3R - 77

REPORTS

DATE:

March 16, 1992

REPORT
GROUND WATER QUALITY MONITORING
JANUARY, 1992
MAVERIK REFINERY TANK FARM
KIRTLAND, NEW MEXICO

MAVERIK COUNTRY STORES, INC.

March 16, 1992

Prepared by:

GeoWest Golden, Inc.
Salt Lake City, Utah

Job No. 9131.01

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1.0 INTRODUCTION

This report presents the results of a round of ground water sampling conducted January 20-21, 1992 at the Maverik Tank Farm and Refinery, Kirtland, New Mexico. The purpose of this ground water monitoring was to assess the effectiveness of the Ground Water Stabilization Plan, as submitted to the New Mexico State Oil Conservation Division (OCD) on July 26, 1990 and subsequently modified as per correspondence between the OCD and Dames & Moore dated August 13, 1990, January 23, 1991, and February 13, 1991.

The February 13, 1991 letter proposed ground water sampling at the site during March, June, September and December of 1991. The March and September sampling events were to include more wells than the other two sampling events. The March and June monitoring was conducted as scheduled and a "Semiannual Ground Water Monitoring Report, July, 1991" was prepared by Dames & Moore and submitted to OCD describing the findings of this investigation.

The proposed September and December samplings were not conducted due primarily to the fact that remaining piping and tankage were being removed from the tank farm area. Mr. Wm. Olsen, OCD, was informed of this and was advised that sampling would be conducted in January, 1992 following the more comprehensive September plan.

2.0 SCOPE OF WORK

Water quality samples were to have been taken from the following 12 wells: MW-9, 10, 13, 14, 15, 16, 17, 18, 19, 20, 21, and 22 (see Figure 1 for locations). The samples were to have been analyzed benzene, toluene, ethylbenzene and xylenes (BTEX), 1,2-dichloroethane (DCA), chloride, sulfate and total dissolved solids. Field measurements were to have been made of pH, specific conductivity and temperature.

Water level measurements were to have been made in each of the above-noted wells and also in wells MW-1 and 2.

Some deviations from this plan occurred. Wells MW-17 and 18 had apparently been destroyed during the piping and tankage removal operations and no evidence of these wells was present. The water inside MW-13, a steel drive-point, was nearly at ground surface, was frozen and could not be sampled. Although not scheduled, samples for organic analyses were obtained from MW-1 and 2. Samples for inorganic analytes were not obtained from MW-21.

The laboratory (Intermountain Laboratories, Inc., Farmington, NM) was requested to analyze for BTEX by Method 8020 and for DCA by Method 8010, both of which are GC methods with nominal detection limits of 0.5 and 1.0 ug/l, respectively. The laboratory instead used a GC/MS methodology (Method 8240) with nominal detection limits of 5 ug/l.

Three casing volumes were purged from each well by bailing with an HDPE disposable bailer prior to sampling. A separate disposable bailer was used to collect samples. A Hydac pH, conductivity and temperature meter was used to make measurements of these parameters in the field and a Keck ET-89 electric tape was employed to measure water depths.

3.0 RESULTS

3.1 Water Quality Testing

The results of both the laboratory and field analytical testing of the January 1992 sampling are summarized on Table 1. The analytical laboratory's report forms are included in Appendix A. The results of all four periods of water quality monitoring conducted since the slurry wall was installed in June 1990 are summarized in Table 2. Some existing wells were sampled several times prior to the first sampling event included in Table 2. Wells MW-9, 10 and 13 had been sampled 7 additional times and MW-14 and 15 had been sampled 4 additional times. The results of the earlier analyses at these wells and at other wells no longer in existence or being monitored can be found in the Dames & Moore December 1990 Status Report submitted to OCD and earlier submitted reports.

3.1.1 Volatile Organics Monitoring

No volatile organics were reported above detection limits at any of the four off-site wells from which samples were obtained. During March, 1991 (the only other 1991 sampling), xylenes were detected in MW-9 and 14 at less than 2 ug/l and DCA was reported in MW-9 at 1.8 ug/l. In sampling conducted prior to slurry wall installation, DCA was reported at concentrations of up to 8.6 ug/l and xylenes up to 3.2 ug/l in some of these off-site wells. Benzene has not been reported above detection limits during any samplings of these wells.

All BTEX compounds were below detection limits in the six on-site wells tested. It should be noted that one of the key wells in this group, MW-18, could not be sampled since it had been destroyed. Benzene, ethylbenzene and xylenes had been previously reported in MW-18 both during the two 1991 sampling events and earlier. Low

concentrations (less than 5 ug/l) of BTEX components other than benzene had also been previously reported in other wells of the on-site group.

DCA was reported above detection limits in MW-19 (at 14 ug/l) and in MW-21 (at 8.8 ug/l) in the on-site group of wells. This compound, for which the New Mexico drinking water quality standard is 10 ug/l and the EPA MCL is 5 ug/l, has been detected previously in these two wells. During the three other sampling events conducted since slurry wall installation, DCA was reported at 45, 35 and 44 ug/l in MW-19 and at 67, 44 and 40 ug/l in MW-21.

With the destruction of MW-17, MW-22 is the only well remaining within the slurry wall. Concentrations of BTEX and DCA were well in excess of water quality standards and, in nearly all cases, were higher than found in any previous samplings. The concentrations reported in January 1992 were as follows, in ug/l: DCA, 5,400; benzene, 37,000; toluene, 27,000; ethylbenzene, 1,900; and xylenes, 13,500. Total BTEX concentrations in MW-22 during the four sampling periods since installation of the slurry wall have been, in chronological order from September 1990 to January 1992, 50.6, 34.01, 21.96 and 78.4 mg/l with the benzene proportion of the totals ranging from 42 to 68 percent.

The concentrations of volatile organics reported in MW-22 during the various sampling events are somewhat suspect as being representative of concentrations in ground water due to the fact that a sheen of hydrocarbon has been reported on the surface of the water in the well or on the water in the container used to collect the water purged from the well. A minute amount of free hydrocarbon carried over to the sample vial can dramatically increase the volatile organic concentrations reported. Therefore, the concentrations of volatile organics reported in the MW-22 samples do not appear to be valid indicators of biodegradation. The MW-22 data does not indicate a decrease in these constituents whereas other indicators do suggest active biodegradation is

occurring. Future sampling of MW-22 or other wells to be installed within the slurry wall will attempt to reduce the possibility of free product carryover to the sample by employing the use of so-called "drop-pipes". These consist of one-inch diameter PVC tubes placed within the two-inch PVC casing in a manner which prevents free hydrocarbon from entering; all purging and sampling will be performed from within the drop-pipe to prevent floating hydrocarbon from entering the sampling stream.

3.1.2 Inorganic Constituent Monitoring

General water quality at the site, as evidenced by specific conductivity, total dissolved solids values, and anion concentrations, is poor and is strongly influenced by recharge from the Farmer's Mutual Ditch when it is flowing, and by ground water evaporation southwest of the site with consequent increase in salts.

During the January 1992 sampling, TDS values were typically in the 950 to 1,400 mg/l range. A value of 7,780 mg/l was obtained at MW-15 south of Highway 489. The 12,800 mg/l concentration reported at MW-14, is some 50 percent higher than the maximum value previously recorded in this well. Two nearby wells (MW-9 and 16) also located west of the slurry wall, exhibited TDS values approximately an order of magnitude lower consistent with earlier sampling results.

