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REPORTS

DATE: 1984



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Later Broker?

PRELIMINARY HYDROGEOLOGICAL

INVESTIGATION AND RECOVERY EFFORTS

REPORT

TEXAS-NEW MEXICO PIPELINE

MONUMENT, NEW MEXICO

December, 1984 DR

Prepared for:

Mr. Bernie Lednicky Manager, Texas-New Mexico Pipeline Hobbs, NM

Prepared by:

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Geologist

William Smith

Manager, Western Region

INTRODUCTION

During the last week of September 1984, Texas-New Mexico Pipeline of Hobbs, New Mexico contracted Groundwater Technology, a division of Oil Recovery System Inc., to perform a subsurface assessment of potential crude oil loss at the Monument field The pipeline group informed Groundwater Technology pipeline. that a potential pipeline leak may have occurred which could threaten the nearby municipal water wells.

This report includes Groundwater Technology initial site assessment, investigative procedures, abatement installations, water sampling and analysis and comprehensive hydrogeological study for determining the possible effects of the inadvertantly released crude oil to the subsurface.

BACKGROUND

In response to Texas-New Mexico Pipeline's telephone request, Groundwater Technology hydrogeologist arrived on site on October 3, 1984 to begin site exploration. Dark patches of suspected crude oil were seen adjacent to a pipeline owned by Texas-New An estimated acre of surface soils were contaminated with the leaked crude oil. As part of an emergency clean-up plan the Pipeline Company in cooperation with the Environmental Improvement Division and Oil Conservation Department of New Mexico excavated an acre of saturated soils to a depth of approximately 4 feet. An estimated 1000 barrels of crude oil was removed with the excavated soils. This conservative figure was calculated assuming that .3 barrel/cubic yard (12.6 gallons) Estimated Stal Cali were adsorbed onto the soils over one acre to a depth of 2-4 feet.

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In conjunction with soil excavation, the near by municipal well (located approximately 100 feet from the excavated area), was also shut down as free floating oil was observed to have impacted the well. Public water needs were then supplied by the remaining municipal water well located one quarter of a mile south of the excavated site. See the appendix for a well location map. A back up well located farther away from the investigation area was also refurbished by the Pipeline Company to ensure an adequate water supply.

LOCAL HYDROGEOLOGY

The Ogallala Aquifer underlies this section of southeastern New Mexico. In this area the major aquifer is a sand and gravel zone semi-confined between a top caliche layer and bottom red beds. Static water level was observed to be 17-20 feet below the ground surface. Soft and hard caliche was encountered from 1 foot to the water level. Below the caliche layer (20-55 feet), a fine to medium grained sand is encountered. The impermeable red beds begin at a depth of 50-55 feet. (see Geologic cross-section)

The major water bearing zone was observed to be the medium-grained sand zone at 20-55 feet. Static water level was observed to vary between 17-20 feet below the ground surface and, due to the presence of the impermeable caliche layer the aquifer, is semi-confined or semi-artesian in some locations depending on depth of the water table and caliche. Natural groundwater movement (as defined by the groundwater gradient maps) was determined to flow from the north to the south or from the suspected loss area toward the municipal water supply well.





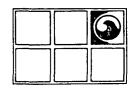
INITIAL INVESTIGATIVE PROCEDURES

On October 3, Groundwater Technology met with local drillers at Monument to discuss their availabilities and capabilities and were put on stand-by status. A meeting with the client, the Oil Conservation Department (OCD) and Groundwater Technology followed. The monitoring phase of the study site was discussed and permission was given by the OCD for drilling activities to begin. The purpose of the first phase of exploratory drilling was to determine the areal extent and concentration of fugitive product.

The initial site visit consisted of measuring the shut down water well for water level and possible product infiltration, locating several investigation wells to define the contaminated area and sampling the water from the remaining down gradient municipal wells to determine if these wells were impacted by free floating product and/or dissolved hydrocarbons.

This initial investigation determined that the closest municipal well was contaminated by four feet of product (floating on the water table inside the well bore). The remaining (at that time) municipal well was not impacted by product and subsequent laboratory analysis reported the remaining well was also not contaminated by dissolved hydrocarbons and was of acceptable quality for use. An old municipal well was refurbished (by Texas-New Mexico Pipeline) for possible use as a precaution. This refurbished well was brought on-line because of its remoteness to the contaminated area and to ensure the integrity of the water supply system.





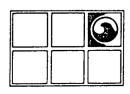
In order to expedite recovery operations the contaminated water well was utilized as a recovery well. The town's submersible water pump was used to begin to apply hydraulic control in the contaminated area. A water disposal truck was used to pump 4,200 gallons of water that evening. The water was disposed of in a proper manner after the tank was full. During this time an increased thickness of product was observed in the water well. An automatic product recovery pump was later installed in the well to facilitate product retrieval.

MONITORING WELL INSTALLATION

Drilling commenced on October 4, 1984 to install the first series of investigation wells. An air rotary rig was used to drill 8" bore holes. Hand slotted 5" PVC wells were placed in the bore holes. Eight wells were initially located by Groundwater Technology in order to begin defining the extent and magnitude of product in the vicinity of the excavated site and the contaminated water well. After these wells were installed additional wells were installed to continue to define the area of contamination. Presently, the site has twenty-nine observation wells.

All monitoring wells were drilled to approximately 30 feet, screened and cased with 5" PVC, sand packed to within 6 feet of the surface then surface sealed with Portland cement. The screen zones extend between 5-8 feet above and at least 20 feet below the water table. Wells were left as casing stick-ups about 1.5 feet above grade.

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All wells were developed with a 15 foot rig bailer. At least four full bailer volumes were removed. The monitoring wells were cleaned and developed to reflect the true product/water levels found in the surrounding formation.

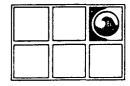
Wells were surveyed-in for location and vertical elevation control. By utilizing the elevation of the well, Groundwater Technology can correctly monitor depth to water and depth to product in the wells and relate the accumulated data to a common elevation. From this data ground water gradient, product thickness and water table fluctuations can be determined. See appendix for groundwater gradient maps before and after pumping and apparent product thickness maps.

RECOVERY EQUIPMENT INSTALLATION AND OPERATION

After the decision was made to recover oil from the water well, the original town water pump was purchased by the Pipeline Company and was kept operating in the well. This effort kept water and product moving toward the pumping well. A decision was reached to re-fit the water well to a product recovery point using specially designed product collection pumps. A double pump, explosion proof, recovery system was installed in the water well on October 12.

The selection of equipment was determined from the construction of the existing town well and the groundwater data accumulated by Groundwater Technology.





An Oil Recovery System 2hp stainless steel Water Table
Depression Pump was selected for the project. This pump was
chose due to its explosion proof/intrinsically safe design and
its automatic controls. A float probe can be set at a predetermined
depth in the Recovery Well. This probe will cycle the pump
and keep a cone of depression in the well. By this means product
within the radius of influence will begin to flow by gravity
into the recovery well.

Discharge waters were pumped across the site into a waste water collection line. Permission was granted by the owner to utilize the pipeline for this purpose.

Once product accumulates in the recovery well a product pump remove the crude oil into a recovery tank. An Oil Recovery System Probe Scavenger was chosen as the product recovery unit. This system is also explosion-proof and communicates with a pump control system through intrinsically safe signals. By using a float conductivity sensor, the probe will tell the Scavenger when sufficient product has accumulated in the well for pumping (2-4 inches). The logic system will then automatically turn the pump on and remove the product.

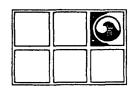
220V and 110V electrical service was brought into the recovery shack and wired into explosion-proof receptacles.

After one day of pumping at approximately 25 gpm, a cone of depression drew significant amounts of product into the recovery well. The drawdown at this point was 17'. When the Probe Scavenger was put on-line it began to recover product immediately. Since initiation of product recovery system, approximately 100 gallons per day of product has been recovered and collected in the storage tank. Total recovery to date has exceeded 5,000 gallons.

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What Date? Dec 34? (12066/5)

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FURTHER INVESTIGATIVE PROCEDURES

Following the initiation of the product recovery system, additional investigative procedures were undertaken to further define the extent of contamination. By the beginning of November, twenty-nine monitoring wells were installed along 1/3 of a mile of pipeline. Areas to either side of the pipeline were explored as product was found in various configurations.

Monitoring Wells # 9-29 were designed similar to Monitoring Wells # 1-8. Five inch PVC was used with the hand slotted sections ranging from a depth of 30 to within 6-10 feet of the ground level. All Monitoring Wells were gravel packed with pea gravel and surface-sealed (at least 3 feet thick) with Portland cement. Bailing of the wells were completed as previously mentioned. Elevation control on all 29 wells was completed by King Surveying of Hobbs, New Mexico.

As a second phase design of controlling the plume, Well

ll was converted into a water table control point. Electrical
and plumbing lines were run into a shed located over Monitoring
Well ll. A submersible pump was installed and continually pumped
to hydraulically control any product moving down gradient from
Recovery Well #1. Product recovery was designed to begin as
product thickness increased in the vicinity of Monitoring
Well ll. Due to construction characteristics of the monitoring,
the effectiveness of this water table control/product recovery
well is limited. Currently, a properly designed recovery well
will be installed in this area to replace the emergency use
of this monitoring well and improve hydrogeologic control of
the product plume in this area.





WATER SAMPLING AND ANALYSIS

Observation wells not contaminated by free-floating product and the public water supply wells were incorporated into a sampling and analysis program to define the extent of dissolved hydrocarbon contamination and to monitor groundwater conditions.

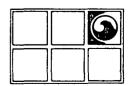
The sampling procedures conducted on-site included the cleansing and washing of all sampling equipment with trisodium phosphate and distilled water prior to their introduction to each well.

A clean 12" acrylic bailer and the attached cord is soaked and washed in a TSP solution and rinsed several times with distilled water before being used to bail at least fifteen bailer volumes of water from well. Only wells without free floating product are sampled.

After this bailing procedure, a 12" all teflon (EPA recommended) sampler is washed and rinsed with distilled water. Care is made not to run the bailer along the well wall when taking a sample. After bailing 3 times, the fourth bailer of water is used to rinse the VOA vial and cap. After this precaution a water sample is poured from the teflon bailer into the teflon /glass vial taking care that no air bubbles are sealed into the vial. The vial is then tagged with a pre-labeled sticker and placed in an ice chest.

The collected samples are packed with new ice and sent next day air to Oil Recovery Systems Lab in New Hampshire for analysis.

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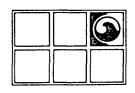
A gas chromatograph/flame ionization detector is used to analyze the static headspace of the samples for volatile hydrocarbons. Method detection limits (MDL) for Benzene and Toluene are 1 ppb, ethylbenzene 6 ppb, total xylenes 6 ppb and aliphatic and miscellaneous aromatics 20 ppb. Groundwater Technology Labs are certified and adhere to EPA performance criteria.

RESULTS/CONCLUSIONS

From the data collected on free-floating product patterns in the monitoring wells, it appears that two separate product plumes are situated around the pipeline. The North Plume is reacting to pumping actions in Recovery Well #1 and Recovery Well #2 (MWll). The down gradient extent of this plume appears to be between Monitoring Well 11 and Monitoring Well 12. A zero (no product) line extends from Monitoring Well 25 southwest to Monitoring Wells # 12 and 18. This is the boundary area between the two suspected plumes.

From the plotted free product data south of this zero line, one can suggest that a separate plume extends from Monitoring Well #24 southwest (transversing the pipeline) towards Monitoring Well #20. Since the groundwater gradient dips from a north to southerly direction a line leak from the Texas-New Mexico Pipeline would seem to flow along the pipeline and not toward the area North of Monitoring Well 26. The groundwater gradient and plume location suggest there is another source of product than the original loss area.





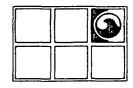
Another fact supporting the two plume theory was seen during the excavation of the Texas-New Mexico Pipeline. From the area of the initial soil excavation to the Town Road 322, the pipeline was excavated and showed no evidence of any past or present leaks. Minute seeps at couplings were noticed, although of no volumetric significance.

Texaco's Houston laboratory reported to Groundwater Technology the results of its crude oil analysis for sulfur content, API gravity and viscosity. From the preliminary findings, Plume 1 has shown an increasing weathering effect as product has traveled from the Recovery Well #1 area down gradient toward Monitoring Well #11. Sulfur content, viscosity, and API gravity measurements have increased which infers that an increased weathering (aging) effect has occurred as the crude oil has traveled away from its source. This is typical of a product plume configuration that the product farthest from the loss area has undergone the most weathering.

Similar results are being quantified from suspected Plume #2. A comparison between Plume #1 and Plume #2 are pending completion.

The sampling and analysis program has determined that, as expected, the dissolved hydrocarbon plume is slightly larger than the free-floating product plume with the boundaries of the dissolved hydrocarbon plume being similar to the configuration of the free product plume. Several rounds of sampling and analysis have defined the plume and have documented the remaining public water supply well to be non-contaminated. The site will continue to be monitored to determine the migrational path of the contaminated plume.

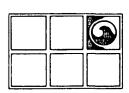


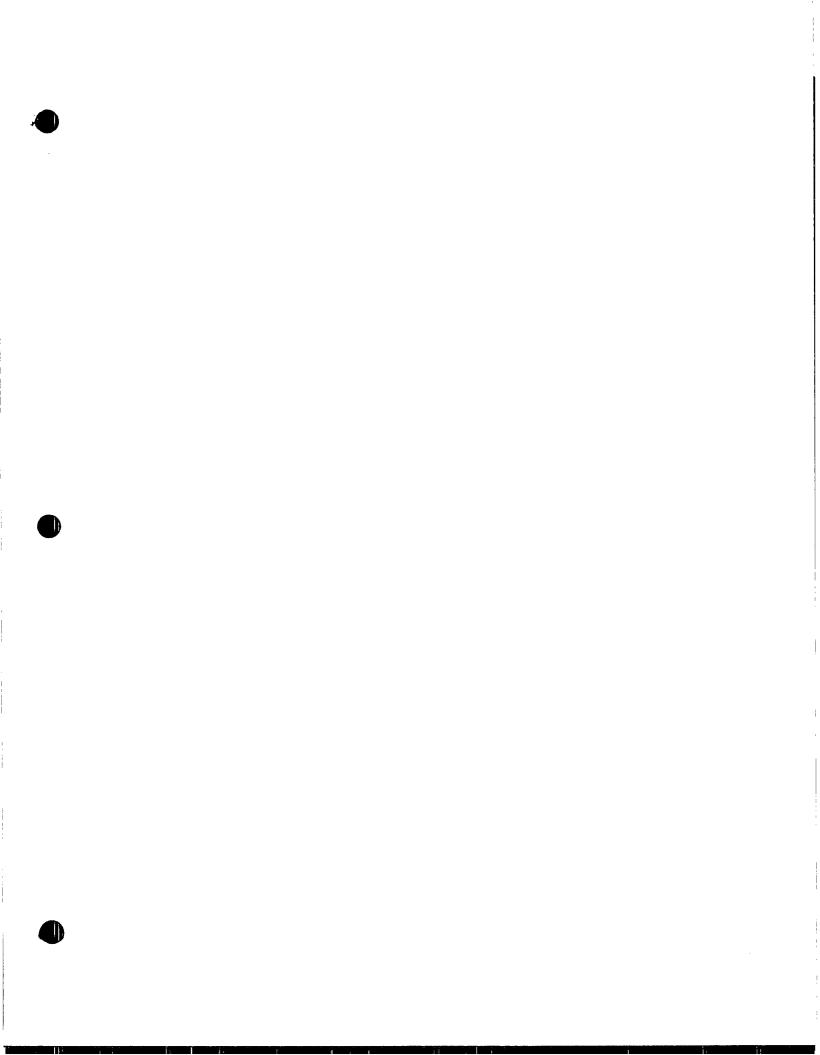


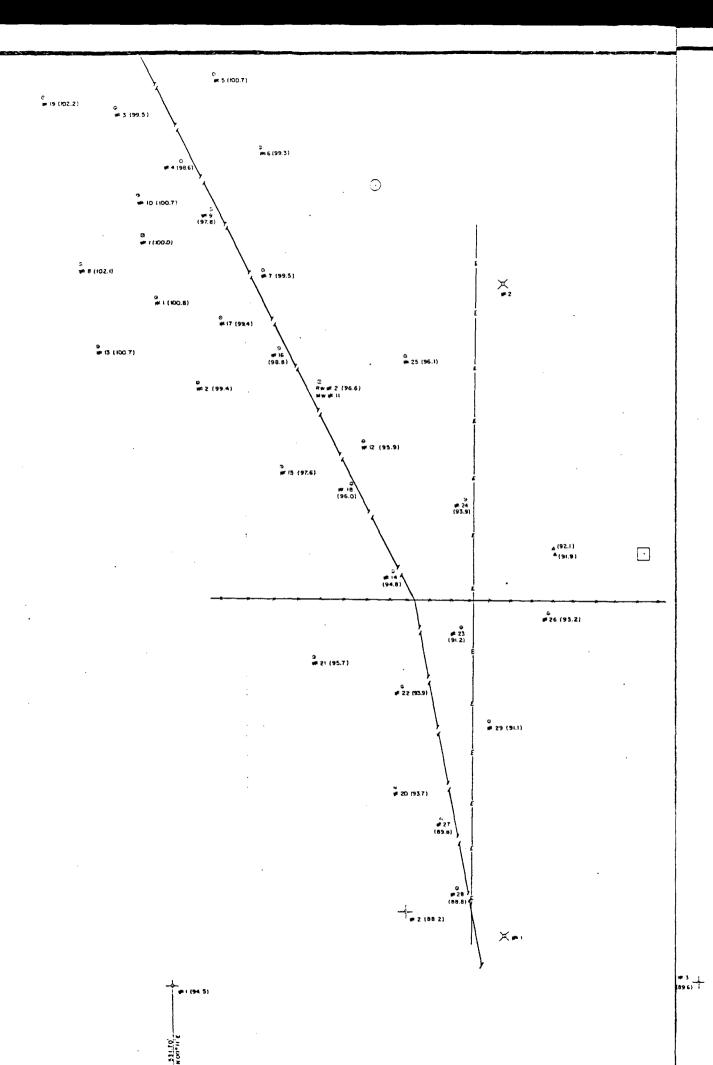
From the data Groundwater Technology has analyzed, a two plume system seems apparent. Further investigations involving water sampling and analysis and additional exploration are being conducted which will help support and clarify the site conditions.

