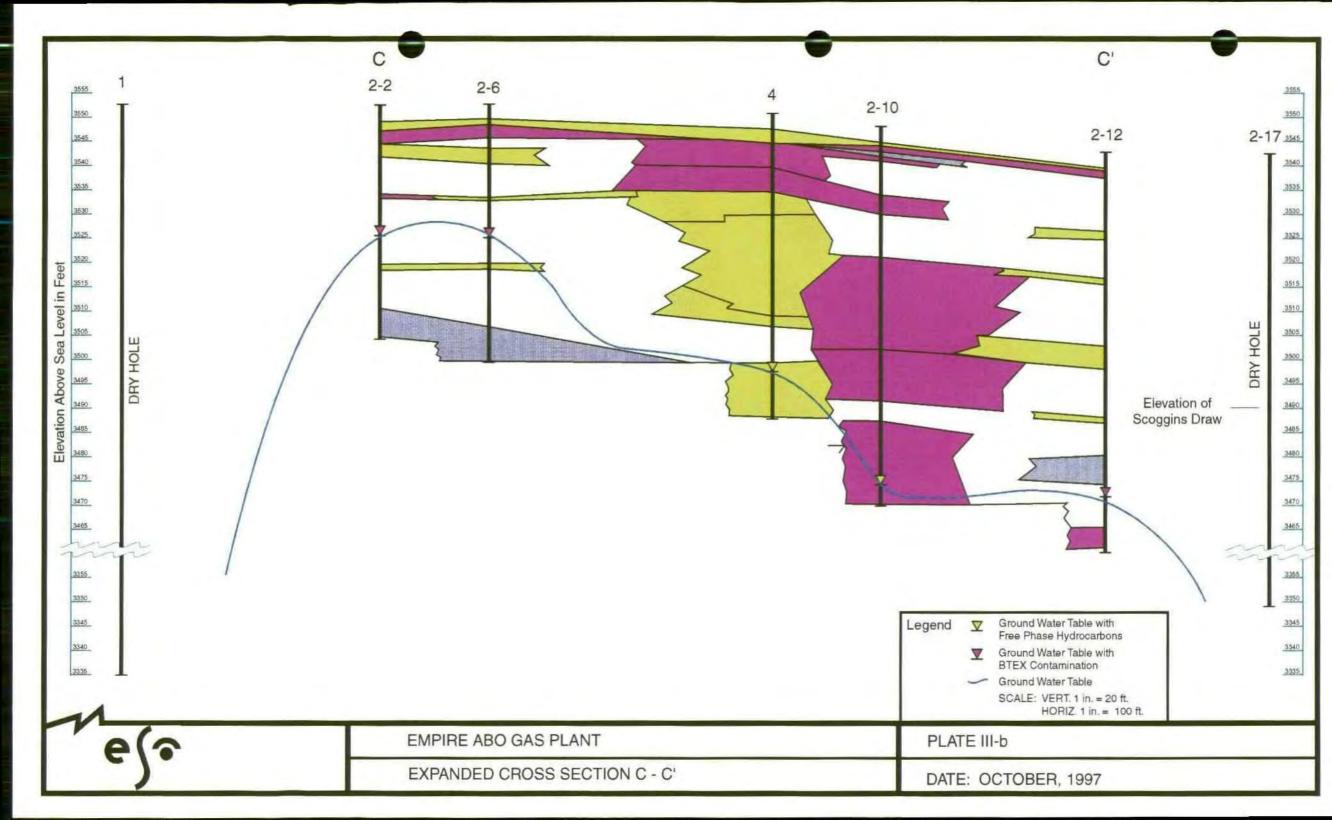
EMPIRE ABO GAS PLANT **GROUNDWATER CROSS SECTIONS**

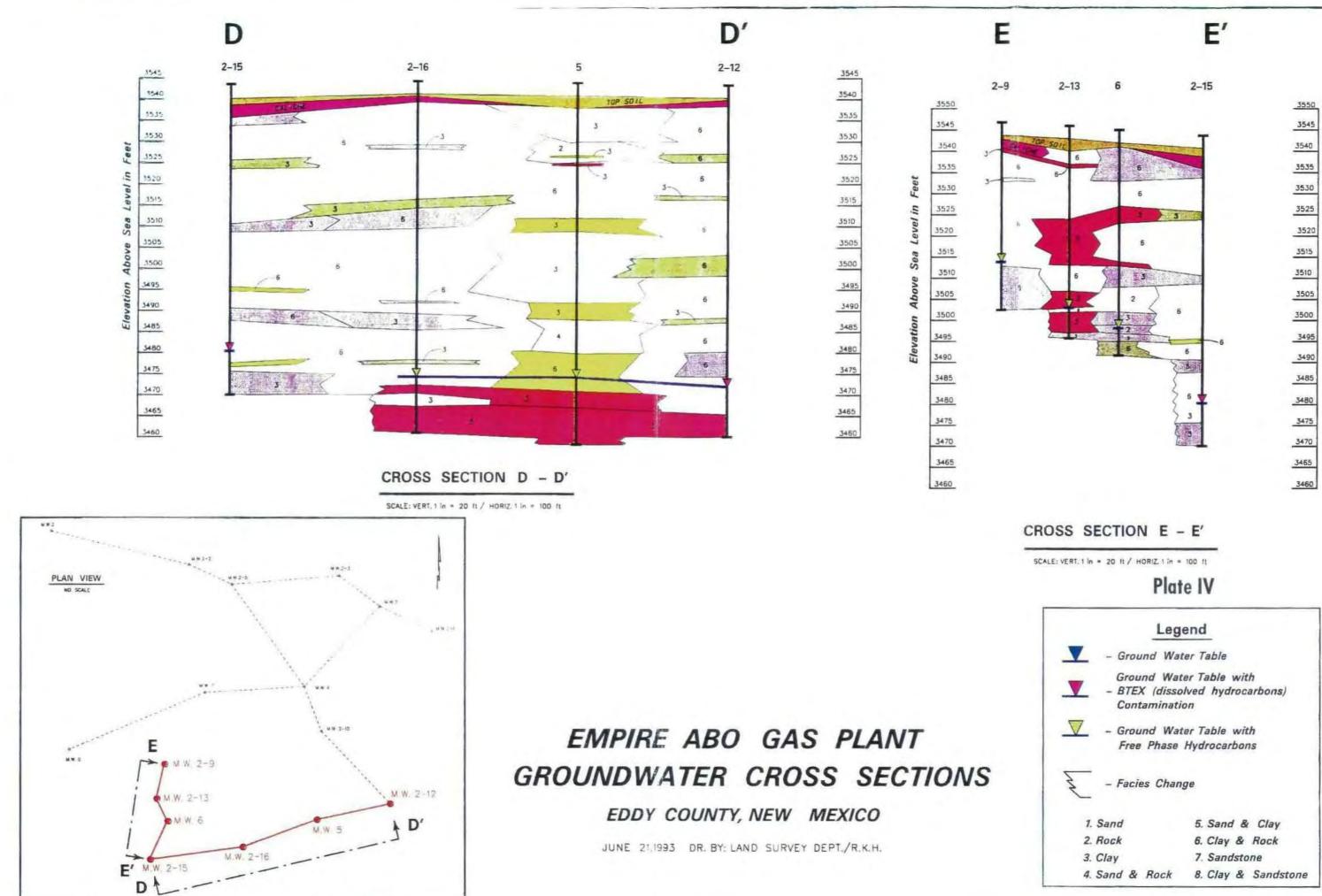
EDDY COUNTY, NEW MEXICO

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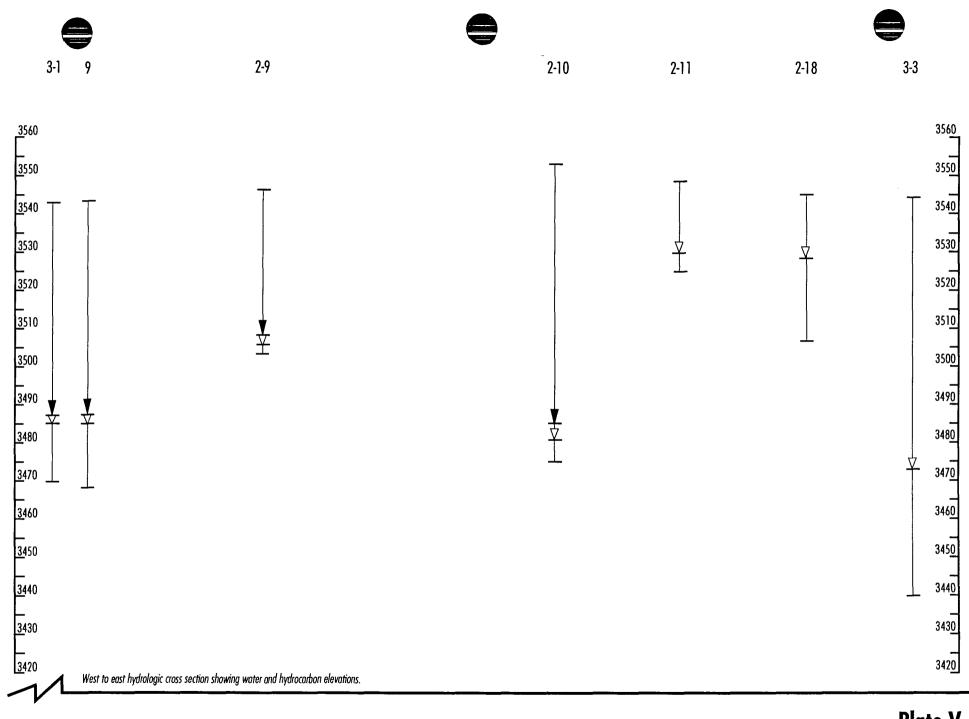
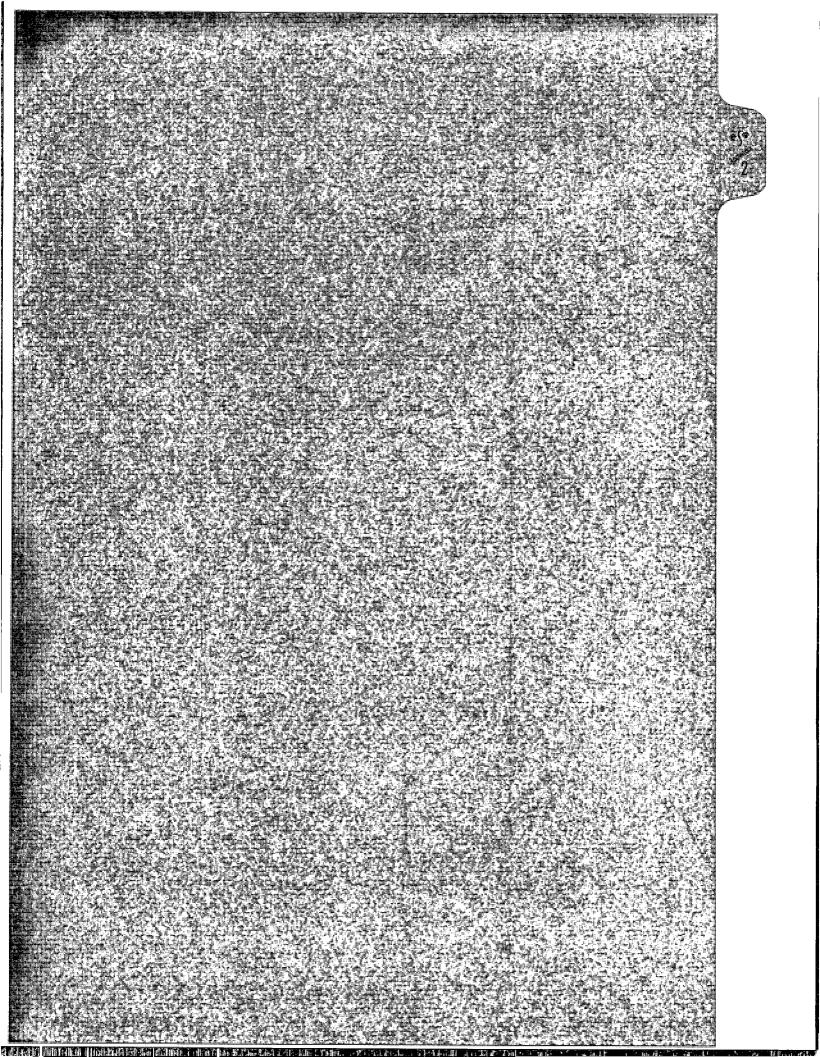
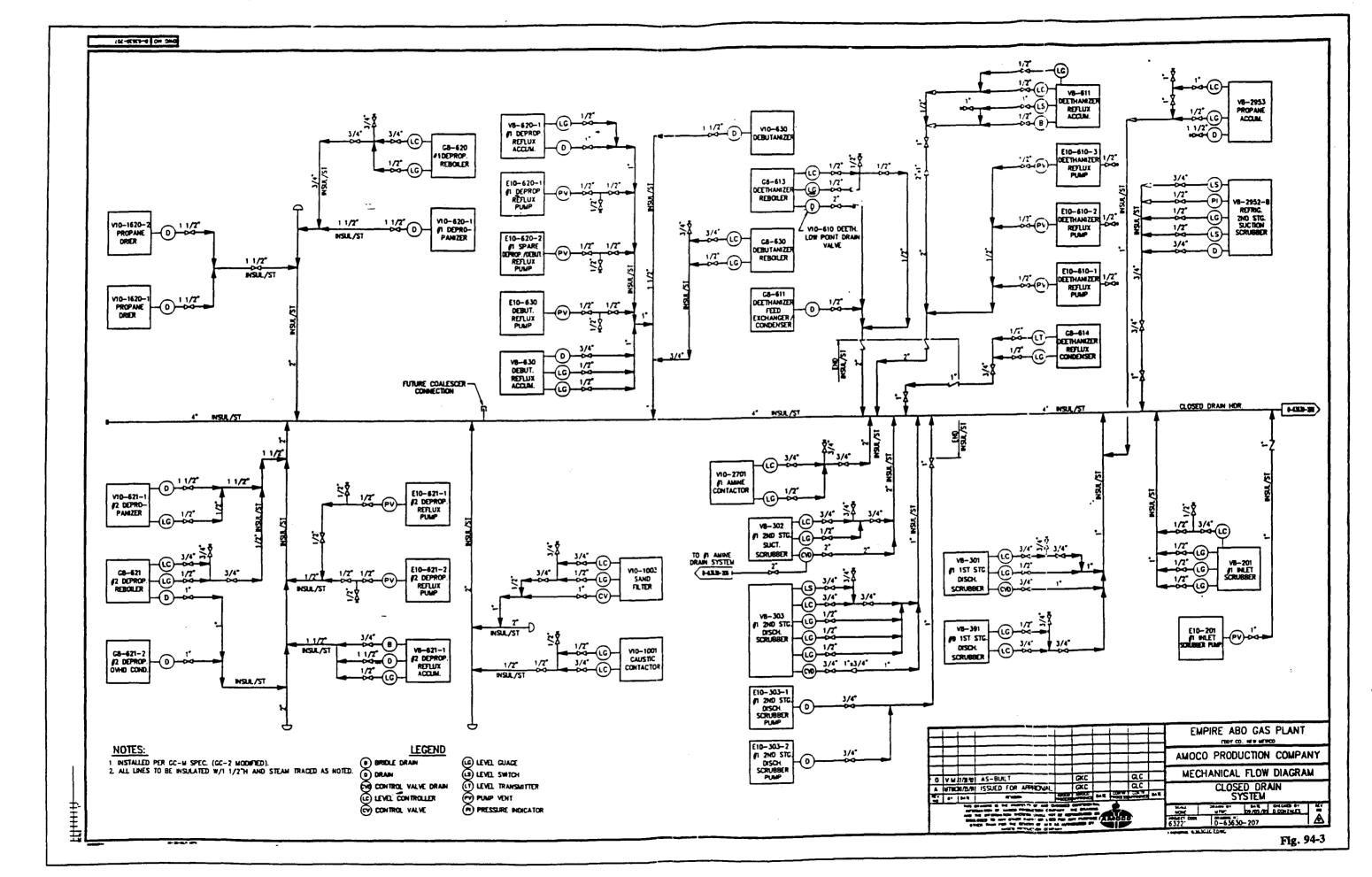
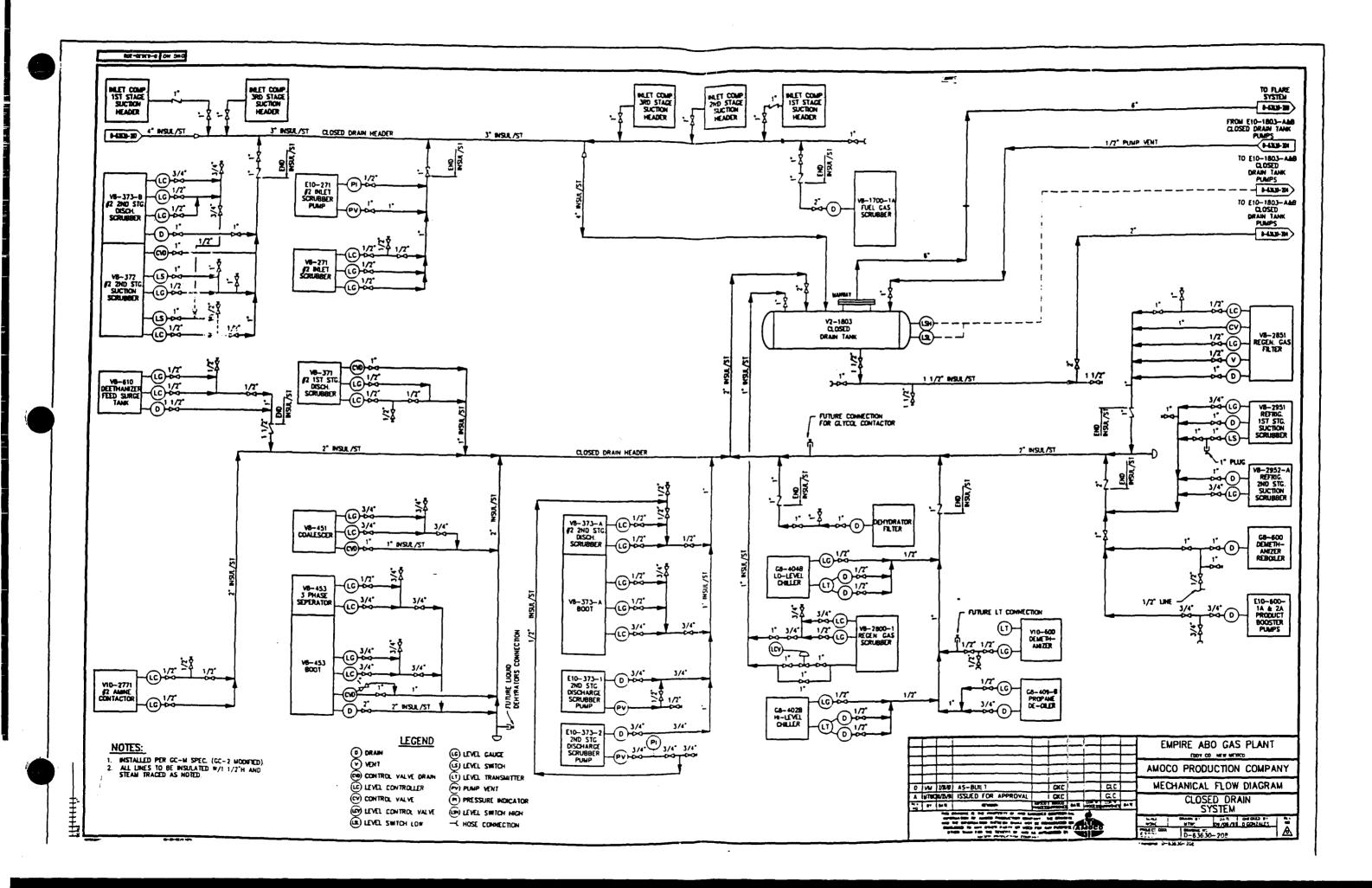


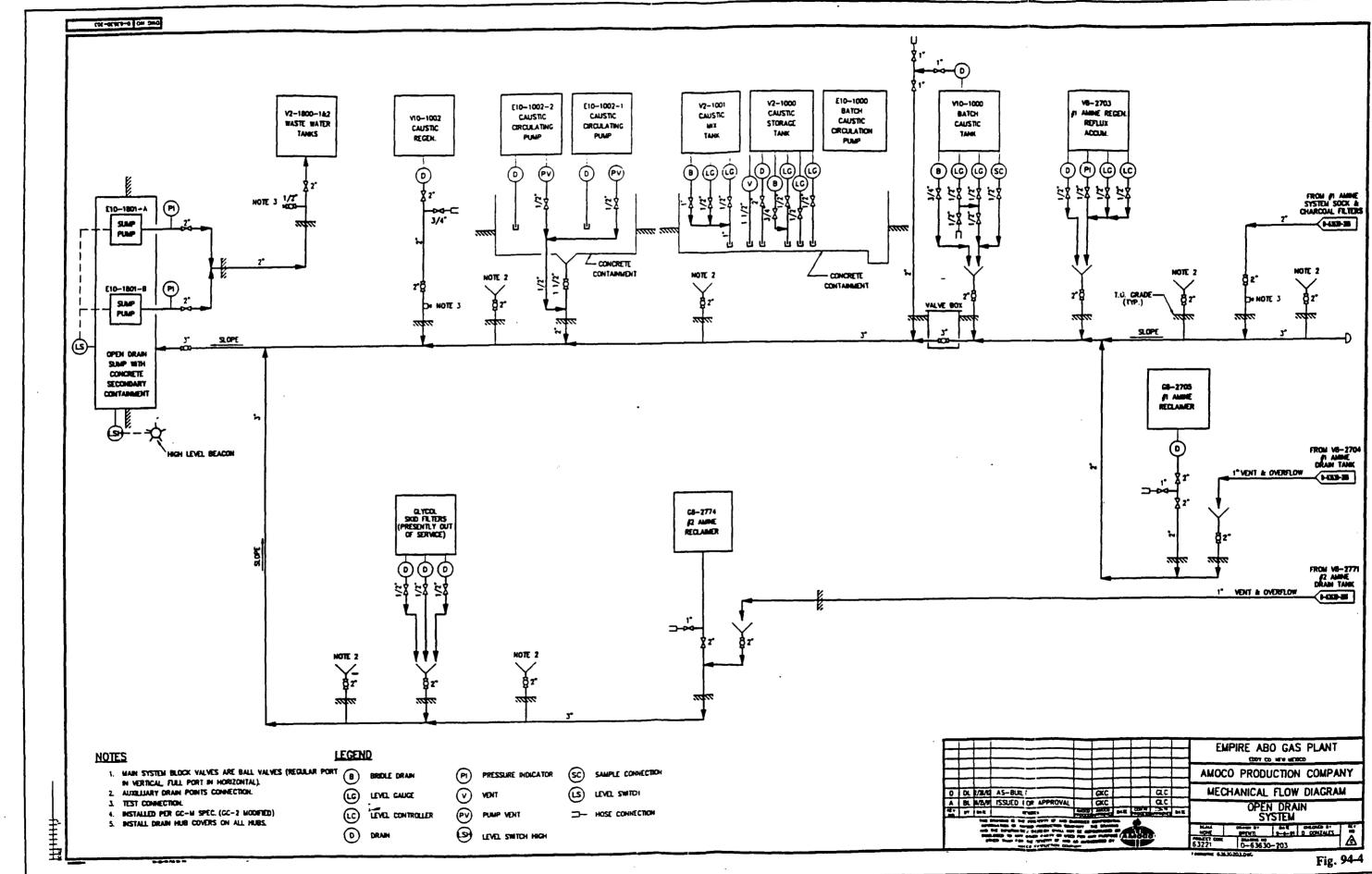
Plate V Hydrologic Cross Section

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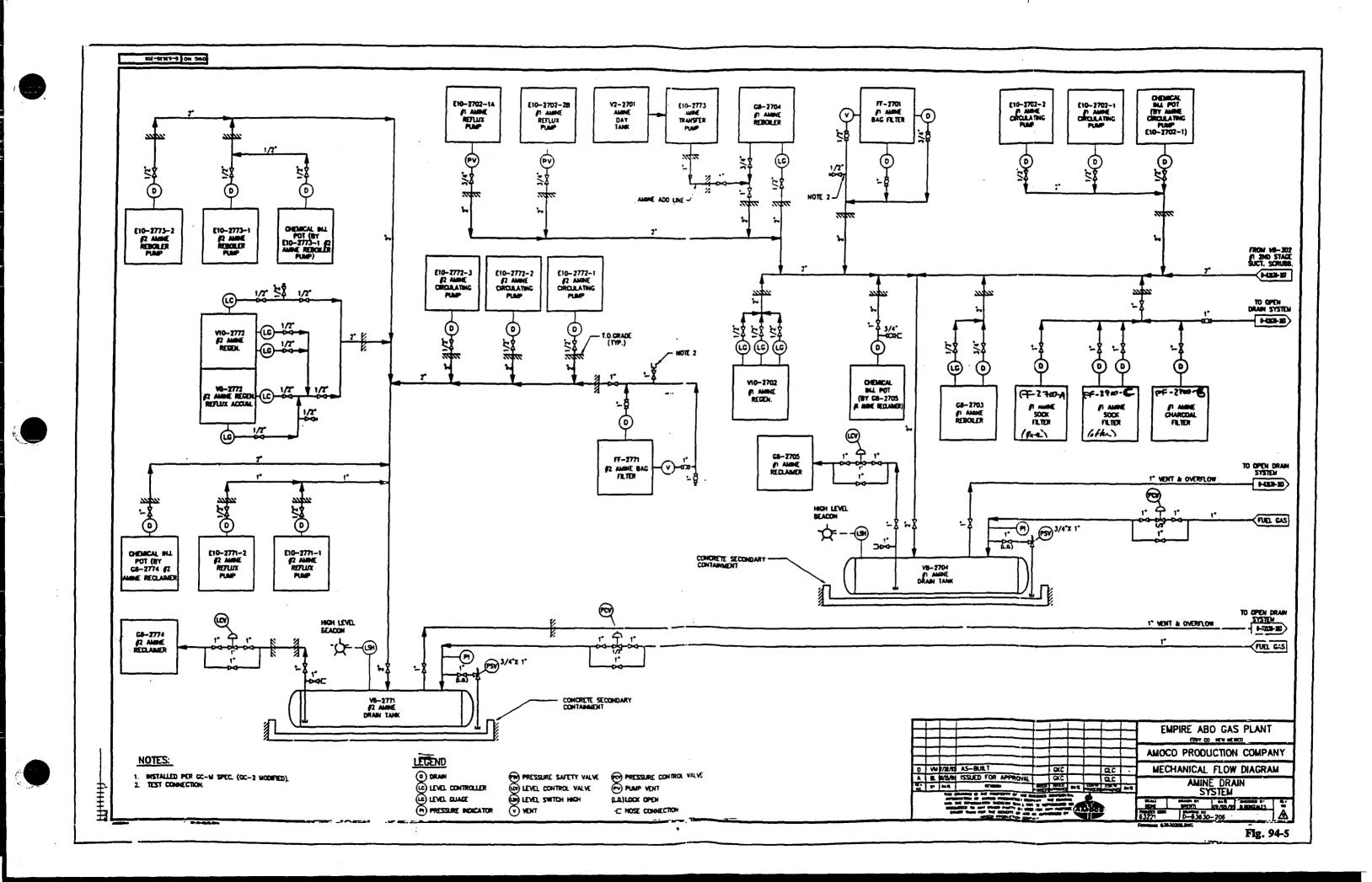


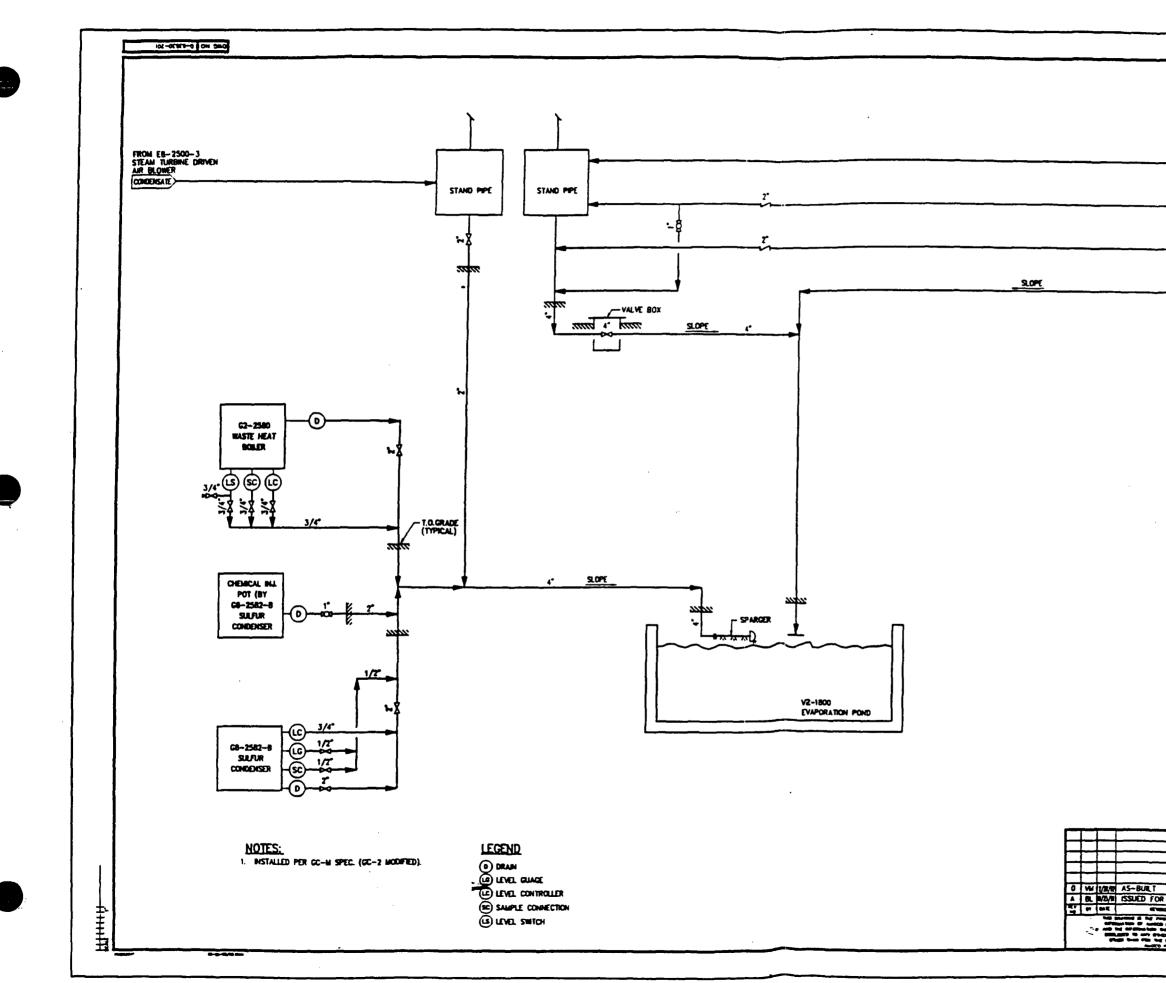




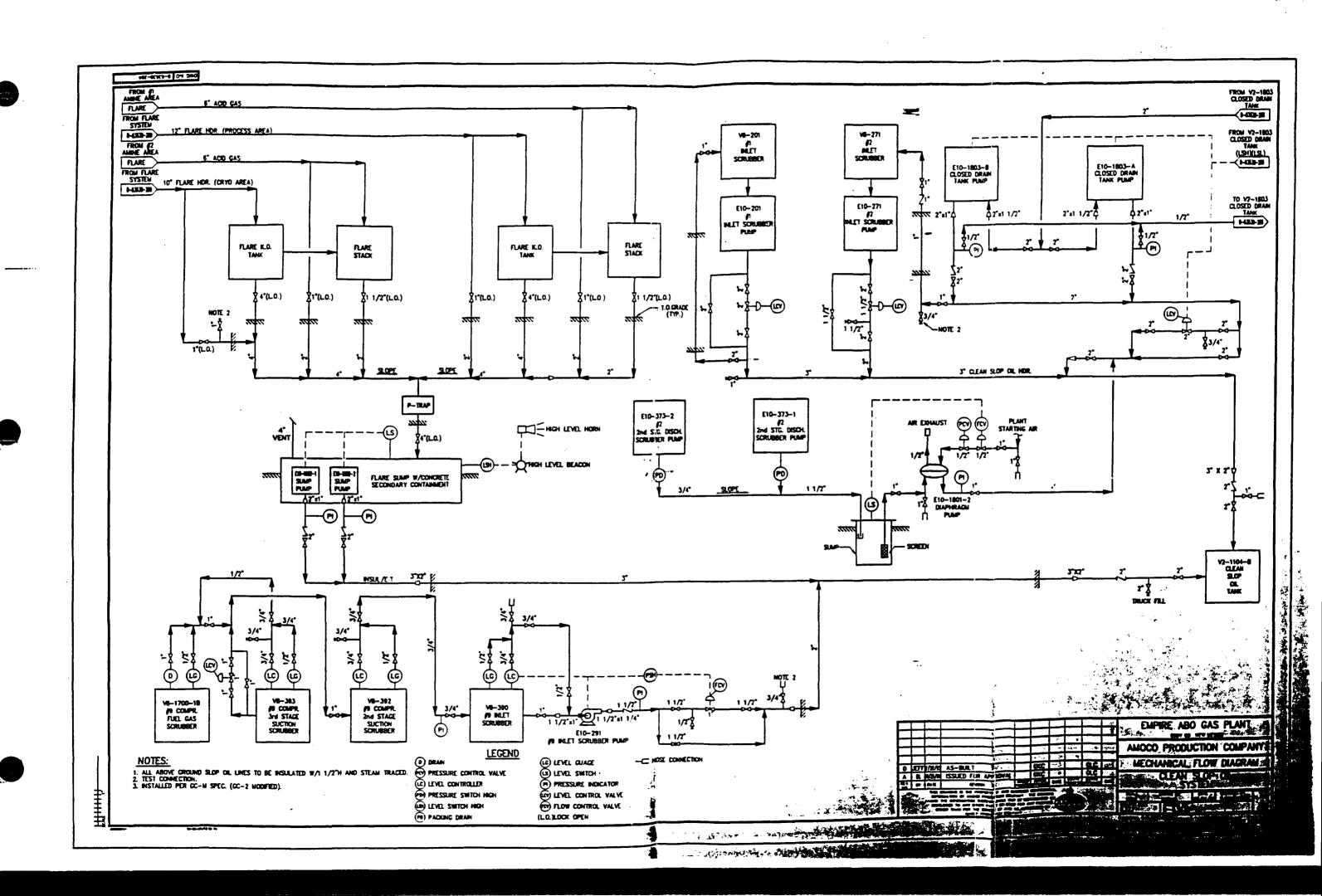


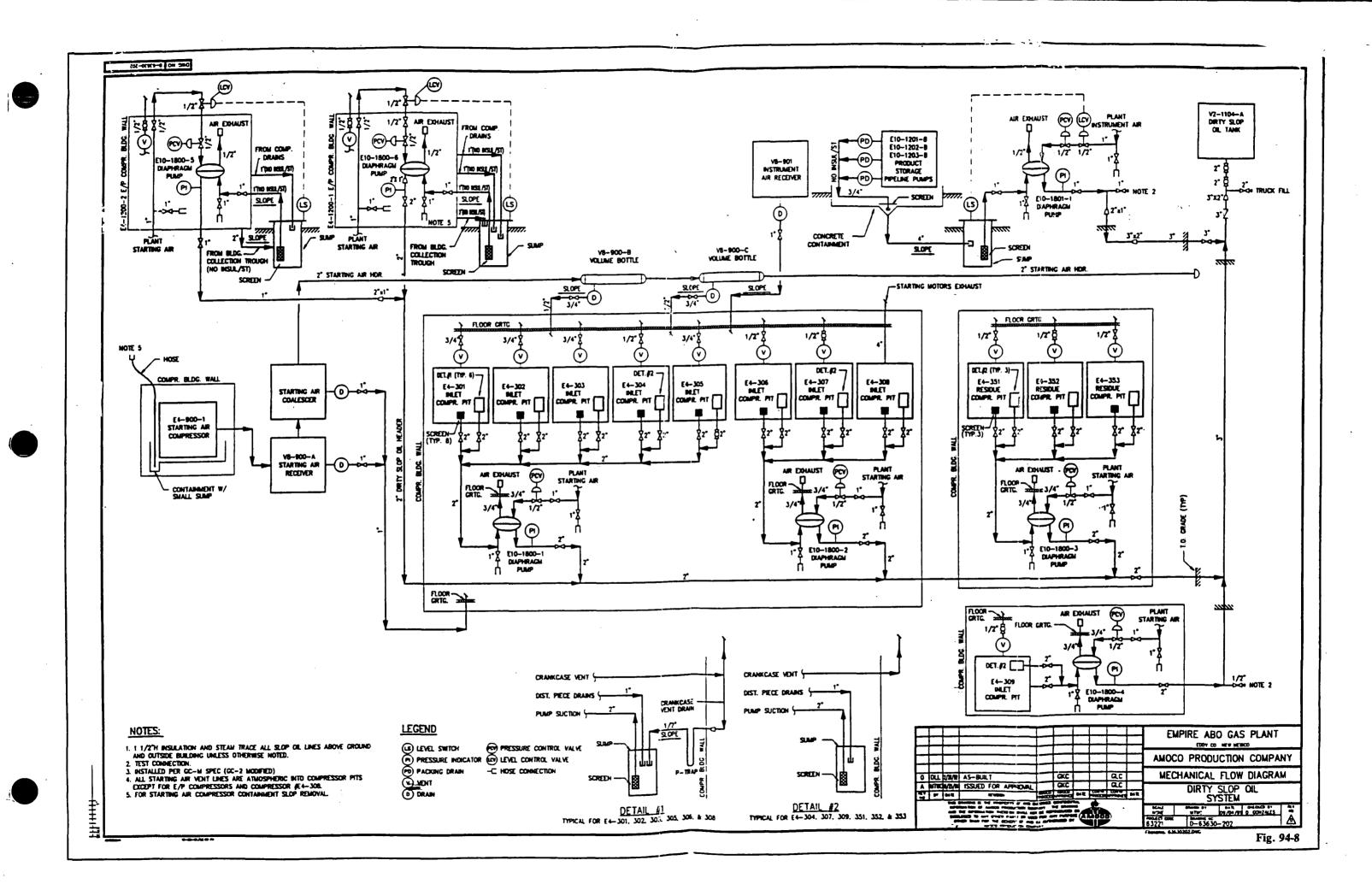
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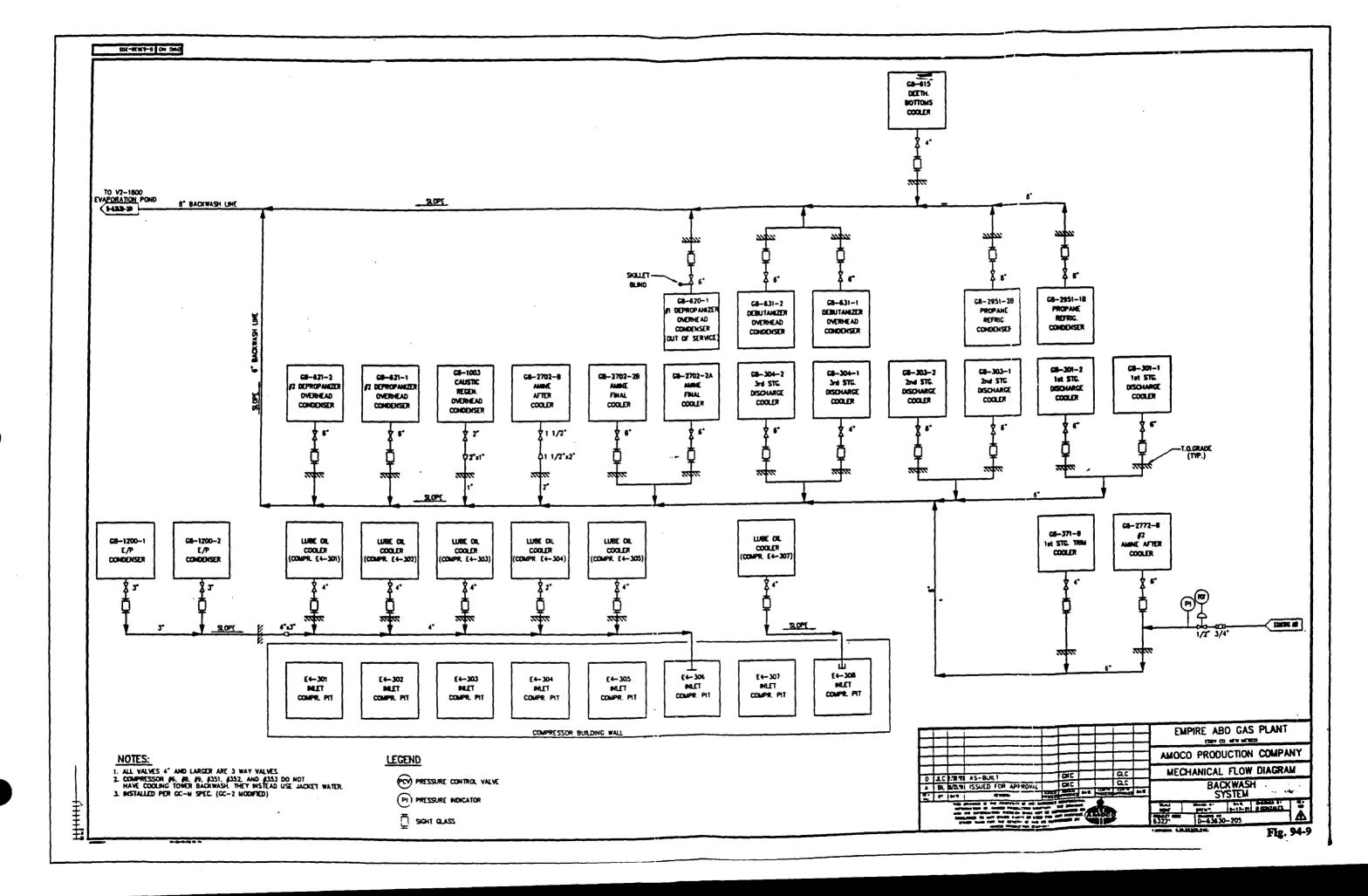


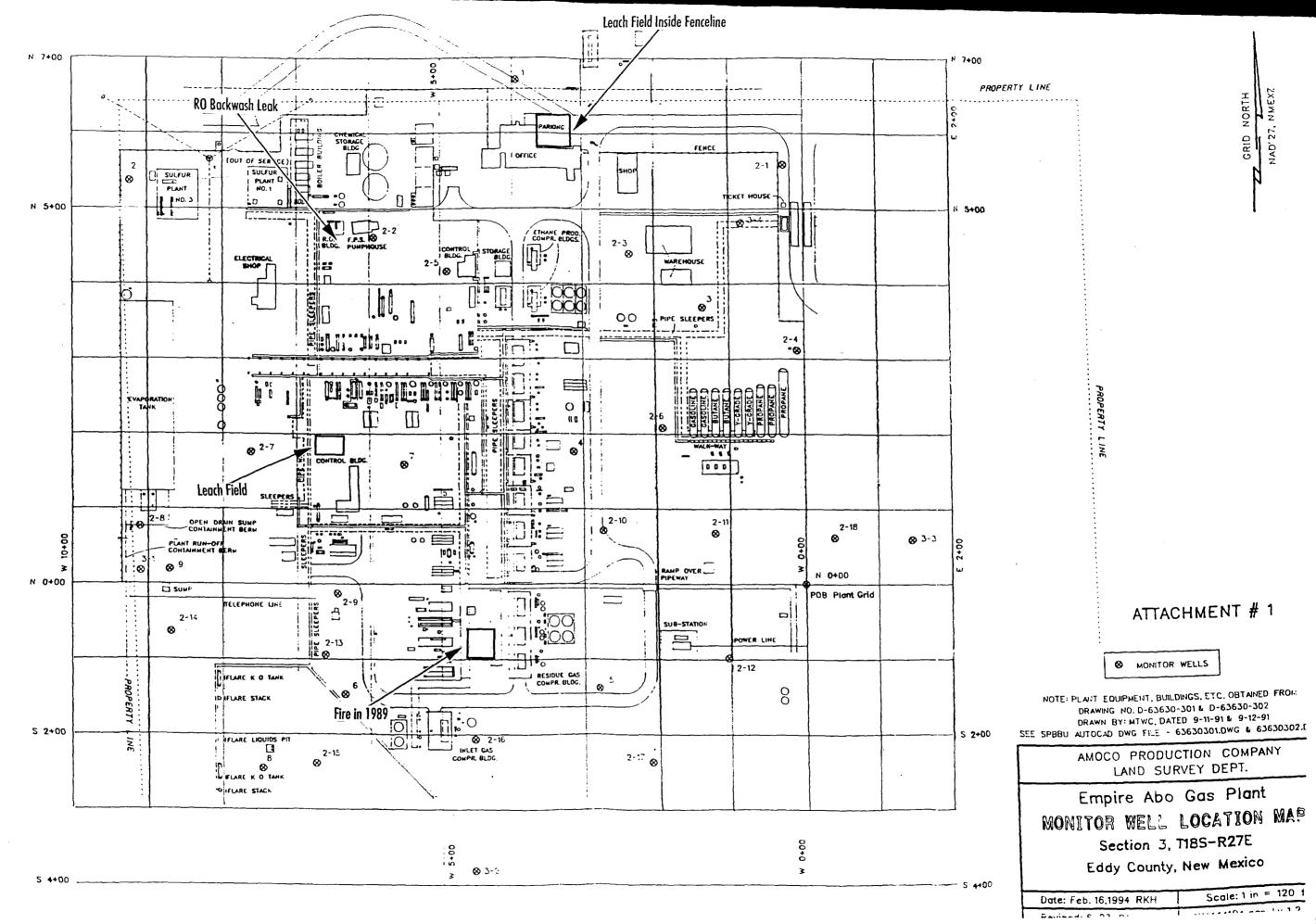
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	FROM CB-1500
4°	EVAPORATOR DUMP LINE
	Fitch (2-1501-1) THRU (2-1501-5
2*	
	FROM G2-1501-1 THRU G2-1501-5
7*	Sources
	FROM BACK-
8" BADXWASH LINE	WASH 57570
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	FUELDE LOS DIG DUITE
	EMPIRE ABO GAS PLANT
	AMOCO PRODUCTION COMPANY
R APPROVAL GKC GLC	MECHANICAL FLOW DIAGRAM
	BLOW DOWN SYSTEM
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·	Fig. 94-6



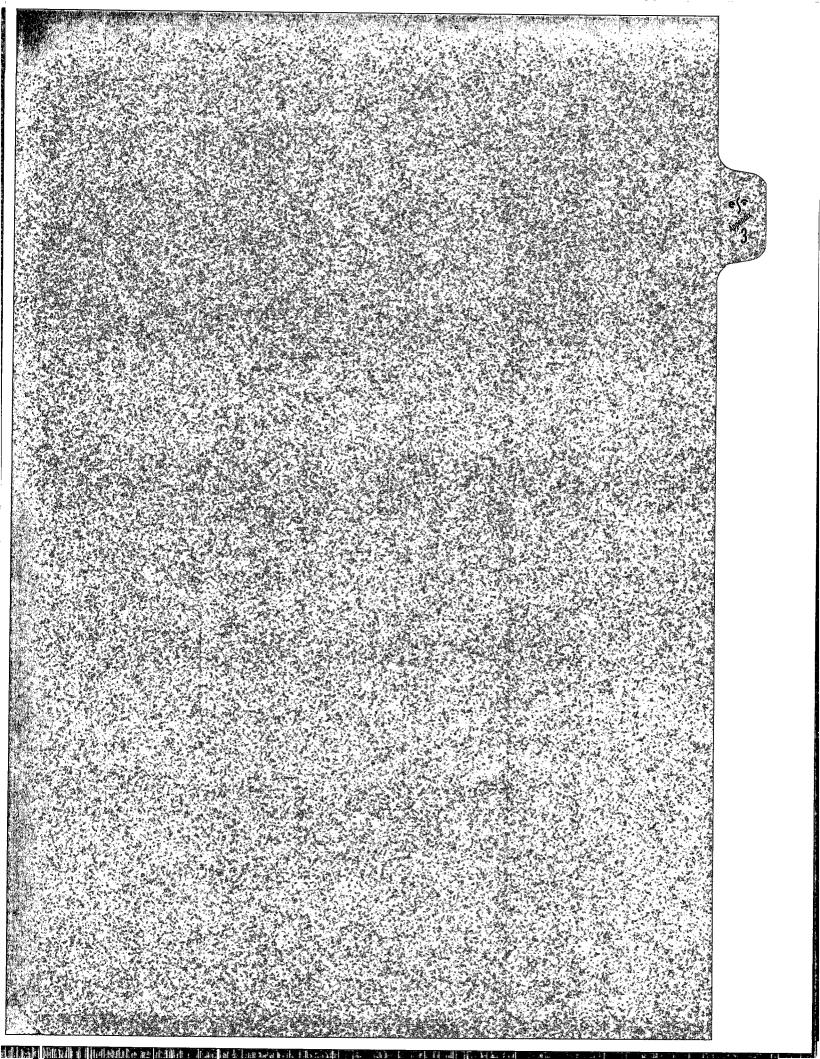








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ARCO Permian—Empire Abo Plant Environmental Site Assessment and Notice of Intent to Discharge Analytical Results from the Evaporation Pond

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Table 1					
Analytical R	esults Empire	e Abo	Plant	- ARCO	Permian

	EAGP EVAP POND	EAGP EVAP POND	
Parameters	9706051220	9707011300	Units
1,1,1,2-Tetrachloroethane	ND		ug/L
1,1,1-Trichloroethane	ND		ug/L
1,1,2,2-Tetrachloroethane	ND		ug/L
1,1,2-Trichloroethane	ND		ug/L
1,1-Dichloroethane	ND		ug/L
1,1-Dichloroethene	ND		ug/L
1.2,3-Trichloropropane	ND		ug/L
1,2-Dibromoethane	ND		ug/L
1,2-Dichlorobenzene	ND		ug/L
1,2-Dichloroethane	ND		ug/L
1,2-Dichloropropane	ND		ug/L
1,3-Dichlorobenzene	ND		ug/L
1,4-Dichloro-2-Butene	ND		ug/L
1,4-Dichlorobenzene	ND		ug/L
2-Butanone (MEK)	ND		ug/L
2-Chloroethylvinyl Ether	ND		ug/L
2-Hexanone (MBK)	ND		ug/L
4-Methyl-2-Pentanone (MIBK)	ND		ug/L
Acetone	ND		ug/L
Acrolein	ND		ug/L
Acrylonitrile	ND		ug/L
Alkalinity	329		mg/L
Aluminum, Al	ND		mg/L
Arsenic, As	ND		mg/L
Barium, Ba	0.21		mg/L
Benzene	ND		ug/L
Boron, B	0.6		mg/L
Bromodichloromethane	ND		ug/L
Bromoform	ND		ug/L
Bromomethane	ND		ug/L
Cadmium, Cd	ND		mg/L
Calcium, Ca	199	224	mg/L
Carbon Disulfide	ND		ug/L
Carbon Tetrachloride	ND		ug/L
Chloride	1080	1170	mg/L
Chlorobenzene	ND		ug/L
Chlorodibromomethane	ND		ug/L
Chloroethane	ND		ug/L
Chloroform	ND		ug/L
Chloromethane	ND		ug/L
Chromium, Cr	ND		mg/L
cis-1,2-Dichloroethene	ND		ug/L
cis-1,3-Dichloropropene	ND		ug/L
Cobalt, Co	ND		mg/L
Copper, Cu	ND		mg/L
Cyanide, Total	ND		mg/L
Dibromomethane	ND		ug/L
Dichlorodifluoromethane	ND		ug/L
Ethyl Methacrylate	ND		ug/L
Ethylbenzene	ND		ug/L
Fluoride	2.2		mg/L
Freon 113	ND		ug/L
lodomethane	ND		ug/L
Iron, Fe	ND		mg/L
Lead, Pb	ND	1	mg/L
Magnesium, Mg	28.7	1	mg/L
Manganese, Mn	ND		mg/L
Mercury	ND	<u>├────</u>	mg/L





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Analytical Results	Empire Abo	Plant -	ARCO Permian	ARCO Permi

	EAGP EVAP POND	EAGP EVAP POND	
Parameters	9706051220	9707011300	Units
Methyl-tert Butyl Ether	ND		ug/L
Methylene Chloride	ND		ug/L
Molybdenum, Mo	ND		mg/L
Nickel, Ni	ND		mg/L
Nitrate/Nitrite as N	0.5		mg/L
O-Xylene	ND		ug/L
P/M Xylenc	ND		ug/L
pH	8.9		pH Units
Phenol	ND		mg/L
Selenium, Se	ND		mg/L
Silver, Ag	ND		mg/L
Sodium, Na	1080	586	mg/L
Specific Conductance	4740		umhos/cm
Styrene	ND		ug/L
Sulfate	599	667	mg/L
Tetrachloroethene	ND		ug/L
Toluene	ND		ug/L
Total Hardness	615		mg/L as
Total Phosphorus as (P)	0.72		mg/L
trans-1,2-Dichloroethene	ND		ug/L
trans-1,3-Dichloropropene	ND		ug/L
Trichloroethene	ND		ug/L
Trichlorofluoromethane	ND		ug/L
Vinyl Acetate	ND		ug/L
Vinyl Chloride	ND		ug/L
Zinc, Zn	ND		mg/L
TDS	~ 3000-4000	3120	mg/L

~ Estimated TDS value

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ARCO Permian—Empire Abo Plant Environmental Site Assessment and Notice of Intent to Discharge Department of Agriculture Correspondence

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United States Department of Agriculture

Natural Resources Conservation Service 3105 West Main Street Artesia, New Mexico 88210-3105

> Telephone (505) 746-4121 Fax (505) 748-2609

July 22, 1997

Melinda G. Hunt Environmental Services, Inc. 4665 Indian School, NE Suite 106 Albuquerque, NM 87110

Subject: Irrigation Plan

Dear Ms. Hunt:

Using the data given of 1,260,000 gallons per minute per month maximum and 378,000 gallons per minute per month minimum with an average of 630,000 gallons per minute per month this would equal 1.933 acre feet per month or 23.2 acre feet per year. I would highly suggest no more than 1.5 acre feet per year application using native vegetation. This would require an area of 15.50 acre to be irrigated in a 12 month period. I would suggest that a 21 acre area be used.

Due to the T.D.S. being 3,120 gallons per minute or 4,000+ conductance and the chlorides being 47 mg/liter, I would also suggest for sprinkler irrigation that the following 12 hour sets be used. 6:00 pm to 6:00 am for the months of 1/2 of March through October because when it is hot, dry and windy these salts and especially the chlorides can and will cause "leaf" burn or damage. You would then go to 8:00 am to 8:00 pm during the months of November, December, January, February, and the first 1/2 of March because of the freezing temperatures during the night time.

The water quality is a problem but not one that can't be managed. Please note that there are some farmers using water for irrigation that is "hotter" than this but they do need management.

I would highly recommend that you do not use light, frequent irrigation's due to the salt build up in the soil and instead a 4"+ gross application per set or time period should be used. I would like to suggest that this be done on an area with at least 30"+ soil depth, preferably silt loams. For example, most good native grass species have rooting depths of 24" to 36" and most silt loams have an average of 1.8"/foot available water holding capacity. 4" gross applications would equal 2.2 feet "wetting" depth or 26" to 27".

July 22, 1997 Melinda G. Hunt Page Two

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It is also suggested that all major brush species be chemically removed using Hexianone or its equivalent and I would "inter-seed" in standing native grasses using a highly productive, salt tolerant native grass species such as Alkali Sacaton. Tests at the NMSU, Agriculture Science Center in Artesia have shown that this is the most productive species under limited irrigation compared to all native species and most introduced species. I would not plow, till or disturb the project area, just inter-seed the alkali sacaton at a one pound per acre rate during the months of August and September. This grass species has over 1.2 million seeds per pound and it is warm seasoned. It will grow in February if the conditions are right. Once this grass becomes dominant, I would use the 20+ acres as a separate, fenced grazing area with its own trough and etc... set up. It would take about two years for the Alkali Sacaton to become established. Therefore, this 20 acre area would need to be fenced out but grazed with heavy, short duration periods for weed control. The main thing that will happen when irrigating the regular native vegetation is the tremendous increase in "annual weeds", especially Russian Thistle and Kochia. Using heavy, short duration grazing on these plants would be a valuable source of protein.

I have not been out to the site due to the heavy workload placed on me by the new Farm Program, but I plan to make time in August and September to get out there. I would like to meet with someone and go over the site, soils, etc... at that time.

Basically, four to five irrigation's over each acre per year would give 1.5 acre feet per acre and should give 6 to 10 Animal Unit Months of grazing per acre. This variation in grazing months is due to the fact that the "bloom" of annuals could raise the Animal Unit Months to 12 for six months to one year.

20 acres equal 871,200 square feet. This shape or size should depend on the soils and methods of irrigation.

Regarding the irrigation system, I would suggest the following:

Design a small irrigation reservoir or using the existing evaporation ponds to hold seven days supply of water for safety and/or other unforeseen breakdowns even though the system would only be designed for 1 day's supply in one 12 hour period. I would design everything based on maximum output and cut down the hours of application accordingly. Therefore, a maximum of 29.17 gallons per minute for 7 days equals 294,033 gallons or .9 acre feet. Could the evaporation ponds be used for the irrigation reservoir?? There are lots of different sprinkler irrigation methods for applying the water. For example, an 800 foot sideroll unit with 50 foot wheel moves equals 20 sprinklers using 8.5 gallons per minutes per sprinkler and sprinklers spaced at 40 feet equals .409" per hour gross application rate times 12 hours which would equal 4.9" gross application. This July 22, 1997 Melinda G. Hunt Page Three

would use 175 gallons per minute times 720 minutes which would equal 126,000 gallons per set divided by the maximum daily input rate of 42,000 gallons or use 3 days worth. Therefore the unit would run only 1 night every three days and cover .918 acres per set. There could be a thousand variations of this type. Please note that an 800 foot wide sideroll would need to run 1090 feet length field to get 20 acres of coverage. 50 foot moves, not 60 foot are recommended because you would want smaller wheels for less wind problems. You would also want single nozzles not double because you do not want to have fine droplets (salts) and the doubles nozzles plug up easily. You would also want 40-45 pounds operating sprinkler pressure for the same reasons and you would need a 4" P.V.C. pipeline (1090 feet) with 4" sprinkler valves at 50 foot intervals.

This example would have 22 sets and take 66 days to cover 20 acres. Please not that this was based on the maximum, the average would run less than 12 hours. Not knowing what the set up is, I would also recommend that you have an "auto-on" and "auto-start" level in the evaporation pond but make it so that it has a manual override.

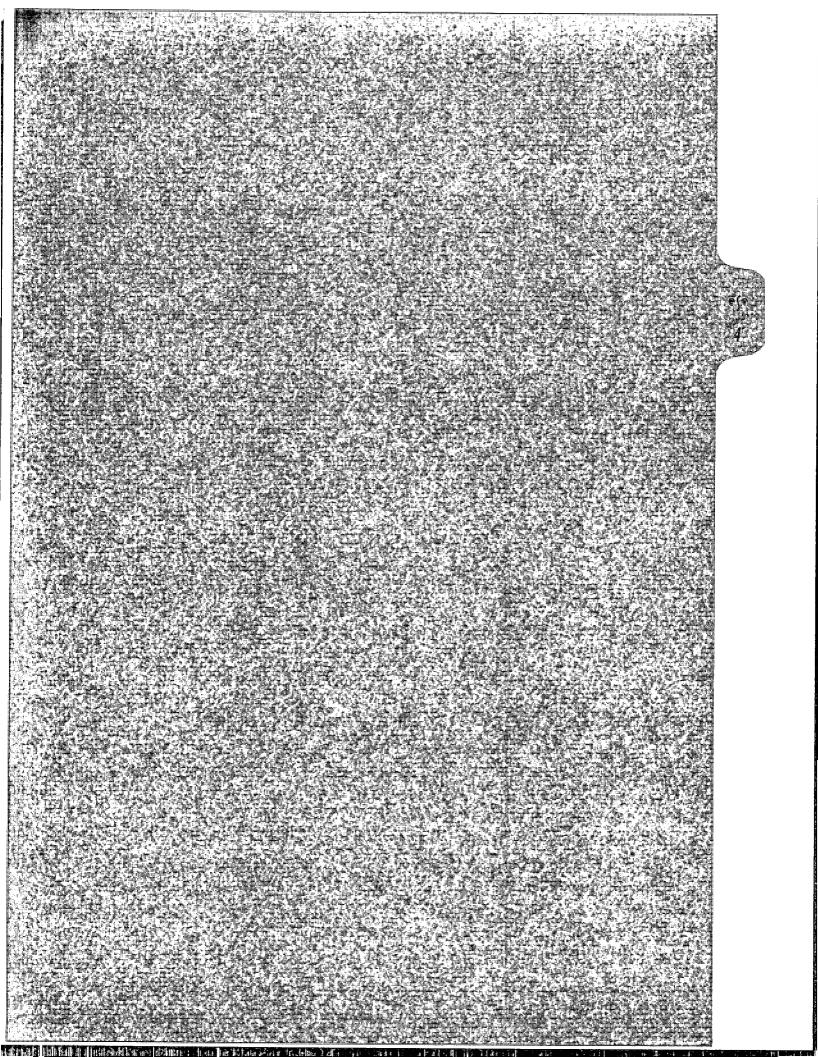
Please remember that there are many variations on the suggestions that I have made. Call me for an appointment and I will get you more information after I have viewed the site. If you have any questions, please contact me.

Sincerely,

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Donald L. Alam District Conservationist Artesia District Office

cc: Lewis Derrick, Bogle Farms Margaret Low, Arco-Permian Randy McCollum, Elkhorn Operating Company





ARCO Permian—Empire Abo Plant Environmental Site Assessment and Notice of Intent to Discharge SPCC Plan

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ARCO Permian A Unit of ATLANTIC RICHFIELD COMPANY

SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN

EMPIRE ABO GASOLINE PLANT EDDY COUNTY, NEW MEXICO

OPERATED BY ELKHORN OPERATING COMPANY

Approved by:

Margaret J. Lowe Environmental Engineer

TX (State) Registration _64382

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Randy McCollum Plant Manager

Jøhn Whitehead Vice President, Operations and Development

Vaul for Thalia R. Gelbs

ΡE

Thalia Gelbs SENM Asset Manager

SECTION I - COMMITMENT OF MANPOWER

ARCO Permian and Elkhorn Operating Company commit to complying with all aspects of this plan. Oil storage tanks will have adequate secondary containment to prevent a spill from reaching navigable water. Since it is not practical to install secondary containment for all equipment in the plant, ARCO Permian and Elkhorn Operating Company commit to provide the necessary personnel, equipment, and materials required to expeditiously control and remove any harmful quantity of oil discharged.

SECTION II - SPILL RESPONSE

A. INITIAL ACTION AT THE SITE OF A SPILL

The responsible Elkhorn Operating Company employee at the scene of the operation who first learns about an oil spill or pollution shall take the following action:

- 1. Notify Appropriate Supervisor Immediately contact supervisor, giving an assessment of the situation.
- 2. Alleviate danger If any human life or property is in danger, take prompt action to alleviate such danger.
- 3. Contain spill If the spill can be stopped or brought under control, take prompt action to do so. If possible, contain the spread of the spill using equipment available on-site.
- 4. Determine if spill reached "navigable water" "Navigable water" includes a variety of different sources, including lakes, creeks, and dry draws. A spill into navigable water is reportable if it is enough to create a sheen. Even if the draw is dry at the time of the spill, if oil gets into it, the spill is reportable to the National Response Center (NRC). If the spill did not get into "navigable water" respond according to procedure outlined in Appendix 1. If the spill did get into "navigable water", call the NRC and one of the following in order:

1)	Plant Manager Randy McCollum	Home	(505) 677-5117 (505) 746-8766
2)	SENM Asset Manager Thalia Gelbs	Home	(915) 688-5992 (915) 697-5238
3)	Environmental Engineer Margaret J. Lowe	<u>Home</u>	(915) 688-5799 (915) 697-7374
4)	Environmental Engineer Peggy Waisanen	<u>Home</u>	(915) 688-5703 (915) 688-5158
5)	Vice President, Operations and Development John Whitehead	<u>Home</u>	(915) 688-5847 (915) 697-0156
6)	Elkhorn General Operations Manager Ken Allen	<u>Home</u>	(918) 492-4418 (918) 664-9731
7)	ARCO Permian President Tony Best	<u>Home</u>	(915) 688-5217 (915) 689-3550

Your supervisor will contact the Plant Manager and either of the Environmental Engineers and apprise them of the situation.