Most of the conductivity values were higher than had previously been reported, with several more than twice as high. One, however, in MW-19, is highly suspect since the reported conductivity (460 umhos/cm) had a lower numerical value than the TDS (1,220 mg/l) reported for the same well. Previous conductivity values in this well ranged from 1,500 to 1,700 umhos/cm. A contributing factor to the variability in conductivity measurements may have been the fact that the conductivity meter was not calibrated prior to making the measurements. Although the Hydac meter is factory calibrated,

more accurate results are obtained, especially when dealing with waters with high specific conductance, when field calibration is performed.

The pH values obtained ranged from 6.86 to 8.31. These are consistent with the previous readings in the individual wells. The lowest pH value measured, 6.86, was in MW-22 located within the slurry wall. This is noteworthy, since, as explained in the next paragraph, lower pH values may constitute evidence of the occurrence of biodegradation.

Sulfate concentrations are related to evapotranspiration effects as are the other salts, but are also indicative of the biological oxidation of organic compounds. The low sulfate concentrations observed within the slurry wall (at MW-17 and 22) both during previous sampling events and during January 1992 in MW-22, indicate that reduction-oxidation processes from bacterial microorganisms (e.g., sulfate reduction) that oxidize organic matter and reduce inorganic compounds in the ground water are occurring in the shallow ground water in the area defined by the slurry wall. The sulfate concentration in MW-22, inside the slurry wall, (less than 1 mg/l), is 2-3 orders of magnitude lower than in the other on-site wells (400-700 mg/l range) or off-site wells (300 to 6,800 mg/l range). This is the lowest concentration reported from samples within the slurry wall, but all such samples have been consistently lower than those detected outside.

The sulfide concentrations detected are also indicative of the fact that biodegradation is occurring. When sulfate reduction occurs during the oxidation of organic matter, hydrogen sulfide production takes place along with the release of hydrogen ions. Sulfide concentrations have not previously been measured in ground water at the site and would not have been during the January sampling except for an error in communication; the results, however, supply additional evidence that biodegradation is occurring within the slurry wall. The sulfide concentration in MW-22,

within the slurry wall, was reported at 1.86 mg/l. This is much higher than in the other well samples which, with one exception, ranged from less than 0.1 to 0.55 mg/l. The exception was in MW-15 which exhibited sulfide at 1.00 mg/l.

Chloride concentrations during January 1992 were lower than previously recorded in the on-site wells, especially in MW-19 reported at 98 mg/l whereas the previous range was 430 to 620 mg/l. In the off-site wells, chloride concentration tended to be higher than or at the high end of the previously reported range.

3.2 Water Level Elevations

Water level measurements were made in 11 wells during the January sampling event. As noted previously, water levels could not be taken in MW-17 or 18 since these had been destroyed during tankage removal nor in MW-13 since this steel drive-point well was frozen. The water levels are tabulated in Table 3. The spot elevations of the wells are shown on Figure 1.

The data shows the shallow ground water gradient to be toward the south-southwest with an overall gradient between the north and south property boundaries of approximately 0.01 feet per foot. The gradient appears to steepen somewhat adjacent to and downgradient from the slurry wall. These findings are in agreement with previous results.

Water levels in the wells were generally 1.5 to 2 ft higher than recorded in the June 1991 sampling and 0.5 to 1.5 ft higher than in the March 1991 sampling. With the exception of MW-1, where the water table was about 11 ft below ground surface, the depth to water below ground surface at the other wells ranged from 1 to 4.5 ft.

Water level data taken in September 1990, March 1991 and June 1991 indicated a head differential between MW-17 and 22 ranging from 0.94 to 1.6 ft suggesting the presence of a gradient within the slurry wall. Since well 17 was destroyed, no additional data regarding the apparent gradient was collected during the January 1992 sampling.

4.0 CONCLUSIONS AND RECOMMENDATIONS

No volatile organics were reported above detection limits in any of the four off-site wells which were sampled; these included three west of the property boundary on Virginia Murray's land and one south of Highway 489.

Volatile organics were reported above detection limits in two of four on-site wells sampled which were adjacent to or downgradient of the slurry wall. In the one well adjacent to the slurry wall (MW-21) DCA was reported at 8.8 ug/l, just under the New Mexico drinking water quality standard of 10 ug/l; DCA concentrations ranged from 40 to 67 ug/l during the three prior sampling periods at this well. No volatiles were reported above detection limits in MW-20, directly downgradient from MW-21 or in MW-10, adjacent to MW-20 and directly downgradient of the slurry wall. In MW-19, near the southwestern downgradient corner of the slurry wall, DCA was reported at 14 ug/l. While slightly in excess of the New Mexico drinking water quality standard, this concentration is significantly lower than the 35 to 45 ug/l concentrations reported during the three previous sampling periods since the slurry wall was installed.

BTEX and DCA concentrations within the slurry wall had shown a decrease since wall installation but the concentrations during January 1992 were in excess of previous levels. This may have been the result of free product contaminating the sample. Although the BTEX and DCA levels in ground water within the slurry wall do not in themselves suggest that biodegradation is occurring, there are other indicators such as the low sulfate and high sulfide concentrations and reduced pH, which indicate that it is.

The low levels or absence of refinery-related volatiles in downgradient wells indicates that the slurry wall has been successful in confining the contaminants to the

area of the old spill. Those contaminants observed in MW-19 probably represent residual and declining constituents from the period before the slurry wall was installed.

In order to continue to monitor the effectiveness of the remediation system installed, the following program is recommended:

1. Install a replacement well for MW-17 inside the slurry wall. This will provide a second data point with which to assess biodegradation.

2. Continue monitoring water quality on a quarterly basis for the remainder of 1992 with the January 1992 sampling considered to the first quarter sampling event. This is to be performed at the following wells: MW-Replacement 17 and 22 within the slurry wall; off-site monitor wells MW-9, 13, 14, 15, and 16; and on-site downgradient and cross-gradient MW-10, 19, 20 and 21. Samples from all the monitored wells should be analyzed for DCA by Method 8010 and BTEX by Method 8020. Field measurements of pH and conductivity should also be made. Samples for analysis of sulfate and sulfide should be obtained from the two wells within the slurry wall.

3. If, after two consecutive quarters during 1992, MW-9, 14 and 16 continue to exhibit concentrations of DCA and BTEX below New Mexico drinking water standards, these three wells should be eliminated from the ground water monitoring program.

4. Water levels should continue to be taken at all wells sampled for water quality plus MW-1 and 2.

5. Four 2-inch diameter PVC piezometers should be installed by hand auguring to a depth of 8-10 feet below ground surface within the area encompassed by the slurry wall in order to assess the apparent gradient previously noted. Water levels in these piezometers will be measured during the quarterly sampling.

6. A report of the findings of this program will be provided to OCD after the third quarter sampling results are available and after the 4th quarter results are available.