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TEXAS-NEW MEXICO PIPE LINE CO.

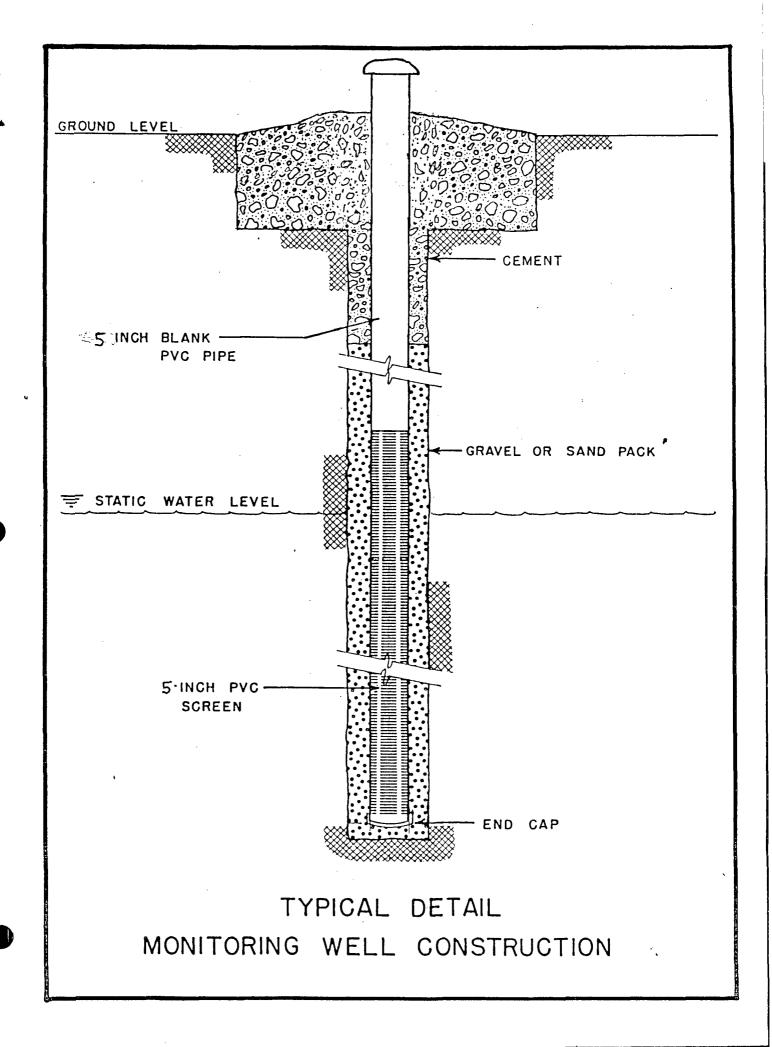
MONUMENT TEST WELLS

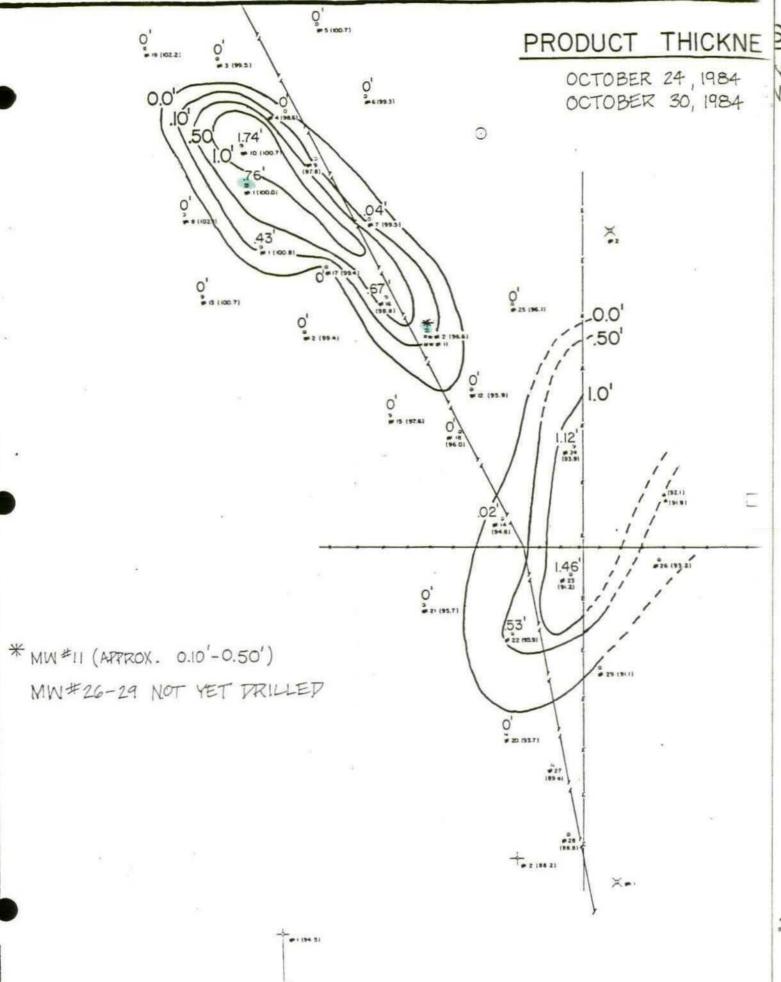
SEC. 29, T195, R37E, N.M.P.M., Lea County, New Mexico



LEGEND			
0 Montor Well			
G Recovery Wall .			
()Relative Elevation			
# Electric Line			
4 Vent			
Domestic Wall			
H Oil Well			
() Storage Tank			
Tank Battery			
Fence			
Buried Pipeline			

	ELATIVE	MORTH	EAST
	LEVATION	COORD	COORD
SH Set. Cor.		000	000
SE Sec. Cor.	R/A i	-16 0 1	5277.1
PW 1	100.0	2056.2	2514.9
RN 2			
MW 11	96.6	1755.0	2881.6
	100.8	1928.2	2542.8
MW 2	99.4	1754.6	2630.7
MW 3	99.5 95.6	2314.4	2459.0 2593.9
FW 5	100.7	2383.6	2660.6
8W 6	99.3	2234.3	2759.5
FW 7	99.5	1983.3	
PW 6	102.1	1993.6	
FW 9	97.8	2106.4	2652.4
MW 10	100.7	2138.1	2507.7
EW 11	96.6	1755.0	2881.6
PW 2	95.9	1636.2	2971.6
F# 13	100.7	1829.3	
FW 14	94.8	1372.1	
FW 15	97.6	1582.7	2804.6
MW 16	98.8	1627.7 1	2798.8
MW 17	99.4		2675.3
FM 18	96.0	1549.9	
₩ 19	162.2	2336.6	2306.9
MW 20 MW 21	93.7		3039.2 2870.9
FW 22	95.7		
FW 23	91.2		3178.2
PN 24	93.3		3185.9
EN 25	96.1 i	1811.2	3060.3
MW 26	93.2		3357.2
VN: 27	89.8	866.7	3133.6
PW 28	88.8	726.6	3166.3
FN 29	91.1	1064.6	3235.3
Vent Pt. 1	72.1	1419.4	3370.9
Vent Pt. 2	91.9	1402.7_	3371.9
5W 1	94.5	523.4	2574.8
	86.2	679.2	3060.1
[44 3	89.6	521.6	3690.5
Pwr. Ln. (No.)	N/A	2027.5	3207.5
Pwr. Ln. (No.)	N/A	697.8	3198.8
, -,, -, -, -, -, -, -, -, -, -, -,		057.10	
01! Well 1	N/A	629.8	3267.2
Oil Well 2	N/A	1957.7	3262.5
		1 3560 3	- 3000
Storage Tank	N/A	2159.7	2998.1
Tark Battery	N/A	1406.9	3560.0
Ferce (E)	N/A	1312.2	3294.1
Ferce (W)	N/A	1314.5	2893.6
	N/A	2499.6	2461.3
Pipeline (P.I.)	N/A	1312.6 566.4	3080.1
Pipeline (S)	P/A	300.4	1 2612.9





MAP

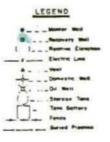
N # |- 19 N # 20-25

TEXAS-NEW MEXICO PIPE LINE CO.

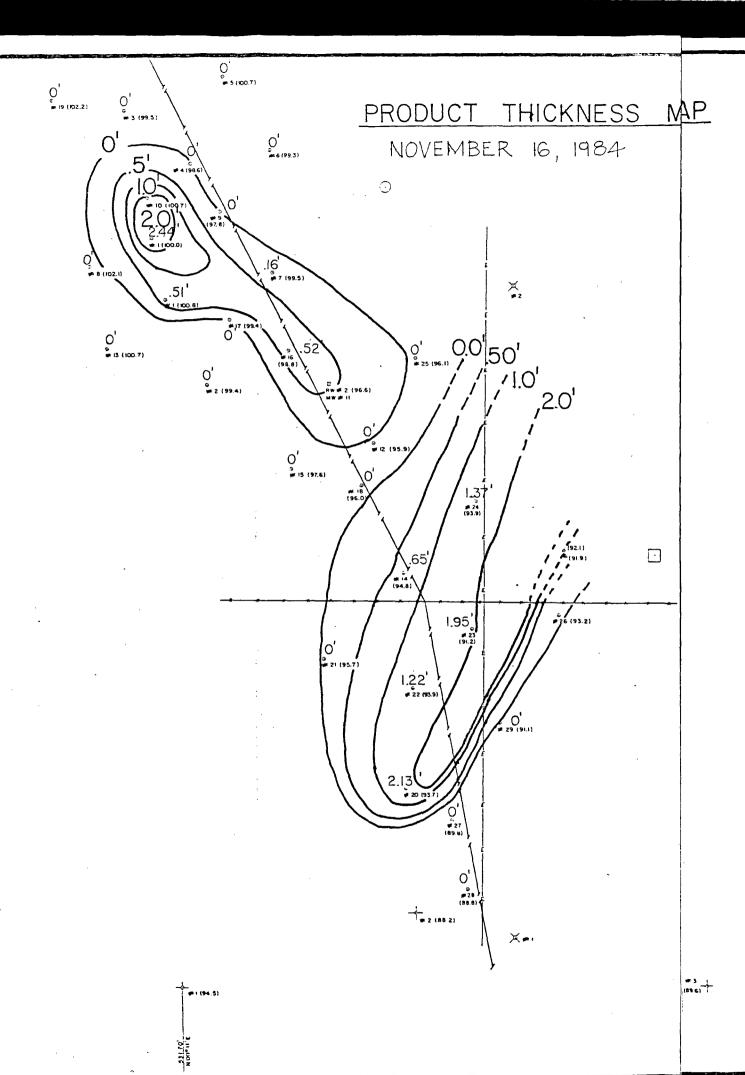
MONUMENT TEST WELLS

SEC. 29. TI95, R37E, N.M.P.M., Lea County, New Mexico





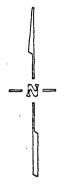
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SW Sec. Cor.		-16-9	000 •
SE Sec. Cor.	5.5	-18.7	5277.1
RW 1	100.0	2056.2	2514.9
RM 2			
MW 11	96.6	1755.0	2881.6
MM 1	100.8	1928.2	2542.8
MW 2	99.4	1754.6	2630.7
MM 3	99.5	2314.4	2459.0
M 1	96.6	2207.6	2593.9
MW 5	100.7	2383.5	2660.6
MW 6	99.3	2234.3	2759.5
MM 7	99.5	1983.3	2765.6
PN 8	102.1	1993.6	2387.0
191 9	97.8	2108.4	2652.4
MW 10	100.7	2138.1	2507.7
PM 11 PM 2	96.6	1755.0	2881.6
MW 12	95.9	1636.2	2971.6
MW 13	100.7	1829.3 1372.1 1582.7	2422.
FW 14	94.8	1372.1	3034.4
MW 15	97.6	1582.7	2804.6
MW 16	98.8	1827.7	2798.8
46 17	99.4	1887.5	2675.
MM 18	96.0	1549.9	2951.1
MW 19	162.2	2336.6	2106.9
MW 20	93.7	932.5	3039.2
MM 21	95.7	1195.7	2870.
MW 22	93.9	1134.9	1057.5
MM 23	91.2	1257.1	3178.2
MN 24 MN 25	93.3	1811.2	3060.
MW 26	93.2	1286.5	3357.
MW 27	89.8	1286.5 866.7	3133.6
MW 28	88.8	726.6	3166.
HW 29	91.1	1064.6	3235
/ent Pt. 1	22.1	1419.4	3370.5
Vent Pt. 2	91.9	1402.7	3371.5
DW 1 DW 2	94.5	679.2	3060.
DW 3	88.2	521.6	3690.
24 3	89.6	361.0	1090.
Per. In. INc.	N/A	2027.5	3207.5
Per. Ln. ISO.	N/A	697.8	3198.
Dil Well !	N/A	629.8	3267.
Oil Well 2	N/A	1957.7	3262.
Storage Tank	N/A	2159.7	2998.
Tank Battery	W/A	1 1406.9	1 3560.0
name partitly	1.7.7	1,440.7	
Fence (E)	N/A	1312.2	3294.
Fence (W)	N/A	1314.5	2893.
Pipeline (N)		2499.6	2461.
Pipeline (P.I		1312.6	3080.
Pipeline (S)	1 N/A	566.4	3219.

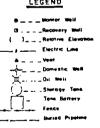


TEXAS-NEW MEXICO PIPE LINE CO.