B. ACTIVATION OF THE OIL SPILL CONTINGENCY PLAN:

- e. Determine the needs of equipment and personnel involved in the cleanup operations.
- f. Keep the SENM Asset Manager, or in his/her absence, the Operations and Development Manager, fully informed of all events and developments.
- g. Keep the Environmental Department informed of all events and developments and seek advice if necessary.
- 3. The facility's Plant Manager shall clean up the spill as follows:
 - a. Establish a plan of action for cleanup. This plan should be discussed with the Environmental Engineer and the responsible agency before implementing.
 - b. Procure bulldozers and/or back hoe to build additional containment such as dikes, dams, etc., to better contain the oil spill.
 - c. Procure vacuum trucks to reclaim the effluents spilled.
 - d. Restore the area of the spill, as nearly as possible, to the same condition as before the spill. Consider input from the Asset Manager, Environmental Engineer, landowner, the Oil Conservation Division and/or the Bureau of Land Management in determining the degree to which the spill is cleaned up and land reclaimed.
 - e. The Environmental Engineer will coordinate appropriate action if the spill reaches waters of the United States. In his/her absence, this will be done by another Environmental Engineer or the SENM Asset Manager.
 - f. Record any reportable SPCC spill and maintain records in local files.
 - g. If the spill enters the waters of the U.S. and is greater than 1000 gallons, or if two reportable spills occur within 12 consecutive months, a report must be submitted to the EPA within 60 days. This report will contain the entire SPCC plan along with details of the spill event(s).

SECTION III - SPILL PREVENTION

A. FACILITY INFORMATION

This spill prevention, control and countermeasure plan is to be followed to prevent an occurrence of an oil spill. In the event an oil spill does occur, appropriate countermeasures will be taken at the Empire Abo Gasoline Plant, Eddy County, New Mexico.

The reporting system, facilities, type of material, previous oil or produced water spills, environmential characteristics, potential containment, and effects of an oil spill at these facilities are described.

Anyone who will be involved in this spill prevention, control and countermeasure plan will acquaint himself with this plan, governmental actions and pertinent statutes and regulations.

- 1. Facility Location The Empire Abo Gasoline Plant is located in Township 18 South, Range 27 East, NE/4 SE/4 section 3 in Eddy County, New Mexico. The facility is a gas processing plant.
- 2. Environment Of Area The surrounding area is native range land used for livestock grazing. The plant site is on ARCO Permian owned land. Surrounding land ownership is a combination of the United States Government and the State of New Mexico. Water drainage is into Scoggin Draw.
- Plant Office Elkhorn Operating Company PO Drawer 70 257 Empire Road Artesia, NM 88211-0070 Phone: (505) 677-2161

ARCO Permian Office ARCO Permian 600 N. Marienfeld P.O. Box 1610 Midland, TX 79702 Phone: (915) 688-5200

B. SPILL PREVENTION REQUIREMENTS

1. Inspection and Records

- a. The operator, by his normal work procedure and reports, inspects the storage area equipment daily for malfunctions. The routine surveillance of storage facilities each day ensures equipment is functioning properly.
- b. On an annual basis the Environmental Engineer and/or the Plant Manager will inspect the oil handling systems using checklist in Attachment #3.
- c. Non-destructive testing on the NGL bottle tanks will be conducted on a three-year basis. This will be recorded and records maintained at the plant.

2. Personnel Training and Spill Prevention Procedures

- a. Annually, personnel are instructed in the following:
 - Operation and maintenance of equipment to prevent a discharge.
 - Applicable pollution control laws, rules, and regulations.
 - Training records are maintained at the facility.
- b. Scheduled spill prevention briefings for the operating personnel are conducted frequently enough to ensure adequate understanding of the SPCC plan.

3. Facility Drainage

The drainage of oily fluid from the diked containment areas will be through the use of vacuum trucks and/or portable pumps with disposal at approved facilities or will be replaced in the production stream for reconditioning. Rainwater and storm water may be drained from the secondary containment <u>IF</u> there is no oil sheen. Attachment 4 will be used as documentation for disposition of fluid in secondary containment.

The facility is contained on the southwest and southeast by a stormwater control levee. This levee is in place to act as containment for stormwater and as tertiary containment for oil, other hydrocarbon liquids, or chemicals. Oil will be collected if accumulations occur in this area as described above for diked contrinment areas.

On the operator's routine rounds, the operator will look for signs of oil. If oil is observed, the Plant Manager will be notified and the product inside the firewall will be recovered by pumps and/or vacuum trucks and handled in approved methods (disposal or recycled). The test for oil will be a sheen that is visible to the eye. If no oil is observed a pump may be used to remove rainwater that has accumulated. Discharge will be to a portion of the plant where no erosion or sediment transport to water bodies will occur. Drain lines may be unlocked, and rainwater allowed to flow out of the dike if there is no sheen of oil observed. There must be personne' observing the discharge activities at all times. Attachment 4, Onshore Facility Bulk Storage Tanks Drainage System, will be used to document any discharge activity. Records will be maintained at the facility of all drainage activities.

4. Spill Prevention Instruction For Contractors - Contractors will be sufficiently instructed on preventative measures they should employ while working at the facility. An authorized representative of Elkhorn Operating Company or ARCO Permian will intervene if necessary while the contractor is working at the plant to prevent a spill event.

B. CHEMICAL SPILLS

Reportable Spill: Spills of caustics, acids, water, or chemicals endangering persons, wildlife, or property

Methanol	5000 lbs. or 16 bbls.
Ethylene Glycol	5000 lbs. or 16 bbls.

For other chemicals, contact the Environmental Engineer.

Reporting Method:

- Discuss any possible applicable spill with Asset Manager or Environmental Group before reporting further, unless people or wildlife is immediately endangered.
- Endangering spills should be reported to the New Mexico Oil Conservation Division and the Bureau of Land Management (if applicable) district office.
- If communications with Asset Manager or Environmental Group confirm the existence of a "reportable quantity" spill, additional reports must be made to the National Response Center.

MSDS sheets and other available resources should be used in obtaining data on chemicals used in your facility.

C. GASEOUS RELEASE

Reportable Release:

- On BLM land, any event releasing 500 MCF or more of gas (use BLM form NM 3162-1)
- Any event that releases more than 500 MCF requires immediate notification of the NMOCD district office
- Any event that releases more than 5000 MCF requires · ritten notification of the NMOCD district office
- Any event that places life or property in danger requires NMOCD verbal and written report

Reporting Method:

- Discuss any possible applicable release with Asset Manager or Environmental Group before reporting, unless people or wildlife is immediately endangered.
- Endangering releases should be reported to the New Mexico Oil Conservation Division and the Bureau of Land Management district office.

SECTION II. NOTES ON REPORTING

A. TELEPHONE REPORTS

- 1. Reports should be made as soon as possible, at least within 24 hours. It is recommended to discuss spill with Asset Manager or Environmental Group before reporting spills.
- 2. For telephone reports, use the ARCO Report Form as a guide to indicate what information needs to be given.
- 3. Document in facility records, all attempts to telephone reports to agencies successfully or unsuccessfully.
- 4. Document spills of less than reportable amounts in facility files.

B. WRITTEN REPORTS

- 1. Use the ARCO Spill Report Forms for reporting all spills and releases.
- 2. Use Release Notification and Corrective Action Form (C-141) to report to OCD.
- 3. Reports should be submitted within 10 days of spill.



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ARCO PERMIAN SPILL REPORT WORKSHEET

Field/Lease/Fa	cility:			
	Qtr/Qtr	Sec.	Township	Range
County:			State:	
Land:	Fee	State	Federal	Indian
Date of Spill: _	······	Time:	Reported by:	
Fluid Spilled:				
Oil:		bbl	OR	gal
Water:		bbl	OR	
Gas:		mcf	OR	scf
Chemical:	······································	gal	OR	lb
Fluid Recover	ed:			
Oil:		bbl	OR	gal
Water:	·····	bbl	OR	gal
Chemical:		gal	OR	Ib
Weather Cond	litions: Clear	Cloudy	Snow Rai	n
at 1-800-424-8	802. Done?			onal Response Center must be notified
Was wildlife in	npacted?	If yes, exp	lain	
<u></u>				
Source and Ca	use of Spill:			
Agencies notif	ied:		_	
Agency		Time	Agency Rep. Notified	Notifying ARCO Employee
				· · · · · · · · · · · · · · · · · · ·
				ls?
				-
Person Prepar	ring Report:			Date:

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ONSHORE FACILITY BULK STORAGE TANKS DRAINAGE SYSTEM

Inspection Procedure:

The Plant Manager or his designee will conduct annual visual inspections of the diked areas and these will be documented. The operators will conduct daily inspections, and these will not be documented.

Record of drainage, bypassing, inspection and oil removal from secondary containment:

	Date of Bypassing		Date of	Oil	Supervisor's or
Date of Drainage	Open	Closed	Inspection	Removal	Inspector's Signature
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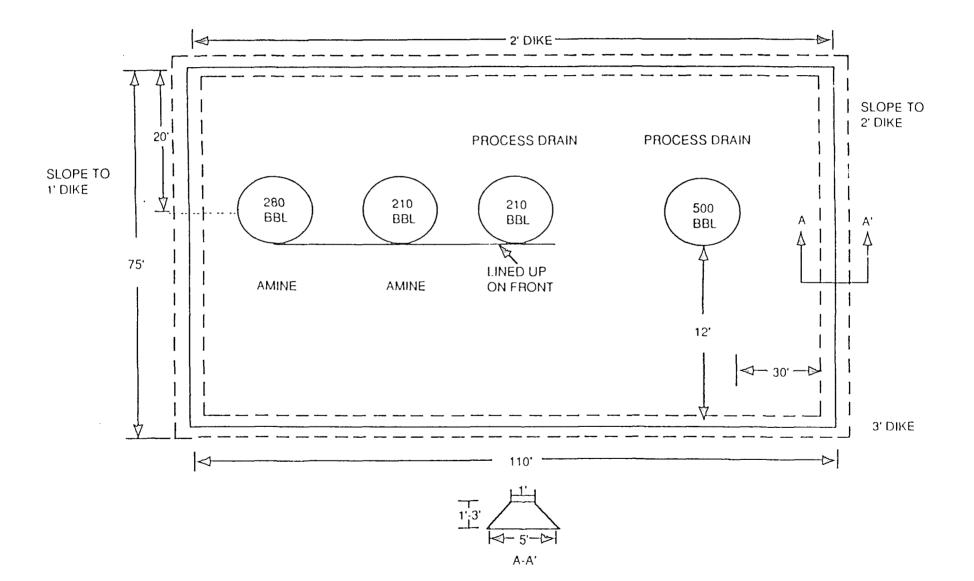
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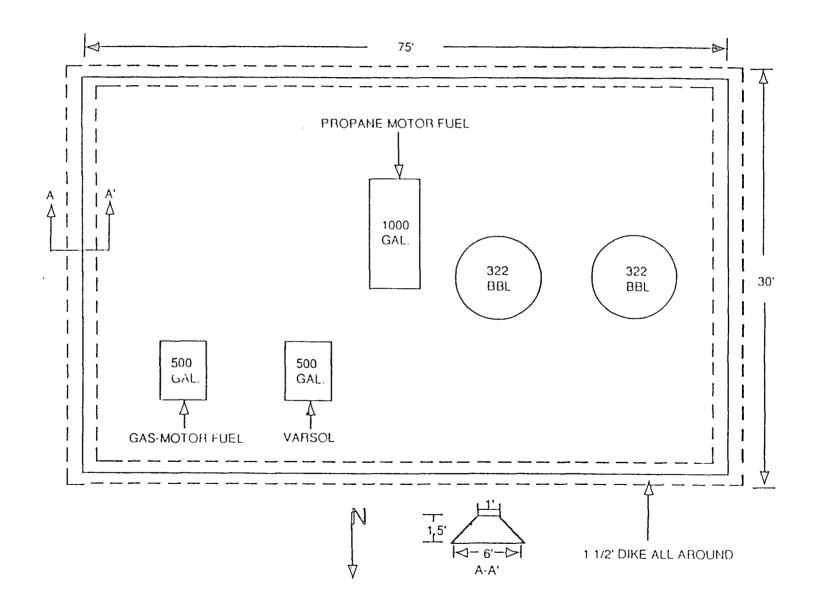




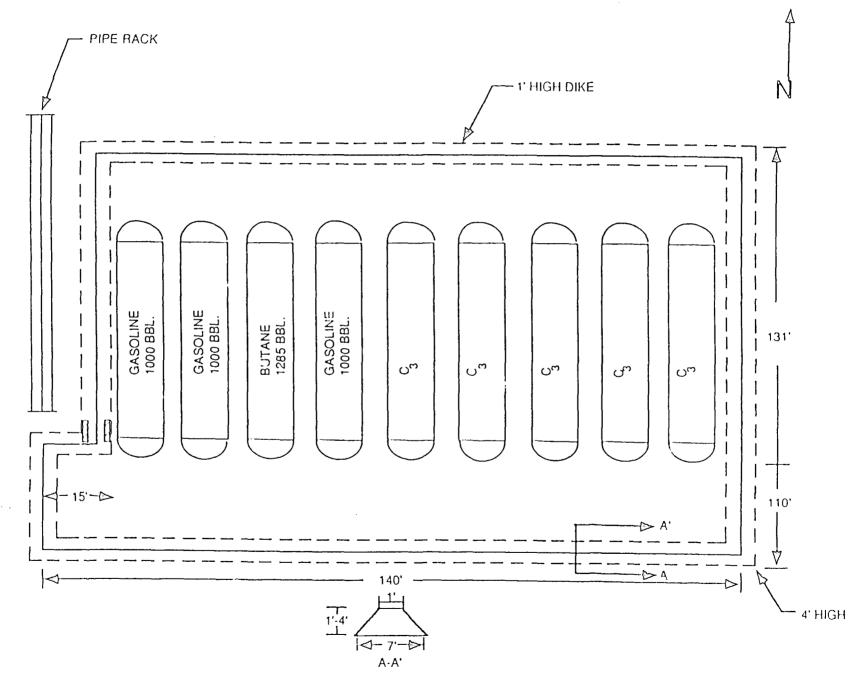


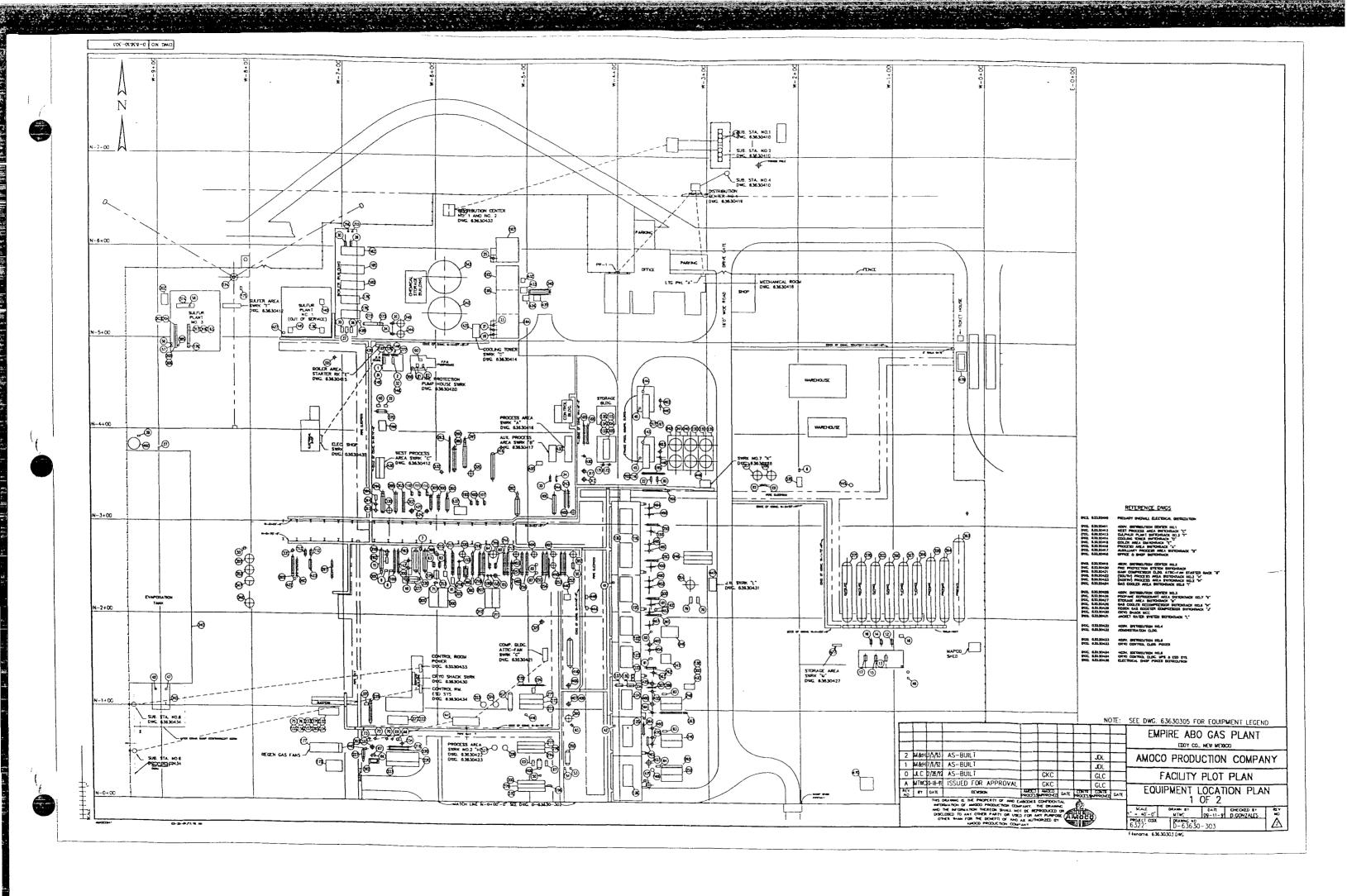


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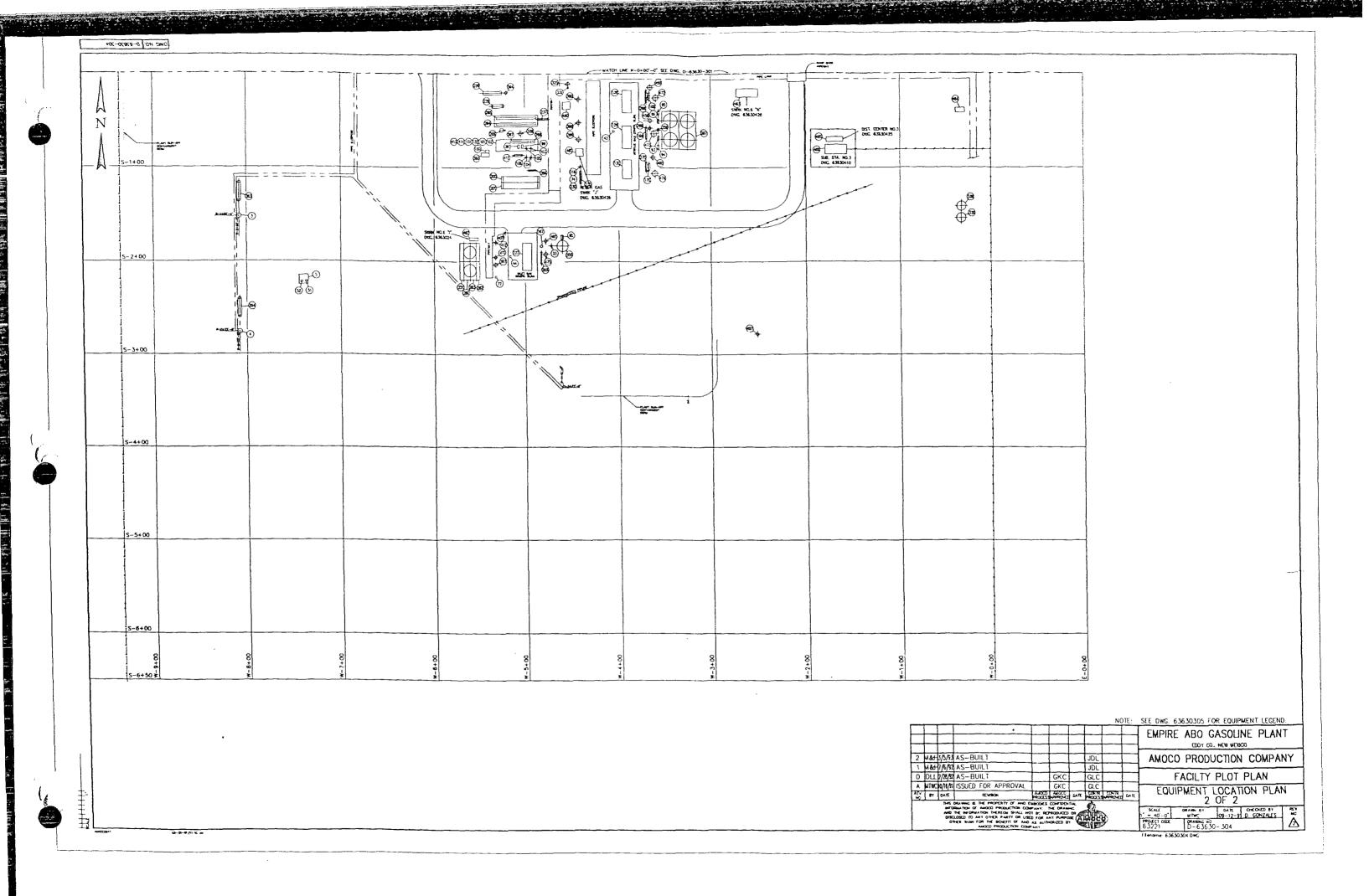






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EXHIBIT A

116 RELEASE NOTIFICATION AND CORRECTIVE ACTION

116.A. NOTIFICATION:

(1) The Division shall be notified of any unauthorized release occurring during the drilling, producing, storing, disposing, injecting, transporting, servicing or processing of crude oil, natural gases, produced water, condensate or oil field waste including Regulated NORM, or other oil field related chemicals, contaminants or mixture thereof, in the State of New Mexico in accordance with the requirements of this Rule. {1-1-50... - 97]

(2) The Division shall be notified in accordance with this Rule with respect to **any** release from any facility of oil or other water contaminant, in such quantity as may with reasonable probability be detrimental to water or cause an exceedance of the standards in 19 NMAC 15.A.19. B(1), B(2) or B(3). [-97]

116.B. REPORTING REQUIREMENTS: Notification of the above releases shall be made by the person operating or controlling either the release or the location of the release in accordance with the following requirements:

(1) A Major Release shall be reported by giving both immediate verbal notice and timely written notice pursuant to Paragraphs C(1) and C(2) of this Rule. A Major Release is:

(a) an unauthorized release of a volume, excluding natural gases, in excess of 25 barrels;

(b) an unauthorized release of any volume which:

(i) results in a fire;

(ii) will reach a water course;

(iii) may with reasonable probability endanger public health; or

(iv) results in substantial damage to property or the environment;

(c) an unauthorized release of natural gases in excess of 500 mcf; or

(d) a release of any volume which may with reasonable probability be detrimental to water or cause an exceedance of the standards in 19 NMAC 15.A.19. B(1), B(2) or B(3).[-97]

(2) A Minor Release shall be reported by giving timely written notice pursuant to Paragraph C(2) of this Rule. A Minor Release is an unauthorized release of a volume, greater than 5 barrels but not more than 25 barrels; or greater than 50 mcf but less than 500 mcf of natural gases. [-97]

116.C. CONTENTS OF NOTIFICATION:

(1) Immediate verbal notification required pursuant to Paragraph B shall be reported within twenty-four (24) hours of discovery to the Division District Office for the area within which the release takes place. In addition, immediate verbal notification pursuant to Subparagraph B.(1).(d). shall be reported to the Division's Environmental Bureau Chief. This notification shall provide the information required on Division Form C-141. [5-22-73... - 97]



(2) Timely written notification is required to be reported pursuant to Paragraph B within fifteen (15) days to the Division District Office for the area within which the release takes place by completing and filing Division Form C-141. In addition, timely written notification required pursuant to Subparagraph B.(1).(d). shall also be reported to the Division's Environmental Bureau Chief within fifteen (15) days after the release is discovered. The written notification shall verify the prior verbal notification and provide any appropriate



additions or corrections to the information contained in the prior verbal notification. [5-22-73... - -97]

116.D. CORRECTIVE ACTION: The responsible person must complete Division approved corrective action for releases which endanger public health or the environment. Releases will be addressed in accordance with a remediation plan submitted to and approved by the Division or with an abatement plan submitted in accordance with Rule 19 (19 NMAC 15.A.19). [--97].

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ARCO Permian—Empire Abo Plant Environmental Site Assessment and Notice of Intent to Discharge WQCC 1203 Notification of Discharge -- Removal





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B. Plans, specifications and reports required by this Section, if related to facilities for the production, refinement and pipeline transmission of oil and gas, or products thereof, shall be filed instead with the Oil Conservation Division. [1-4-68, 12-1-95]

C. Plans and specifications required to be filed under this Section must be filed prior to the commencement of construction. [9-3-72]

1203. NOTIFICATION OF DISCHARGE--REMOVAL.

A. With respect to any discharge from any facility of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, the following notifications and corrective actions are required: [2-17-74, 12-24-87]

1. As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter, any person in charge of the facility shall orally notify the Chief of the Ground Water Protection and Remediation Bureau of the department, or his counterpart in any constituent agency delegated responsibility for enforcement of these rules as to any facility subject to such delegation. To the best of that person's knowledge, the following items of information shall be provided:

a. the name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility;

b. the name and address of the facility;

c. the date, time, location, and duration of

the discharge;

d. the source and cause of discharge;

e. a description of the discharge, including its chemical composition;

f. the estimated volume of the discharge; and

g. any actions taken to mitigate immediate damage from the discharge. [2-17-74, 2-20-81, 12-24-87, 12-1-95]

When in doubt as to which agency to notify, the
 20 NMAC 6.2



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person in charge of the facility shall notify the Chief of the Ground Water Protection and Remediation Bureau of the department. If that department does not have authority pursuant to commission delegation, the department shall notify the appropriate constituent agency. [12-24-87, 12-1-95]

3. Within one week after the discharger has learned of the discharge, the facility owner and/or operator shall send written notification to the same department official, verifying the prior oral notification as to each of the foregoing items and providing any appropriate additions or corrections to the information contained in the prior oral notification. [12-24-87]

4. The oral and written notification and reporting requirements contained in this Subsection A are not intended to be duplicative of discharge notification and reporting requirements promulgated by the Oil Conservation Commission (OCC) or by the Oil Conservation Division (OCD); therefore, any facility which is subject to OCC or OCD discharge notification and reporting requirements need not additionally comply with the notification and reporting requirements herein. [2-17-74, 12-24-87]

5. As soon as possible after learning of such a discharge, the owner/operator of the facility shall take such corrective actions as are necessary or appropriate to contain and remove or mitigate the damage caused by the discharge. [2-17-74, 12-24-87]

6. If it is possible to do so without unduly delaying needed corrective actions, the facility owner/operator shall endeavor to contact and consult with the Chief of the Ground Water Protection and Remediation Bureau of the department or appropriate counterpart in a delegated agency, in an effort to determine the department's views as to what further corrective actions may be necessary or appropriate to the discharge in question. In any event, no later than fifteen (15) days after the discharger learns of the discharge, the facility owner/operator shall send to said Bureau Chief a written report describing any corrective actions taken and/or to be taken relative to the discharge. Upon a written request and for good cause shown, the Bureau Chief may extend the time limit beyond fifteen (15) days. [12-24-87, 12-1-95]

7. The Bureau Chief shall approve or disapprove in writing the foregoing corrective action report within thirty (30) days of its receipt by the department. In the event that the report is not satisfactory to the department, the Bureau Chief shall specify in writing to the facility owner/operator any shortcomings in the report or in the corrective actions already taken or proposed to be taken relative to the discharge, and shall give the facility owner/operator a reasonable and clearly specified

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time within which to submit a modified corrective action report. The Bureau Chief shall approve or disapprove in writing the modified corrective action report within fifteen (15) days of its receipt by the department. [12-24-87]

8. In the event that the modified corrective action report also is unsatisfactory to the department, the facility owner/operator has five (5) days from the notification by the Bureau Chief that it is unsatisfactory to appeal to the department secretary. The department secretary shall approve or disapprove the modified corrective action report within five (5) days of receipt of the appeal from the Bureau Chief's decision. In the absence of either corrective action consistent with the approved corrective action report or with the decision of the secretary concerning the shortcomings of the modified corrective action report, the department may take whatever enforcement or legal action it deems necessary or appropriate. [12-24-87, 12-1-95]

9. If the secretary determines that the discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of Section 4103 of this Part, and the water pollution will not be abated within one hundred and eighty (180) days after notice is required to be given pursuant to Section 1203.A.1 of this Part, the secretary may notify the facility owner/operator that he is a responsible person and that an abatement plan may be required pursuant to Sections 4104 and 4106.A of this Part. [12-1-95]

B. Exempt from the requirements of this Section are continuous or periodic discharges which are made: [2-17-74]

1. in conformance with regulations of the commission and rules, regulations or orders of other state or federal agencies; or [2-17-74]

2. in violation of regulations of the commission, but pursuant to an assurance of discontinuance or schedule of compliance approved by the commission or one of its duly authorized constituent agencies. [2-17-74]

C. As used in this Section and in Sections 4100 through 4115, but not in other Sections of this Part: [2-17-74, 12-1-95]

1. "discharge" means spilling, leaking, pumping, pouring, emitting, emptying, or dumping into water or in a location and manner where there is a reasonable probability that the discharged substance will reach surface or subsurface water; [2-17-74]

2. "facility" means any structure, installation, operation, storage tank, transmission line, motor vehicle, rolling

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stock, or activity of any kind, whether stationary or mobile;
[2-17-74]

3. "oil" means oil of any kind or in any form including petroleum, fuel oil, sludge, oil refuse and oil mixed with wastes; [2-17-74]

4. "operator" means the person or persons responsible for the overall operations of a facility; and [12-24-87]

5. "owner" means the person or persons who own a facility, or part of a facility. [12-24-87]

D. Notification of discharge received pursuant to this Part or information obtained by the exploitation of such notification shall not be used against any such person in any criminal case, except for perjury or for giving a false statement. [2-17-74]

E. Any person who has any information relating to any discharge from any facility of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, is urged to notify the Chief of the Ground Water Protection and Remediation Bureau of the department. Upon such notification, the secretary may require an owner/operator or responsible person to perform corrective actions pursuant to Sections 1203.A.5 or 1203.A.9 of this Part. [12-1-95]

[1204-1209] Reserved

1210. VARIANCE PETITIONS.

A. Any person seeking a variance pursuant to Section 74-6-4 (G) NMSA 1978, shall do so by filing a written petition with the commission. The petitioner may submit with his petition any relevant documents or material which the petitioner believes would support his petition. Petitions shall: [7-19-68, 11-27-70, 9-3-72]

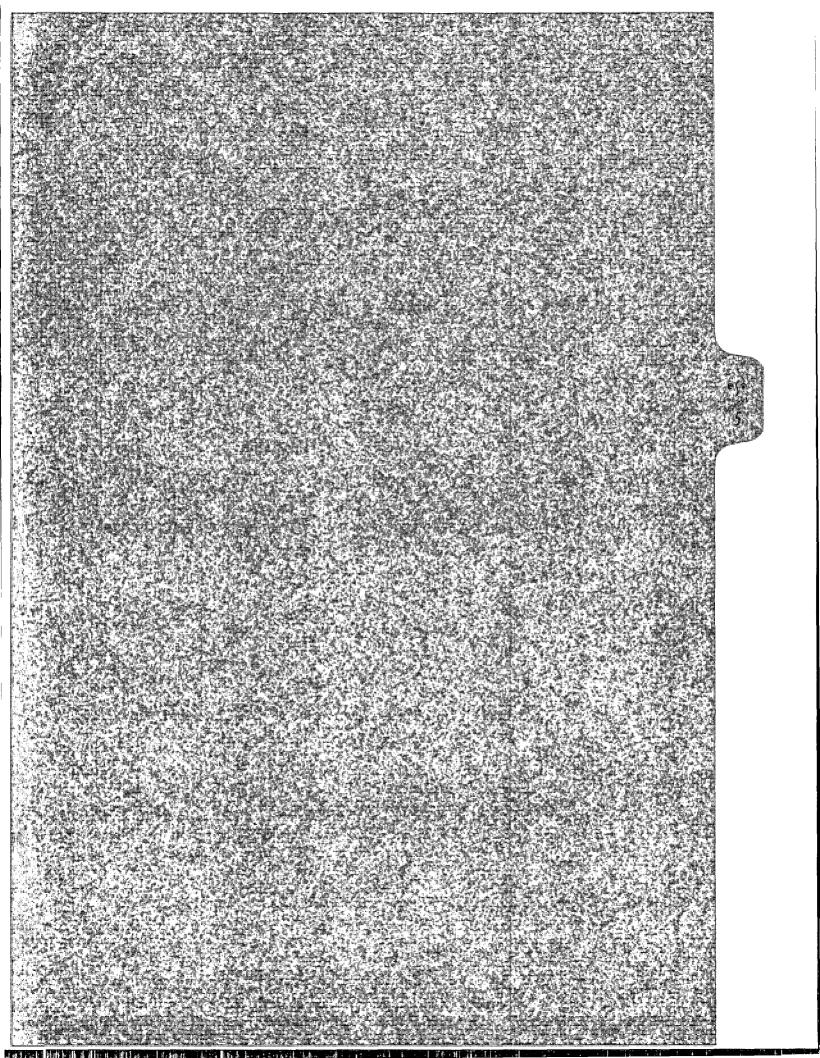
1. .state the petitioner's name and address;
[7-19-68, 11-27-70]

2. state the date of the petition; [7-19-68]

3. describe the facility or activity for which the variance is sought; [7-19-68, 11-27-70]

4. state the address or description of the property upon which the facility is located; [11-27-70]

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ARCO Permian—Empire Abo Plant Environmental Site Assessment and Notice of Intent to Discharge 1996 Ground Water Sampling Results



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July 9-12, 1996

Total chromium was detected in 20 of the groundwater samples. Concentrations range from 0.06-0.35 mg/L where detected.

Sample Number	Laboratory Results (mg/L)											
	Benzene	Toluene	Ethylbenzen	Xylene	PCB	Total						
[[e	2		Chromium						
MW 2	0.198	0.283	0.235	0.461	<0.0001	<0.05						
MW 3	FP^1	FP	FP	FP	14 mg/kg	<0.05						
MW 4	2.69	0.16	0.46	0.84	<0.01	0.06						
MW 5	FP	FP	FP	FP	<1.0	0.14						
MW 6	FP	FP	FP	FP	<1.0	0.35						
MW 7	1.15	0.571	0.492	0.881	<0.01	0.10						
MW 8	0.728	0.554	0.970	2.340	<0.01	0.07						
MW 9	FP	FP	FP	FP	<0.01	0.10						
MW 2-2	<0.01	<0.01	<0.01	<0.01	<0.0001	<0.05						
MW 2-3	0.229	0.163	0.150	0.306	< 0.0001	<0.05						
MW 2-4	1.79	0.36	0.23	0.37	<0.01	0.07						
MW 2-5	<0.01	< 0.01	<0.01	<0.01	<0.0001	<0.05						
MW 2-6	FP	FP	FP	FP	<1.0	0.35						
MW 2-7	2.04	0.227	1.15	1.354	< 0.005	0.19						
MW 2-9	FP	FP	FP	FP	<0.01	0.16						
MW 2-10	FP	FP	FP	FP	<0.005	0.09						
MW 2-12	FP	FP	FP	FP	<1.0	0.26						
MW 2-13	FP	FP	FP	FP	<1.0	0.09						
MW 2-14	0.039	0.046	0.103	0.222	<0.0001	<0.05						
MW 2-15	FP	FP	FP	FP	<0.01	0.20						
MW 2-16	0.080	0.106	0.134	0.330	<0.001	<0.05						
MW 2-18	FP	FP	FP	FP	<0.01	0.13						
MW 3-1	0.252	0.074	0.122	0.290	<0.0001	<0.05						
MW 3-2	FP	FP	FP	FP	<1.0	0.22						
MW 3-3	FP	FP	FP	FP	<0.005	0.15						
MW 3-4	0.157	0.109	0.117	0.221	<0.0001	0.13						

Groundwater Sampling Laboratory Results Table E.





¹ FP = Free Product

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ARCO Permian—Empire Abo Plant Environmental Site Assessment and Notice of Intent to Discharge Amoco Ground Water Monitoring Report



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Amoco Exploration And Production

U.S. NGL Business Unit 501 WestLake Park Boulevard Post Office Box 3092 Houston, Texas 77253-3092



February 22, 1996

Mr. Roger Anderson Environmental Bureau Chief Oil Conservation Division Energy, Minerals and Natural Resources Department 2040 South PaCheco Street Santa Fe. NM 87505

Groundwater Update Empire Abo Gas Plant

Attached are two copies of the written report which updates the status of the groundwater project at the Empire Abo Gas Plant. The monitor wells have been measured and sampled three times since the last report. We are also currently completing the installation of our free-phase hydrocarbon recovery system. We anticipate that this system should be fully operational by the end of February.

If you have any questions or need additional information. please contact Scott Neumann at 713-366-2501.

Yours truly.

H. A. Partow Manager, Environmental. Health and Safety Services

 cc: Energy, Minerals and Natural Resources Department Oil Conservation Division
 P.O. Drawer DD
 Artesia, NM 88211

GROUNDWATER REPORT EMPIRE ABO GAS PLANT

This report summarizes the status of the groundwater remediation project at our Empire Abo Gas Plant (EAGP) located in Eddy County, New Mexico. The report supplements the information previously reported to the New Mexico Oil Conservation Division (NMOCD).

There are currently 27 active groundwater monitor wells located at the site. The wells range in depth from 28' to 113'. The depths to fluid in these wells vary from 6' to 84' from the surface (Attachment #1). In addition, 2 wells (MW-1, TD = 200 and MW 2-1, TD = 160) located on the northern edge of the plant did not encounter any fluids and were plugged. The subsurface lithology at the site consists of interbedded sands, clays and caliche, few of which are correlatable even in adjacent wells. There are no mappable water horizons found across this site and no major or minor aquifers present in the area.

The wells have been periodically measured and sampled since the inception of the project. The most recent sampling event took place on December 4. 1995. All of the data has been summarized on Attachment #2. The last measuring/sampling indicated nineteen of the wells contained free-phase hydrocarbons. The measured hydrocarbon thickness varied from 0.02' to 6.44' (see Attachment #1). A pneumatic hydrocarbon recovery system, which will recover free-phase hydrocarbons from each of the nineteen wells, is currently being installed.

The pneumatic hydrocarbon recovery system will run off plant instrument air and the plants drain system will be utilized for fluid recovery. The system has been designed to minimize water recoveries although the recovered fluids will go through a separation process to recover the hydrocarbons. Attachment #3 (Figures 1 & 2) shows the piping layout for the system.

Two types of pneumatic pumps will be utilized in order to optimize system performance. Thirteen Tierra Madre 2SK2 skimming pumps with hydrophobic filters will be employed for recovering free-phase hydrocarbons only. These pumps will run off of 7 surface mounted controllers. In addition, 6 total fluid pumps will be used where fluid level drawdown is necessary. This drawdown is necessary where fluid levels in the monitor wells are above the screened intervals. The pumps will be adjusted to recover free-phase hydrocarbons and minimal amounts of water. Evacuator II and Gladiator pumps with built-in pump controllers are being installed to recover total fluids. The information related to the pumps has been included as Attachment #4.

We anticipate that the product recovery system will be fully operational by the end of February 1996. We will continue to monitor the progress and report our findings to the New Mexico Oil Conservation Division.





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EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2	INITIAL WATER LEVEL	33
TOTAL DEPTH OF WELL:	37.5	TOP OF SCREEN:	22 5
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	375
ELEVATION (ASL):	3548.5		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL			BENZENE	M.P.O.	BTEX			VOLATILES					
1-24-92	32.5	3516	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	37.7	3510.8	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	27	3521.5	0.032	0.001	0.018	0.028	0.079	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	33.5	3515			SAMPLE NOT A	NALYZED					< 0.05	1800	6.1	i	2400
3/1/93	33.8	3514.7	0.016	0.03	0.035	0.074	0.155	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	32.82	3515.68	0.018	0.017	0.005	0.009	0.049	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	23.83	3524.67	0.001	ND	ND	ND	0.001	NS NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	23.8	3524.7	0.003	0.002	0 002	0.003	0.01	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	33.74	3514.76	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
6/21/94	33.82	3514.68	0.001	ND	0.001	0.002	0.004	NS		NS	NS	NS	NS	NS	NS
9/21/94	33.39	3515.11	ND	0.002	ND	ND	0.002	NS	ND	ND	NS		NS	NS	NS
11/21/94	33.12	3515.38	ND	0.001	0.002	0.004	0.007	NS		ND	NS	NS	NS	NS	NS
3/25/95	33.67	3514.83	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	M:
6/30/95	32.9	3515.6	ND	DИ	ND	ND	ND	NS	NS	NS			NS	NS	NS
12/4/95	33.79	3514.71	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	N:

MONITOR WELL NUMBER:	3	INITIAL WATER LEVEL
TOTAL DEPTH OF WELL:	91.5	TOP OF SCREEN:
WATER WELL DRILLER:	EADES	BASE OF SCREEN
ELEVATION (ASL):	3555.7	

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI-	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL°°			BENZENE	M.P.O.	BTEX			VOLATILES					
1-24-92	77	3478.7	111	14	238	299	662	NR	PRODUCT	PRODUCT	ŃS	NS	NS	NS	1
3-11-92	83	3472.7			FREE PRODUCT	; NOT ANA	LYZED								
10-1-92	72	3483.7			FREE PRODUCT	; NOT ANA	LYZED								
1-13-93	85	3470.7			FREE PRODUCT	; NOT ANA	LYZED				< 0.05	1150	37.65		24
3/1/93	85.25	3470.45			FREE PRODUCT;	NOT ANAL	YZED								
6/8/93					FREE PRODUCT;	NOT ANAL	YZED							_	
9/14/93					FREE PRODUCT; NOT ANALYZED										
12/8/93				<u>, , , , , , , , , , , , , , , , , , , </u>	FREE PRODUCT;	NOT ANAL	YZED				1				
3/15/94					FREE PRODUCT;	NOT ANAL	YZED				1				
6/21/94	84.9	3470.8			FREE PRODUCT;	NOT ANAL	YZED								
9/21/94					FREE PRODUCT;	NOT ANAL	YZED								
11/21/94	81.75	3473.95			FREE PRODUCT:	NOT ANAL	YZED (PR	DDUCT -	3.47')						
3/25/95	82.69	3473.01		<u></u>	FREE PRODUCT	NOT ANAL	YZED IPR	DDUCT =	4.36')						
6/30/95	81.72	3473.98			FREE PRODUCT;	NOT ANAL	YZED (PR	DDUCT .	3.36')		1				
12/4/95	81.18	3474.52			FREE PRODUCT;	NOT ANAL	YZED (PR	DUCT -	3.19')		1				
											1	· · · · · · · · · · · · · · · · · · ·			





EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	4	INITIAL WATER LEVEL:	51
TOTAL DEPTH OF WELL:	62.5	TOP OF SCREEN:	47.5
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	625
ELEVATION (ASL):	3551.3		

WATER SAMPLE ANALYSIS; mg/

DATE	WATER	WATER	BENZENE	TOLUENE	ËTHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI-	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
l l	LEVEL	LEVEL°°			BENZENE	NA.P.O.	BTEX		·	VOLATILES					
1-24-92	51	3500.3	1.25	0.464	1.76	2.26	5.734	0.49	21	ND	NS	NS	NS	NS	NS
1-24-92	51	3500.3	1.14	0.426		1.94	5.106	0.42	16	NĎ		NS	NS	NS	NS
3-11-92	51	3500.3	3.64	86.8	38.7	109	238.14	72.7	1615	116	NS	NS	NS	NS	NS
3-11-92	51	3500.3	0.95	1.12	1.25	3.54	6.86	1.05	32	2	NS	NS	NS	NS	NS
10-1-92	34	3517.3	0.957	0.039	1.16	1.52	3.68	NS	7	NĎ	NS	NS	NS	NS	NS
1.13.93	44	3507.3	0.827	0.325	0.954	1.48	3.59	NS	25	18	0.2	700	5.15		2458
3/1/93	53.6	3497.7			FREE PRODUCT	NOT ANAL	YZED								
6/8/93					FREE PRODUCT:										
9/14/93				and the second sec	FREE PRODUCT	Contractory of Contra									
12/8/93					FREE PRODUCT	NOT ANAL	YZED								
3/15/94					FREE PRODUCT:	NOT ANAL	YZED								
6/21/94	53.48	3497.82			FREE PRODUCT										
9/21/94					FREE PRODUCT;					_					
11/21/94	57.23	3494.07			FREE PRODUCT	NOT ANAL	YZED (PRO	DDUCT =	0.07')						
3/25/95	52.83	3498.47			FREE PRODUCT	NOT ANAL	YZED (PRO	DDUCT -	0.09')						
6/30/95	57.3	3494			FREE PRODUCT;	NOT ANAL	YZED (PRO	DDUCT -	0.05')						
12/4/95	52.95	3498.35			FREE PRODUCT;	NOT ANAL	YZED (PRO	DDUCT =	0.01')		I				
	1										1				
• • • • • • • • • • • • • • • • • • • •	-	• • • • • • • • • • • • • • • • • • • •										·	••••••	••••••••••••••••••	

MONITOR WELL NUMBER:	5	INITIAL WATER LEVEL	92
TOTAL DEPTH OF WELL:	99	TOP OF SCREEN:	74
WATER WELL DRILLER:	EADES	BASE OF SCREEN	99
ELEVATION (ASL):	3543.9		

WATER SAMPLE ANALYSIS; mg/

TOTAL MTBE VOLATILES SEMI- CHROMIUM CHLORIDES NITRATES NITRITES SULFATES	MTBE	TOTAL	XYLENE	ETHYL-	TOLUENE	BENZENE	WATER	WATER	DATE	
BTEX VOLATILES	1	BTEX	M.P.O.	BENZENE			LEVEL	LEVEL®		
11.871 0.65 57 17 NS NS NS NS NS	0.65	11.871	5.26	1.81	3.87	0.931	3475.1	68.8	1-24-92	
2.654 0.15 8 ND NS NS NS NS NS	0.15	2.654	1.47	0.534	0.534	0.107	3474.9	69	3-11-92	
0.363 NS 1 ND NS NS NS NS NS	NS	0.363	0.144	0.162	0.01	0.047	3472.9	71	10-1-92	
0.358 NS ND ND <0.05 900 4.92 246	NS	0.358	0.073	0.069	0.115	0.101	3472.4	71.5	1-13-93	
1.27 NS 4 4 NS NS NS NS NS	NS	1.27	0.441	0.253	0.343	0.235	3474.1	69.8	3/1/93	
ED		YZED	NOT ANAL	FREE PRODUCT;					6/8/93	
ED	FREE PRODUCT; NOT ANALYZED									
ED		YZED	NOT ANAL	FREE PRODUCT;					12/8/93	
ED		YZED	NOT ANAL	FREE PRODUCT;					3/15/94	
ED		YZED	NOT ANAL	FREE PRODUCT;			3473.65	70.25	6/21/94	
ED		YZED	NOT ANAL	FREE PRODUCT;					9/21/94	
ED (PRODUCT = 0.03')	UCT =	YZED (PRO	NOT ANAL	FREE PRODUCT;			3473.82	70.08	11/21/94	
(ED (PRODUCT = 0.03')	UCT =	YZED (PRC	NOT ANAL	FREE PRODUCT;		· · · · · · · · · · · · · · · · · · ·	3473.36	70.54	3/25/95	
ED (PRODUCT = 0.03')	UCT =	YZED (PRC	NOT ANAL	FREE PRODUCT;		•	3473.85	70.05	6/30/95	
ED (PRODUCT = 0.15')	UCT =	YZED (PRO	NOT ANAL	FREE PRODUCT;			3473.65	70.25	12/4/95	
		TZED (PRU	NUTANAL	THEE FRODUCT;			34/3.05	10.25	12/4/95	

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EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	6	INITIAL WATER LEVIL	48
TOTAL DEPTH OF WELL:	53	TOP OF SCREEN:	33
WATER WELL DRILLER:	EADES	BASE OF SCREEN	53
ELEVATION (ASL):	3544.9		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL			BENZENE	₩.P.O.	BTEX			VOLATILES]				
1 24 92		3544.9			FREE PRODUC	T PRESENT	NOT ANA	LYZED							1
3 11 92		3544.9			FREE PRODUC	T PRESENT	; NOT ANA	LYZED							
10-1-92	42	3502.9			FREE PRODUC	T PRESENT	NOT ANA	LYZED							
1-13-93	39	3505.9			FREE PRODUC	T PRESENT	; NOT ANA	LYZED			< 0.05	1000	5.05		82
3/1/93	46.8	3498.1			FREE PRODUC	T PRESENT	NOT ANA	LYZED			1				
6/8/93					FREE PRODUC	T PRESENT	NOT ANA	LYZED	, <u>.</u> .		1				1
9/14/93					FREE PRODUC	T PRESENT	; NOT ANA	LYZED			1				1
12/8/93					FREE PRODUC	T PRESENT	NOT ANA	LYZED			1				1
3/15/94					FREE PRODUC	T PRESENT	NOT ANA	LYZED							
6/21/94	43.7	3501.2			FREE PRODUC	T PRESENT	; NOT ANA	LYZED							
9/21/94					FREE PRODUC	T PRESENT	; NOT ANA	LYZED			1				
11/21/94	46.56	3498.34			FREE PRODUC	T PRESENT	; NOT ANA	LYZED (F	PRODUCT = 4	.21')	1				
3/25/95	46.44	3498.46			FREE PRODUC	T PRESENT	NOT ANA	LYZED (P	PRODUCT = 2	.73')	1				
6/30/95	46.71	3498.19			FREE PRODUC	T PRESENT	NOT ANA	LYZED (F	RODUCT = 4	20')		[]			1
12/4/95	45.65	3499.25			FREE PRODUC	T PRESENT	NOT ANA	LYZED (F	RODUCT = 4	.19')	1				1
											1		1		1

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MONITOR WELL NUMBER:	7	INITIAL WATER LEVEL	21
TOTAL DEPTH OF WELL:	28.5	TOP OF SCREEN:	135
WATER WELL DRILLER:	EAOES	BASE OF SCREEN	28.5
ELEVATION (ASL):	3546.9		

WATER SAMPLE ANALYSIS; mg/

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
UATE	LEVEL	LEAEToo	OCIVECINE	IULUENE	BENZENE	M.P.O.	BTEX	WIBE	VOLATILES	VOLATILES	CHROMIUM	CHLUNIDES	NUTRATES	NUMBES	JULFAIES
1-24-92	8.5		3.13	0.795				0.03	10	the second se	NS NS	NS	NS	NS	N
3-11-92	7.7	3539.2	313	0.759	0.625	0.907		0.08	1 8	NO	NS	NS	NS	NS	N
10-1-92	16	3530.9	4.54	1.28	0.936	1.27	8.03	NS	7	NO	NS	NS	NS	NS	N
1-13-93	9	3537.9	1.61	0.933	0.583	1.23	4.35	NS	13	3	< 0.05	1500	242		232
3/1/93	9.4	3537.5	1.85	0.228	0.243	0.368	2.69	NS	4	ND	NS	NS	NS	NŠ	N
6/8/93	1				FREE PRODUCT	NOT ANAL	YZED	L			1	1			
9/14/93					FREE PRODUCT	NOT ANAL	YZED								
12/8/93					FREE PRODUCT	NOT ANAL	YZED				1	1			
3/15/94					FREE PRODUCT	NOT ANAL	YZED					1			
6/21/94	9.82	3537.08			FREE PRODUCT	NOT ANAL	YZED		· · · · · · · · · · · · · · · · · · ·		1	1			
9/21/94					FREE PRODUCT	NOT ANAL	YZED				1	1			
11/21/94	8.6	3538.3			FREE PRODUCT	NOT ANAL	YZED (PR	ODUCT -	• 0.14')						
3/25/95	7.55	3539.35			FREE PRODUCT	NOT ANAL	YZED (PR	ODUCT -	0.121						
6/30/95	8.66	3538.24			FREE PRODUCT	NOT ANAL	YZED (PR	ODUCT -	= 0.18')						
12/4/95	8.25	3538.65			FREE PRODUCT	NOT ANAL	YZED (PR	ODUCT =	0.151		1				
											1				

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** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING • •



EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	8	INITIAL WATER LEVER	83
TOTAL DEPTH OF WELL:	92	TOP OF SCREEN:	72
WATER WELL DRILLER:	EADES	BASE OF SCREEN	92
ELEVATION (ASL):	3544.1		

WATER SAMPLE ANALYSIS; mg/l

		and the second se	LYSIS; mg/l								·	·····		······································	
DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL°°			BENZENE	M.P.O.	BTEX			VOLATILES					
1-24-92	67.3	3476.8	ND	ND	ND	0.001	0.001	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	67.4	3476.7	ND	0.001	ND	ND	0.001	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	67.4	3476.7	ND	ND	ND	ND	0	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	76	3468.1	0.048	0.042	0.036	0.069	0.195	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	68	3476.1	0.122	0.264	0.186	0.465	1.04	NS	5	ND	< 0.05	1350	4.92	î	2227
3/1/93	68.7	3475.4	0.042	0.109	0.08	0.166	0.397	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	69.02	3475.08	0.014	0.011	0.004	0.007	0.036	NS	ND	ND	NS	NS	NS	NS	NS.
6/8/93	69.02	3475.08	0.023	0.014	0.004	0.007	0.048	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	68.68	3475.42	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	68.6	3475.5	0.009	0.003	0.003	0.004	0.019	NS	NS	NS	NŠ	NS	NS	NS	NS
12/8/93	68.6	3475.5	0.015	0.004	0.003	0.003	0.025	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	69.7	3474.4	0.012	0.005	0.003	0.005	0.025	NS	NS	NS	NS	NS	NŠ	NS	NS
6/21/94	70.01	3474.09	0.003	0.002	0.002	0.003	0.01	ND	NŠ	NS	NS	NS	NS	NS	NS
6/21/94	70.01	3474.09	0.002	0.001	0.001	0.002	0.006	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	68.29	3475.81	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NŠ	NS
9/21/94	68.29	3475.81	ND	0.001	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	68.73	3475.37	Pump Failed - No	t Sampled											
3/25/95	69.55	3474.55	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
6/30/95	69.56	3474.54	ND	ND	ND	ND	ND	NS	NS	NŠ	NS	NS	NS	NS	NS
12/4/95	69.49	3474.61	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
						I									

MONITOR WELL NUMBER:	9	INITIAL WATER LEVEL:	66
TOTAL DEPTH OF WELL:	74.5	TOP OF SCREEN:	54 5
WATER WELL DRILLER:	EADES	BASE OF SCREEN	74 5
ELEVATION (ASL):	3543.2		

WATER SAMPLE ANALYSIS; mg/

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI-	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL°°			BENZENE	M.P.O.	BTEX			VOLATILES					
1-24-92	58	3485.2	75	312	39	712	1498		FREE PRODUCT	Î	NS	NS	NS	NS	NS
3-11-92	58	3485.2	5.57	5.89	2.27	5.51	19.24	0.79	53	18	NS	NS	NŠ	NS	NS
10.1.92	50	3493.2			FREE PRODUCT	PRESENT;	NOT ANA	YZED							
1-13-93	61	3482.2			FREE PRODUCT	PRESENT:	NOT ANA	YZED			< 0.05	NS	12.1	5	NS
3/1/93	61	3482.2			FREE PRODUCT	PRESENT;	NOT ANA	YZED							
6/8/93					FREE PRODUCT	PRESENT;	NOT ANA	YZED							
9/14/93					FREE PRODUCT	PRESENT;	NOT ANA	YZED			1				
12/8/93					FREE PRODUCT	PRESENT;	NOT ANA	YZED			1				
3/15/94					FREE PRODUCT	PRESENT;	NOT ANA	YZED			1				
6/21/94	59.66	3483.54			FREE PRODUCT	PRESENT;	NOT ANA	YZED			I				
9/21/94					FREE PRODUCT	PRESENT;	NOT ANA	.YZED							
11/21/94	59.62	3483.58			FREE PRODUCT	PRESENT;	NOT ANA	LYZED (P	RODUCT = 0.	24')	1				
3/25/95	60.65	3482.55			FREE PRODUCT	PRESENT;	NOT ANA	YZED IP	RODUCT = 0.	49')	1				
6/30/95	60.26	3482.94		· ·	FREE PRODUCT	PRESENT;	NOT ANA	VZED IP	RODUCT = 0.	25')	1				
12/4/95	60.88	3482.32			FREE PRODUCT	PRESENT;	NOT ANA	YZED (P	RODUCT = 0.	63')	1				
F	EEY ABOVE	SEA LEVEL				 					••••••••••••••••••••••••••••••••••••••				••••••

ALL MEASUREMENTS ARE FROM TOP OF CASING

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EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2.2	INITIAL WATER LEVEL	42
TOTAL DEPTH OF WELL:	48	TOP OF SCREEN:	38
WATER WELL DRILLER:	EADES	BASE OF SCREEN	48
ELEVATION (ASL):	3552.55		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI-	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL			BENZENE	₩. P.O .	BTEX			VOLATILES		Į –			
10-12-92	27	3525.55	0.001	ND	ND	ND	0.001	ND	ND	ND	0.11	NS	N	/A	N
1-13-93	27.2	3525.35	0.003	ND	0.002	0.004	0.009	NS	ND	ND	NS	NS	NS	NS	N
3/1/93	26.8	3525.75	0.005	0.022	0.036	0.09	0.153	NS	1	ND	NS	NS	NS	NS	N
6/8/93	26.52	3526.03	0.001	ND	DM	NĎ	0.001	NS	ND	ND	NS	NS	NS	NS	N
9/14/93	26.9	3525.65	ND	ND	ND	ND	ND	NS	ND	МD	NS	NS	NS	NS	N
12/8/93	26.9	3525.65	ND	0.001	ND	ND	0.001	NS	NS	NS	NS	NS	NS	NŠ	N
3/15/94	26.96	3525.59	0.001	ND	ND	ND	0.001	NS	NS	NS	NS	NS	NS	NS	N
6/21/94	27.12	3525.43	ND	ND	ND	ND	ND	ND	NS	NS	NŠ	NS	NS	NS	N
9/21/94	26.96	3525.59	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	N
11/21/94	27.05	3525.5	0.001	ND	ND	0.001	0.002	NS	ND	ND	NS	NS	NS	NS	N
3/25/95	27.07	3525.48	ND	ND	ND	ND	ND	NS	NS	NS	NŠ	NS	NS	NS	N
6/30/95	27.28	3525.27	0.001	0.001	ND	ND	0.002	NS	NS	NS	NS	NS	NS	NS	N
12/4/95	27.42	3525.13	0.002	ND	ND	ND	0.002	NS	NS	NS	NS	·	NS	NS	N
											1				

MONITOR WELL NUMBER:	2.3	INITIAL WATER LEVEL	100
TOTAL DEPTH OF WELL:	108	TOP OF SCREEN:	98
WATER WELL DRILLER:	EADES	BASE OF SCREEN	108
ELEVATION (ASL):	3557.98		

WATER SAMPLE ANALYSIS; mg/

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI-	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL			BENZENE	M.P.O.	8TEX			VOLATILES					
10-12-92	97			ND	ND	ND	ND	ND	ND	ND	< 0.05	204	N	IA I	185
1-13-93	89.4			ND	- ND	DМ	ND	ND	ND	ND	< 0.05	850	13		249
3/1/93	83.2			Ō.103	0.083	0.166	0.385	NS	ND	NO	NS	NS	NS	NS	N
6/8/93	83.6	3474.38	ND	ND	ND	ND	ND	ND	ND	ND	NS NS	NŠ	NS	NS	N
9/14/93	84.2	3473.78	ND	ND	ND	ND	ND	NŚ	ND	ND	NS	NS	NS	NS	N
12/8/93	84	3473.98	NS	NS	NS	NS	NS	NS	NS	NS	NŠ	NS	NS	NS	N
3/15/94	84.3	3473.68	0.001	ND	ND	ND	0.001	NS	ND	NO	NS	NS	NS	NS	N
6/21/94	84.4	3473.58	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	N
9/21/94	83.11	3474.87	ND	ND	ND	ND	ND	NS	NS	NS	NS NS	NS	NS	NS	N
11/21/94	83.4	3474.58	Pump Failed								1				
3/25/95	83.72	3474.26	No Pump									<u> </u>			
6/30/95	83.76	3474.22	No Pump								1				
12/4/95	83.5	3474.48	No Pump								ł				}
	1										<u>∤ ······</u>	∲			}

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

D. Dilution factor - 20 F. Estimate only: Value is shown working timory success to be a substable of a substable of a

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EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2.4	INITIAL WATER LEVEL	53
TOTAL DEPTH OF WELL:	58	TOP OF SCREEN:	48
WATER WELL DRILLER:	EADES	BASE OF SCREEN	58
ELEVATION (ASL):	3554.09		

WATER SAMPLE ANALYSIS; mg/

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL.	XYLENE	TOTAL	MTBE	VOLATILES	SEMI-	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	FBAEF	LEVEL			DENZENE	M.P.O.	DTEX			VOLATILES	l				
10-12-92	50	3504.09	0.285	0.01	0.016	0.018	0.329	ND	ND	ND	< 0.05	48	- O	0	750
1.13.93	54	3500.09	1.1	0.531	0.144	0.274	2.05	NS	7	ND	< 0.05				860
3/1/93	54.9	3499.19	0.365	0.041	0.051	0.087	0.544	NS	4	ND	NS		NS	NS	NS
6/8/93	55.1	3498.99	0.418	0.086	0.029	0.039	0.552	NS	3	ND	NS		NS	NS	N:
9/14/93	54.6	3499.49	0.613	0.027	0.023	0.024	0.587	NS	4	ND	NS	NS	NS	NS	NS.
12/8/93	54.2	3499.89	0.432	0.004	0.023	0.016	0.475	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	55.43	3498.66	0.262	0.002	0.007	0.002	0.275	NS	1	NS	NS	NS	NS	NS	NS
6/21/94	56.35		0.505	0.004	0.009	0.004	0.522	0.03	NS	NS	NS	NS	NS	NS	NS
9/21/94	56.25	3497.84	0.499	0.004	0.014	0.006	0.523	NS	3	ND	NS	NS	NS	NS	NS
11/21/94	55.57	3498.52	Dry - Not Sample	d							l				l
3/25/95	54.48	3499.61	0.824	0.006	0.038	800.0	0.875	NS	NS	NS	NS	NS	NS	NS	N:
6/30/95	51.87	3502.22	1.61	0.004	0.074	0.017	1.71	NS	NS	NS	NS	NS	NS	NS	N:
12/4/95	54.06	3500.03	0.528	ND	0.028	0.008	0.564	NS	NS	NS	NS	NS	NS	NS	<u>N</u> :
[L <u></u>		I	I	l	l	¥	L	l		L

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MONITOR WELL NUMBER:	2.5	INITIAL WATER LEVEL
TOTAL DEPTH OF WELL:	53	TOP OF SCREEN:
WATER WELL DRILLER:	EADES	BASE OF SCREEN:
ELEVATION (ASL):	3553	

WATER SAMPLE ANALYSIS; mg/l

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DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MIBE	VOLATILES	SEMI-	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL			BENZENE	M.P.O.	otex			VOLATILES					
10-12-92	45	3508	0.001	ND	ND	ND	0.001	ND	ND	ND	0.12	NS	N.		N
1-13-93	1	3553	0.002	ND	0.001	0.002	0.005	NS	DM				NS	NS	N
3/1/93	27.4	3525.6	0.002	0.005	0.007	0.016	0.03	NS	ND	ND		NS	<u>NS</u>		N
6/8/93	27.27	3525.73	ND	ND	ND	ND	ND	NS	DM	DM	NS	NS	NS	NS	N
9/14/93	27.3	3525.7	ND	0.01	0.001	0.008	0.019	NS	ND	ND	NS		NS	NS	N
12/8/93	27.2	3525.8	0.002	0.002	0 01 3	0.029	0.046	NS	NS	NS	NS		NS	NS	N
3/15/94	27.46	3525.54	ND	ND	ND	ND	ND	NS	ND	ND	NS		NS	NS	NN
6/21/94	27.4	3525.6	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	MS	NS	N
9/21/94	27.46	3525.54	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	N
11/21/94	27.37	3525.83	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NN
3/25/95	27.61	3525.39		ND	ND	ND	ND	NS	NS	NS	NŠ	NS	NS	NS	N
6/30/95	27.86		ND	0.001	ND	ND	0.001	NS	NS	NS	NS	NS	NS	NS	N
12/4/95	27.89		ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	N
	1								1	· · · · · · · · · · · · · · · · · · ·					