TABLE 1

RESULTS OF ANALYTICAL TESTING OF GROUND WATER AT MAVERIK KIRTLAND REFINERY, JANUARY 1992

Location	DCA	B	T	E	X	pH	SC	TDS	Chloride	Sulfate	Sulfide
Within Slurry Wall											
MW-22	5,400	36,000	27,000	1,900	13,500	6.86	1,970	948	164	<1	1.86
On-Site											
MW-1	ND	ND	ND	ND	ND	7.88	2,390	NA	NA	NA	NA
MW-2	ND	ND	ND	ND	ND	7.28	5,070	1,390	64	681	0.55
MW-10	ND	ND	ND	ND	ND	7.31	1,840	942	37	422	0.27
MW-19	14	ND	ND	ND	ND	7.66	460	1,220	98	457	0.14
MW-20	ND	ND	ND	ND	ND	7.54	3,750	952	32	427	0.25
MW-21	8.8	ND	ND	ND	ND	8.31	5,110	NA	NA	NA	NA
Off-Site											
MW-9	ND	ND	ND	ND	ND	7.31	4,360	1,260	38	638	0.13
MW-14	ND	ND	ND	ND	ND	7.20	19,380	12,800	691	6,840	0.26
MW-15	ND	ND	ND	ND	ND	7.15	12,120	7,780	920	3,970	1.00
MW-16	ND	ND	ND	ND	ND	7.30	2,050	1,010	45	345	<0.10

NOTES:

Samples taken January 20-21, 1992

Abbreviations: DCA = 1,2-dichloroethane; B = benzene; T = toluene; E = ethylbenzene; X = total xylenes; SC = specific conductance; TDS = total dissolved solids; ND = not detected at detection limit of 5 µg/l; NA = not analyzed

Organic values in µg/l; pH in standard units; SC in µmhos/cm; chloride, sulfate and sulfide in mg/l

TABLE 2

SUMMARY OF GROUND WATER QUALITY MONITORING RESULTS SINCE INSTALLATION OF SLURRY WALL

Location	Sampling Period	DCA	B	T	E	X	pH	SC	TDS	Sulfate	Chloride
Within Slurry Wall											
MW-17	1	360*	11,000*	15,000*	1,160*	13,000*	7.01	2,500	2,160*	27	401*
	2	400*	11,000*	10,000*	1,900*	15,000*	7.04	2,700	1,860*	12	344*
	3	420*	9,800*	6,300*	1,800*	16,000*	7.04	2,650	1,890*	<5	358*
	4	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
MW-22	1	7,200*	21,000*	20,000*	1,100*	8,300*	7.00	1,500	1,300*	18	216
	2	2,200*	17,000*	9,500*	910*	6,600*	6.87	1,900	1,220*	12	163
	3	3,600*	15,000*	3,200*	760*	3,000*	7.06	1,700	1,180*	59	135
	4	5,400*	36,000*	27,000*	1,900*	13,500*	6.86	1,600	948	<1	164
On-Site											
MW-10	1	1.4	<0.5	<0.5	<0.5	<1	6.95	1,550	952	436	39
	2	<1	<0.5	<0.5	<0.5	<0.5	7.29	1,700	1,620*	5	118
	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4	<5	<5	<5	<5	<5	7.31	1,840	942	422	37
MW-18	1	<1	17*	<12	84	880*	7.00	1,500	682	67	44
	2	<1	26*	<12	85	770*	7.24	1,200	758	163	41
	3	<1	<25	<25	78	930*	6.77	1,200	812	181	41
	4	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
MW-19	1	45*	<0.5	<0.5	1.1	1.9	6.95	3,000	2,210*	292	620*
	2	35*	<0.5	<0.5	<0.5	<0.5	7.22	2,500	1,830*	354	494*
	3	44*	<0.5	<0.5	5.9	<0.5	7.10	2,400	1,750*	359	430*
	4	14*	<5	<5	<5	<5	7.66	460	1,220*	457	98
MW-20	1	<1	<0.5	<0.5	<0.5	<1	7.01	1,350	1,310*	650*	46
	2	2.0	<0.5	<0.5	<0.5	0.7	7.39	3,000	1,630*	735*	110
	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4	<5	<5	<5	<5	<5	7.54	3,750	952	427	32

Location	Sampling Period	DCA	B	T	E	X	pH	SC	TDS	Sulfate	Chloride
MW-21	1	67*	<0.5	1.5	1.1	5	7.01	1,500	917	386	78
	2	44*	<0.5	<0.5	<0.5	<0.5	7.62	1,700	1,130*	342	68
	3	40*	<0.5	<0.5	<0.5	<0.5	7.44	1,700	1,100*	309	61
	4	8.8	<5	<5	<5	<5	8.31	5,110	NA	NA	NA
Off-Site											
MW-9	1	2.1	<0.5	<0.5	<0.5	<1	6.97	1,550	1,140*	551	35
	2	1.8	<0.5	<0.5	<0.5	1.2	7.57	2,000	1,280*	664*	43
	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4	<5	<5	<5	<5	<5	7.31	4,360	1,260*	638*	38
MW-13	1	<1	<0.5	1.5	<0.5	<1	7.02	2,950	3,040*	1,630*	140
	2	<1	<0.5	<0.5	<0.5	<0.5	7.84	3,250	2,900*	1,540*	122
	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-14	1	2.0	<0.5	<0.5	<0.5	<1	6.97	5,450	3,920*	2,080*	174
	2	<1	<0.5	<0.5	<0.5	1.7	7.51	8,400	8,370*	4,520*	440*
	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4	<5	<5	<5	<5	<5	7.20	19,380	12,800*	6,840*	691*
MW-15	1	<1	<0.5	<0.5	<0.5	<1	7.00	3,250	2,540*	1,380*	163
	2	<1	<0.5	<0.5	<0.5	<0.5	7.02	8,500	8,580*	3,890*	934*
	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4	<5	<5	<5	<5	<5	7.15	12,120	7,780*	3,970*	920*
MW-16	1	<1	<0.5	<0.5	<0.5	<1	6.97	1,370	867	292	28
	2	<1	<0.5	<0.5	<0.5	<0.5	7.57	1,200	804	230	28
	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4	<5	<5	<5	<5	<5	7.30	2,050	1,101*	345	45
Water Quality Stds.											
New Mexico		10	10	750	750	620	6-9	-----	1,000	600	250
EPA MCL		5	5	2,000	700	10,000	-----	-----	500	250	250

NOTES:

Abbreviations: DCA = 1,2-dichloroethane; B = benzene; T = toluene; E = ethylbenzene; X = xylenes; SC = specific conductivity; TDS = total dissolved solids; MSG = well missing; NA = not analyzed

Organic values in µg/l; plt in standard units; SC in µmhos/cm; TDS, sulfate and sulfide in mg/l