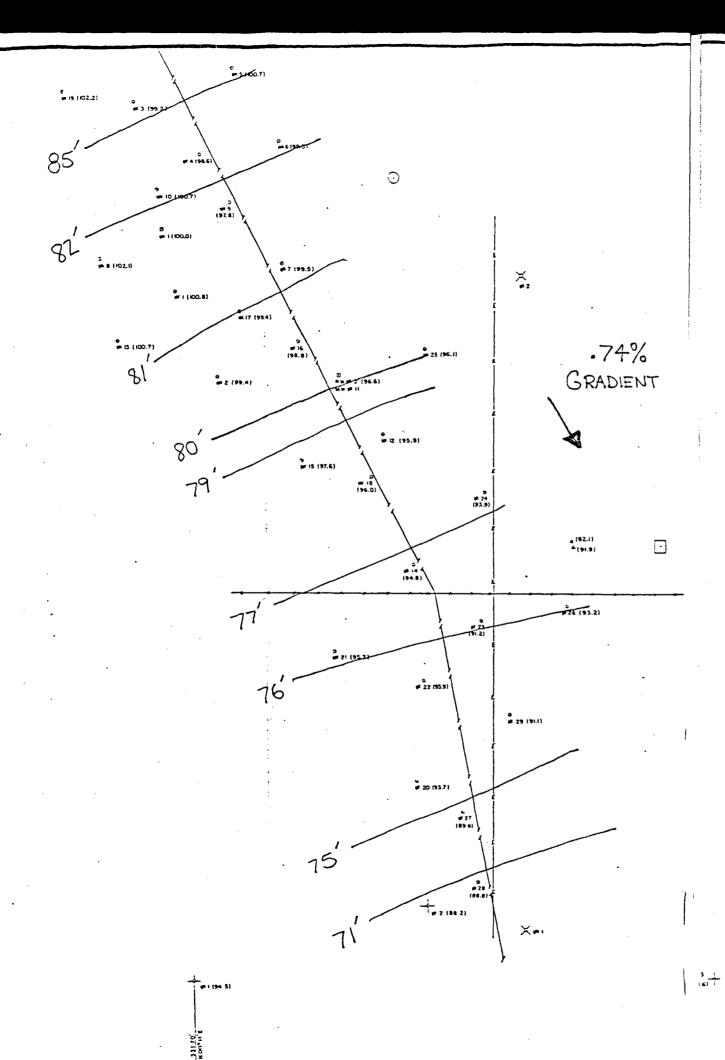
MONUMENT TEST WELLS

SEC. 29, TI95, R37E, N.M.P.M., Lea County, New Mexico



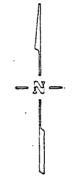


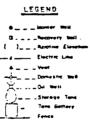
	RELATIVE	NORTH	EAST
LOCATION	RLEVATION	COORD	COORD
Cultura Con	1 51/5	000	000
SW Sec. Cor. SE Sec. Cor.	1-N/A		527-1
	<u> </u>	 	
RW 1	100.0	2056.2	2514.9
RW 2	96.6	1755.0	2881.6
MW 11	1	L	
MW 1 MW 2	99.4	1928.2	2542.8 2630.7
MW 3	99.5	2314-4	2459.0
MW 4	96.6	2207.6	2593.9
MW 5	100.7	2383.8	2660.6
MW 6	99.3	2234.3	2759.5
MW 7	102.1	1983.3	2765-6
MM 9	97.8	2108.4	2652.4
MW 10	100.7	2138.1	2507.7
MW 11	96.6	1755.0	2881.6
RW 2	1		
MW 12	95.9	1636.2	2971.6
MW 13 MW 14	100.7	1829.3	3034.4
MW 15	97.6	1582.7	2804-6
MW 16	98.8	1827.7	2798.8
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MW 22	93.9	1134.9	3057.5
MW 23	91.2	1257.1	3178.2
MN 24	93.3	1520.3	3185.9
MW 25	96.1	1811.2	3060.3
MW 26 MW 27	93.2	1286.5	3357.2
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Vent Pt. 1	92.1	1419.4	3370.9
Vent Pt. 2	91.9	1402.7	3371.9 2574.8
DW 2	94.5	679.2	3060.1
DW 3	89.6	521.6	3690.5
) N/A	2027.5	3207.5
Pwr. Ln. iso.	N/A	697.8	3198.8
Oil Well I	N/A	629.8	3267.2
Oil Well 2	N/A	1957.7	3262.5
Storage Tank	N/A	2159.7	2998.1
F=== 5====	1.8973	1 1406 0	7.560.0
Tank Battery	N/A	1406.9	3560.0
Fence (E)	N/A	1312.2	3294.1
Fence (W)	N/A	1314.5	2893.6
Pipeline (N)	N/A	2499.6	2461.3
Pipeline (P.I. Pipeline (S)	N/A N/A	566.4	3080.1
Transfer (S)	7.77.0	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1 3643.9
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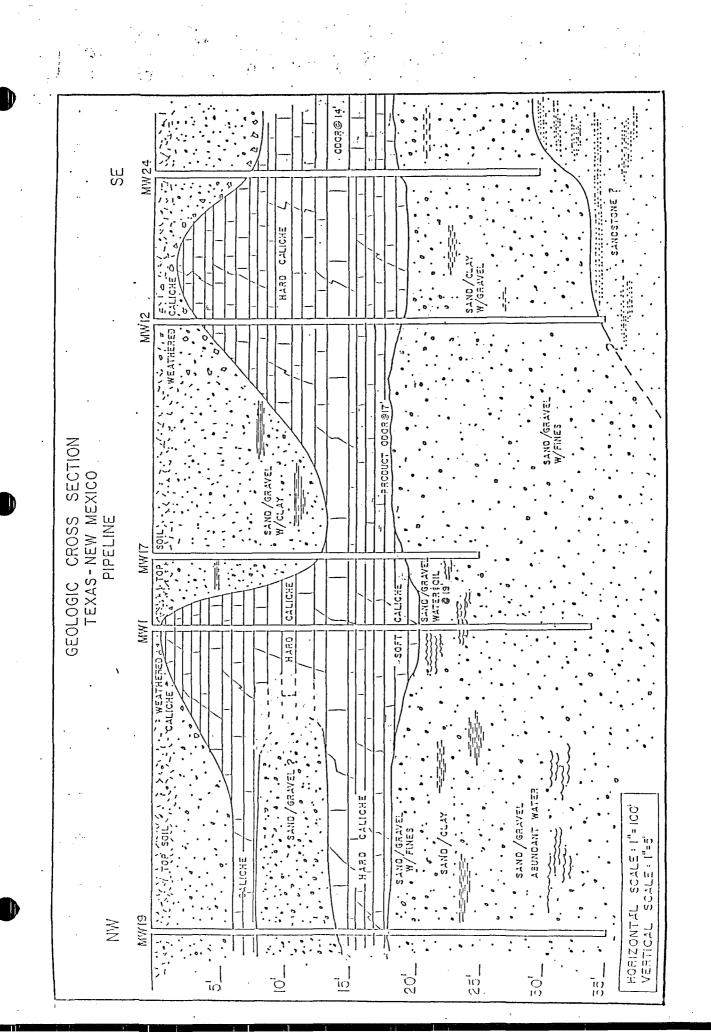
TEXAS-NEW MEXICO PIPE LINE CO. MONUMENT TEST WELLS

SEC. 29, T195, R37E, N.M.P.M.. Lea County, New Mexico

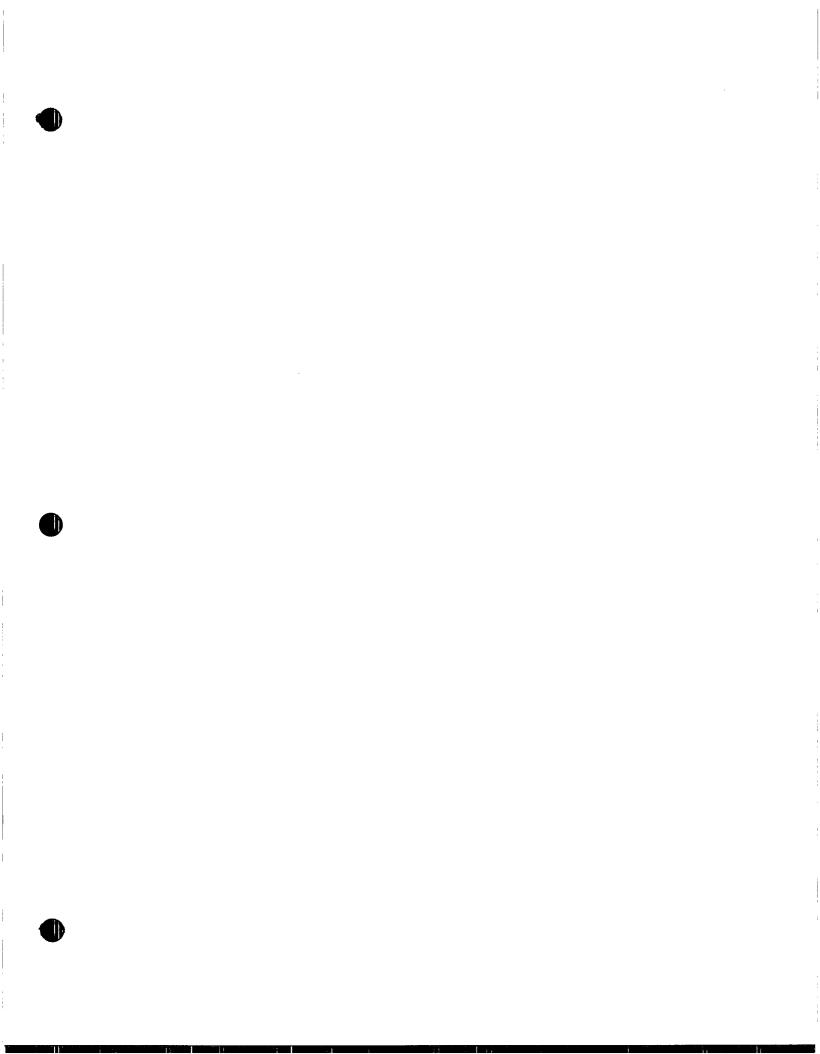




	RELATIVE	MORTE	EAST
LOCATION	ELEVATION	COORD	COORD
	N/A	000	
SE Sec. Cor.	1.12	-15-9	
RW 1	100.0	2056.2	2514.9
RN 2	96.6	1755.D	
MW 11		·	
MW 1 MW 2	100.8	1928.2	
- 7H 2 - HW 3	99.3	1754.6	
55. 1	95.6	2207.6	
MW 5	100.7	2383.6	
MW 6	1 99.3	2234.3	2759.5
MR 7	99.5	1983.3	
MSW 8 MSW 9	1 102.1	1993.6	2367.0
HN 10	1 100.7	2106.4	
Aller 11			
RW Z	96.6	1755.0	2881.6
HW 12	95.9	1636.2	
MW 13	106.7	1529.3	. 722
56 14 56 15		1372.1	
MW 16	97.6	1 1577 7	
VI. 17	1 99.4	1887.5	
MN 18	96.0	1549.9	
MW 19	162.2	2336.6	2306.9
MW: 20	93.7	932.5	3035.2
MW 21 MW 22	95.7	1195.7	
MW 23	91.2	1257.1	
MS 24	91,5	1520.3	
MN 25	96.	1811.2	1000.3
MN 26	93.2	1286.5	3357.2
MN 27	89.5	566.7	
MW 26 MW 29	98.8		3166.3 3235.3
	. 71	1.004.5	
Vent Pt. 1	1 22.1	1 1419.4	3370.9
Vent Pt. 2	91.9	1 1402,7	3371.9
DW 1	94.5	523.4	2574.8
DW 2	86.2		3060_1
D₩ 3	59.6	521.6	3690.5
Per, Ln. (No.	1 N/A	2027.5	3207.5
Per. Ln. (So.)	1 K/A		3198.6
		1	
Cil Heli l	N/A		3267.2
011 -e 11 2	1 N/A	1957.7	3262.5
Storage Tank	N/A	2159.7	2998.1
Scorace .ank	1 8/ 8	1 1.57.7	233001
Tank Battery	N/A	1406.9	3560.0
Fence (E)	H/A		3294.4
fence (W)	H/A	1314.5	2893.6
Fipeline (N)	T H/A	2499.6	2461.3
Pipeline (P.I.)			3080.1
Pipeline (S)	: N/A		3219.4



MAIN POWER CORD WTDP POWER CORD TANK FULL RECOVERY WELL DESIGN TEXAS · NEW MEXICO PIPELINE HYDROCARBON PUMP WATER PUMP PROBE PROBE SCAVENGER (PUMP ASSY) WATER DISCHARGE STATIC WATER LEVEL : 17' SUBMERSIBLE WATER PROBE: 45' WATER PUMP DEPRESSED WATER LEVEL: 36 MOTOR -





				•	,	Well Number MW 1	Drilling Log
	Project :	Texas-	New Mex	ico_P/	Ďwner.	Same	Sketch Map
•						Number 20-2050	
			•			.37 Diameter8!!	·
	Surface E	levation _	v	Vater Leve	l, Initial	24-hrs	·
	Screen: D	ia. <u>511</u>	L	ength	<u>, 5 !</u>	Slot Size .Hand	
	Casing: D	ia. <u> </u>	L	ength	9'	Type <u>PVC</u>	
	Drilling Co	ompany	Larry"s	_Drill	_ Drilling	Method _Air_Rotary	Notes
	Driller	Larr	y		Log by	Driller	
	Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log		oil Classification ire, Structures)
	- 0 2 4 6 8 10 12 14 16 20 22 24 37					Hard Caliche Same Same Same Same Soft Caliche to 19 Same Same Same Same Same Same Same Same	l smell at 18', oil



Division of Oil Recovery Systems, Inc. **Drilling Log** Well Number MW 2 Sketch Map Project Texas New Mexico Pipeline Owner Same Location Monument, New Mex. Project Number 20-2050 Date Drilled 10/4-10/6 Total Depth of Hole 37 Diameter 8''Surface Elevation _____ Water Level, Initial ____ 24-hrs. ____ Screen: Dia. 5'1 Length 25' Slot Size Hand Casing: Dia. 5'' Length 12' Type PVC Notes Drilling Company Larrys Drilling Drilling Method Air Rotary Driller Larry Log by Driller Well Construction Depth (Feet) Graphic Log Sample Number Notes Description/Soil Classification (Color, Texture, Structures) 0. Hard Caliche 2 -Same 4 Same 6 -Same - 8 -Same 10-Same -12-Soft Caliche, wet at 21' -14 Same -16 Same -18-Same -20 Same -22 -Sand, clay and some gravel 22'-31' -24 Same -26 Same -28 Same -30 Same -32 -Sand and gravel, water strong at 31' 34 Same · 36 · Same · 38 -Bottom of well 37' Screen 37-12' Cased 0-12'

02100144



		Division of Oil	Recovery S	ystems, tr	Well Number <u>MV 3</u>	Drilling Log		
Project .:	Texas-l	New Mexic	o Pipel	ine Owner	Same	Sketch Map		
					Number 20-2050			
					_37 Diameter8!!			
					24·hrs			
Screen: D	Screen: Dia5'' Length26' Slot Size Hand							
					Type PVC			
Drilling Co	mpany L	arry's D	rilling	. Drilling l	Method Air Rotary	Notes		
Driller	Ları	<u>-y</u>		Log by	Driller			
Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	· · ·	oil Classification re, Structures)		
					Black dirt 0-1'	· .		
2_					Soft caliche 1-15'			
4_	Î			_		!		
6-								
8				-	-			
10_				<u> </u>	Same			
12				-				
_ 14_				F -				
_ 16_			1	-	Gravel and sand 15-21	1		
_ 18_				┝¥┥	Same	•		
20-	}		1	F -1				
_ 22_	}			F -	Brown and red clay 2	L-2/'		
24				h 1				
- 26- - 28-	1			F 7	Same	•		
30_				F 7	Clay and gravel 27–29			
- 32-					Clay, sand and gravel w	3r 7A-01.		
- 34	1			[]	Sand and gravel Same			
- 36-			1		Sand-Lots of water			
- 38-		1	1		Bottom of well 37			
L 1	İ		1		boccom of well o.			
-	Ì				26' Screen			
<u> </u>				<u> </u>	12' Blank			
	}			<u> </u>				
- 4	Ì			<u> </u>				
- 4	Ì			-				
1 11	1	1	1 1	1				



) , 3101113, 11	Well Number <u>MV 4</u>	Drilling Log
h	Project Texas=Ne	w Mexico	Pipeli	⊥100wner.		Sketch Map
,			-		Number20_2050	
	Date Drilled 10/4	<u>-10/6</u> τ	otal Depth	of Hole	37 Diameter8!!	
	Surface Elevation	V	Vater Leve	l, Initial	24·hrs	
	Screen: Dia <u>5¹¹</u>		.ength2	20!	Slot SizeHand	
	Casing: Dia511	L	ength1	.4!	TypePVC	
	Drilling Company La	rry's Dr	illing	_ Drilling I	Method _Air_Rotary	Notes
	Driller Larry	*		Log by	-Driller	
	Depth (Feet) Well Construction	Notes	Sample Number	Graphic Log		oil Classification ure, Structures)
	- 0 - - 2 -				Top soil—some oil Caliche with oil	
	- 4-				Same	
	- 6- 			 	Caliche-clean 6-11'	
	- 8 -			-	Same	
Ì	10-			-	Same	
,	12-			h -	Sand and caliche 11-	17'
	14-			F -		
	16				Same	
		.			Clay and sand -water	17–21'
	20	Ì			Same	
	22			F -1	Clay and same 21-27'	
	24					:
	26			F -	Same	
	28				Sand and gravel 27-31	1
	30				Same	
	32				Sand 31-35'	
	34	ļ			Same	
	36				Bottom of well $37'$	
					20' Screen 14' Blank	
<u>.</u>					I' CAVE-IN	
	<u> </u>					
	-					
	<u> </u>					
	<u> </u>					

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<u> </u>	الــــالــ	Division of Oil	Recovery S	Systems, li	Well Number <u>MV 5</u>	Drilling Log
Project	Texas No	w Mexico Pi	peline_	_ Owner .	Sane	Sketch Map
			•		Number 20-2050	
		-			37! Diameter 8!!	
					24-hrs	1
Screen: D)ia	_ <u>5''</u> L	.ength	20!	Slot Size Hand	
Casing: D)ia	_ <u>5''</u> ւ	.ength	_15.'	TypePVC	
Drilling C	ompany ₋	Larry's Dri	lling	_ Drilling	Method <u>Air Rotary</u>	Notes
Driller	Lar	ry		Log by	_Driller	
Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log		ioil Classification ure, Structures)
- 0- - 2-					Caliche hard 0–9'	
- 4- - 6- - 8-					Same	
- 10- - 12-					Sand and caliche soft	9–15'
14-				7	Same	
16-				-ਊ-	Sand and clay-wet clay	21 feet 15-21'
18-					Same	
20					Same	
22					Clay some gravel 21-	-26'
24					Same	
26					Clay, gravel and sand	to 31'
28					Same	
30	,				Same	15.1
32					Gravel and sand 31-3	35'
34					Same	
30					Bottom of well 35'	
-					2010	
-					20'Screen 15'Blank	
-				-	2 CAVE-IN	
 - 						
+ 1				-		
H -						
	1	, 1	. 1	j		

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GROUNDWATER
TECHNOLOGY
Division of Oil Recovery Systems Inc.