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EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	26	INITIAL WATER LEVEL	21
TOTAL DEPTH OF WELL:	24	TOP OF SCREEN:	14
WATER WELL DRILLER:	EADES	BASE OF SCREEN	24
ELEVATION (ASL):	3551.11		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	CHROMIUM	CHLORIDES]	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL°°			BENZENE	M.P.O.	BTEX			VOLATILES					OCHAILS
10-12-92	17	3534.11	9.91	5.64	0.99	1.97	18.5	0.08	22	ND	< 0.05	572	0	5	105
1-13-93	11.3	3539.81	12.2	1.01	0.134	0.386	13.7	NS	23	ND	< 0.05		13.	75	128
3/1/93	11.3	3539.81	28.6	2.5	0.482	1.07	32.7	NS	40	ND			NS	NS	140 M
9/14/93	11.7	3539.41	35.4	3.32	0.936	1.8	41.5	NS	60	ND	NS		NS	NS	N
12/8/93	11.6	3539.51	NS	NS	NŠ	NS	NS	NS	NS	NS		NS		NS	N
3/15/94					FREE PRODUCT	PRESENT;	NOT ANA	YZED							
6/21/94	22.6	3528.51			FREE PRODUCT	PRESENT:	NOT ANA	YZED							
9/21/94					FREE PRODUCT						{				r —
11/21/94	22.76	3528.35			FREE PRODUCT					30'1	f				
3/25/95	22.81	3528.3			FREE PRODUCT						ł			······	
6/30/95	23.18	3527.93			FREE PRODUCT	PRESENT	NOT ANA	YZED (PE		18'1	<u> </u>				
12/4/95	23.02	3528.09			FREE PRODUCT	PRESENT		VZED IP		12.1					
	1									41	h	├ ┨			
	4										L				

MONITOR WELL NUMBER:	2.7		INITIAL WATER LEVEL	60
TOTAL DEPTH OF WELL:	66		TOP OF SCREEN:	56
WATER WELL DRILLER:	EADES	•	BASE OF SCREEN:	66
ELEVATION (ASL):	3547.34			

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	ICHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL°°			BENZENE	M.P.O.	BTEX	1 -		VOLATILES					JULIATES
10-12-92	55	3492.34	15.5	6.33	1.64	3.1	28.8	ND	40		< 0.05	48	N	<u>к</u>	3370
1-13-93	63	3484.34		FREE PRODUCT	PRESENT; NOT	NALYZED				i				<u> </u>	
3/1/93	66	3481.34	-	FREE PRODUCT	PRESENT; NOT A	NALYZED					1			┨━	}
6/8/93				FREE PRODUCT	PRESENT; NOT A	NALYZED					∤ −−−−−−			{	
9/14/93				FREE PRODUCT	PRESENT; NOT A	NALYZED					{			{	∤
12/8/93				FREE PRODUCT	PRESENT: NOT A	NALYZED								ł	{
3/15/94	1			FREE PRODUCT							· · · · · · · · · · · · · · · · · · ·			{	·
6/21/94	62.24	3485.1		FREE PRODUCT	PRESENT; NOT A	NALYZED				·				ł	}
9/21/94				FREE PRODUCT	PRESENT; NOT A	NALYZED					}			╂─────	}
11/21/94	62.72	3484.62		FREE PRODUCT	PRESENT; NOT A	NALYZED	PRODUCT	≈ 0.0'l		······································	<u> </u>			<u> </u>	∤
3/25/95	63.88	3483.46		FREE PRODUCT					· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	<u>∤ · </u>			┨	
6/30/95	62.61	3484.73		FREE PRODUCT							·{			<u>}</u>	·{
12/4/95	63.92	3483.42		FREE PRODUCT					1					{	<u> </u>
											<u> </u>			{	}

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EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

	MONITOR WELL NUMBER:	2.9	INITIAL WATER LEVEL	34
1	TOTAL DEPTH OF WELL:	43	TOP OF SCREEN:	33
	WATER WELL DRILLER:	EADES	BASE OF SCREEN	43
	ELEVATION (ASL):	3546 81		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL.	XYLENE	TOTAL	MTBE	VOLATILE	S SEMI-	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL	_		BENZENE	M.P.O.	BTEX			VOLATILES					
10-12-92	32	3514.81		<u> </u>	FREE PRODUCT	PRESENT;	NOT ANA	YZED			1	1			
1.13.93	31	3515.81			FREE PRODUCT	PRESENT:	NOT ANA	VZED			< 0.05	NS	127.	5	M
3/1/93	33	3513.81			FREE PRODUCT	PRESENT;	NOT ANA	YZED		7.5 FEET OI	FREE PRODUC	T PRESENT)			
6/8/93					FREE PRODUCT	PRESENT;	NOT ANA	YZED							1
9/14/93					FREE PRODUCT	PRESENT;	NOT ANA	LŸZED							1
12/8/93					FREE PRODUCT	PRESENT;	NOT ANA	YZED							
3/15/94					FREE PRODUCT	PRESENT;	NOT ANA	YZED							
6/21/94	40.B	3506.01			FREE PRODUCT	PRESENT;	NOT ANA	YZED							1
9/21/94					FREE PRODUCT	PRESENT;	NOT ANA	YZED							1
11/21/94	39.35	3507.46			FREE PRODUCT	PRESENT;	NOT ANA	YZED (PI	RODUCT -	4.64')					
3/25/95	39.79	3507.02			FREE PRODUCT	PRESENT;	NOT ANA	YZED (PI	RODUCT -	5.43')]			
6/30/95	39.28	3507.53			FREE PRODUCT	PRESENT;	NOT ANA	YZED (PI	RODUCT -	4.60')		1	1		
12/4/95 \	39.22	3507.59			FREE PRODUCT	PRESENT;	NOT ANA	YZED (PI	ODUCT -	5.07')					1
												1	11		1

61

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MONITOR WELL NUMBER:	2 10	INITIAL WATER LEVEL
TOTAL DEPTH OF WELL:	78	TOP OF SCREEN:
WATER WELL DRILLER:	EADES	BASE OF SCREEN.
ELEVATION (ASL):	3548.67	

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL°°			BENZENE	M.P.O.	BTEX	Ĭ		VOLATILES					
10-12-92	64	3484.67			FREE PRODUCT	PRESENT;	NOT ANA	LYZED			1	11		<u> </u>	1
1.13-93	71	3477.87			FREE PRODUCT	PRESENT;	NOT ANA	LYZED			1	1		1	
3/1/93	74	3474.67			FREE PRODUCT	PRESENT;	NOT ANA	LYZED			1	11		1	1
6/8/93					FREE PRODUCT	PRESENT;	NOT ANA	LYZED				11		1	
9/14/93					FREE PRODUCT	PRESENT;	NOT ANA	LYZED			1	1		1	1
12/8/93					FREE PRODUCT	PRESENT;	NOT ANA	LYZED			1	11		1	1
3/15/94					FREE PRODUCI	PRESENT;	NOT ANA	LYZED			1	1 1		1	1
6/21/94	74.42	3474.25			FREE PRODUCT	PRESENT;	NOT ANA	LYZED			1	11		1	1
9/21/94					FREE PRODUCI	PRESENT;	NOT ANA	LYZED			1	[]		1	l
11/21/94	76.21	3472.46			FREE PRODUCT	PRESENT;	NOT ANA	LYZED (P	RODUCT = 6.	89')	1	11			1
3/25/95	76.62	3472.05			FREE PRODUCI	PRESENT:	NOT ANA	LYZED (P	RODUCT = 7.	32')		11		1	1
6/30/95	76.56	3472.11			FREE PRODUCT	PRESENT;	NOT ANA	LYZED (P	RODUCT - 6.	761	1	11		1	1
12/4/95	76.54	3472.13			FREE PRODUCT	PRESENT;	NOT ANA	LYZED (P	RODUCT = 6.	44'1	1	11			1
											1	<u> </u>		<u> </u>	<u>├</u>



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EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2 11	INITIAL WATER LEVEL	17
TOTAL DEPTH OF WELL:	23	TOP OF SCREEN:	13
WATER WELL DRILLER:	EADES	BASE OF SCREEN	23
ELEVATION (ASL):	3547.06		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVELºº			BENZENE	M.P.O.	BTEX			VOLATILES					
10-12-92	17	3530.06			FREE PRODUCT	PRESENT;	NOT ANAL	YZED			1	†		{	{
-13-93	19	3528.06			FREE PRODUCT	PRESENT;	NOT ANAL	YZED			1			1	
3/1/93	19.5	3527.56			FREE PRODUCT	PRESENT;	NOT ANAL	YZED			1	11			·
6/ 8/93					FREE PRODUCT	PRESENT;	NOT ANAL	YZED		-	1				
9/14/93					FREE PRODUCT	PRESENT;	NOT ANAL	YZED			1	1			
12/8/93					FREE PRODUCT	PRESENT;	NOT ANAL	YZED						l	
3/15/94					FREE PRODUCT	PRESENT;	NOT ANAL	YŽED			1		· · · · · · · · · · · · · · · · · · ·		
6/ 21/94	22.94	3524.12			FREE PRODUCT	PRESENT;	NOT ANAL	YZED				1		·	
3/21/94					FREE PRODUCT	PRESENT;	NOT ANAL	YZED			1	1			
11/21/94	23.05	3524.01			FREE PRODUCT	PRESENT;	NOT ANAL	YZED (PR	ODUCT = 0.7	4')	1	† — †			}
3/25/95	23.04	3524.02			FREE PRODUCT	PRESENT; P	NOT ANAL	YZED (PR	ODUCT = 0.0	11	1	<u> </u>			}
5/ 30/95	22.91	3524.15			FREE PRODUCT	PRESENT; P	NOT ANAL	YZED (PR	ODUCT = 0.7	11	1	1 1			
2/4/95	23.12	3523.94			FREE PRODUCT	PRESENT; P	NOT ANAL	YZED (PR	ODUCT - 0.2	0.1	1	1			
	1										1	<u> </u>		}	

MONITOR WELL NUMBER:	2 12	INITIAL WATER LEVEL	17
TOTAL DEPTH OF WELL:	63	TOP OF SCREEN:	73
WATER WELL DRILLER:	EADES	BASE OF SCREEN	83
ELEVATION (ASL):	3543.4		

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL			BENZENE	M.P.O.	BTEX			VOLATILES					
10-12-92	74		0.18	0.042	0.027	0.107	0.356	ND	ND	ND	< 0.05	616	N/	A	2375
1.13.93	71.5		0.827	0.0852	0.171	0.356	2.01	NS	6	ND	< 0.05	675	8		1874
3/1/93	71.4	3472	0.008	0.013	0.017	0.037	0.075	NS	ND	ND	NS	NS	NST	NS	NS
6/ 8/93	71.68	3471.72	0.014	0.014	0.005	0.007	0.04	NS	ND	ND	NŠ	NS	NS	NS	NS
9/14/93	71.4	3472	0.048	0.079	0.032	0.063	0.222	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	71	3472.4	0.066	0.035	0.013	0.022	0.136	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	71.88	3471.52	1.02	0.269	0.233	0.386	1.91	NS	2	ND	NS	NS	NS	NS	NS
6/21/94	71.9	3471.5	4.68D	1.05	0.688	1.24	7.66	ND	NS	NS		NS	NS	NS	NS
9/21/94	73.65	3469.75	NS	NŜ	NS	NŠ	NS NS	NS	NŠ	NS		NS	NS	NS	
11/21/94	74.05	3469.35			FREE PRODUCT	PRESENT: 1	TANAL	YZED (PR	ODUCT = 3.8	5'1				i	
3/25/95	74.39	3469.01			FREE PRODUCT										
6/30/95	73.86	3469.54			FREE PRODUCT										
12/4/95	73.76	3469.64			FREE PRODUCT										
	1				• • • • • • • • • • • • • • • • • • •		1							{	





EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2-13	INITIAL WATER LEVEL	43
TOTAL DEPTH OF WELL:	49	TOP OF SCREEN:	39
WATER WELL DRILLER:	EADES	BASE OF SCREEN	49
ELEVATION (ASL):	3545.91		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL""			BENZENE	M.P.O.	BTEX			VOLATILES		}			
0-12-92	42	3503.91	21	2.43	26.1	42.6	92.2	3.74	567	195	< 0.05	236	N	/A	225
13-93	44.5	3501.41			PUMP IN WELL P	OT OPERA	BLE; NO S	AMPLE T	AKEN						1
3/1/93	43	3502.91			FREE PRODUCT	PRESENT; P	OT ANAL	YZED			1	1			
5/ 8/93					FREE PRODUCT	PRESENT; P	IOT ANAL	YZED			1	11			
9/14/93					FREE PRODUCT	PRESENT; P	OT ANAL	YZED			1				<u>∤</u>
12/8/93					FREE PRODUCT	PRESENT; P	OT ANAL	YZED			1	11			↑
3/15/94					FREE PRODUCT	PRESENT; P	OT ANAL	YZED			1	11			1
6/21/94	49.92	3495.99			FREE PRODUCT	PRESENT; P	OT ANAL	YZED			1			1	·······
9/21/94					FREE PRODUCT	PRESENT; P	IOT ANAL	YZED			1				
1/21/94	46.86	3499.05			FREE PRODUCT	PRESENT; P	OT ANAL	YZED (PR	ODUCT = 2.7	3'1	1	11			1
8/25/95	46.76	3499.15			FREE PRODUCT	PRESENT; P	OT ANAL	YZED (PR	ODUCT = 1.3	7')	1	11			1
6/30/95	46.33	3499.58			FREE PRODUCT	PRESENT; P	OT ANAL	YZED (PR	ODUCT = 2.5	1)	1	11			1
2/4/95	46.55	3499.36			FREE PRODUCT	PRESENT; A	OT ANAL	YZED (PR	ODUCT = 2.5	0'1	1	11		1	1
									····		1			1	1

MONITOR WELL NUMBER:	2-14	INITIAL WATER LEVEL:	70
TOTAL DEPTH OF WELL:	78	TOP OF SCREEN:	66
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	76
ELEVATION (ASL):	3545.91		

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI-	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL°°			BENZENE	M.P.O.	BTEX			VOLATILES					
10-12-92	65	3480.91	0.044	0.022	0.006	0.011	0.083	ND	ND	ND	< 0.05	1460		A	2500
1-13-93	61.8	3484.11			SAMPLE NOT A	NALYZED		<u></u>			• • • • • • • • • • • • • • • • • • • •	•••••••••••••••••••••••••••••••••••••••			
3/1/93	62.1	3483.81	0.037	0.001	ND	0.003	0.041	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	62.32	3483.59	6.15	0.761	0 234	0.326	7.47	NS	8	ND	NS	NS	NS	NŠ	NS
9/14/93	62.2	3483.71	0.342	0.056	0.148	0.182	0.728	NS	1	ND	NS	NS	NS	NS	NS
12/8/93	62	3483.91	0.245	0.039	0.122	0.168	0.574	NŠ	NS	NS	NS	NS	NS	NŠ	NS
3/15/94	62.96	3482.95	0.007	0.002	0.002	0.005	0.016	NS	ND	ND	NS	NS	NS	NŠ	NS
3/15/94	62.96	3482.95	0.007	0.002	0.002	0.005	0.016	NS	ND	ND	NS	NS	NŠ	NS	NS
6/21/94	62.8	3483.11	0.115	0.056	0.078	0.164	0.413	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	61.37	3484.54	0.119	0.043	0.046	0.086	0.294	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	62.11	3483.8			FREE PRODUCT	PRESENT; N	OT ANAL	YZED (PR	ODUCT = 0.0	1')	t <u></u>				
3/25/95	62.86	3483.05			FREE PRODUCT	PRESENT: N	OT ANAL	YZED IPR	ODUCT = 0.0	11	1				
6/30/95	61.87	3484.04			FREE PRODUCT										
12/4/95	61.77	3484.14			FREE PRODUCT										
	1			······································	<u>-</u>					·	<u> </u>				



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EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2.15	INITIAL WATER LEVEL	67
TOTAL DEPTH OF WELL:	73	TOP OF SCREEN:	63
WATER WELL DRILLER:	EADES	BASE OF SCREEN	73
ELEVATION (ASL):	3543.64		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL.	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL			BENZENE	M.P.O.	BTEX			VOLATILES					
10-12-92	64	3479.64	0.042	0.043	0.05	0.135	0.27	ND	2	NĎ	< 0.05	1248	N	A	2500
1-13-93	63	3480.64	0.652	0.74	0.424	1.03	2.85	NS	12	3	0.12	875	7.9		1186
3/1/93	63.3	3480.34	0.111	0.029	0.029	0.076	0.245	NŠ	1	2	NS	NS	NS	NS	NS
6/8/93	63.7	3479.94	0.341	0.098	0.106	0.192	0.737	NS	2	4	NS	NS	NS	NŠ	NS
9/14/93	63.2	3480.44	0.103	0.009	0.005	0.008	0.125	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	63.1	3480.54	3.55	0.668	0.153	0.247	4.62	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	64.42	3479.22	10.4D	2.36D	0.91	1.55	15.2	NS	17	NS	NS	NS	NS	NS	NS
6/21/94	64.37	3479.27	0.863	0.03	0.162	Ō.29	1.35	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	62.94	3480.7	0.103	0.009	0.014	0.033	0.159	NS	ND	5	NS	NS	NS	NS	NS
11/21/94	63.27	3480.37	0.119	0.010	0.008	0.040	0.177	NS	ND	NĎ	NS	NS	NS	NS	NS
11/21/94	63.27	3480.37	0.113	0.009	0.009	0.035	0.166	NS	ND	ND	NS	NŠ	NS	NS	NS
3/25/95	64.28	3479.36	1.95	0.171	0.115	0.158	2.39	NS	NS	NS	NS	NS	NS	NŠ	NS
3/25/95	64.28	3479.36	1.04	0.082	0.058	0.082	1.26	NS	NS	NS	NS	NS	NS	NS	NS
6/30/95	64.02	3479.62	0.476	0.043	0.032	0.053	0.604	NS	NS	NS	NS	NŠ	NS	NŠ	NS
12/4/95	65.2	3478.44			FREE PRODUCT	PRESENT; P	INT ANAL	YZED (PR	ODUCT = 0.5	0')	1				
											1				

MONITOR WELL NUMBER:	2 16	INITIAL WATER LEVEL	11
TOTAL DEPTH OF WELL:	83	TOP OF SCREEN:	73
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	83
ELEVATION (ASL):	3544.39		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL			BENZENE	M.P.O.	BTEX			VOLATILES					
10-12-92	74	3470.39	0.461	0.305	0.082	0.134	0.982	ND	1	ND	< 0.05	624	N	A	237
1-13-93	70	3474.39		PUMP IN WEL	L NOT OPERABL	E; NO SAM	PLE TAKEN	1			1	1			
3/1/93	70.1	3474.29	6.58	0.011	0.106	0.486	7.18	NS	11	2	NS NS	NS	NS	NS	N
6/8/93					FREE PRODUCT;	NOT ANAL	YZED				1				
9/14/93		-			FREE PRODUCT;	NOT ANAL	YZED				1	1			
12/8/93	1				FREE PRODUCT;	NOT ANAL	YZED				1	11			
3/15/94					FREE PRODUCT;	NOT ANAL	YZED	-			1				
6/21/94	70.51	3473.88			FREE PRODUCT;	NOT ANAL	YZED				1				
9/21/94	•				FREE PRODUCT;	NOT ANAL	YZED				1				
11/21/94	70.06	3474.33			FREE PRODUCT;	NOT ANAL	YZED (PRO	DUCT -	0.0')						· · · · · · · · · · · · · · · · · · ·
3/25/95	70.55	3473.84			FREE PRODUCT;	NOT ANAL	YZED				1				
6/30/95	69.81	3474.58			FREE PRODUCT;	NOT ANAL	YZED				1				
12/4/95	74.2	3470.19			FREE PRODUCT;	NOT ANAL	YZED (PRO	DDUCT =	3.10')		1	11			
				· · · · · · · · · · · · · · · · · · ·							1				

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EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2-18	INITIAL WATER LEVEL	33
TOTAL DEPTH OF WELL:	39	TOP OF SCREEN:	29
WATER WELL DRILLER:	EADES	BASE OF SCREEN	39
ELEVATION (ASL):	3545.79		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI-	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL°°			BENZENE	M.P.O.	BTEX			VOLATILES					
10-12-92	30	3515.79	8.33	0.685	0.352	0.292	9.66	0.03	10	ND	< 0.05	560	1	5	225(
1-13-93	21.7	3524.09			FREE PRODUCT						< 0.05	975	2.41		309:
3/1/93	21.8	3523.99			FREE PRODUCT	PRESENT; A	IOT ANAL	YZED							······
6/8/93	22	3523.79	9.71	0.492	0.294	0.3	10.8	NS	21	ND	NS	NS	NS	NS	N:
9/14/93	22.99	3522.8	6.49	0.008	0.114	0.019	6.63	NS	8	ND	NS	NS	NS	NS	N:
9/14/93	22.99	3522.8	5.72	0.008	0.085	0.018	5.83	NS	7	ND	NS	NS	NS	NS	N:
12/8/93	22.9	3522.89	4.95	0.004	0.084	0.019	5.08	NS	NS	NS	NS	NS	NS	NS	N:
12/8/93	22.9	3522.89	5.87	0.004	0.094	0.022	5.99	NS	NS	NS	NS	NS	NS	NS	N:
3/15/94	22.58	3523.21	5.17D	0.004	0.068	0.018	5.26	NS	5	ND	NS	NS	NS	NS	N
6/21/94	22.65	3523.14	5.16D	0.008	0.088	0.022	5.28	ND	NŠ	NS	NS	NS	NS	NS	N
9/21/94	21.69	3524.1	NS	NS	NS	NS	ŃŚ	NS	NS	NS	NS	NS	NS	NS	N.
11/21/94	22.22	3523.57			FREE PRODUCT	PRESENT; N	IOT ANAL	YZED (PR	ODUCT = 0.0)`)					
3/25/95	23.14	3522.65			FREE PRODUCT	PRESENT; N	OT ANAL	YZED (PR	ODUCT = 0.0)1')					
6/30/95	22.1	3523.69			FREE PRODUCT	PRESENT; N	IOT ANAL	VZED (PR	ODUCT = 0.0))					
12/4/95	22.2	3523.59			FREE PRODUCT	PRESENT; A	IOT ANAL	YZED IPR	ODUCT = 0.0))					

MONITOR WELL NUMBER:	3-1	INITIAL WATER LEVEL:	56
TOTAL DEPTH OF WELL:	73	TOP OF SCREEN:	53
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	73
ELEVATION (ASL):	3543.04		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER	WATER	BENŽENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI-	CHROMIUM	CHLORIDES	NITRATES	MITRITES	SULFATES
	LEVEL	LEVEL""			BENZENE	M.P.O.	BTEX			VOLATILES					
6/16/94	59.22	3483.82	NS	NS	NS	NS	NS	NS	NS	NS NS	NS	NS	NS	NS	N
9/21/94	58.49	3484.55	NS	NS	พร	NS	NS	NS	NS	NS	NS	NS	NS	NS	₩.
11/21/94	59.22	3483.82			FREE PRODUCT	PRESENT;	NOT ANAL	YZED (PR	ODUCT = 0.0	01')	1	[
3/25/95	60.01	3483.03			FREE PRODUCT	PRESENT;	NOT ANAL	YZED (PR	IODUCT = 0.0	DI')	1				
6/30/95	59.69	3483.35			FREE PRODUCT	PRESENT;	NOT ANAL	YZED (PF	ODUCT = 0.0	01')	1	1			
12/4/95	60.15	3482.89			FREE PRODUCT	PRESENT;	NOT ANAL	YZED (PP	ODUCT = 0.0	02')	1				
									I			1			
									1	1	1	1			

D. Dilution factor - 20 F. Estimate only: Value is above working linear current. Hist graphilishing due to rootriv interferen

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EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	3.2	INITIAL WATER LEVEL	90
TOTAL DEPTH OF WELL:	103	TOP OF SCREEN:	63
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	103
ELEVATION (ASL):	3541.59		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER	WATER	BENZENE	TOLUEME	ETHYL-	XAFENE	TOTAL	MTBE	VOLATILES	SEMI-	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL			BENZENE	M.P.O.	BTEX			VOLATILES					
6/16/94	72.34	3469.25	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	71.8	3469.79	ŃŚ	NS	NS	NS	NS	NS	RS .	NS	NS	พิริ	NS	NS	NS
11/21/94	72.87	3468.72			FREE PRODUCT	PRESENT; P	OT ANAL	YZED (PR	ODUCT = 1.4	3')					
3/25/95	74.21	3467.38			FREE PRODUCT	PRESENT; P	OT ANAL	YZED (PR	ODUCT = 2.7	6')	1				
6/30/95	73.43	3468.16			FREE PRODUCT	PRESENT; P	JOT ANAL	YZED (PR	ODUCT = 1.5	1')	1				
12/4/95	73.24	3468.35			FREE PRODUCT	PRESENT: P	JOT ANAL	YZED (PR	ODUCT = 1.3	6')	1				
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EMPIRE ABO GAS PLANT MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	33	INITIAL WATER LEVEL:	68
TOTAL DEPTH OF WELL:	83	TOP OF SCREEN:	58
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	83
ELEVATION (ASL):	3544.93		

WATER SAMPLE ANALYSIS; mg/l

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DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL-	XYLENE	TOTAL	MTBE	VOLATILES	SEMI-	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEVEL°°			BENZENE	M.P.O.	BTER			VOLATILES	1				
6/16/94	74.58	3470.35	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	N:
9/21/94	74.15	3470.78	NS	NS	NS	NŠ	NS	NS	NS	NS	NS	MS	NS	NS	N:
11/21/94	74.2	3470.73			FREE PRODUCT	PRESENT; P	OT ANAL	YZED (PR	ODUCT = 0.1	4')	1	<u> </u>			
3/25/95	74.42	3470.51			FREE PRODUCT	PRESENT; P	JOT ANAL	YZED (PR	ODUCT = 0.1	2')	1				
6/30/95	73.26	3471.67			FREE PRODUCT	PRESENT; P	OT ANAL	VZED (PR	ODUCT = 0.1	0.)	1				
12/4/95	74.16	3470.77			FREE PRODUCT	PRESENT; P	OT ANAL	YZED 9Pf	RODUCT = 0.	16')	1	1			
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INITIAL WATER LEVEL:	95
TOP OF SCREEN:	68
BASE OF SCREEN:	113

WATER SAMPLE ANALYSIS; mg/l

MONITOR WELL NUMBER:

TOTAL DEPTH OF WELL: WATER WELL DRILLER: ELEVATION (ASL):

DATE	WATER	WATER	BENZENE	TOLUENE	ETHYL.	XYLENE	TOTAL	MTBE	VOLATILES	SEMI	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
	LEVEL	LEAEF .	_		BENZENE	M.P.O.	BTEX			VOLATILES					
6/16/94	87.07	3471.56	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	8:
9/21/94	86.35	3472.28	0.08	0.001	0.022	0.039	0.142	NS	ND	ND	NS	NS	NS	NS	N
11/21/94	86.51	3472.12			NO PUMP . NOT	SAMPLED					[
3/25/95	86.75	3471.88			NO PUMP . NOT	SAMPLED					l				
6/30/95	84.96	3473.67			NO PUMP . NOT	SAMPLED					1				
12/4/95	86.44	3472.19			NO PUMP - NOT	SAMPLED									
I											L				
							l				L				

MONITOR WELL INFORMATION SUMMARY

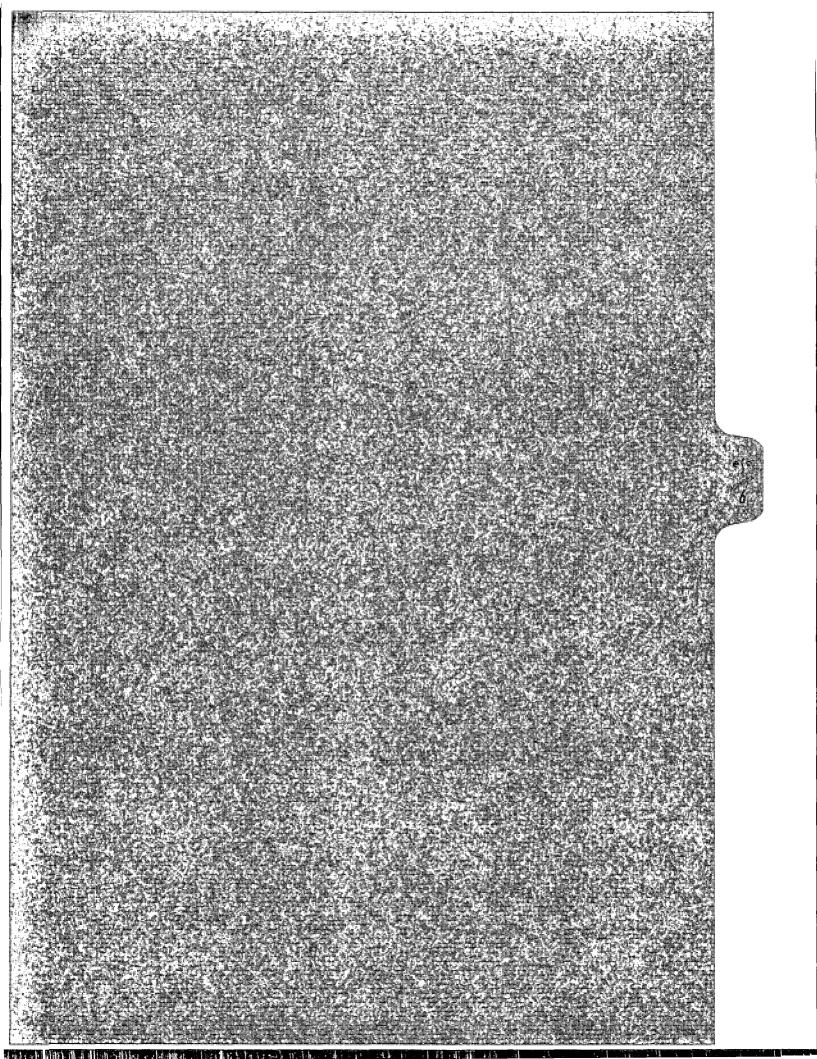
EMPIRE ABO GAS PLANT

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FINAL ANALYSIS REPORT

Address: P.	сор Preduction - О. Всж 67 н Норбы, КМ 882			e: 1/20/93 • # H1118		
	e: Empire Abo G	as Plant				
Project Loo						
Sampled by:		Date: 1/13/9				
Analyzed by		Date: 1/15/9			•• •	
type of Sem	ples: Water	Sample Condi	110n: P53		Unite: mg∕k	(, (mg/1)
SAMPLE NO.	FIELD COLE	CHLORIDES	CHROMIUM	NITRATE	NITEITE	SULFATE
1	EAGP 2-1	NOT RUN-INSU	FFICIENT SAM	PLE +++	• • •	* * *
Z	EAGP 2-2	NOT AQUEOUS	* * *	• • •	• • •	* * •
ف	EAGP 2-3	650	-	13.0	0.00	
÷	EAGP 2-4	1150		5.75	0.00	658
5	EAGP 2-5	NOT AQUECUS		* * *	\$ ¢ ¢	* * *
ú	EAGP 2-6	600 NR/INS.SAMP.	<0.05	13.75	0.00	
7	EAGP 2-9	NR/INS.SAMP.	0.18	127.5	0.90	NR/INS.SAMP.
8		NOT AQUEOUS			* * *	• • •
. 9	EAGP 2-11	NOT AQUEOUS			* * *	* * *
10	EAGP 2-12	675		8.00	0.00	1674
11	EAGP 2-14	NOT RUN-INSU	FFICIENT SAM	PLE +++	• • •	+ 1 +
12	EAGP 2-15	875	0.12	7.90	0.00	1166
13	EAGP 2-17	NOT RUN-INSU	FFICIENT SAM	PLE ···	• • •	* * *
14	EAGP 2-18	975	<0.05	2.41	0.03	3092
15	EAGP 2	1800	<0.05	6.15	0.90	2400
16	EAGP 3	1150	<0.05	37.65	0.00	2458
17	EAGP 4	728	0.20	5.15	ð. 6 0	2458
18	EAGP 5	900	<0.05	4.92	0.00	2464
19	EAGP 6	1000	<0.05	5.05	0.00	826
20	EAGP 7	1500	<0.05	242.0	0. ØC	2323
21	EAGP 8	1350	<0.05	4.92	8.00	
22	EAGP S	NR/INS.SAMP.	<0.05	12.15	2.90	INS. SAMP.

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Date _____3

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fichael R. Foyler

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Empire Abo Gas Plant, Artesia, NM

Lab#:	92W1298		Method:	Amoco	Modified	8015
Date s	ampled:	10/09&12/92	Date rea	ceived	: 10/13/92	2

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	· Y -				BTEX	
Sample ID	Benz	Tolu	EtBz	Xyls	TOTAL	MTBE
EAGP #2-2	0.001	ND	ND	ND	0.001	ND
EAGP #2-3	ND	ND	ND	ND	ND	ND
EAGP #2-4	0.285	0.010	0.016	0.018	0.329	ND
EAGP #2-5	0.001	ND	ND	ND	0.001	ND
EAGP #2-6	9.91	5.64	0.990	1.97	18.5	0.08
EAGP #2-7	15.5	6.33	1.64	3.10	26.6	ND
EAGP #2-12	0.180	0.042	0.027	0.107	0.356	ND
EAGP #2-13	21.0	2.43	26.1	42.6	92.2	3.74
EAGP #2-14	0.044	0.022	0.006	0.011	0.083	ND
EAGP #2-15	0.042	0.043	0.050	0.135	0.270	ND
EAGP #2-16	0.461	0.305	0.082	0.134	0.982	ND
EAGP #2-18	8.33	0.685	0.352	0.292	9.66	0.03

NOTES

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1. Unit of data is mg/L.

2. ND = not detected at or above reporting limit.

3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes, and MTBE = methyl tertiary butyl ether.

4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

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5. Reporting limit for MTBE is 0.02 mg/L.

Comments: Samples EAGP #2-9 and #2-11 are product samples. Samples EAG P #2-10 is mud and product. Many samples had no headspace or too much headspace. Several vials were covered with a white powder. Product samples should not be shipped in same container has water samples. Container had a very strong hydrocarbon oodor.

Sampled by: APC - R. Carey Cook

Date analyzed: 10/17/92

Checked by: T. G. Miller

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AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR TOTAL PETROLEUM HYDROCARBONS

Location: Empire Abo Gas Plant, Artesia, NM

Lab#: 92W1298		Method:	Amoco	Modified	8015
Date sampled:	10/09,12/92	Date r e	ceived	: 10/13/92	2

Sampl	le ID	Vol	latiles	Semi-Volatiles
EAGP	# 2 -2		ND	ND
EAGP	#2-3		ND	ND
EAGP	#2-4		ND	ND
EAGP	#2-5		ND	ND
EAGP	#2-6		22	ND
EAGP	#2-7		40	7
EAGP	#2-12		ND	ND
EAGP	#2-13	Ę	567	195
EAGP	#2-14		ND	ND
EAGP	#2-15		2	ND
EAGP	#2-16		1	ND
EAGP	#2-18		10	ND

NOTES

1. ND = Not Detected at or above reporting limit.

2. The reporting limit for TPH by GC is 1 mg/L for volatiles and 5 mg/L for semi-volatiles.

Comments:

LAND BREAT DOWN TO THE PROPERTY OF

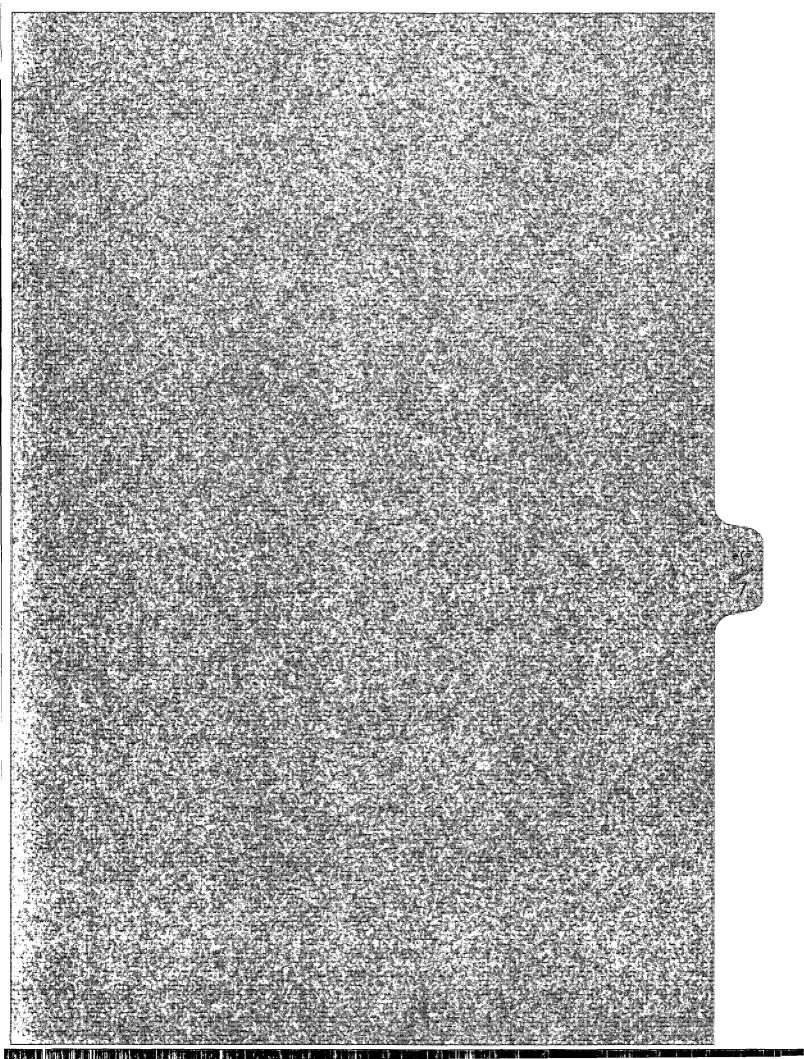
Date analyzed: 10/17/92

REAL AND A PRIME LANCES IN THE

Checked by: T. G. Miller

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SOIL SURVEY

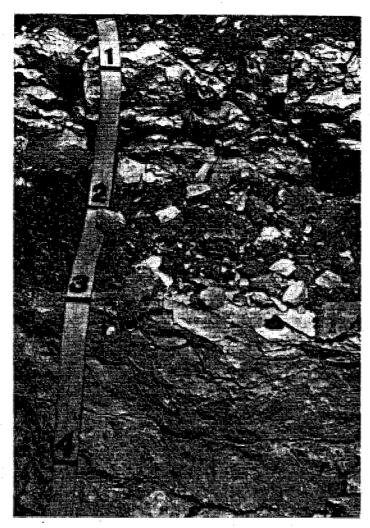


Figure 13.—Profile of Ector stony loam, 0 to 9 percent slopes.

Reestablishment of native grasses is difficult because rainfall is undependable. (Dryland capability unit VIIs-5; Limestone Hills range site)

Ector extremely rocky loam, 9 to 25 percent slopes (EE).—This soil occurs on rolling to hilly uplands. It is extensive in the western part of the Area. Exposed bedrock and catsteps cover 20 to 50 percent of the surface. The rock outcrops keep the soil relatively stable. Vertical and horizontal cracks in the bedrock are numerous. Included in mapping were pockets of Ector stony loam, 0 to 9 percent slopes, between the rock outcrops. Also included were rocky areas where vertical cliffs are common. The included areas make up less than 15 percent of the acreage.

This soil absorbs water readily, but the water-holding capacity is very low to low. Runoff is rapid after the soil becomes saturated. Surface water is generally lacking, but there are a few seeps and low-yielding springs in canyons.

This soil is suited to native pasture and wildlife habitat. Good management is needed to maintain a cover of vegetation that will adequately control water erosion. Revegetation is difficult because rainfall is undependable. (Dryland capability unit VIIs-5; Limestone Hills range site)

Ector-Reagan association, 0 to 9 percent slopes (ER).— This soil association occurs in a regular pattern along the contact zone between limestone uplands and lower lying, broad alluvial plains or fans. It is in the western part of the survey Area. Ector stony loam, 0 to 9 percent slopes, makes up about 50 to 80 percent of the acreage, and Reagan loam, 0 to 3 percent slopes, about 15 to 40 percent. Included in mapping were areas of Upton gravelly loam, 0 to 9 percent slopes, and of Pima silt loam, 0 to 1 percent slopes. The included areas make up less than 10 percent of the acreage.

The Ector soil is the least productive of these soils. The Reagan soil produces more forage than the other soils, but it is subject to water erosion if the vegetative cover is seriously depleted. Runoff is rapid from the Ector soil after heavy rainfall, and good management is needed to check erosion. Revegetation is difficult because rainfall is undependable.

All the acreage is used for native pasture and wildlife habitat. (Ector soil is in dryland capability unit VIIs-5 and Limestone Hills range site; Reagan soil is in dryland capability unit VIs-4 and Loamy range site)

Gypsum Land

Gypsum land (GA) consists of very steep and steep, broken, or eroded exposures of gypsiferous rocks and earths and very shallow soils. It is difficult to cross by ordinary means. Most of the acreage is near the Texas State line along breaks leading to the Black River, and in the vicinity of the eastern side of Lake McMillan. The areas are associated with Cottonwood and Reeves soils. Included in mapping were areas of Cottonwood loam, 0 to 3 percent slopes. The included areas make up less than 15 percent of the acreage.

The gypsiferous materials range from white, chalky earths to hard, light-colored, crystalline gypsum rocks. There are pockets of soil material as much as 10 inches thick. Fine to coarse gypsum crystals are common on the surface of barren areas.

Surface runoff is rapid to very rapid. The waterholding capacity is very low. The soil material is well drained, but very droughty and saline. Plant roots are limited by the salinity of the gypsiferous material close to the surface. The vegetation consists of a sparse cover of gyp grama, soaptree yucca, gyp grass, coldenia, and broom snakeweed. Good management is needed to maintain a cover of vegetation.

Gypsum land is used for wildlife habitat and for limited grazing. Forage production on this land type is among the lowest in the survey Area. (Dryland capability unit VIIs-2; Gyp Hills range site) Fores in the survey area Gypsum land-Cottonwood complex, 0 to 3 percent

Gypsum land-Cottonwood complex. 0 to 3 percentslopes (GC, Cs). This complex (fig. 14) consists of barren, gypsiferous rocks and very shallow soils. Gypsum land makes up about 50 to 70 percent of the acreage, and Cottonwood loam, about 20 to 40 percent. Sinkholes are common, but they do not contain water. This complex occurs on uplands in the central part of the survey Area. Most of the acreage was mapped at low intensity. Some areas of limestone outcrop near Lake McMillan and



Figure 14.--An area of Gypsum land-Cottonwood complex, 0 to 3 percent slopes.

bortheast of Artesia were included in the low-intensity survey. The areas within the high-intensity survey include areas of Reeves loam, 0 to 3 percent slopes. The included areas make up less than 10 percent of the acreage.

The Cottonwood soil in this complex has the profile described for the Cottonwood series.

This complex is used for native pasture and wildlife habitat. Good management is needed to prevent overy grazing and to check erosion. Revegetation is difficult because rainfall is undependable? (Dryland capability unit VIIs-3; Gyp Flats range site)

Gypsum land. Reeves complex, 0 to 3 percent slopes, eroded (GR).—Gypsum land makes up about 50 to 60 percent of this complex, and Reeves sandy loam, about 30 to 40 percent. Included in mapping were areas of Reagan loam, 0 to 3 percent slopes, and of Pajarito-Dune land complex, 0 to 3 percent slopes. The included areas make up less than 10 percent of the acreage.

The Reeves soil in this complex consists of sandy loam to a depth of about 14 inches.

Windblown sand from adjoining sandy soils has greatly altered the surface of these areas. Low sand dunes or hummocks less than 3 feet in height have formed around mesquite bushes and other woody plants. Many areas between hummocks are nearly barren.

These soils are very droughty. The water-holding capacity is low to very low. Permeability is rapid in the surface layer of the soils and in the low dunes.

This complex is used for native pasture and wildlife abitat. Good management is needed to check wind erosion. Revegetation is difficult because rainfall is undependable. Forage production is among the lowest in the survey Area. (Gypsum land is in dryland capability unit VIIs-3 and Gyp Flats range site; Reeves soil is in dryland capability unit VIe-2 and Sandy range site)

Harkey Series

The Harkey series consists of deep, well-drained, strongly calcareous, moderately dark colored soils that developed in mixed alluvium. These soils occur on low terraces on flood plains of major streams. They are naturally free of salts, except in areas adjacent to Lake McMillan and the Pecos River. In these areas the water table is at a depth of less than 5 feet part of the year.

In cultivated areas, soils of the Harkey series typically have a surface layer of brown very fine sandy loam 9 inches thick. In uncultivated areas, this layer is slightly lighter colored and contains less organic matter. The next layer, to a depth of more than 50 inches, is brown loam or very fine sandy loam.

These soils are uneroded or only slightly eroded. They are moderately fertile and have a low content of organic matter. Permeability is moderate, and the water-holding capacity is high. Rainfall amounts to 10 to 14 inches annually, and the mean annual temperature is 60° to 64° F. The frost-free season is 210 to 220 days. Elevations range from 3,000 to 3,400 feet.

Harkey soils are used for irrigated crops, native pasture, and wildlife habitat. The vegetation consists mainly of black grama, blue grama, tobosa, and vine-mesquite. wet; abundant very fine and fine roots; many very fine and fine pores; few, fine, distinct seams of lime, gypsum, and salts; material from this horizon has been mixed with overlying and underlying material; strongly calcareous; clear, wavy boundary.

- C1-8 to 18 inches, brown (10YR 5/3) loam, dark brown (10YR 4/3) when moist; massive; slightly hard when dry, friable when moist, slightly sticky when wet; plentiful very fine and fine roots; many very fine and fine pores; few, fine, prominent seams of lime, gypsum, and salts; strongly calcareous; abrupt, wavy boundary.
- C2cs-18 to 31 inches, white (10YR 8/2), fine, crystalline. gypsiferous earths, very pale brown (10YR 8/3) when moist; massive; hard to very hard when dry, firm to very firm when moist; few very fine roots; many very fine pores; strongly calcareous; gradual, wavy boundary.
- C3cs—31 to 66 inches, pinkish-white (7.5YR 8/2), fine, crystalline, gypsiferous earths, pinkish gray (7.5YR 7/2) when moist, intermixed with light-brown (7.5YR 6/4) silty clay, brown (7.5YR 5/4) when moist; massive; slightly hard when dry, friable when moist; many very fine pores; strongly calcareous.

Reeves loam, 0 to 1 percent slopes (RI).—This soil has the profile described as typical of the series. It occurs in the general vicinity of Artesia, Loving, and Malaga. Included in mapping were small areas of Cottonwood and Karro soils. Cottonwood soils make up about 5 to 10 percent of the acreage, and Karro soils, about 10 to 25 percent.

This soil is susceptible to wind erosion, especially after preparation of the seedbed. Seedling damage from high winds is common. The surface crusts at times, and the crust inhibits seedling emergence.

This soil is used mainly for irrigated crops, but a mall acreage is used for native pasture. Most of it has been bench leveled to grades of 0.2 to 0.3 percent. The rooting zone is restricted by the underlying gypsiferous material. The depth to this material varies greatly from place to place, especially in areas where the soil has been leveled. Chlorosis, or yellowing of the leaves, can be expected in severely leveled areas. (Irrigated capability unit IIIs-14; dryland capability unit VIs-3; Loamy range site)

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s; s: **Reeves loam, 1 to 3 percent slopes** (Rn).—Except for the slope, this soil has a profile similar to that described as typical of the series. Included in mapping were small areas of Cottonwood and Karro soils. The Cottonwood soil makes up as much as 10 percent of the acreage, and the Karro soil, as much as 25 percent.

This soil is susceptible to wind erosion, especially after preparation of the seedbed. Seedling damage from high winds is common. Surface crusting inhibits seedling emergence.

This soil is used for irrigated crops and native pasture. It is less productive than Reeves loam, 0 to 1 percent slopes. Most of the irrigated acreage has been bench leveled to grades of 0.2 to 0.3 percent. Severe cuts and fills have substantially altered the surface layer. The depth to the underlying gypsiferous material varies from place to place, but it is generally 20 to 36 inches. (Irrigated capability unit IIIe-2; dryland capability unit VIs-3; Loamy range site)

Reeves loam, saline, 0 to 1 percent slopes (Rr).—This soil occurs in the general vicinity of Loving, Malaga, Black River Village, and Artesia. Except for the greater content of salt, it has a profile similar to that described as typical of the series. Reprecipitated gypsum in the form of fine crystals occurs in splotches or seams above the gypsiferous substratum. The salt content of the plow layer ranges from about 0.2 to 0.3 percent. The depth of the soil material varies from place to place, but it is generally about 20 to 36 inches. These areas were mapped at high intensity. Included in mapping were areas of Karro loam, saline, 0 to 1 percent slopes, which make up 10 to 25 percent of the acreage. Also included were areas of Cottonwood soils; of Reeves loam, shallow, 0 to 1 percent slopes; and of Reeves loam, 0 to 1 percent slopes. These soils make up less than 5 percent of the acreage.

These soils make up less than 5 percent of the acreage. This soil is subject to wind erosion, especially after seedbed preparation. Seedling damage from high winds is common. The surface crusts readily, and the crust inhibits seedling emergence.

This soil is used for irrigated crops, native pasture, and wildlife habitat. Only salt-tolerant crops can be grown successfully. Chlorosis is common. The salinity of the soil and the gypsiferous substratum necessitate special treatment or design for structures, either aboveor below-ground. Good management of irrigation water is necessary to reduce the salinity of the soil. (Irrigated capability unit IIIs-6; dryland capability unit VIs-2; Salt Flats range site)

Reeves loam, shallow, 0 to 1 percent slopes (Rt).—This soil occurs throughout the central part of the survey Area, but mainly near Artesia, Loving, and Malaga. It has the profile described as typical of the shallow phase of the series. Included in mapping were small, scattered areas of the following: Cottonwood soils; Reeves loam, 0 to 1 percent slopes; and Reeves loam, saline, 0 to 1 percent slopes. The included soils make up 10 to 25 percent of the acreage.

This soil is susceptible to wind erosion, especially when the seedbed is being prepared. Seedling damage caused by high winds is common. The surface crusts at times, and the crust inhibits seedling emergence. The waterholding capacity is low. The organic-matter content is low. Shallowness restricts the effective rooting depth.

This soil is used for irrigated pasture, native pasture, and irrigated crops. It is among the least productive of the irrigated soils in the Area. Only salt-tolerant, shallow-rooted crops are suitable. Chlorosis is common. Good management of irrigation water is needed to keep the soil from becoming saline. Special treatment or design is needed for surface or buried structures. (Irrigated capability unit IVs-3; dryland capability unit VIs-3; Loamy range site)

Reeves-Gypsum land complex, 0 to 3 percent slopes (RG).—This complex occurs on plains throughout the central part of the survey Area. Reeves loam, 0 to 1 percent slopes, which makes up 35 to 45 percent of the acreage, occurs in pockets, swales, and drainageways. Except that it occurs in undisturbed areas, its profile is similar to that described as typical of the series. Gypsum land, which makes up 15 to 25 percent of the acreage, occurs on the higher parts of the landscape. It is the land type described in Gypsum land-Cottonwood complex, 0 to 3 percent slopes. Included in mapping were areas of Cottonwood soils which make up 15 to 25 percent of the acreage, and areas of Reagan and Largo soils, which make up 5 to 15 percent.

This complex is used for native pasture and wildlife habitat. The soils are not easily eroded. Good range management is needed to maintain a cover of desirable forage. Reestablishment of the native vegetation is difficult because temperatures are high and rainfall is undependable. Surface water is lacking. Ground water is hard to locate and, in places, is of poor quality. (Reeves soil is in dryland capability unit VIS-3 and Loamy range site; Gypsum land is in dryland capability unit VIIs-3 and Gyp Flats range site)

Reeves-Reagan loams, 0 to 3 percent slopes (RM).— This complex occurs on uplands, as tracts 3 to 6 miles wide. It is in the south-central part of the survey Area, near the Texas State line, and in the northeastern part. Reeves loam, which makes up about 35 to 45 percent of the acreage, has a profile similar to that described as typical of the series, except that the surface has not been disturbed. It occurs in pockets, swales, and along drainageways. Reagan loam, 0 to 3 percent slopes, which makes up about 25 to 30 percent of the acreage, occurs mainly at or near the center of swales and drainageways. Included in mapping were areas of Upton soils, which make up 15 to 20 percent of the acreage. Also included were areas of Gypsum land-Cottonwood complex, 0 to 3 percent slopes, which make up less than 20 percent of the acreage.

This complex is used for native pasture and wildlife habitat. The soils are uneroded or only slightly eroded. Good range management is needed to maintain a cover of desirable forage. Reestablishment of the native vegetation is difficult because temperatures are high and rainfall is undependable. There is little or no surface water. Ground water is hard to locate and, in places, is of poor quality. (Reeves loam is in dryland capability unit VIs-3 and Loamy range site; Reagan loam is in dryland capability unit VIs-4 and Loamy range site)

Rock Land

Rock land (RO) consists of steep to vertical, calichecapped escarpments of highly dissected, fractured, reddish-colored sandstone, siltstone, shale, limestone, and thin-bedded, gypsiferous rocks. It occurs east of the Pecos River and is associated with escarpments at the edges of the "Shallow Sand Country." Included in mapping were areas of Potter soils on breaks, which make up less than 10 percent of the acreage. Simona soils occur on the plain above this land type, and Pajarito soils, on the slopes below.

The soil material is generally a gravelly fine sandy loam that overlies fractured, indurated caliche. It is shallower than that of Stony and Rough broken land and is more rocky. Loose gravel and stones are commonly scattered on the steep, angular to rounded slopes. The regolith (the mantle of loose soil material, sediments, and broken rock that overlies solid rock) varies in thickness from almost nothing on the steep slopes to about 10 inches along the edges of the escarpments and in small areas where remnants of old landforms remain.

Rock land is suitable for wildlife habitat and recreational and esthetic uses. The vegetation consists of a

sparse cover of grama grasses, broom snak bush, and mesquite. Surface water is lacking from these areas provides water for lower The areas are difficult to cross by ordinary m land capability unit VIIIs-1)

Russler Series

The Russler series consists of moderately d well-drained, saline soils that developed in erous alluvium. These soils are shallow to soft gypsiferous earths or rocks. They occur near Willow Lake, north and south of Malagof the Delaware River.

Soils of the Russler series typically hav layer of brown loam about 11 inches thick. T brown clay loam to a depth of about 34 inche 11 inches of the subsoil is reddish-brown cla substratum is reddish-brown gypsiferous m contains many concretions of lime and fin crystals of gypsum. The depth to the su about 45 inches.

These soils are susceptible to wind and we and most areas are slightly to moderately ere is slow to medium. The intake rate is slow. I is moderately slow, and the water-holding low to moderate. Rainfall amounts to 10 1 annually, and the mean annual temperatur 64° F. The frost-free season is 210 to 220 days range from 3,000 to 3,800 feet.

Russler soils are used for irrigated crops. ture, and wildlife habitat. Salinity severely use for irrigated crops and affects the desi ment of structures built on or below the sisalt-tolerant crops can be grown in irrigated rosis is common. The vegetation consists maigrama, blue grama, side-oats grama, vine-me sacaton, tobosa, burrograss, broom snalmesquite.

Typical profile of Russler loam, NW1/4S T. 23 S., R. 28 E.

- Ap-0 to 11 inches, brown (7.5YR 5/4) loan (7.5YR 4/4) when moist; massive; h friable when moist, sticky when u very fine and fine roots; many very pores; strongly calcareous; mildly al smooth boundary.
- B21ca-11 to 19 inches, brown (7.5YR 5/4) dish brown (5YR 4/4) when moist; lar blocky structure; hard when dry moist, sticky and plastic when wet; fine and fine roots; many very fine smooth ped surfaces; distinct se strongly calcareous; mildly alke boundary.
- B22ca—19 to 34 inches, brown (7.5YR 5/4) dish brown (5YR 4/3) when moi coarse, angular blocky structure; h friable when moist, sticky and pla plentiful very fine and fine roots; and fine pores; smooth ped surfaces concretions of lime; strongly calc alkaline; gradual boundary.
- B23ca—34 to 45 inches, reddish-brown (5YR reddish brown (5YR 4/4) when 1 angular blocky structure; hard when moist, sticky and plastic when wet and fine roots; many very fine a

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SOIL SURVEY

TABLE 5.—Enginee

Soil series and	Suitability as a source of—		Degree of limitation for disposal fields	Highway location	Dikes and levee:	
map symbols	Topsoil Road fill		for septic tanks and tile systems	_		
Gypsum land: GA, GC, GR, Gs. (For Cottonwood part of GC and Gs, see Cotton- wood series; for Reeves part of GR,	Poor: little or no soil.	Poor: gypsiferous material.	Severe:, creviced? , material that may allow pollution of water supply.	Gypsiferous material; little or no soil.	Not applicable	
see Reeves series.) Harkey: Ha, Hk	Fair to good if fertilized.	Poor to fair	Slight to moderate: moderate permeability.	Features favorable	Features favorabi	
		-	pormentation of the			
Karro: KA, KL, Kr, Ku, Kv.	Fair in upper- most 10 inches if fertilized.	Fair	Slight to moderate: moderate permeability.	Features favorable	Features favorable	
			F			
Kermit: KM (For Berino part of KM, see Berino series.)	Poor: drifting sand.	Good if soil binder is added.	Slight: drifting sand.	Loose sand hinders hauling; drifting sand; embank- ments highly erodible when exposed.	Not applicable	
Kimbrough: KO, KS, KT. (For Stegall part of KS and KT, see Stegall series.)	Fair in uppermost 9 inches.	Poor: surface is good, but hard caliche occurs below a depth of 9 inches.	Severe: fractured caliche at a depth below 9 inches; danger of pollu- tion.	Hard caliche at a depth of 9 inches.	Hard caliche at a depth of 9 inch	
Largo: LA, LG, LN (For Stony land part of LN, see Stony land.)	Poor to fair: moderately slow intake rate; erodible.	Poor	Severe: the over- flow phase is sub- ject to flooding; moderate perme- ability.	Overflow phase is subject to periodic flooding; exposed embankments are highly erodible.	Unstable; level gra necessary.	
Likes: LS	Poor: sandy	Very good	Slight: gently sloping.	Loose sand hinders hauling; embank- ments are highly erodible.	Unstable; sandy material; level grade and soil binder are nece: sary.	
Limestone rock land: LT.	Poor: rock out- crops.	Unsuitable	Not applicable	Limestone bedrock at or near the surface; slopes are more than 25 percent.	Not applicable	
Mobeetie: MO	Poor: erodible	Fair	Slight: gently sloping.	Exposed embank- ments are highly erodible.	Unstable; subject piping; level gra and protective soil binder are necessary.	
Pajarito: PA, PD (For Dune land part of PD, see Dune land.)	Poor: sandy	Good to a depth of 3 feet; fair below 3 feet.	Slight: moderately rapid perme- ability.	Loose sand hinders hauling; drifting sand; exposed em- bankments are highly erodible.	Unstable; sandy material; level grade and prote tive soil binder necessary.	

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interpretations-Continued

EDDY AREA, NEW MEXICO							
Not applicable.	Not applicable	Not applicable	Poor shear strength and bearing capacity.	Special treatment needed for gypsum salts; varying hardness of gypsiferous rocks.	С		
Features favoral	If cultivated, the sandy loam type is susceptible to wind erosion.	If cultivated, the 'sandy loam type is susceptible to wind erosion.	Fair bearing capacity and shear strength.	Features favorable	в		
Features favoral	ble Susceptible to crusting; high lime content.	Features favorable	Moderate bearing capacity.	Special treatment needed for gypsum salts generally below a depth of 3 feet.	в		
Not applicable_	Not applicable	Not applicable	Good suitability if soil is confined.	Subject to blowouts	A		
Not applicable_	Not applicable	_ Not applicable	Good suitability; hard caliche at a depth of 9 inches.	Hard caliche at a depth of 9 inches.	D		
Instable; good core material.	for Susceptible to water erosion.	Overflow phase is sus- ceptible to periodic flooding.	Fair to poor bearing capacity and shear strength; low to high shrink-swell potential; overflow phase is susceptible to periodic flooding.	Features favorable	С		
Not applicable_	Rapid intake rate; sprinkler system needed; susceptible to wind erosion.	Susceptible to wind erosion.	Good suitability if confined.	Features favorable	A		
Not applicable_	Not applicable	Not applicable	Good suitability; blasting required for excavations.	Limestone bedrock at or near the sur- face; steep.	D		
Moderately per- susceptible to piping.	vious; Rapid intake rate; sprinkler system needed; susceptible to wind erosion.	Not applicable	Features favorable	Features favorable	в		
Not applicable_	Rapid intake rate; sprinkler system needed; dune topog- raphy; susceptible	Very sandy; suscepti- ble to soil blowing.	Good suitability if confined.	Features favorable	A		

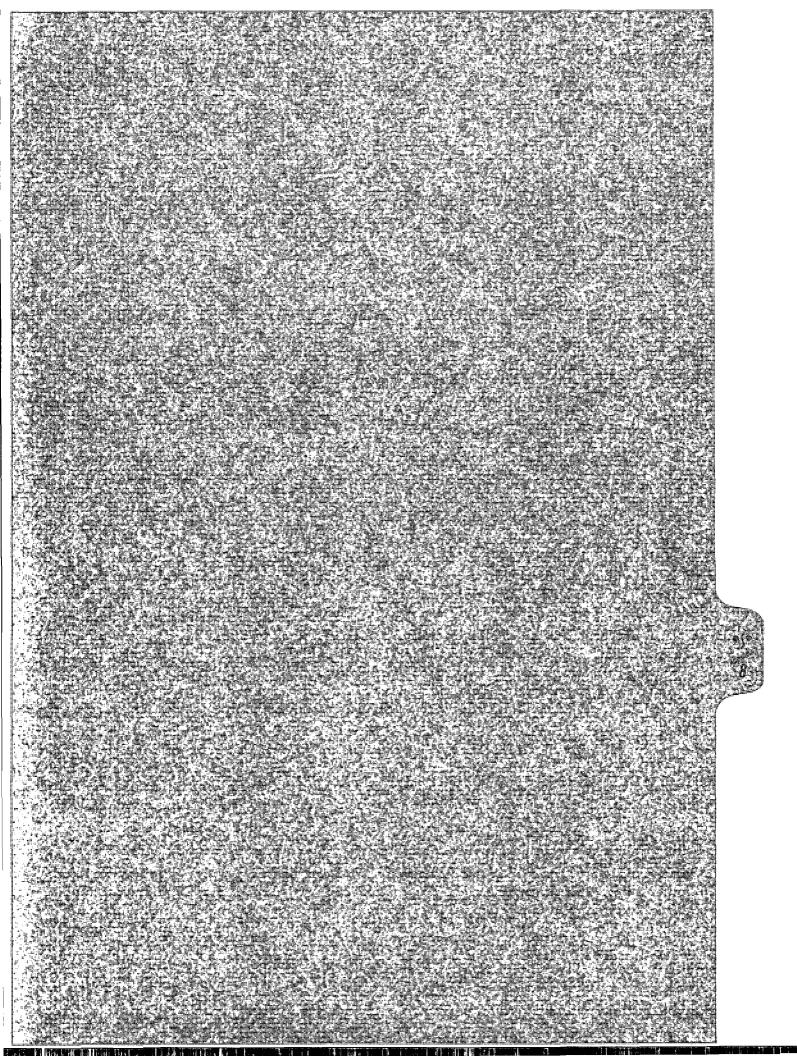
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Soil series and	Suitability as a source of-		Degree of limitation for disposal fields	Highway location	Dikes and levees	
map symbols	Topsoil	Road fill	for septic tanks and tile systems			
Pima: PM, Pe, Pn, Pv_	Fair to poor: slow intake rate; erodible.	Poor	Severe: periodic flooding; moder- ately slow perme- ability.	Unstable material; subject to periodic flooding.	Subject to cracking wide embankmen is necessary.	
Potter: PS (For Simona part of PS, see Simona series.)	Poor: gravelly	Good: hard caliche at a depth of 10 inches.	Severe: fractured caliche below a depth of 10 inches; danger of well pollution.	Hard caliche at a depth of 10 inches.	Not applicable	
Reagan: RA, RE, Rc Rd (For Upton part of RE, see Upton series.)	Fair if fertilized	Fair	Slight to moderate: moderate perme- ability.	Features favorable	Features favorable.	
Rf	Poor: salty	Poor	Severe: subject to saturation because of seepage.	Subject to periodic saturation because of seepage.	Unstable; subject t cracking.	
Reeves: RG, RM, RI, Rn (For Reagan part of RM, see Rea- gan series; for Gypsum land part of RG, see Gypsum land.)	Fair if fertilized	Poor	Severe: gypsiferous material at a depth of 20 to 36 inches; crevices and solution holes; danger of pollu- tion.	Gypsiferous material at a depth of 20 to 36 inches.	Gypsiferous materi at a depth of 20 to 36 inches.	
Rr	Poor: salty	Poor	Severe: gypsum at a depth of 20 to 36 inches; danger of pollution of water supply.	Gypsum below a depth of 20 to 36 inches.	Unstable; subject t cracking.	
Rt	Fair if fertilized: 10 to 20 inches thick.	Poor	Severe: gypsiferous material at a depth of 10 to 20 inches.	Gypsum at a depth of 10 to 20 inches.	Gypsum at a depth of 10 to 20 inche	
Rock land: RO	Unsuitable	Poor	Not applicable	Bedrock at or near the surface; rough broken to- pography.	Not applicable	
Russler: RS, RU, Rv (For Ector part of RU, see Ector series.)	Poor: gypsiferous soil.	Poor to very poor_	Severe: moderately slow permeability; gypsum below a depth of 16 to 48 inches; crystalline gypsum; danger of pollution of water supply.	Unstable material; gypsiferous soil material with gyp- siferous, interbed- ded clays at a depth of 16 to 48 inches.	Unstable; level grac and wide emband ments necessary.	
Simona: SA, SG, SM, SN. (For Bippus part of SM, see Bippus series; for Wink part of SN, see Wink series.)	Poor: sandy	Fair in surface layer; good at a depth of 10 to 24 inches be- cause material is hard caliche.	Severe: hard ca- liche below a depth of 10 to 24 inches.	Hard caliche below a depth of 10 to 24 inches.	Not applicable	

See footnote at end of table.