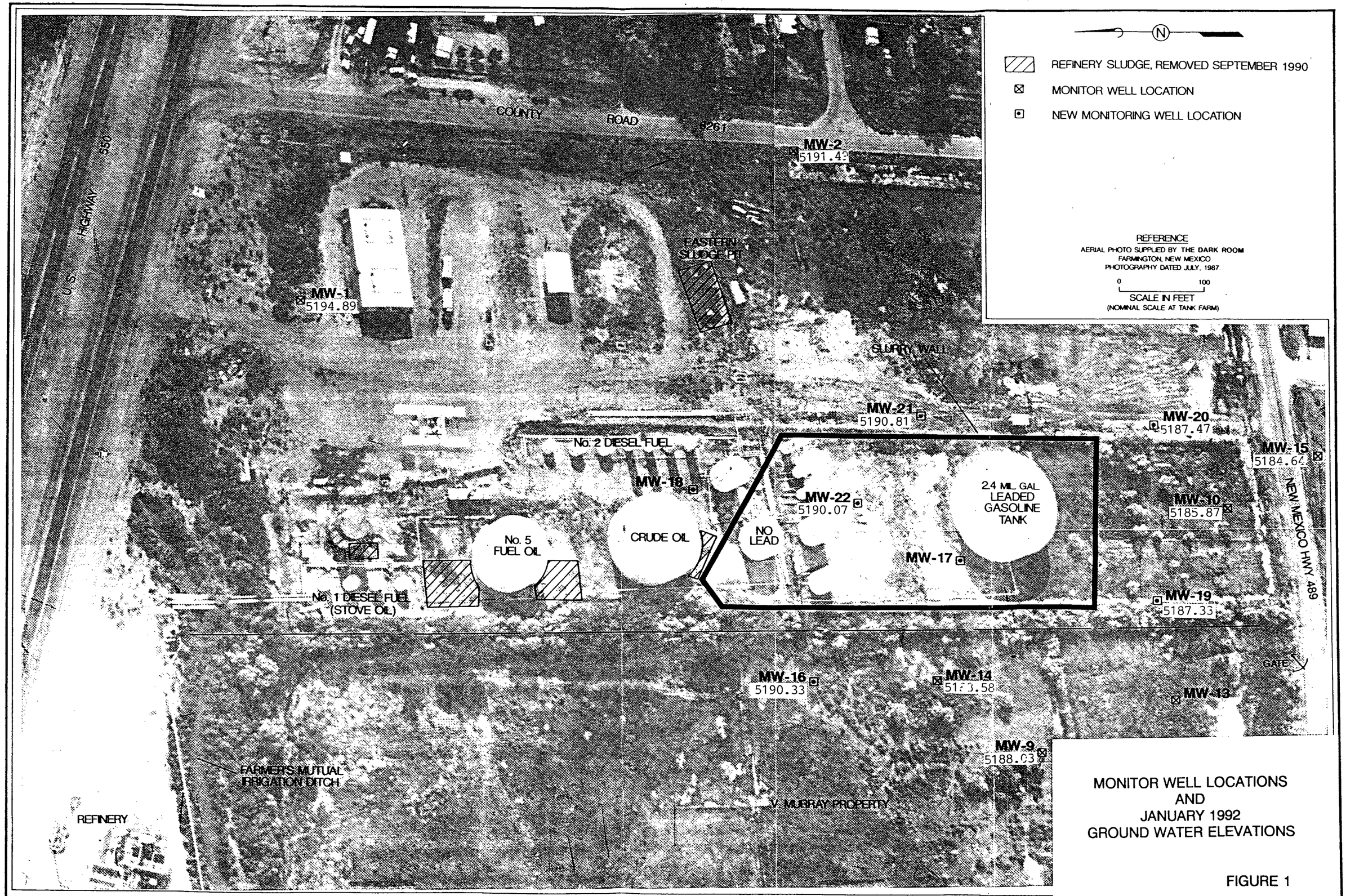
Sampling dates: 1 = Sept. 13 & 14, 1990; 2 = March 18 & 19, 1991; 3 = June 13, 1991; 4 = January 20 & 21, 1992

* = exceeds New Mexico MCL for drinking water

TABLE 3

WATER LEVEL ELEVATIONS
JANUARY 1992

Location	Datum (ft, msl)	Depth To Water (ft)	Water Level (ft, msl)	Depth to Water Below Ground Surface (ft)
MW-1	5207.24	12.35	5194.89	10.9
MW-2	5196.93	5.44	5191.49	3.8
MW-9	5191.22	3.19	5188.03	1.5
MW-10	5189.30	3.43	5185.87	1.6
MW-13	5187.76	Frozen		
MW-14	5194.47	5.89	5188.58	2.1
MW-15	5188.80	4.16	5184.64	0.8
MW-16	5194.98	4.65	5190.33	3.4
MW-17	Missing			
MW-18	Missing			
MW-19	5189.54	2.21	5187.33	1.0
MW-20	5191.05	3.58	5187.47	2.6
MW-21	5194.81	4.00	5190.81	2.8
MW-22	5195.86	5.79	5190.07	4.5



MONITOR WELL LOCATIONS
AND
JANUARY 1992
GROUND WATER ELEVATIONS

FIGURE 1

FILE 14819-005 BY ____ DATE ____ CHECKED BY ____ DATE ____

APPENDIX A

ANALYTICAL LABORATORY DATA SHEETS

Inter·Mountain
Laboratories, Inc.

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CASE NARRATIVE

Enclosed are the corrected analysis as requested by Pete Olsen. The requested analysis for the samples was an 8010/8020 combination for Halogenated Compounds and BTEX Compounds. Since the samples were from a refinery our Bozeman MT laboratory analyzed the samples on a gas chromatograph with a mass spectrometer detector due to co-elution of hydrocarbons with analytes which might bias the results high. As Mr. Olsen pointed out the method number shown on the report did not match the analysis that was preformed. The method number was corrected as was an error in the detection limits for the analysis.

Please feel free to call me if you have any further questions.

Tony Tristano
Senior Analytical Chemist

Inter·Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

EPA METHOD 8240
AROMATIC VOLATILE COMPOUNDS
BETX

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 1	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921165	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservative:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.

Reference:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Analyst

Reviewed

Inter-Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 1	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921165	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservation:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Vinyl chloride	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
Benzyl chloride	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Chloroacetaldehyde	ND	5.0	ug/L

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 1	Date Reported:	02/02/92
Laboratory ID:	B921165	Date Sampled:	01/21/92
Sample Matrix:	Water	Date Analyzed:	01/26/92

Parameter	Analytical Result	Detection Limit	Units
1-Chlorohexane	ND	5.0	ug/L
Chloromethylmethyl ether	ND	5.0	ug/L
Chlorotoluene	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Trichloropropane	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Soled Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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EPA METHOD 8240
AROMATIC VOLATILE COMPOUNDS
BETX

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 2	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921173	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservative:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.

Reference:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 2	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921173	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservation:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Vinyl chloride	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
Benzyl chloride	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Chloroacetaldehyde	ND	5.0	ug/L

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 2	Date Reported:	02/02/92
Laboratory ID:	B921173	Date Sampled:	01/21/92
Sample Matrix:	Water	Date Analyzed:	01/26/92

Parameter	Analytical Result	Detection Limit	Units
1-Chlorohexane	ND	5.0	ug/L
Chloromethylmethyl ether	ND	5.0	ug/L
Chlorotoluene	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Trichloropropane	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

References:

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EPA METHOD 8240
AROMATIC VOLATILE COMPOUNDS
BETX

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 9	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921169	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservative:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.

Reference:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 9	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921169	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservation:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Vinyl chloride	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
Benzyl chloride	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Chloroacetaldehyde	ND	5.0	ug/L

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 9	Date Reported:	02/02/92
Laboratory ID:	B921169	Date Sampled:	01/21/92
Sample Matrix:	Water	Date Analyzed:	01/26/92

Parameter	Analytical Result	Detection Limit	Units
1-Chlorohexane	ND	5.0	ug/L
Chloromethylmethyl ether	ND	5.0	ug/L
Chlorotoluene	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Trichloropropane	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Soled Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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EPA METHOD 8240
AROMATIC VOLATILE COMPOUNDS
BETX

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 10	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921168	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservative:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.

Reference:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 10	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921168	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservation:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Vinyl chloride	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
Benzyl chloride	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Chloroacetaldehyde	ND	5.0	ug/L

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 10	Date Reported:	02/02/92
Laboratory ID:	B921168	Date Sampled:	01/21/92
Sample Matrix:	Water	Date Analyzed:	01/26/92

Parameter	Analytical Result	Detection Limit	Units
1-Chlorohexane	ND	5.0	ug/L
Chloromethylmethyl ether	ND	5.0	ug/L
Chlorotoluene	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Trichloropropane	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Soled Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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EPA METHOD 8240
AROMATIC VOLATILE COMPOUNDS
BETX

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 14	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921172	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservative:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.