	Division of Oil Recovery Systems,		rilling Log
	m . N . M	Well Number NW 6	
ļ	Project Texas-New Mexico Pipeline Owner	er .cauc	
	Location Monument, N.M. Project	· · · · · · · · · · · · · · · · · · ·	
	Date Drilled 10/4-10/6 Total Depth of Hole	i	
	Surface Elevation Water Level, Initial		
	Screen: Dia. 5'' Length 20'		
	Casing: Dia. 5'1 Length 14'	!	
	Drilling Company Larry's Drilling Drilling	ng MethodAir_Rotary	
	Driller Larry Log by	by Driller	
	Well Construction Notes Number Graphic Log	Description/Soil Classification (Color, Texture, Structures)	
		Black soil no oil	:
		Hard caliche	
	6	- Same	
	L 8-II II II II .		
	L 10-1	Soft caliche to 15'	
}	-12-	Soft carrene to 15	į
	- 14-	Same	
	<u> </u>	Wet clay, sand and caliche 15-20'	
	-18- .	Same	
	-20-	Clay, sand and gravel-water to 27'	
	- 22 -	- July, Sand and graver-water to 27	
	- 24-	Same	
	- 26 -		
	-28- -	Some sand and gravel 27-29'	}
	-30-1	Sand and lots of gravel 29-39'	
	- ₃₂ -	Januaria rocs of graver 29-39	
	-34 -	Same	
	\[\begin{aligned}	Jaine	
	- 38-	Bottom of well 37'	
	-40-	- Doccom of well 37	
	├ [~] -	- 20' Screen	
	├ - .	14' Blank	
	├ -{ -	3' CAVE-IN	
	├ -{	_	
	├ ऱ -	-	
	, ., ., ., .,	1	1

6	GROUNDWATER
	TECHNOLOGY
	Division of Oil Recovery Systems, Inc.

Division of Oil Recovery Systems, Inc.									
					Well Number <u>M.7</u>	[
Project	Project Texas New Mexico Pipeline Owner Same Sketch Map								
Location M	Location Monument, N.M. Project Number 20-2050								
Date Drilled	d <u>10/</u> 4	-10/6 т	otal Depth	of Hole	37! Diameter 8!!				
Surface Elevation Water Level, Initial 24-hrs									
Screen: Dia	Screen: Dia5!! Length20! Slot Size Hand								
Casing: Dia	L <u>- 5!!</u>	L	ength	15''	Type <u>PVC</u> _	J.			
Drilling Cor	npany 💪	my's Dril	Ling	_ Drilling N	MethodAir_Rotary	Notes /			
Driller	larry.			Log by	Driller				
Depth (Feet)	Well	Notes	Sample Number	Graphic Log		oil Classification ure, Structures)			
F 0-1					Hard caliche to 5'	*			
- 2-					Same				
- 4-					Same				
- 6-					Soft cáliche and sand	5–17'			
- 8-						2 2,			
10-									
12		j							
14-					Same				
16				-					
18-		ļ		-	Clay and sand-oil smel	1 17-20'			
20-				-	Clay and sand-water				
- 22-				 -	Same				
24-		! !		<u> </u>	Clay and gravel to 31'	:			
26				F -					
28	- 11	ļi		F -	Same				
30	1			- -					
32				F -{	Sand and gravel-water a	at 31 feet 31-35'			
34-				-	Ū				
36				- 1	Bottom of well 37'				
F - 11		1			•				
H -11					20' Screen				
十十				H -	15' Blank				
十 十				 	2' CAVE IN				
十 十		ij		F +					
十 1				 					
T		.]		 					
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	<u> </u>		Division of Oil	Recovery S	Systems, Ir	well Number <u>MV 8</u>	Drilling Log		
)	Project	Texas-N	lew Mexico P	ineline	Owner	Same	Sketch Map		
				•		Number 20-2050			
	Date Drilled 10/4-10-6 Total Depth of Hole .37! Diameter8!!								
						24-hrs			
						Slot Size .Hand			
						TypePVC			
						Method Air Rotary	Notes		
				_		-Driller			
						W			
	Depth (Feet)	Well	Notes	Sample Number	Graphic Log		oil Classification		
	Dept	Well	ž	Sar	3rapt	(Color, Textu	ure, Structures)		
						·	,		
	- 0-				-	Hard caliche			
	- 2-				-	Sand and gravel to 11'			
	4-			·					
	- 6-	,				Same -			
	- 8-								
)	10-								
	12-					Hard caliche 11-22'			
	14-					_			
	- 16-					Same	İ		
	18-								
	20					G1 00 05.1			
	22					Clay 23–25'			
	24]]		Same	:		
	26-		<u> </u>				-27'		
	28					Sand and gravel 27	' - 36'		
	30		1						
	32								
	34					Same			
	36	1				Bottom of well $37'$			
						201 G-			
	├ -				L]	20' Screen 15' Blank			
þ					-	2' CAYE IN			
	┝╶╢				 				
	-	. [F -1				
	├ -				├ ┤				
	l.]]	I	1	1 1					

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	Divisi	on of Oil R	ecovery Sy			Drilling Log		
m			·		Well Number	Sketch Map		
					Same	Sketch map		
					Number 20–2050			
Date Drilled 10/4-10/6 Total Depth of Hole 35 Diamèter 8"								
					24-hrs			
Screen: Dia.	5''	Le	ength	<u> 21</u>	Slot Size Hand			
					Type _PVC	Notes		
			-		Method Air Rotary	·		
				Log by	_Driller			
Depth (Feet)	Construction	Notes	Sample Number	Graphic Log	•	oil Classilication re, Structures)		
- 0 - 2 - 4 10 12 14 16 20 22 24 28 30 32 34 36) 	Top soil to 1' Hard caliche 1-4' Gravel, sand to 7' Same Soft caliche 7-15' Same Same Sand and gravel 1' Sand, gravel and clay Sand and clay (damp) sme Same Clay, gravel and sand. Same Bottom of well 35' 14'BLANK 21' SCREEN	17-19' ell stops 19-23'		

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				, 0 , 0, 1, 1, 1	Well NumberMW_10	Drilling Log
Project T	'exas-New	≀ <u>Mexico Pi</u> p	<u>eline</u>		Same	į –
Location.	Monume	ent, N.M.		_ Project f	Number <u>20–2050</u>	
Date Drill	ed <u>10/</u> 2	<u>і–10/6 </u> т	otal Depth	of Hole	35' Diameter8!!	
					24-hrs	
					Slot Size .Hand	
Casing: D	ia	<u>5″</u> ι	.ength	<u>10´</u>	Type <u>PVC</u>	
Drilling Co	ompany La	ırry's Dri	illing_	_ Drilling f	Method Air Rotary	Notes
Driller		<u></u>		Log by	_Driller	
Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log		Soil Classification ture, Structures)
- 0-					Top soil to 1'	<u> </u>
_ 2_					Caliche hard 1-7'	
- 4-					Same	
- 6-			'		Same	
8-					Caliche soft and sand	7_14'
-10-						, · 147
-12-			1	 	Same	
-14-					Sand and gravel some cl	av to 17'
-16 -					Same	ay co a.
-18 -				╟╶┤	Smell sand, gravel and	clav 17_19'
-20 -					Sand and clay. No smel	-
-22 -						I mater at 2, 2, 2,
-24 -				1	Same	3
-26 -						
-28 -				1-0-	Same	
-30 -			i l			s of water oil in water.
-32 -			.	<u>i</u>	29–35'	5 Or water Off the water.
-34 -						
-36 -				 	Bottom of well 35	
-				1	10'BLANK	
F -					25' SCREEN	
				J1	25 -	
D -				J1		
1				J		
			1	J1	I	
<u></u>	1			; - -		

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GROUNDWATER
TECHNOLOGY
Division of Oil Recovery Systems, Inc.

					Well Number MW 11 Drilling Log			
Project	Project Texas-New Mexico Pipeline Owner Same Sketch Map							
Location	Location Monument, N.M. Project Number 20-2050							
					38!_ Diameter8!!			
Surface F	levation	,	Water Leve	Linitial	· 24-hrs			
Screen: D)ia	<u> </u>	Length	<u> 20´</u>	Slot SizeHand			
Casing: D)ia	-")	Length	<u> </u>	туре			
Drilling C	ompany Lá	arry's Dr	illing	_ Drilling N	Method Air Rotary Notes			
Driller	Lan	cy		Log by	Driller			
eet)	ion			60				
Depth (Feet)	truci	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)			
Dep	Well Construction	Z	Sa N∪	Grap	(Odioi, Texture, Oridicial ca)			
- 0-								
2				-	Top soil to 1'			
4_					Hard caliche 1–5'			
- 6-					Same			
- 8-					Sand gravel and caliche 5-14'			
-10-								
-12-					Same			
-14-				\[\nu_{\nu}\]				
- 1 - 11				≢	Hard caliche, rock			
-16- -18-					Gravel, caliche, smell			
-20-					Caliche to 23'			
1 11					Same			
-22-					Same			
-24-					Clay and sand, hard 23-36'			
26-								
28-					•			
30-					Same			
-32-								
34-					Same			
-36 -					Sand and sand stone soft, water			
38-]				Bottom of well 38', CASING PULLED UP 4' FROM			
	:				35'			
					20 SCREEN			
					20 33.3-2 .			
]]	Γ 1				
0210014	4		 -	 	Page of			

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Division of Oil Recovery Systems, Inc. **Drilling Log** Well Number ___MW 12___ Project Texas-New Mexico Pipeline Owner Same Sketch Map Location Monument, N.M. Project Number 20–2050 Date Drilled 10/4-10/6 Total Depth of Hole 35 Diameter 8'' Surface Elevation _____ Water Level, Initial _____ 24-hrs. ____ ____ Slot Size Hand Length 10 Type PVC Notes Drilling Company Larry's Drilling Drilling Method Air Rotary Driller Larry Driller_ Log by .__ Well Construction Sample Number Description/Soil Classification (Color, Texture, Structures) 0. Top soil, loose rock to 1' 2 Caliche hard 1-19' 4-8-10 Same 12 14-16 Same 18 20 Clay, sand some gravel 19-25' 22 24 Same^{*} 26 Clay and sand 25-28' 28 Clay, sand some gravel 30 Real soft sand and clay. Water 32 Same 34 Harder sand and sand stone to 35' 36 Bottom of well 35' 10 BLANK 25 SCREEN



Division of Oil Recovery Systems, Inc. Drilling Log									
Towns N		1.		Well NumberM_13	Sketch Map				
Project 1045 tew reaco Tiperite Owner 316									
				Number 20–2050					
	Date Drilled 10/4-10/6 Total Depth of Hole 34 Diameter 8!!								
Surface Elevation	Surface Elevation Water Level, Initial 24-hrs								
Screen: Dia	Screen: Dia. 5" Length 29 Slot Size Hand Casing: Dia. 5" Length 5 Type PVC								
					Notes				
		_		Method Air Rotary					
	<u>.y</u>		, Log by .	Driller					
Depth (Feet) Well Construction	Notes	Sample Number	Graphic Log		oil Classification re, Structures)				
F 0-11				lanea wasta					
- 2-				Loose rock					
- 4-1]		Hard caliche	•				
- 6-									
- 8-				C					
-10-		j i		Same					
-12 -] [- -						
- ₁₄ -			- · -						
16				Soft caliche and sand to	17'				
- ₁₈ -				Same					
-20 -				Hard white caliche					
- ₂₂ -				Sand and clay and gravel	to 29'				
24			<u> </u>		:				
26				Same					
28 -		1 1	-						
30			-	Same					
$\begin{bmatrix} 30 \\ 32 \end{bmatrix}$				Water, clay and same	29–31'				
34 -				Sand and sandstone	31–35'				
36									
F° -				Bottom of well 34					
 - 				•					
				29' SCREEN					
- -1				5' BLANK					
- -1									
-									
		1 1	1 1						

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Division of Oil Recovery Systems, Inc.								
	Well Number <u>MW14</u>	Drilling Log						
Project Texas_New Mexico Pipeline Owner Same Sketch Map								
Location Monument, N.M. F	Project Number 20-2050							
Date Drilled 10/4-10/6 Total Depth of Hole 34 Diameter8!!								
Surface Elevation Water Level, Initial 24-hrs								
Screen: Dia Length	Screen: DiaSlot Size Hand							
Casing: Dia. 5 Length	Surface Elevation Water Level, Initial 24-hrs Screen: Dia5 Length25 Slot Size _Hand Casing: Dia5 Length9 Type _PVC							
Drilling Company Larry's Drilling	Drilling Method Air Rotary	- Notes						
Driller Larry L	Log byDriller							
Depth (Feet) Well Construction Notes Sample Number		n/Soil Classification xture, Structures)						
- 0-11 11 11	Caliche, smell at 16',	water and oil to 19'						
- 2- - 4- - 6- - 8- - 10- - 12- - 14- - 16- - 18- - 20- - 22- - 24-	Same Same Same Caliche, sand and clay							
- 26- -	Same							
- 28-	Soft sand and clay							
30	Gravel, sand and sandst	one, clay to 35'						
32		·						
34	Same							
36	Bottom of well 34'							
	25'SCREEN 9' BLANK							
-								



	Division of Oil Recover		·					
	DIVISION OF OIL HACOVAL	y Systems, n	Well Number MW 15	Drilling Log				
Project Texas N	ew Mexico Pipeline	Owner _	Same	Sketch Map				
			Number 20-2050					
Date Drilled 10/4-10/6 Total Depth of Hole 35 Diameter 8''								
Surface Flevation Water Level Initial 24-brs								
Screen: Dia.	5″Length_	25	Slot Size Hand					
Casing: Dia	5 Length	10'	Slot Size Hand					
Drilling Company Larry's Drilling Drilling Method Air Rotary Notes								
Driller Larry		Log by	_Driller	<u> </u>				
Depth (Feet) Well Construction	Notes Sample Number	Graphic Log	•	oil Classification are, Structures)				
- 0- - 2- - 4- - 6- - 8- - 10- - 12- - 14- - 16- - 18- - 20- - 22- - 24- - 26- - 28-		Jo	Same Water, caliche and clay Clay, gravel and sand Clay and sand	l. Smell at 17'. 11-19'				
- 30- - 32- - 34- - 36- 			Cased Bottom of well 35' 25' SCREEN 10' BLANK					



	Division of Oil Re			c.				
				Well Number MV 16		Drilling Log		
Project Twas Na	w Mexico Pip	elimc		Same				
Location Monument, N.M. Project Number 20-2050								
Date Drilled 10/4-10/6 Total Depth of Hole 25 Diameter 8''								
Surface Elevation	Wa	ater Level, I	nitial	24·hrs				
Screen: Dia.	5Le	ngth	20	Slot Size Hand				
Casing: Dia.	_ ″ Q Le	ngth	_5_	Type _PVC				
Drilling Company La	rry's Dri	lling_D	rilling M	Method Air Rotary	Notes			
DrillerLarry	<i>1</i>	L	og by	-Driller		· · · · · · · · · · · · · · · · · · ·		
Depth (Feet) Well Construction	Notes	Sample Number	Graphic Log	•	oil Classification ure, Structures)			
- 0-				Top soil to 1'				
2-1				Caliche, smell at 16'	1_17'			
- 4-1			- 4	Juliano, Smorr de 10	2 27			
- 6-				~				
8-1				Same				
- 10-		-						
12-								
14-		-		Same				
16		 -						
18		<u> </u> -	7-	Sand, gravel and clay	17-19'	·		
20-		-	=-	Sand and clay. Little		19-25'		
22		1}-						
24				Same	\$			
26				Bottom of well 25'				
L - 1 11				20'SCREEN				
-		11_		5'BLANK				
-			. 4) OLIVITY				
-		-	.]					
-			. 4					
-		-	. 4					
-		-	. 4	,				
F -		-	. 4					
F -			. 4			1		
F -		-	. 4					
├ -		-						
! !! !!	- 11	[]	1			j		



Division of Oil Recovery Systems, Inc.									
				Well NumberMV_17	i				
Project Texas	-New Mexico Pip	elire	Owner .	_Same	Sketch Map				
LocationMC	nument, N.M	•	. Project I	Number .20-2050					
Date Drilled 10/4-10/6 Total Depth of Hole 30 Diameter 8!!									
Surface Elevation Water Level, Initial 24-hrs									
Screen: Dia. 5 Length 20 Slot Size Hand									
Casing: Dia. 5" Length 10' Type PVC									
Drilling Company Larry's Drilling Drilling Method Air Rotary Notes									
DrillerLarryLog byDriller									
Depth (Feet)	Notes	Sample Number	hic Log	•	oil Classification are, Structures)				
Dep		S z	Graphic	(00,01, 10,110	, 6.1.2612.00,				
0-				Loggo wests to 11					
2-				Loose rock to 1'	4 401				
4-				Sand, gravel and some cl	ay 1–10'				
6-1				Samo					
8-				Same					
10-				Clay some gravel to 13'					
-12-				Same					
-14-				Hard white caliche	13 16!				
- 16-				Sand and gravel. Smell					
- 18-				Same	dc 17				
- 20-			-	Clay and sand	19–23'				
- 22-		·	L 77 -	outly and band	17 23				
- 24-			L * -	Clay, sand and gravel	23–25'				
26-			-	Bottom of well 30'	23 23				
F 4									
 - 				0.0/					
F -			├- [·] -┤	20'SCREEN					
F -				10' BLANK					
H -									
├ - 									
H -			 - 						
H -									
H -			 - 						
H -			-						
- - ·									
h -			├ ┤						
1 11									

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Division of Oil Recovery	Systems, Inc.	—							
	Well Number <u>MW 18</u>	Drilling Log							
Project Texas New Mexico Pipeline	OwnerSame	Sketch Map							
Location Monument, N.M.	Project Number 20–2050								
Date Drilled 10/4-10/6 Total Depth of Hole 28 Diameter 8"									
Surface Elevation Water Lev	el, Initial 24-hrs								
Screen: Dia Length	30 slot Size Hand								
Casing: Dia. 5" Length	8'Type _PVC								
Drilling Company Larry's Drilling Drilling Method Air Rotary Notes									
Driller Larry	Log by Driller	L							
Well Construction Notes Number		on/Soil Classification exture, Structures)							
	Loose rock to 1'								
- 2-	Caliche, gravel and s	and soft 1-12'							
- 4-	II -	1 12							
- 6-	- Same								
- 8- ·	 								
- 10-1	Same								
- 12-	Hard white caliche								
- 14-	- Same								
- 16-	Sand, gravel and clay	. Smell							
- 18-	Sand and gravel to 19								
20-	$\frac{1}{2}$ Sand, clay and gravel	19–22'							
22	Sand and gravel								
24	Same	:							
26	Same								
	Same								
30	Bottom of well 28								
	- 20'SCREEN								
	B'BLANK								



		Well NumberM 19	Drilling Log
Project <u>Texas New Mexico</u> Pi	pelineOwne	Sane	Sketch Map
Location Monument, N.M.	Project	t Number .20-2050	
Date Drilled10/4_10/6_ T	otal Depth of Hol	34_ Diameter8''	
Surface Elevation W	Vater Level, Initial	24-hrs	
Screen: Dia. 5" L	ength2	Slot Size Hand	
Casing: Dia5L	ength	Slot Size Hand	
		g MethodAir_Rotary	Notes
OrillerLarry	Log b	/Driller	
Depth (Feet) Well Construction Notes	Sample Number Graphic Log		oil Classification ire, Structures)
- 0- - 2- - 4- - 6- - 8- - 10- - 12- - 14- - 16- - 18- - 20- - 22- - 24- - 26- - 28- - 30- - 32- - 34- - 36- - 36- 		Top soil and rock Same Same Caliche Sand and gravel Sand Sand Sand Sand and caliche hard Same Sand, clay and gravel Sand, clay damp Same Same Bottom of well 3A' 25' SCREEN 9' BLANK	at 31' to 35'