		EDDY AREA, NEW M	1EXICO		6
nterpretations—Contin	ued				1
Farm ponds and embankments	Irrigation	Leveling and benching	Foundations for low buildings ¹	Pipelines	Hydro logic group
Subject to cracking; some areas are sub- ject to a high water table.	Slow intake rate; level grade needed; subject to accumu- lation of salt.	Features favorable	Fair to poor bearing capacity and shear strength; moderate to high shrink- swell potential.	Periodic flooding; occasional high water table in the gray variant type; special treatment for salts needed in saline phase.	C
Not applicable	Not applicable	Not applicable	Caliche at a depth of 10 inches.	Caliche at a depth of 10 inches.	С
Gypsum or soft caliche below a depth of 40 inches in places.	Susceptible to accumu- lation of salt.	Features favorable	Fair bearing capacity and shear strength; low to high shrink- swell potential.	Gypsum salts below a depth of 40 inches in places; special treatment needed.	С
Unstable; dispersed	Susceptible to accu- mulation of salt.	Features favorable	Poor bearing capacity and shear strength; moderate shrink- swell potential.	Special treatment needed for salts.	С
Gypsiferous sub- stratum.	Susceptible to accumu- lation of salt; gypsif- erous material at a depth of 20 to 36 inches.	Limitation on depth of cuts.	Poor to fair bearing capacity and shear strength; moderate shrink-swell poten- tial.	Special treatment needed for salts.	С
ypsum below a depth of 20 to 36 inches.	Susceptible to accumu- lation of salt; gyp- sum at a depth of 20 to 36 inches.	Limitation on depth of cuts.	Poor bearing capacity and shear strength; moderate shrink- swell potential; pe- riodic overflow or shrinkage.	Special treatment needed for salts.	C
Gypsum at a depth of 10 to 20 inches.	Susceptible to accumu- lation of salt; gyp- sum at a depth of 10 to 20 inches.	Soil smoothing only; gypsum at a depth of 10 to 20 inches.	Poor bearing capacity and shear strength.	Special treatment needed for salts.	C
Not applicable	Not applicable	Not applicable	Good suitability; blast- ing required for excavations.	Blasting required to bury exposed bed- rock.	D
Not applicable	Slow intake rate; crusts easily; sus- ceptible to water erosion.	Limitation on depth of cuts; gypsiferous soil.	Poor bearing capacity and shear strength; moderate to high shrink-swell poten- tial.	Special treatment needed for salt be- low a depth of 16 to 48 inches.	в
Not applicable	Not applicable	Not applicable	Good suitability if confined.	Hard caliche below a depth of 10 to 24 inches.	в





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State Enginizer Office

WELL RECORD

INSTRUCTIONS: This form should be concursed to triplicate, preferably typewritten, and submitted to nearest district office of the State Engineer. All pections, except Section 5, shall be answered as completely securately as possible when any well is drilled, repaired or despend. When this form is used as a plug record, only Section 1A and Section 5 need be completed.

		(A) Owner of well Pau	American P	etrolous Corporation
		Street and Number Box	<u>68</u>	
		City	Hobbu	State Nor Mardico
		Well was drilled under F	ermit No	1
			- M of Section	10 mm 18 8 mm 22 P
		(B) Drilling Contractor.	Bas Burgo	Licence No. Doll
	}	Street and Number Dori	306	- ANGENEZ AG. 20 - Dec.
		City	<u>a ddolil</u>	State MC7 Mord co
1 (Drilling was commanced.		July 32 10 56
(Plate	pí BóQ acras)	Drilling was completed		July 31 10 58 July 31 10 5
Elevation at	top of casing in f	set above sea lovel	Total c	enth of wall 130

Elevation at top of casing in fest above see lovel. Total depth of wall State whether wall is shallow or artesian Shallow Depth to water upon completion 50

Section 2

PRINCIPAL WATER-DEARING STRATA

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record of mudding and cementing Section 4 Depth in Fost Disseter Teas No. Backs of Electrodo Ucod Hoto in in. Clay Consent Fram To

Section 5

FLUGGING RECORD

Name of Plugging Contractor		License	No
Street and Number	City	State	
Tons of Clay usedTons of	Roughage used	Type of rougha	3e
Plugging method used	Data	Plugged	
Plugging anonoved by:	Cement	Plugs were placed	i an follown:

Plugging approved by:			Cement Plugs were placed as follows:				
		Klo.		of Plug	No. of Secto Ucst		
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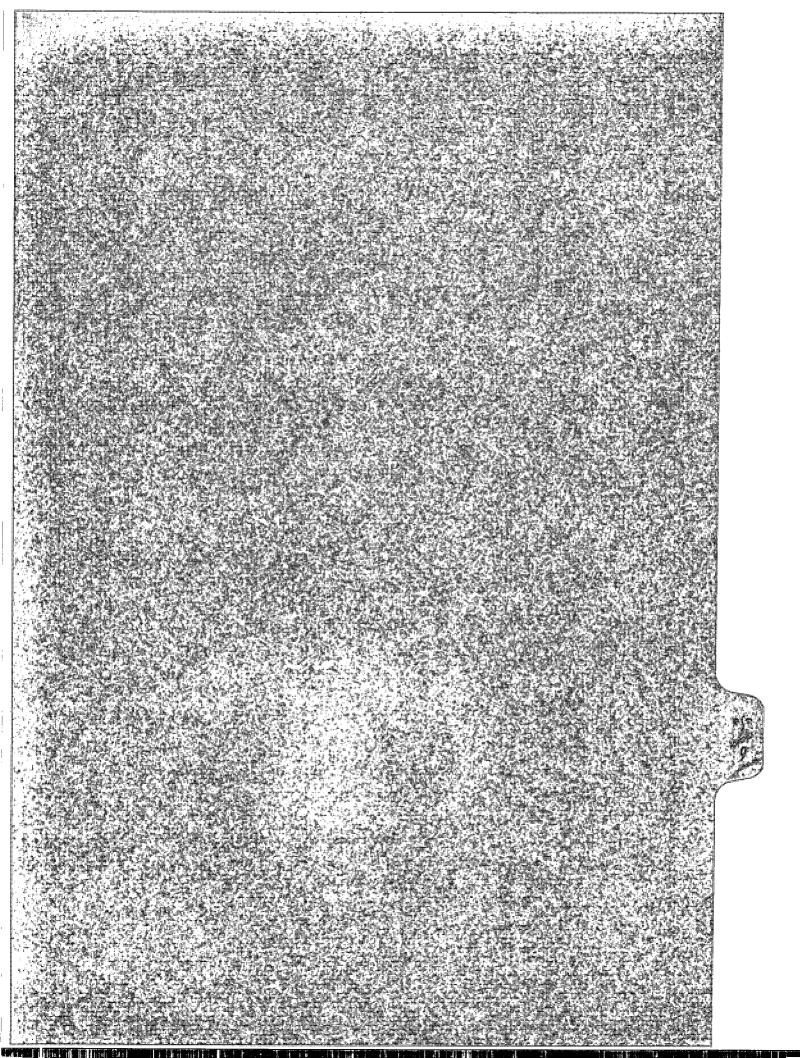
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LOG OF WELL

Depth i		Thickness	0-100	
Drom	To	in Fest	Color	Type of Material Encountered
0	6	6		Surface Soll
6	28	22		Sandy Clay
26	32	ฏ		Cypen
37		25		Sendy Cley
46	<u> </u>	<u>k</u>		Cypo
50	68	<u>೩</u> ಕ		any water Sand.
58	64	24		Sand & Gravel
\$2	25	75		Souty Clay -
24	99_	5		Hater Sand & Gravol
99	126	27		Sandy Clay
126	130	Ą.		Red Clay
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The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described well.

Kell Drilla



Remediation System Operations

1997 First Quarterly Report

Amoco Pipeline Station Artesia, New Mexico

Prepared for: AMOCO CORPORATION One Mid America Plaza Suite 300 Oakbrook Terrace, Illinois 60181

Prepared by: CLAYTON ENVIRONMENTAL CONSULTANTS, INC. 1240 Iroquois Drive, Suite 206 Naperville, Illinois 60563 630-369-0201

Project 64661.00 (2775)

April 30, 1997

Clayton / littelhauser

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T.D.S. 3. May HE

Clayton ENVIRONMENTAL CONSULTANTS

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	Wells with No Free Product
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4.0	FLUIDS PUMPED ,
5.0	SOIL REMEDIATION

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Remediation System 1997 First Quarterly Report Amoco Pipeline Station - Artesia, New Mexico 2775RE06.HMM/P64661 (04-21-97/KLT)

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Remediation System 1997 First Quarterly Report Amoco Pipeline Station - Artesia, New Mexico 2775RE06.HMM/P64661 (04-21-97/KLT)

1.0 INTRODUCTION

This report summarizes the results of the remediation system operations for the period of January 16, 1997 through April 15, 1997.

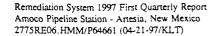
The primary objectives of the remediation system continue to have been met since the system installation, namely:

- Approximately 131 gallons of product have been recovered.
- No free product has been observed in the downgradient wells.

No oil was recovered in the fourth quarter. For most of 1996 the only oil that was recovered was the oil that was placed in the recovery tank from wells which were bailed. Free product is not reaching the interception trench, and free product appeared in only two of the three wells (MW-10, MW-12, and MW-13) located in close proximity and north of the trench. The levels in the wells (MW-10 and MW-13) were only .05 feet and .02 feet. These were exactly the same levels observed on 1/10/97.

The air stripper continues to have operational problems. During the first quarter a lightning strike caused failure on the coyote pump protector, which was replaced. Failure of the pump protector also led to failure of the pumps in the interception trench, which were also replaced.

The discharge limit from the air stripper for benzene, for the sample taken on 4/02/97, was slightly exceeded, but the discharge limits for ethylbenzene, toluene, and xylene were met.



As promised in the last report, an evaluation of the remediation system operation was conducted during the first quarter of 1997 to determine what changes should be made to the operation of the system. These proposed changes are described in Section 1.1.

As previously stated, the cleanup objectives for the landfarming area were met in 1996 for TPH as gas and diesel. A dramatic reduction in the TPH value as oil was achieved, but the values still slightly exceed the objective of 5,000 mg/Kg. Landfarming was suspended in November 1996 and will resume during the next quarter. The landfarming will continue until the cleanup objectives are met.

1.1 **RECOMMENDED CHANGES IN THE SYSTEM OPERATION**

Amoco has conducted a review of the system operations. The major conclusions are:

- There is no movement of free product to the interception trench. Free product levels in all wells have remained essentially constant for the last 5 quarters.
- Only one well (MW-2) has product in excess of .16 feet. This well is located approximately 3,000 feet north of the interception trench.
- The oil water separator is serving no purpose since free product in not reaching the interception trench.
- The air stripper has experienced numerous operational difficulties. The difficulties have included failure due to calcium deposits, mechanical failure due to lightning, and the corrosive effects due to the high H₂S content.

For the reasons stated above, we plan to discontinue operations of the air stripper and to do the following:

Remediation System 1997 First Quarterly Report Amoco Pipeline Station - Artesia, New Mexico 2775RE06.HMM/P64661 (04-21-97/KLT) Obtain samples from MW-11 and MW-14 on a quarterly basis and determine the BETX concentrations.

- Install Oxygen Releasing Compounds (ORCs) in the three sumps within the interception trench in order to enhance in the biodegradation of any BETX reaching the trench.
- Bail MW-2 on a quarterly basis if the free product level exceeds 1.0 feet. If the well continues to recharge to over 1.0 feet each quarter, develop a more aggressive product recovery system.
- Prepare annual, rather than quarterly reports unless a significant change in the system operation occurs (such as the occurrence of free product in MW-11 or MW-14).
- Dismantle the air stripper and associated equipment (e.g., oil/water separator and pumps) after 2 more quarters unless significantly elevated BETX levels are detected in MW-11 or MW-14. The results of analysis of samples from the next two quarters will be submitted to the Oil Conservation Division, and approval to dismantle the air stripper will be requested before the actual dismantling. If significant levels of BETX are observed in these wells after the air stripper system is dismantled, a risk-based assessment of the effects of the BETX, incorporating the results of natural attentuation, will be made.

Remediation System 1997 First Quarterly Report Amoco Pipeline Station - Artesia, New Mexico 2775RE06.HMM/P64661 (04-21-97/KLT)

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2.0 LABORATORY RESULTS

2.1 MONTHLY BETX RESULTS FOR THE INFLUENT AND EFFLUENT OF THE AIR STRIPPER

The samples for the influent and effluent of the air stripper were taken on 4/02/97. The results from this sampling event are summarized in Table 1. All figures and tables are presented at the end of the text before the appendices. The analytical results are presented in Appendix A. Samples were not obtained at other times due to failure of the pump protector and pumps, as described in the introduction.

2.2 QUARTERLY BETX RESULTS FOR MONITORING WELLS WITH NO FREE PRODUCT

The quarterly BETX results for monitoring wells which did not contain free product are presented in Table 2. The analytical results are presented in Appendix A for the samples taken on 4/02/97.

The two monitoring wells south of the interception trench (monitoring wells MW-11 and MW-14) have never shown any indication of free product. In addition, neither those wells, or any other well, show the presence of BETX.



Remediation System 1997 First Quarterly Report Amoco Pipeline Station - Artesia, New Mexico 2775RE06.HMM/P64661 (04-21-97/KLT)

3.0 PRODUCT THICKNESS

Product thickness measurements were taken in the monitoring wells during the April sampling event. Table 3 contains product thickness information. The free product thickness map is shown in Figure 9. The product thickness maps from January 10, 1997; September 30, 1996; April 16 and 17, 1996; November 25 and 26, 1995; October 2, 1995; June 16, 1995; February 9, 1995; and July 2, 1996 are shown in Figures 8,7, 6, 5, 4, 3, 2, and 1. It is clear from the data that the product thickness has decreased in all of the wells (with the exception of Well No. 2) over the duration of the remediation period. In addition, the product thickness has remained essentially constant in all wells containing free product for the last 5 quarters.

Remediation System 1997 First Quarterly Report Amoco Pipeline Station - Artesia, New Mexico 2775RE06.HMM/P64661 (04-21-97/KLT)



4.0 FLUIDS PUMPED

Due to the failure of the pump protector and pumps, the air stripper operated only intermittently during the quarter. On 4/02/97 the pumping rate was 17.5 GPM, which is typical of prior pumping rates when the air stripper was receiving water from the interception trench. The average pumping rate has been approximately 6 GPM.

No oil was recovered between January 1997 and April 1997. As noted in the Introduction, there currently appears to be no movement of the oil. The only well showing a depth in excess of .16 feet is Well No. 2, which is near the storage tank. The wells in closest proximity to the interception trench (8, 10, 12, 13) contain .05 feet of product, or less.

Remediation System 1997 First Quarterly Report Amoco Pipeline Station - Artesia, New Mexico 2775RE06.HMM/P64661 (04-21-97/KLT)



5.0 SOIL REMEDIATION

The soil remediation program began in early 1995. The remediation goal is TPH values of 5,000 mg/Kg, expressed as gas, diesel, or oil. The table below summarizes all results, to date:

Sampling			PH Values in mg/Kg)	
Date	As Gas	As Diesel	As Oil	Number of Samples
4/27/95	< 100	5,847	44,433	3
7/28/95	< 100	1,149	34,130	3
10/12/95	< 10	< 100	6,247	3
12/29/95	< 100	4,200	19,666	3
4/22/96	< 10	<10	6,750	3
6/28/96	< 100	< 100	9,700	4
7/2/96	< 50	< 50	6,673	9
10/14/96	<10	1,333	6,386	9

All analytical results are included in previous quarterly reports. As shown by the table, the TPH goals for gas and diesel have been met, while the TPH goal as oil has not yet been met. Disking and sampling were discontinued in November 1996 due to the low biological activity and frozen soils encountered during the winter months. Disking and sampling will begin again in the second quarter of 1997 until the TPH goal as oil is met.

Remediation System 1997 First Quarterly Report Amoco Pipeline Station - Artesia, New Mexico 2775RE06.HMM/P64661 (04-21-97/KLT)

FIGURES

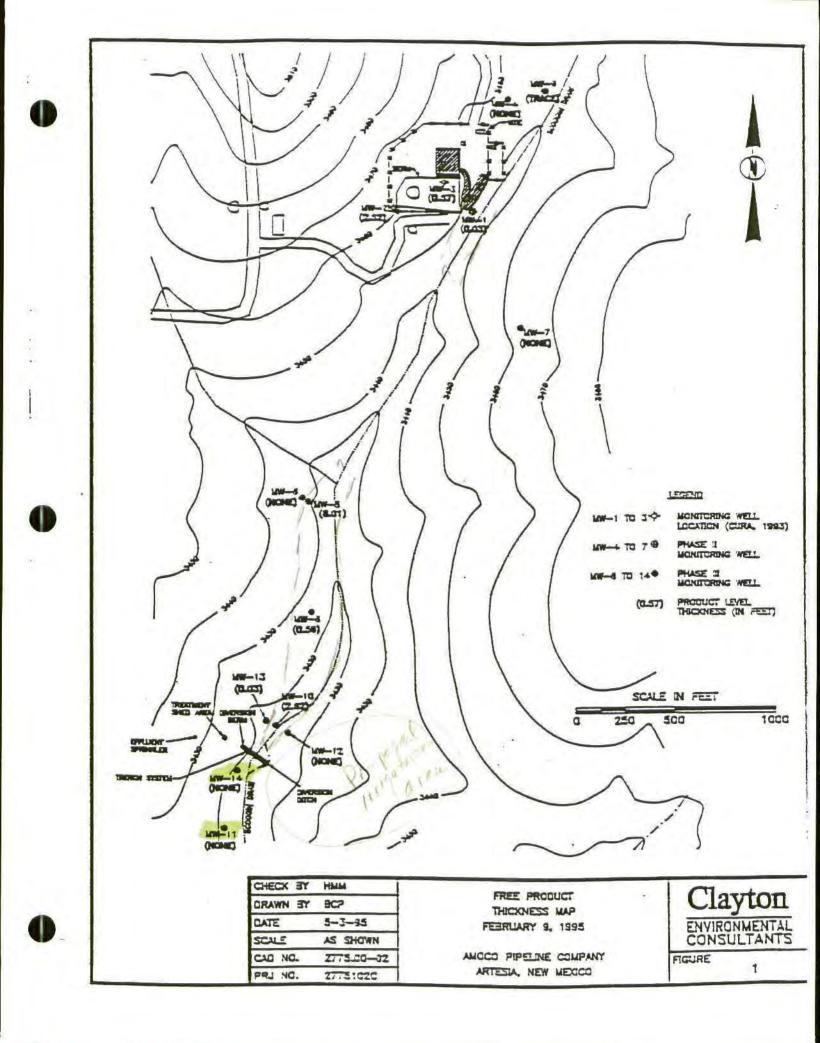


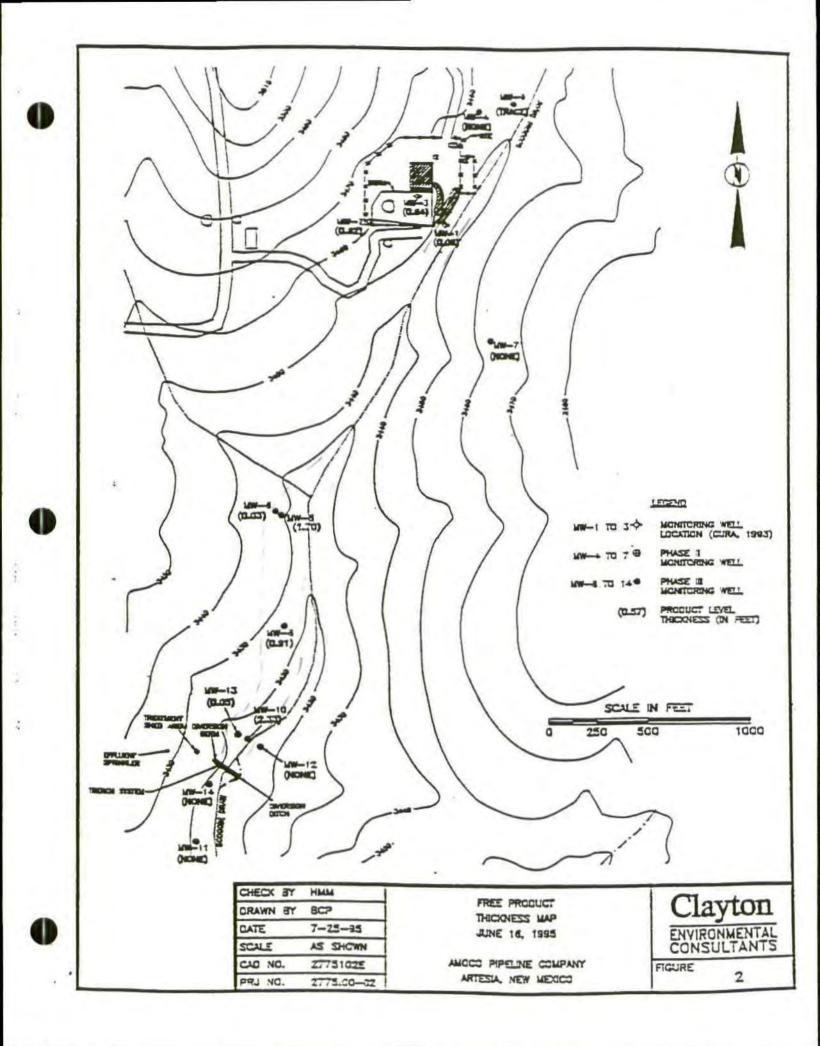
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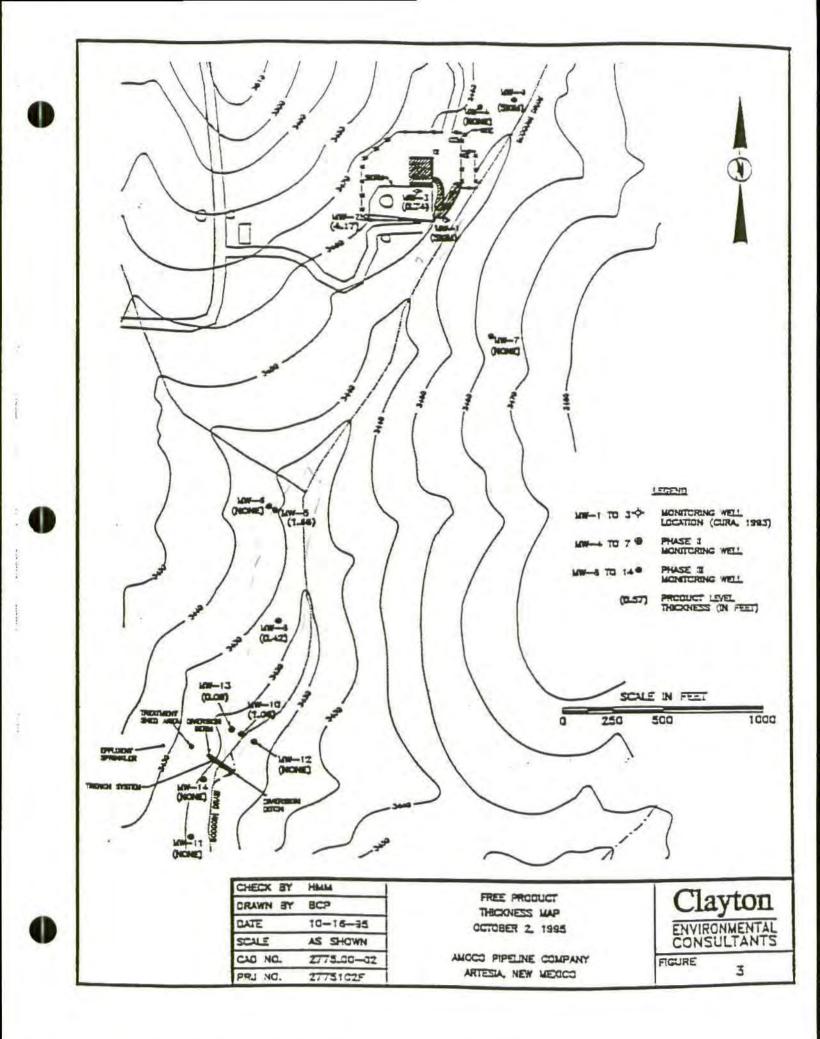
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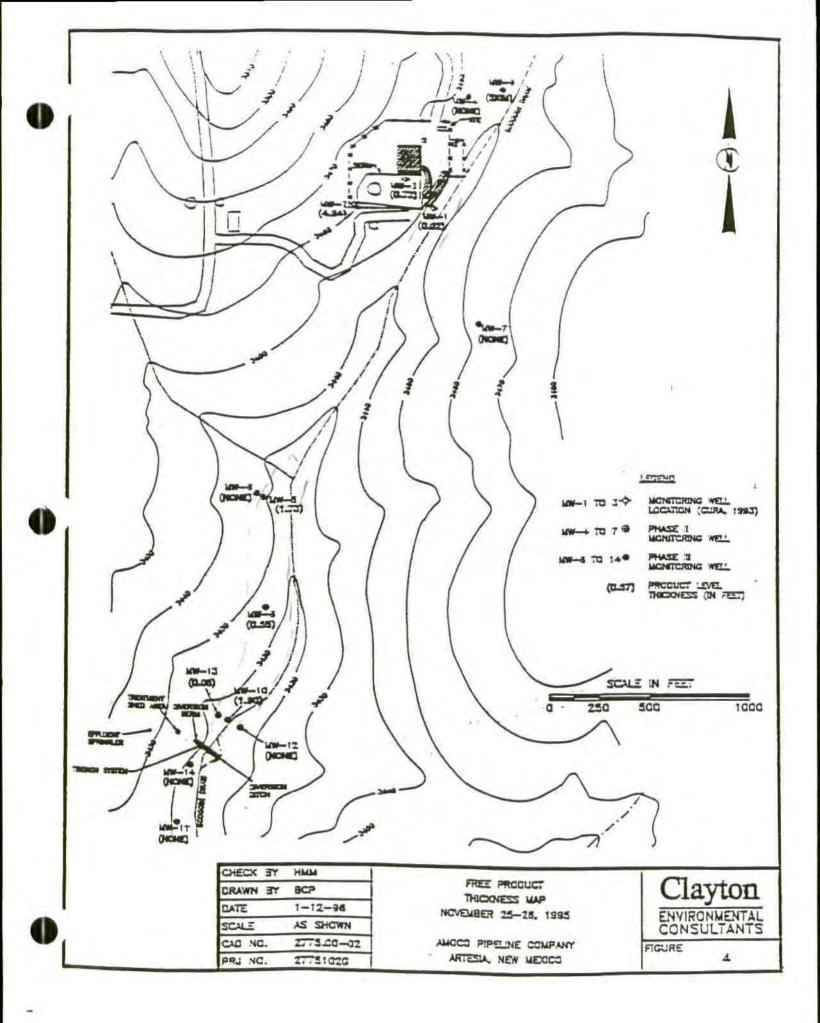
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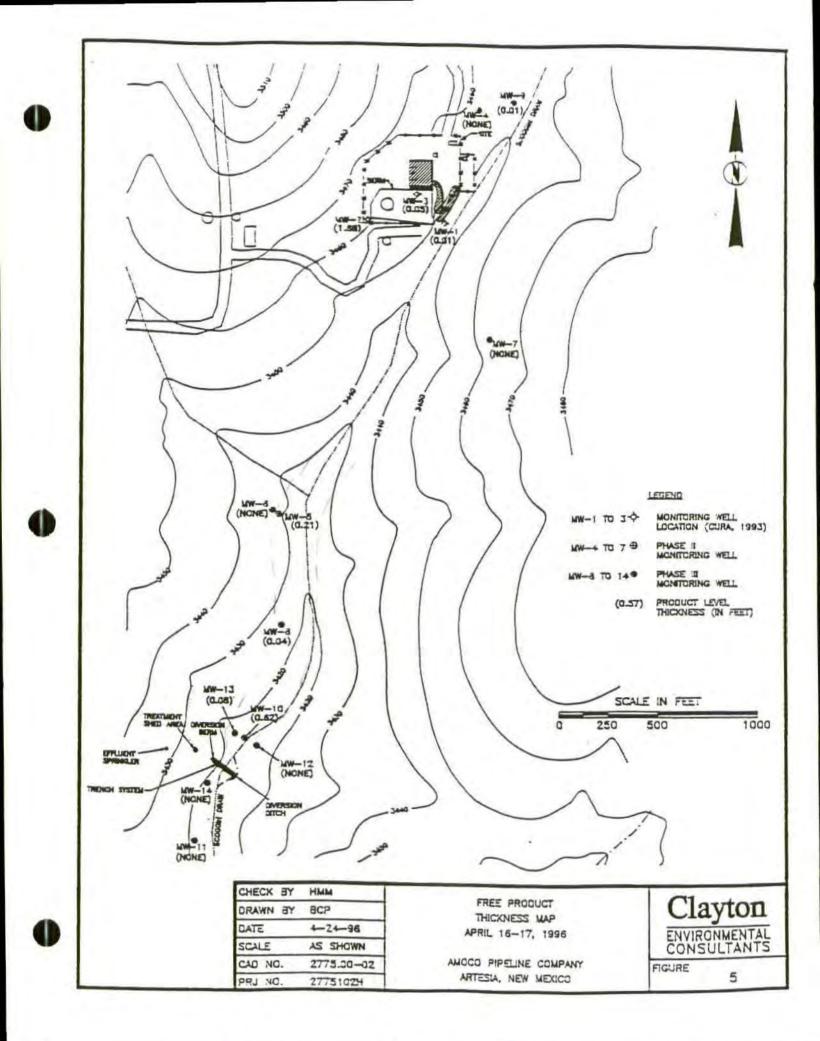
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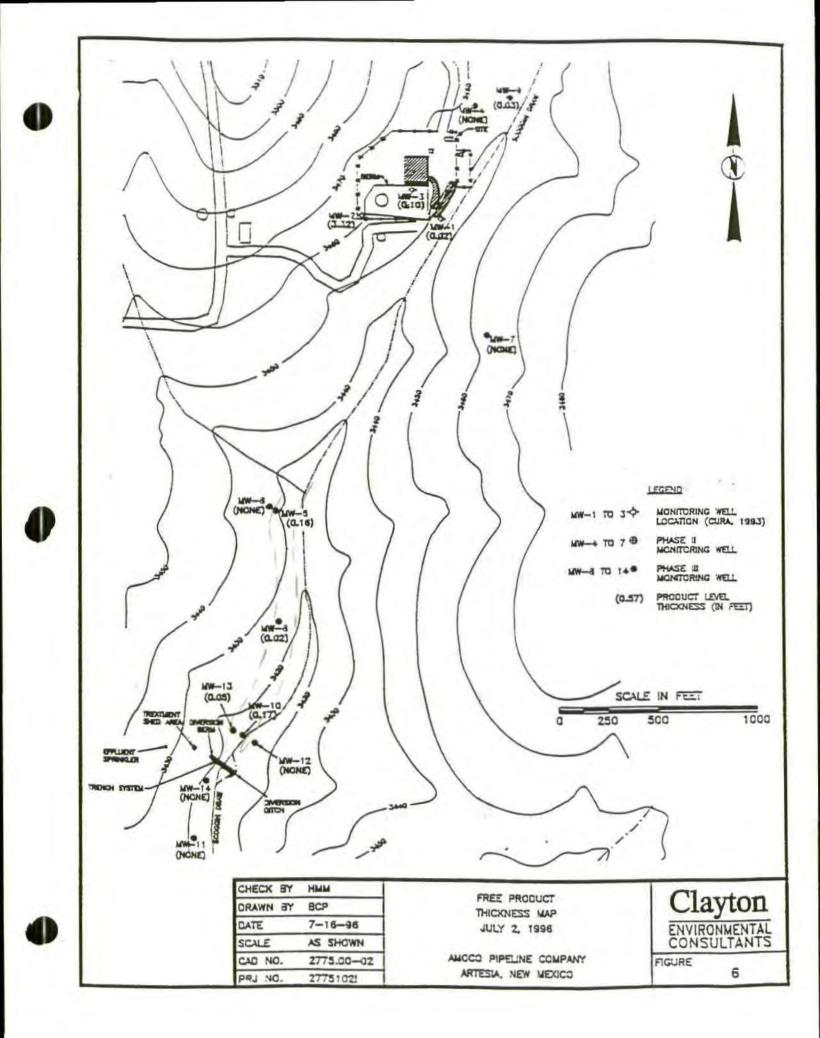


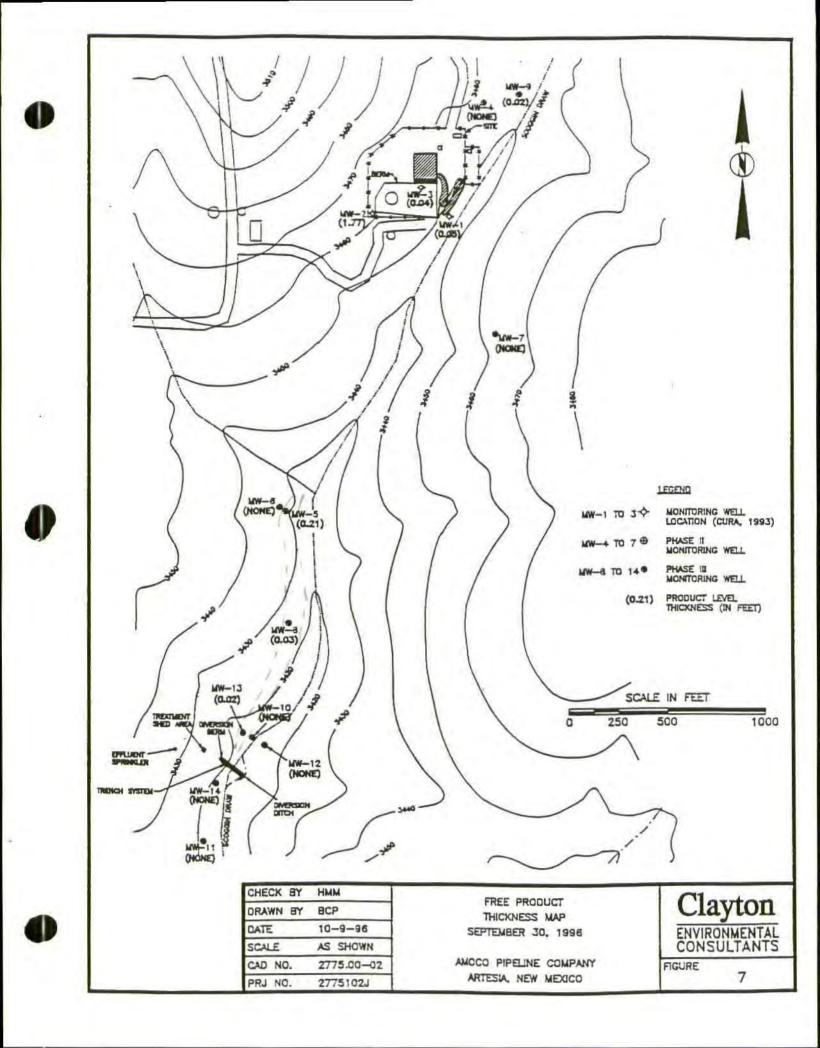


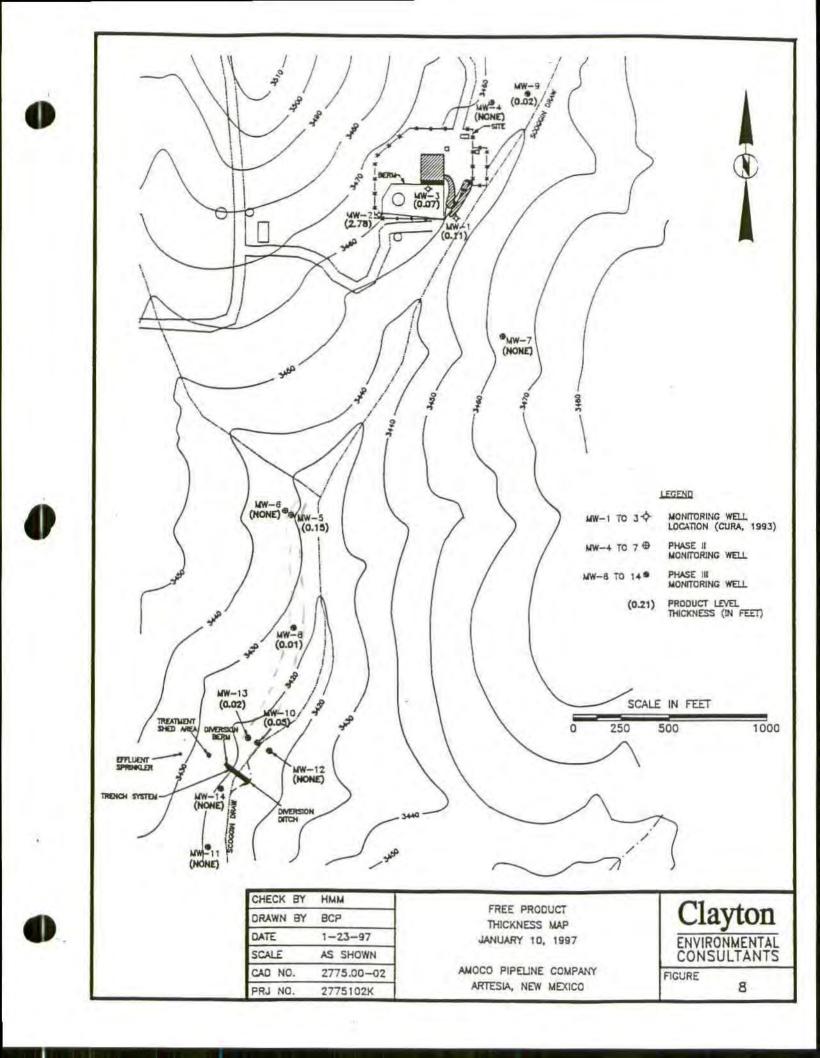












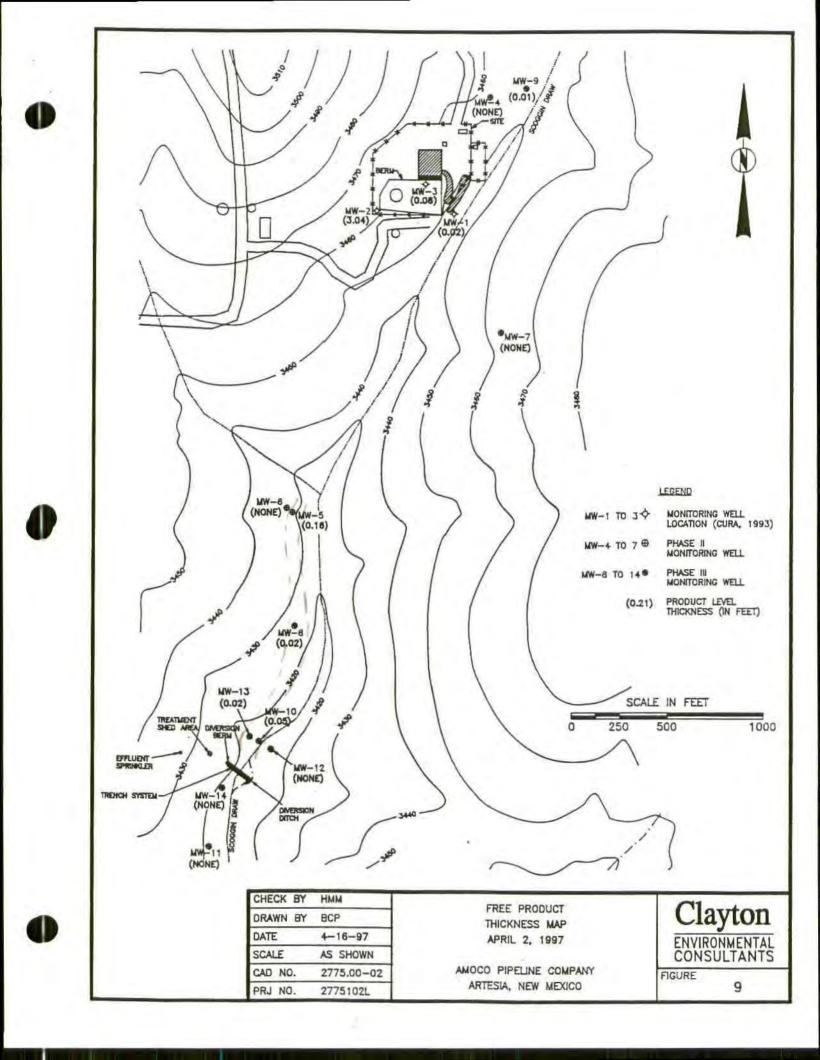


Table 1:	Monthly BETX Results for the Influent and Effluent of the Air Stripper
Table 2:	Quarterly BETX Results for Monitoring Wells with No Free Product
Table 3:	Monitoring Well Water / Product Levels

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Remediation System 1997 First Quarterly Report Amoco Pipeline Station - Artesia, New Mexico 2775RE06.HMM/P64661 (04-21-97/KLT)





Monthly BETX Results for the Influent and Effluent of the Air Stripper

Amoco Pipeline Company Artesia, New Mexico

						1	NFLUENT							
Sample Date:	11/25/94	12/21/94	02/28/95	04/12/95	07/12/95	10/12/95	11/04/95	01/16/96	02/28/96	03/13/96	04/16/96	05/23/96	07/02/96	07/06/96
Benzene	2,970	3,070	3,060	3,300	2,700	1,900	2,100	2,000	2,400	2,800	2,200	2,400	1,900	2,000
Ethylbenzene	364	338	442	476	380	250	340	210	280	310	260	240	280	260
Toluene	808	1,220	1,350	1,130	420	190	81	29	<20	<25	20	61	160	170
Xylene	1,770	2,130	2,750	2,500	1,900	1,100	1,800	840	1,000	1,200	910	780	1,000	920
						E	FFLUENT							
Sample Date:	11/25/94	12/21/94	02/28/95	04/12/95	07/12/95	10/12/95	11/04/95	01/16/96	02/28/96	03/13/96	04/16/96	05/23/96	07/02/96	07/06/96
Benzene	1.8	6.6	3.3	3.6	4.6	<1.0	3.5	<1.0	540	160	220	<1.0	3.8	8.0
Ethylbenzene	<1.0	<1.0	1.4	2.8	1.5	<1.0	<1.0	< 1.0	63	20	25	<1.0	<1	1.2
Toluene	<1.0	5.1	2.2	2.8	1.1	< 1.0	<1.0	< 1.0	<5	1.8	2.2	< 1.0	<1	<1
Xylene	< 1.0	5.7	6.6	14.5	6.5	< 1.0	3.0	< 1.0	240	80	99	< 1.0	2.9	4.1

						1	NFLUENT
Sample Date:	8/2/96	10/15/96	11/10/96	01/10/97	01/10/97	04/02/97	
Benzene	1,200	2,400	2,400	810	2,200	1,800	
Ethylbenzene	210	290	270	100	220	180	
Toluene	160	<50	26	<50	< 50	<20	
Xylene	810	960	950	300	750	470	
						E	FFLUENT
Sample Date:	8/2/96	10/15/96	11/10/96	01/10/97	01/10/97	t 04/02/97	
Sample Date: Benzene	<u>8/2/96</u> 9.3	10/15/96	11/10/96 520	01/10/97 1.9	01/10/97 2.0		
Benzene		<u></u>		en en la seconda en composita en la seconda en la second		04/02/97	
	9.3	<1	520	1.9	2.0	04/02/97 19	

NOTES: 1. All results are in ug/L.

2. Permit effluent limits are benzene (10 ug/L), ethylbenzene (750 ug/L), xylene (620 ug/L), and toluene (750 ug/L).



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TABLE 2

Quarterly BETX Results for Monitoring Wells With No Free Product

Amoco Pipeline Company Artesia, New Mexico

WELL 4											
Sample Date:	11/25/94	12/22/94	02/16/95	06/16/95	10/02/95	11/26/95	04/17/96	07/06/96	09/30/96	01/10/97	04/02/97
Benzene	<1	<1	<1	54.4	9.8	4.7	6.3	5.0	<1	<1	1.3
Ethylbenzene	<1	<1	<1	2.5	<1	1.3	<1.0	<1	<1	<1	<1
Toluene	<1	<1	<1	<1	<1	2.0	1.1	<1	< 1	<1	<1
Xylene	<1	<1	<1	6.7	<1	3.8	36	2.0	<1	<1	<1
WELL 6											
Sample Date:	11/25/94	12/21/94	02/16/95	06/16/95	10/02/95	11/26/95	04/16/96	07/06/96	09/30/96	01/10/97	04/02/97
Benzene	FREE	FREE	2.2	FREE	31	58	<1	<1	<1	<1	<1
Ethylbenzene	PRODUCT	PRODUCT	< 1	PRODUCT	<1	61	<1	<1	2.0	<1	<1
Toluene	PRESENT	PRESENT	< 1	PRESENT	<1	< 1.0	< 1	< 1	< 1	<1	< 1
Xylene			<1	l	2.5	19	3.7	<1	<1	<1	<1
					WEL	L.7					
Sample Date:	11/25/94	12/22/94	02/16/95	06/16/95	10/02/95	11/26/95	04/17/96	07/06/96	09/30/96	01/10/97	04/02/97
Benzene	<1	1590	846	3100	880	3000	1900	1,800	170	160	<1
Ethylbonzone	<1	39	20.9	58 7	17	51	130	160	<2	<1	<1
Toluene	<1	<10	< 10	36	<10	46	<20	<10	<2	<1	<1
Xylene	<1	86 5	52 7	140	35	200	100	120	11	32	<1
					WELI	. 10					
Sample Date:	11/17/94	12/22/94	02/16/95	06/14/95	10/02/95	11/25/95	04/16/96	07/02/96	09/30/96	01/10/97	04/02/97
Benzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	62	N/A	N/A
Ethylbenzene	<u>N/A</u>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.2	N/A	N/A
Toluene	N/A	N/A	N/A	N/A	N/A	N/A	<u>N/A</u>	N/A	<1	N/A	<u>N/A</u>
Xylene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.2	N/A	N/A
					WELI	_ 11					
Sample Date:	11/17/94	12/22/94	02/16/95	06/14/95	10/02/95	11/25/95	04/16/96	07/02/96	09/30/96	01/10/97	04/02/97
Benzene	<1	<1	<1	<1	<1	1.3	<1	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1	<1	<1	2.1	1.1	<1	<1	1.5	<1
Toluene	<1	<1	<1	<1	<1	5.3	2.8	<1	<1	1.2	<1
Xylene	<1	<1	<1	<1	<1	6.1	3.7	<1	<1	6	<1
					WELI	. 12					
Sample Date:	11/17/94	12/22/94	02/16/95	06/16/95	10/02/95	11/26/95	04/16/96	07/02/96	09/30/96	01/10/97	04/02/97
Benzene	75	56	<1	<1	<1	1.1	1.5	4.1	30	2.3	< 1
Ethylbenzene	1	< 1	<1	<1	<1	< 1.0	18	<1	<1	<1	< 1
Toluene	1.1	<1	<1	<1	<1	3.5	5.1	<1	<1	<1	<1
Xylene	1	<1	<1	<1	<1	5.1	5.8	1.2	<1	<1	<1
					wei.	1					
Sample Date:	11/17/94	12/22/94	02/16/95	06/16/95	10/02/95	11/26/95	04/16/96	07/02/96	09/30/96	01/10/97	04/02/97
Benzene	<1	<1	<1	<1	<1	< 1.0	<1	<1	<1	<1	<1
Ethylbenzene	< 1	< 1	<1	<1	<1	1.7	<1	< 1	<1	<1	<1
Toluene	< 1	< 1	<1	<1	<1	3.6	1.7	< 1	<1	<1 ·	< 1
Xylene	<1	< 1	<1	<1	<1	6.8	2.4	<1	<1	<1	<1

NOTE: All results are in ug/L.

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Monitoring Well Water / Product Levels

Amoco Pipeline Company Artesia, New Mexico

WELL IDENTIFICATION	DATE	DEPTH TO PRODUCT (feet)	DEPTH TO WATER (feet)	PRODUCT LEVEL THICKNESS (feet)
MW-1	05/21/93		20.73	0.21
	11/17/94	17.54	17.56	0.02
	02/09/95	18.02	18.05	0.03
	06/16/95	19.15	19.21	0.06
	10/02/95	SKIM	16.48	SKIM
	11/26/95	15.85	15.87	0.02 (1)
	04/16-17/96	14.32	14.33	0.01
	07/06/96	15.55	15.57	0.02
	09/30/96	11.70	11.75	0.05
	01/10/97	12.79	12.90	0.11
	04/02/97	13.60	13.62	0.02
MW-2	05/21/93		27.56	1.75
	11/17/94	23.28	26.67	3.39
	02/09/95	23.98	26.50	2.52
	06/16/95	25.63	26.45	0.82
	10/02/95	22.01	26.18	4.17
	11/26/95	21.23	26.17	4.94 (1)
	04/16-17/96	20.58	22.46	1.88
	07/06/96	21.86	25.18	3.32
	09/30/96	19.17	20.94	1.77
	01/10/97	20.20	22.98	2.78
	04/02/97	21.00	24.04	3.04
MW-3	05/21/93		17.81	1.36
	11/17/94	13.07	13.65	0.58
	02/09/95	13.75	14.32	0.57
	06/16/95	15.20	15.84	0.64
	10/02/95	10.69	11.43	0.74
	11/26/95	9.69	10.41	0.72 (1)
	04/16-17/96	9.58	9.63	0.05
	07/06/96	11.70	11.80	0.10
	09/30/96	8.71	8.75	0.04
	01/10/97	10.33	10.40	0.07
	04/02/97	11.36	11.42	0.06
	11/17/94	NONE	28.28	NONE
10100 -	02/09/95	NONE	28.51	NONE
	06/16/95	NONE	29.58	NONE
	10/02/95	NONE	29.55	NONE
	11/26/95	NONE	22.61	NONE
	04/16-17/96	NONE		NONE
	07/06/96	NONE	20.63	NONE
	09/30/96		26.44	
		NONE	21.88	NONE
	01/10/97	NONE	25.24	NONE
	04/02/97	NONE	25.49	NONE



2775TL14.WK1/P64661/HMM/8DP (04-10-97/8DP) - Page 1 of 4

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Monitoring Well Water / Product Levels

Amoco Pipeline Company Artesia, New Mexico

WELL	DATE	DEPTH TO PRODUCT (feet)	DEPTH TO WATER (feet)	PRODUCT LEVEL THICKNESS (feet)
	44/47/04		000000000000000000000000000000000000000	
MW-5	11/17/94	16.22	24.19	7.97
	02/09/95	16.84	24.85	8.01 (1)
	06/16/95 10/02/95	19.44 16.19	21.14 17.85	1.70 1.66
	11/26/95	17.58	19.31	1.73 (1)
	04/16-17/96	17.04	17.25	0.21
	07/06/96	16.20	16.36	0.16
	09/30/96	11.17	11.38	0.10
	01/10/97	13.45	13.60	0.15
	04/02/97	14.19	14.35	0.16
		······································		
MW-6	11/17/94	TRACE	14.53	TRACE
	02/09/95	NONE	15.02	NONE
	06/16/95	16.24	16.27	0.03
	10/02/95	NONE	13.55	NONE
	11/26/95	NONE	14.84	NONE
	04/16-17/96	NONE	13.80	NONE
	07/06/96	NONE	14.55	NONE
	09/30/96	NONE	9.62	NONE
	01/10/97	NONE	12.26	NONE
	04/02/97	NONE	12.03	NONE
MW-7	11/17/94	NONE	34.33	NONE
	02/09/95	NONE	34.67	NONE
	06/16/95	NONE	35.61	NONE
	10/02/95	NONE	33.79	NONE
	11/26/95	NONE	3 3.2	NONE
	04/16-17/96	NONE	30.95	NONE
	07/06/96	NONE	33.36	NONE
	09/30/96	NONE	29.15	NONE
	01/10/97	NONE	30.72	NONE
	04/02/97	NONE	31.85	NONE
MW-8	11/17/94	13.69	14.95	1.26
	02/09/95	14.46	15.02	0.56
	06/16/95	15.50	16.41	0.91
	10/02/95	13.03	13.45	0.42
	11/26/95	14.16	14.71	0.55 (1)
	04/16-17/96	13.66	13.70	0.04
	07/05/96	13.05	13.07	0.02 (1)
	09/30/96	8.04	8.07	0.03
	01/10/97	9.89	9.90	0.01
	04/02/97	10.58	10.60	0.02

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Monitoring Well Water / Product Levels

Amoco Pipeline Company Artesia, New Mexico

WELL	DATE	DEPTH TO PRODUCT	DEPTH TO WATER	PRODUCT LEVEL THICKNESS
IDENTIFICATION		(feet)	(feet)	(feet)
MW-9	11/17/94	23.07	23.10	0.03
	02/09/95	TRACE	23.41	TRACE
	06/16/95	TRACE	24.65	TRACE
	10/02/95	SKIM	20.73	SKIM
	11/26/95	SKIM	19.52	SKIM
	04/16-17/96	17.53	17.54	0.01
	07/06/96	21.20	21.23	0.03
	09/30/96	16.00	16.02	0.02
	01/10/97	17.55	17.57	0.02
	04/02/97	18.91	18.92	0.01
MW-10	11/17/94	19.02	21.24	2.22
	02/09/95	19.74	22.36	2.62
	06/16/95	20.97	23.30	2.33
	10/02/95	18.49	19.55	1.06
	11/25/95	20.13	22.03	1.90 (1)
	04/16-17/96	20.26	20.88	0.62
	07/05/96	19.86	20.03	0.17 (1)
	09/30/96	NONE	15.62	NONE
	01/10/97	19.00	19.05	0.05
	04/02/97	19.35	19.40	0.05
MW-11	11/17/94	NONE	19.34	NONE
	02/09/95	NONE	19.61	NONE
	06/16/95	NONE	20.08	NONE
	10/02/95	NONE	19.74	NONE
	11/25/95	NONE	19.94	NONE
	04/16-17/96	NONE	19.68	NONE
	07/06/96	NONE	19.75	NONE
	09/30/96	NONE	18.65	NONE
	01/10/97	NONE	19.92	NONE
	04/02/97	NONE	14.50	NONE
M₩-12	11/17/94	NONE	16.47	NONE
	02/09/95	NONE	16.78	NONE
	06/16/95	NONE	17.28	NONE
	10/02/95	NONE	16.03	NONE
	11/25/95	NONE	16.63	NONE
	04/16-17/96	NONE	16.55	NONE
	07/06/96	NONE	16.45	NONE
	09/30/96	NONE	13.81	NONE
	01/10/97	NONE	18.92	NONE
	04/02/97	NONE	15.20	NONE

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2775TL14.WK1/P64661/HMM/BDP (04-10-97/BDP) - Page 3 of 4

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Monitoring Well Water / Product Levels

WELL IDENTIFICATION	DATE	DEPTH TO PRODUCT (feet)	DEPTH TO WATER (feet)	PRODUCT LEVEL THICKNESS (feet)
MW-13	11/17/94	20.41	20.49	0.08
	02/09/95	20.84	20.87	0.03
	06/16/95	21.35	21.40	0.05
	10/02/95	19.35	19.44	0.09
	11/25/95	21.53	21.58	0.05 (1)
	04/16-17/96	21.82	21.90	0.08
	07/05/96	21.00	21.05	0.05 (1)
	09/30/96	16.40	16.42	0.02
	01/10/97	19.17	19.19	0.02
	04/02/97	18.50	18.52	0.02
MW-14	11/17/94	NONE	18.11	NONE
	02/09/95	NONE	18.45	NONE
	06/16/95	NONE	18.93	NONE
	10/02/95	NONE	18.63	NONE
	11/26/95	NONE	18.83	NONE
	04/16-17/96	NONE	18.55	NÓNE
	07/06/96	NONE	18.58	NONE
	09/30/96	NONE	17.63	NONE
	01/10/97	NONE	17.42	NONE
	04/02/97	NONE	17.82	NONE

Amoco Pipeline Company Artesia, New Mexico

(1) Well bailed after level measurements taken.

2775TL14.WK1/P64661/HMM/BDP (04-10-97/BDP) - Page 4 of 4

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APPENDIX A

LABORATORY RESULTS

- BETX Results For The Influent and Effluent Of The Air Stripper --Samples Taken 11/10/96
- Quarterly BETX Results for Monitoring Wells with no Free Product

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Remediation System 1997 First Quarterly Report Amoco Pipeline Station - Artesia, New Mexico 2775RE06.HMM/P64661 (04-21-97/KLT)

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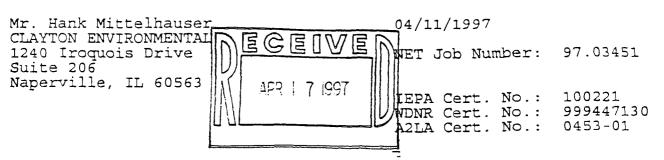


NATIONAL **ENVIRONMENTAL** TESTING. INC.

Bartlett Division 850 West Bartlett Rd. Bartlett, IL 60103 Tel: (630) 289-3100 Fax: (630) 289-5445

Bockford Division 3548 35th Street Rockford, IL 61109

Tel: (815) 874-2171 Fax: (815) 874-5622 (800) 807-2877



Enclosed is the Analytical and Quality Control reports for the following samples submitted to Bartlett Division of NET, Inc. for analysis.

Project Description: Amoco Pipeline Co.-Artesia Station

Sample Number	Sample Description	Date Taken	Date Received
404147 404148 404149 404150 404151 404152 404153 404154 404155	Influent; Grab Effluent; Grab Monitor Well #11; Grab Monitor Well #14; Grab Monitor Well #12; Grab Monitor Well #6; Grab Monitor Well #7; Grab Monitor Well #4; Grab Trip Blank	04/02/1997 04/02/1997 04/02/1997 04/02/1997 04/02/1997 04/02/1997 04/02/1997 04/02/1997	04/03/1997 04/03/1997 04/03/1997 04/03/1997 04/03/1997 04/03/1997 04/03/1997 04/03/1997 04/03/1997

Sample analysis in support of the project referenced above has been These completed and results are presented on the following pages. results apply only to the samples analyzed. Reproduction of this report only in whole is permitted. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Procedures used follow NET Standard Operating Procedures which reference the methods listed on your report. Should you have questions regarding procedures or results, please do not hesitate to call. NET has been pleased to provide these analytical services for you.

This Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Approved by

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Mary Pearson Project Manager







NATIONAL ENVIRONMENTAL TESTING, INC. Bartlett Division 850 West Bartlett Rd. Bartlett, IL 60103 Tel: (630) 289-3100

Fax: (630) 289-5445

Rockford Division 3548 35th Street Rockford, IL 61109

Tel: (815) 874-2171 Fax: (815) 874-5622 (800) 807-2877

ANALYTICAL REPORT

04/11/1997

Sample No. : 404147

NET Job No.: 97.03451

Sample Description:

Suite 206

Mr. Hank Mittelhauser

CLAYTON ENVIRONMENTAL 1240 Iroquois Drive

Naperville, IL 60563

Influent; Grab Amoco Pipeline Co.-Artesia Station

Date Taken: 04/02/1997 Time Taken: 11:00 IEPA Cert. No. 100221 Date Received: 04/03/1997 Time Received: 10:15 WDNR Cert. No. 999447130

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Parameter	Results	Onits	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
UST VOLATILES 8240 - AQUEOUS							
Benzene	1,800	ug/L	04/09/1997	1.0	kaf	1890	8240 (1)
Ethyl Benzene	180	ug/L	04/09/1997	1.0	kaf	1890	8240 (1)
Toluene	<20	ug/L	04/09/1997	1.0	kaf	1890	8240 (1)
Xylenes, Total	470	ug/L	04/09/1997	1.0	kaf	1890	8240 (1)
Surr: Toluene-d8	90.0	£	04/09/1997	88-110	kaf	1890	8240 (1)
Surr: Bromofluorobenzene	91.6	£	04/09/1997	86-115	kaf	1890	8240 (1)
Surr: 1,2-Dichloroethane-d4	78.8	£	04/09/1997	76-114	kaf	1890	8240 (1)

VOA analyzed at a 20x dilution.