Reference:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 14	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921172	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservation:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Vinyl chloride	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
Benzyl chloride	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Chloroacetaldehyde	ND	5.0	ug/L

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 14	Date Reported:	02/02/92
Laboratory ID:	B921172	Date Sampled:	01/21/92
Sample Matrix:	Water	Date Analyzed:	01/26/92

Parameter	Analytical Result	Detection Limit	Units
1-Chlorohexane	ND	5.0	ug/L
Chloromethylmethyl ether	ND	5.0	ug/L
Chlorotoluene	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Trichloropropane	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Soled Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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EPA METHOD 8240
AROMATIC VOLATILE COMPOUNDS
BETX

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 15	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921167	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservative:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.

Reference:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 15	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921167	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservation:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Vinyl chloride	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
Benzyl chloride	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Chloroacetaldehyde	ND	5.0	ug/L

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 15	Date Reported:	02/02/92
Laboratory ID:	B921167	Date Sampled:	01/21/92
Sample Matrix:	Water	Date Analyzed:	01/26/92

Parameter	Analytical Result	Detection Limit	Units
1-Chlorohexane	ND	5.0	ug/L
Chloromethylmethyl ether	ND	5.0	ug/L
Chlorotoluene	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Trichloropropane	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Soled Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Analyst

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Inter·Mountain Laboratories, Inc.

910 Technology Boulevard, Suite B
Bozeman, Montana 59715

EPA METHOD 8240
AROMATIC VOLATILE COMPOUNDS
BETX

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW16	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921170	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservative:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.

Reference:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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Inter-Mountain Laboratories, Inc.

910 Technology Boulevard, Suite 8
Bozeman, Montana 59715

EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW16	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921170	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservation:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Vinyl chloride	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
Benzyl chloride	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Chloroacetaldehyde	ND	5.0	ug/L

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client: MAVERIK COUNTRY STORES
Sample ID: MW16
Laboratory ID: B921170
Sample Matrix: Water

Date Reported: 02/02/92
Date Sampled: 01/21/92
Date Analyzed: 01/26/92

Parameter	Analytical Result	Detection Limit	Units
1-Chlorohexane	ND	5.0	ug/L
Chloromethylmethyl ether	ND	5.0	ug/L
Chlorotoluene	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Trichloropropane	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Soled Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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EPA METHOD 8240
AROMATIC VOLATILE COMPOUNDS
BETX

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW19	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921171	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservative:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.

Reference:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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910 Technology Boulevard, Suite B
Bozeman, Montana 59715

EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW19	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921171	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservation:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Vinyl chloride	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	14	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
Benzyl chloride	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Chloroacetaldehyde	ND	5.0	ug/L

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Bozeman, Montana 59715

EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW19	Date Reported:	02/02/92
Laboratory ID:	B921171	Date Sampled:	01/21/92
Sample Matrix:	Water	Date Analyzed:	01/26/92

Parameter	Analytical Result	Detection Limit	Units
1-Chlorohexane	ND	5.0	ug/L
Chloromethylmethyl ether	ND	5.0	ug/L
Chlorotoluene	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Trichloropropane	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Soled Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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Bozeman, Montana 59715

EPA METHOD 8240
AROMATIC VOLATILE COMPOUNDS
BETX

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 20	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921174	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservative:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.

Reference:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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910 Technology Boulevard, Suite B
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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 20	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921174	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservation:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Vinyl chloride	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
Benzyl chloride	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Chloroacetaldehyde	ND	5.0	ug/L

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EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 20	Date Reported:	02/02/92
Laboratory ID:	B921174	Date Sampled:	01/21/92
Sample Matrix:	Water	Date Analyzed:	01/26/92

Parameter	Analytical Result	Detection Limit	Units
1-Chlorohexane	ND	5.0	ug/L
Chloromethylmethyl ether	ND	5.0	ug/L
Chlorotoluene	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Trichloropropane	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Soled Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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Bozeman, Montana 59715

EPA METHOD 8240
AROMATIC VOLATILE COMPOUNDS
BETX

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 21	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921164	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservative:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.

Reference:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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910 Technology Boulevard, Suite B
Bozeman, Montana 59715

EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 21	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921164	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservation:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Vinyl chloride	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
1,2-Dichloroethane	8.8	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
2-Chloroethylvinyl ether	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
Benzyl chloride	ND	5.0	ug/L
bis(2-Chloroethoxy)methane	ND	5.0	ug/L
bis(2-Chloroisopropyl)ether	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Chloroacetaldehyde	ND	5.0	ug/L

Inter·Mountain Laboratories, Inc.

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Bozeman, Montana 59715

EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 21	Date Reported:	02/02/92
Laboratory ID:	B921164	Date Sampled:	01/21/92
Sample Matrix:	Water	Date Analyzed:	01/26/92

Parameter	Analytical Result	Detection Limit	Units
1-Chlorohexane	ND	5.0	ug/L
Chloromethylmethyl ether	ND	5.0	ug/L
Chlorotoluene	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
Trichloropropane	ND	5.0	ug/L

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Soled Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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Bozeman, Montana 59715

EPA METHOD 8240
AROMATIC VOLATILE COMPOUNDS
BETX

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 22	Date Reported:	02/02/92
Project ID:	*Kirtland Refinery*	*Date Sampled:*	01/21/92
Laboratory ID:	B921166	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservative:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Benzene	37000	1000	ug/L
Toluene	27000	1000	ug/L
Ethylbenzene	1900	1000	ug/L
m,p-Xylene	9600	1000	ug/L
o-Xylene	3900	1000	ug/L

ND - Compound not detected at stated Detection Limit.

Reference:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

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910 Technology Boulevard, Suite B
Bozeman, Montana 59715

EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 22	Date Reported:	02/02/92
Project ID:	Kirtland Refinery	Date Sampled:	01/21/92
Laboratory ID:	B921166	Date Received:	01/24/92
Sample Matrix:	Water	Date Extracted:	01/26/92
Preservation:	Cool,HCl	Date Analyzed:	01/26/92
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	1000	ug/L
Bromomethane	ND	1000	ug/L
Dichlorodifluoromethane	ND	1000	ug/L
Vinyl chloride	ND	1000	ug/L
Chloroethane	ND	1000	ug/L
Methylene chloride	ND	1000	ug/L
Trichlorofluoromethane	ND	1000	ug/L
1,1-Dichloroethene	ND	1000	ug/L
1,1-Dichloroethane	ND	1000	ug/L
trans-1,2-Dichloroethene	ND	1000	ug/L
Chloroform	ND	1000	ug/L
1,2-Dichloroethane	5400	1000	ug/L
1,1,1-Trichloroethane	ND	1000	ug/L
Carbon tetrachloride	ND	1000	ug/L
Bromodichloromethane	ND	1000	ug/L
1,2-Dichloropropane	ND	1000	ug/L
cis-1,3-Dichloropropene	ND	1000	ug/L
Trichloroethene (TCE)	ND	1000	ug/L
Dibromochloromethane	ND	1000	ug/L
1,1,2-Trichloroethane	ND	1000	ug/L
trans-1,3-Dichloropropene	ND	1000	ug/L
2-Chloroethylvinyl ether	ND	1000	ug/L
Bromoform	ND	1000	ug/L
1,1,1,2-Tetrachloroethane	ND	1000	ug/L
Tetrachloroethene (PCE)	ND	1000	ug/L
Chlorobenzene	ND	1000	ug/L
1,2-Dichlorobenzene	ND	1000	ug/L
1,3-Dichlorobenzene	ND	1000	ug/L
1,4-Dichlorobenzene	ND	1000	ug/L
Benzyl chloride	ND	1000	ug/L
bis(2-Chloroethoxy)methane	ND	1000	ug/L
bis(2-Chloroisopropyl)ether	ND	1000	ug/L
Bromobenzene	ND	1000	ug/L
Chloroacetaldehyde	ND	1000	ug/L

Inter-Mountain Laboratories, Inc.