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TECHNOLOGY Division of Oil Recovery Systems		
	Well Number MW 20	Drilling Log
Project Texas-New Mexico Pipeline Owner		Sketch Map
Location Monument, N.M. Proje	į į	
Date Drilled $10/4-10/6$ Total Depth of Ho		
Surface Elevation Water Level, Initia		
Screen: Dia5!! Length20!		
Casing: Dia		Notes
Drilling Company Larry's Drilling Drilling		
Driller Larry Log b	yl	
Depth (Feet) Well Construction Notes Number Graphic Log	Description/So (Color, Textur	il Classification e, Structures)
	Top soil, loose rock 0-	-6''
	_ Caliche soft to 12' 6'	'-16'9''
- 4- -	4	
6_	4	
8	_ Same	
	4	
	4	
- 14- -	_ Same	
	_	
- 18- -	_ Sand and clay 16'9	''-27' (water)
- 20- -	4	
<u> </u>	4	
- 24- -	4	:
- 26- -	_ Same	
- 28- -	Soft sand	
- 30-	- Bottom of well	
H -	4	
├ 	20' Screen	
├ - -	10' Blank	
├ - -	4	
├ -	-	
├ -	-	
├ - -	_	
├ -	-	
<u> </u>	-	



Division of Oil Recovery System	ns, Inc.	5							
	Well Number <u>MW 21</u>	Drilling Log							
Project Texas-New Mexico Pipeline_Own	ner _Same	Sketch Map							
Location Monument, N.M. Proj	ect Number 20-2050								
Date Drilled 10/4-10/6 Total Depth of Hole30 Diameter8''									
Surface Elevation Water Level, Initial 24-hrs									
Screen: Dia. 5" Length 20!	Slot Size Hand								
Casing: Dia. 5" Length 10!	Type PVC	1							
Drilling Company Larry's Drilling Drilling Method Air Rotary Notes									
DrillerLog	by Driller								
Well Construction Notes Number Graphic Log	Description/S (Color, Textu	oil Classification ure, Structures)							
F 0-1	- Caliche hard to 11'								
F 4-1									
F 6-1	Same								
- 8- -	_								
	-								
	Caliche, sand and clay	11–18'							
	-								
	Same								
	Clay, sand and gravel(d	amp) to 21'							
	Same								
	Clay, sand and gravel	21–23'							
	Red clay 23-26'	:							
	Clay and sand water								
28-	Same								
	Bottom of well								
	7								
	20' Screen 10' Blank								
-									
 - -									
- -									
-	_								
 -	-								

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Location Monument, N.M. Date Drilled 10/4-10/6 Total Depth Surface Elevation Water Level Screen: Dia. 5'' Length Casing: Dia. 5'' Length Drilling Company Larry's Drilling	Well NumberM 22	Sketch Map
Location Monument, N.M. Date Drilled 10/4-10/6 Total Depth Surface Elevation Water Level Screen: Dia. 5'' Length Casing: Dia. 5'' Length Drilling Company Larry's Drilling	Project Number 20-2050	- - -
Date Drilled 10/4-10/6 Total Depth Surface Elevation Water Level Screen: Dia. 5'' Length Casing: Dia. 5'' Length Drilling Company Larry's Drilling	of Hole30 Diameter8!! I, Initial 24-hrs Slot Size _Hand	-
Surface Elevation Water Level Screen: Dia. 5'' Length Casing: Dia. 5'' Length Drilling Company Larry's Drilling	1, Initial 24-hrs 	-
Screen: Dia. 5'' Length Casing: Dia. 5'' Length Drilling Company Larry's Drilling	20' Slot Size Hand	
Casing: Dia. 5!! Length		
Drilling Company Larry's Drilling	4.04	- {
	10' Type <u>PVC</u>	-
Driller Larry	Drilling Method Air Potary	Notes
	Log byDriller	
Depth (Feet) Well Construction Notes Sample Number		Soil Classification ture, Structures)
- 0-	- Caliche	
- 2- - 4- - 6- - 8- - 10- - 12- - 14- - 16- - 18- - 20- - 22- - 24- - 26- - 28- - 30- 	Same Soft caliche to 16 1/2 Same Caliche water at 19' Clay and sand. Lots of Same Bottom of well 20' Screen 10' Blank	16 1/2–19

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Division of Oil Recov	very Systems, Inc.	-s ·							
	Well Number <u>MV 23</u>	Drilling Log							
Project Texas New Mexico Pipeline Owner Same Sketch Map									
Location Monument, N.M. Project Number 20-2050									
Date Drilled 10/4-10/6 Total Depth of Hole : 30Diameter8!!									
Surface Elevation Water Level, Initial 24-hrs									
Screen: Dia5!1 Length20! Slot Size _Hand									
Casing: Dia. 5" Length 10! Type PVC									
Drilling Company Larry's Drilling Drilling Method Notes									
	Log byDriller								
Depth (Feet) Well Construction Notes	Description (Color, Te	/Soil Classification xture, Structures)							
H 0-1 1 1	Top soil 0-1'								
- 2-	Caliche(odor at 12').	1–12'							
- 4-	Garrene (odor de 12).	1 12							
- 6-	·								
- 8-	Same								
12-	Caliche 12-13 1	/2'							
- 14-	Sand and gravel	13 1/2–18'							
16-	- Same								
	Clay and sand. Blowing	ng out oil at 19'							
20	Clay, sand and gravel	19–30'							
22									
24	1 -	·							
26	Same								
28									
30	Bottom of well	1							
		,							
-									
-									
F -	 - -								
3 11 11 11	11 1								

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Division of Oil Recovery Systems, Inc. Well Number 11, 24 Drilling Log									
					Well Number M 24	<u></u>			
Project	Texas_Ne	w Mexico Pi	Sketch Map						
Location	_Monume	ent, N.M.	Number 20-2050						
Date Drilled 10/4_10/6 Total Depth of Hole30 Diameter8!!									
Surface E	Surface Elevation Water Level, Initial 24 hrs								
Screen: D	Screen: Dia5!! Length20! Slot Size _Hand								
Casing: D	Casing: Dia5'! Length10' Type _PVC								
Drilling Company Larry's Drilling Drilling MethodAir_Rotary Notes									
DrillerLarryLog byDriller									
Depth (Feet)	Well	Notes	Sample Number	Graphic Log	·	oil Classification ne, Structures)			
- 0- - 2-			 		Caliche and soil				
- 4-					Same				
- 6-					Caliche hard				
8-									
10-					Same	4.5			
12	ļ				Caliche soft (odor at 1	4')			
14-									
16-					Caliche, sand and grave	1			
18-					Same				
20	Ī				Clay, sand and gravel				
22					Clay and sand. Water a	t 24'			
24					Same				
26					Clay, sand, some gravel	oil show on water			
28-					Same				
307		1			Bottom of well				
					20' Screen 10' Blank				
<u> </u>									
-	ł				,				
-	ł								
-									
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Division of Oil Recovery	Well Number <u>MV 25</u>	Drilling Log
Project Texas-New Mexico Pipeline	Owner Suie	Sketch Map
	Project Number	
	h of Hole30 Diameter8''	
	el, Initial24-hrs	
Screen: Dia. 5" Length	20' Slot Size Hand	
Casing: Dia5" Length	10'' Type .PVC	
Drilling Company Larrt's Drilling	3 Drilling Method Air Rotary	Notes
Driller Larry	Log byDriller	
Depth (Feet) Weil Construction Notes Sample Number	11 ,= 1	oil Classification are, Structures)
- 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30	Sand, caliche and grave Same Caliche Same Same Sand, clay and gravel. Same Sand, clay and gravel Same Sand and clay Same Same Same Same Same One Same Same Same Same Sand, clay and gravel. Same Same Sand, clay and gravel. Same Sand, clay and gravel.	Wet at 15' 15-18'

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Drilling Log

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		Well Number <u>MW 26</u>	
)	Project Texas-New Mexico Pipeline	Owner Sare	Sketch Map
	Location Monument, N.M.	Project Number <u>20–2050</u>	-
	Date Drilled $\frac{10/4-10/6}{}$ Total Depth	of Hole34_ Diameter8!!	-
	Surface Elevation Water Leve	l, Initial 24-hrs	-
	Screen: Dia. 5" Length		-
	Casing: Dia5" Length		
	Drilling Company Larry's Drilling	Drilling Method Air Rotary	Notes
	Driller Larry	Log byDriller	
	Depth (Faet) Well Construction Notes Number		Soil Classification ture, Structures)
	10	- Sand, gravel and calid - Same - Same - Sand, gravel and calid - Caliche - Same - Sand and gravel - Same - Sand and clay - Same - Same - Same - Same - Same - Same - Same - Same - Same - Same - Same - Same - Same - Same - Same - Same - Same - Same	che



	occion, cyclome, n	Well Number <u>MW 27</u>	Drilling Log							
Project Texas-New Mexico Pip	eline Owner	Sane	Sketch Map							
Location Monument, N.M.	Project I	Number <u>20-2050</u>								
Date Drilled 10/4-10/6 Total Depth of Hole 30 Diameter 8"										
Surface Elevation Wa	Surface Elevation Water Level, Initial 24-hrs									
Screen: Dia5'' Le	ength24'	Slot SizeHand								
Casing: Dia. 5" Le	ength 6'	Type <u>PVC</u> _								
Drilling Company Larry's Dri	11ing Drilling I	Method Air Rotary	Notes							
Driller Larry Log by Driller										
Depth (Feet) Well Construction Notes	Sample Number Graphic Log		oil Classification ure, Structures)							
- 0- - 2- - 4- - 6- - 8- - 10- - 12- - 14- - 16- - 18- - 20- - 22- - 24- - 26- - 28- - 30- 		Caliche hard Same Same Same Caliche, sand and grave Same Sand and clay Same Same Same Same Sand and gravel Same Bottom of well 24' Screen 6' Blank	el to 11' 11.26'							

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Division of Oil Recovery Systems, Inc. **Drilling Log** Well Number __ MW_28___ Sketch Map Project Texas-New Mexico Pipeline Owner Same Location Monument, N.M. Project Number 20-2050 Date Drilled 10/4-10/6 Total Depth of Hole 30 Diameter 8" Surface Elevation _____ Water Level, Initial _____ 24-hrs. ____ Screen: Dia. 5'' Length 24' Slot Size Hand Casing: Dia. ____5'' Length ____6' Type .PVC _____ Notes Drilling Company Larry's Drilling Drilling Method Air Rotary Driller Larry Log by Driller Well Construction Depth (Feet) Sample Number Notes Description/Soil Classification Graphic (Color, Texture, Structures) . 0. Hard caliche to 15' 2 -- 4-. 6-Same - 8 --10 --12 -Same -14 --16 – Sand, clay and caliche 15-20' -18 -Same -20 – Clay and sand to 23' -22 -Clay and sand (damp) 23-24' -24 -Sand and gravel. Water at 24' -26 – Same -28 -Same -30 -Bottom of well 24' Screen 6' Blank

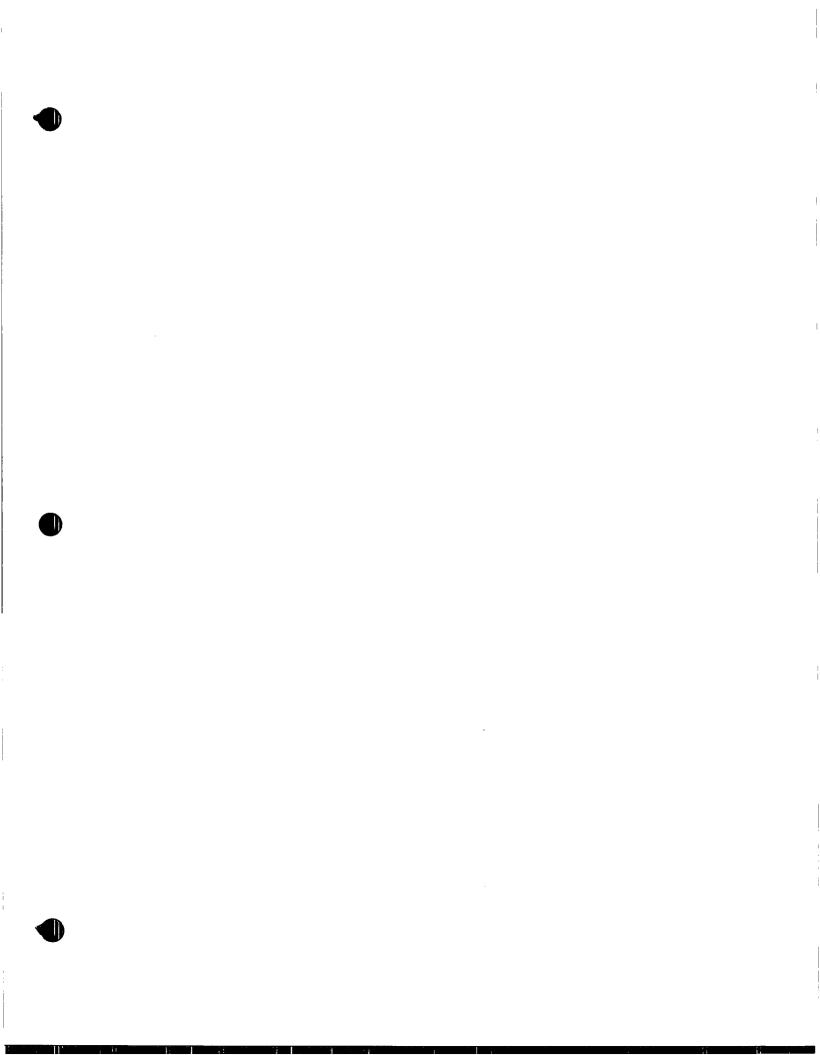
02100144

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a 11 11 11	INOLO	ystems, Inc		Drilling Log
- Towns Now Marion	Direction		Well Number <u>MV 29</u>	Sketch Map
	· ·	•	umber 20_2050	
			30 Diameter8!!	
			24-hrs	
			Slot Size Hand	
			TypePVC	
			ethod Air Rotary	Notes
	•		_Driller	,
		· · · · · · · · · · · · · · · · · · ·		
Depth (Feet) Well Construction Notes	Sample Number	Graphic Log	(Color, Text	ioil Classification ure, Structures)
_ 0_			Hard caliche to 13'	
_ 2_			nara carrene co 15	
- 4-			•	
- 6-			Same	
8				
-10-				
-12-			Same	
-14-			Caliche, sand and clay	13–18'
-16 -		-	Same	10 10
-18 -			Clay and sand (damp) to	19'
-20 -		- = -	Sand, gravel and clay.	
-22 -				
-24 -				:
-26 -			Same	
-28 -				
-30 -			Bottom of well	
 - 			20' Screen	
			10' Blank	
 				
h -				
 - 				
 - -				
 - 	-			

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DATA GATHERED DURING PUMPING TEST

Job:	ex	N.	Yex

Name: C.H.

te: OCT 15+16

Well Designation: MW 1+2

Pump & Setting: 2 HP FRANKLIN



MWI 1	Time	Elapsed Time (min)	Discharge (gpm)	PDTP	DTW	PT	1 Drawdown
10/15	1212 PM		25	19.23	19.44	<u>.al</u>	
,	1220			19.24	19.46	.22	·
	1240			19.24	19.48	1.24	
	12 56			19.24	19.48	-24	
	50		30	19.25	19.50	1,25	
	218		1	19.26	19.50	124	
	310		35	19.28	19.54	.26	
	352			19.29	19.56	.27	
	721			19.34	19.66	.32	•
nwi				_			
10/16	900 AM		40	19,40	19.92	·.52	
	620 Pm			19.45	20.05	.60	
	718 PM		1	19.45	20.06	.61	
MW2	1212 pm		25	«()	18.62	HONE	
	1223				18.64		
	17 36				18.61		
	1253			:	18.61		
	125				18.61		
	213				18.60	·	
	310		1		18.60	·	
11/16	910 Am		40		18.64		
•	6 20 Pm		1		18.67	V	

DATA GATHERED DURING PUMPING TEST

Job: TEX/ N.MEX

Name: CH

Dite: 10/15+16

Well Designation: MW3,4,5

Pump & Setting: 2HP FRANKLIN



1N3	Time	Time (min)	(gpm)	DTP	DTW	PT	Drawdown
1N3 1/15	1515		25		15.25	NONE	
1	1249					_1	
	117						
	207		,		15.26		
	2 ⁰⁷ 2 ³⁷		1		15.25		
	714 pm		40		15.28		
0/16	848 Am		·		15.31	·	
·	650 PM		1		15.34	1	
w5							
0/15	1212 pm		25		16.51	HONE	
10/16	955 Am		40		16.51		
	930 bw		40		16.52	<u>_</u>	
1W4-							
115	1212 pm		25	•	15.6A	None	
	110	•			15.66		
	205				15.65		
	2 ⁰⁵				15.66		
	324		1		15.67		
	710		40	·	15.70	•	
10/16	8'40 _{Am}	·			15.75	·	
'	8 ⁴⁰ Am 6 ⁴⁵ pm		<u> </u>		15.77	4	
	-						
	ļ						

DATA GATHERED DURING PUMPING TEST

Job: Tex/N.MEX
Name: CH

Well Designation: MW 6,7

Oil Recovery

nte: 10/15 + 10/16

Pump & Setting: 2HP FRANKLIN

6		Time (min)	(gpm)	DTP	DTW	PT	Drawdown
6 5	1212		25		16.41	NONE	
	1229				16.42		
	1246				16.41		
	115				16.41		
	200		1		16.41	·	
16	948 AM		40		16.42		
	6.30 pm		<u> </u>		16.42	1	
ا ا 7د	·						
15	12 ¹² pm		25		18.08	none	
	1225				18.09	1	
	1238				18.08		
	l 47				18.08		
	215		\downarrow		18.08		
16	920 _{AM}		40		18-11		
	630 pm		40		18.12	V	
J8	12 ¹² pm		25		19.69	None	
5	120		}		19.67		
	208						
	230						
	716				19.72		
16	900 _{Am}		40		19.83		
	620 pm		40		19.87	↓	
	•						