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NATIONAL ENVIRONMENTAL TESTING, INC. Bartlett Division 850 West Bartlett Rd. Bartlett, IL 60103 Tel: (630) 289-3100 Fax: (630) 289-5445 Rockford Division 3548 35th Street Rockford, IL 61109

Tel: (815) 874-2171 Fax: (815) 874-5622 (800) 807-2877

ANALYTICAL REPORT

04/11/1997

Sample No. : 404148

NET Job No.: 97.03451

Sample Description:

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Suite 206

Mr. Hank Mittelhauser

CLAYTON ENVIRONMENTAL 1240 Iroquois Drive

Naperville, IL 60563

Effluent; Grab Amoco Pipeline Co.-Artesia Station

Date Taken: 04/02/1997 Time Taken: 11:10 IEPA Cert. No. 100221 Date Received: 04/03/1997 Time Received: 10:15 WDNR Cert. No. 999447130

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Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
UST VOLATILES 8240 - AQUEOUS							
Benzene	19	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Ethyl Benzene	1.9	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Toluene	<1.0	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Xylenes, Total	5.8	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Surr: Toluene-d8	92.2	8	04/11/1997	88-110	kaf	1894	8240 (1)
Surr: Bromofluorobenzene	93.8	8	04/11/1997	86-115	kaf	1894	8240 (1)
Surr: 1,2-Dichloroethane-d4	82.8	Ł	04/11/1997	76-114	kaf	1894	8240 (1)





Bartlett Division 850 West Bartlett Rd. Bartlett, IL 60103 Tel: (630) 289-3100 Fax: (630) 289-5445 Rockford Division 3548 35th Street Rockford, IL 61109

Tel: (815) 874-2171 Fax: (815) 874-5622 (800) 807-2877

ANALYTICAL REPORT

04/11/1997

Sample No. : 404149

NET Job No.: 97.03451

Sample Description:

a di kana kata mana da kata manangan na kata na manan na manan na manan na manan na manan na manan na kata na m

Suite 206

Mr. Hank Mittelhauser

CLAYTON ENVIRONMENTAL 1240 Iroquois Drive

Naperville, IL 60563

Monitor Well #11; Grab Amoco Pipeline Co.-Artesia Station

Date Taken: 04/02/1997 Time Taken: 11:50 IEPA Cert. No. 100221 Date Received: 04/03/1997 Time Received: 10:15 WDNR Cert. No. 999447130

A MARY CAR STOLER, S. LANDARD, IN CARD, S. M. MARY TANK SHE WITCH STATES AND A STATE OF A STATE OF A STATE OF A

Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
UST VOLATILES 8240 - AQUEOUS							
Benzene	<1.0	ug/L	04/10/1997	1.0	kaf	1892	8240 (1)
Ethyl Benzene	<1.0	աց/Ն	04/10/1997	1.0	kaf	1892	8240 (1)
Toluene	<1.0	ug/L	04/10/1997	1.0	kaf	1892	8240 (1)
Xylenes, Total	<1.0	ug/L	04/10/1997	1.0	kaf	1892	8240 (1)
Surr: Toluene-d8	93.8	£	04/10/1997	88-110	kaf	1892	8240 (1)
Surr: Bromofluorobenzene	96.4	8	04/10/1997	86-115	kaf	1892	8240 (1)
Surr: 1,2-Dichloroethane-d4	77.0	B	04/10/1997	76-114	kaf	1892	8240 (1)



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ANALYTICAL REPORT

Mr. Hank Mittelhauser CLAYTON ENVIRONMENTAL 1240 Iroquois Drive Suite 206 Naperville, IL 60563

04/11/1997

Sample No. : 404150

NET Job No.: 97.03451

Sample Description:

Monitor Well #14; Grab Amoco Pipeline Co.-Artesia Station

Date Taken: 04/02/1997 Time Taken: 12:26 IEPA Cert. No. 100221 Date Received: 04/03/1997 Time Received: 10:15 WDNR Cert. No. 999447130

Parameter	Results	Units	Date of	Method	Analyst	Batch No.	Analytical
			Analysis	PQL		Prep/Run	Method
UST VOLATILES 8240 - AQUEOUS							
Benzene	<1.0	ug/L	04/10/1997	1.0	kaf	1892	8240 (1)
Ethyl Benzene	<1.0	ug/L	04/10/1997	1.0	kaf	1892	8240 (1)
Toluene	<1.0	ug/L	04/10/1997	1.0	kaf	1892	8240 (1)
Xylenes, Total	<1.0	ug/L	04/10/1997	1.0	kaf	1892	8240 (1)
Surr: Toluene-d8	91.6	\$	04/10/1997	88-110	kaf	1892	8240 (1)
Surr: Bromofluorobenzene	96.4	\$	04/10/1997	86-115	kaf	1892	8240 (1)
Surr: 1,2-Dichloroethane-d4	83.6	8	04/10/1997	76-114	kaf	1892	8240 (1)



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ANALYTICAL REPORT

Mr. Hank Mittelhauser CLAYTON ENVIRONMENTAL 1240 Iroquois Drive Suite 206 Naperville, IL 60563 04/11/1997

Sample No. : 404151

NET Job No.: 97.03451

Sample Description:

Monitor Well #12; Grab Amoco Pipeline Co.-Artesia Station

Date Taken: 04/02/1997 Time Taken: 12:45 IEPA Cert. No. 100221 Date Received: 04/03/1997 Time Received: 10:15 WDNR Cert. No. 999447130

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Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
UST VOLATILES 8240 - AQUEOUS							
Benzene	<1.0	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Ethyl Benzene	<1.0	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Toluene	<1.0	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Xylenes, Total	<1.0	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Surr: Toluene-d8	93.6	8	04/11/1997	88-110	kaf	1894	8240 (1)
Surr: Bromofluorobenzene	99.0	8	04/11/1997	86-115	kaf	1894	8240 (1)
Surr: 1,2-Dichloroethane-d4	84.6	8	04/11/1997	76-114	kaf	1894	8240 (1)



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ANALYTICAL REPORT

Mr. Hank Mittelhauser CLAYTON ENVIRONMENTAL 1240 Iroquois Drive Suite 206 Naperville, IL 60563

04/11/1997

Sample No. : 404152

NET Job No.: 97.03451

Sample Description:

Monitor Well #6; Grab Amoco Pipeline Co.-Artesia Station

Date Taken: 04/02/1997 Time Taken: 13:15 IEPA Cert. No. 100221 Date Received: 04/03/1997 Time Received: 10:15 WDNR Cert. No. 999447130

Parameter	Results	Units	Dace of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
UST VOLATILES 8240 - AQUEOUS							
Benzene	<1.0	ug/L	04/11/1997	1.0	kaf	1893	8240 (1)
Bthyl Benzene	<1.0	ug/L	04/11/1997	1.0	kaf	1893	8240 (1)
Toluene	<1.0	ug/L	04/11/1997	1.0	kaf	1893	8240 (1)
Xylenes, Total	<1.0	ug/L –	04/11/1997	1.0	kaf	1893	8240 (1)
Surr: Toluene-d8	93.6	₽	04/11/1997	88-110	kaf	1893	8240 (1)
Surr: Bromofluorobenzene	96.4	\$	04/11/1997	86-115	kaf	1893	8240 (1)
Surr: 1,2-Dichloroethane-d4	82.0	8	04/11/1997	76-114	kaf	1893	8240 (1)

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ANALYTICAL REPORT

Mr. Hank Mittelhauser CLAYTON ENVIRONMENTAL 1240 Iroquois Drive Suite 206 Naperville, IL 60563

04/11/1997

404153 Sample No. :

NET Job No.: 97.03451

Sample Description:

Monitor Well #7; Grab Amoco Pipeline Co. - Artesia Station

Date Taken: 04/02/1997 Time Taken: 14:00 IEPA Cert. No. 100221

04/03/1997 Date Received: Time Received: 10:15 WDNR Cert. No. 999447130

Parameter	Results	Units	Date of	Method	Analyst	Batch No.	Analytical
			Analysis	PQL		Prep/Run	Merhod
UST VOLATILES 8240 - AQUEOUS							
Benzene	<1.0	ug/L	04/11/1997	1.0	kaf	1893	8240 (1)
Ethyl Benzene	<1.0	ug/L	04/11/1997	1.0	kaf	1893	8240 (1)
Toluene	<1.0	ug/L	04/11/1997	1.0	kaf	1893	8240 (1)
Xylenes, Total	<1.0	ug/L	04/11/1997	1.0	kaf	1893	8240 (1)
Surr: Toluene-d8	94.4	\$	04/11/1997	88-110	kaf	1893	8240 (1)
Surr: Bromofluorobenzene	97.8	£	04/11/1997	86-115	kaf	1893	8240 (1)
Surr: 1,2-Dichloroethane-d4	84.8	£	04/11/1997	76-114	kaf	1893	8240 (1)

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ANALYTICAL REPORT

Mr. Hank Mittelhauser CLAYTON ENVIRONMENTAL 1240 Iroquois Drive Suite 206 Naperville, IL 60563

04/11/1997

Sample No. : 404154

NET Job No.: 97.03451

Sample Description:

Monitor Well #4; Grab Amoco Pipeline Co.-Artesia Station

Date Taken: 04/02/1997 Time Taken: 15:12 IEPA Cert. No. 100221

Date Received: 04/03/1997 Time Received: 10:15 WDNR Cert. No. 999447130

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Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
UST VOLATILES 8240 - AQUEOUS							
Benzene	1.3	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Ethyl Benzene	<1.0	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Toluene	<1.0	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Xylenes, Total	<1.0	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Surr: Toluene-d8	93.0	8	04/11/1997	88-110	kaf	1894	8240 (1)
Surr: Bromofluorobenzene	95.0	8	04/11/1997	86-115	kaf	1894	8240 (1)
Surr: 1,2-Dichloroethane-d4	85.0	\$	04/11/1997	76-114	kaf	1894	8240 (1)





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ANALYTICAL REPORT

Mr. Hank Mittelhauser CLAYTON ENVIRONMENTAL 1240 Iroquois Drive Suite 206 Naperville, IL 60563 04/11/1997

Sample No. : 404155

NET Job No.: 97.03451

Sample Description:

Trip Blank Amoco Pipeline Co.-Artesia Station

Date Taken: Time Taken: IEPA Cert. No. 100221 Date Received: 04/03/1997 Time Received: 10:15 WDNR Cert. No. 999447130

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Parameter	Results	Units	Date of Analysis	Method PQL	Analyst	Batch No. Prep/Run	Analytical Method
UST VOLATILES 8240 - AQUEOUS							
Benzene	<1.0	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Ethyl Benzene	<1.0	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Toluene	<1.0	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Xylenes, Total	<1.0	ug/L	04/11/1997	1.0	kaf	1894	8240 (1)
Surr: Toluene-d8	91.8	£	04/11/1997	88-110	kaf	1894	8240 (1)
Surr: Bromofluorobenzene	96.0	8	04/11/1997	86-115	kaf	1894	8240 (1)
Surr: 1,2-Dichloroethane-d4	82.8	8	04/11 / 1997	76-114	kaf	1894	8240 (1)





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QUALITY CONTROL REPORT

CONTINUING CALIBRATION VERIFICATION

CLAYTON ENVIRONMENTAL 1240 Iroquois Drive Suite 206 Naperville, IL 60563 Mr. Hank Mittelhauser

04/11/1997

NET Job Number: 97.03451

	Run	CCV		
	Batch	True	Conc.	Percent
Analyte	Number	Conc.	Found	Recovery
UST VOLATILES 8240 - AQUEOUS				
Benzene	1890	50.0	45.7	91.4
Ethyl Benzene	1890	50.0	44.6	89.2
Toluene	1890	50.0	43.6	87.2
Xylenes, Total	1890	150	130	86.7
UST VOLATILES 8240 - AQUEOUS				
Benzene	1892	50.0	52.4	104.8
Ethyl Benzene	1892	50.0	51.4	102.8
Toluene	1892	50.0	50.3	100.6
Xylenes, Total	1892	150	152	101.3
UST VOLATILES 8240 - AQUEOUS				
Benzene	1893	50.0	44.0	88.0
Sthyl Benzene	1893	50.0	43.9	87.8
Toluene	1893	50.0	44.4	88.9
Xylenes, Total	1893	150	132	88.0
UST VOLATILES 8240 - AQUEOUS				
Benzene	1894	50.0	50.5	101.0
Sthyl Benzene	1894	50.0	50.2	100.4
Toluene	1894	50.0	49.9	99.8
Xylenes, Total	1894	150	151	100.7



CCV - Continuing Calibration Verification

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QUALITY CONTROL REPORT

BLANK ANALYSIS

CLAYTON ENVIRONMENTAL 1240 Iroquois Drive Suite 206 Naperville, IL 60563 Mr. Hank Mittelhauser

04/11/1997

NET Job Number: 97.03451

	Prep	Run	Blank			
	Batch	Batch	Analysis		Reporting	Analytical
Analyte	Number	Number	Results	Units	Limit	Method
UST VOLATILES 8240 - AQUEOUS						8240B (9)
Benzene		1890	<1.0	uq/L	1.0	82408 (9)
Bthyl Benzene		1890	<1.0	ug/L	1.0	8240B (9)
Toluene		1890	<1.0	ug/L ug/L	1.0	8240B (9)
Xylenes, Total		1890	<1.0	ug/L ug/L	1.0	82408 (9)
Surr: 1,2-Dichloroethane-d4		1890	76.4	8 03\1	76-114	
Surr: Toluene-d8		1890	92.0	* *		8240B (9)
Surr: Bromofluorobenzene		1890	93.0	र १:	88-110 86-115	8240B (9) 8240B (9)
UST VOLATILES 8240 - AQUEOUS		1890	33.0	16	86-115	
Benzene		1892	<1.0	·· / *	• •	8240B (9)
Ethyl Benzene		1892	<1.0	ug/L	1.0	82403 (9)
Toluene		1892	<1.0	ug/L	1.0	8240B (9)
Xylenes, Total		1892	<1.0	ug/L	1.0	8240B (9)
Surr: 1,2-Dichloroethane-d4			<1.0 79.4	ug/L	1.0	82409 (9)
Surr: Toluene-d8		1892 1892		8	76-114	82403 (9)
Surr: Bromofluorobenzene			94.2	8	88-110	8240B (9)
UST VOLATILES 8240 - AQUEQUS		1892	95.4	8	86-115	82408 (9)
Benzene						8240B (9)
		1893	<1.0	ug/L	1.0	8240B (9)
Ethyl Benzene		1893	<1.0	ug/L	1.0	8240B (9)
Toluene		1893	<1.0	ug/L	1.0	8240B (9)
Xylenes, Total		1893	<1.0	ug/L	1.0	8240B (9)
Surr: 1,2-Dichloroethane-d4		1893	82.6	£	76-114	8240B (9)
Surr: Toluene-d8		1893	93.8	8	88-110	82408 (9)
Surr: Bromofluorobenzene		1893	97. 0	8	86-115	8240B (9)
UST VOLATILES 8240 - AQUEOUS						82408 (9)
Benzene		1894	<1.0	ug/L	1.0	8240B (9)
Ethyl Benzene		1894	<1.0	ug/L	1.0	8240B (9)
Toluene		1894	<1.0	ug/L	1.0	8240B (9)
Xylenes, Total		1894	<1.0	ug/L	1.0	8240B (9)

Advisory Control Limits for Blanks:

All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.



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QUALITY CONTROL REPORT

BLANK ANALYSIS

CLAYTON ENVIRONMENTAL 1240 Iroquois Drive Suite 206 Naperville, IL 60563 Mr. Hank Mittelhauser

04/11/1997

NET Job Number: 97.03451

TAN MALE 2 I TRANSPORT MARKED 10 TO THE PROPERTY OF

Analyte	Prep Batch Mumber	Run Batch Number	Blank Analysis Results	Onits	Reporting Limit	Analytical Method
Surr: 1,2-Dichloroethane-d4		1894	80-4	8	76-114	8240B (9)
Surr: Toluene-d8		1894	93-4	8	88-110	8240B (9)
Surr: Bromofluorobenzene		1894	96-0	8	86-115	8240B (9)

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Advisory Control Limits for Blanks:

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All compounds should be less than the Reporting Limit, except for phthalate esters, toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit.

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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

CLAYTON ENVIRONMENTAL 1240 Iroquois Drive Suite 206 Naperville, IL 60563 Mr. Hank Mittelhauser

04/11/1997

NET Job Number: 97.03451

	Prep	Run			
	Batch	Batch	True	Conc.	LCS
Analyte	Number	Number	Conc.	Found	% Recovery
UST VOLATILES 8240 - AQUEOUS			.		
Benzene		1890	20.0	19.4	97.0
Ethyl Benzene		1890	20.0	19.5	97.5
Toluene		1890	20.0	19.1	95.5
Xylenes, Total		1890	60.0	57.2	95.3
Surr: 1,2-Dichloroethane-d4		1890	50.0	38.4	76.8
Surr: Toluene-d8		1890	50.0	46.3	92.6
Surr: Bromofluorobenzene		1890	50.0	46.1	92.2
UST VOLATILES 8240 - AQUEOUS					
Benzene		1892	20.0	18.1	90.5
Ethyl Benzene		1892	20.0	20.0	100.0
Toluene		1892	20.0	18.7	93.5
Xylenes, Total		1892	60.0	56.4	94.0
Surr: 1,2-Dichloroethane-d4		1892	50.0	40.1	80.2
Surr: Toluene-dß		1892	50.0	46.6	93.2
Surr: Bromofluorobenzene		1892	50.0	47.5	95.0
UST VOLATILES 8240 - AQUEOUS					
Benzene	,	1893	20.0	17.1	85.5
Ethyl Benzene		1893	20.0	18.8	94.0
Toluene		1893	20.0	18.4	92.0
Xylenes, Total		1893	60.0	55.0	91.7
Surr: 1,2-Dichloroethane-d4		1893	50.0	42.3	84.6
Surr: Toluene-d8		1893	50.0	47.0	94.0
Surr: Bromofluorobenzene		1893	50.0	47.9	95.8
UST VOLATILES 8240 - AQUEOUS					
Benzene		1894	20.0	18.2	91.0
Ethyl Benzene		1894	20.0	19.2	96.0
Toluene		1894	20.0	18.2	91.0
Xylenes, Total		1894	60.0	55.0	91.7
Surr: 1,2-Dichloroechane-d4		1894	50.0	43.2	86.4
Surr: Toluene-d8		1894	50.0	46.0	. 92.0







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QUALITY CONTROL REPORT

LABORATORY CONTROL STANDARD

CLAYTON ENVIRONMENTAL 1240 Iroquois Drive Suite 206 Naperville, IL 60563 Mr. Hank Mittelhauser

04/11/1997

NET Job Number: 97.03451

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Analyte	Prep Batch Rumber	Run Batch Number	True Conc.	Conc. Found	LCS % Recovery
Surr: Bromofluorobenzene		1894	50.0	47.2	94.4

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QUALITY CONTROL REPORT

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

CLAYTON ENVIRONMENTAL 1240 Iroquois Drive Suite 206 Naperville, IL 60563 Mr. Hank Mittelhauser 04/11/1997

NET Job Number: 97.03451

Analyte	Prep Batch Number	Run Batch Number	Matrix Spike Result	Sample Result	Spike Amount	Units	Percent Recovery	MSD Result	MSD Spike Amount	Units	Percent Recovery	MS/M RPD
UST VOLATILES 8240 - AQUEOU												
Benzene		1890	67.2	50	20.0	ug/L	86.0	66.6	20.0	ug/L	83.0	3.5
Ethyl Benzene		1890	24.9	5.0	20.0	ug/L	99.5	24.4	20.0	ug/L	97.0	2.5
Toluene		1890	38.0	19	20.0	ug/L	95.0	37.4	20.0	ug/L	92.0	3.2
(ylenes, Total		1890	96.1	39	60.0	ug/L	95.2	93.8	60.0	ug/L	91.3	4.2
UST VOLATILES 8240 - AQUEOU												
Benzene		1892	19.2	<1.0	20.0	ug/L	96.0	19.1	20.0	ug/L	95.5	ο.Ξ
Ethyl Benzene		1892	20.3	<1.0	20.0	ug/L	101.5	20.6	20.0	ug/L	103.0	1.5
Toluene		1892	19.5	<1.0	20.0	ug/L	97.5	20.1	20.0	ug/L	100.5	2.9
Xylenes, Total		1892	58.8	<1.0	60.0	ug/L	98.0	60.7	60.0	ug/L	101.2	3.1

NOTE: Matrix Spike Samples may not be samples from this job.

Advisory Control Limits for MS/MSDs:

For Inorganic Parameters and GC Volatiles, the spike recovery should be 75 - 125% if the spike added value was greater than or equal to one fourth of the sample result value. If not, the control limits are not established. The RPD for the MS/MSD pair should be less than 20.



MS = Matrix Spike

MSD - Matrix Spike Duplicate RPD - Relative Percent Difference

RPD calculations are performed on the Percent Recovery calculated from the observed Matrix spike and Matrix Spike Duplicate results.

NET Midwest, Bartlett Division

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	: Less than; When appearing in the results column indicates the analyte was not detected at or above the reported value.
mg/L	: Concentration in units of milligrams of analyte per liter of sample. Measurement used for aqueous samples. Can also be expressed as parts per million (ppm).
<i>n</i> ð\3	: Concentration in units of micrograms of analyte per gram of sample. Measurement used for non-aqueous samples. Can also be expressed as parts per million (ppm) or mg/Kg.
ug/L	: Concentration in units of micrograms of analyte per liter of sample. Measurement used for aqueous samples. Can also be expressed as parts per billion (ppb).
ਘਰ/Kਰ	: Concentration in units of micrograms of analyte per kilogram of sample. Measurement used for non-aqueous samples. Can also be expressed as parts per billion (ppb).
TCLP	: These initials appearing in front of an analyte name indicate that the Toxicity Characteristic Leaching Procedure (TCLP) was performed for this test.
Surr:	: These initials are the abbreviation for surrogate. Surrogates are compounds that are chemically similar to the compounds of interest. They are part of the method quality control requirements.
ŧ	: Percent; To convert ppm to %, divide the result by 10,000. To convert % to ppm, multiply the result by 10,000.
ICP	: Indicates analysis was performed using Inductively Coupled Plasma Spectroscopy.
АА	: Indicates analysis was performed using Atomic Absorption Spectroscopy.
GFAA	: Indicates analysis was performed using Graphite Furnace Atomic Absorption Spectroscopy.
PQL	: Practical Quantitation Limit; the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Method References

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- Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", USEPA SW-846, 3rd Edition, 1986.
- (2) ASTM "American Society for Testing Materials"
- (3) <u>Methods 100 through 499:</u> see "Methods for Chemical Analysis of Water and Wastes", USEPA, 600/4-79-020, Rev. 1983.
- (4) See "Standard Methods for the Examination of Water and Wastewater", 17th Ed, APHA, 1989.
- (5) <u>Methods 600 through 625:</u> see "Guidelines Establishing Test Procedures for the Analysis of Pollutants", USEPA Federal Register Vol. 49 No. 209, October 1984.
 - (6) <u>Methods 500 through 599:</u> see "Methods for the Determination of Organic Compounds in Drinking Water," USEPA 600/4-88/039, Rev. 1988.

(7) See "Methods for the Determination of Metals in Environmental Samples", Supplement I EPA-600/R-94/111, May 1994.

(8) See "Standard Methods for the Sxamination of Water and Wastewater", 18th Ed., APHA, 1992.

(9) <u>Methods 1000 through 9999:</u> see "Test Methods for Evaluating Solid Waste", USEPA SW-846, 3rd Edition, 1986, Including Updates I and II.

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DATE TIME SAMPLE ID/DESCRIPTION	Containers T NOO T NO		Which regulations apply: RCRA NPDES Wastewator UST Drinking Water Other None
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4/2/97 11:50 3 YOAS MEANTON WOII A	14 KAX X I		
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I REQUEST NET	E REMAINDER TO CLIENT VIA TO DISPOSE OF ALL SAMPLE REM/		DATE 4/2/82 100
HELPOURSHED BY: DATE TIME 17:00	RECEIVED BY:	nering hours BI:	4397 10:15 Ctourd
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Amoco Exploration and Production Natural Gas Group

U.S. NGL Business Unit 501 WestLake Park Boulevard Post Office Box 3092 Houston, Texas 77253-3092

August 8, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Roger Anderson Environmental Bureau Chief New Mexico Oil Conservation Division 2040 South Pacheco Santa Fe, New Mexico 87505

Re: Empire Abo Gasoline Plant Discharge Plan GW-22, Eddy County, New Mexico

Dear Mr. Anderson,

Amoco Production Company closed the sale of the subject facility to ARCO Permian in August, 1996. Amoco has made ARCO Permian aware of the existence of the facility Discharge Plan and provided a copy thereof to ARCO Permian. Please remove Amoco Production Company as the operator for this plan.

Please feel free to contact Mike McKinley at (713) 366-3907 if you need further information on this matter.

Sincerely

H. A. Partlow Manager, Environment, Health & Safety Services

cc: Mr. Eric Siegmund ARCO Permian P. O. Box 1610 Midland, Texas 79702

> Ronnie Tuttle - Empire Abo Gas Plant Neal Spencer - 1750 WL3, Houston Tim Custer - 1710 WL3, Houston

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AUG 1 3 1996

Environmental Bureau Oil Conservation Division

August 8, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Eric Siegmund **ARCO** Permian P. O. Box 1610 Midland, TX 79702

Re: Empire Abo Gasoline Plant Discharge Plan GW-22. Eddy County, New Mexico

Dear Mr. Siegmund,

As you are aware, Amoco Production Company closed the sale of the subject facility to ARCO Permian in August, 1996. Attached are copies of the facility Discharge Plan submitted in November 1994, and a letter approving the plan issued by the Oil Conservation Division in January, 1995. Amoco has previously made ARCO Permian aware of the existence of the plan and provided a copy thereof to ARCO Permian.

Amoco requests that ARCO Permian make any necessary filings to accept transfer of the plan. A copy of this letter, without attachments, will also be sent to the New Mexico Oil Conservation Division.

Please feel free to contact Mike McKinley at (713) 366-3907 if you need further information on this matter.

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Sincerely.

H. A. Partlow Manager, Environment, Health & Safety Services

CC: Mr. Roger Anderson, New Mexico Oil Conservation Division 2040 South Pacheco Santa Fe, NM 87505

> Ronnie Tuttle - Empire Abo Gas Plant Neal Spencer - 1750 WL3, Houston Tim Custer - 1710 WL3, Houston



Amoco Exploration and Production Natural Gas Group

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U.S. NGL Business Unit 501 WestLake Park Boulevard Post Office Box 3092 Houston, Texas 77253-3092

OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

Time 2:20 PM 9-12-96 Date Telephone Personal 915-688-5799 Other Parties Originating Party Ms. Margaret Lowe. Enr. Engla Pat Sanchez - OCT ul Arco Permian Subject Gas Plant -GW-22 Transfe Empire Abo 3111 pg. 36. Pev Discussion Ms. if She had -and tecieved from notice 1 etter AMOLO and 51 iy forme her then 36 they 31 · pm. wor 563 10 5 AVCO cl an Perman \mathbb{Q} inh Conclusions or Agreements will - Lubmi Ms. gwe COVEN 4 had 3111 (Walc) ypdate plant 45mg Sch num 01 V Lor am Distribution File Signed

STATE OF NEW MEXICO OIL CONSERVATION DIVISION MEMORANDUM OF MEETING OR CONVERSATION Certified Mail: P-594-835-290 816196 1:45 PM Time Date Telephone Personal Originating Party Other Parties Sunchez - OCD Ms. Pegg 1 n Arco aisanen -627- (5_{05}) 7156 Subject New Mexico Plan Requirements 10 harge for Empire Abu 2 15 this Discussion Arip locking at 15 USING and XYUN DIGN + Knon t pormittin NC4 Wrement 3 discharge DIOL Vigur 594 835 230 (D) US Postal Service Receipt for Certified Mail No Insurance Coverage Provided. Do not use for International Mail (See reverse) Street & Number Post Office, State, & ZIP Code Conclusions or Agreements Postage 63 MG. will Waismen GIVE CA ding Deven Datentia VP lus vcgula tions <u>Distribution</u> Signed File

ACKNOWLEDGEMENT OF RECEIPT OF CHECK/CASH

e4-

I hereby acknowledge receipt o	f check No. dated $1-16-95$,
or cash received on	in the amount of \$ 1667.50
from Anice PRODUCTION	1 CONPARIY
for (CW-22) ABO G	MS PLANT
Submitted by:	رته می » Date:
submitted to ASD by:	Date: 2 - 15 - 95
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STATE OF NEW MEXICO County of Bernalillo

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Bill Tafoya being duly sworn declares and says that he is Classified Advertising manager of The Albuquerque Journal, and that this newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Session Laws of 1937, and that payment therefore has been made or assessed as court costs; that the notice, copy of which is hereto attached, was published in said paper in the regular daily edition, 25th day

for <u>concernent</u> times, the first publication being on the of $22c_{2}=$, 1994, and the subsequent consecutive publications

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SMERIAL CALAS legau Allan NOTARY FURLIC STATE OF NAW MUSIC ommission Explore:

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Sworn and subscribed to before the, a notary Public in and for the County of Bernalillo and State of New Mexico, this 25th day of . 72 1994.

PRICE

Statement to come at end of month.

CLA-22-A (R-1/93) ACCOUNT NUMBER <u>C 80932</u>

 87505, Teleptione (505) 827-31:
 (GW-22) Amoco Production Company, N.E. Sponcer, Man-gor Plant Operations, P.O. Box 3092; Houston, Texas, 77283, 3082; Houston, Texas, 77283, 3092; Houston, Texas, 77283, 1007; Spitz, Hanger, Status, Houston, Spitz, MMPM, Eddy County, Naw Maxico, Approxi-mately, 71, 620, galloná par day of, Wasdo, Jonar, with a total discolved isolido concentra-tion, of 11,000 mg/r will be collected and stored in an above ground closed top steel hank prior to transport to an OCD approved offsite disposal facility. Groundwater most likely, the antifected in the tant prior to transport to an OCD approved offsite disposal facility. Groundwater most facility. Groundwater most facility. Groundwater most facility. Bo the state of the ovort of an accidental dis-observed colids concentra-dissolved colids concentra-tion of opproximately 300 mg/l. The discharge pion addresses how spills i loaks and other nacidental discharges to the surface will be managed. (GW-31) "Iteration Oil Com-bary Motion Colids and the accidental discharges to the surface will be managed. (GW-31) "Iteration Oil Com-bary Motion Emironmental Repro-sentative" P.O. Box 1822, has tempeted in the Nirk Bear plan application for renewal box field the state of the plan application for renewal box 23 East, NMPM addy County, New Lesses, Approxi-tative will be stored in above ground toxed top stoel nnks prior to diposal a approved I OCD appro disposal (facility, Total) solved solids concentratio total deceived bolida con-centration of Isia mg/L The disclarge plan additionable to the spille of leave and other accidential discharges to the surface will be managed. Any interestig beron rist' obtain further information mon the Oli Ob-servation Division and may submit written comments to the Director of the Oli Conservation Division is the address given tabor. The discharge plan application may be viewed at the address given tabor. The discharge plan application may be viewed at the address given tabor. The discharge plan application may be viewed at the address given tabor. The discharge plan application may be viewed at the borne of the Oli Conservation Division and 4.00 plm, Mondae thus food dischard billing on any protosed thechard billing on any protosed the oliver address before the billing of any be automated to the billing of hearing the oliver of bublication of this notice during wich comments the address before the billing of devision of the food earth of the billing of the billing of a set of the arting the food of the billing hearing the billing of the billing of the address before the billing of hearing the bill of the billing of hearing the billing of the billing of hearing the billing of the billing hearing the bill of the billing of hearing the billing of the billing hearing total dissolved solida con centration of USO mg/L. Th discharge plan addressed how The

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Affidavit of Pullication

No. 14897

STATE OF NEW MEXICO,

County of Eddy:

Gary D. Scott	being duly
sworn, says: That he is the	Publisher of The
Artesia Daily Press, a daily n	ewspaper of general circulation,
published in English at Artesia	, said county and state, and that
the hereto attached Lega	l Notice

was published in a regular and entire issue of the said Artesia Daily Press, a daily newspaper duly qualified for that purpose within the meaning of Chapter 167 of the 1937 Session Laws of

days" the state of New Mexico for _____l ____consecutive weeks on

- - - /

the same day as follows:

First Publication <u>November 23, 1994</u>
Second Publication
Third Publication
Fourth Publication
Xan Katt
Subscribed and sworn to before me this
December 19_{94}
on De l' Maann
Notary Public, Eddy County, New Mexico

My Commission expires September 23, 1996

LEGAL NOTICE

NOTICE OF PUBLICATION STATE OF NEW MEXICO



Control of Publication ENERGY, MINERALS AND CONCENTRATION OF

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to the New Mexico Water Quality Control Commission Regulations, the following discharge plan applications have been submitted to the Director of the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telepphone. (505)827-7131: (GW-22) - Amoco Production Company, N.E. Spencer, Manager Plant Operations, P.O. Box 3092, Houston, Texas, 77253, has submitted a discharge plan application for renewal for their Empire Abo Gas Plant located in the NE/4 SE/4 Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. Approximately 17,500 gallons per day of waste water with a total dissolved solids concentration 11,000 mg/1 will be collected and stored in an above ground closed top steel tank prior to transport to an OCD appproved offsite disposal facility. Groundwater most likely to be affected in the event of an accidental discharge is at a depth approximately 50 feet with a total dissolved solids concentration of approximately 300 mg/1. The discharge plan addresses how spills, leaks, and other accidental discharges to the surface will be managed. (GW-21) - Marathon Oil Company, Robert Menzie, Jr., Production Environmental Representative, P.O. Box 552, Midland, Texas, 79792-0552, has submitted a discharge plan ap-

plication for renewal for their

Îndian Basin Gas Plant located

in the NE/4 Section 23. Town-

ship 21 South, Range 23 East,

NMPM, Eddy County, New

Mexico. Approximately

84,000 gallons per day of waste water will be stored in

above ground closed top steel

tanks prior to disposal at an

OCD approved disposal

facility. Total dissolved solids.

concentration of the waste water is approximately 12,000 mg/1 total dissolved solids. Groundwater most likely to be affected in the event of an accidental discharge is at a depth of approximately 240 feet with a total dissolved solids concentration of 550 mg/1. The discharge plan addresses how spills, leaks and other accidental discharges to the surface will be managed.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge plan application may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday thru Friday. Prior to ruling on any proposed discharge plan or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted to him and public hearing may be requested by any interested person. Request for public heairng shall set forth the reasons why a hearing shall be held. A hearing will be held if the director determines that there is significant public interest.

If no hearing is held, the Director will approve or disapprove the plan based on the information available. If a public hearing is held, the Director will approve tha plan based on the information in the plan and information presented at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 17th day of November, 1994.

STATE OF NEW MEXICO OIL CONSERVATION DIVISION s-William J. LeMay WILLIAM J. LEMAY, Director

SEAL

Published in the Artesia Daily Press, Artesia, N.M. November 23, 1994.

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NOTICE OF PUBLICATION

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

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GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 17th day of November, 1994.

STATE OF NEW MEXICO OIL CONSERVATION DIVISION 00 WILLIAM J. LEMAY, Director

THE REPORT OF MALE AND ADDRESS

SEAL

July 14, 1997

Mr. Roger Anderson New Mexico Oil Conservation Division 2048 South Pacheco Santa Fe, New Mexico 87505

Re: Empire Abo Gasoline Plant

Dear Mr. Anderson:

As we discussed in our phone conversation last week, I am sending you the TCLP metals results from the cooling tower cleaning wastes. This waste stream is the wet sand mixture removed from the basin during recent maintenance on the cooling tower. The TCLP results are significantly below the EPA limits.

We request permission to land spread this waste inside the plant boundaries. The mixture will be spread in a manner to ensure there is no runoff resulting from the application.

We would appreciate your prompt response. If you have any questions, please contact me at (915) 688-5799.

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Sincerely,

April Jangan

Margaret J. Lowe Environmental Engineer

cc: R. McCollum/EAGP File



PHONE (915) 673-7001 @ 2111 BEECHWOOD @ ABILENE, TX 79603

PHONE (505) 393-2326 @ 101 E. MARLAND @ HOBBS, NM 88240

ANALYTICAL RESULTS FOR ELKHORN OPERATING COMPANY ATTN: GLEN PARRISH 257 EMPIRE DRIVE ARTESIA, NM 88210 FAX TO:

Receiving Date: 06/27/97 Reporting Date: 07/11/97 Project Number: NOT GIVEN Project Name: COOLING TOWER Project Location: EMPIRE ABO GAS PLANT Sampling Date: NOT GIVEN Sample Type: SOLID Sample Condition: INTACT Sample Received By: JDP Analyzed By: GP

TCLP METALS

LAB NO. SAMI	PLE ID	As ppm	Ag ppm	Ba ppm	Cd ppm	Cr ppm	Pb ppm	Hg ppm	Se ppm
ANALYSIS DATE:		7/9/97	7/9/97	7/10/97	7/9/97	7/2/97	7/9/97	7/11/97	7/9/97
EPA LIMITS:		5	5	100	1	5	5	0.2	1
H3028-1A COO		<1	<1	<5	<0.1	<1	<1	<0.02	<0.1
·									
Quality Control		0.053	4.01	5.00	1.965	1.08	2.00	0.0091	0.094
True Value QC		0.050	4.00	5.00	2.000	1.00	2.00	0.0100	0.100
% Recovery		106	101	100	98	108	100	91	94
Relative Standard Deviation		5.3	0.3	7.6	0.4	1.1	1.4	6.5	11.1
METHODS: EPA 1		206.2	272.1	208.1	213.1	218.1	239.1	245.1	270.2

Gayle A. Potter, Chemist

07/11/97

STATE OF NEW MEXICO



ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION 2040 S. PACHECO SANTA FE. NEW MEXICO 87505 (505) 827-7131

May 9, 1996

<u>CERTIFIED MAIL</u> <u>RETURN RECEIPT NO. P-269-269-146</u>

Mr. H. A. Partlow Amoco Production Company P.O. Box 3092 Houston, Texas 77253-3092

RE: GROUND WATER REMEDIATION EMPIRE ABO GAS PLANT

Dear Mr. Partlow:

The New Mexico Oil Conservation Division (OCD) has reviewed Amoco Production Company's (Amoco) February 29, 1996 "GROUNDWATER PROJECT, EMPIRE ABO GAS PLANT". This document contains Amoco's plan to modify the current ground water remediation monitoring and reporting schedule for the Empire Abo Gas Plant.

The above referenced plan is approved under the following conditions:

1. The investigation report will contain:

- a. A description of all investigation and remedial activities which have occurred including conclusions and recommendations.
- b. A summary of all past and present laboratory analytic results of ground water quality sampling and copies of the laboratory analyses.
- c. The product thickness in each well.
- d. The volume of product and/or water recovered from each well during the reporting period and the total volume of product and/or water recovered to date.

- 2. Amoco will notify the OCD at least 48 hours in advance of all scheduled activities such that the OCD has the opportunity to witness the events and/or split samples.
- 3. All original documents will be submitted to the OCD Santa Fe Office with copies provided to the OCD Artesia Office.

Mr. H.A. Partlow May 9, 1996 Page 2

Please be advised that OCD approval does not limit Amoco to the work proposed should remedial actions fail to adequately remediate contamination at the site, or if contamination exists which is beyond the scope of the work plan. In addition, OCD approval does not relieve Amoco of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please contact me at (505) 827-7154.

Sincerely

William C. Olson Hydrogeologist Environmental Bureau

xc: OCD Artesia District Office

P 269 269 146

US Postal Service Receipt for Certified Mail No Insurance Coverage Provided. Do not use for International Mail (See reverse) Sent to Street & Number Post Office, State, & ZIP Code Postage \$ Certified Fee Special Delivery Fee **Restricted Delivery Fee** 1995 Return Receipt Showing to Whom & Date Delivered Return Receipt Showing to Whom Date, & Addressee's Address 3800 **TOTAL** Postage & Fees \$ Postmark or Date Form Sd

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Amoco Production Company

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501 WestLake Park Boulevard Post Office Box 3092 Houston, Texas 77253-3092

February 29, 1996

Mr. Roger Anderson Environmental Bureau Chief Oil Conservation Division Energy, Minerals and Natural Resources Department 2040 South PaCheco Street Santa Fe, NM 87505

Groundwater Project Empire Abo Gas Plant

Thank you for taking time to meet with us last week to talk about the Empire Abo Gas Plant (EAGP) remediation project. At this meeting, we addressed a number of issues that were not included in the February 22, 1996 report. Most of these discussions centered around future actions at the site. Below is a summary of the proposed changes to our current remedial program.

Proposed Course of Action

- 1. We are currently measuring and sampling the wells not containing free-phase hydrocarbons on a quarterly basis. These wells will now be measured and sampled on an annual basis. We will notify the New Mexico Oil Conservation Division (OCD) at lease one week prior to sampling.
- 2. We are currently measuring the wells with free-phase hydrocarbons on a quarterly basis. We will now measure these wells semi-annually. Additional measurements will be performed as necessary in order to evaluate the hydrocarbon recovery progress.
- 3. We will provide the OCD with an annual report (to be submitted by March 1) including all measuring/sampling results and a progress report on free-phase hydrocarbon recovery. A copy of the report will be sent to the OCD Artesia District Office.
- 4. After successful removal of the free-phase hydrocarbons, we will evaluate the site for closure.

If you concur with the changes above, please provide us with your written approval for our files. If you need any additional information or have any questions, please contact Scott Neumann at 713-366-2501.

Yours truly

H. A^P Partlow Manager, Environmental, Health and Safety Services

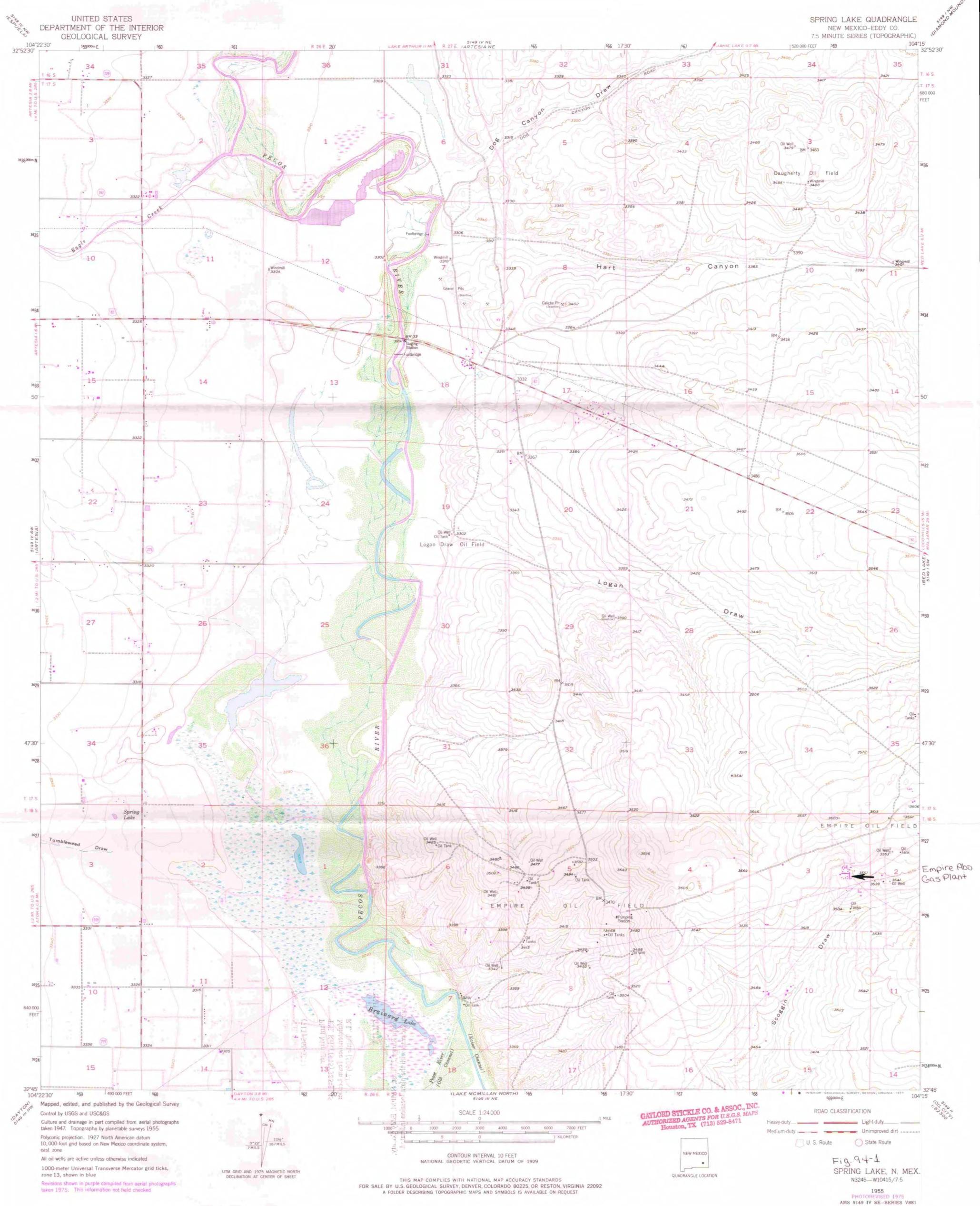
cc: Energy, Minerals and Natural Resources Department
Oil Conservation Division
811 South 1st
Artesia, NM 88210



Discharge Plan Renewal December 1994

Empire Abo Gasoline Plant Eddy County New Mexico

Amoco Production Company



AMOCO PRODUCTION COMPANY

Empire Abo Gasoline Plant

Discharge Plan Renewal

This application for renewal of the discharge plan for the Empire Abo Gasoline Plant follows the Discharge Plan Guidelines issued by the New Mexico Oil Conservation Division (NMOCD). The original plan was approved December 13, 1984 with a subsequent modification approved July 15, 1986 and renewed September 14, 1990. Approval was given by letter dated February 25, 1991 to install a new process drain system. The intent of this application is to incorporate these changes and reflect any other changes to the existing plan.

I. TYPE OF OPERATION

The plant has a design capacity of 56 MMSCFD and currently processes natural gas in the range of 40 MMSCFD. Major plant processes include inlet, residue, refrigeration, compression, dehydration and cryogenic recovery. Residue gas and NGL's are sold via pipeline from the plant. NGL's and sulfur are also trucked from the plant.

II. OPERATOR

Amoco Production Company
P. O. Box 3092Manager, Plant Operations
N.E. Spencer
(713) 366-3373Houston, Texas 77253N.E. Spencer
(713) 366-3373Empire Abo Gasoline Plant
P. O. Box 70Plant Manager
T.E. Krisa (915) 385-3145
Maintenance Team Leader
R.L. Tuttle (505) 748-1271

III. LOCATION OF DISCHARGE/FACILITY

NE/4, SE/4 Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. Figure 94-1 is a topographic map with the plant location indicated.

IV. LANDOWNERS

Amoco Production Company P. O. Box 3092 Houston, Texas 77253

V. FACILITY DESCRIPTION

Facility plot plans are provided in Figures 94-2A, 94-2B, 94-2C and 94-2D.

VI. SOURCES, QUANTITIES & QUALITY OF EFFLUENT WASTE SOLIDS

There is basically no change in the sources of effluent and process fluids from the 1989 plan. Water handling equipment includes boilers, cooling tower, and the amine and caustic systems. Table 94-1 reflects the additives currently being used to treat the water. Appendix 94-A contains a copy of the Material Safety Data Sheets for these additives.

VII. TRANSFER & STORAGE OF PROCESS FLUIDS & EFFLUENTS

A. The <u>closed drain system</u> (Figure 94-3) collects all process hydrocarbon drains and vents. The collected hydrocarbon liquids are transferred via the closed drain headers to the closed drain header tank (sump tank). Liquids are pumped to the North Slop Oil Tank.

The <u>open drain system</u> (Figure 94-4) collects plant process non-hydrocarbon drains. It collects blowdowns and drains from the caustic, amine and glycol systems via the open drain hubs which is stored in the open drain sump and pumped to the wastewater tanks for disposal.

The <u>amine system</u> (Figure 94-5) collects drains off equipment that contained amine for recirculating through the amine system. Equipment drains off the Nos. 1 and 2 amine systems are collected in two underground sumps.

The <u>blowdown system</u> (Figure 94-6) collects the blowdown drains off the five main boilers, the waste heat boiler and the condenser at the sulfur plant. The collection line from the sulfur plant drains into the north end of the evaporation pond. The main boiler blowdown collection line ties into the backwash collection line. This line drains into the east end of the evaporation pond.

The <u>clean slop oil system</u> (Figure 94-7) is a continuation of the closed drain system as well as a drainage system for No.9 compressor scrubber liquids and flare knockout liquids. The system collects liquids from the header drain tank (sump tank), No.9 inlet scrubber and the flare knockout sump and stores these liquids in the North Slop Oil Tank for truck disposal. The <u>dirty slop oil system</u> (Figure 94-8) collects plant compressor fluids and synthetic oil drains in the starting air system and from the containment at the product storage area. These liquids are pumped to the South Slop Oil Tank for disposal. The compressor crankcase vent drip legs and drains empty to 30" steel pits inside the compressor buildings.

The <u>backwash system</u> (Figure 94-9) collects discharge fluids resulting from backwashing water coolers. The collection lines on the west side of the compressor building drain into the evaporation pond. The lines on the east side of the building drain into the compressor pits for disposal through the dirty slop oil system.

Any equipment (i.e. pumps, filters) that has the potential for leaking contamination products onto the ground has <u>concrete containment</u> around it. The containment areas have 6" of wall above and below grade. The containments also have drain points so that any fluid accumulations can be pumped out to an open drain auxiliary hub.

VIII. EFFLUENT DISPOSAL

- A. On-site Disposal: Cooling tower blowdown water, boiler blowdown water and backflush water from the reverse osmosis (RO) unit, used to create soft water for the boilers, is sent to the evaporation pond. Approximately 12,000-15,000 barrels of water per month is transferred from the pond to Stephens & Johnson Operating Company for use in their waterflood operations. Occasionally, some of the water is transferred to the county for use in road construction and repair.
- B. Off-site Disposal

General Refuse - Waste Management hauls to City of Roswell Municipal Landfill, NMEID: #03374.

Oily Waste and Plant Waste Water - I. & W. Inc. hauls to I. & W. Inc's. Walter Solt State Well #1, NMOCD: Order SWD-318 and/or Arco's Empire Abo Unit C-49 SWD, NMOCD: PMX58.

Cooling Tower Blowdown Water - Carried by line to Stephens & Johnson Operating Company's (P.O. Box 2249, Wichita Falls, Tx 76307-2249) waterflood system for their South Red Lake Grayburg Unit.

Filters are picked up by Procycle Metals, Inc., 433 E. Colinas Blvd. #1180, Irving, Texas. Permits: EPA ID #TX0988036026, TWC #41814, TNRCC #20903.

IX. INSPECTION, MAINTENANCE AND REPORTING

There is no change from procedures previously included in the 1984 plan in terms of routine inspection procedures for collection, storage and disposal units having leak detection systems.

The facility is contained on the southwest and southeast through a stormwater control levee. The levee is in place to catch stormwater and to act as a tertiary containment for oil, other hydrocarbon liquids, or chemicals. Any oily fluid that may accumulate in this area will be recovered with vacuum trucks and/or portable pumps and disposed at an approved offsite facility or replaced into the production stream for reconditioning.

X. CONTINGENCY PLAN

A. 1. Oil and Produced Water Spills

In the event of an oil or produced water spill, the person discovering it should immediately notify the appropriate supervisor in charge. This person should assess the situation and stop the source of the spill if it may be safely accomplished. The supervisor in charge should proceed to the spill site and direct control and containment activities. He should assess the need for additional assistance and equipment. Upon assessment the supervisor in charge should immediately contact the Plant Foreman, the AMOCO HOTLINE (713) 366-7500, and the Environment, Health and Safety Coordinator as appropriate.

Immediate notification of district NMOCD office, (505) 748-1283, is required for spills or leaks of 25 bbls. or more of crude oil or condensate of 100 barrels or more of salt water. Written notification is required for spills or leaks of five bbls. or more of oil or condensate or 25 bbls. or more of salt water.

2. Chemical Spills

In the event of a chemical spill, the person discovering the spill should contact the appropriate supervisor. The person discovering the release should not attempt any identification, control or containment without the proper personal protective equipment. Upon proper identification of the chemical, the supervisor should contact the EH&S Coordinator or other EH&S staff through the AMOCO HOTLINE or consult the Material Safety Data Sheets for hazardous characteristics and proper handling procedures.

Chemtrec (800-424-9300) may be contacted with any questions concerning response or chemical hazards.

After proper handling procedures have been identified, control and containment should begin. The supervisor in charge should proceed to the spill site and direct control and containmement activities. He should assess the need for additional assistance and equipment.

Upon assessment, the supervisor should immediately contact the Plant Foreman, the EH&S Coordinator, and the AMOCO HOTLINE as appropriate.

NOTE: Immediate notification per NMOCD Rule 116 (Attachment No.94-B) shall be made to the NMOCD for spills or leaks of any magnitude which may with reasonable probability endanger human health or result in substantial damage to property.

A copy of the current SPCC Plan for the Empire Abo Gasoline Plant is attached as Appendix 94-C.

B. Appendix 94-D provides cleanup guidelines for spills.

XI. SITE CHARACTERISTICS

A. Hydrologic Features

1. The general hydrogeology of the area has been summarized in our approved Discharge Plan submitted in December, 1984. Additional information has been provided to the NMOCD in our semi-annual groundwater monitoring reports which we have been submitting since July, 1992.

In summary, the Empire Abo Gas Plant (EAGP) is located approximately 9 miles southeast of Artesia in Eddy County. The nearest body of water is the Pecos River which is located approximately 4 miles west of the plant. (Figure 94-10). To our knowledge there are no major or minor aquifers present in this area and no wells providing water for any use within one mile of the plant. There are no discharges to the ground at this plant and all water is confined to the closed drain system as previously described.

There are currently 27 active monitor wells located at the site (Figure 94-11). The subsurface hydrogeology is very complicated and it appears very few of the wells are in communication with adjacent

wells. Pump tests indicate that the aquitards are of very limited aerial extent and have no current or future use. Many of the monitor wells have measured free product. Systems to recover free product are currently being evaluated. Figure 94-12 shows the product thickness measured for each well on June 16, 1994.

- 2. Since we have no active discharges to the surface we will not be affecting the groundwater. Several of our monitor wells were sampled for chlorides in the past and they ranged from 600-1800 ppm. The average observed was approximately 1000 ppm.
- No flow direction can be determined from the groundwater monitor wells located at the site due to the inhomogeneity of the subsurface. A 1952 report by the State Bureau of Mines and Mineral Resources suggests a southwesterly flow (Figure 94-13).
- B. Geologic Description of Discharge Site.
 - The soil encountered in the drilling of the monitor wells consisted of dense clays and rock with occasional sand lenses. Figure 94-14 is a 200 foot soil boring which shows the subsurface lithology. No water was encountered in this well.
 - 2. There are no aquifers present in this area, only small non-contiguous perched zones.
 - 3. The water zone appears to be associated with the sands and clays.
 - 4. Most of the monitor wells encountered rock within 10' of the surface.
- C. Flood Protection
 - 1. The flood potential at the site is very low. See details on page 3 of the December 13, 1984 plan.
 - 2. A berm has been constructed to catch any runoff from the plant.

XII. ADDITIONAL INFORMATION

As previously mentioned, the closed loop drain systems, berms, concrete containments, etc. have greatly decreased the potential for any discharges to the surface. These upgrades along with the absence of aquifers and the significant distance to a water body indicate that the potential for contamination from the plant is minimal.

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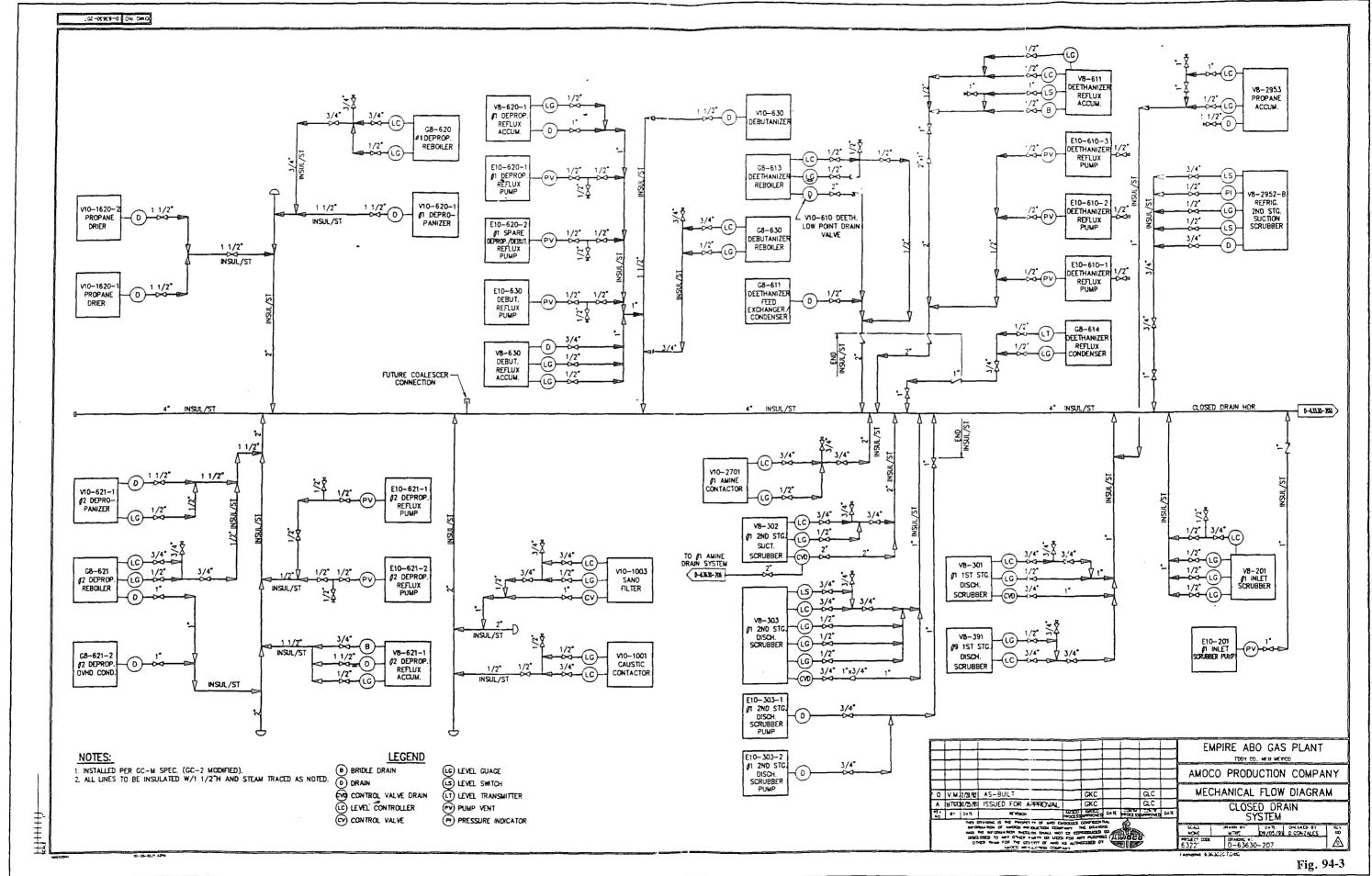
Table 94-1 Characteristics of Effluent Streams Empire Abo Gasoline Plant

		Estimated Flow	Additives to Stream	
Source	Primary Effluent	(GPD)	Material Added	Purpose of Additive
Process System				
1. Separators	Water/H.C. Liquids	3360	None	ł
2. Drains	Oily Water/Caustic/ Amine	840	None	I
 Engine Cooling Systems 	Water/Oil/ H.C. Liquids	420	Unichem 2310	Corrosion Inhibitor
<u>Utility Systems</u>				
1. Boiler/Condensate	Low TDS Water	2200	Unichem 3141 Unichem 3220 Unichem 3030 Unichem 3941	Oxygen Scavenger Corrosion Inhibitor Scale and Corrosion Inhibitor Alkalinity Adjustment Compound
2. Cooling Tower	High TDS Water	10500	Unichem Alpha 570 Unichem Alpha 580 Unichem Alpha 512 Unichem 1300	Biocide Biocide Biocide Scale and Corrosion Inhibitor