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Bozeman, Montana 59715

EPA METHOD 8240
PURGEABLE HALOCARBON COMPOUNDS

Client:	MAVERIK COUNTRY STORES		
Sample ID:	MW 22	Date Reported:	02/02/92
Laboratory ID:	B921166	Date Sampled:	01/21/92
Sample Matrix:	Water	Date Analyzed:	01/26/92

Parameter	Analytical Result	Detection Limit	Units
1-Chlorohexane	ND	1000	ug/L
Chloromethylmethyl ether	ND	1000	ug/L
Chlorotoluene	ND	1000	ug/L
Dibromomethane	ND	1000	ug/L
1,1,2,2-Tetrachloroethane	ND	1000	ug/L
Trichloropropane	ND	1000	ug/L

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Soled Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Analyst

Reviewed

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Maverick Country Stores	DATE REPORTED:	01/30/92
ID:	1215		
SITE:	MW2	DATE RECEIVED:	01/21/92
LAB NO:	F7947	DATE COLLECTED:	01/21/92

Total Dissolved Solids (180C), mg/L.		1390
Sulfide as H2S, mg/L.....		0.55
	mg/L	meq/L
Chloride.....	64.2	1.81
Sulfate.....	681	14.2

Mary Stepp
Lab Director

Wanda Orso
Water Lab Supervisor

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Maverick Country Stores	DATE REPORTED:	01/30/92
ID:	1315		
SITE:	MW9	DATE RECEIVED:	01/21/92
LAB NO:	F7943	DATE COLLECTED:	01/21/92

Total Dissolved Solids (180C), mg/L.		1260
Sulfide as H2S, mg/L.....		0.13
	mg/L	meq/L
Chloride.....	37.9	1.07
Sulfate.....	638	13.3

Mary Stepp
Lab Director

Wanda Orso
Water Lab Supervisor

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Maverick Country Stores	DATE REPORTED:	01/30/92
ID:	1520		
SITE:	MW10	DATE RECEIVED:	01/21/92
LAB NO:	F7942	DATE COLLECTED:	01/21/92

Total Dissolved Solids (180C), mg/L.	942	
Sulfide as H2S, mg/L.....	0.27	
	mg/L	meq/L
Chloride.....	37.3	1.05
Sulfate.....	422	8.80

Mary Stepp
Lab Director

Wanda Orso
Water Lab Supervisor

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Maverick Country Stores	DATE REPORTED:	01/30/92
ID:	1350		
SITE:	MW14	DATE RECEIVED:	01/21/92
LAB NO:	F7946	DATE COLLECTED:	01/21/92

Total Dissolved Solids (180C), mg/L.	12800	
Sulfide as H2S, mg/L.....	0.26	
	mg/L	meq/L
Chloride.....	691	19.5
Sulfate.....	6840	142

Mary Stepp
Lab Director

Wanda Orso
Water Lab Supervisor

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Maverick Country Stores	DATE REPORTED:	01/30/92
ID:	1540		
SITE:	MW15	DATE RECEIVED:	01/21/92
LAB NO:	F7941	DATE COLLECTED:	01/21/92

Total Dissolved Solids (180C), mg/L.	7780	
Sulfide as H2S, mg/L.....	1.00	
	mg/L	meq/L
Chloride.....	920	26.0
Sulfate.....	3970	82.6

Mary Stepp
Lab Director

Wanda Orso
Water Lab Supervisor

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Maverick Country Stores	DATE REPORTED:	01/30/92
ID:	1410		
SITE:	MW16	DATE RECEIVED:	01/21/92
LAB NO:	F7944	DATE COLLECTED:	01/21/92

Total Dissolved Solids (180C), mg/L.	1010	
Sulfide as H2S, mg/L.....	<0.10	
	mg/L	meq/L
Chloride.....	43.7	1.23
Sulfate.....	382	7.96

Mary Stepp
Lab Director

Wanda Orso
Water Lab Supervisor

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Maverick Country Stores	DATE REPORTED:	01/30/92
ID:	Lab Split		
SITE:	MW16	DATE RECEIVED:	01/21/92
LAB NO:	F7949	DATE COLLECTED:	01/21/92

Total Dissolved Solids (180C), mg/L.	1020	
Sulfide as H2S, mg/L.....	*	
	mg/L	meq/L
Chloride.....	44.6	1.26
Sulfate.....	345	7.19

* Insufficient sample to run duplicate.

Mary Stepp
Lab Director

Wanda Orso
Water Lab Supervisor

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Maverick Country Stores	DATE REPORTED:	01/30/92
ID:	1015		
SITE:	MW19	DATE RECEIVED:	01/21/92
LAB NO:	F7945	DATE COLLECTED:	01/21/92

Total Dissolved Solids (180C), mg/L.		1220
Sulfide as H2S, mg/L.....		0.14
	mg/L	meq/L
Chloride.....	98.4	2.78
Sulfate.....	457	9.52

Mary Stepp
Lab Director

Wanda Orso
Water Lab Supervisor

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Maverick Country Stores	DATE REPORTED:	01/30/92
ID:	1120		
SITE:	MW20	DATE RECEIVED:	01/21/92
LAB NO:	F7948	DATE COLLECTED:	01/21/92

Total Dissolved Solids (180C), mg/L.		952
Sulfide as H2S, mg/L.....		0.25
	mg/L	meq/L
Chloride.....	31.6	0.89
Sulfate.....	427	8.90

Mary Stepp
Lab Director

Wanda Orso
Water Lab Supervisor

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

CLIENT:	Maverick Country Stores	DATE REPORTED:	01/30/92
ID:	1615		
SITE:	MW22	DATE RECEIVED:	01/21/92
LAB NO:	F7940	DATE COLLECTED:	01/21/92

Total Dissolved Solids (180C), mg/L.	948	
Sulfide as H2S, mg/L.....	1.86	
	mg/L	meq/L
Chloride.....	164	4.63
Sulfate.....	0.82	0.02

Mary Stepp
Lab Director

Wanda Orso
Water Lab Supervisor

CHAIN-OF-CUSTODY

Project No.

Project Name: Maverik - Kirtland Refinery

Samplers: (Signature) Dan C Murray

	Sample No.	Date	Time	Sample Location	No. of Containers	Analysis Requested: BTEX 8020	1&2 DCE, TCE 8010	CL & TDS	H_2S			Remarks
1	~~MW22~~	1-21-92	4:15	MW22	6	2	2	1	1			Maverik Country Stores
2	~~MW15~~	1-21-92	3:40	MW15	6	2	2	1	1			Attn: Dan L. Murray
	3	1-21-92	3:20	MW10	6	2	2	1	1			380 No. 200 W.
	4	1-21-92	1:15	MW9	6	2	2	1	1			Suite 260
	5	1-21-92	2:10	MW16	6	2	2	1	1			Bountiful, Ut. 84010
	6	1-21-92	10:15	MW19	6	2	2	1	1			
	7	1-21-92	1:50	MW14	6	2	2	1	1			(801) 295-5557
	8	1-21-92	12:15	MW2	6	2	2	1	1			EXT. 687
	9	1-20-92	5:00	MW21	2	1	1					
	10	1-21-92	11:20	MW20	6	2	2	1	1			Fax # 801-292-1406
	11	1-20-92	5:20	MW1	2	1	1					

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Dan C Murray	1-21-92 4:55				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time		
			01-21-92 1650		

Remarks:

GeoWest
Golden, Inc.
530 Commons Drive Golden, CO 80401 (303) 526-9838

GEOWEST
Golden, Inc.