JOB: TEXAS · NEW MEXICO PIPELINE

Job No: 20 · 2050

e: OCT. 4, 1984

PUMP TEST

Well No. RW1 Elev:



- (•							
1	Time	Elapsed min.	GPM	DTW	DTP	PT	Ad just DTW	Drawdown	Piez. Elev.
	9:05			17.70	17.67	.03′			•
	10:50			17.69	17.67	.02′			
	10:53	0	25	17.69	17.67	, oa '		0	
	11:06	13		31.54	30.76	.78′		13.82	
	11:08	15		31.84	31.11	.73′		14.15	
	11:10	17		32.14	31.29	.85′		14.45	
	11:12	19		32.35	31.43	.9a'		14.66	
	11:14	21		32.59	J1,58	1.01		14.90	
	11: 16 "	23		32.33	31,69	1.04		14.64	
	11:18	25		32.88	31.80	1.08		15.19	
	11:20	27		33.02	31.89	1.13			
	32	29		33.14	31.97	1.17			
	11:ач	31		33.25	32.03	1.22		·	
	11:26	33		33.35	32.08	1:27			
	11:28	35		33.43	32.12	1.31	ļ	15.74	
	11:30	37		33.56	32.16	1.40	ļ		
	11:32	39	<u> </u>	33.61	32.20	1.41/			
	11:34	41		33.67	32.24	1.43			
	11:36	43		33.74	32.26	1.48/			
	11:38	45		33.75	32.29	1.46	1	16.06	
	11:40	47		ਰੱਤ , ⁷⁵	32.32	1431			
	11:42	49		33.71	32,35	1.36			
	11:44	51		33.75	32.28	1.37			
	11:46	53		33.75	32.42	1.33		16.06	
	11:48	55		33. 7 a	32.45	1. 27		16.03	
	1150	57		33.72	32.48	1.24			
	11:52	59	V	33.75	32.51	1.24			

JOD: TEXAS-NEW MEXICO PIPELINE

PUMP TEST

Job No: 20-2050

te: Oct 4, 1984

Well No. RW1 Elev:



_				-							
	Time	Elapsed min.	GF	'M I	DTW	DTP	PT1	Adjust DTW	Drawdo	wη	Piez. Elev.
	1:54	61	25	-	33.75	32.54	1.21				•
	1:56	63			33,75	32.57	1.18				
	1:58	65			33.75	32,60	1.15		16.06		
12	00:E	67			33,75	32,64	1.11				
12	a: 02	69			33.75	32,66	1.09				
17	2:04	71			33.75	32.70	1.05	· · · · · · · · · · · · · · · · · · ·			
12	2:06	73			33.75	32,72	1.03	· .			
10	3:08	75			33,72	32,74	.98				
12	1:10 -	77			33,70	32.77	.93				
12	a: 1a	79			33.75	32.80	.95				
12	3:16	83			33,75	32.86 ⁻	.89				
13	2:26	93			33.35	32.99	. 76				
12	a; 32	99			33.69	33.06	.63				
12	2:40	107			33:75	33.13	.62				
12	ર્રુ: પધ	111			33.75	33.18	.57				
1	2:52	119			33.75	33.26	- 49				
	:62	129			33,45	33,35	.40				
1	: 15	142			33,75	33,45	• 30		\ \V		
1	:32	159		\downarrow	33,75	33,55	. 20		16.06		
5	12:12Pm		2	5	17.99	17.88		•-			
	12:59				27.74	27.25	.49		•	:	
	1:55				30.31	29.44	.87				
	2:21				30.53	29.50	1.03				
	3:12			/	33.39	31.73	1.66				
6	8:00	n m	4	0	37.15	27.83	9.32				
<u> </u>	1:207	Pm	ļ		32.40	31.60	.80	AFTER	P20DUCT	PI	MPINH
	7:18F	m	1	/	33.20	32.09	1.11				



10/3

CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument</u>, NM
DATE: <u>November 30</u>, 1984

OBSERVATION WELL ΛDJ. NO. DTW DTP PT PT×.8 ELEV. WATER DTW 130 RW 17.10 ORIGINAL TOWN TIMP (111P) 21.53 4.43 SET AT 63.8' BY 400 21.50 17.09 4.41 DRILLERS. RAISED TO 43.8 BY 6T. RECHARGE 3.0 Ft

^{*} ORIGINALLY THE MORTH MULLICIPAL WATER WELL.



CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument</u>, N.M.

DATE: <u>October 24-31,1984</u>

NO.	DATE	DTW	DTP	PT	PT×.8	ADJ. DTW	ELEV. WATER
MWI	10-24-84	20.27	19.74	. 43			
	10-25-84	20,26	19.75	.51			
	10-26-84	28.35	19.78	52			
	16-27-84	19.67	19.61	06			
	10-28-84	19.52	19.44	.08			
	10.29.84	20.62	90.46	16			
	10-30-84	20.51	20.42	<u></u>			
	10-31-84	19.86	19,52	34			



CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, N.M.

DATE: October 24-31,1984

NO.	DATE-	DTW	DTP	PT	PT×.8	ADJ. DTW	ELEV. WATER
MW3	10-24-84		15.40				
	10-25-84	15.40	15.40				
	1D-26-84	15.43	15.43				
	10-27-84	15.33	15.33				
	10-28-84	15.28					
	10-29-84	15,29				 	
	10-30-84	15.29	15.29				
	10-31-84	15.32	15.32				
	1						



CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, N.M.

DATE: October 24-31,1984

OBSERI	ATION	WELL		· · · · · · · · · · · · · · · · · · ·			
NO.	DATE-		DTP	PT	PT×.8	ADJ. DTW	ELEV. WATER
mw4	10.54.84	15.87	15.87				
	10-25-84	15.26	15.76				
	10.26-84	15.39	15.39				
	10.27.84	15.74	15.74				
	10-28-84	15.67				<u></u>	
	10-29-84	15.70					
	10.20.21	1650	1530				·
	1030.84	15.70	15.10				
	10-31-84	1575	15.74				
	100101	10.10	10.1				
			· 			 	
				<u> </u>			
		,					



CLIENT: Texas-New Mexico Pipeline
LOCATION: Monument, N.M.
DATE: October 24-31,1984

OBSERVATION	WELL
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OBSERV	MOLIAN	WELL					
NO.	DATE-	WTO	DTP	PT	PT×.8	ADJ. DTW	ELEV. WATER
MW5	10-24-84	16.51	16.51				
<u> </u>	12.26.24	17 = 3		 			
	10-25-84	16.55	16.55				
	10-26-84	16.52	16.52				
	10:27:84	16.50	16.50			 	
	10-23-84	11 50					
	10 20 01	110.00					
	10-29-84	16.50					
		14 6	7. 5.				
	10-30-84	16.01	16.51				
	10-31-84	11 50	16:50				
	10 01 8 1	16.00	16.50				
				· · · · · · · · · · · · · · · · · · ·			
]						



CLIENT: Texas-New Mexico Pipeline

LOCATION: Monument, N.M.

DATE: October 24-31,1984

NO.	DATE-	DTW	DTP	PT	PT×.8	ADJ. DTW	ELEV. WATER
mw6	103434	16.43	16.43				
	10-25-84	16.44	16.44				
	10-26.84	16.44	16.44				
	10-27-84	16.43	16.43				
	10-58-84	16.42					
	10-29-84	16.41					
	10.30.84	16.42	16.42				
	10-31-84	16.42	16.42				
				<u> </u>			



CLIENT: Texas-New Mexico Pipeline

LOCATION: Monument, N.M.

DATE: October 24-31, 1984

OBSERV	VALION	WELL						
NO.	DATE	WTO	DTP	PT	PT×.8	ADJ. DTW	ELEV.	WATER
MW7	10-24-84	18,45	78771	.04				
	12 25 21		·					
	10-25-84	18.43	18.40	03				
	10-26-84	18,45	18,43	02				
ļ	10.07.01							
}	10-27-84	18.40	18.39	01				
	10-28-84	18.38	18,26	0a				
	10-29-84	18,25	18.23	.02				
	10-30-84	10 00	10.01	~~~				
	10008	10. da	18.01	.01				
	1031-84	18.26	18.25	.01				
L	<u> </u>					ll	 	



CLIENT: Texas-New Mexico Pipeline

LOCATION: Monument, N.M.

DATE: October 24-31,1984

OBSER\	VATION	WELL		·	ı ————		
NO.	DATE-		DTP	PT	PT×.8	ADJ. DTW	ELEV. WATER
MWID	10-54-84	20.34	18.60	1.74			
	10-25-84	20.27	18.58	1.69			
	10.26.84	20.60	18.68	1.92			
	1027-84	18.94	18.27	.67			
	10-28-84	19.94	18:14	1.80			
	10-29-84	18.98	18.20	.78			
	10.30-84	13.90	18.16	.74			
	10-31-84	19.19	18.41	1.28			
				,			



CLIENT: <u>Texas-New Mexico Pipeline</u>

LOCATION: Monument, N.M.

DATE: October 24-31, 1984

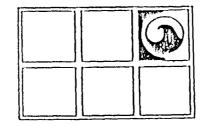
NO.	DATE	DTW	DTP	PT	PT×.8	ADJ. DTW	ELEV. WATER
MWII	10-24-84		21.55				
			20,50				
			19.10				
	10 2584		18.42				
			22.56				
			21.95				
			24.78				
	10-96-84		24,52				
	1027-84		22,30				
			22.30				
			20.86				
	10-38-84		23.47				
			9370				
	10-29-84		20.85				
	10.30.84		22.41				
	10-31-84		20.68				
			20.62				
						l	



CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, N.M.

DATE: October 24-31,1984

ATION	VYCLL			l———	1 40.1	
		DTP	PT	PT×.8	DTW	ELEV. WATER
10.21.84	16.47	16.47			<u> </u>	
1				 	\ \	
10.25.84	16.48	16.48				
						
10-26-84	16.57	16.57		 	ļ 	
				<u> </u>		
10-27-84	16.60	16.60				
	,		 -		ļ	
10-38-84	16.56					
10-29-84	16.47					
1030.84	16.47	16.47				
·						
1031-84	16.49	16.49				
	DATE- 10.21/84 10.25/84 10.21/84 10.29/84 10.20/84	DATE - DTW 10.2184 16.47 10.25.84 16.48 10.26-84 16.57 10.27.84 16.60 10.28.84 16.56 10.29.84 16.47	DATE - DTW DTP 10:21:84 16:47 16:47 10:25:84 16:48 16:48 10:26:84 16:57 16:57 10:27:84 16:60 16:60 10:28:84 16:47 10:20:84 16:47 16:47 10:30:84 16:47 16:47	DATE DTW DTP PT 10.21.84 16.47 16.47 10.25.84 16.48 16.48 10.26.34 16.57 16.57 10.27.84 16.60 16.60 10.29.84 16.47 — 10.20.84 16.47 16.47 10.30.84 16.47 16.49	DATE- DTW DTP PT PTX.8 10.21/84 16.47 16.47 10.25/84 16.48 16.48 10.26-84 16.57 16.57 10.27/84 16.60 16.60 10.28/84 16.47 — 10.29/84 16.47 16.47 10.30/84 16.47 16.49	DATE - DTW DTP PT PT X.8 DTW 10.21/84 16.47 16.47 10.25/84 16.48 16.48 10.26/84 16.57 16.57 10.27/84 16.60 16.60 10.28/84 16.47 - 16.47 10.30/84 16.47 16.47



GROUNDWATER TECHNOLOGY Consulting Groundwater Geologists

GROUNDWATER GRADIENT DATA

CLIENT: Texas-New Mexico Pipeline
LOCATION: Monument, N.M.
October 24-31,1984

					DATE:	Octob	per 24-31,1984
OBSERV	VATION	WELL					
NO.	DATE	DTW	DTP	PT	PT×.8	ADJ. DTW	ELEV. WATER
<u>wmis</u>	10-24-84	19.48	19.48				
	10-25-84	19 57	19.50				
	10.26-84	19.50	19.50				
	10-27-84	19.42	19.42				
	10-38-84	19.78					
	10-29-84	19.28					
	10-30-84	19.26	19.26				
	10 21 21	10 20	10 22	···			
	10-31-84	14.50	14.30				
			<u>'</u>				
	1		[,	}	

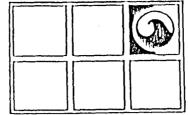


CLIENT:	Texas-New	Mexico	Pipeline
			

LOCATION: Monument, N.M.

DATE: October 24-31,1984

OBSER\	ATION	WELL			· · · · · · · · · · · · · · · · · · ·	·	,
NO.	DATE-	DTW	DTP	PT	PT×.8	ADJ. DTW	ELEV. WATER
MICH	10-34-34	16.25	16.23	.02			
	102521	11 20	V 5 3				
	103284	16.97	16.27	.02			
	10.2634	16.32	1630	.02			
	1037-87	96.91	16.34	.02			
	10-28-84	11.38	16.36	<u>.D2</u>			
	10 0.0 01	1000	10.0.73				
	10-29-84	16.37	16.35	.02			
	10.20.21		W 22				
	1030-84	16.33	1633	.02			
	10-31-84	1/224	16.32	.02			
	1001.07	1001	10.000				·
				,			



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GROUNDWATER GRADIENT DATA

CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, N.M.

DATE: October 24-31,1984

OBSER	VATION	WELL			DATE		
NO.	DATE	DTW	DTP	РТ	PT×.8	ADJ.	ELEV. WATER
MW15	10-24-84	18.02	18.02				
	10 26 21	10.51	12.51				
	10-25-84	18.04	18.04				
	10-26-84	18.11	18.11				
	10-27-24	13.14	18.14			<u> </u>	
	10-28-84	13.11					
	10 00 11	10.11					
	10-29-34	18.03					
		12.50					
	10-30-84	18.00	18.00				
	10.31-84	1790	17.98	. 			
	1001 01	1.1.10	17:10				



CLIENT: Texas-New Mexico Pipeline

LOCATION: Monument, N.M.

DATE: October 24-31, 1984

ORZEKI	AHON	WELL					
NO.	DATE	WTD	DTP	PT	PT×.8	ADJ. DIW	ELEV. WATER
WW16	16 24-84	19.24	18.57	. 67			
	1000 311						<u> </u>
ļ ———	10:92-89	79.52	18,54	- 69			
	10-26-84	19.30	18.63	67			
	10-27-84	19.30	18.64	.66			
	10-28-84	19.25	18.58	.67			
	10-29-84	19.17	18.45	.72			
	10-30-84	10 1=	10				
	10:20.01	19.12	18. 44	69			
	10-31-84	19.13	18.45	.67			
ļ							
1							



CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, N.M.

DATE: October 24-31,1984

OBSER!	/ATION	WELL					· · · · · · · · · · · · · · · · · · ·
NO.	DATE-	DTW	DTP	PT	8.×T9	ADJ. DTW	ELEV. WATER
MWIT	10-94-84	13.68	1868				
	10-25-84	13.69	18.69		l		
	10-26-84	18.73	18.73				
						<u> </u>	
	10-27-84	18.66	18.66			ļ	
	10-28-84	13 5)					
	10 26 01	10.00					
	10-29-84	18.50					
							,
	10-30-34	13.47	18.47				
	16 15 71	10.52	10 5				
	10-31-84	18.50	18.20				
							
							
L	l			<u></u>	L	L	l



CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, N.M.

October 24-31,1984

				-	DATE:	OCCOL	per 24-31,1904
	VATION						
1	DATE		DTP	PT	PT×.8	ADJ. DTW	ELEV. WATER
WMIS	10-31-31	16.87	16.87				
	10.25.34	11,89	16.39		ļ		,
		,					
	10-26-24	1695	16.95	 			
	1027-84	16.97	1697				
	10-28-84	16.98					
	10-29-84	16.93					
	10 26 21	V O2	V G 2	-			
	10:30:84	16.72	16.7 L				
	10-31-84	16.92	16.92				



CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, N.M.

DATE: October 24-31,1984

OBSE	RV	ΆΤ	ION	WELI	_
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UBSERV	AHON	WELL					
NO.	DATE-		OTP	PT	PT×.8	ADJ. DTW	ELEV. WATER
MWIG	10-24-84	17.02	50.57				
	10-35-84	17.02	17.02				
	10-26-84	1705	17.05				
	10-27-84	17.99	17.99				
	10.58.84	1698					
	1029-84	16.98					
	1030-81	16.98	16.48				
	10-31-84	17.00	17.00				



CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, N.M.