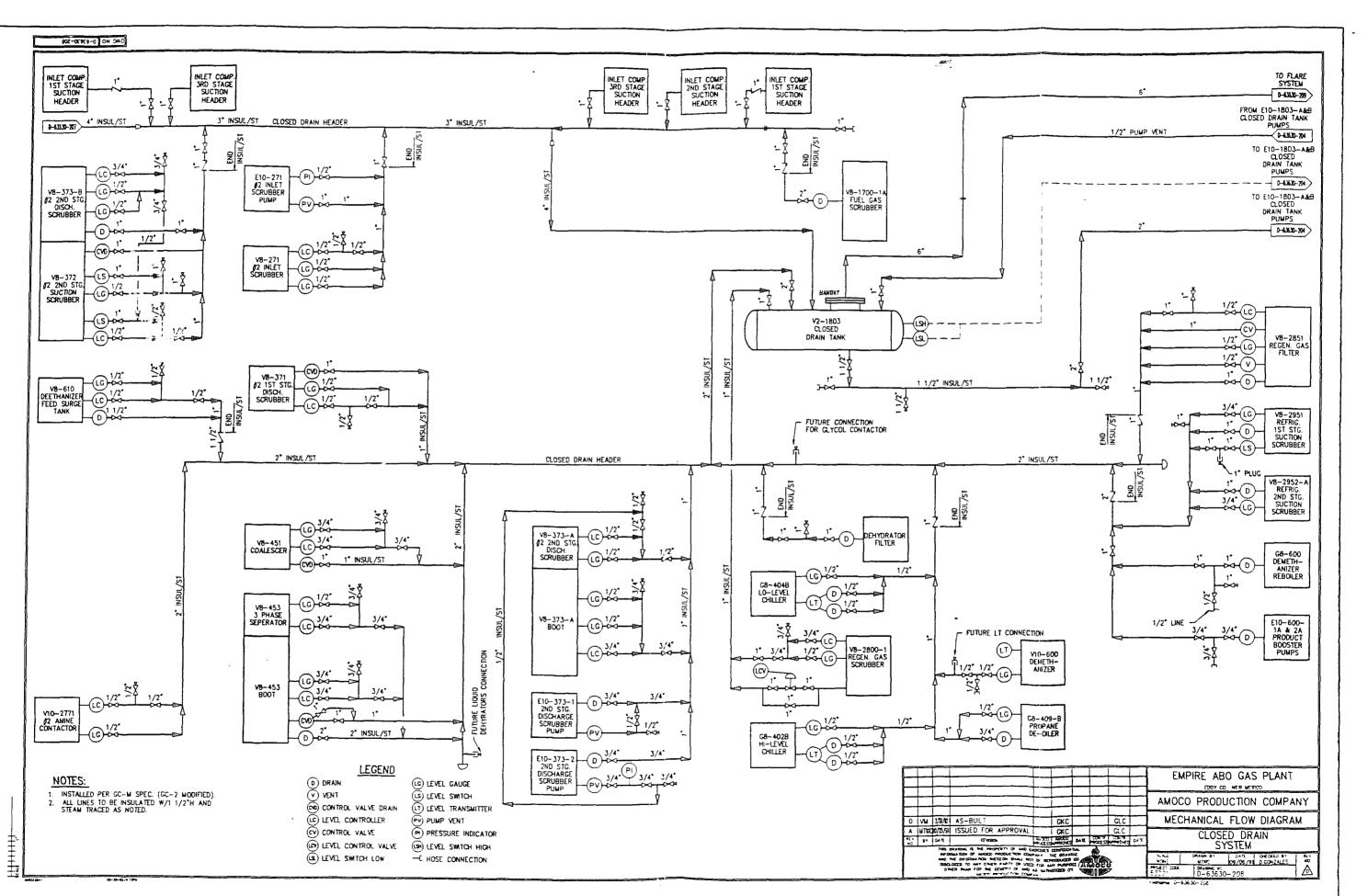
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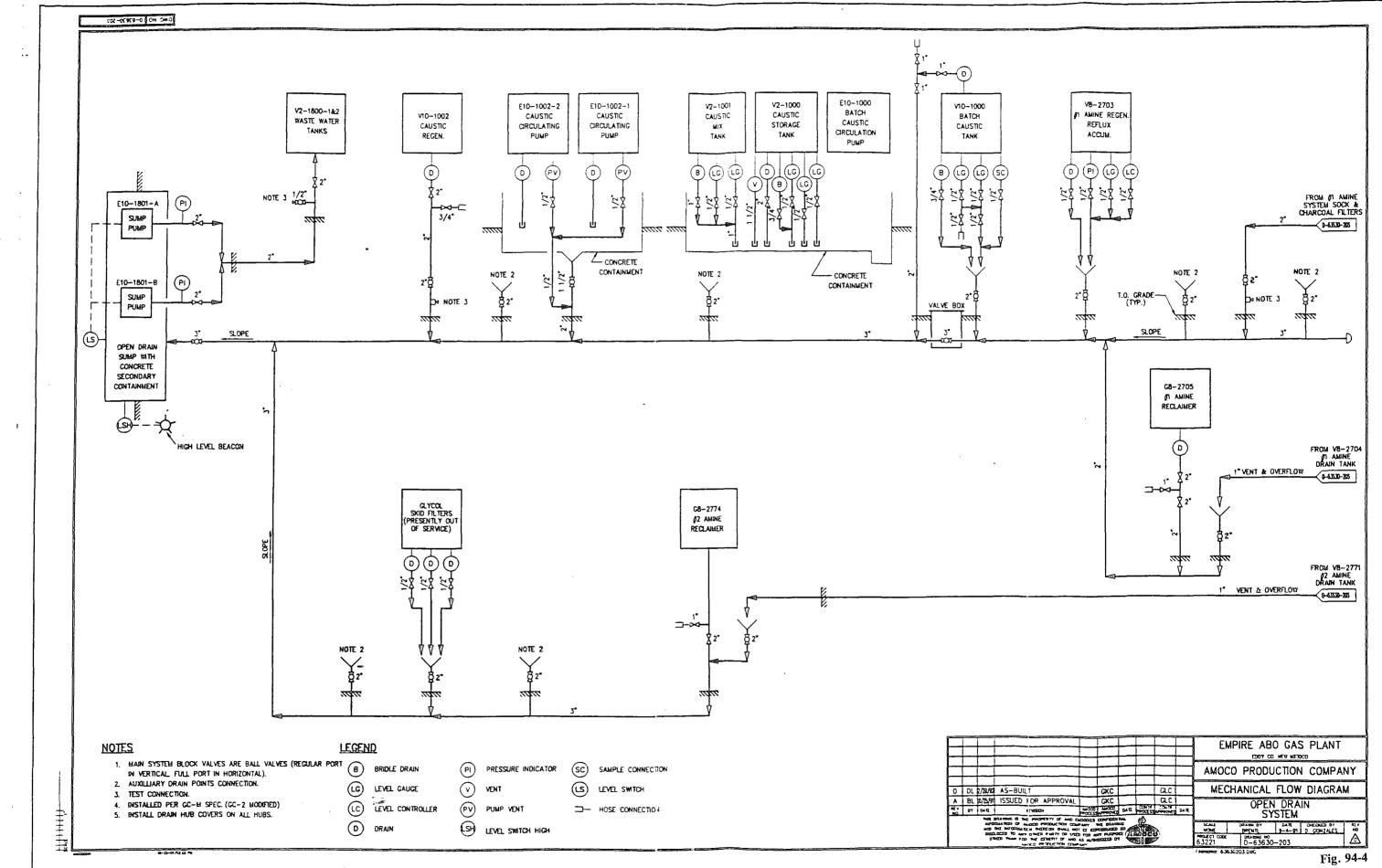
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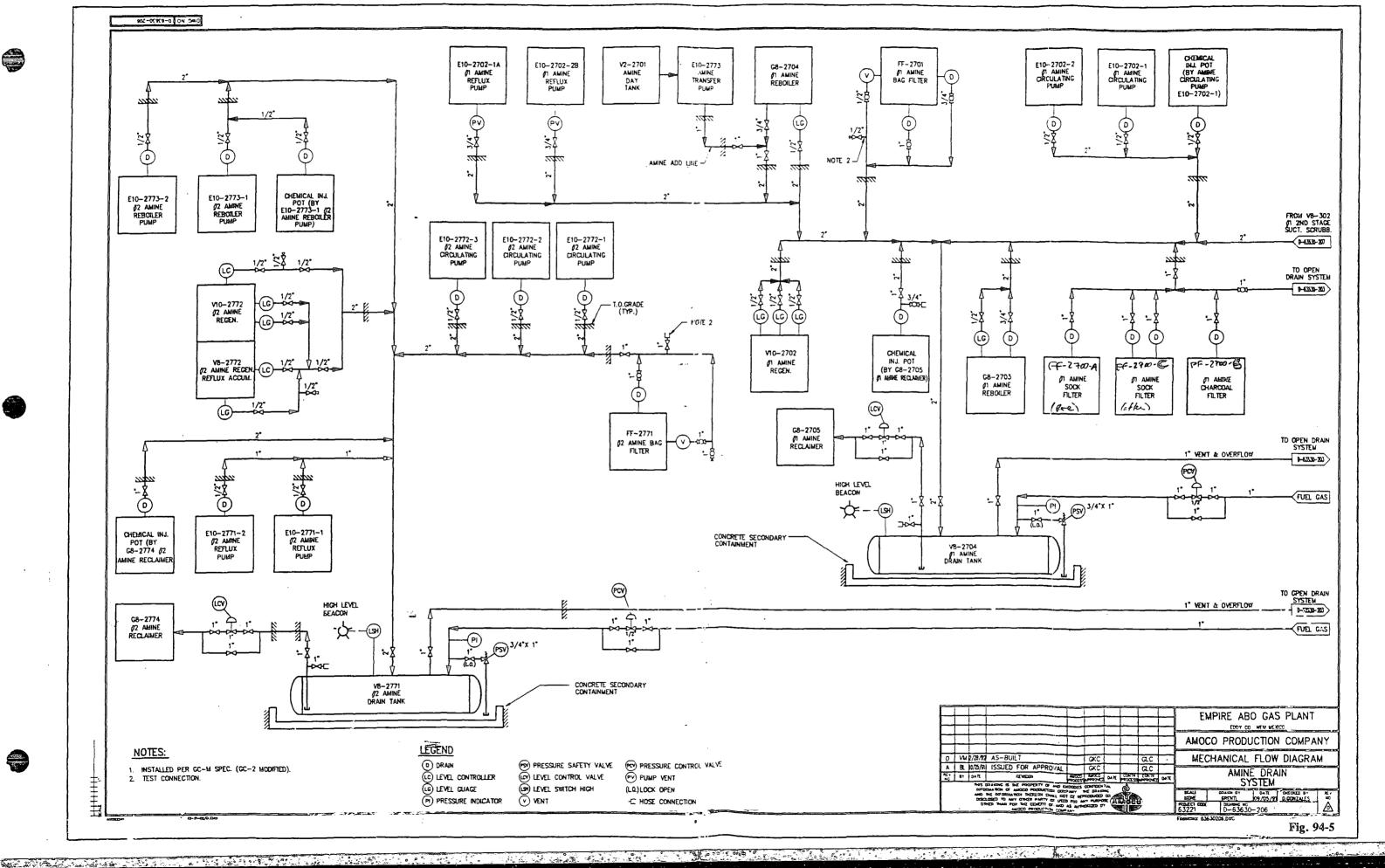
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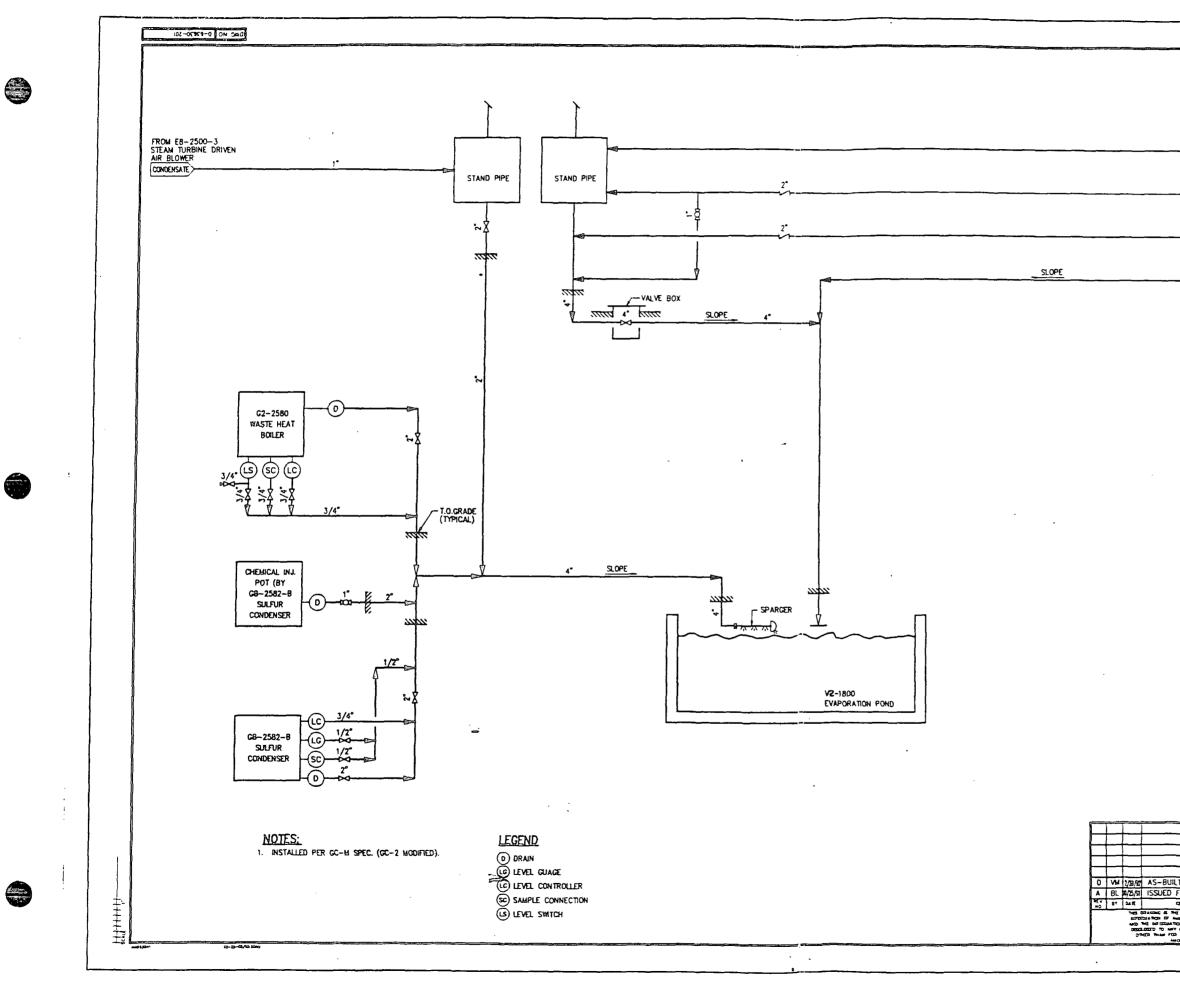
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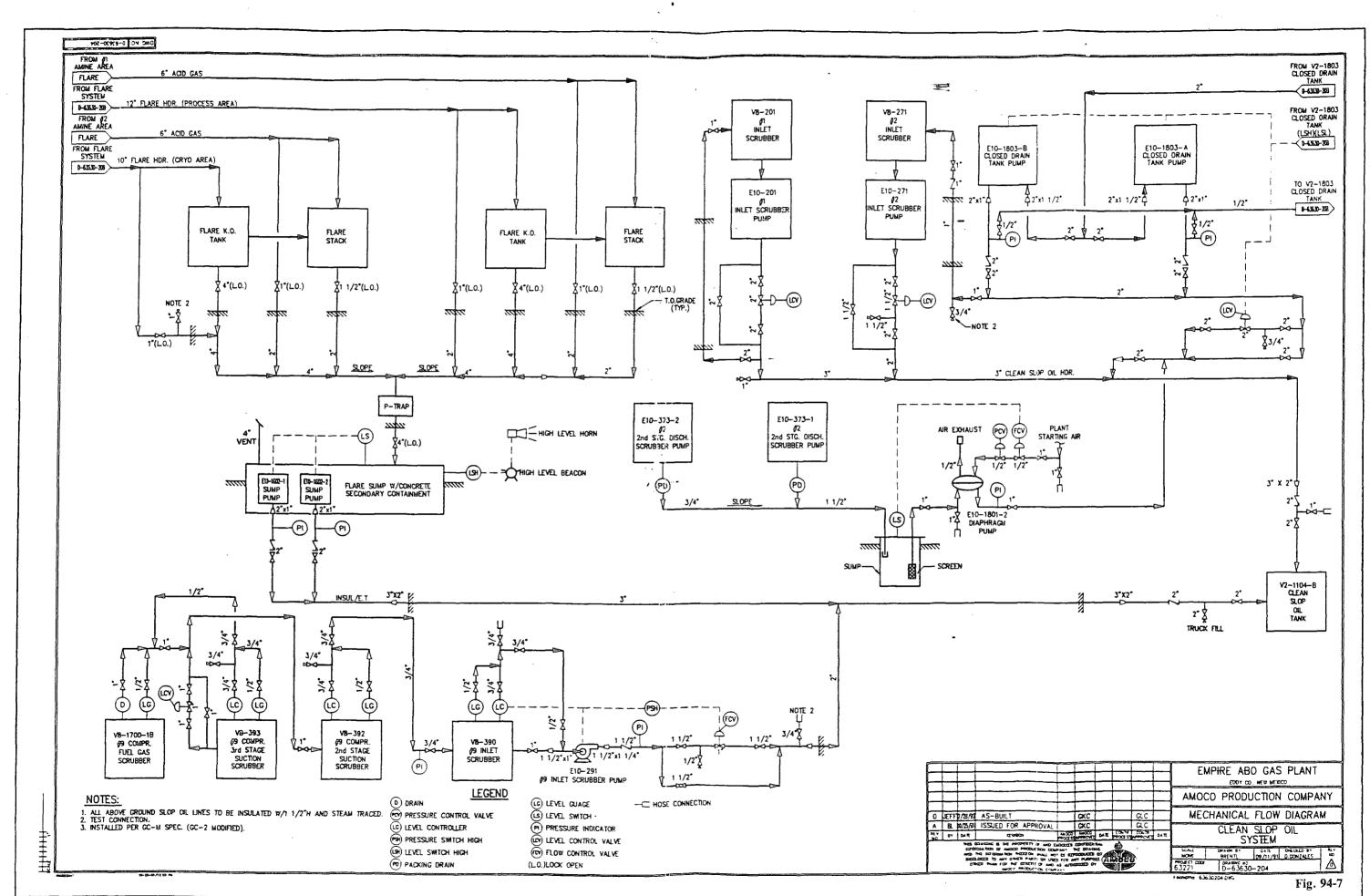
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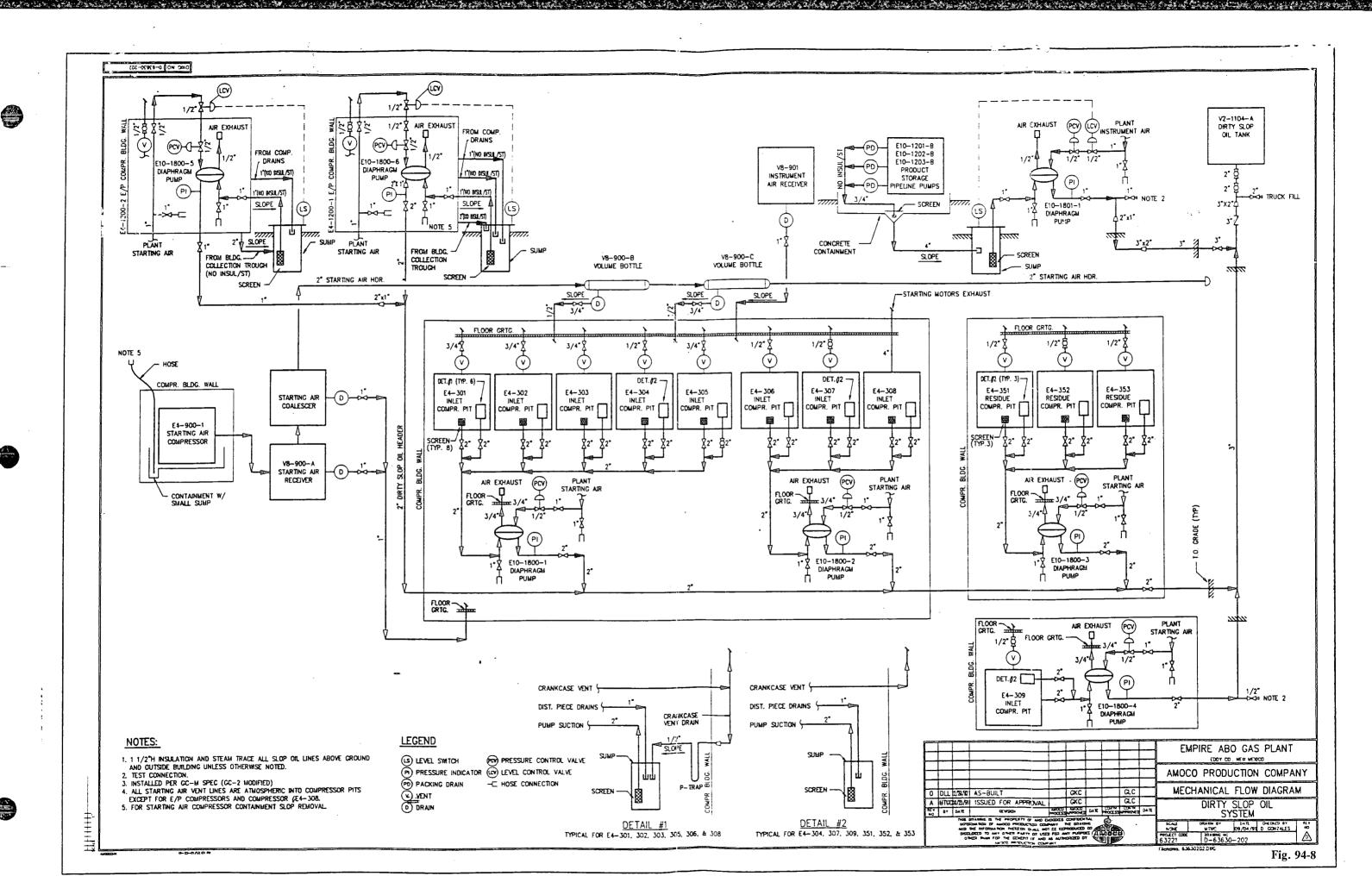
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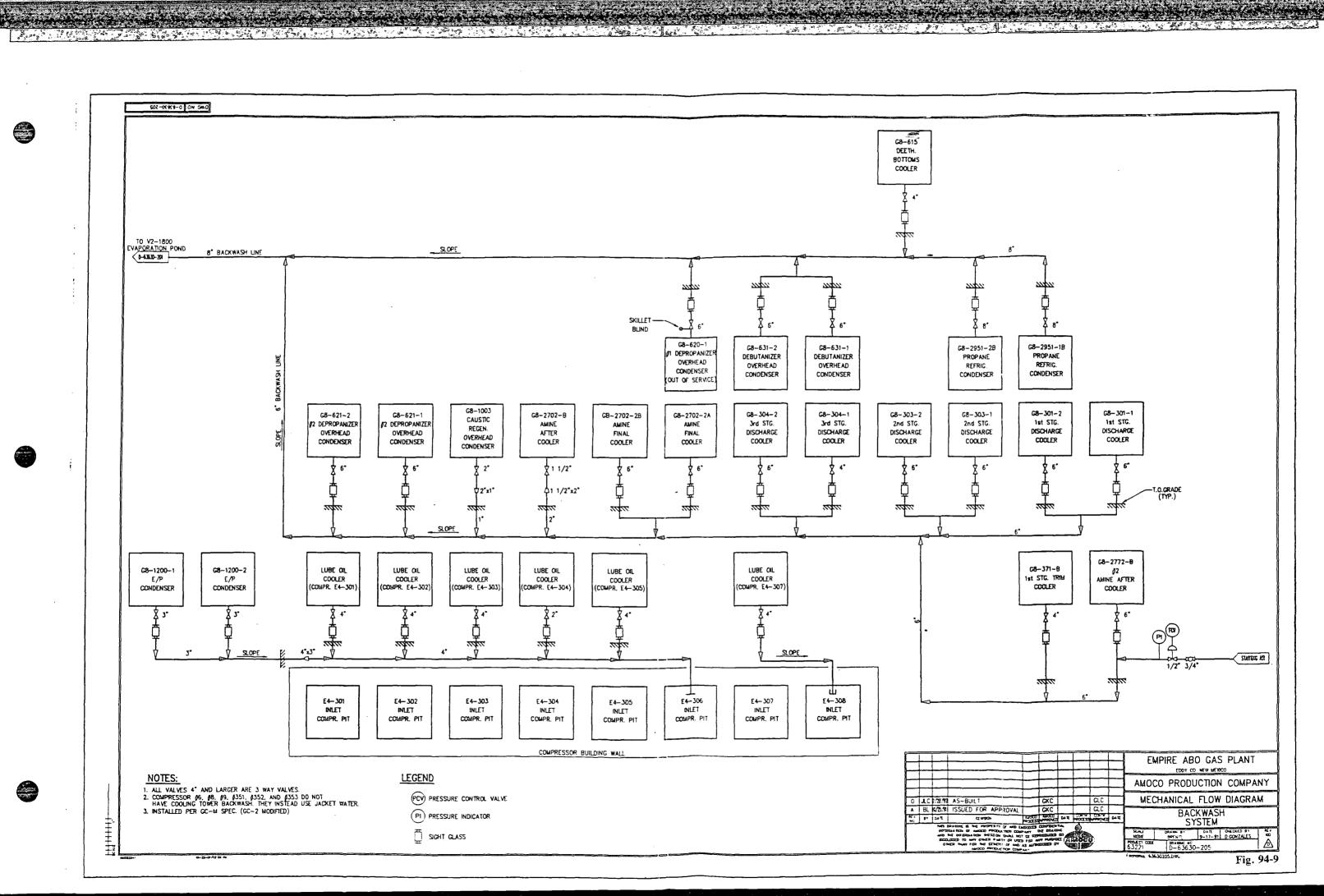
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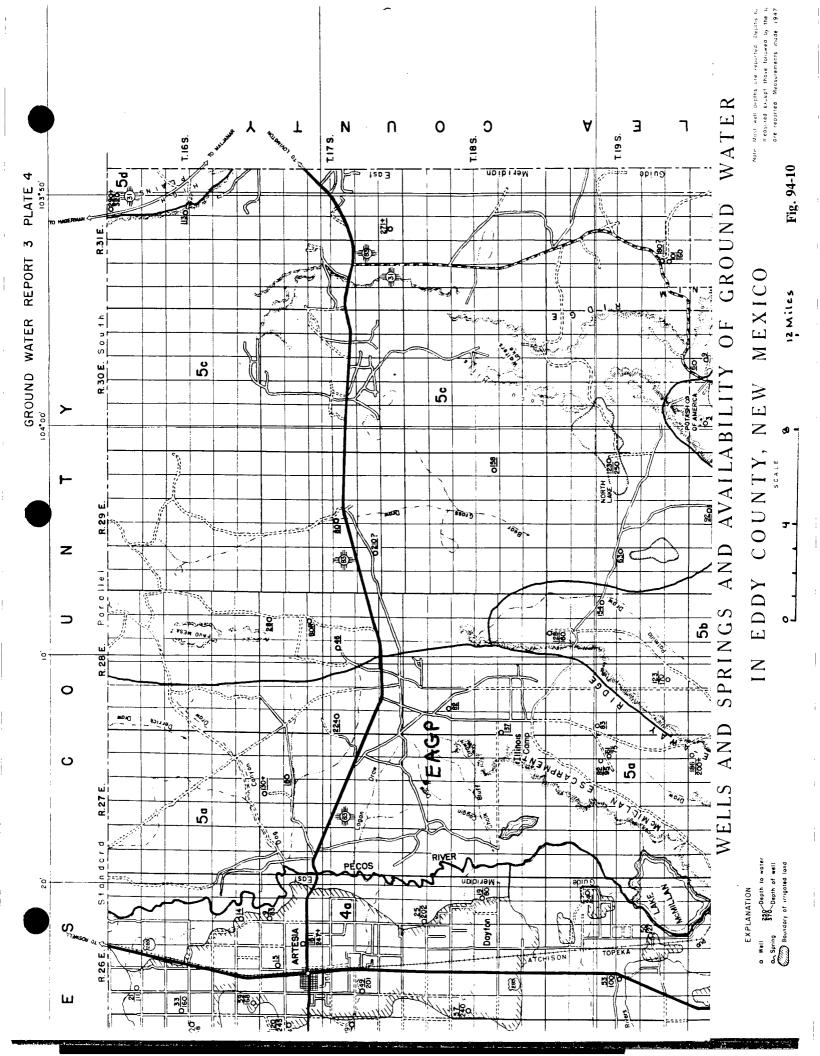
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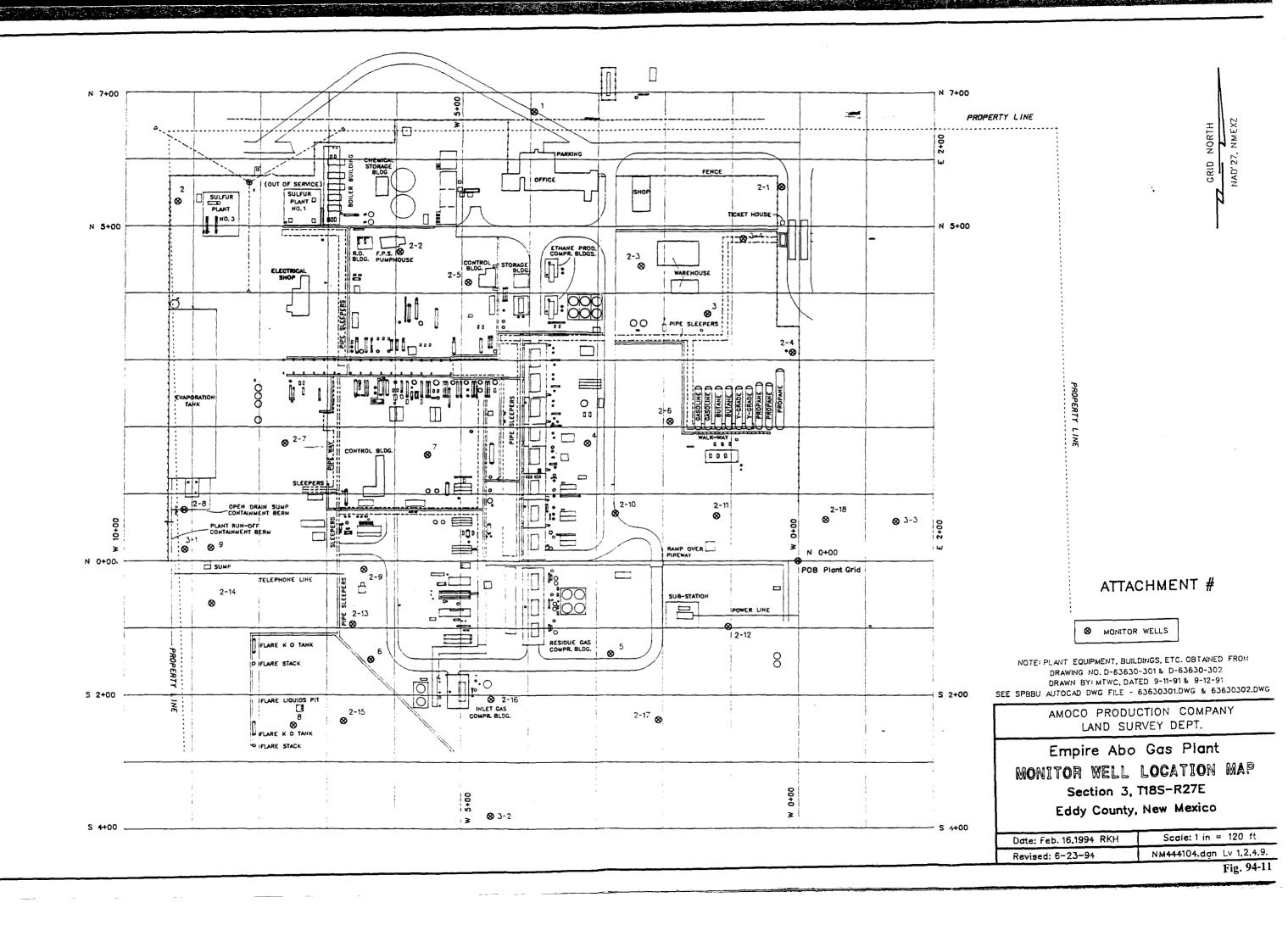


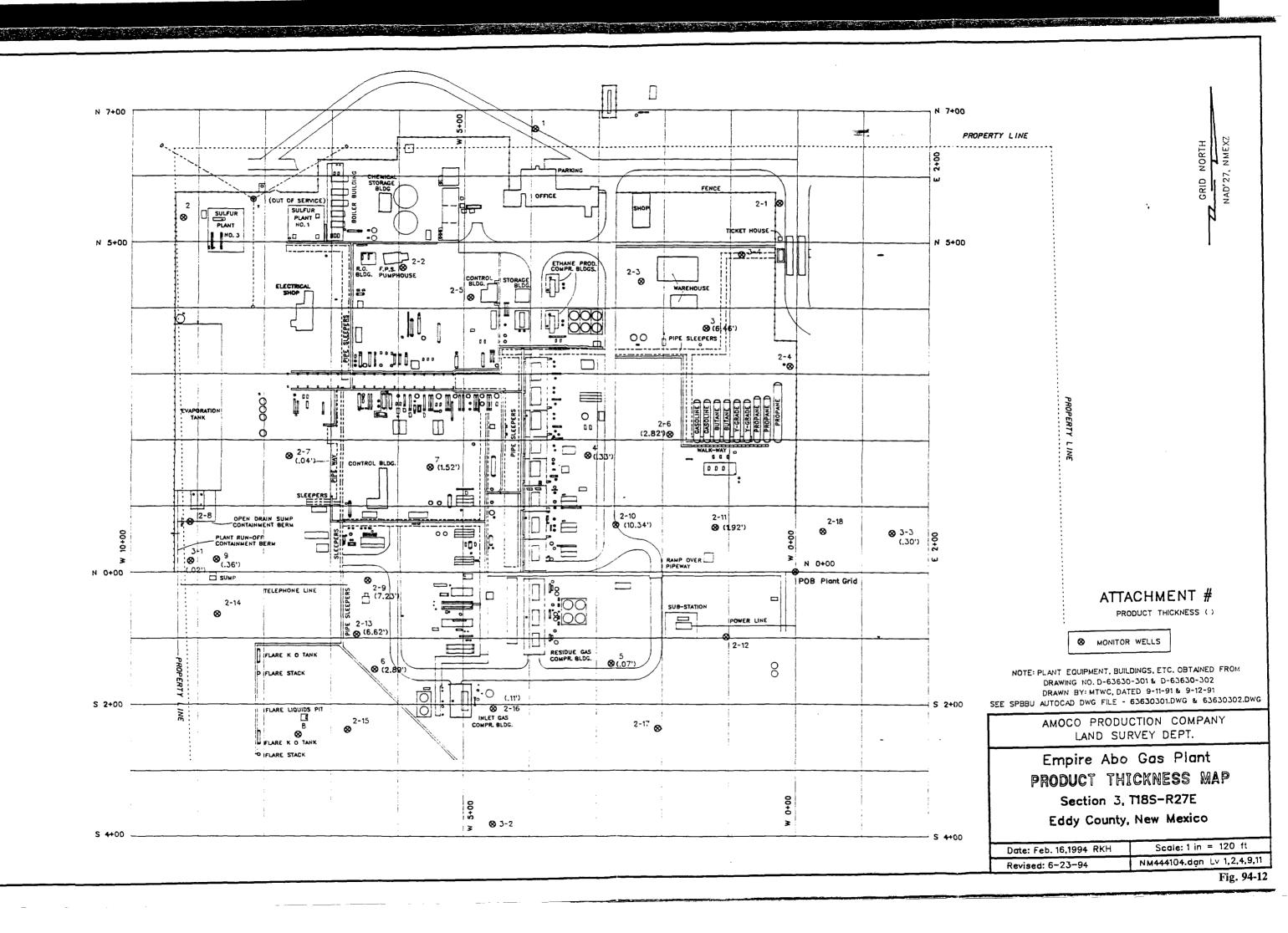
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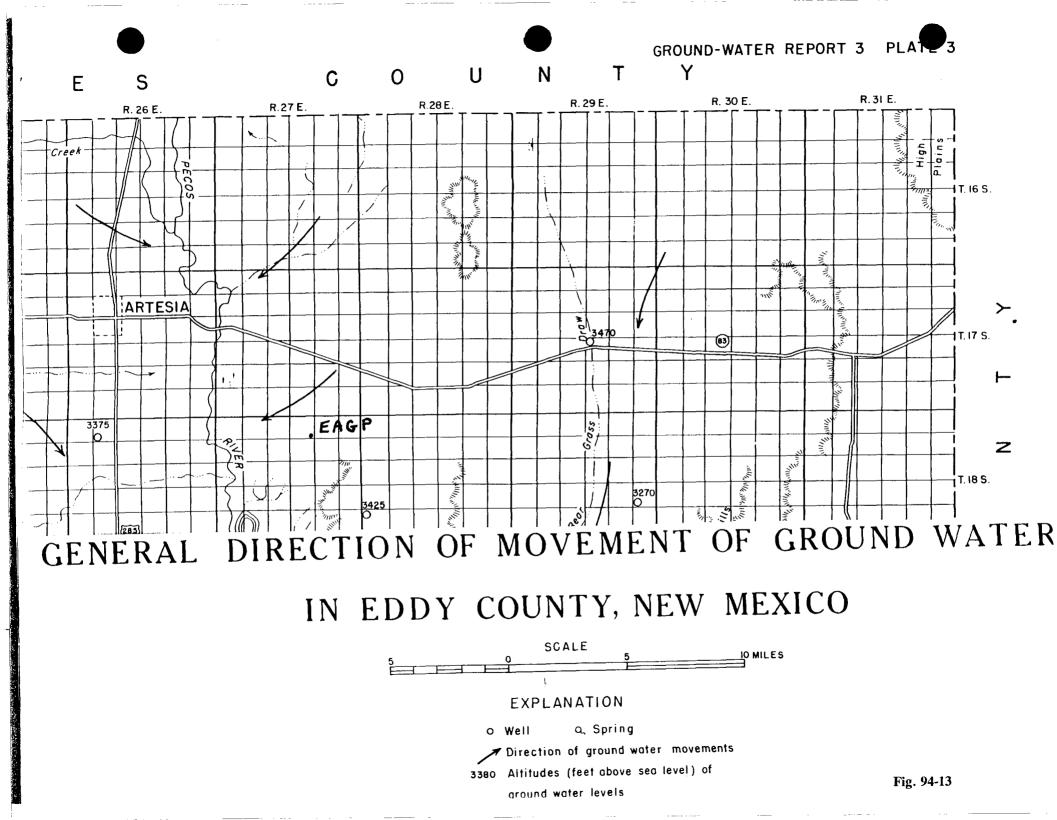


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STATE ENGINEER OFFICE

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		1	2	1	WHITE CLAY
		2	3.5	1.5	BROWN SAND
	2	3.5	9	5 .5	WHITE CLAY & ROCK
		9	12	3	BROWN CLAY
ľ		12	20	8	GRAY CLAY & ROCK
		20	22	2	BROWN CLAY & ROCK
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Section 7. REMARKS AND ADDITIONAL INFORMATION

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The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above secribed hole.

Ins fue tas Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is indicated, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Appendix 94-A

Material Safety Data Sheets for Chemicals Potentially in Effluent Streams

<u>Manufacturer</u>

Trade Name

Unichem International

Unichem 2310 Unichem 3141 Unichem 3270 Unichem 3030 Unichem 3941 Unichem Alpha 512 Unichem Alpha 580 Unichem Alpha 570 Unichem 1300

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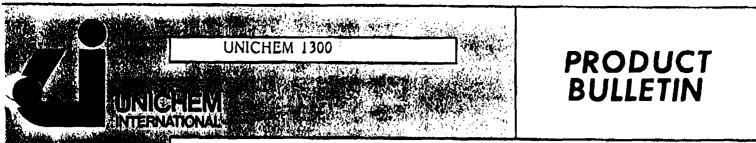
DESCRIPTION

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L. Barriston



UNICHEM 1300 is an organic scale and corrosion inhibitor and dispersant for use in cooling tower recirculating water systems. UNICHEM 1300 contains specific compounds proportioned for scale and corrosion inhibition. UNICHEM 1300 is a highly effective anti-precipitant for calcium phosphate, calcium carbonate, and calcium sulfate. In addition, it contains tolytriazole for copper and copper alloy corrosion inhibitions. UNICHEM 1300 additionally inhibits iron deposition at inhibition percentages approaching 100%. It is an excellent dispersant for particulate matter such as mud, silt, and dead bacteria (slime) commonly found in cooling water systems. BRAN PA RANGE

UNICHEM 1300 should be fed to the system continuously. The amount of UNICHEM 1300 normally used should be 50 to 100 ppm. The amount of UNICHEM 1300 fed to the system is normally controlled by an orthophosphate residual of 10 to 14 ppm.

Appearance: Form: Density: Freeze Point: Flash Point: Clear Amber Liquid 11.2 pounds/gallon 0°F None

UNICHEM 1300 is low in toxicity; however, due care should be exercised in the handling of any water treatment compound in its concentrated form. If spilled, wash thoroughly with copious quantities of water. If irritation persists, contact a physician.

UNICHEM 1300 is available in 55 gallon drums or in bulk quantities.

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MATERIAL SAFETY DATA SHEET

Date Prepared 05/22/86

Supersedes Previous Sheet Dated 10/31/85

PRODUCT IDENTIFICATION

Unichem International 707 N. Leech/P. O. Box 1499/Hobbs, New Mexico 88240 EMERGENCY TELEPHONE NUMBER (505) 393-7751

Trade Name UNICHEM 1300

Chemical Description Proprietary Scale and Corrosion Inhibitor Blend

II. HAZARDOUS INGREDIENTS

TLV (Units)
2 mg/m³
10 mg/m ⁷
Not Established

Neither this product nor its ingredients are listed in any of OSHA Standard, Section 1910.1200 sources as carcinogenic.

III. PHYSICAL DATA

Boiling Point, 760 mm Hg	212°F	Freezing Point	0°F
Specific Gravity $(H_2 O=1)$	1.3 g/ml	Solubility in Water	Complete

Appearance and Odor Amber, Clear Liquid; Slight Sweet Odor

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Test Method) None

Extinguishing Media Carbon Dioxide, Dry Chemical, Water Spray or Fog, Foam. Use a water apray to cool fire-exposed containers.

Special Fire Fighting Procedures Firefighers should wear self-contained breathing apparatus and full protective clothing. Firefighters should be made awars of the corrosive mature of this chemical.

Unusual Fire and Explosion Hazards

None

the use of this information or the use of any materials designated.

Page 1 of 2

NDV 01'94 11:07 No.003 P.04

Page 2 of 2	Product Unichem 1300
	V. HEALTH HAZARD DATA
meshold Limit	Value Not Determined
eyes. Inhalatio	EXDOSUFE Contact will cause burns to the skin and severe damage to the n of vapors or mists will irritate the entire respiratory tract. Ingestion ation and burning of the digestive tract.
water for at lea Wash with soap a	Irst Aid Procedures Eyes: Flush promptly with copious quantities of st fifteen minutes. Seek medical attention. Skin: Flush area with water. nd remove contaminated clothing. Inhalation: Remove to fresh sir. Apply stion if necessary. Ingestion: Call a physician. Do not induce vomiting. r or milk.
	VI. REACTIVITY DATA
Stability Stab	
Incompatibility	(Materials to Avoid) Strongly acidic materials, oxidizers.
Hazardous Decom	position of Products Oxides of Carbon and Nitrogen
Hazardous Polym	erization May Occur Conditions to Avoid Will Not Occur X None
	VII. SPILL OR LEAK PROCEDURES
	en if Material is Released or Spilled Provide adequate ventilati f ignition. Contain and absorb spill.
Waste Disposal state, and feder	
	VIII. SPECIAL PROTECTION INFORMATION
	TECTION (Specify Type) Use air-supplied or self-contained breathing osure levels exceed TLV for this product or its ingredients.
Ventilation	Local Exhaust As needed to prevent Special None Becumulation of
	Mechanical (General) Vapore above Other None
Protective Glov	es Rubber Eye Protection Safety Glasses, Goggles, and/or Face Shield
Other Protectiv	
	IX. SPECIAL PRECAUTIONS
low fire-risk ar	be Taken in Handling and Storing Store in cool, well-ventilated, es sway from ignition sources and incompatible materials. Keep containers in use. Do not transfer or store in improperly marked containers. NS Avoid prolonged or repeated breathing of vapors or contact with skin.

PRODUCT BULLETIN

DESCRIPTION

INTERNATIONAL

ID:

UNICHEM 2310

UNICHEM 2310 is a nitrite based corrosion inhibitor. UNICHEM 2310 contains buffering agents and other inorganic compounds which act together with the nitrite to form a highly effective corrosion inhibitor. UNICHEM 2310 also contains specific inhibitors for the protection of copper, copper alloys, and other metals in mixed metal systems.

<u> USES</u>

UNICHEM 2310 is recommended for use in closed water systems. UNICHEM 2310 may be used in systems utilizing glycol or alcohol as antifreeze without adversely affecting the inhibitor or the antifreeze. UNICHEM 2310 should be used in systems with low to moderate hardness levels.

APPLICATION

UNICHEM 2310 should be applied to the system at the rate of two to three gallons per one thousand gallons of contained water or makeup. The system pH should be maintained above a pH of 7.5 to prevent degradation of the nitrite. A sodium nitrite residual should be maintained at 400-600 ppm as sodium nitrite.

PROPERTIES

Appearance	Light Yellow Clear Liquid
Density	9.70 lbs/gallon
Pour Point	
Flash Point (TCC)	None

HANDLING

Due care should be taken when handling any industrial compound. Avoid contact with eyes, skin, and clothing. If contact occurs, flush thoroughly with water. If irritation persists, seek medical aid. Use with adequate ventilation.

PACKAGING

UNICHEM 2310 is available in 55 gallon drums or in bulk quantities.

			MATERI	ΔΙς	SAFETY	n۵.	TΔ	SHE	FT
	INTERNATIONAL		Supers	edes P	Dations S	e Prei heet I	pareo Dated	Not	2786 Dated
<u> </u>		Ι.	PRODUCT						
Jnichem Int	ernational	707			BOX 1499/HO PHONE NUMB				
Trade Name	UNICHEM 2	310							
Chemical De	-								
	PT0		LAZADDO						
•••	Notoriol	II.	HAZARDU	15 ING	REDIENTS	777 57 7			
	Material					TLV (UIIIL	SJ ·	
Neither this	Nitrite (Oxidi product nor in purces as carcin	ts ing nogenic			in any of O	IONE ES		•	10n
Neither this 1910.1200 so	product nor il Surces as carcin	ts ingr nogenic	III. PH	listed (SICAL	in any of O			•	10n
Neither this 1910.1200 so BOILING POI	product nor in Surces as carcin Nt. 760 mm H	ts ingr nogenic g 2124	III. PH	(SICAL	in eny of O DATA ing Point	ISHA SE	andar 22°F	d, Sect	ion
Neither this 1910.1200 so BOILING POI Specific Gr	nt, 760 mm H avity (H ₂ O=1	g 212) 1.16	III. PH ^a F 5 g/ml	(SICAL Freez Solub	in any of O DATA ing Point ility in W	ater	22°F Comp	d, Sect	1 on
Neither this 1910.1200 so BOILING POI Specific Gr	nt, 760 mm H avity (H ₂ O=1 and Odor Lig	g 2124) 1.16	III. PH F 5 g/ml Llow to Wate	(SICAL Freez Solub	in any of O DATA Ling Point ility in W Clear Liqui	ater	22°F Comp	d, Sect	1 o n
Neither this 1910.1200 so Boiling Poi Specific Gr Appearance	nt, 760 mm H avity (H ₂ O=1 and Odor Lie IV.	g 212 g 212) 1.16 ght Yel	III. PH F 5 g/ml 11ow to Wate RE AND EXP	(SICAL Freez Solub	in any of O DATA ing Point ility in W	ater	22°F Comp	d, Sect	1 o n
Neither this 1910.1200 so Bolling Poi Specific Gr Appearance Flash Point	nt, 760 mm H avity (H ₂ O=1 and Odor Lig IV. (Test Method	g 2124) 1.14 ght Yel FIF	III. PH F 5 g/ml Llow to Wate RE AND EXP	(SICAL Freez Solub r White LOSION	in any of C DATA ing Point ility in W Clear Liqui HAZARD D	ater d; s11	22°F Compi ght Od	d, Sect	· · · · · · · · · · · · · · · · · · ·
Neither this 1910.1200 so Boiling Poi Specific Gr Appearance Flash Point Extinguishi	nt, 760 mm H avity (H ₂ O=1 and Odor Lie IV.	g 212 g 212) 1.12 ght Yel FIF d) No arbon ² C	III. PH F 5 g/ml 1 low to Wate RE AND EXP Dioxide, Dry	(SICAL Freez Solub r White LOSION	in any of C DATA ing Point ility in W Clear Liqui HAZARD D	ater d; s11	22°F Compi ght Od	d, Sect	· · · · · · · · · · · · · · · · · · ·
Neither this 1910.1200 so Bolling Poi Specific Gr Appearance Flash Point Extinguishi mater sprsy Special Fir	nt, 760 mm H avity (H ₂ O=1) and Odor Lig IV. (Test Method ng Media ca to cool fire-e) e Fighting Pi d full protects	g 212 g 212) 1.16 ght Yel FIF d)Nc arbon C xposed F.OCEd	III. PH F 5 g/ml Llow to Wate RE AND EXP Dioxide, Dry containers. UFES Fir	(SICAL Freez Solud r White LOSION Chemic	in any of C DATA ing Point ility in W Clear Liqui HAZARD D	Vater	22°F Comp ght Od Fog,	d, Sect	Use a
Neither this 1910.1200 so Boiling Poi Specific Gr Appearance Flash Point Extinguishi water spray Special Fir	nt, 760 mm H avity (H ₂ O=1) and Odor Lig IV. (Test Method ng Media ca to cool fire-ex	g 212 g 212) 1.16 ght Yel FIF d)Nc arbon C xposed FOCEd ive clo	III. PH F 5 g/m1 Llow to Wate RE AND EXP Dioxide, Dry containers. UFCS Fir othing.	(SICAL Freez Solub r White LOSION Chemic	in any of C DATA ing Point ility in W Clear Liqui HAZARD D al, Water Sp	Vater	22°F Comp ght Od Fog,	d, Sect	Use a
Neither this 1910.1200 so Boiling Poi Specific Gr Appearance Flash Point Extinguishi water spray Special Fir	nt, 760 mm H avity (H ₂ O=1) and Odor Lig IV. (Test Method ng Media ca to cool fire-e) e Fighting Pi d full protects	g 212 g 212 g 212 g 212 g 1.12 ght Yel FIF d)No arbon t xposed FOCE ive clo	III. PH F 5 g/ml Llow to Wate RE AND EXP one Dioxide, Dry containers. UFES Fir othing. AZAFdS	(SICAL Freez Solub r White LOSION Chemic efigher	in any of C DATA ing Point ility in W Clear Liqui HAZARD D al, Water Sp	ATA	22°F Compi ght O Fog,	d, Sect	Use a

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	۷.	HEALTH HAZAR	D DATA	
reshold Lim	it Value Not Determ	nined		
-Ingestion may	CREXDOSURE Prolonge cause catharais. Inhe ause irritation.	ed skin contact w. alation of mist ma	ill cause dryne ay cause respir	as and irritation. atory irritation. E
water for at 1 - Wash with mosp	FIRST AID Procedu east fifteen minutes. and remove contaminat iration if necessary. ter or milk.	Seek medical at ted clothing. In	tention. Skin: halstion: Remo	Flush area with we ve to fresh air. App
	VI	. REACTIVITY	DATA	
	able X Cond	ditions to Avoid	None	
	ty (Materials to A	void) Aci	ds, Reducing Ag	entș
lazardous Dec	omposition of Prod	UCTS Oxides o	f Carbon and Ni	trogen
Hazardous Pol	ymerization May O	CCUT Not Occur x	Conditions	to Avoid None
			Spilled Pro	·
Remove sources	VII. aken if Material i of ignition. Contein l Method Die	s Released or and absorb spil	Spilled Pro	·
Remove sources	VII. aken if Material i of ignition. Contein l Method Dis eral regulations.	S Released OF n and absorb spil	Spilled Pro	vide adequate ventil
Ramove sources Waste Disposa state, and fed Respiratory P	VII. aken if Material i of ignition. Contein l Method Dis eral regulations.	s Released or and absorb spil pose via a licens ECIAL PROTECTIO Type) Use air-	Spilled Pro	vide adequate ventil mal company. Follow N f-contained breathin
Ramove sources Waste Disposa state, and fed Respiratory P	VII. aken if Material i of ignition. Contain l Method Dis eral regulations. VIII. SPE rotection (Specify xpoaura levels exceed	s Released or and absorb spil pose via a licens ECIAL PROTECTIO Type) Use air-	Spilled Pro d waste dispose N INFORMATIC supplied or sel duct or its ing	vide adequate ventil mal company. Follow N f-contained breathin
Ramove sources Waste Disposa state, and fed Respiratory P apparatus if e	VII. aken if Material i of ignition. Contain l Method Dis eral regulations. VIII. SPE rotection (Specify xpoaura levels exceed	s Released of a and absorb spil pose via a licens ECIAL PROTECTIO Type) Use air- TLV for this pro- needed to prevent umulation of	Spilled Pro	vide adequate ventil mal company. Follow N /-contained breathin redients.
Ramove sources Waste Disposa state, and fed Respiratory P apparatus if e	VII. aken if Material i of ignition. Contain l Method Dis eral regulations. VIII. SPE rotection (Specify xposure levels exceed Local Exhaust As acc Mechanical (General	s Released of a and absorb spil pose via a licens ECIAL PROTECTIO ' Type) Use air- TLV for this pro- needed to prevent umulation of y vapors above	Spilled Pro	vide adequate ventil mal company. Follow N f-contained breathin redients. None None
Respiratory P epperatus if e Ventilation	VII. aken if Material i of ignition. Contain and Dispersions. VIII. SPE rotection (Specify xposure levels exceed Local Exhaust Ac Excal Exhaust Ac Machanical (General OVES Rubber	s Released of a and absorb spil pose via a licens ECIAL PROTECTION ' Type) Use air- TLV for this pro- needed to prevent umulation of) vapors above TLV Eye Protect	Spilled Pro de waste dispose N INFORMATIO supplied or sel duct or its ing Special Other 100 Safety Cl Face Shie	vide adequate ventil mal company. Follow N f-contained breathin redients. None None
Respiratory P epperatus if e Ventilation	VII. aken if Material i of ignition. Contain and Dispersion VIII. SPE rotection (Specify xposure levels exceed Local Exhaust Ac Exchanical (General OVES Rubber	s Released of a and absorb spil pose via a licens ECIAL PROTECTION ' Type) Use air- TLV for this pro- needed to prevent umulation of) vapors above TLV Eye Protect	Spilled Pro d waste dispose N INFORMATION supplied or self duct or its ing Special Other 100 Safety Cl Face Shiet ts, Eyewash Sta	vide adequate ventil sal company. Follow N r-conteined breathin redients. None None asses, Goggles, and/ eld

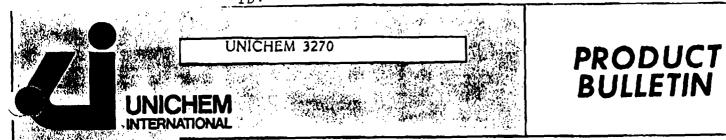
ID:			NDV O	1'94	10:04 No	0.002 P	.06
UNICHEM INTERNATIONAL	MATERI		D	ate Pr	epared_o	5/22/86	•••
					Dated_N	ot Dated	
	7 N. Leech/P EMERGENCY	. O. H	Box 1499	/Hobbs	New Me: (505) 39		8824
Trade Name UNICHEM 3030							
Chemical Description Prop	rietary Boiler	Water	Scale and	Corrosi	ion Inhibi	tor	
· I	I. HAZARDOU	IS ING	REDIENTS	,			
Material				TLV	(Units)		
Proprietary Chelant Potassium Hydroxide CAS# 1310-1	58-3 (Corrosive	a) .			ng/m³	••	•
• •	III. PHY	SICAL	DATA	•			
Boiling Point, 760 mm Hg 2		Freez	ing Poir	nt	10°F		
Specific Gravity (H _z O=1) 1	.3 g/ml	Solub	ility in	Water	Complet	e ·	
Appearance and Odor Light	t Brown Liquid;	; No 5i	gnificant	Odor			
IV. F	IRE AND EXPL	OSION	HAZARD	DATA			
Flash Point (Test Method)	None	-		•	-		•
Extinguishing Media Carbon water spray to cool fire-expose	n Dioxide, Dry ad containers.	Chemic	al, Water	Spray (or fog, Fo	sm. Use	8 .
Special Fire Fighting Proce apparatus and full protective of nature of this chemical.	edures Fire	fighter	s should b	wear sel	f-contain aware of	d breat	hing osive
Unusual Fire and Explosion	Hazards	None		n be #2 - = *e - ±	nan a far in agenca ea		· · ·
na anta	· · · · · · · · · · · · · · · · · · ·	• 	•	· · • · · · ·	•• •.	e 2 Maril - Cost A	tan kirk
Liability is expressly disc the use of this information	· •	-	•				t of

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NOV 01'94 10:04 No.002 P.07

Page 2 of 2	Product UNICHEM 3030
	V. HEALTH HAZARD DATA
Threshold Limit	Value Not Determined
eyes. Inhalatio	EXPOSURE Contact will cause burns to the skin and severe demage to the n of vapors or mists will irritate the entire respiratory tract. Ingestion ation and burning of the digestive tract.
water for at lea Wash with soap a	Irst Aid Procedures Eyes: Flush promptly with copicus quantities of at fifteen minutes. Seek medical attention. Skin: Flush area with water. and remove contaminated clothing. Inhalation: Remove to fresh air. Apply ation if necessary. Ingestion: Call a physician. Do not induce vomiting. If or milk.
	VI. REACTIVITY DATA
Stability Stab	able X Conditions to Avoid None
Incompatibility	(Materials to Avoid) Strongly acidic materials, oxidizers.
Hazardous Decon	IDOSITION OF Products Oxides of Carbon and Nitrogen
Hazardous Polym	PERIZATION May Occur Conditions to Avoid Will Not Occur x None
	VII. SPILL OR LEAK PROCEDURES
Remove sources o	Cen if Material is Released OF Spilled Provide adequate ventilati of ignition. Contain and absorb spill.
Waste Disposal state, and feder	
	VIII. SPECIAL PROTECTION INFORMATION
Respiratory Pro apparatus if exp	DIECTION (Specify Type) Use air-supplied or self-contained breathing osure levels exceed TLV for this product or its ingredients.
Ventilation	Local Exhaust As needed to prevent Special None
	Mechanical (General) Vapors above Other None
Protective Glov	Ves Rubber Eye Protection Safety Glasses, Goggles, and/or Face Shield
Other Protectiv	Ve Equipment Overalls, Rubber Boots, Eyewash Stations, Safety Showers
	IX. SPECIAL PRECAUTIONS
ecautions to low fire-risk ar closed when not	be Taken in Handling and Storing Store in cool, well-ventilated, to a away from ignition sources and incompatible materials. Keep container in use. Do not transfer or store in improperly marked containers.
Other Precaution	ONS Avoid prolonged or repeated breathing of vapors or contact with skin.



UNICHEM 3270 is a volatile neutralizing amine corrosion inhibitor.

UNICHEM 3270 is used for corrosion protection in steam and condensate lines and in auxiliary equipment of boiler plants. This compound volatilizes and quickly neutralizes carbon dioxide and other acidic components in steam at the point of condensation. In addition to corrosion prevention in the return condensate system, this compound effectively reduces the iron content of the condensate return and thus minimizes boiler deposits due to iron.

UNICHEM 3270 should be fed continuously to the boiler feed water in proportion to the quantity of make-up water. A pH of 6.8 to 8.5 should be maintained in the condensate return.

Color: Form: Pour Point: Flash Point, Closed Cup: pH: Density: Slight Yellow Liquid 15°F 120°F 12.7 8.1 pounds/gallon

UNICHEM 3270 is a highly alkaline compound and due care should be exercised in its handling. If this compound is spilled on the skin or in the eyes, wash with copious amounts of water. In case of eye contact a physician should be consulted.

UNICHEM 3270 is normally sold in 55 gallon drums or in bulk quantities.

P. O. Hox 1499 - Hobbs, N. M. 88240 - Pho. (505) 393-7751

ID:		NOV 01'94	10:06 No.002 P.09
		SAFETY DA Date Pre	pared
		Previous Sheet	Dated None
I.	PRODUCT IDENT		
Unichem International 707 I		BOX 1499/HODDS, EPHONE NUMBER (New Mexico 88240 505) 393-7751
Trade Name UNICHEM 3270			
Chemical Description			
Propri	etery Neutralizin	g Amine Blend	
II.	HAZARDOUS IN	GREDIENTS	
Material		TLV	(Units)
Proprietary Neutralizing A	mine	. 10	mda
1910.1200 sources as carcinogeni	c.		
	III. PHYSICA	L DATA	
	PF (Initial) Fre		15°F
Specific Gravity (H ₂ O=1) 0.9	7 g/ml SOlt	bility in Water	Complete
Appearance and Odor Water Whi	te to Light Yella	w Clear Liquid, Ami	ne Odor
IV. FI	RE AND EXPLOSIC	IN HAZARD DATA	
Flash Point (Test Method) 12	O"F TCC		
Extinguishing Media Carbon water apray to cool fire-exposed		ical, Water Spray o	or Fog, Foem. Use a
Special Fire Fighting Procedu apparatus and full protective cl nature of this chemical.			f-contained breathing aware of the corrosive
Unusual Fire and Explosion H	azards None		ب ب

iability is expressly disclaimed for any loss or injury arising out of the use of this information or the use of any materials designated.

	ID:		NOV 01'94	10:07 No.002 P.10
Page 2 of 2	Proc	JUCT UNIC	HEM 3270	
	V. HEA	ALTH HAZARD	DATA	
areshold Limi	t Value Not Determined			
-	CREXDOSURE Contact will on of vapors or mists will station and burning of the	l irritate th	e entire reep	and severe damage to t biratory tract. Ingest
water for at le Wash with soap	First Aid Procedures ast fifteen minutes. Seek and remove contaminated cl tration if necessary. Inge ter or milk.	< medical att. lothing. Inh	ention. Skir alation: Rem	n: Flush area with wat hove to fresh air. App
		REACTIVITY	DATA	
	able X Condition stable	ns to Avoid	None	
Incompatibilit	y (Materials to Avoid)) Strongly	acidic materi	als, oxidizers.
Hazardous Deco	pmposition of Products	Oxides of	Carbon and N	litrogen
Hazardous Poly	/merization May Occur Will Not Oc	ccur X	Conditions	s to Avoid
	VII. SPILL	L OR LEAK P	ROCEDURES	
	Aken if Material is Rel of ignition. Contain and Method Dispose	absorb spill	•	covide adequate ventila
	eral regulations.			
	VIII. SPECIAL	PROTECTION	N INFORMATI	ON
	OTECTION (Specify Type sposure levels exceed TLV f			
Ventilation	Local Exhaust As needed	d to prevent tion of	Special	None
	Mechanical (General)	apors above TLV	Other	None
Protective Glo	OVES Rubber Ey	ye Protecti	ON Safety (Face Sh	Glasses, Goggles, and/o ield
Other Protect:	ive Equipment Oversils	, Rubber Boot	s, Eyewash St	tations, Sefety Showers
	IX. SPE	ECIAL PRECA	UTIONS	
Precoutions to	be Taken in Handling	and Storin		n cool. well-ventilated
	area away from ignition sou t in use. Do not transfer	urces and inc	ompatible mat	

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ID:	NDV 01'94	10:08 No.002 P.11
	MATERIAL SAFETY D	ATA SHEET
UNICHEM INTERNATIONAL	Date Pl Supersedes Previous Shee	repared <u>10-10-90</u> t_Dated <u>None</u>
	1. PRODUCT IDENTIFICATION	
Unichem International	707 N. Leech/P. O. Box 1499/Hobbs EMERGENCY TELEPHONE NUMBER	
Trade Name UNICHEN 39	41	
Chemical Description	Boiler Alkalinity Adjustment Compound	
	II. HAZARDOUS INGREDIENTS	
Material	TLV	(Units)
odium Hydroxide (CAS \$ 1310-73	-2) 2 mg/m³	
cinogenio.	Inte are listed in any of OSHA Standard, Ser III. PHYSICAL DATA	
	212°F (Initial Freezing Point	-15°F
Specific Gravity (H ₂ O=1)	1.26 g/m1 Solubility in Water	Soluble
	ht tan liquid; no odor	
IV.	FIRE AND EXPLOSION HAZARD DATA	
Flash Point (Test Method) Extinguishing Media Carbo Tire-exposed containers.	None n Dioxide, Dry Chemical, Water Spray or Fog, Fom	m. Use a water spray to cool
Special Fire Fighting Prop nd full protective clothing. Firefigh	ECUTES Firefighters should wear self-construction of the corresive nature	ontained breathing apparatus s of this chemical.
Unusual Fire and Explosion	Hazards None	
	claimed for any loss or inju n or the use of any materials de	. –

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NOV 01'94 10:08 No.002 P.12

Page 2 of 2	Product	UNICHEM 3941
	V. HEALTH	HAZARD DATA
Threshold Limit	Value Not Determined	
Effects of Over Inhelation of vepors burning of the digesti	or mists will irritate the entire r	burns to the skin and severe damage to the eyes. respiratory tract. Ingestion will cause irritation and
clothing. INHALATION:	Seek medical attention. SKIN: Flush	Flush promptly with copious quantities of water for at area with water. Wesh with somp and remove contaminated respiration if necessary. INCESTION: Call a physician.
	VI. REACT	IVITY DATA
Stability Stab		None Name
Incompatibility	(Materials to Avoid) Strong	zly Acidic Materiale; Oxidizers
Hazardous Decom	Dosition of Products Drider	s of Carbon and Nitrogen
Hazardous Polymo	erization Hay Occur Will Not Occur	Conditions to Avoid
	VII. SPILL OR L	EAK PROCEDURES
	en if Material is Released ion. Contain and absorb spill. Nethod Dispose via a licensed	d weste disposel company. Follow local, state, and
	VIII. SPECIAL PROTE	ECTION INFORMATION
· · ·	CCTION (Specify Type) wels exceeds TLV for this product or i	Use air-supplied or self-contained breathing its ingredients if applicable.
Ventilation L	ocal Exhaust As Needed to Prevent Accumulation of	Special None
. <u> </u>	echanical (General) Vepore	Other None
Protective Glove	S Rubber Eye Prot	CECTION Sefety Glasses, Goggles
Other Protective	Equipment Overalls, Rubbs	r Boots, Eyowash Stations, Safety Showers
	IX. SPECIAL F	PRECAUTIONS
-risk area away from		COFING Store in cool, well-ventilated, low terials. Keep containers closed when not in use. Do
transfer to improper in the Precautions		ed breathing of vapors or contact with skin. Do not

UNICHEM 3141

ID:



DESCRIPTION

UNICHEM 3141 is a water soluble solution of catalyzed sulfite.

USES

UNICHEM 3141 is used for the removal of dissolved oxygen in boilers and other closed system water heating installations.

APPLICATION

Add UNICHEM 3141 continuously to the boiler feedwater at a rate sufficient to maintain a sufficient of 20-40 ppm.

TYPICAL PROPERTIES

Appearance	Water White Clear Liquid 10.0 Ibs/gal
pH	4.3
Freeze Point	

HANDLING

UNICHEM 3141 is a strong skin and tissue irritant. If contacted, wash affected area for filteen minutes with fresh water. If irritation or reduces persist, consult a physician. If ingested, consult a physician immediately.

Take usual precautions necessary for hundling industrial chemicals. Do not allow to contaminate food or food products. Keep out of reach of children. Keep containers closed when not in use.

PACKAGING

UNICHEM 3141 is packaged in 55 gallon steel drums or sold in bulk quantities.