June 28, 1993

Mr. William C. Olson, Hydrogeologist
State of New Mexico Oil Conservation Division
P.O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87504

RE: Ground Water Quality Monitoring Report
Maverik Refinery and Tank Farm
Kirtland, New Mexico

Dear Bill:

This is to report on behalf of our client Maverik Country Stores, the results of ground water quality monitoring and other recent activities at the referenced site. As proposed in our April 26, 1993 report and agreed to in your letter of May 17, 1993 to Mr. William Call of Maverik, off-site wells were deleted from monitoring during the ground water quality monitoring event which took place on May 23, 1993. Off-site wells will be included in the next monitoring event which will be conducted in October or November 1993 and in the future on an annual basis. As agreed to in your letter, this will be a brief report of the results obtained to be followed by a more comprehensive report including the laboratory reports and the September-October results to be submitted by the end of the calendar year.

Although not required by our agreement, for the first time the four piezometers installed near the inside corners of the slurry wall (P-1 through P-4) were sampled and analyzed to provide further insight into the contaminant concentrations inside the slurry wall other other than that which is provided by MW-17 and MW-22. These 2-inch diameter piezometers are installed as monitor wells to a total depth of 8 ft below grade and are

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screened from 3 to 8 ft below grade. Construction details are included in Appendix B of our April 26, 1993 report.

Attached Table 1 summarizes the results obtained during the May sampling along with all previous results since the slurry wall was installed. Well locations and a plot of the May 1993 results obtained for the key organic analytes are shown on Figure 1.

You may recall that we were somewhat cautious regarding the results of our March 1993 sampling since some hydrocarbon sheen was noted in some of the wells within the slurry wall confines. To reduce this potential source of error, samples were obtained after purging the wells using a sampling device consisting of a new 50 ml syringe mounted at the end of decontaminated 1 inch diameter PVC which can be activated from the surface. Samples were removed from about half way down the water column in the wells. We believe that this provided samples representative of formation water and uncontaminated by free hydrocarbon.

Five on-site wells were sampled which were outside the confines of the slurry wall. In the three down-gradient wells (MW-10, 19 and 20) samples were below detection limits for BTEX. MW-10 and 20 were also below detection limits for DCA but DCA was detected at a concentration just below New Mexico drinking water standards at 7.9 ug/l. This is consistent with recent concentrations of DCA in this well.

In well M-21, adjacent to but outside the slurry wall, only DCA was detected at 14.8 ug/l, again consistent with recent values for this analytes in this well.

In the other on-site well, MW-18, upgradient of the slurry wall, no DCA was detected but relatively low concentrations of BTEX constituents, consistent with those of the last sampling round, were detected. The non-detection of BTEX components in MW-21

downgradient of MW-18 and the reverse situation regarding DCA, suggests that the BTEX constituents in ground water sampled by MW-18 are attenuated or biodegraded in transit around the east side of the slurry wall before they reach the area sampled by MW-21 and do not pose an off-site threat.

The two wells (MW-17 and 22) within the confines of the slurry wall exhibited the high values of BTEX constituents not dissimilar to past results. Concentrations in the former were about the same as in March 1993 whereas those in the latter were significantly lower. DCA was lower in both wells, especially MW-22, than in March of this year.

Although the DCA concentrations were much lower in the 4 piezometers than in the two wells inside the slurry wall (below detection limits to 10.6 ug/l), the BTEX concentrations varied greatly over short distances. In the two piezometers at the south or downgradient portion of the enclosed area, concentrations ranged from below detection limits to 5.2 ug/l. In the two piezometers located at the northern or upgradient portion of the enclosed area concentrations were several magnitudes higher but still about one-half to one-third of the BTEX levels in MW-17 and 22.

As requested in your May 17 letter, nutrient addition operations to stimulate hydrocarbon biodegradation were conducted within the area enclosed by the slurry wall during the period June 7-11. The area was leveled using a dozer blade and the ground surface ripped using a dozer equipped with 3.5 ft long ripping teeth. Some 4,000 lbs of 16-20-0 ammonium phosphate granular fertilizer was applied to the area and disked into the soil; this fertilizer formulation and application rate had been determined during the 1990 nutrient addition to be appropriate to supply the essential nutrients (nitrogen and phosphorus) to stimulate microbial activity at the site. The fertilizer was watered in over a three-day period using a commercial impulse-type water applicator. Approximately 150,000 gallons of water was applied during this period.

The next scheduled activity at the Maverik Kirtland site is the ground water monitoring event to be conducted in October or November of 1993. We will advise you in advance of the planned dates for this sampling.

If you have questions regarding the foregoing or would like further elaboration, please contact me at your convenience.

GeoWest Golden, Inc.

Peter F. Olsen
Senior Project Manager

cc: Denny Faust, NMOCD
Dan Murray, Maverik Country Stores

TABLE 1

SUMMARY OF GROUND WATER QUALITY MONITORING RESULTS SINCE INSTALLATION OF SLURRY WALL

Location	Sampling Period	DCA	B	T	E	X	Total BTEX	pH	SC	Sulfate
Within Slurry Wall										
MW-17	1 (9/90)	360*	11,000*	15,000*	1,160*	13,000*	40,000	7.01	2,500	27
	2 (3/91)	400*	11,000*	10,000*	1,900*	15,000*	37,900	7.04	2,700	12
	3 (6/91)	420*	9,800*	6,300*	1,800*	16,000*	33,900	7.04	2,650	<5
	4 (1/92)	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
	5 (6/92)	45*	9,240*	7,580*	1,150*	7,190*	25,160	7.26	2,730	91
	6 (8/92)	27*	7,710*	1,920*	669*	5,130*	15,429	7.23	2,810	327
	7 (12/92)	17.3*	7,990*	4,740*	638*	4,600*	17,968	7.54	2,970	352
	8 (3/93)	16.8*	13,800*	6,830*	1,110*	6,930*	28,670	7.37	2,610	12
	9 (5/93)	12.5*	13,700*	6,360*	993*	10,530*	31,583	7.33	2,470	NA
MW-22	1 (9/90)	7,200*	21,000*	20,000*	1,100*	8,300*	50,400	7.00	1,500	18
	2 (3/91)	2,200*	17,000*	9,500*	910*	6,600*	34,010	6.87	1,900	12
	3 (6/91)	3,600*	15,000*	3,200*	760*	3,000*	21,960	7.06	1,700	59
	4 (1/92)	5,400*	36,000*	27,000*	1,900*	13,500*	78,400	6.86	1,600	<1
	5 (6/92)	3,170*	21,200*	7,540*	1,040*	5,730*	35,510	7.13	1,690	7
	6 (8/92)	568*	20,500*	4,610*	588	3,280*	28,978	7.28	1,545	46
	7 (12/92)	908*	12,100*	4,220*	514	3,254*	20,088	7.43	1,508	6
	8 (3/93)	1,930*	29,800*	14,100*	1,170*	7,030*	52,100	7.26	1,408	<2
	9 (5/93)	28*	17,000*	6,520*	1,100*	6,150*	30,770	7.61	6,550	NA
P-1	9 (5/93)	<1	4,110*	18.8	361	2,522*	9,534	7.04	2,290	NA
P-2	9 (5/93)	3.2	5.2*	<1	<1	<1	5.2	7.36	3,910	NA
P-3	9 (5/93)	10.6*	<1	<1	<1	<1	<1	7.24	11,160	NA
P-4	9 (5/93)	8.3	6,690*	4,090*	559	6,260*	17,599	NA	NA	NA