DATE: October 24-31,1984

ODOLIN	AITON	VYCLL			,		<u> </u>
NO.	DATE	DTW	DTP	PT	8.× T9	ADJ. DTW	ELEV. WATER
WMSO	10-29-84	17.40					
	10.21.21	7111	17111				
	10-30-84	11.011	17.41				
	10-31-84	17.43	17.43				
mw31	10-29	17.74		j			
	15 20						
	10-30	17.70					
	10-31	17.70		· · · · · · · · · · · · · · · · · · ·			
							·
mw22	10-29	17.03	16.97	.06			
<u> </u>			0.5				
	10-30	17.45	16.92	.53			
	10-31	17.95	16.85	1.10			
	10		131.				
MW23	10-30	13.72	13.62	.10			
	10-31	15.10	13.64	1.46			
mwa4	1	15.77 16.00	14.65	1.13			
mwa5	1000	10.00		<u></u>	l	i	





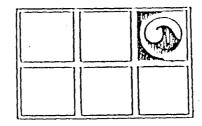
CLIENT: <u>Texas-New Mexico Pipeline</u> LOCATION: <u>Monument</u>, NM DATE: <u>November 30</u>, 1984

OBSERV	<u> </u>	WELL					
NO.	DATE	DTW	DTP	PT	PT×.8	VDJ.	ELEV. WATER
i	11-13-84	34.19	31.42	2.77			
	11-14-84	34.78	31.50	3.28			
	11-15-84	34.50	31.66	2.84			
	11-16-84	34.55	3175	2.80			·
	11-17-84		31.76	2.44			
	11-18-84						
	11-18-84		32.62	6.28			
<u></u>	11-18-84						
	11-19-84	21.24	18.95	2.29			
	11-13-84			· 55 · 53			
	11-14-84		19.92	·53			
)	11-15-84	20.48	19.95	.53			•
	11-16-84	20.47	19.96	.61			
	111-17-84	20.48	19.97	.51			
	11-18-84	20.47	19.95	.52			
	11-19-84			.53			
	1						
							·
L	L	l	l	l	l	لـــــــــــــــــــــــــــــــــــــ	



CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument</u>, NM
DATE: <u>November 30</u>, 1984

ODSLIT	77-11014	, <u> </u>		,		, ———	, <del>,,,, </del> ,
NO.	DATE	WTO	DTP	РТ	8.×19	ADJ. DIW	ELEV. WATER
2	11-13	1925					
	11-14	19.28					
	11-15	19.31					
	11-16	19.32					
	111-17	19.35					
	11-18	19:36					
	11-19	19.34					
D							
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# GROUNDWATER TECHNOLOGY

### GROUNDWATER GRADIENT DATA .

CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument</u>, NM
DATE: <u>November 30</u>, 1984

OBSERV	7411014	WELL		,	,	1	1
NO.	DATE	DTW	DTP	РТ	PT×.8	ADJ.	ELEV. WATER
3	11-13	15.50					
	11-14	15.53					
	11-15	15.53					
	11-16	15.53					
	11-17	15.53					
	11-18	15.53					
	11-19	15.53					
				<del></del>			
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CLIENT: Texas-New Mexico Pipeline
LOCATION: Monument, NM

					DATE:	Noveml	per 30, 1984
OBSERV	VATION	WELL					
NO.	DATE	OTW	отр	PT	PT×.8	01W 	ELEV. WATER
4	11-13	15.98					
	11-14	16.01					
	11-15	16.00					
	11-16	16.02					
	11-17	16.01					
	11-18	16.01					
	11-19	15.93					
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CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument</u>, NM
DATE: <u>November 30</u>, 1984

OBSER	Y/-(   1   1   1   1	WELL	,	,	,	,	•
NO.	DATE	WTO	DTP	PT	8.×19	ADJ. DIW	ELEV. WATER
5	111-13	16.52				<u> </u>	·
	11-14	16.56					
	111-15	16.53					
	11-16	16.54					
	11-17	16.53					
	11-18	16-52					
	11-19	16.52					
)							
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### GRADIENT DATA . GROUNDWATER

CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, NM DATE: November 30, 1984

OBSERV	MOLTAN	WELL
110		

OBSER	VA-11014	VYCLL		,	,	,	•
NO.	DATE	WTG	DTP	РТ	8.×19	ADJ. DIW	ELEV. WATER
6	11-13	16.47					
	11-14	16.47					
<b> </b>	11-15	6.48				]	
	11-16	6.48	6.47	TIZACE			
	11-18	16.40	0.41	IRALE			
	11.10	16.70	·				
							·
1							
ļ							



CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument</u>, NM
DATE: <u>November 30</u>, 1984

OBSER	VALION	VYELL	,	·	,	,	•
NO.	DATE	WTO	קדם	7.7	PT×.8	ADJ.	ELEV. WATER
7_	11-13-84		18.65	.12			
	11-14-84		18.56	1.14			
	11-15-84		18.59	.14			·
	11-16-80	18.76	18.60	.16			
	11-17-84	18.79	18.60	.19			
	11-18-84	18.83	18.62	.71			
	11-19-84	18.80	18.60	.20			
				<u></u>			
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<u> </u>							
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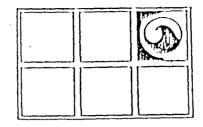
CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, NM
DATE: November 30, 1984

00000			•	•	DATE	Novemi	Jei 30, 1904
OBSERV	VATION	WELL			1	,	1
NO.	DATE	WTO	DTP	PT	PT×.8	ADJ.	ELEV. WATER
8	11-13	20.27					
	11-14	20.29					·
	11-15	20.30		·			
\ <u></u>	11-16	20.32					
	11-18	20.31					
	11-19	20.15					
	1111	20.10					
Ψ							
							,
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			,				



CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument</u>, NM
DATE: <u>November 30</u>, 1984

r	JUSCICY		VYELL		, <del></del>		1	ı ————————————————————————————————————
	NO.	DATE	DTW	DTP	РГ	PT×.8	ADJ. DIW	ELEV. WATER
	9	11-13	15.92					
-		11-14	15.95					
		11-15	15.96					
1		11-16	15.97					
		11-17	15.98					
	·	11-18	15.98					
		11-19	15.87					
		-						
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## GROUNDWATER TECHNOLOGY

### GROUNDWATER GRADIENT DATA .

CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument, NM</u>
DATE: <u>November 30, 1984</u>

003511	1	77		ı <del></del>		I	1
NO.	DATE	DTW	DTP	PT	8.×T9	ADJ. DIW	ELEV. WATER
10	11-13-84	20.73	18.75	1.98			
	11-14-84	20.75	18.75	2.00			
	11-15-84	20.76	18.78	1.98			
	11-16-84		18.79	2.00			
	11-17-84	20.75	18.79	1.96			
	11-18-84	20.30	18.71	1.59			
	11-19-84	19.15	18.72	. 63			
)							
			· <del></del>				
		· <del>- · · · · · · · · · · · · · · · · · ·</del>					
	·						
}		 			·		
	j						
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CLIENT: <u>Texas-New Mexico Pipeline</u> LOCATION: <u>Monument</u>, NM DATE: <u>November 30</u>, 1984

NO.	DATE	DTW	DTP	PT	PT×.8	ADJ.	ELEV. WATER
11	11-13		21.10				
	11-14		21.05				
	11-15		23.58				
	11-15		21.54				
	11-16		20.79				·
	11-16		23.50				
	11-17		22.60 23.20				
<b>'</b>	11-19		23.22				
			LJ: LL				
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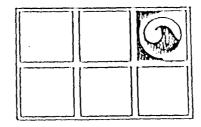
CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, NM DATE: November 30, 1984

					DATE	молени	per 30, 1984
OBSERV	MOITAY	WELL	·	, <del></del> _		,	
NO.	DATE	DTW	DTP	PT	P1×.8	ADJ. <u>DIW</u>	ELEV. WATER
12	11-13	16.70		و نوست روست و سان دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد او دارد			
	11-14	16.74	. ——				
ļ	11-15	16.77					
	11-16	16.78					
	11-18	16.84					
	11-19	16.90					
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CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument</u>, NM
DATE: <u>November 30</u>, 1984

OBSERV	MHON	WELL	,		,	-	,
NO.	DATE	WTO	отр	19	8.×19	ADJ. DIW	ELEV. WATER
13	11-13	14.65					
	11-14	19.67					
	11-15	19.67					
	11-16	19.68					
	11-17	19.69					
	11-18	19.70					
	11-19	19.65					
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# GROUNDWATER TECHNOLOGY

### GROUNDWATER GRADIENT DATA -

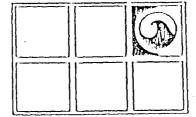
CLIENT: <u>Texas-New Mexico Pipeline</u> LOCATION: <u>Monument</u>, NM DATE: <u>November 30</u>, 1984

OBSERV	MITON	WELL					
NO.	DATE	DT W	DTP	PT	8.×19	ADJ. DTW	ELEV. WATER
14	11-13	17.03	16.40	.63			
	11-14	17.05	16.40	.65			
	11-15	17.10	16.43	.67			
	11-16	17.11	16.46	.65			
	11-17	17.24	16.46	.78			
	11-18	17.34	16.47	.87			
	11-19	17.50	16.55	.95			
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CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument</u>, NM
DATE: <u>November 30</u>, 1984

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	NO.	DATE	WTD	DTP	PT.	8.×T9	ADJ.	ELEV. WATER
	15	11-13	18.25					
_		11-14	18.29	,				
_		11-15	18.31					
_		11-16_	18.33					
		11-17	18.36					
		11-18	18.38					
-		11-1-1	18.40					
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## GROUNDWATER TECHNOLOGY

Consulting Groundwater Geologists

### GROUNDWATER GRADIENT DATA -

CLIENT: Texas-New Mexico Pipeline
LOCATION: Monument, NM
DATE: November 30, 1984

					DATE:	Noveml	oer 30, 1984
OBSERV	MOITAN	WELL	•				
NO.	DATE	WTO	DTP	p.t.	PT×.8	ADJ.	ELEV. WATER
16	11-13-84		18.77	.60			
	11-14-84		18.78	.60			
	11-15-84	19.35	16.82	. 53			
	11-16-84	19.34	18.82	.52			
	11-17-84		18.84	.48			
	11-18-84		18.88				
	11-19-84	19.35	18.90	.45			
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CLIENT: Texas-New Mexico Pipeline
LOCATION: Monument, NM
DATE: November 30, 1984

					DATE:	Novemb	per 30, 1984
OBSER!	MOITAY	WELL	,			·	
NO.	DATE	WTO	DTP	PT	8.× T9	ADJ. DIW	ELEV. WATER
	11-13	18.86					
	11-14	18.87					
	11-15	18.90					
	11-16	18.92					
	11-17	18.94					
	11-18	18.95					
	11-19	18.90					
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CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, NM DATE: November 30, 1984

0030	RVATION	WELL	,	,	,		,
NC	DATE	отм	DTP	pr	8.×T9	ADJ. DIW	ELEV. WATER
18	11-13	17.11					
	11-14	17.13					
	11-15	17.15					
	11-16	17.17					
	11-17	17.22					
	_11-18_	17.21					
	11-19	17.24					
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CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument</u>, NM
DATE: <u>November 30</u>, 1984

OUSERV	MION	WELL						
NO.	DATE	DTW	DTP	PT	PT×.8	ADJ. DIW	ELEV. W	ATER
19	11-13	17.07						
	11-14	17.10						
	11-15	17.10						
	11-16	17.11						
	11-17	17.09						<u> </u>
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	11-19	17.09						
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CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument</u>, NM

DATE: <u>November 30</u>, 1984

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OBSERV	VALION	WELL	·			1-0::	
NO.	DATE	WTO	DTP	PT	PT×.8	ADJ.	ELEV. WATER
70	11-13	19.26	1735	191			,
	11-14	19.30	17.32	1.98			
	11-15	19.35	17.32	2.03			
	11-16	19.39	17.26	2.13			
	11-17	19.45	17.20	2.25			·
	11-18	19.54	17.20	2.34			
	11-19	19.67	17.70	2.37			
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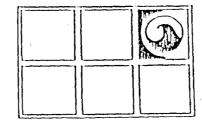
CLIENT: Texas-New Mexico Pipeline
LOCATION: Monument, NM
DATE: November 30, 1984

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					DATE	Novemb	per 30, 1984
OBSERV	NOITAN	WELL	v '				
NO.	DATE	WTO	OTP	ין ין	8.×19	ADJ. DIW	ELEV. WATER
21	11-13	17.83					
	11-14	17.86					
	11-15	17.84	,				
	11-16	17.85					
	11-17	17.85					
	11-18	17.87					
	11-19	17.88					
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CLIENT: Texas-New Mexico Pipeline
LOCATION: Monument, NM
DATE: November 30, 1984

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NO.	DATE	DTW	910	PT	8.×19	ADJ. DIW	ELEV. WATER
22	11-13	18.23	16.94	1.29			
ļ	11-14	18.19	16.95	1.24			
	11-15	18.21	16.97	1.24			
	11-6	18.20	16.98	1.26			
	11-18	18 20	16.97	1.73			
}	111-19	18.20	16.97	1.23			
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## GROUNDWATER TECHNOLOGY

### GROUNDWATER GRADIENT DATA .

CLIENT: <u>Texas-New Mexico Pipeline</u>
LOCATION: <u>Monument</u>, NM
DATE: <u>November 30</u>, 1984

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NO.	DATE	WTO	פדפ	PT	8,×19	ADJ. DIW	ELEV. WATER
23	11-13	15.63	13.70	1.93			
	11-14	15.68	13.73	1.95			
	11-15	15.11	13.75	1.96			
	11-16	15.71	13.76	1.95			
	11-18	15.72	13.76	1.94			
	11-19	15.74	13.79	1.95			
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CLIENT: Texas-New Mexico Pipeline
LOCATION: Monument, NM
DATE: November 30, 1984

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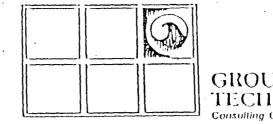
CLIENT: Texas-New Mexico Pipeline
LOCATION: Monument, NM
DATE: November 30, 1984

OBSER\	VATION	WELL			DATE		Jel 90, 1904
NO.	DATE	DTW	DTP	PT	PT×.8	ADJ. DIW	ELEV. WATER
25	11-13	16.18					
	11-14	16.22	. —				
	11-15	16.26					
	11-16	16.77					
	11-18	16 37					
	11-19	16.35					
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CLIENT: Texas-New Mexico Pipeline LOCATION: Monument, NM
DATE: November 30, 1984

					DATE	HOAGIII	per 30, 1984
OBSER	MOITAY	WELL	4.5		,	·	,
NO.	DATE	DTW	סדף	PT	8.×17	ADJ. DIW	ELEV. WATER
76	11-13	17.33					
	11-14	17.35					
	111-15	17.35		·			
	11-16	17.34		·			
<u> </u>	111-18	17.30					
	11-10	17.30					
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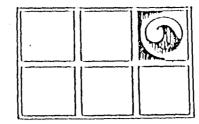
CLIENT: <u>Texas-New Mexico Pipeline</u> LOCATION: <u>Monument</u>, NM DATE: November 30, 1984

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OBSERV	MOLTAY	WELL	<u>'</u>				
NO.	DATE	ртw	ore	PT	8.×19	ADJ. DJW	ELEV. WATER
27	11-13	16.94					
	11-14	16.49					
	11-15	16.40					
	11-16	16.28					
	11-18	16.13					
	11-19	10.10					
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CLIENT: Texas-New Mexico Pipeline
LOCATION: Monument, NM
DATE: November 30, 1984

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OBSERV	MOLTAY	WELL	,	,	, <del></del>	·	,
NO.	DATE	DTW	DIP	PT	₽1×.8	ADJ. D[W_	ELEV. WATER
28	11-13	17.77			-		
	11-14	17.11					
	11-15	16.96					
	11-16	16.76					
		16.56					
	11-18	16.52	16.51	TRACE			
		16.50			-		
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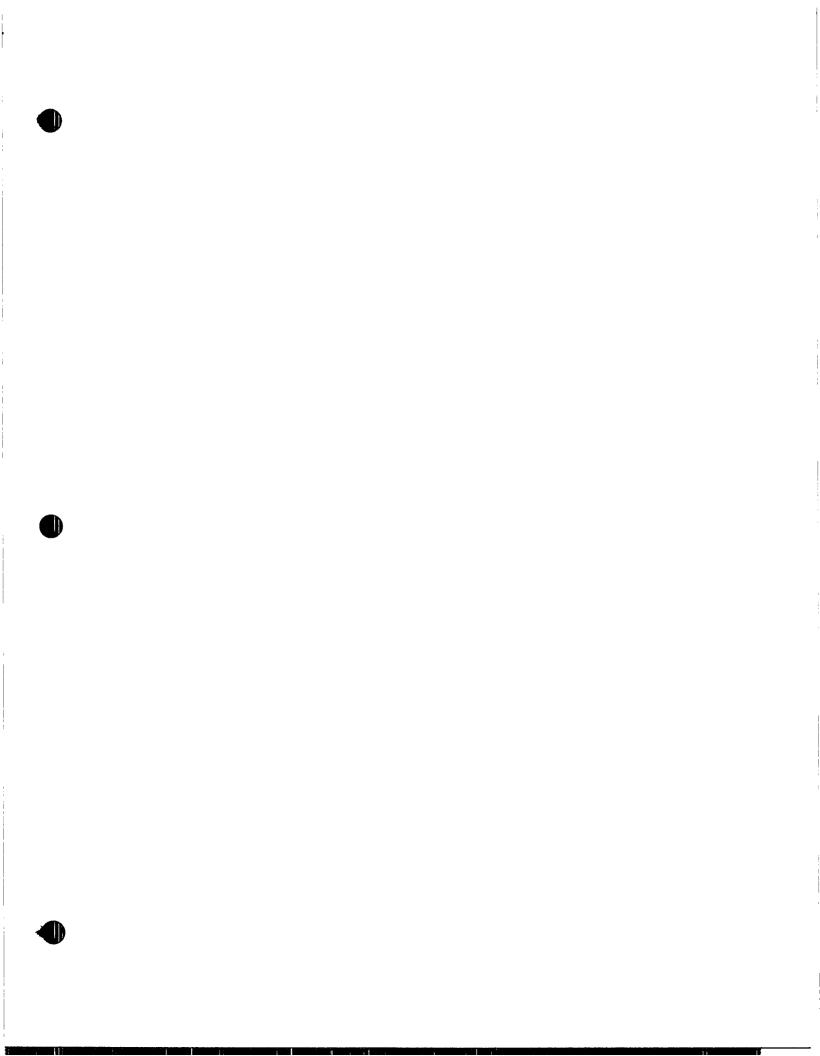


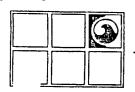
## GROUNDWATER TECHNOLOGY

### GROUNDWATER GRADIENT DATA .

CLIENT: <u>Texas-New Mexico l'ipeline</u>
LOCATION: <u>Monument</u>, NM
DATE: November 30, 1984

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OBSERV	MOITAY	WELL	i,		,	•	•
NO.	DATE	DTW	סוס	PT	0,×19	ADJ. DIW	ELEV. WATER
29	11-13	15.00					
	11-14	15.01					
	11-15	15.03					
	11-16	15.03					
	11-17	15.00					
	11-18	15.01					
	11-19	15.01					
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### **GROUNDWATER TECHNOLOGY LABORATORY**

ANALYTICAL & CONSULTING SERVICES
Division of Oil Recovery Systems, Inc.
4 Mill St., Greenville, NH 03048
Tel: (603) 878-2500

Con. Gold offices:

Needham, MA — Redondo Beach, CA
Chadds Ford, PA — Concord, CA
Novi, MI

Laboratory Test Results

10/11/84
Report No. 20-2050-1
Submitted to:

Cliff Harper Groundwater Technology 5047 Clayton Rd. Concord, CA 94519

The attached report covers water samples 12442-12443 taken by C. Harper at site 20-2050, Monument, New Mexico and analyzed by GC/FID Static Headspace Analysis for volatile hydrocarbons, analyst J.P.M.