P.O. Box 1498 . Hobbs, N.M. 88240 - Pho. (505) 363-775

reduct Name, INTCREN 3141 retion: 01 PRODUCT IDENTIFICATION NTCHEN HITERANTICAL, INC. Xmergency Telephone 505-393-7751 NO. SOL 1496 Previous Version Date 2/10/91 NOT N. LERG Date Prepared 9/21/93 Note Prepared 9/21/93 9/21/93 Previous Version: 0000002 0053 Previous Version: 0000002 0053 Previou: 000001 Previous Versious Versious	aduat Maine .	TOURN 3111				
NICHEM INTERNATIONAL, INC. Emergency Telephone 505-393-7751 10. EXI 1499 Previous Version Date 2/10/91 07 N. LENCH Date Prepared 9/21/93 0800, NN SEDIA-1499 Version: 0000002 seduct Name: UNICHEM 3141 Nomical Description: roppietary boiler water oxygen scavenger odium bisulfite CASE i Range roppietary boiler water oxygen scavenger roppietary boiler water oxygen scavenger roppietary bisulfite CASE i Range roppietary bisulfite 07631-90-5 < 304 roppietary fill 12 Deg.7 roppietary 600 mm Hg 122 Deg.7 Solubility in water: Complete ropperation 03 PHYSICAL DATA Solubility in water: Complete ropperation 04 FIRE AND EXPLOSION HARARD DATA Solubility in water: Complete representer ontised for proper disposal. Special Fire Fighting Procedures De not enter contised for proper disposal. Special Fire Fighting Procedures De not enter contised for proper disposal. Special Fire Fighting Procedures De not enter contised for proper disposal. Special Fire fighting liquid for proper disposal. special Fire Fighting Procedures De not inject a solid stream <tr< th=""><th>COUCT NAME! IN</th><th>ICHER JIAT</th><th></th><th></th><th></th><th></th></tr<>	COUCT NAME! IN	ICHER JIAT				
0.0. BOZ 1499 Previous Version Date 2/10/91 DIR LERG Date Prepared 9/21/93 OBSS, NN 88241-1499 Version: 0000002 soduct Name: UNICHEM 3141 hemical Description: roppietary boiler water oxygen scavenger Gtion: 02 HARANDOUS INGREDIENTS component Name odium bisulfite officient is person odium bisulfite officient 03 PHYSICAL DATA researd Point: researd Point: 13 Deg.F. boiling Point, 760 mm Hg: profile Oravity(Hidel) i 1.200 solution 04 FIRE AND EXPLOSION HARARD DATA retion: researd for exhibitible. Keep containers cool. Contain firs fighting liquids for proper disposal. special Fire Fighting Procedures Da on tenser confised fire opper disposal. special Fire Fighting Procedures Da not enter confised fire opper disposal. special Fire Fighting Procedures Da ot enter confised fire opper disposal. special Fire Fighting Procedures Da ot enter confised fire opper disposal. special Fire Fighting Procedures Da ot enter confised fire opper disposal. special Fire Fighting Procedures Da ot enter confised fire opper disposal. <	ction: 01 PRODUCT	IDENTIFICATI	:0N	ی و به به مده به هم و هم ا	، یہ یہ منظم نے جو بی بی	
0. BC 1499 Previous Version Date 2/10/91 DIN LIERCH Date Prepared 9/21/93 DSNS, NN 62241-1499 Version: 0000002 seduct Name: UNICHEM 3141 hemical Description: roppietry boller water oxygen scavenger ction: 02 HARARDOUS INGREDIENTS component Name odium bisuifite color: 03 PRYSICAL DATA ressing Point: 13 Deg.F. soling Point, 760 mm Hg: 212 Deg.F pointing Found, 760 mm Hg: 212 Deg.F pointing Found, 760 mm Hg: 212 Deg.F pointing Found, 760 mm Hg: 212 Deg.F point: 04 FIRE AND EXPLOSION HAEARD DATA The state white, clear liquid; slight musty odor. ction: 04 FIRE AND EXPLOSION HAEARD DATA That firs fighting liquids for proper disposal. protective priseure damand mode. Do not inject a solid stream pointing appareaus with fill scoppic scopersteat in the point in the fill scoppic scopersteat in the point in promotive present including POOL to not inject a solid stream citute of form into her, scheming pool; this may cause splittering and increase fire including Pool; this may cause splittering and increase fire including pool; this may cause splittering and increase fire including Pool; this may cause splittering and increase fire including pool; this may cause splitter pressure damand mode. Do not inject a solid stream	NICHEM INTERNATIO	NAL INC.	Rmergency Telephon	ne 505	-393-7751	
OBS., NY EB241-1490 Version: 0000002 seduct Name: UNICHER 3141 hemical Description: rop:ietary boiler water oxygen scavenger otion: 02 HAZARDOUS: INGREDIENTS omponent Name odiu: bisulfite oftion: 03 PHYSICAL DATA researcy Point: 13 Deg.F. oiling Point, 760 m Hg: 212 Deg.F pecific Gravity(H20el): programeo and Odor: Water white, clear liquid; slight musty Ddor. sting Point: IS DEG.F. oiling Point, 760 m Hg: 212 Deg.F pecific Gravity(H20el): i.200 Solubility in water: Complete programeo and Odor: Water white, clear liquid; slight musty Ddor. sting point: (2 File AND EXPLOSION HAEARD DATA hash Foint (2 File AND EXPLOSION HAEARD DATA hash roint is net combined fire opace without proper personal protective equipment including NIOSH approved self-contained bretching apparatus with full facepiace operated in the positive pressure dename mode. Do not inject a solid stream of water or form into het, burning pools, this may cause splatering and increase fire intensity. Procuete personnel to a safe area. Keep unnecessary pools away. Innewul Fire and Explosion Haeards None stifer to f Overskypogure Part and Explosion Haeards None <td></td> <td></td> <td>Previous Version D</td> <td>)ate</td> <td>2/10/91</td> <td></td>			Previous Version D)ate	2/10/91	
roduct Name: UNICHEN 3141 hemical Description: roprietary boiler water oxygen scavenger ction: 02 HAZARDOUS: INGREDIENTS colou: 03 PRYSICAL DATA resaing Point: 13 Deg.F. colling Point: 13 Deg.F. colling Point: 13 Deg.F. colling Point: 13 Deg.F. colling Point: 14 1.200 Solubility in water: Complete spearance and Oder: Water white, clear liquid; slight musty Oder. ction: 04 FIRE AND EXPLOSION HAZARD DATA hash Point (Test Mathed): None ktinquishing Media Notecial is not combustible. Resp containers cool. Contain fire fighting liquids for proper disposal. protective equipment including MIOBH Approved self-contained breething apparatum with full scopiece coveraged in the positive pressure demand mode. Do not inject a solid stream of water or form into her, burning pools; Water solid stream of water or form into her, burning pools; Water solid stream of water or form into her, burning pools; Water solid stream of water or form into her, burning pools; Water solid stream of water or form into her, burning pools; Water solid stream of water or form into her, burning pools; Water proper days. huwwyi Firw and Explosion Mazards None	••••				9/21/93	
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Skin Contact may cause irritation. Inhalition: may cause irritation of tract. Ingestion: may cause gastrointestin vositing and diarrhea.	upper respirato			
mergency and First Aid Procedures				
SKIN Wash with soap and water. Remove launder contaminated clothing bef attention if reduces or irritation	ore reuse. Get a	thing and edical		-
Exes Flush eyes immediately with large loast 15 minutes. Lift lower and Get medical attention.	amounts of wate upper lids occas	er for at bionally.		
INHALATION		4 1/2 1E		-
Remove victim to fresh air. Give not breathing. If breathing is di Keep person warm, guiet and get m	fficult, adminis	iter oxygen.		
INGLETION Call a physician immediately. Giv Do NOT induce vomiting unless ins poison control center. Never give unconscious person.	tructed by a phy	Aician or		-
ection: Q6 REACTIVITY DATA				
Stable (Y=Yes/N=No)1 Y	ر کا که خد هستیه رم چرچی کا پند کا کا این باید بند ب	، یہ <u>س</u> ی سے میں پہ ی ہی ہے ہے ک و اور اور اور اور اور اور اور اور اور او		ھ چجبو بھ ک
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roduct NAME	: UNICHEM 3141		
	SPILL OR LEAK PROCEDURES	CONTINUED	
should be of been comple so without watercours material waterial waterial minimally of Place all of DOT approve	excluded from area of spi eted. Shut off source of hazard. Frevent material es. Provide adequate vent ith sand or earth. Recove contaminated material for collected material and sp ed containers. horities. If this product	11 until clean-up has spill if possible to do from entering sewers or ilation, Contain spilled red undamaged or reuse or reclamation. ill absorbents into	
substance National R	(see Section 10), notify Beponse Center. Additiona Etion 302/304 (40 CFR 355	the U.S.EPA or the 1 notification pursuant	
accos dance	storage, transportation with NDA; or State regula	tions under authority of	
• • •		ery Act (40 CFR 260-271).	
	SPECIAL PROTECTIVE INFORM	TION	****
Rospinatory A respirate	Protection Or is normally not requir adequate ventilation.		
Ventilation The use of	mechanical dilution vent	ilation is recommended	
above ambi auffcient	his product is used in an ent temperatures or is ag local vontilation should apposures below safs worki	itated. When applicable, I be provided to maintain	
Protestive	-		
Neopcens, chlorids (nitrile, polyvinyl alcoho PVC)	ol (PUA), polyviny]	
Eye Protect	tion glash gogglas or face whi	ald in compliance with	
OSHA regul permits sa	ations is advised; howeve lety glasses under cortai unses is not recommended.	er OSHA regulations also	
Eye wash a	nctive Equipment and malaly shower		
Section: 09	SPECIAL PRECAUTIONS		
Pressutions Avoid gont	a to be Taken in Handling Lagt with eyes, skin or of	and Storing	
vapors or	miet,		

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ID:	NOV 01'94	10:11 No.002 P.17
MATERIAL SAFETY DA	TA SHEET	PAGE 4
Product Name: UNIGHTM 3141		
Section: 09 SPECIAL PRICAUTIONS CON		
Other Precautions		
Containers of this mitarial may be hazardous Since emptied containers retain product resid liquid, and/or solid), all hazard precautions data sheet must be observed. Do not transfer marked container. Do not uso pressure to empt Do not: Cut, heat, weld, or expose containers	ues (vapor, given in the to improperly sy container. to flame or	
uther sources of ignition. Keep container clo adequits ventilation. Wash thoroughly after h		
Containers should be grounded and bonded to r container(s) when being emptied. Containers a	eceiving	
washed out and used for other purposes.		
for industrial use only		
	ای به نوبه هیچ کاری کاری کاری به مربز او بر با با ا	ی چ چ می می است.
Section: 10 REGULATORY INFORMATION	ومدها الأكري الأكرك المحدود مرجوع معالم الم	و بو بو به خد خد خد به بو بو بو بو بو
Superfund Amendments and Reauthorisation Act 0	E 1986(BARA) TILIA I	<u> </u>
Sutton 302/304-Extremely Hasardous Substanc		an an the second se
SARA requires emergency planning based on T Quantities (TFQs) and release reporting bas Quantities (RQs) in 40 CFR 355 (used for SA and 312). These values are subject to chang	ed on Reportable RA 302, 304, 311	
regulations should be consulted to verify c		
requirements. Components present in this product at a	level which	
could require reporting under the statute a	lro:	
COmponent Name *=NONE**	RO TP	<u>t Range</u>
Section 311/312 Chemical Inventory Reporting The Superfund Amenduwals and Reauthorization	on Not (SARA) may	R 370)
require submission of reports (chemical lis Tier II) to the State Sumryency Response Co	st, MSDS, Tler I & ommission, Local	
Emergency Response Committee and the local The SARA physical and health bazards relate area	fire department.	
X Acute Health Hazard Sudden	n Release of Pressure ive	_ Pire
Bection 313-List of Toxic Chemicals (40 CM) This product contains the following toxic of to the reporting requirements of Section 3:	chemicals subject 13 of the	
Emergency Planning and Community Right-to- (40 CFR 372). This information should be in MSDSE that are copied and distributed for t	Know Act of 1986 ncluded in all	
Component Name **NONE**	<u>сле #</u>	§ Range

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	ID:	<u>N</u> OV 01'94	10:12 No.002 P.1
NATEI	RIAL SAFETY	DATA SHEET	PAGE 5
Product Name: UNI(снум 3141 ,		•
Bection: 10 REGULATO		Continued	
CERCIA, 40 CFR 26	1 AND 302	سیریکسی کی اور اور میں	
The Comprehensive Liability Act of	Prvironmental Respon 1980 (CBRCLA) require	s notification of the	
Hazardous Substan		er than the reportable	
	listed in 40CFR 302.4	. Values are given in ixture, if applicable.	
(Thuse values are	e subject to change an	d the regulations	
SUDUITO DE COMBAIL	ted to verify current	BLALUCOTY JEVELB.)	
Component Name		<u>CAS # CI</u> 07631-90 -5	SOOO
Component Name			
sodius bisulfite			
T	WA MG/H3; 5.0		
National Pire Prote			
<u>2</u> Health Q Reactive	0 F Aci	ire D Other	
-			
	portation Shipping Inf net Bisulfites, inorga	nic, aqueous solutions, n.	0.5.
Hazard Class: 8	I	dentification: UN2693	
Facksging Group: D Contains: Sodium b	•		
Hasardous Substance		ency Response Guide Number	: 60
Labels: Corrosive			
	nurol Act (TRCA), 40 C		
compliance with TS	enponents if product i	e a mircure, to th	
	: tion is to remain atta	shad to the untorial	
safety data sheet		gued fo fue waterist	
ODIFUCT, UNICERM I	RNATIONAL believes tha NTERNATIONAL expressly	disclaims liability	
	jury arising out of th use of any materials		
** **	· -		
End of Mads			
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PRODUCT BULLETIN

ALPHA 512 is a broad-spectrum microbiocide effective in the control of sulfate-reducing bacteria, aerobic bacteria, algae, and fungi.

Active Ingredient: Potassium Dimethyldithiocarbamate... 30 wt. %

ALPHA 512 is used in industrial and/or commercial recirculating cooling tower systems and industrial air-washing systems to control microbiological slime. Prior to the use of ALPHA 512 in industrial and/or commercial recirculating cooling tower systems, systems should be cleaned to remove algal growth, microbiological slime, and other deposits. Then make an initial slug addition of 4 to 6 fluid ounces of ALPHA 512 per 1000 gallons of water to provide 33 to 50 ppm of ALPHA 512, based on total weight of water in the system. Repeat initial dosage until control is evident. Make subsequent slug addition of 2 to 6 fluid ounces of ALPHA 512 per 1000 gallons of water (17 to 50 ppm ALPHA 512) every two to five days or as needed. The frequency of addition depends upon the relative amount of bleedoff and the severity of the microbiological problem. Slug additions should be made in the sump of recirculating cooling tower systems.

Density (Pounds per Gallon): Freeze Point: Flash Point (TCC): Appearance: 8.63 -35⁰F 69⁰F Brown Clear Liquid

Danger! Contains methanol, which may cause blindness. Avoid skin and eye contact. Avoid breathing vapors or mists. Wear protective safety equipment including goggles and rubber gloves. Refer to Material Safety Data Sheet and drum label for further information.

Prolonged contact of concentrated ALPHA 512 with copper or copper alloys should be avoided.

ALHPA 512 is available in drum or bulk quantities.

Ι	D	:

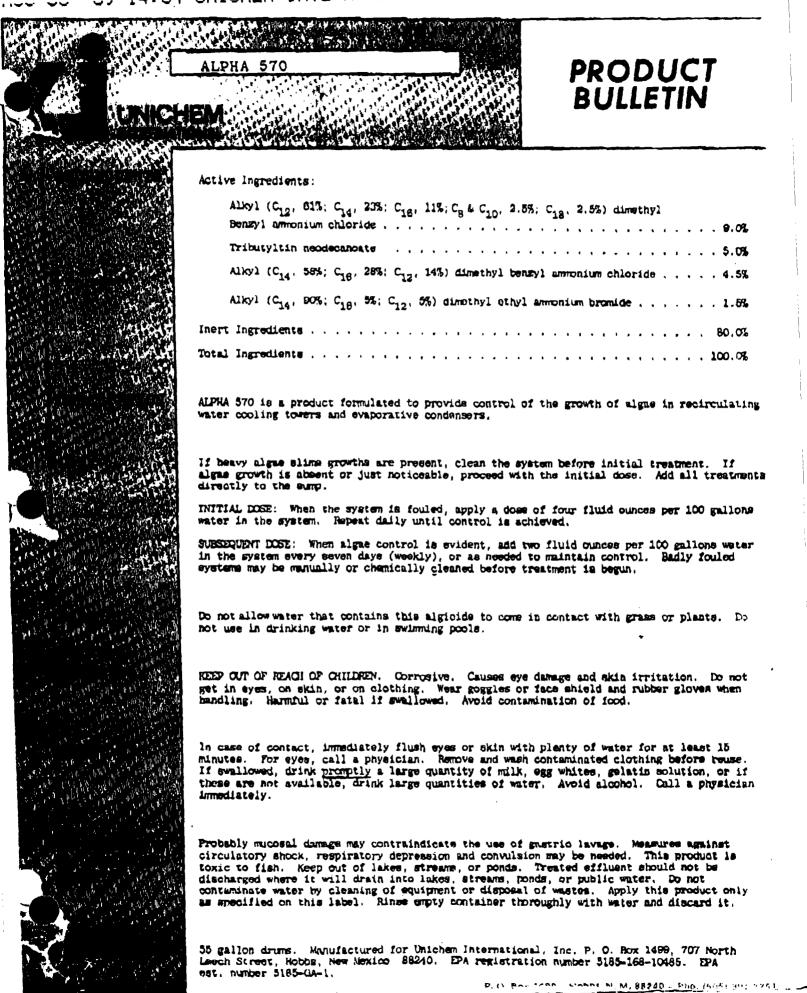
11			10 10 100002 1 120
	MATERI	AL SAFETY DA	TA SHEET
UNICHEM	_		pared_05/15/87
INTERNATIONAL.	Supers	edes Previous Sheet	Dated Not Dated
	I. PRODUCT	IDENTIFICATION	
Unichem International		2. 0. Box 1499/Hobbs, Y TELEPHONE NUMBER	
Trade Name) *		
Chemical Describtion Pro	oprietary Microbi	ocide Blend	
	II. HAZARDOU	JS INGREDIENTS	
Material		TLV	(Units)
Potassium Dimethyldithioc Methanol CAS# 000-067-561	arbamate CAS# 12	8-03-0 None Established 200 ppm (Skin) 8	Hour TWA or 260 mg/m ³
1910.1200 sources as carcin	-	SICAL DATA	
Boiling Point, 760 mm Hg	150°F (Initial)	Freezing Point	-35 [°] F
Specific Gravity (H2O=1)	1.0 g/ml	Solubility in Water	Complete
Appearance and Odor Br	own Clear Liquid	; Alcoholic - Sulfur Odo:	Ź
IV.	FIRE AND EXP	LOSION HAZARD DATA	· · · · · · · · · · · · · · · · · · ·
Flash Point (Test Method)	69 ⁰ F TCC	· · · · ·	
Extinguishing Media Car water spray to cool fire-ex	bon Dioxide, Dry posed containers	Chemical, Water Spray.o.	r Fog, Foame. Use a
Special Fire Fighting Pro apparatus and full protecti nature of this chemical.		ighters should wear self refighters should be made	-
Unusual Fire and Explosion dangerous fire hazard when oxidizing agents.		thanol is a moderate exp sparks, or flames and ca	
bility is expressly di the use of this informati			

Page 1 of 2

ID: DATCHER INTE DUDDE NR M

NOV 01'94

10:14 No.002 P.21



ID:	112 HUUU (111	NOV 01'94 10:15	5 No.002 P.22
UNICHEM		SAFETY DA Date Pre S Previous Sheet	pared_05/22/86
	. PRODUCT IDE	NTIFICATION	
Unichem International 70		. Box 1499/Hobbs, ELEPHONE NUMBER (New Mexico 88 505) 393-7751
Trade Name ALPHA 570			
Chemical Description Proprietary Bio	ocide Blend		
	II. HAZARDOUS	INGREDIENTS	
Material		TLV	(Units)
Alkyl Dimethyl Benzylammo Alkyl Dimethyl Ethylammo Tributyltin Neodecanoate		Not E	steblished stablished stablished
Neither this product nor its 1910.1200 sources as carcinog		ted in any of OSHA S	Landard, Section
	III. PHYSI	CAL DATA	
Boiling Point, 760 mm Hg	208°F Fr	eezing Point	32°F
Specific Gravity (H ₂ O=1)	0.998 g/ml ŠO	lubility in Water	Complete
Appearance and Odor Light	Strew Color, Sligh	t Musty Odor; Liquid	
IV.	FIRE AND EXPLOS	ION HAZARD DATA	•
Flash Point (Test Method)	None		
Extinguishing Media Carb water apray to cool fire-expo		mical, Water Spray o	r Fog, Foam. Use a
Special Fire Fighting Pro apparatus and full protective nature of this chemical.		shers should wear sel shters should be made	
Unusual Fire and Explosio	n Hazards Nor	10	

Liability is expressly disclaimed for any loss or injury arising out c the use of this information or the use of any materials designated.

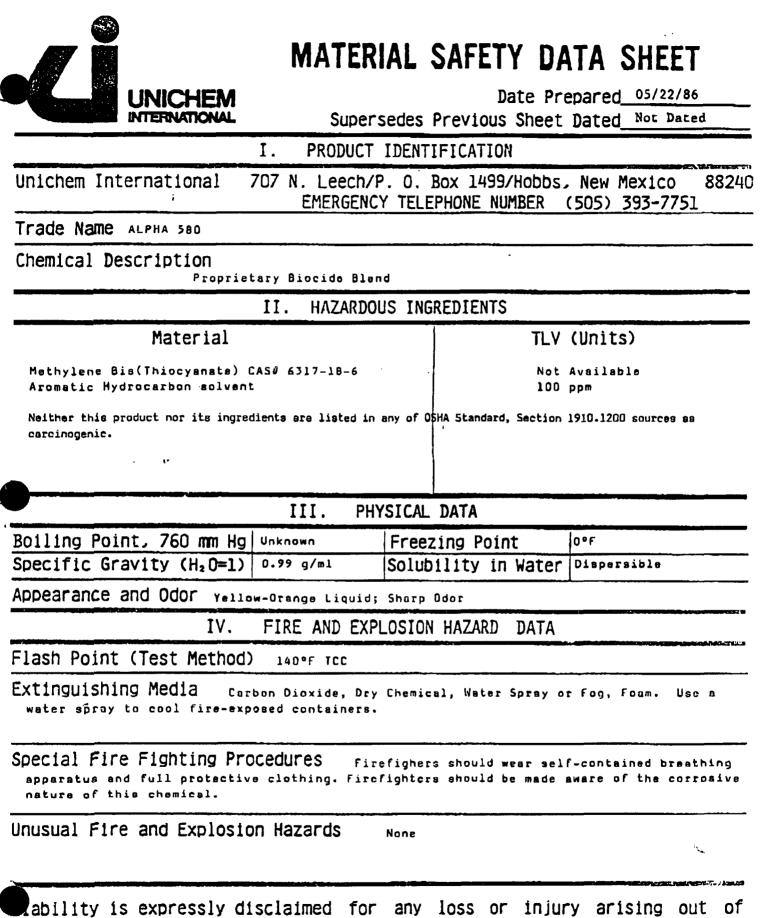
	TD:		
			1313
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NOV 01'94

10:16 No.002 P.23

e 2 of 2	Product ALPHA 370
	V. HEALTH HAZARD DATA
nold Limi	t Value Not Determined Acute Oral LD, : 0.88 g/kg (Male rate) 1.08 g/kg (Female Rat Acute Dermal LD, : Greater then 2 g/kg for male and female re-
ves. Inheleti	TEXPOSURE Contact will cause burns to the skin and severe damage to the on of vapors or mists will irritate the antire respiratory tract. Ingestion tation and burning of the digestive tract.
eter for at lunch with coop rtifical respi	FIRST AID PROCEDURES Eyes: Flush promptly with copious quantities of est fifteen minutes. Seek medical attention. Skin: Flush eres with weter. and remove contaminated clothing. Inhelation: Remove to Fresh mir. Apply ration if necessary. Ingestion: Call a physician. Do not induce vomiting. er or milk. See note to physician below. (Section IX - Other Preceditions)
	VI. REACTIVITY DATA
	ble X Conditions to Avoid None
compatibilit	(Materials to Avoid) Highly Alkalina Materials, Oxidizars
ardous Deco	mposition of Products Oxides of Carbon and Nitrogen
ardous Poly	merization Hay Occur Conditions to Avoid None
	VII. SPILL OR LEAK PROCEDURES
8001008	Ken if Material is Released or Spilled Provide adequate vontilation of ignition. Contain and absorb spill. This product is toxic to fish. Keep treems, and ponds.
te Disposal	Method Dispose via a licensed waste disposel company. Follow local, rel regulations.
	VIII. SPECIAL PROTECTION INFORMATION
	OTECTION (Specify Type) Use sir-supplied or self-contained breathing sposure levels exceed TLV for this product or its ingredients.
cilation	Local Exhaust As needed to prevent Special None
	Mechanical (General) vepure above Other None
cective Glo	
r Protect	Ve Equipment Overalls, Rubber Boots, Eyewash Stations, Safety Showers
	IX. SPECIAL PRECAUTIONS
re-riak a	be Taken in Handling and Storing Store in cool, well-ventileted, bree away from ignition sources and incompatible materials. Keep containers in use, Do not transfer or store in improperly marked containers.
r Trecaut. no: ingest. not circulatio	LONS Avoid prolonged or repeated breathing of vapors or contact with skin. TO PHYSICIAN: Probably mucceul damage may contraindictable the use of gastric levage. Neasures h shock, respiratory depression, and convulsion may be magded.



ID:

the use of this information or the use of any materials designated.

ID: NOV 01'94 10 Page 2 of 2 Product ALPHA 380	:18 No.002 P.25
V. HEALTH HAZARD DATA	and a second
Threshold Limit Value Not Determined Acute Oral LD 1 238 mg/Kg (Male Rate 184 mg/Kg (Female R	a) Acute Dermal LD I so ata) 203 mg/Kg
ETTECTS OF OVEREXPOSURE Contact will cause burns to the skin and se eyes. Inhalation of vapors or mists will irritate the entire respirator will cause irritation and burning of the digestive tract. Potential sen ingestion and dermal absorption.	y tract. Ingestion
Emergency and First Aid Procedures Eyes: Flush promptly with copie water for at least fifteen minutes. Seek medical attention. Skin: Flue Wash with soap and remove contaminated clothing. Inhalstion: Remove to artifical respiration if necessary. Ingestion: Call a physician. Do no Dilute with water or milk. See Note to Physician. (Section IX - Other	ash area with water.) fresh air. Apply not induce vomiting.
VI. REACTIVITY DATA	् न्द्र देव
Stability Stable X Conditions to Avoid None	
Incompatibility (Materials to Avoid) Highly Alkaline Materials,	Oxidizers
Hazardous Decomposition of Products Oxides of Carbon and Nitroge	n
Hazardous Polymerization May Occur Conditions to Av	'oid
VII. SPILL OR LEAK PROCEDURES	,
Waste Disposal Method Dispose via a licensed waste disposal co state, and federal regulations.	toxic to fish. Key
VIII. SPECIAL PROTECTION INFORMATION	
Respiratory Protection (Specify Type) Use air-supplied or self-con apparatus if exposure levels exceed TLV for this product or its ingredie	tained breathing nts.
Ventilation Local Exhaust As needed to prevent Special None	
Mechanical (General) vapors abave Other None.	- ¹
	, Goggles, and/or
Other Protective Equipment Overalls, Rubber Boots, Eyewash Stations	, Safety Showers
IX. SPECIAL PRECAUTIONS	
Precautions to be Taken in Handling and Storing Store in cool, low fire-risk area away from ignition sources and incompatible materials closed when not in use. Do not transfer or store in improperly marked of	 Keep containers
ther Precautions Avoid prolonged or repeated breathing of vepors or Do not ingest. To Physicians Probable mucosul damage may contraindicate the use of a against circulation shock, respiratory depression and convulsion may be needed.	contact with skin.

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APPENDIX 94-B

RULE 116 - NOTIFICATION OF FIRE, BREAKS, LEAKS, SPILLS AND BLOWOUTS

- A. The Division shall be notified of any fire, break, leak, spill, or blowout occurring at any injection or disposal facility or at any oil or gas drilling, producing, transporting, or processing facility in the State of New Mexico by the person operating or controlling such facility.
- Β. "Facility," for the purpose of this rule, shall include any oil or gas well, any injection or disposal well, and any drilling or workover well; any pipe line through which crude oil, condensate, casinghead or natural gas, or injection or disposal fluid (gaseous or liquid) is gathered, piped, or transported (including field flowlines and lead-lines but not including natural gas distribution systems); any receiving tank, holding tank, or storage tank, or receiving and storing receptacle into which crude oil, condensate, injection or disposal fluid, or casinghead or natural gas is produced, received, or stored; any injection or disposal pumping or compression station including related equipment; any processing or refining plant in which crude oil, condensate, or casinghead or natural gas is processed or refined; and any tank or drilling pit or slush pit associated with oil or gas well or injection or disposal well drilling operations or any tank, storage pit, or pond associated with oil or gas production or processing operations or with injection or disposal operations and containing hydrocarbons or hydrocarbon waste or residue, salt water, strong caustics or strong acids, or other deleterious chemicals or harmful contaminants.
- C. Notification of such fire, break, leak, spill, or blowout shall be in accordance with the provisions set forth below.
 - <u>Well Blowouts</u>. Notification of well blowouts and/or fires shall be "immediate notification" described below. ("Well blowout" is defined as being loss of control over and subsequent eruption of any drilling or workover well, or the rupture of the casing, casinghead, or wellhead or any oil or gas well or injection or disposal well, whether active or inactive, accompanied by the sudden emission of fluids, gaseous or liquid, from the well.)
 - 2) "Major" Breaks, Spills, or Leaks. Notification of breaks, spills, or leaks of 25 or more barrels of crude oil or condensate, or 100 barrels or more of salt water, none of which reaches a watercourse or enters a stream or lake; breaks, spills, or leaks in which one or more barrels of crude oil or condensate or 25 barrels or more of salt water does reach a watercourse or enters a stream or lake; and breaks, spills, or leaks of hydrocarbons or hydrocarbon waste or residue, salt water, strong caustics or strong acids, gases, or other deleterious chemicals or harmful contaminants of any magnitude which may with reasonable probability endanger human health or result in substantial damage to property, shall be "immediate notification" described below.

- 3) <u>"Minor" Breaks, Spills, or Leaks</u>. Notification of breaks, spills, or leaks of 5 barrels or more but less than 25 barrels of crude oil or condensate, or 25 barrels or more but less than 100 barrels of salt water, none of which reaches a watercourse or enters a stream or lake, shall be "subsequent notification" described below.
- 4) Gas Leaks and Gas Line Breaks. Notification of gas leaks from any source or of gas pipe line breaks in which natural or casinghead gas of any quantity has escaped or is escaping which may with reasonable probability endanger human health or result in substantial damage to property shall be "immediate notification" described below. Notification of gas pipe line breaks or leaks in which the loss is estimated to be 1000 or more MCF of natural or casinghead gas but in which there is no danger to human health nor of substantial damage to property shall be "subsequent notification" described below.
- 5) <u>Tank Fires</u>. Notification of fires in tanks or other receptacles caused by lightning or any other cause, if the loss is, or it appears that the loss will be, 25 or more barrels of crude oil or condensate, or fires which may with reasonable probability endanger human health or result in substantial damage to property, shall be "immediate notification" as described below. If the loss is, or it appears that the loss will be at least 5 barrels but less than 25 barrels, notification shall be "subsequent notification" described below.
- 6) Drilling Pits, Slush Pits, and Storage Pits and Ponds. Notification of breaks and spills from any drilling pit, slush pit, or storage pit or pond in which any hydrocarbon or hydrocarbon waste or residue, strong caustic or strong acid, or other deleterious chemical or harmful contaminant endangers human health or does substantial surface damage, or reaches a watercourse or enters a stream or lake in such quantity as may with reasonable probability endanger human health or result in substantial damage to such watercourse, stream, or lake, or the contents hereof, shall be "immediate notification" as described below. Notification of breaks or spills of such magnitude as to not endanger human health, cause substantial surface damage, or result in substantial damage to any watercourse, stream, or lake, or the contents thereof, shall be "subsequent notification" described below, provided however, no notification shall be required where there is no threat of any damage resulting from the break or spill.
- 7) <u>Immediate Notification</u>. "Immediate Notification" shall be as soon as possible after discovery and shall be either in person or by telephone to the district office of the Division district in which the incident occurs or if the incident occurs after normal business hours, to the District

Supervisor, the Oil and Gas Inspector, or the Deputy Oil and Gas Inspector. A complete written report ("Subsequent Notification") of the incident shall also be submitted in DUPLICATE to the appropriate district office of the Division within ten days after discovery of the incident.

- 8) <u>Subsequent Notification</u>. "Subsequent Notification" shall be a complete written report of the incident and shall be submitted in duplicate to the district office of the division district in which the incident occurred within two days after discovery of the incident.
- 9) <u>Content of Notification</u>. All reports of fires, breaks, leaks, spills, or blowouts, whether verbal or written, shall identify the location of the incident by quarter-quarter, section, township, and range, and by distance and direction from the nearest town or prominent landmark so that the exact site of the incident can be easily located on the ground. The report shall specify the nature and quantity of the loss and also the general conditions prevailing in the area, including precipitation, temperature, and soil conditions. The report shall also detail the measures that have been taken and are being taken to remedy the situation reported.
- 10) <u>Watercourse</u>, for the purpose of this rule, is defined any lake-bed or gully, draw, stream bed, wash, arroyo, or natural or man-made channel through which water flows or has flowed.

(Prior to c pleting Part 1, refer to regulations and instantions page 5.)

SPILL PREVENTION CONTROL & COUNTERMEASURE PLAN

PART I GENERAL INFORMATION

APPENDIX 94-C

1. Name of facility : EMPIRE ABO GAS PLANT

2. Type of facility : GAS PROCESSING AND INJECTION FACILITY

3. Location of facility : Eddy County, New Mexico - Approximately 8 miles southeast of Artesia, New Mexico

4. Name and address of owner or operator:

Name: Amoco Production Company

Address: P.O. Box 3092, 501 WestLake Park Blvd. Houston, Texas 77253

5. Designated person accountable for oil spill prevention at facility:

Name and title: Phil Haney, Plant Foreman

6. Facility experienced a reportable oil spill event during the twelve months prior to Jan. 10,1974 (effective date of 40 CFR, Part 112). (IF YES, COMPLETE ATTACHMENT #1.)

MANAGEMENT APPROVAL This SPCC Plan will be implemented as herein described. Signature David R. King Name: Dave King Title: Manager, Operations (Plant)

CERTIFICATION

I hereby certify that I have examined the facility, and being familiar with the provisions of 40 CFR, Part 112, attest that this SPCC Plan has been prepared in accordance with good engineering practices.

Daniel Troy Vickers

Printed Name of Registered Professional Engineer

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Signature of Registered Professional Engineer

Registration No. : 63839

State: Texas

(Part I) Page I of 5

(Seai)

Date 10/25/93

PART I GENERAL INFORMATION

7. Potential Spills-Prediction & Control:

<u>Source</u>	Major Type of Failure	Total Quantity <u>(bbls)</u>	Rate (bbls/hr)	Direction of Flow*	Secondary Containment
1. NGL Storage	e Area				
9 Storage Tanks (NGL)	a. Corrosion From Inside Tank	C ₄ & C ₅ only 4285 bbls.	C4&C5 only 50bbl/hr	SW	Earthen Dike Enclosure w / 14000 bbl capacity
	 b. Valve mal- function (Block or Relief) 				oupuony
2. Process Dra	in Storage				
1 Amine Tank	a. Corrosion From Inside Tank	280	5 bbl/hr	SW	Earthen Dike Enclosure w/ 2100 bbl.
1 Amine Tank	a. Corrosion From Inside Tank	210	5 bbl/hr	SW	capacity
1 Storage Tank (Slop)	a. Corrosion From Inside Tank	210	5 bbl/hr	SW	
1 Storage Tank (Slop)	a. Corrosion From Inside Tank	500	5 bbl/hr	SW	
3. Lube Oil Sto	orage				
2 Storage Tanks	a. Corrosion From Inside Tank	644	320 bbl on site	SW	Earthen Dike Enclosure w/ 550 bbl. capacity
1 Fuel Storage Tank	a. Corrosion From Inside Tank	12	12	SW	
1 Varsol Storage Tank	a. Corrosion From Inside Tank	12	12	SW	
1 Propane Fuel Storage Tank	a. Corrosion e From Inside Tank	24	24	SW	
Name of facility:	Empire Abo	Gas Plant			
Operator:	Amoco Pro	duction Compa	iny	(Part I) Pa	ge 2 of 5

4. Slop Oil Storage

	2 Slop Oil Storage Tanks	a.	Corrosion From Inside Tank	800	5 bbi per hr.	SW	Earthen Dike Enclosure w/ 550 bbl. capacity
5.	Injection Area						
	1 Lube Oil Storage Tanks	a.	Corrosion From Inside Tank	210	5 bbl per hr.	SW	Earthen Dike Enclosure w/ 300 bbl. capacity
	1 Jacket Water Storage Tank	a.	Corrosion From Inside Tank	250	5 bbl per hr.	SW	Earthen Dike Enclosure w/ 350 bbl. capacity

Name of facility:

Empire Abo Gas Plant

Operator:

Amoco Production Company

(Part I) Page 3 of 5

Discussion:

In the NGL storage area only the butane (C₄) and the gasoline (C₅) will not vaporize upon release (even in -10° F temperature). The diked area is sized at a safety factor of 3.0 times the volume of the liquids within the vessels. In addition to this safety factor, the diked volume is also sized with excess to allow 24 hours of production.

In the Process Storage area, the dikes are constructed to contain the volume of all tanks and the projected produced volume for 24 hours. In addition, the diked area has a safety factor of 25%.

In the Lube storage area, the dikes are sized for containment of the largest vessel and a safety factor of 70 %.

In the Slop Oil storage are, the dikes are sized for containment of the largest vessel and a safety factor of 37.5%.

In the Injection area, this is a facility that is jointed operated by Amoco and Arco. Amoco operates the facility while Arco performs maintanence. The dikes are sized for the volume of the oil storage tank plus 24 hours of production and a safety factor of 10%.

*Attach map if appropriate.

Name of facility: Empire Abo Gas Plant

Operator:

Amoco Production Company

(Part I) Page 4 of 5

PART I GENERAL INFORMATION

[Response to statement should be: YES, NO, or NA (Not Applicable).]

8. Containment or diversionary structures or equipment to prevent oil from reaching navigable waters are practicable. (If NO, complete Attachment #2.) YES

9. Inspections and Records

A. The required inspections follow written procedures.

YES

- B. The written procedures and a record of inspections, signed by the appropriate supervisor or inspector, are attached.
 - Discussion: The local Plant Foreman will make regular observations of operations under his control. The facility is manned 24 hours per day. The facilities are periodically visually inspected by plant operators during their normal duties in their 12 hour shift. On a semi-annual basis the Plant Foreman or his designee will inspect tanks, tank containment dikes, valves, and the amount of spill containment material that is available. The Plant Foreman (or designee) will document the results of the inspections on the SPCC Inspection Report Form (SPCC I) which will be made part of the permanent SPCC Plan.

10. Personnel Training and Spill Prevention Procedures

A. Personnel are properly instructed in the following:

(I) operation and maintenance of equipment to prevent oil discharges, and	YES
(2) applicable pollution control laws, rules, and regulations.	YES

Describe procedures employed for instruction:

New spill prevention and control technology, changes in state and federal regulations and the use of the "HOT LINE" reporting system will be covered at least on an annual basis in a 2 hour environmental training course

B. Scheduled prevention briefings for the operating personnel are conducted frequently enough to assure adequate understanding of the SPCC Plan. YES

Describe briefing program:

Scheduled prevention briefings are conducted on a semi-annual basis and are conducted to:

- 1. Discuss and review spill events or failures.
- 2. Review oil containmnet and clean-up procedures.
- 3. Review semi-annual Supervisor Inspection Report (SPCC I).

Name of facility: **Empire Abo Gas Plant**

Operator:

Amoco Production Company

(Part I) Page 5 of 5

(Prior to completing Part II, Alternate A, refer to regulations and instructions pages 6-7.)

PART II, ALTERNATE A DESIGN AND OPERATING INFORMATION ONSHORE FACILITY (EXCLUDING PRODUCTION)

A. Facility Drainage

1. Drainage from diked storage areas is controlled as follows (include operating description of valves, pumps, ejectors, etc. (Note: Flapper-type valves should not be used):

The drainage of oily fluid from the diked containment will be through the use of 100 bbl vacuum tanker trucks and/or portable pumps with disposal at approved facilities or will be replaced into the production stream for reconditioning. Also the various drain lines may be unlocked and rainwater allowed to flow out of the dike if there is no sheen of oil. Attachment #3 will be used for documentation as well as the Amoco Waste Manifest, if transported.

2. Drainage from undiked areas is controlled as follows (include description of ponds, lagoons, or catchment basins and methods of retaining and returning oil to facility):

The facility is contained on the southwest and southeast through a stormwater control levee. This levee is in place to act as a catchment for stormwater and also to act as a tertiary containment for oil, other hydrocarbon liquids, or chemicals. Oil will be collected if accumulations occur in this area as in A.1. above.

3. The procedure for supervising the drainage of rain water from secondary containment into a storm drain or an open watercourse is as follows (include description of (a) inspection for pollutants, and (b) method of valving security). (A record of inspection and drainage events is to be maintained on a form similar to Attachment #3):

On the operator's routine rounds, the operator will look for signs of oil. If oil is observed, the Plant Foreman will be notified and the product inside the firewall will be recovered by pumps and/or vacuum trucks and handled in approved methods (disposal or recycled). The test for oil will be a sheen that is visible to the eye. If no oil is observed a pump may be used to remove rainwater that has accumiated. Discharge will be to a portion of the location that has been permanentized to prevent eroison and or sediment transport to water bodies. Also the various drain lines may be unlocked and rainwater allowed to flow out of the dike if there is no sheen of oil. There must be personnel on the site at all times during discharge activities.

Name of facility: Empire Abo Gas Plant

Operator:

Amoco Production Company

(Part II, Alternate A) Page 1 of 5

[Response to statements should be: YES, NO, or NA (Not A pplicable).]

E. Bulk Storage Tanks

1. Describe tank design, materials of construction, fail-safe engineering features, and if needed, corrosion protection:

Tank design is of welded construction or bolted. Tanks are connected to allow equalizing overflow. The storage system is automated and includes automatic shutdown systems as well as alarms that alert personnel.

2. Describe secondary containment design, construction materials, and volume:

The secondary containment is as drawn on the attached plats. The material used in the construction is compacted clay and caliche. Compaction is sufficient to prevent breakthrough for 72 hours. See Section 1, General Information, for volumes.

3. Describe tank inspection methods, procedures, and recordkeeping:

The tanks will be visually inspected on a daily basis. Semi-annual inspections by the Production Foreman or his designee will be conducted and documented. Non destructive testing on the NGL bottle tanks will be conducted on a 3 year basis. This will be recorded and records maintained.

4. Internal heating coil leakage is controlled by one or more of the following control factors:

NA

(a) Monitoring the steam return or exhaust lines for oil.

Describe monitoring procedure:

- (b) Passing the steam return or exhaust lines through a settling tank, skimmer, or other separation system.
- (c) Installing external heating systems.
- 5. Disposal facilities for plant effluents discharged into navigable waters are observed frequently for indication of possible upsets which may cause an oil spill event. **NA**

Describe method and frequency of observations:

Name of facility: Empire Abo Gas Plant

Operator: Amoco Production Company

(Part II, Alternate A) Page 2 of 5

[Response to statements should be: YES, NO, or NA (Not Applicable).]

C. Facility Transfer Operations, Pumping, and In-plant Process

- 1. Corrosion protection for buried pipelines:
 - (a) Pipelines are wrapped and coated to reduce corrosion. YES
 - (b) Cathodic protection is provided for pipelines if determined necessary by electrolytic testing.
 - (c) When a pipeline section is exposed, it is examined and corrective action taken as necessary. YES
- 2. Pipeline terminal connections are capped or blank-flanged and marked if the pipeline is not in service or on standby service for extended periods. YES

Describe criteria for determining when to cap or blank-flange:

When the line is not in service or will be taken ourt of service for an extended period of time then the pipe will be blanked-flanged or capped. The time that is considered extended may vary from job to job, location of line and other lock out tag out procedures that are in place for this facility.

3. Pipe supports are designed to minimize abrasion and corrosion and allow for expansion and contraction. **YES**

Describe pipe support design:

Pipe supports are weided or U-bolted.

4. Describe procedures for regularly examining all above-ground valves and pipelines (including flange joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces):

The local Plant Foreman will make regular observations of operations under his control. The facility is manned 24 hours per day. The facilities are periodically visually inspected by plant operators during their normal duties in their 12 hour shift. On a semi-annual basis the Plant Foreman or his designee will inspect tanks, tank containment dikes, valves, flange joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces and the amount of spill containment material that is available.

5. Describe procedures for warning vehicles entering the facility to avoid damaging aboveground piping: NA

There is a process overview program for this facility. All drivers must sign in at the office and briefing is held.

Name of facility: Empire Abo Gas Plant

Operator: Amoco Production Company

(Part II, Alternate A) Page 3 of 5

[Response to statements should be: YES, NO, or NA (Not Applicable).]

D. Facility Tank Car & Tank Truck Loading/Unloading Rack

Tank car and tank truck loading/unloading occurs at the facility. (If YES, complete 1 through 5 below.) 1. Loading/unloading procedures meet the minimum requirements and regulations of the

- Department of Transportation (refer to 49 CFR Parts 171,173,174,177, and 179). YES
- 2. The unloading area has a quick drainage system.

- NO
- 3. The containment system will hold the maximum capacity of any single compartment of a tank truck loaded/unloaded in the plant.

Describe containment system design, construction materials, and volume:

Natural gasoline is the only product that is loaded at this facility that has a specific that is heavy enough to allow for settling to the ground. An overflow line connects from the truck being loade to the plant inlet line to prevent overfilling and thus spills.

4. An interlocked warning light, a physical barrier system, or warning signs are provided in loading/unloading areas to prevent vehicular departure before disconnect of transfer lines. **NO**

Describe methods, procedures, and/or equipment used to prevent premature vehicular departure:

Chock blocks are place in front of and behind at least one wheel of all trucks being loaded.

5. Drains and outlets on tank trucks and tank cars are checked for leakage before loading/unloading or departure.

YES

Name of facility: Empire Abo Gas Plant

Operator: Amoco Production Company

(Part II, Alternate A) Page 4 of 5

[Response to statements should be: YES, NO, or NA (Not Applicable).]

E. Security

nts handling, processing, or storing oil are fenced.	YES
rance gates are locked and/or guarded when the plant is unattended or not in production.	NA
y valves which permit direct outward flow of a tank's contents are locked closed when in non-ope us.	erating or standby N O
rter controls on all oil pumps in non-operatingor standby status are:	
locked in the off position;	NA
located at site accessible only to authorized personnel.	NA
cussion of items 1 through 4 as appropriate:	

The facility is manned 24 hours per day, each day.

6. Discussion of the lighting around the facility:

The facility is lighted during all hours with lights.

Name of facility:Empire Abo Gas PlantOperator:Amoco Production Company

(Part II, Alternate A) Page 5 of 5

[Prior to completing Part 11, Alternate B, refer to regulations and instructions page 7.)

PART II, ALTERNATE B DESIGN AND OPERATING INFORMATION ONSHORE OIL PRODUCTION FACILITY

[Response to statements should be: YES, NO, or NA (Not Applicable).]

A. Facility Drainage

- 1. Drainage from diked storage areas is controlled as follows (include operating description of valves, pumps, ejectors, etc.):
- The procedure for supervising the drainage of rain water from secondary containment into a storm drain or an open watercourse is as follows (include description of (a) inspection for pollutants, and (b) method of valving security). (A record of inspection and drainage events is to be maintained on a form similar to Attachment #3):
- 3. Field drainage ditches, road ditches, and oil traps, sumps, or skimmers, if such exist, are inspected at regularly scheduled intervals for accumulations of oil. Describe inspection procedures, intervals, and methods employed to remove oil:

B. Bulk Storage Tanks

1. Describe tank design, materials of construction, and fail-safe engineering features:

Name of facility

Operator

(Part 11, Alternate B) Page 1 of 2

PART II, ALTERNATE B DESIGN AND OPERATING INFORMATION ONSHORE OIL PRODUCTION FACILITY

[Response to statements should be: YES, NO, or NA (Not Applicable).]

2. Describe secondary containment design, construction materials, and volume:

3. Describe tank examination methods and procedures:

C. Facility Transfer Operations

1. Describe scheduled basis for examinations of above-ground valves and pipelines and salt water disposal facilities:

2. Describe flowline maintenance program to prevent spills:

D. Oil Drilling and Workover Facilities

- 1. A blowout preventer (BOP) assembly and well control system is installed before drilling below any casing string and, as required during workover operations.
- 2. The BOP assembly is capable of controlling any expected wellhead pressure.
- 3. Casing and BOP installations conform to state regulations.

Name of facility

Operator

(Part II, Alternate B) Page 2 of 2

SPCC PLAN, ATTACHMENT #I SPILL HISTORY

Complete this form for any reportable spill(s) which has (have) occurred from this facility during the twelve months prior to January 10,1974 into navigable water.) 1. Date Volume Cause: Corrective action taken: Plans for preventing recurrence: 2. Date Volume Cause: Corrective action taken: Plans for preventing recurrence: 3. Date Volume Cause: Corrective action taken: Plans for preventing recurrence: Name of facility: **Empire Abo Gas Plant** Operator: **Amoco Production Company** (Attachment #1, SPCC Plan)

SPCC PLAN, ATTACHMENT #2 OIL SPILL CONTINGENCY PLANS AND WRITTEN COMMITMENT OF MANPOWER, EQUIPMENT, AND MATERIALS

econdary containment or diversionary structures are impracticable for this facility for the following reasons (attach additional pages if necessary):

A strong oil spill contingency plan is attached. See the SPBBU Emergency Task Group Plan

A written commitment of manpower, equipment, and materials is attached. See the SPBBU Emergency Task Group Plan

Name of facility:Empire Abo Gas PlantOperator:Amoco Production Company

(Attachment #2, SPCC Plan)

SPCC PLAN, ATTACHMENT #3 ONSHORE FACILITY BULK STORAGE TANKS DRAINAGE SYSTEM

Inspection Procedure:

The Plant Foreman or his designee will conduct semi-annual visual inpections of the diked area and these will be documented. The Plant Technicans will conduct daily inspections and these will not be documented.

Record of drainage, bypassing, inspection, and oil removal from secondary containment:

Date of Drainage Date of Bypassing Open Closed

Date of Inspection

<u>Oil Removal</u>

Supervisor's or Inspector's Signature

Name of facility:

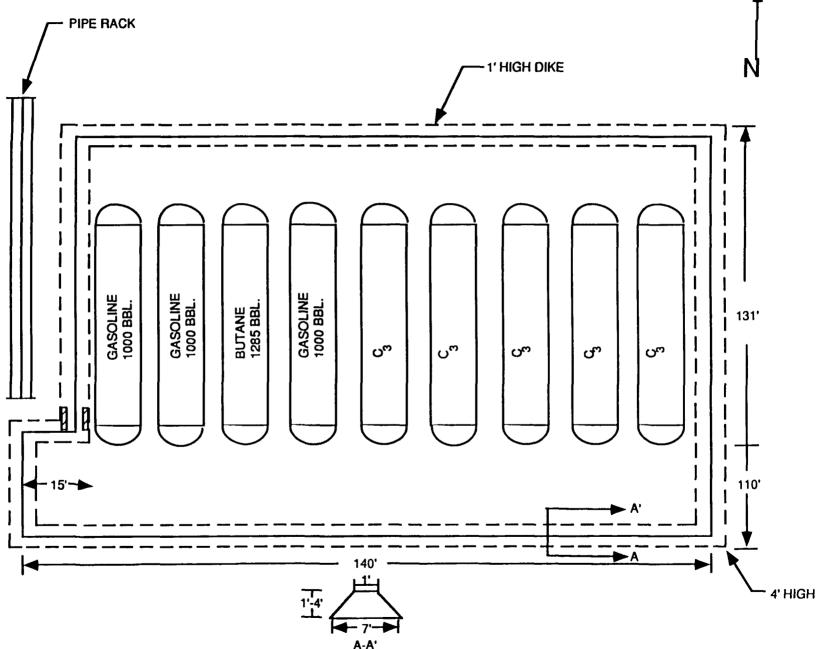
Empire Abo Gas Plant

Operator:

Amoco Production Compan y

(Attachment #3, SPCC Plan)

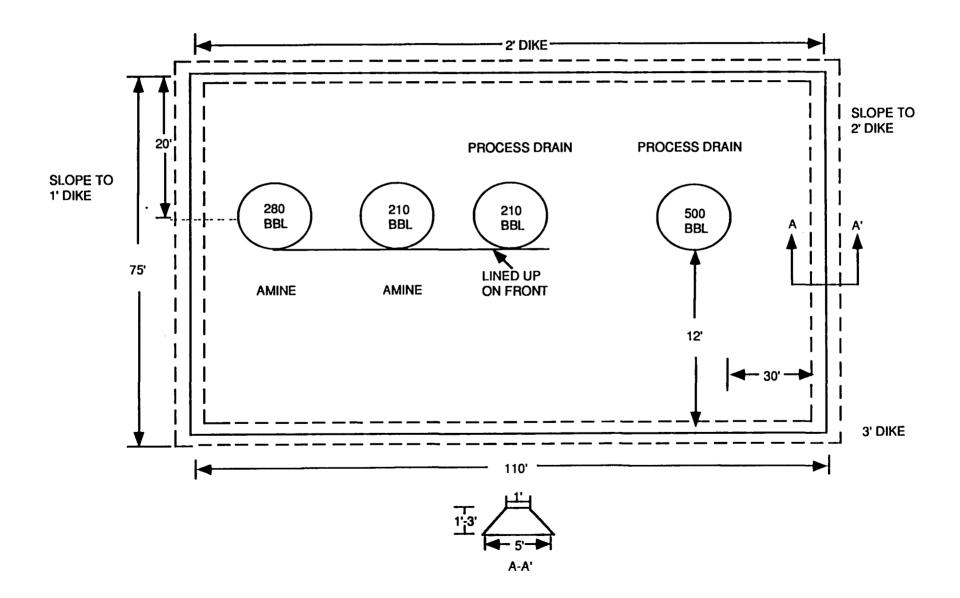
NGL DIKE - EAGP



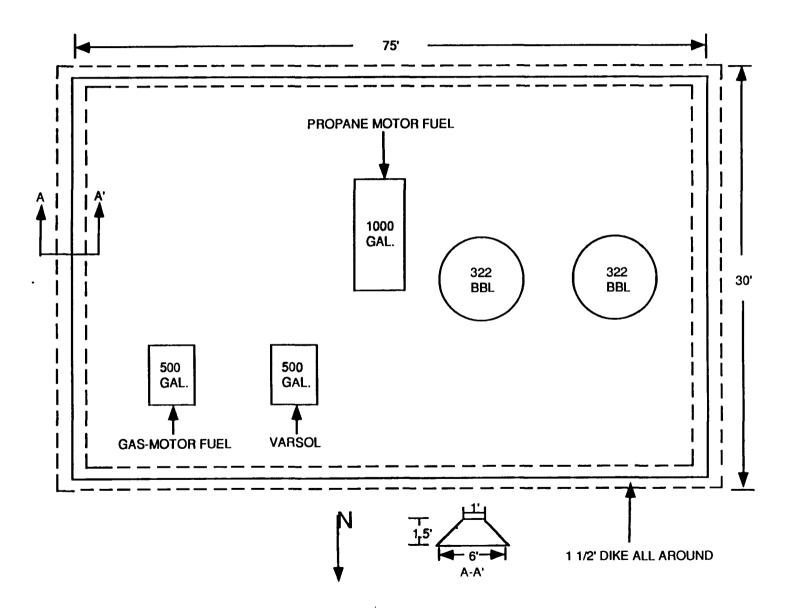
A-A'



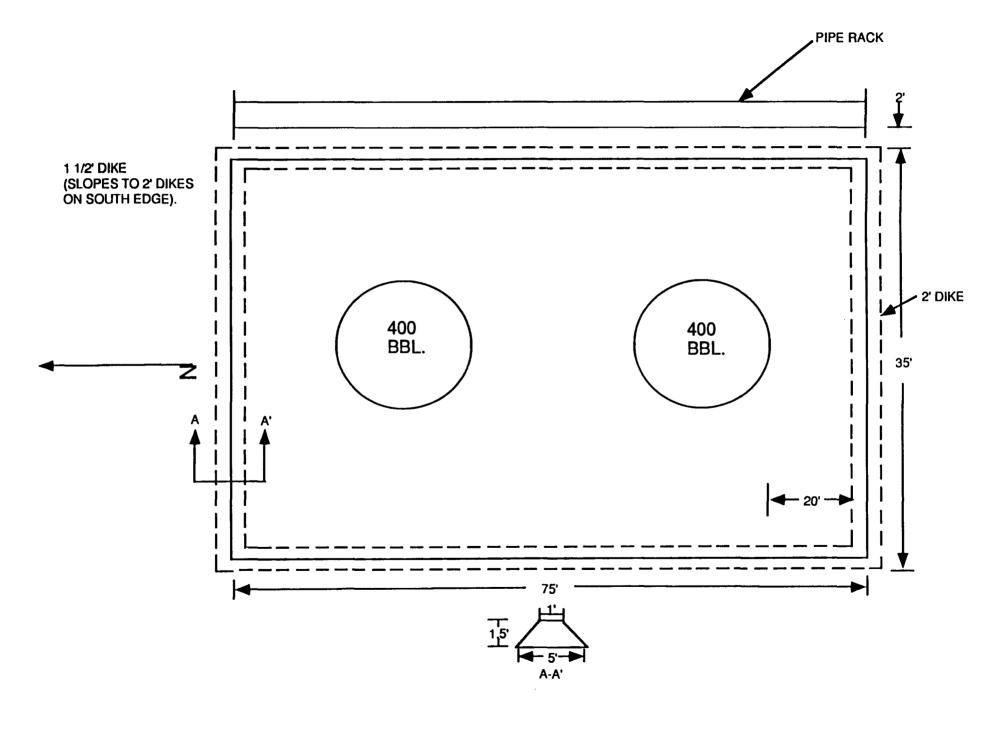
PROCESS DRAIN STORAGE DIKING EAGP



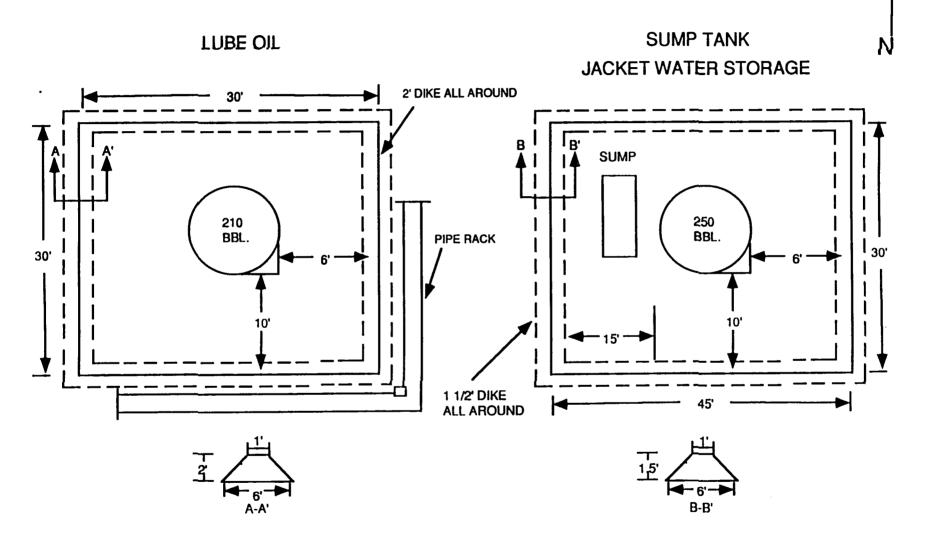
LUBE OIL STORAGE - EAGP



SLOP OIL TANKS - EAGP



INJECTION AREA DIKING EAGP



--AMOCO-OPERATED AND MAINTENANCE PERFORMED FOR ARCO

APPENDIX 94-D

NATURAL GAS LIQUIDS BUSINESS UNIT SOIL REMEDIATION GUIDELINES FOR CRUDE OIL SPILLS

Following are the NGLBU soil remediation guidelines which are to be utilized in remediation operations for new hydrocarbon spills.

Minimum concentration levels for TPH shall be based on state regulatory requirements or NGLBU target levels, whichever is more stringent. NGLBU target levels for New Mexico and Texas consists of 0.1% (1000 ppm) for surface and subsurface TPH within the spill area. For those spills where an above ground remediation plot will be used, NGLBU target levels for TPH will be 0.5% (5000 ppm) or less. A summary and a copy of hydrocarbon spill regulations for Texas and New Mexico are found in Appendixes A and B, respectively. These appendixes should be consulted for specific state requirements for contaminate levels, risk based assessments, and reporting requirements.

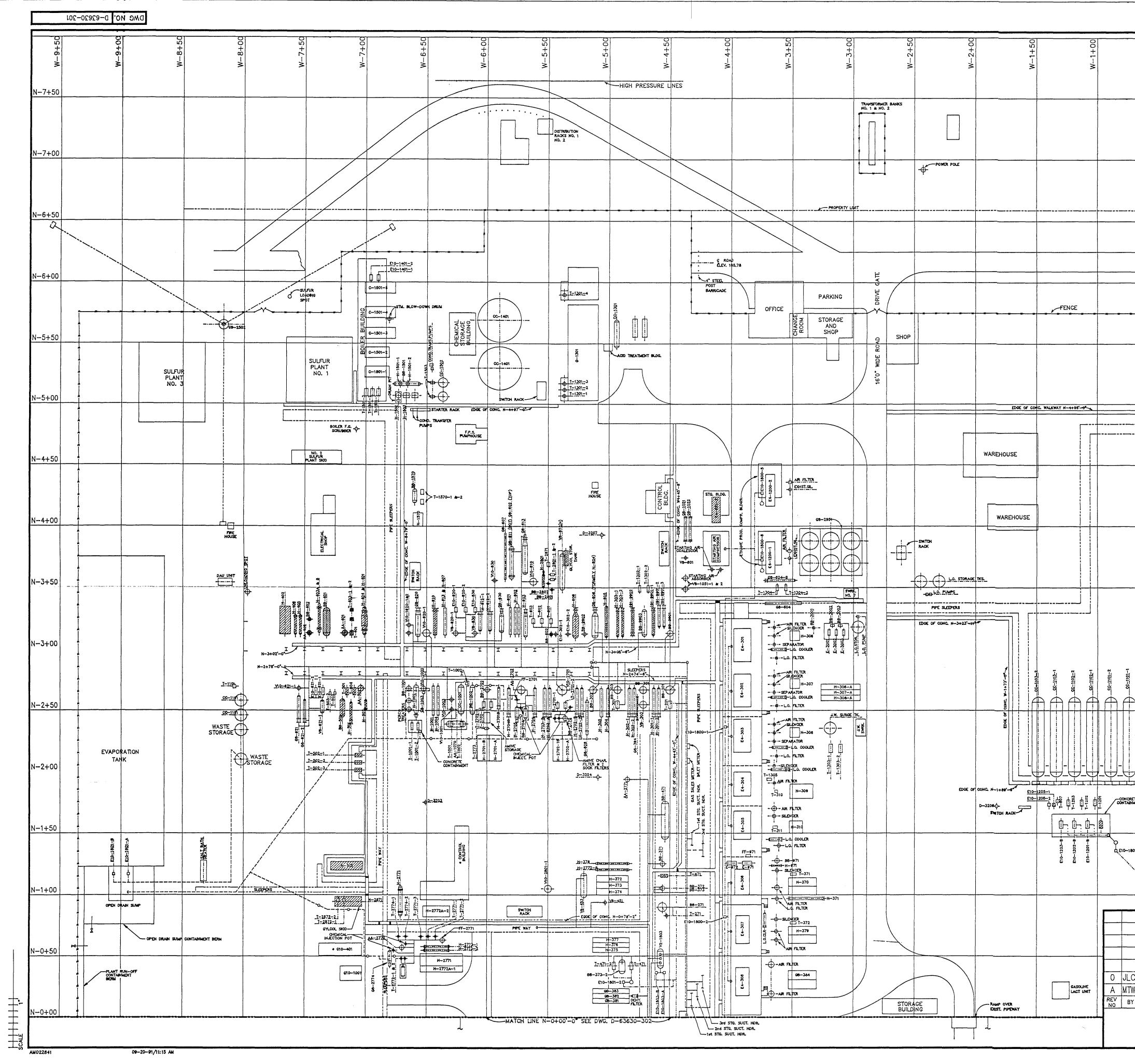
Soil samples may be sent for offsite analysis to a NGLBU approved laboratory (Contact your Field EH&S Coordinator).

GUIDELINES

- 1) Notification
 - ALL CRUDE OIL SPILLS/LEAKS (as well as any other spill) MUST be immediately reported to the Amoco Hotline.
- 2) Initial Response
 - Source elimination and site security as appropriate.
 - Containment of spill material.
 - Site stabilization and immediate removal of free liquid.
- 3) Excavation
 - All hydrocarbon contaminated soil associated with the spill/leak containing more than 0.1% (1000 ppm) of TPH MUST be brought to the surface for remediation.
 - For crude oil spills/leaks which occur onto an area with prior existing hydrocarbon soil contamination, the FRESH SPILL MUST be excavated as outlined above. The prior hydrocarbon soil contamination shall be handled on a case by case basis. The EH&S Coordinator MUST be notified for guidance before any remediation activity begins on the prior existing contamination.
- 4) Remediation Of Soil
 - **Remediation** of the hydrocarbon contaminated soil MUST begin as soon as possible.
 - Insitu remediation (in place) may be used for crude oil spills of one (1) barrel or less with a soil contamination depth of twelve (12) inches or less. The soil to be

remediated must be mixed with clean ambient (surrounding) soil or other new soil to achieve a uniform mixture consisting of 0.1% (1000 ppm) or less of TPH. Should there be excess soil from this mixture that can not be leveled out within the spill area, it shall be placed in an onsite remediation plot no more than twelve (12) inches in depth for further biodegradation. In certain situations, exceptions to the insitu remediation guidelines may be warranted. **These exceptions MUST be approved by the EH&S Manager.** Contact your Field EH&S Coordinator for assistance.

- Onsite landfarming shall be used for ALL crude oil spills greater than one (1) barrel. The excavated soil must be mixed with clean ambient (surrounding) soil or other new soil to achieve a uniform mixture consisting of 0.5% (5000 ppm) or less of TPH. This mixture shall be placed in an onsite remediation plot no more than twelve (12) inches in depth for further biodegradation.
- The EH&S Coordinator shall be responsible for coordinating the:
 - Sampling of the remediated soil,
 - Documentation of sample coordinates and remediation plot location,
 - Analysis of the remediated soil (portable TPH meter or outside lab) and
 - Submitting to the Houston EH&S Group the appropriate information as required by that state's spill reporting requirements (see Appendix A for New Mexico and Appendix B for Texas)
- 5) Remediation Costs
 - Each separate, new crude oil spill at a facility, well site or flowline will be considered a single project. If projected remediation costs exceed the operators agreement allowance, an AFE <u>must be sent to all working interest owners</u>.
 - If an AFE is submitted, work should not commence (excludes initial response, see Step #2) until receipt of approval by:
 - Working interest owners,
 - Exceptions to the WI owners approval may be warranted in emergency situations. Contact your Field EH&S Coordinator.
 - Appropriate regulatory agency(ies) and
 - NGLBU EH&S Group.

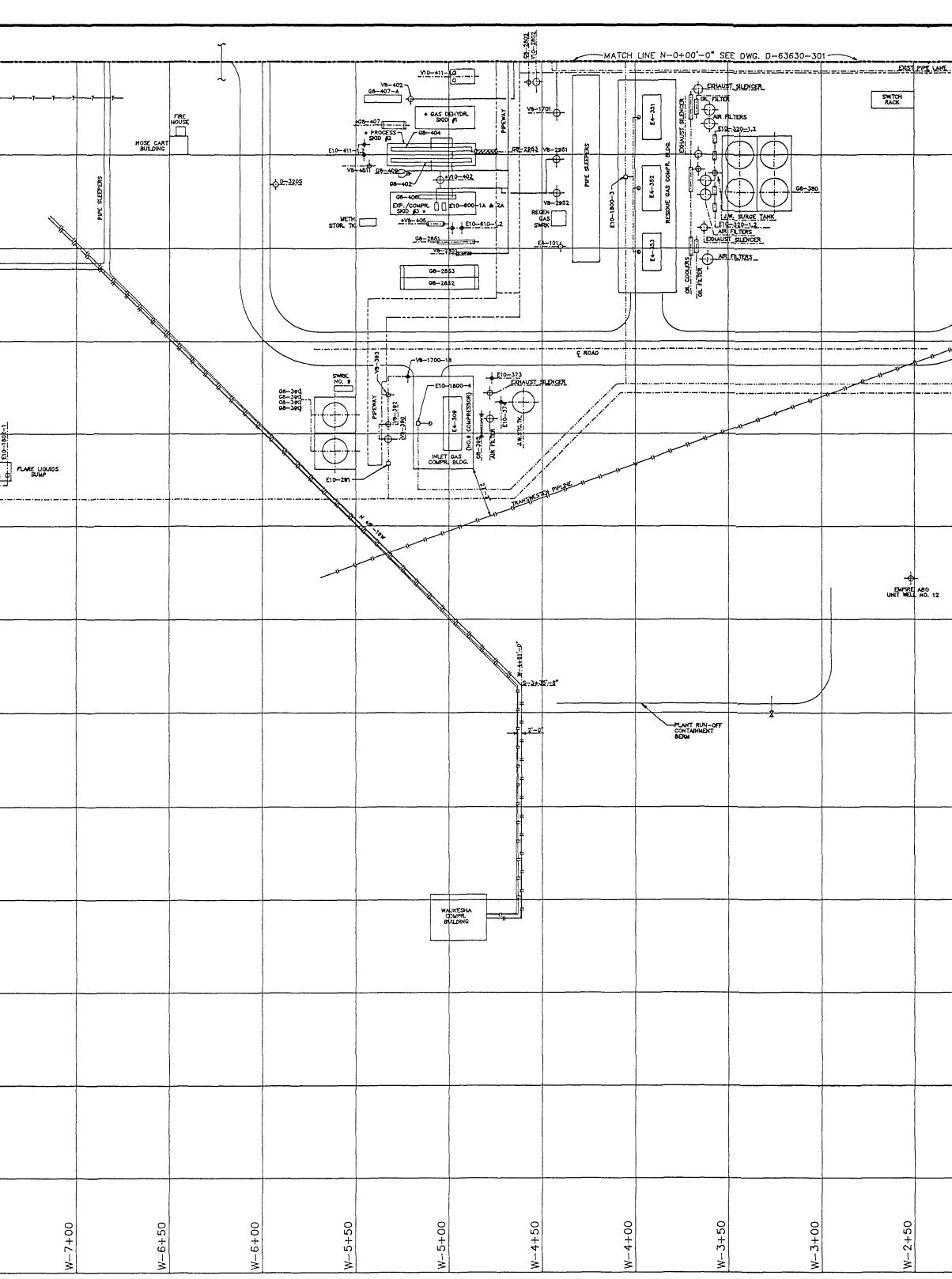


0+50	00+0				PMENT SCHEDULE	9-L0002 (D-1	
N−0	N-V	AA-401 AA-402 (AA-501	TOWERS ABSORBER & SCRUBBER DEETHANIZER REABSORB		EXCHANGERS & COOLERS 1at STAGE TRIM COOLER 1st STAGE DIS. COOLERS 2nd STAGE DIS. COOLERS	T-1502 T-1503 T-1570-1,2	PUMPS (CONTINUED) FDWTR. MK-UP PUMP (BLBG.) CONDENSATE PUMPS CONDENSATE TRANSFER PUMP
1		(c) $AA = 2702$ (A) $AA = 2771$ (c) $AA = 2772$	AMINE REGENERATOR AMINE CONTACTOR AMINE REGENERATOR	H-303-1,2 H-304 H-	3rd STAGE DIS. COOLERS 3rd STAGE DIS. COOLERS (C 3rd STAGE DIS. COOLERS (C	T-2501 T-2701-1,2 T-2702-1,2	LOADING PUMP (S.PL) AMINE CIRCULATING PUMPS AMINE REGEN. REF. PUMPS
		(A) V10-610 (A) V10-620-1 (A) V10-621-1	DEETHANIZER 1 DEPROPANIZER 2 DEPROPANIZER	H-306 H-307 H-308	STEAM CONDENSER (C	T-2772-1,2 T-2773	AMINE CIRCULATING PUMPS REGENERATOR REF. PUMPS AMINE TRANSFER PUMP
		(A) V10-630 (A) V10-1001 (B) V10-1002	DEBUTANIZER CAUSTIC CONTACTOR CAUSTIC REGENERATOR	H-309 H-310 H-370	J. W. COOLER J. W. COOLER	T-2801-1.2 T-2871	AMINE REBOILER PUMPS GLYCOL PUMPS GLYCOL TRANSFER PUMP
·		(A) <u>V10–2701</u>		H-371 H-372 H-373		E10-302-1,2 E10-1201-B	GLYCOL PUMPS 3rd STAGE KNOCK-OUT PUMPS PIPELINE PUMP PIPELINE PUMP
		(A)(D) BB-201 (A)(D) BB-271	VESSELS AND TAU INLET SCRUBBER INLET SCRUBBER	H-375 H-376	1st STAGE DISCH. COOLER (E 2nd STAGE DISCH. COOLER	E10-1203-B E10-1205-1,2	PIPELINE PUMP PIPELINE PUMP BUTANE BOOSTER PUMPS (N.I.S.)
		(A) BB-301 (A&C) BB-302 (A) BB-303	1st STAGE DIS. SCRUBBO 2nd STAGE SUC. SCRUBBO 2nd STAGE DIS. SCRUBBO	BER H378 ER H379	1st STAGE GAS TRIM COOLER (E JACKET WATER COOLER (E	E10-1800-5 E10-1800-6	NLET COMPR. DIRTY SLOP OIL PUMPS E/P COMPR. DIRTY SLOP OIL PUMP E/P COMPR. DIRTY SLOP OIL PUMP OPEN DRAIN SUMP PUMPS
		(A) BB-371 (A) BB-372 (A) BB-373-1 (A) BB-373-2	1st STAGE DIS. SCRUBBI 2nd STAGE SUC. SCRUBBI 2nd STAGE DIS. SCRUBB 2nd STAGE DIS. SCRUBB	BER H-402 ER H-403A,B	LEAN OIL COOLER (E DEETH, REABS, HEAT EXC. (D	E10-1801-A&B E10-1801-1 E10-1801-2 E10-1803-A&B	PRODUCT STORAGE DIRTY SLOP OIL PUMP CLEAN SLOP OIL PUMP CLOSED DRAIN TANK PUMPS
		(A) BB-401 BB-402 (A) BB-471	RICH OIL FLASH TANK RECOMPR. SUC. SCRUBB DEETHANIZER FEED SURG	H-405 ER H-406	DEETH, READS, REBOILER DEETH, READS, SIDE HTR.	E10-2580 E10-2810-1,2	SULFUR LOADING PUMP (43 S.P.) GLYCOL CIRC, PUMPS (GLYCOL SKID)
1		BB-501 86-601 BB-602	STILL REF. ACCUMULATO 3rd STAGE COND. ACCUI DEETH. REFLUX ACCUM.	R H-475	GAS TO GAS EXCHANGER STILL CONDENSER OIL RECLAIMER	E10E-3201-2 E10M-3201-1	FIRE PROT. PUMP (F.P.S. PUMP HOUSE) FIRE PROT. PUMP
		(A) V8-620-1 (A) V8-621-1 (A) V8-630	1 DEPROP. REFLUX ACC 2 DEPROP. REFLUX ACC DEBUT. REFLUX ACCUM.		DEETH. BTMS. COOLER DEETH. FEED BTMS. EXCH. DEETH. REBOILER	E10M-3202	(F.P.S. PUMP HOUSE) PRESS. MAINT. PUMP FIRE PROT. PUMP
		BB-971 BB-1001 (B) BB-1002	INSTR. AIR RECEIVER (3) PERCO TREATERS CAUSTIC TREATER	H-604 H-605 H-606	GAS CHILLER GAS TO GAS EXCHANGER DEETH, OVH'D, CONDENSER	E10-1401-1,2	UTILITY WATER PUMPS
		(A) V10-1003 (A) V10-1620-1,2 BB-1501	SAND FILTER PROPANE DRYERS BOILER FEED TANK	H607 (A) G8620 (A) G8621	DEPR. FD-DEBUT. BTMS. EXCH. 1 DEPROPANIZER REBOILER 2 DEPROPANIZER REBOILER DEPROPANIZER REBOILER		
	HOUSE	BB-1570 BB-2501 BB-2502 BB-2571	CONDENSATE STORAGE) (A) G8-621-2 T) (A) G8-630	DEPROP. OVH'D. COND. 2 DEPROP. OVH'D COND, DEBUTANIZER REBOILER DEBUT OVH'D. COND		
		BB-2571 BB-2572 (B) BB-2702 (C) BB-2704	SULFUR SCRUBBER (S.P. SULFUR SCRUBBER (S.P. AMINE REGEN. REF. ACC AMINE SUMP	_) H613	DEBUT. OVH'D. COND. DEBUT. BTMS. COOLER INSTR. AIR COOLER CAUSTIC REG. FD. BTMS. EX.		
		BB-2801 BB-2802 BB-3001	GLYCOL SURGE TANK GLYCOL FILTER AIR TANK	H-1002 G8-1003 H-1004	CAUSTIC RECEN, REBOILER CAUSTIC RECEN, REBOILER CAUSTIC RECEN, OVH'D, COND, LEAN CAUSTIC COOLER		
		88-3002 88-3003 (A) 88-9901	INSTR. AIR DRYER INSTR. AIR DRYER REFRIG. 2nd STG. SUCT.	H-1501-1,2 H-1502 SCRUBBER H-1503-1,2,3	DEAERATOR EVAPORATOR EVAPORATOR CONDENSER		
		(A) 88-9902 (A) 88-9903 (A)(D) V2-1803	PROPANE PURIFIER PROPANE ACCUMULATOR CLOSED DRAIN TANK	H-1570 H-2701AB H-2701B	STEAM CONDENSER AMINE REFLUX CONDENSERS AMINE AFTER COOLER		
		(A) V8-303 (A) V8-451 (A) V8-453 V8-601	P 1st STAGE DISCHARGE SC COALESCER 3 PHASE SEPARATOR	H-2702-18 H-2702-8,28	AMINE COOLER AMINE COOLER AMINE FINAL COOLERS AMINE FYCHANGERS		
K QATE		(A) V8-652(N)	ETHANE PRODUCT SCRU DEETHANIZER REFLUX AG ETHANE PRODUCT TREAT RECEN GAS RECOMP. SUCT.	ССИМ. (C) H-2704 TERS (C) H-2704B	AMINE EXCHANGERS AMINE REGEN, REBOILER AMINE REGEN, REBOILER AMINE RECLAIMER		
		V8-1032 V8-2581 V8-2810	REACTOR (NO. 3 S.P.) PACKED STRIPPING COLL (GLYCOL SKID)	H-2771 MN H-2772A1-2 H-2772B	AMINE REGEN. REF. COND. AMINE COOLER AMINE TRIM COOLER		
LOADI		V82850 V1028011,2 V102810	ACID GAS SCRUBBER (N BULK GAS DEHYDRATORS GLYCOL SURGE TANK	0. 3 S.P.) H-2773-1,2 5 H-2801	AMINE EXCHANGER GLYCOL REBOILER PROPANE CONDENSERS		
		C-1501-1,2,3,4	(GLYCOL SKID) BOILERS BOILERS (BOILER BLDG.)	HH9902 G8-381 G8-382	ECONOMIZER 1at STAGE COOLER 2nd STAGE COOLER		
		C-2501 CC-1001	FURNCLRCOND.(S.PL STORAGE TANK CAUS. STRG. & MIX TAN)	3rd STAGE COOLER JACKET WATER COOLER 1st STAGE TRIM COOLER		
 -		CC-1101 CC-1101-1,2,3,4 CC-1102-1,2	LEAN OIL STORAGE TANI PROPANE STORAGE TANI BUTANE STORAGE TANKS	(A) G8-611 (S) G8-602 (A) G8-613	DEETHAN. FEED EXCH./CONDENSE DEETHANIZER FEED HEATER DEETHANIZER REBOILER	R]	
		CC-1301 CC-1401	GASOLINE STORAGE TAN SULFURIC ACID STRG. TAN WATER STORAGE TANK	NK (A) G8-606 G8-607	ETHANE PRODUCT CONDENSERS DEETHANIZER REFLUX CONDENSER DEETHANIZER BOTTOMS COOLER		
		CC-1502 CC-2501	CONDENSATE STORAGE T SEP. STRC. TANK (S.P.L. GLYCOL STORAGE TANK)	DEETHANIZER FEED/MEA EXCH. REGEN GAS COOLER REGEN GAS RECOMPR. COOLER		
		G2-2580	LUBE OIL STORAGE TANK AMINE STORAGE TANK WASTE HEAT BOILER & CONDENSER (NO. 3 S.P.	G8-2582A,B (B) G8-2774	STEAM CONDENSER (NO. 3 S.P.) SULFUR CONDEN. #4 (NO. 3 S.P.) #2 AMINE RECLAIMER REFRIGERANT CONDENSER		
		(E) <u>E4-301-308</u> E-971	COMPRESSORS INLET GAS COMPRESSOR IN. AIR COMP. (COMP.BL	S (A40) T-201	INLET KNOCKOUT PUMP		
	ł	E-972 E-3001 E-3002	AIR COMPRESSOR		Znd STAGE KNOCKOUT PUMP JACKET WATER PUMP JACKET WATER PUMP		
	0¥207 -	E-3003 E4-601-1,2	AIR COMPRESSOR REGEN GAS COMPRESSO ETHANE PRODUCT COMP	T-371 RS T-372	JACKET WATER PUMP J. W. PUMP - COMPR. #7 PRESATURATOR OIL PUMP		
	<u>_ P_+297_</u>	N-501 N-2771	HEATERS FIRED HEATER AMINE REBOILER	(A) T-471,2 T-501	HIGH PR. LEAN OIL PUMP 2nd STAGE KNOCKOUT PUMP STILL REFLUX PUMP		
		N-2871 G8-2580	GLYCOL REGENERATOR L SALT BATH HEATER FEED HEATER 1 (NO. 3	T-503-1.2 S.P.) (A) T-601	HOT OIL PUMPS STILL NET MAKE PUMP DEETHANIZER FEED PUMP		
C-1101-4		68-2581 610-401 610-1001	FEED HEATER #2 (NO. J REGEN GAS HEATER REGEN GAS HEATER	(A) T-603 (A) E10-620-1	DEETH. FEED PUMP (SPARC) DEETH. REFLUX PUMP DEPROP. REFLUX PUMP		
	A I	D-2501 0-2502	MISCELLANEOU AR BLOWER (SULPL) AR BLOWER (SULPL)	(A) E10-620-2 (A) E10-630	DEBUT. REFLUX PUMP		
		(Bac)	IN. AIR. DEHY. (COMP. E COOLING TOWER DAU UNIT AMINE FILTERS (SOCK)	(B) T-1001-1.2 (B) T-1001-1.2 T-1002 T-1101	TRUCK RACK RERUN PUMP CAUSTIC CIRC. PUMP CAUSTIC CHARGE PUMP LEAN OIL MAKE-UP PUMP		
		G9-2501 G9-2502	ACD DAY TK. (ACD TRE MUFFLE FURNACE (SULF WASTE GAS INCIN. STAC	AT BLDG.) T-1201 PL) T-1202	TRUCK RACK PROPANE PUMP PIPELINE BUTANE PUMP TRUCK RACK GAS PUMP		
		0-3201 - 6 D-3207 E8-2580	FIRE HYDRANT & MONITO	DR T-1301-1,2,3,4 T-1302-1,2) T-1303-1,2	COOLING TOWER PUMP COOLING WTR. BSTR. PUMP J.W. CIRCULATING PUMPS		
		G9 -2580 (C) FF-2701	MUFFLE FURNACE (NO BOILER FUEL GAS SCRUE 1 AMINE BAG FILTER	3 S.P.) T-1304-1,2 BER T-1305	COOLING WATER BOOSTER PUMPS J.W. DRAIN PUMP BLR. FDWTR. PUMP (BLR.BG.)		
	G T IALK-WAY	(C) FF-2771 NOTES:	2 AMINE BAG FILTER				
	Ť	2. • INDICATE 3. 222 INDICA	WALK-WAYS ARE TO BE S EQUIPMENT FURNISHED TES EQUIPMENT OUT OF S	BY TULSA PRO-QUIP. IN	лс.		
		<u>LEGEND:</u> (A)		CLOSED DRAIN SYS			
	Į	(B) (C)	<i>J</i>	DPEN DRAIN SYSTE AMINE DRAIN SYSTE CLEAN SLOP OIL S	EM		
		(E)		DIRTY SLOP OIL SY			
` .	Ŧ						
					EMPIRE A	30 GA co., new m	
							DN COMPANY
28/92	AS-BUILT	G	кс	GLC	KEY P	IPING	PLAN
	ISSUED FOR APPROV	AMOCO AN	KC CONTR	GLC	AREA L	AYOU	T_OF
A	REMISION	PROCESSIAPP	ROVED DATE PROCESS	APPROVED DATE	PIPING SY		S (1 OF 4)
HIS DR	AWING IS THE PROPERTY OF A			Part of the second s	00115		
INFORM AND TH DISCLO	RAWING IS THE PROPERTY OF A MATION OF AMOCO PRODUCTION IE INFORMATION THEREON SHAL DSED TO ANY OTHER PARTY OR ER THAN FOR THE BENEFIT OF	COMPANY. THE L NOT BE REPROD USED FOR ANY F	DRAWING UCED OR URPOSE		SCALE DRAWN BY NONE MTWC ROJECT CODE DRAWING	DATE 09-11	

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	S-1+00			 				- FLARE HOR
						0FTA	GAS TO FLARE	88-2371 ARE K.Q. TANK
	S-1+50						<u>S=1+37'=</u> PLARE STACK Pi Bi Bi	
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	S-2+00						FLARE HOR.	
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						 ACID	GAS TO FLARE	
	S-3+00				A A A A A A A A A A A A A A A A A A A	 	S- <u>3+28'-9</u> FLARE STACK 9 3 5 5	· · · · · ·
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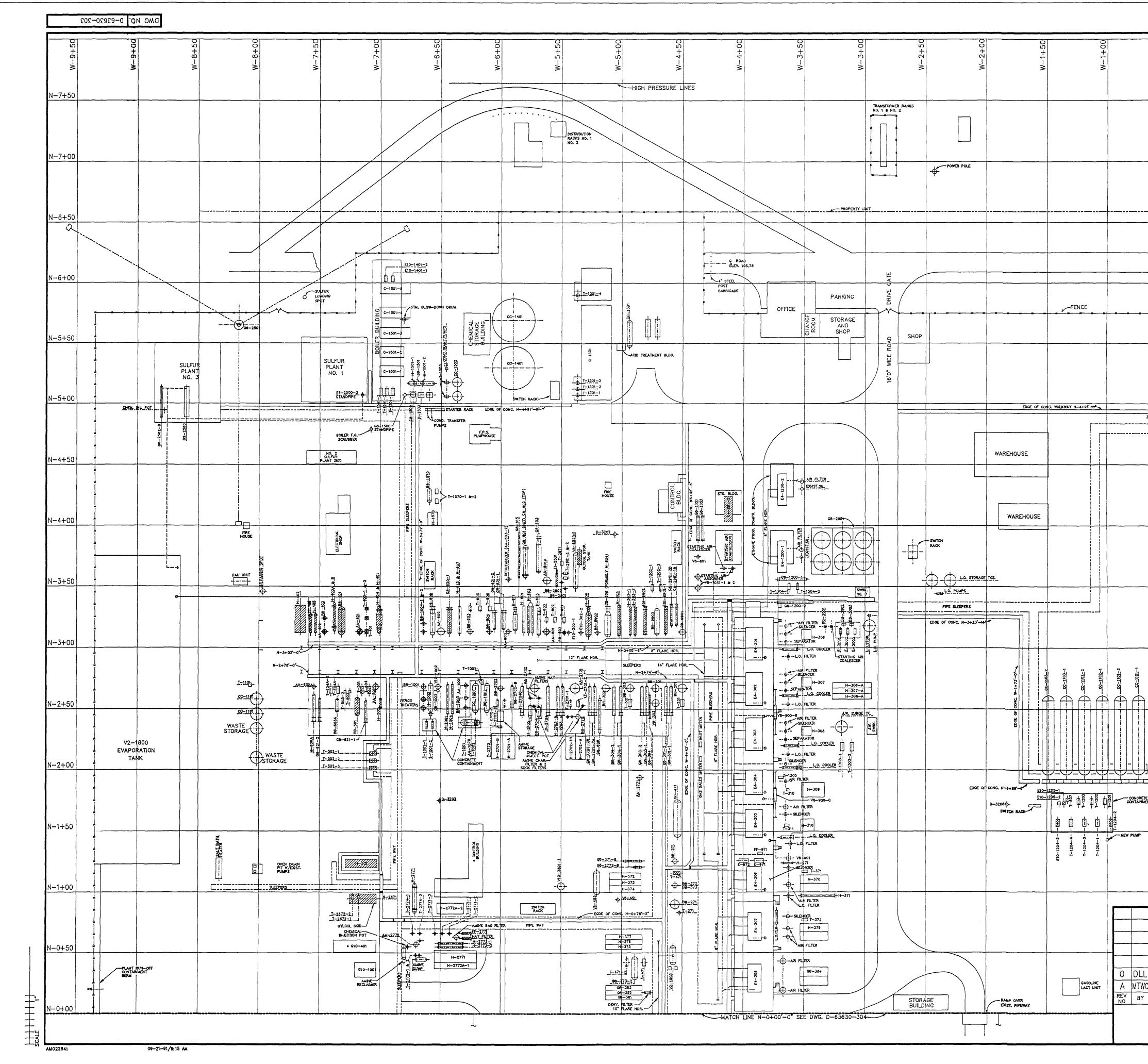
	E	EQUIPMENT	SCHEDU	JLE	
			COMPRESSOR		
			N 1976		
ITEM NO.	DESCRIPTION	PLOT PLAN DWG. NO.	ITEM NO.	DESCRIPTION	PLOT PLAN DWG. NO.
	VESSELS		1	COMPRESSOR	
V8-392	2nd STAGE SUCTION SCRUB.	D-19-L0002	E4-309	INLET GAS COMPRESSOR (E)	D-19-L0002
V8-393	3rd STAGE SUCTION SCRUB.	D-19-L0002		PUMPS	
V8-303	1st STAGE DISCH. SCRUB.	D-19-L0004	E10-373	J.W. CIRCULATING PUMP	0-19-L000
V8-390	1st STACE SUCTION SCRUB.	D-19-L0002	E10-374	J.W. TRANSFER PUMP	D-19-L0002
	EXCHANCERS		E10-375	DRAIN SUMP PUMP	D-19-L0002
68-390	JACKET WATER COOLER	D-19-L0002	E10-376	PRE. POST LUBE OIL PUMP	0-19-L0002
G8-391	1st STAGE DISCH COOLER	D-19-L0002	E10-472	2nd STAGE KO PUMP	D-19-L0002
G8-392	2nd STAGE DISCH. COOLER	D-19-L0002			
68-393	3rd STACE DISCHL COOLER	D-19-L0002			
G8-394	1st STAGE TRIM COOLER	D-19-L0004			
68-395	LUBE OIL COOLER	D-19-L0002			

NOTE	S:				
2. **	FORMER	IS EQUIPME RLY H-604 RLY T-501		BY TULS	A PRO-QUIP. INC.
					£ D-5171
			. D-19-L0002		-

										EMPIRE ABO GASOLINE PLANT EDDY CO., NEW MEXICO
										AMOCO PRODUCTION COMPANY
)	DLL	2/28/92	AS-BUILT		GKC		GLC			KEY PIPING PLAN
v v	MTWC by	DATE	ISSUED FOR APPROVAL REVISION		GKC AMOCO APPROVED		GLC CONTR PROCESS	CONTR APPROVED	DATE	AREA LAYOUT OF PIPING SYSTEMS (2 OF 4)
THIS DRAWING IS THE PROPERTY OF AND EMBODIES CONFIDENTIAL INFORMATION OF AMOCO PRODUCTION COMPANY. THE DRAWING AND THE INFORMATION THEREON SHALL NOT BE REPRODUCED OR DISCLOSED TO ANY OTHER PARTY OR USED FOR ANY PURPOSE OTHER THAN FOR THE BENEFIT OF AND AS AUTHORIZED BY AMOCO PRODUCTION COMPANY.										
										Filename: 63630302.DWG FIG: 94-2B

	RAMP OVER EQST. PIPEWAY						EQUIPMENT SCHEDU CRYDGENIC RECOVERY FACU	ĨŶ
	TEOST. PIPEWAY			SLOP OIL LACT CLEAN SLOP OIL TANK CLEAN SLOP OIL TANK COC-1104 SLOP OIL SLOP OIL SLO	(b) * (A) * * * * * * * * * * * * *	ITEM NO. AA-601,1A AA-602,2A AA-602,2A AA-1001 AA-1002 AA-1001 AA-1001 AA-1002 AA-1002 AA-1002 AA-1002 AA-1002 AA-1002 AA-1002 AA-1002 BB-303 BB-471 BB-601 BB-603,3A BB-1002 BB-1002 BB-1004 BB-2301 BB-2351	CRYOGENIC RECOVERY FACL DESCRIPTION VESSELS DEENTANIZERS DEPROPANIZERS DEPROPANIZERS DEPROPANIZERS DEBUTANIZER CAUSTIC CONTACTOR CAUSTIC CONTACTOR CAUSTIC CONTACTOR CAUSTIC CONTACTOR CAUSTIC CONTACTOR CAUSTIC CONTACTOR 2nd STAGE DISCH. SCRUB. DEETH. FEED SURGE TK. 3rd STAGE DISCH. SCRUB. DEPROP. REFLUX ACCUM. DEBUT. REFLUX ACCUM. DEBUT. REFLUX ACCUM. CAUSTIC TREATER SAND FILTER SORBEAD DRYERS FLARE KNOCK-OUT TANK REFRIG. Jrd STAGE SCRUB. REFRIG. SURGE TANK INLET SEP. (ON SKID #2) REGEN. GAS WATER KO TK. (S CHILLER SEP. (ON SKID #3) EXP. FEED SEP. (ON SKID #3) EXP. FIED SEP. (ON SKID #3) DEETH. REFLUX ACCUM. ETHANE PROD. SCRUB. GAS DEHYD. (SKID #1) DEMETHANIZER LIQUID DEHYDRATORS GLYCOL CONTACTOR EXCHANGERS & COOLERS COMPR. JACKET WIT. CLR. 1st STAGE GAS CLR. JACKET WATER CLR. WARM GAS TO GAS EXCH. (SKID DEETH. REBOILER (SKID #2) DEETH. REBOILER (SKID #2) DEETH	TY PLOT PLAN DWG, NO. D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0002 D-19-L0004 D-19-L0002 D-19-L0002 D-19-L0002 D-19-L0004 D-19-L0002 D-19-L0004 D-19-L0004 <t< th=""></t<>
						G8-1052 G8-2802 G8-2810 G8-2851 G8-2853 G8-2951 G8-2953 G8-2953 G8-2951 G8-2953 G8-2953 H-303-1,2 H-304 H-305 H-374 H-607,00 H-610,10A H-611,10A H-613 H-1001 H-1002 H-1003 H-1004 HH-9801-2, E10-291 E10-320-1,2 E10-321-1,2	REGEN. GAS RECOMP. COOLER GLYCOL/REGEN GAS EXCHANG GLYCOL/REGEN GAS EXCHANG GLYCOL REBOILER (GLYCOL SK REGEN GAS EXCH. RESIDUE GAS AFTERCOOLER RESIDUE GAS INTERCOOLER REFRIG. COND. REFRIG. ECONOMIZER 3rd STAGE DISCH. COOLER 4th STAGE DISCH. GAS CLR. 4th STAGE DISCH. GAS CLR. 4th STAGE GAS COOLER DEPROP. FEED-DEBUT. BTMS. DEPROP. REBOILERS DEPROP. REBOILERS DEBUT. REBOILERS DEBUT. REBOILER DEBUT. CONDENSER DEBUT. REBOILER DEBUT. REGEN. FEED DEBUT. REGEN. FEED DEBUT. REGEN. FEED DEBUT. REGEN. FEED CAUSTIC REGEN. REB. CAUSTIC REGEN. REB. CAUSTIC REGEN. REB. CAUSTIC REGEN. COOLER REFRIG. SUBCOOLERS PUMPS PC COMP. INLET SCRUBBER PU 3rd DISCH. SCRUB. KO PUMPS JACKET WATER CRULLATING PUMPS	D-19-L0004 ER ID) D-19-L0002 D-19-L0002 D-19-L0002 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L000
					* *** (E) (C) * (D) * (E) * (E) * (E)	$\begin{array}{c} \underline{E10-402} \\ \underline{E10-411-1,2} \\ \underline{E10-411-1,2} \\ \underline{E10-610-1,2} \\ \underline{E10-1205-1,} \\ \underline{E10-1205-1,} \\ \underline{E10-1205-1,} \\ \underline{E10-1802-1,2} \\ \underline{E10-1802-1,2} \\ \underline{T-301} \\ \underline{T-471} \\ \underline{T-601,2} \\ \underline{T-604A-1,2} \\ \underline{T-605,6} \\ \underline{T-1001} \\ \underline{T-1204-1,2,} \\ \underline{E4-301-308} \\ \underline{E-972} \\ \underline{E4-101} \\ \underline{E4-351,2,3} \\ \underline{E4-401-1,2} \\ \underline{E4-601-1,2} \\ \underline{E4-601-1,2} \\ \underline{E4-1200-1,2} \\ \underline{E4-1200-1,2} \\ \underline{E4-1001} \\ \underline{G10-401} \\ \underline{G10-1001} \\ \underline{G10-1001} \\ \underline{G10-1001} \\ \underline{E4-1200-1,2} \\ \underline{E4-1001} \\ \underline{G10-1001} \\ G10-$	DEMETH. PROD. BOOSTER PUM METHANOL PUMP (SKID 43) LIQ. DEHYD. ANTI FLASH PUMF DEETH. FEED PUMPS PIPELINE PUMP RES. COMP. DIRTY SLOP OIL F INLET COMP. DIRTY SLOP OIL F FLARE LIQUIDS SUMP PUMPS KO PUMP DEETH. REFLUX PUMPS DEETH. REFLUX PUMPS DEETH. REFLUX PUMPS DEETH. REFLUX PUMPS CAUSTIC CHARGE PUMP CAUSTIC CHARGE PUMP S INLET GAS COMPRESSORS INLET GAS COMPRESSORS INST. AIR COMP. (IN COMP. BI REGEN GAS BOOSTER COMPR. REGEN GAS COMPRESSORS EXPANDER COMPR. PUMPS ETHANE PROD. COMPR. HEATERS REGEN. GAS HEATER REGEN. GAS HEATER	D-19-L0002 D-19-L0002 D-19-L0002 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004 D-19-L0004
W2+00	W-1+50	W-1+00	W-0+50		(0) (0) (0) (0) (0) (0) (0) (0) (0) (0)	D-3205	CAUSTIC STORAGE & MIX TAN CRUDE DISTILLATE STOR. TAN J.W. STORAGE TANK (E-309) MISCELLANEOUS FIRE HYDRANT & MONITOR FLARE STACK FLARE STACK CLOSED DRAIN S CLOSED DRAIN S CLEAN SLOP OIL	SYSTEM SYSTEM

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 	00+0		TOWERS		TY FAC. EQUIP. LIST SEE DWG. D-11		PUMPS (CONTINUED)
×	~	AA-401 AA-402 AA-501	DEETHANIZER REABSORBER	G8 G8-394 H-301-1,2	INLET COMP. LUBE OIL COOLERS 1st STAGE TRIM COOLER 1st STAGE DIS. COOLERS	T-1502 T-1503 T-1570-1,2	
		AA-601 AA-601A AA-602	DEETHANIZER (F	H-303-1,2 G8-304-1,2	2nd STAGE DIS. COOLERS 3rd STAGE DIS. COOLERS 3rd STAGE DIS. COOLERS	T-2702-1,2	LOADING PUMP (S.PL.) AMINE CIRCULATING PUMPS AMINE REGEN. REF. PUMPS
		AA-602A AA-603-1 AA-603-2	DEPROPANIZER DEBUTANIZER DEBUTANIZER	H-306 H-307 H-308	STEAM CONDENSER STEAM CONDENSER STEAM CONDENSER	T-2772-1,2 T-2773	AMINE CIRCULATING PUMPS REGENERATOR REF. PUMPS AMINE TRANSFER PUMP
		AA-1001 AA-1002 AA-1070	CAUSTIC CONTACTOR CAUSTIC REGENERATOR CAUSTIC CONTACTOR	H-309 H-310 H-370	J. W. COOLER J. W. COOLER J. W. COOLER		AMINE REBOILER PUMPS GLYCOL PUMPS GLYCOL TRANSFER PUMP
		AA-2701 AA-2702 AA-2771	AMINE CONTACTOR AMINE REGENERATOR AMINE CONTACTOR	H-371 H-372 H-373	LUBE OIL COOLER 1st STAGE GAS COOLER 2nd STAGE GAS COOLER	E10-302-1,2	GLYCOL PUMPS 3rd STAGE KNOCK-OUT PUMPS BUTANE BOOSTER PUMPS (N.I.S.)
		AA-2772 BB-201	AMINE REGENERATOR VESSELS AND TANKS INLET SCRUBBER	H-374 H-375 H-376	3rd STAGE GAS COOLER 1st STAGE DISCH. COOLER 2nd STAGE DISCH. COOLER	E10-2580	SULFUR LOADING PUMP (43 S.P.) GLYCOL CIRC. PUMPS (GLYCOL SKID)
		BB-271 BB-301 BB-302	INLET SCRUBBER	H-377 G8-371-B H-379	JIG STAGE DISCL COOLER Jad STAGE DISCH. COOLER JACKET WATER COOLER JACKET WATER COOLER		FIRE PROT. PUMP (F.P.S. PUMP HOUSE) FIRE PROT. PUMP
		88-303 88-371	2nd STAGE DIS. SCRUBBER 1st STAGE DIS. SCRUBBER	H-401 H-402	PRESATURATOR CHILLER		(F.P.S. PUMP HOUSE) PRESS. MAINT. PUMP
		BB-372 BB-373-1 BB-373-2	2nd STAGE SUC. SCRUBBER 2nd STAGE DIS. SCRUBBER 2nd STAGE DIS. SCRUBBER	H-403A,8 H-404 H-405	DEETH. REABS. HEAT EXC. LEAN OIL CHILLER DEETH. REABS. REBOILER	E10-1401-1,2	FIRE PROT. PUMP UTILITY WATER PUMPS
		88-401 88-402 88-471	RICH OIL FLASH TANK RECOMPR. SUC. SCRUBBER DEETHANIZER FEED SURGE TANK	H-406 H-474 H-475	DEETH. REABS. SIDE HTR. GAS CHILLER GAS TO GAS EXCHANGER		
		88-501 88-601 88-602	Jrd STAGE COND. ACCUM.	G8-621-1 H-502 H-601			
		BB-603 BB-603A BB-604	DEPROP. REFLUX ACCUM. DEPROP. REFLUX ACCUM. DEBUT. REFLUX ACCUM.	H-602 H-603 H-604	DEETH. FEED BTMS. EXCH. DEETH. REBOILER GAS CHILLER		
	<u> </u>	V8-901 BB-1001 BB-1002	INSTR. AIR RECEIVER (J) PERCO TREATERS CAUSTIC TREATER	H-605 H-606 H-607	GAS TO GAS EXCHANGER DEETH. OVH'D. CONDENSER DEPR. FD-DEBUT. BTMS. EXCH.		
		88-1501		H-609 H-609A G8-620-1	DEPROPANIZER REBOILER DEPROPANIZER REBOILER I DEPROP. OVH'D. COND.		
		BB-1570 BB-2501 BB-2502	ACID GAS SCRUB. (S.PL.) REACTOR (SULFUR PLANT) (F	H611	2 DEPROP. OVH'D. COND. DEBUTANIZER REBOILER DEBUT. OVH'D. COND.		
		BB-2571 BB-2572 BB-2702	SULFUR SCRUBBER (S.PL) SULFUR SCRUBBER (S.PL) AMINE REGEN, REF. ACCUM.	H-613 H-971 H-1001	DEBUT. BTMS. COOLER INSTR. AIR COOLER CAUSTIC REG. FD. BTMS. EX.		
	H H H	88-2704 88-2801 88-2802	GLYCOL FILTER	H-1002 G8-1003 H-1004	CAUSTIC REGEN. REBOILER CAUSTIC REGEN. OVHD. COND. LEAN CAUSTIC COOLER		
		BB-3001 BB-3002 BB-3003	INSTR. AIR DRYER		EVAPORATOR EVAPORATOR CONDENSER		
		BB-9901 BB-9902 BB-9903		G8-2702-B	STEAM CONDENSER AMINE REFLUX CONDENSERS AMINE AFTER COOLER		
		J) V2-1803 H) V2-1800 V8-303		G0-2702-24.28	AMINE COOLER AMINE COOLER AMINE FINAL COOLERS		
LK GATE		V8-451 V8-453 V8-601	COALESCER 3 PHASE SEPARATOR ETHANE PRODUCT SCRUBBER	H-2704 H-2704B	AMINE EXCHANGERS AMINE REGEN. REBOILER AMINE REGEN. REBOILER		
TRUCK		(c) V8-900-8 (c) V8-900-C	DEETHANIZER REFLUX ACCUM. STARTING AIR VOLUME BOTTLE STARTING AIR VOLUME BOTTLE	H-2705 H-2771 H-2772A1-2	AMINE RECLAIMER AMINE REGEN, REF. COND. AMINE COOLER		
LOADING		6) V8-1051-1,2 V8-1052 V8-2581	ETHANE PRODUCT TREATERS (F REGEN GAS RECOMP. SUCT. SCRUB. REACTOR (NO. 3 S.P.)		AMINE AFTER COOLER AMINE EXCHANGER GLYCOL REBOILER		
	╶┲┲╌╌┥┞╍╍┙╽	V8-2810 V8-2850	PACKED STRIPPING COLUMN (F (GLYCOL SKID) ACID GAS SCRUBBER (NO. 3 S.P.)	HH9902	PROPANE REFRIG. CONDENSERS ECONOMIZER 1st STAGE COOLER		
		V10-2801-1,2 V10-2810	BULK GAS DEHYDRATORS GLYCOL SURGE TANK (GLYCOL SKID)	G8-382 G8-383 G8-384	2nd STAGE COOLER 3rd STAGE COOLER JACKET WATER COOLER		
		C-1501-1,2,3,4 C-2501	BOILERS BOILERS (BOILER BLDG.) FURNCLRCOND.(S.PL)	G8-394 G8-601 G8-602	1st STAGE TRIM COOLER DEETHAN. FEED EXCH./CONDENSER DEETHANIZER FEED HEATER		
		CC-1001 CC-1101	STORAGE TANKS CAUS. STRG. & MIX TANK (F LEAN OIL STORAGE TANK	G8-603 G8-1200-1,2 G8-606	DEETHANIZER REBOILER ETHANE PRODUCT CONDENSERS DEETHANIZER REFLUX CONDENSER		
		CC-1102-1,	PROPANE STORAGE TANKS (F 2 BUTANE STORAGE TANKS 2 GASOLINE STORAGE TANKS	G8-615 G8-608 G8-1051	DEETHANIZER BOTTOMS COOLER DEETHANIZER FEED/MEA EXCH. REGEN GAS COOLER		
		CC-1301 CC-1401 CC-1502	SULFURIC ACID STRG. TANK WATER STORAGE TANK CONDENSATE STORAGE TANKS (J	G8-1052 G8-1580 G8-2582-B	REGEN GAS RECOMPR. COOLER STEAM CONDENSER (NO. 3 S.P.) SULFUR CONDEN. 44 (NO. 3 S.P.)		
		CC-2501	SEP. STRG. TANK (S.PL) GLYCOL STORAGE TANK LUBE OIL STORAGE TANK	G8-2951 T-201	REFRIGERANT CONDENSER PUMPS INLET KNOCKOUT PUMP		
		(J) 62-2580	AMINE STORAGE TANK WASTE HEAT BOILER (NO. 3 S.P.)	T-271 T-301-1,2 T-310	INLET KNOCKOUT PUMP 2nd STAGE KNOCKOUT PUMP JACKET WATER PUMP		
	*	E4-301-308 E-971	COMPRESSORS INLET GAS COMPRESSORS IN. AIR COMP. (COMP.BLDG.)	T-311 T-371 T-372	JACKET WATER PUMP JACKET WATER PUMP J. W. PUMP - COMPR. 7		
	_ <u>P_</u> ¥207	E-972 E-3001 E-3002	IN. AIR COMP. (COMP.BLDG.) AIR COMPRESSOR AIR COMPRESSOR	T-401 T-403-1,2 T-471,2	PRESATURATOR OIL PUMP HIGH PR. LEAN OIL PUMP 2nd STAGE KNOCKOUT PUMP		
		E-3003 H) E4-601-1,2	AIR COMPRESSOR REGEN GAS COMPRESSORS 2 ETHANE PRODUCT COMPRESSORS		STILL REFLUX PUMP HOT OIL PUMPS STILL NET MAKE PUMP		
		N-501 N-2771	HEATERS FIRED HEATER AMINE REBOILER	T-601 T-602 T-603	DEETHANIZER FEED PUMP DEETH, FEED PUMP (SPARC) DEETH, REFLUX PUMP		
c-1101-4		N-2871 G8-2580	GLYCOL REGENERATOR UNIT SALT BATH HEATER FEED HEATER #1 (NO. 3 S.P.)	T-604	STILL REFLUX PUMP DEPROP. REFLUX PUMP DEBUT. REF. PUMP (SPARC)		
		G8-2581 G10-401 G10-1001	FEED HEATER #2 (NO. 3 S.P.) REGEN GAS HEATER REGEN GAS HEATER	T-606 T-607 T-1001-1.2	DEBUT. REFLUX PUMP TRUCK RACK RERUN PUMP		
		(J) E8-2500-3	MISCELLANEOUS AIR BLOWER (SULPL)	T-1002 T-1101 T-1201	CAUSTIC CHARGE PUMP LEAN OIL MAKE-UP PUMP TRUCK RACK PROPANE PUMP		
			AIR BLOWER (SULPL) IN. AIR. DEHY. (COMP. BLDG.) 2 AMINE HAY FILTER (NO. 2)	T-1202 T-1203	TRUCK RACK PROPANE PUMP PIPELINE BUTANE PUMP TRUCK RACK GAS PUMP PIPELINE PUMP		
		<u>G-1301</u>	COOLING TOWER DAU UNIT AMINE FILTERS (SOCK)	T-1301-1,2,3,4 T-1302-1,2	COOLING TOWER PUMP COOLING WTR. BSTR. PUMP		
		G9-2501 G9-2502	ACID DAY TK. (ACID TREAT BLDG. MUFFLE FURNACE (SULPL) WASTE GAS INCIN. STACK FIRE HYDRANT & MONITOR	T-1304-1,2 T-1305	COOLING WATER BOOSTER PUMPS		
		D-3207 E8-2580	FIRE MONITOR	<u>, -, JUI - 1, Z,</u>	BLR. FDWTR. PUMP (BLR.BC.)		
	*	G9-2580	MUFFLE FURNACE (NO. 3 S.P.) BOILER FUEL GAS SCRUBBER		<u></u>	<u> </u>	
ł			WALK-WAYS ARE TO BE 2'-6" W				
		J. 222 INDICA	ES EQUIPMENT FURNISHED BY TULSA NTES EQUIPMENT OUT OF SERVICE	, rkv-qVIP, }	τω.		
		<u>LEGEND:</u> (F)		SH SYSTEM			
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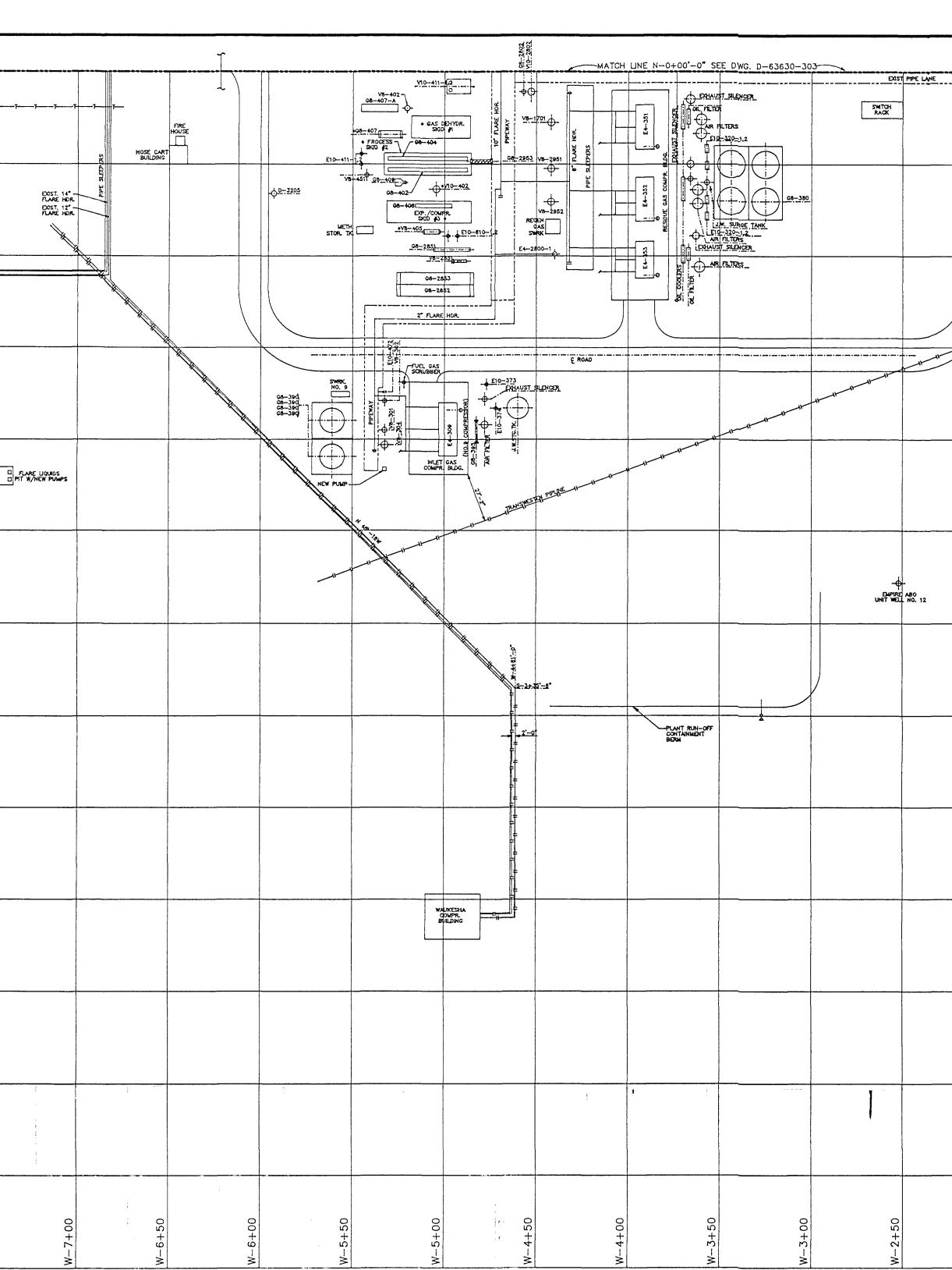
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[EQUIPMENT	SCHEDI	II C	
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		INLET GAS CO	DMPRESSOR		
		ADDITION	1976		
		PLOT PLAN			PLOT PLAN
ITEM NO.	DESCRIPTION	DWG. NO.	ITEM NO.	DESCRIPTION	DWG. NO.
	VESSELS			COMPRESSOR	
V8-301	2nd STAGE SUCTION SCRUB.	D-19-L0002 E	E4-309	INLET GAS COMPRESSOR (G)(H)	D-19-L0002
V8-302	3rd STACE SUCTION SCRUB.	D-19-L0002		PUMPS	
V8-303	1st STAGE DISCH. SCRUB.	D-19-L0004 E	E10-373	J.W. CIRCULATING PUMP	D-19-L0002
V8-304	1st STAGE SUCTION SCRUB.	D-19-L0002 E	E10-374	J.W. TRANSFER PUMP	0-19-L0002
	EXCHANCERS	1	E10-375	DRAIN SUMP PUMP	D-19-L0002
68-390	JACKET WATER COOLER	D-19-L0002 8	E10-376	PRE POST LUBE OIL PUMP	D-19-L0002
G8-391	1st STAGE DISCH. COOLER	D-19-L0002 E	E10-472	2nd STAGE KO PUMP	D-19-L0002
G8-392	2nd STAGE DISCH. COOLER	D-19-L0002			
68-393	3rd STACE DISCH. COOLER	D-19-L0002			
G8394	1st STAGE TRIM COOLER	D-19-L0004			
68-395	LUBE OIL COOLER	D-19-L0002			
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Α	MTWC	10/18/91	
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THIS DRAWING IS THE PROPERTY OF AND EMBODIES CONFIDENTIAL INFORMATION OF AMOCO PRODUCTION COMPANY. THE DRAWING AND THE INFORMATION THEREON SHALL NOT BE REPRODUCED OR DISCLOSED TO ANY OTHER PARTY OR USED FOR ANY PURPOSE OTHER THAN FOR THE BENEFIT OF AND AS AUTHORIZED BY AMOCO PRODUCTION COMPANY.

							[EQUIPMENT SCHEDUL	F
	EQIST. PIPEWAY	<u></u>				i k		CRYOGENIC RECOVERY FACILITY	PLOT PLAN
		****					ITEM NO.	DESCRIPTION VESSELS DEETHANIZERS	DWG. NO.
							AA-602,2A AA-603 AA-1001	DEPROPANIZERS DEBUTANIZER CAUSTIC CONTACTOR	D-19-L0004 D-19-L0004 D-19-L0004
							AA-1002 AA-1070	CAUSTIC REGEN. CAUSTIC CONTACTOR	D-19-L0004 D-19-L0004
						Ν	BB-303 BB-373 BB-471	2nd STAGE DISCH, SCRUB. 2nd STAGE DISCH. SCRUB. DEETH. FEED SURGE TK,	D-19-L0004 D-19-L0004 D-19-L0004
	DIST.						BB-601 BB-603,3A	3rd STAGE DISCH. SCRUB. DEPROP. REFLUX ACCUM.	D-19-L0004 D-19-L0004
	NO. 3	NEW POWER	INE_				88-604 88-1002 88-1003	DEBUT. REFLUX ACCUM. CAUSTIC TREATER SAND FILTER	D-19-L0004 D-19-L0004 D-19-L0002
	SUB-STATION		<u> </u>				BB-1004-1,2 BB-2301 BB-2371	SORBEAD DRYERS FLARE KNOCK-OUT TANK FLARE KNOCK-OUT TANK	D-19-L0004
			,,,,,,				88-9901 88-9903	REFRIG. Jrd STAGE SCRUB. REFRIG. SURGE TANK	D-19-L0004 D-19-L0004
						*	V8-401 V8-402 V8-403	INLET SEP. (ON SKID #2) REGEN. GAS WATER KO TK. (SKID CHILLER SEP. (ON SKID #3)	D-19-L0002 D-19-L0002 D-19-L0002
))	11	11-11-		CLEAN DEL TAN	LOP	*	V8-404 V8-405 V8-451	EXP. FEED SEP. (ON SKID 43) EXP. INTERSTAGE SEP. COALESCER	D-19-L0002 D-19-L0002 D-19-L0002
	- It- It- It- I						V8-601 V8-652(N)	ETHANE PROD. SCRUB. DEETH. REFLUX ACCUM.	D-19-L0004 D-19-L0004
AL AL					CC-1104 SLOP OL STORACE		V8-1051-1,2 V8-1701 V8-2851	ETHANE PROD. TREATERS FUEL GAS SCRUBBER REGEN. GAS FILTER	D-19-L0004 D-19-L0002 D-19-L0002
				DIRTY OL TA	SLOP NK		V8-2951 V8-2952	REFRIG. 1st STAGE SCRUB. REFRIG 2nd STAGE SCRUB. GAS DEHYD. (SKID #1)	D-19-L0002 D-19-L0002 D-19-L0002
							V10-402 V10-411-1,2	DEMETHANIZER LIQUID DEHYDRATORS	D-19-L0002 D-19-L0002
					l		V10-2802	GLYCOL CONTACTOR EXCHANGERS & COOLERS COMPR. JACKET WTR. CLR.	D-19-L0002
							G8-381 G8-382 G8-383	1st STAGE GAS CLR. 2nd STAGE GAS CLR. 3rd STAGE GAS CLR.	D-19-L0004 D-19-L0004 D-19-L0004
							G8-384 G8-401B/C	JACKET WATER CLR. WARM GAS TO GAS EXCH. (SKID	D-19-L0004 2D-19-L0002
					8 	*	G8-402 G8-403B/C G8-404	HIGH LEVEL CHILLER (SKID \$2) IMMED GAS TO GAS EXCH. (SKID LOW LEVEL CHILLER (SKID \$2)	D-19-L0002 20-19-L0002 D-19-L0002
						*		COLD GAS TO GAS EXCH. (SKID DEMETH. REBOILER (SKID 5) REGEN. GAS COOLER	
	<u> </u>		—,—,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				G8-409 G8-601	PROPANE DEOILER (SKID #2) DEETH. FEED EXCH./COND.	D-19-L0002 D-19-L0004
					Í		G8-602 G8-603 G8-604	DEETH. FEED HTR. DEETH. REBOILER ETHANE PROD. COND.	D-19-L0004 D-19-L0004 D-19-L0004
					f	**	G8-606(N) G8-607 G8-608	DEETH. REFLUX COND. DEETH. BTMS. COOLER DEETH. FD./MEA EXCH.	D-19-L0004 D-19-L0004 D-19-L0004
							G8-1051 G8-1052	REGEN GAS COOLER REGEN. GAS RECOMP. COOLER	D-19-L0004 D-19-L0004
							G8-2802 G8-2810 G8-2851	GLYCOL/REGEN GAS EXCHANGER GLYCOL REBOILER (GLYCOL SKID) REGEN GAS EXCH.	D-19-L0002
					Ī		G8-2852 G8-2853	RESIDUE GAS AFTERCOOLER RESIDUE GAS INTERCOOLER REFRIG. COND.	D-19-L0002 D-19-L0002
	:				•		G8-2951 G8-2953 H-303-1,2	REFRIG. ECONOMIZER 3rd STAGE DISCH. COOLER	D-19-L0004 D-19-L0002 D-19-L0004
					-		H304 H305 H374	4th STAGE DISCH. GAS CLR. 4th STG. GAS TO FUEL GAS EXCH 3rd STAGE GAS COOLER	D-19-L0004 D-19-L0004 D-19-L0004
							H-607 H-609,9A	DEPROP. FEED-DEBUT. BTMS. EXC DEPROP. REBOILERS	LD-19-L0004 D-19-L0004
					Ĩ		H-610,10A H-611 H-612-1,2	DEPROP. CONDENSERS DEBUT. REBOILER DEBUT. CONDENSER	D-19-L0004 D-19-L0004 D-19-L0004
					l t		H-613 H-1001 H-1002	DEBUT. BTMS. COOLER CAUSTIC REGEN. FEED BTMS. EXC CAUSTIC REGEN. REB.	D-19-L0004 LD-19-L0004 D-19-L0004
					*		H-1003 H-1004	CAUSTIC REGEN. COND. LEAN CAUSTIC COOLER REFRIG. SUBCOOLERS	D-19-L0004 D-19-L0004 D-19-L0004
							E10-302-1,2	PUMPS 3rd DISCH. SCRUB. KO PUMPS	D-19-L0004
						*	E10-321-1,2	JACKET WATER CIRCULATING PUMPS DEMETH. PROD. BOOSTER (SKID A	D-19-L0002 D-19-L0002 3)D-19-L0002
						*	E10-411-1,2	METHANOL PUMP (SKID 43) LIQ. DEHYD. ANTI FLASH PUMPS DEETH. FEED PUMPS	D-19-L0002 D-19-L0002 D-19-L0002
						***	E10-1204-5 E10-1205-1,	PIPELINE PUMP BUTANE BOOSTER PUMP	D-19-L0004 D-19-L0004
					Į		T-301 T-471 T-601.2	KO PUMP KO PUMP DEETH, REFLUX PUMPS	D-19-L0004 D-19-L0004 D-19-L0004
					•		T-604A-1,2 T-605,6	DEPROP. REFLUX PUMPS DEBUT. REFLUX PUMPS	D-19-L0004 D-19-L0004 D-19-L0004
					•		T-1001 T-1002 T-1204-1,2,3	CAUSTIC CIRC. PUMP CAUSTIC CHARGE PUMP MPELINE PUMPS	D-19-L0004 D-19-L0004
			· · · · · · · · · · · · · · · · · · ·			(G & H)	E4-301-308 E-972	COMPRESSORS INLET GAS COMPRESSORS INSTR. AIR COMPR. (IN COMPR. BI	D-19-L0004
						(G & H)	E4-2800-1 E4-351,2,3	REGEN GAS BOOSTER COMPR. RESIDUE GAS COMPRESSORS	D-19-L0002
							E4-601-1.2	EXPANDER COMPR. (SKID A3) REGEN GAS COMPR. ETHANE PROD. COMPR.	D-19-L0002 D-19-L0004 D-19-L0004
						*	G10-401 G10-1001	HEATERS REGEN. GAS HEATER REGEN. GAS HEATER	D-19-L0004
						Ŧ	CC-1001	TANKS CAUSTIC STORAGE & MIX TANKS	D-19-L0004
					ł			CRUDE DISTILLATE STOR. TANKS J.W. STORAGE TANK (E-309) MISCELLANEOUS	
					ł		D-3205	FIRE HYDRANT & MONITOR	1
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Amoco Production Company

501 WestLake Park Boulevard Post Office Box 3092 Houston, Texas 77253-3092

November 4, 1994

State of New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division 2040 South Pacheco Street Santa Fe, New Mexico 87505

Attention: Mr. Roger C. Anderson Environmental Bureau Chief

File: GDH-3442-988.GW00

Discharge Plan GW-22 Renewal Empire Abo Gasoline Plant Eddy County, New Mexico

Enclosed are the original and one copy of the data required to renew the discharge plan for the Empire Abo Gasoline Plant. Current approval for this plan expires on December 13, 1994. A draft in the amount of \$50.00 is also enclosed as the filing fee for the renewal application.

Amoco is currently undergoing a complete corporate restructuring which has led to personnel leaving the company and the shifting and addition of job responsibilities for those remaining. This has contributed to a delay in the submission of the plan renewal application. We sincerely apologize for not having the plan to you at an earlier date.

Please contact Mike McKinley at (713) 366-3907 if any additional information is required.

Yours very truly,

G.D. Henry Manager, Environment, Health and Safety Natural Gas Liquids Business Unit

cc: NMOCD District II, 811 South First Street Artesia, NM 88210

State of New Mexico Energy, Minerals and Natural Resources Department OIL CONSERVATION DIVISION P.O. Box 2088 Santa Fe, NM 87501

DISCHARGE PLAN APPLICATION FOR NATURAL GAS PROCESSING PLANTS, OIL REFINERIES AND GAS COMPRESSOR STATIONS

(Refer to OCD Guidelines for assistance in completing the application.)

I.	TYPE: Gas Processing Plant
II.	OPERATOR: Amoco Production Company
	ADDRESS: P.O. Box 3092, Houston, TX 77253
	CONTACT PERSON: Mike McKinley PHONE: (713)366-3907
III.	LOCATION: <u>NE</u> /4 <u>SE</u> /4 Section <u>3</u> Township <u>18-S</u> Range <u>27-E</u> Submit large scale topographic map showing exact location.
IV.	Attach the name and address of the landowner(s) of the disposal facility site.
V.	Attach description of the facility with a diagram indicating location of fences, pits, dikes, and tanks on the facility.
VI.	Attach a description of sources, quantities and quality of effluent and waste solids.
VII.	Attach a description of current liquid and solid waste transfer and storage procedures.
VIII.	Attach a description of current liquid and solid waste disposal procedures.
IX.	Attach a routine inspection and maintenance plan to ensure permit compliance.
Х.	Attach a contingency plan for reporting and clean-up of spills or releases.
XI.	Attach geological/hydrological evidence demonstrating that disposal of oil field wastes will not adversely impact fresh water. Depth to and quality of ground water must be included.
XII.	Attach such other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.
XIII.	CERTIFICATION
	I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief. Name: G.D. Henry Title: Mgr., Environment, Health & Safety
	Signature: K. D. Henry Date: 10/31/94

DISTRIBUTION: Original and one copy to Santa Fe with one copy to appropriate Division District Office.

STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

ENERGY, MINERALS AND NATURAL RESOURCES

EDRÜĞ FREE

POST OFFICE BOX 2088 STATE LAND DEFICE BUILDING.

SANTA FE, NEW MEXICO 87504

(505) 827-5800

PARTMENT

BRUCE KING GDVERNOR

ANITA LOCKWOOD CABINET SECRETARY

November 8, 1993

CERTIFIED MAIL RETURN RECEIPT NO. P-176-012-044

Mr. G. D. Henry Environmental Affairs and Safety Manager Amoco Production Company South Permian Basin Business Unit P. O. Box 3092 Houston, TX 77253-3092

RE: Discharge Plan GW-22 Renewal Empire Abo Gasoline Plant Eddy County, New Mexico

Dear Mr. Henry,

On December 13, 1984, the original groundwater discharge plan, GW-22 for the Empire Abo Gasoline Plant located in the SE/4 of Section 3, Township 18 South, Range 37 East, NMPM, Eddy County, New Mexico, was approved by the Director of the Oil Conservation Division (OCD), and was renewed on September 14, 1990. This discharge plan was required and submitted pursuant to Water Quality Control Commission (WQCC) regulations and was approved for a period of five years. The current approval will expire on December 13, 1994.

If your facility continues to have potential or actual effluent or leachate discharges and you wish to continue operation, you must renew your discharge plan. The OCD is reviewing discharge plan submittals and renewals carefully and the review time can extend Please indicate whether you have made, or for several months. intend to make, any changes in you system, and if so, please include these modifications in your application for renewal.

Note that the completed and signed application form must be submitted with your discharge plant renewal request.



Mr. G. D. Henry November 8, 1993 Page 2

If you no longer have any actual or potential discharges please identify this office. If you have any questions, please do not hesitate to contact Bobby Myers at (505)827-4080.

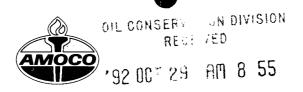
Sincerely,

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Roger C. Anderson Environmental Bureau Chief

RCA/rlm xc: OCD Hobbs Office



Amoco Production Company

South Permian Basin Business Unit 501 WestLake Park Boulevard Post Office Box 3092 Houston, Texas 77253-3092

G.D. Henry Manager, Environmental Affairs and Safety

October 23, 1992

Mr. Roger Anderson Environmental Bureau Chief Oil Conservation Division Energy, Minerals and Natural Resources Department P.O. Box 2088 Santa Fe, New Mexico 87504

988.SWD40-1900-GDH

Discharge Plan GW-22 Empire Abo Gas Plant Eddy County, New Mexico

This letter submits the final status of the retrofitting of the process drain systems in the subject plant. This retrofit was performed to bring that system into compliance with NMOCD guidelines.

Previous guidelines were established to require the installation and retrofit of the system by December 31, 1991. As per our conversation in your office on January 27, 1992, the required modifications were completed by December 31, 1991. Amoco, in addition, performed many additional installations such as catch basins and concrete containments for chemical and hydrocarbon products. These have been ongoing and have now been completed. If additional equipment is added in the future, then this type of containment will be constructed with the initial installation.

Amoco would like to express thanks for working with us and your many recommendations on the improvement of our facility.

If further information on this matter is required please advise or contact Mr. Troy Vickers, Environmental Supervisor at 713-596-7668.

Sincerely

D. David Hanger

G. D. Henry

DTV/