Method Detection Limits (MDL) listed are the levels above which quantitation is considered reliable: benzene and toluene 1 ppb, ethylbenzene 2 ppb, total xylenes 6 ppb, total aliphatic hydrocarbons and miscellaneous aromatics 20 ppb.

If noted on report, MDL is increased by a factor of 44 for dilutions made in order to maintain calibrated range. Precision for levels above 10 times MDL is 10%. Precision at MDL equals 30%. Hexane and ortho-xylene used as calibration standards for aliphatic hydrocarbons and miscellaneous aromatics, respectively.

Respectfully submitted,

Michael D. Webb Technical Director VOA Report No. 20-2050-1

# HYDROCARBONS IN WATER 4g/L (ppb)

SAMPLED KUN
10/4/84 10/9/84
_
ND = NONE DETECTED SW = SCHOOL WELL FDW = FIRE DEPARTMENT WELL

VOA Report No.

# 20-2050-2 HYDROCARBONS IN WATER $\mathcal{A}$ g/L (ppb)

		10/20/84	10/11/84 10/20/ 10/11/84 10/22/ 10/11/84 10/22/
	Q N		
	QN		10/22/84
	QN		
	221		10/22/84
	ΔN		10/22/84
	۵N		10/22/84
10400 669	16600	_	10/20/84 1
	2	10/20/84 2	

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**2***

*NOTES:

ND = NONE DETECTED TRACE = COMPOUND(S) DETECTED BUT BELOW LEVEL FOR RELIABLE QUANTITATION

METHANE DETECTED AT 10-100 PPB. 11

В

4 0

METHANE DETECTED AT 100-1000 PPB. SAMPLE DILUTED; MDL TIMES 44 11

UNCATEGORIZED COMPOUND(S) PRESENT.

VOA Heport No.

# HYDROCARBONS IN WATER 4g/L (ppb)

	L.	ר י	J L	,		
TOTAL	36200	0000		, 7	2 2	2 Z
MISC. AROMATICS C7-CIO	878	1140	0 Z	2 2	2 2	O N
C4-C12 ALIPHATIC HYDROCARBONS	6410	6370	10 C A G T		2 Q	QN
TOTAL XYLENES	1480	1960	0 2	2 2	Q N	Q N
ETHYL BENZENE	1870	1970	) (N	ON.	O.N.	QN
TOLUENE	9710	11100	2	Q	QN	ON
BENZENE	15800	17300	TRACE		ON	ΔN
OATE RUN	10/18/84	10/18/84	10/18/84	10/18/84	10/18/84	10/18/84
DATE SAMPLED	10/16/84 10/18/84		10/16/84			10/16/84
SAMPLE NO. 1.0.	W14	W15	W2	M 8	3.	BLANK
ଲ ଅ ଅ	12533	12534	12535	12536	12537	12538

*NOTES:

DETECTED BUT BELOW LEVEL FOR RELIABLE QUANTITATION TRACE = COMPOUND(S) ND = NONE DETECTED W.W. = WATER WELL

5 = UNCATEGORIZED COMPOUND(S) PRESENT.

GROUNDWATER TECHNOLOGY LABORATORY 44 Mill Street, Greenville, New Hampshire 03048

VOA Report No.

20-2050-4

# HYDROCARBONS IN WATER 4g/L (ppb)

اي		TRACE 3	39	TRACE	164	195	TRACE	O Z
TOTAL		TR		TR		•	H R	
HISC. AROMATICS CT-CIO	•	ΔN	ON N	O N	83	79	ON	QN
C4-C12 ALIPHATIC HYDROCARBONS	,	TRACE	39	TRACE	81	131	ON	ON
TOTAL XYLENES		ON	ND	۵N	ΩN	ΩN	ΔN	QN
ETHYL BENZENE		O N	Q N	QN	Q N	Q N	Q	O N
E TOLUENE B		ΔN	QN	ON N	QN	Q N	TRACE	ON
ENE		Q	ON	O N	O.N.	O N	۵N	۵N
DATE RUN BENZENE		10/24/84	10/24/84	10/24/84	10/23/84	10/24/84	10/24/84	10/24/84
DATE SAMPLED		10/17/84		10/17/84	10/17/84	10/17/84	10/17/84	
<u>o</u> .		MM3	MM4	M M S	MM6	6 M W	MW13	MW19
SAMPLE NO. 1.D.		12551						

<del>.</del>*

*NOTES:

RELIABLE QUANTITATION FOR TRACE = COMPOUND(S) DETECTED BUT BELOW LEVEL ND = NONE DETECTED

1 = METHANE DETECTED AT 10-100 PPB.

# #4 Mill Street, Greenville, New Hampshire 03048 GROUNDWATER TECHNOLOGY LABORATORY

VOA Report No.

20-2050-5

# HYDROCARBONS IN WATER 4g/L (ppb)

DATE DATE DATE SAMPLED RUN BENZENE TOW	DATE DATE SAMPLED RUN BENZENE	DATE LED RUN BENZENE	BENZENE	NZENE	<u>চ</u>	TOLUENE	ETHYL BENZENE	TOTAL	C4-CI2 ALIPHATIC HYDROCARBONS	MISC. AROMATICS C7-CIO	CS TOTAL
2627	M W 3	10/25/8		1/84	QN	O N	ON	O N	180	QN	180 *1
2628	MM4	10/25/84		10/31/84	1020	82	QN	53	2290	36	3480 *7
59	MW 5	10/25/8		1/84	ON	Q.	Q.N	QN	TRACE	O N	TRACE *6
2630	MM6	10/25/84		1/84	QN	۵N	ON	QN	TRACE	O N	TRACE
631	MW8	10/25/84		1/84	ON	Q N	ND	۵N	QN	Q N	, QN
2632	MM 6	10/25/84		10/31/84	6450	3320	296	430	258	3760	14500
633	MW13	10/25/8		1/84	ON	ΩN	QN	۵N	QN	S	QN .
2634	MW15	10/25/84		1/84	19100	12100	2020	1690	10800	1940	46500
2635	MW17	10/25/84		10/31/84	1520	62	OZ	148	866	154	2770 *2

# *NOTES:

TRACE = COMPOUND(S) DETECTED BUT BELOW LEVEL FOR RELIABLE QUANTITATION ND = NONE DETECTED

= METHANE DETECTED AT 10-100 PPB. = METHANE DETECTED AT 100-1000 PPB.

= UNCATEGORIZED COMPOUND PRESENT; POSSIBLY NOT GASOLINE RELATED.

TOTAL ALIPHATICS INCLUDES METHANE.

19 WERE BROKEN VIA SHIPPING. ∞ SAMPLES OF MW12, 18,

#4 Hill Street, Greenville, New Hampshire 03048 GROUNDWATER TECHNOLOGY LABORATORY

# 20-2 -6 HYDROCARBONS IN WATER 4g/L (ppb)

		TOTAL		QN	Q N	۵N	O N	
MISC.	AROMATICS	C7-C10		ΔN	QN	QN	ON	
C4-C12	ALIPHATIC	HYDROCARBONS		ND	ND	Q N	ON	
	TOTAL	XYLENES		ON	ON	QN N	ON	
	ETHYL	BENZENE		۵N	OZ.	QN N	QN	
		TOLUENE		Q N	Q N	Q N	O N	
		NZENE		ΟN	O N	۵X	O N	
	DATE	9 9		11/12/84	11/12/84	11/12/84	11/12/84	
	DATE	SAMPLED		11/6/84		11/6/84	11/6/84	
				MMM	MMMS	MW 28	BLNK	
		SAMPLE NO. 1.D.	definition of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the	12809	12810	12811	12812	

*NOTES:

ND = NONE DETECTED MWW = MUNI WATER WELL MWWS = MUNI WATER WELL STANDBY BLNK = BLANK



MILL STREET, GREENVILLE, NEW HAMPSHIRE 03048

**B L Lednicky** District Manager PO Box 2528 Hobbs NM 88241 505 393 2135

February 7, 1985

Mr. Jerry Sexton State of New Mexico Oil Conservation Division P.O.Box 1980 Hobbs, New Mexico 88241

Dear Jerry:

Re: Monument Water Wells

As per our discussion today attached is an analysis of the water samples taken on January 9, 1985. When Cliff Harper and myself visited with you and Eddie Seay about January 9 you requested that we obtain the samples on the wells drilled by the Oil Conservation Division.

I had previously given this information to Eddie Seay by telephone.

Yours very truly,

7000

BLL: DDM Attachment PRELIMINARY

EASYLINK MBX 5733473A001 15JAN85 12:08/12:35 EST

FROM: TLX 752858 ORS INC GRN UD

OIL RECOVERY SYSTEMS INC

TO: 62725550

Laboratory Test Results

1/15/85
Report No. 20-2050-8
Submitted to:

Cliff Harper Groundwater Technology 5047 Clayton Rd. Concord, CA 94519

	DEFICES LE 1 1985
PLBAGE NUTE	DATE MOTED
B. L. L.	
L. H. N.	
J. B. H.	
K. 11. S.	
U. D. K.	
D. J. N.	
J. D. H.	

The attached report covers water samples 13536-13546 taken by C. Harper at site 20-2050, Monument, New Mexico and analyzed by GC/FID Static Headspace Analysis for volatile hydrocarbons, analysts D.G. and J.P.

Method Detection Limits (MDL) listed are the levels above which quantitation is considered reliable: benzene and toluene l ppb, ethylbenzene 2 ppb, total xylenes 6 ppb. The level for reliable quantitation for total aliphatic hydrocarbons and miscellaneous aromatics is 20 ppb.

If noted on report, MDL is increased by a factor of 44 for dilutions made in order to maintain calibrated range. Precision for levels above 10 times MDL is 10%. Precision at MDL equals 30%. Hexane and ortho-xylene used as calibration standards for aliphatic hydrocarbons and miscellaneous aromatics, respectively.

Respectfully submitted, Michael D. Webb
Technical Director

MMMM

EASYLINK MBX 5736521A001 15JAN85 12:18/12:35 EST FROM: TLX 752858 ORS INC GRN UD OIL RECOVERY SYSTEMS INC

	TOTAL	TRACE	ND	CON	) QN	QX	TRACE	5550	QN QN	QN	ON	QX
	MISC. ARO	QN ON	NO	ND	ND	ND	ND		ND ND	ND	ND	NO
	ALIHYDRO	TRACE	ND	ND	ND	ND	TRACE	1470	QN .	ND	ND	QN
(qdd)	ENES											
) 7/6n	E.BENZ	ND	QN	N	Q	S	QN	QN	QN	QN	ND	ND
IN WATER	TOLUENE	ON	ON	ON	QN	QN	QN	132	ON ON ON	QN	QN	ND
DKOCAKBONS	BENZENE								QN			
X P	RUN	$\overline{}$	$\overline{}$	$\Box$	$\overline{}$	$\overline{}$	$\overline{}$	$\overline{}$	1/14/85	abla	$\overline{}$	abla
	SAMPLED	1/9/85	1/9/85	1/9/85	1/9/85	1/9/85	1/9/85	1/9/85	1/9/85	1/9/85	1/9/85	1/9/85
	le I.D.								3 MW 25			
•	Samp.	1353	1353	13538	1353	1354(	1354	1354;	13543	1354	1354	1354(

TRACE = COMPOUND DETECTED BUT BELOW LEVEL FOR RELIABLE QUANTITATION. 2 = METHANE DETECTED AT 100-1000 PPB

ND = NONE DETECTED

*NOTES:

REPORT NO. 20-2050-8

	D	CECHN	VDWATE OLOGY Recovery Syste	əms, Inc.	299 Tel: (	Los An ISULTING GRO Second Avenue (617) 449-5222	am, MA — Chadds For geles, CA — Concord, UNDWATER GEOLOGI , Needham, MA 02194	CA STS
PROJECT R	FCOVER	EXAS/N	EN MEXICO	PRPELINE	PROJ	ECT NUMBER _	20.2050 DATE 11/30	_
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# Break location Approximate extent of surface clean-up © #19 (102.2) #3 (99.5) #6 (99.3) ODOR # 10 (100.7) Village well #1 # 1(100.0) # 8 (102.1) 011 ODOR #17 (9941 # 13 (100.7) # 25 (96.1) RW#2 (96.6) #2 (99.4) 6 DOR # 12 (95.9) ODOR # (5 (97.6) #26 (93.2) # 21 (95.7) # 22 (93.9) oil # 29 (911) Ø./ # 20 (93.7) Village well #2 #28) (East School well) HABIT #2 (98 2) Standby well (west School well) ©CD#4 ® Proposed #1 (94.5) STATE ROAD 322 30 29 31 32 2704.00 2573 10 N 89° 49' W

# TEXAS-NEW MEXICO PIPE LINE CO.

# MONUMENT TEST WELLS

SEC. 29, T19S, R37E, N.M.P.M., Lea County, New Mexico

	RELATIVE	NORTH	EAST
LOCATION	ELEVATION	COORD	COORD
1001111011	TAMES ATTACHED	COOKE	COOKD
CH CA CA	31 / 8	000	
SW Sec. Cor.	N/A	000	000
L SE Sec. Cor.	N/A	-16.9	5277.1
RW L	100.0	2056.2	2514.9
RW 2			
MW 11	96.6	1755.0	2881.6
MW 1	100.8	1928.2	2542.8
MW 2	99.4	1754.6	
MW 3	99.5		2630.7
MW 4		2314.4	2459.0
	98.6	2207.6	2593.9
MW 5	100.7	2383.8	2660.6
MW 6	99.3	2234.3	2759.5
MW 7	99.5	1983.3	2765.6
MW 8	102.1	1993.6	2387.0
MW 9	97.8	2108.4	2652.4
MW 10	100.7	2138.1	2507.7
MW 11			
RW 2	96.6	1755.0	2881.6
MW 12	95.9	1636 3	
		1636.2	2971.6
MW 13	100.7	1829.3	2422.3
MW 14	94.8	1372.1	3034.4
MW 15	97.6	1582.7	2804.6
MW 16	98.8	1827.7	2798.8
MW 17	99.4	1887.5	2675.3
MW 18	96.0	1549.9	2951.1
MW 19	102.2	2336.6	2306.9
MW 20	93.7	932.5	3039.2
MW 21	95.7	1195.7	2870.9
MW 22	93.9	1134.9	3057.5
MW 23	91.2	1257.1	3170 3
MW 24		1237.1	3178.2
	93.3	1520.3	3185.9
MW 25	96.1	1811.2	3060.3
MW 26	93.2	1286.5	3357.2
MW 27	89.8	866.7	3133.6
MW 28	88.8	726.6	3166.3
MW 29	91.1	1064.6	3235.3
	Acres de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la c	30	
Vent Pt. I	92.1	1419.4	3370.9
Vent Pt. 2	91.9	1402.7	3371.9
DW I	94.5	523.4	2574.8
DW 2	88.2	679.2	
DW 3	89.6		3060-1
1 200 3	03.0	521.6	3690.5
I have the days of	31 /2	2000	2000
Pwr. Ln. (No.)	N/A	2027.5	3207.5
Pwr. Ln. (So.)	N/A	697-8	3198.8
but the	7.00 Fa a		
Oil Well 1	N/A	629.8	3267.2
Oil Well 2	N/A	1957.7	3262.5
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Storage Tank	N/A	2159.7	2998.1
		2 7	22.0.1
Tank Battery	N/A	1406.9	3560.0
1	337.33	1300.5	1200.0
Fence (E)	NI/A	1212 2	2004 2
	N/A	1312.2	3294.1
Fence (W)	N/A	1314.5	2893.6

OCD#1 PROPOSED 125 FEET N. 05 Village Well #2 Toward Well #20

OCD#2 Proposed 200 FEET NW of west school well

OCD#3 Proposed 275 FEET (approximately) west of OCD#1 toward CCD#2

(Location approximate depending on drilling

Results of OCD#1 \$2.)

West school well,

ApriloTaTel by D. Boyer 11/19/84

KING SURVEYING

618 SOUTH TURNER HOBBS, N. M. 8824

SCALE: 1" = 100' DRAWN BY: MAUDIE W.

DATE: 11/2/84 TO 11/5/84 SHEET 1 OF 1

29 28 32 33

- 10 -

LEGEND

O____ Montor Well

Comestic Well

____Storage Tank
____Tank Battery
____Fence

Buried Pipeline