TABLE 1 (continued)

SUMMARY OF GROUND WATER QUALITY MONITORING RESULTS SINCE INSTALLATION OF SLURRY WALL

Location	Sampling Period	DCA	B	T	E	X	Total BTEX	pH	SC	Sulfate
On-Site										
MW-10	1 (9/90)	1.4	<0.5	<0.5	<0.5	<1	<1	6.95	1,550	436
	2 (3/91)	<1	<0.5	<0.5	<0.5	<0.5	<0.5	7.29	1,700	5
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	<5	<5	<5	<5	<5	<5	7.31	1,840	422
	5 (6/92)	1.6	<1	<1	<1	<1	1.6	7.65	1,400	NA
	6 (8/92)	<1	<1	<1	<1	<1	<1	7.85	1,160	NA
	7 (12/92)	<1	<1	<1	<1	<1	<1	7.64	6,110	NA
	8 (3/93)	<1	<1	<1	<1	<1	<1	7.22	9,060	NA
	9 (5/93)	1	<1	<1	<1	<1	<1	7.93	2,320	NA
MW-18	1 (9/90)	<1	17*	<12	84	880*	981	7.00	1,500	67
	2 (3/91)	<1	26*	<12	85	770*	881	7.24	1,200	163
	3 (6/91)	<1	<25	<25	78	930*	1,008	6.77	1,200	181
	4 (1/92)	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
	5 (6/92)	<1	313*	1.1	200	1,710*	2,224	7.07	1,480	NA
	6 (8/92)	<1	527*	10.8	258	2,075*	2,871	7.26	2,100	NA
	7 (12/92)	<25	294*	<25	224	1,460*	1,978	7.31	1,930	NA
	8 (3/93)	<1	117*	8	96	226	447	7.07	2,780	NA
	9 (5/93)	<1	73*	<1	31.2	259	363	7.15	2,220	NA
MW-19	1 (9/90)	45*	<0.5	<0.5	1.1	1.9	3	6.95	3,000	292
	2 (3/91)	35*	<0.5	<0.5	<0.5	<0.5	<0.5	7.22	2,500	354
	3 (6/91)	44*	<0.5	<0.5	5.9	<0.5	5.9	7.10	2,400	359
	4 (1/92)	14*	<5	<5	<5	<5	<5	7.66	460	457
	5 (6/92)	11.4*	<1	<1	<1	<1	<1	7.76	1,970	NA
	6 (8/92)	9.0	<1	<1	<1	<1	<1	7.72	1,320	NA
	7 (12/92)	6.6	<1	<1	<1	<1	<1	7.70	1,620	NA
	8 (3/93)	2.4	<1	<1	<1	<1	<1	7.74	1,750	NA
	9 (5/93)	7.9	<1	<1	<1	<1	<1	7.73	1,630	NA

TABLE 1 (continued)

SUMMARY OF GROUND WATER QUALITY MONITORING RESULTS SINCE INSTALLATION OF SLURRY WALL

Location	Sampling Period	DCA	B	T	E	X	Total BTEX	pH	SC	Sulfate
MW-20	1 (9/90)	<1	<0.5	<0.5	<0.5	<1	<1	7.01	1,350	650*
	2 (3/91)	2.0	<0.5	<0.5	<0.5	0.7	1	7.39	3,000	735*
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	<5	<5	<5	<5	<5	<5	7.54	3,750	427
	5 (6/92)	<1	<1	<1	<1	<1	<1	7.62	1,600	NA
	6 (8/92)	<1	<1	<1	<1	<1	<1	6.97	1,310	NA
	7 (12/92)	<1	<1	<1	<1	<1	<1	7.87	1,340	NA
	8 (3/93)	2.1	<1	<1	<1	<1	2	7.10	6,740	NA
	9 (5/93)	<1	<1	<1	<1	<1	<1	7.86	1,430	NA
MW-21	1 (9/90)	67*	<0.5	1.5	1.1	5	8	7.01	1,500	386
	2 (3/91)	44*	<0.5	<0.5	<0.5	<0.5	<0.5	7.62	1,700	342
	3 (6/91)	40*	<0.5	<0.5	<0.5	<0.5	<0.5	7.44	1,700	309
	4 (1/92)	8.8	<5	<5	<5	<5	<5	8.31	5,110	NA
	5 (6/92)	21.9*	<1	<1	<1	<1	<1	7.37	2,400	NA
	6 (8/92)	8.3	<1	<1	<1	<1	<1	6.96	1,730	NA
	7 (12/92)	1.7	<1	<1	<1	<1	<1	7.69	2,030	NA
	8 (3/93)	5.9	<1	<1	<1	<1	<1	7.58	1,590	NA
	9 (5/93)	14.8*	<1	<1	<1	<1	<1	7.63	2,530	NA
Off-Site										
MW-9	1 (9/90)	2.1	<0.5	<0.5	<0.5	<1	<1	6.97	1,550	551
	2 (3/91)	1.8	<0.5	<0.5	<0.5	1.2	1.2	7.57	2,000	664*
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	<5	<5	<5	<5	<5	<5	7.31	4,360	638*
	5 (6/92)	1.5	<1	<1	<1	<1	<1	7.58	1,680	NA
	6 (8/92)	<1	<1	<1	<1	<1	<1	7.81	1,325	NA
	7 (12/92)	<1	<1	<1	<1	<1	<1	7.33	1,827	NA
	8 (3/93)	1.5	<1	<1	<1	<1	<1	7.63	1,640	NA
	9 (5/93)	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 1 (continued)

SUMMARY OF GROUND WATER QUALITY MONITORING RESULTS SINCE INSTALLATION OF SLURRY WALL

Location	Sampling Period	DCA	B	T	E	X	Total BTEX	pH	SC	Sulfate
MW-13	1 (9/90)	<1	<0.5	1.5	<0.5	<1	1.5	7.02	2,950	1,630*
	2 (3/91)	<1	<0.5	<0.5	<0.5	<0.5	<0.5	7.84	3,250	1,540*
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5 (6/92)	<1	<1	<1	<1	<1	<1	7.11	4,260	NA
	6 (8/92)	<1	<1	<1	<1	<1	<1	7.06	2,910	NA
	7 (12/92)	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8 (3/93)	<1	<1	<1	<1	<1	<1	7.72	3,410	NA
	9 (5/93)	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-14	1 (9/90)	2.0	<0.5	<0.5	<0.5	<1	<1	6.97	5,450	2,080*
	2 (3/91)	<1	<0.5	<0.5	<0.5	1.7	<0.5	7.51	8,400	4,520*
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	<5	<5	<5	<5	<5	<5	7.20	19,380	6,840*
	5 (6/92)	2.3	<1	<1	<1	<1	<1	7.62	4,520	NA
	6 (8/92)	<1	<1	<1	<1	<1	<1	7.38	5,760	NA
	7 (12/92)	<1	<1	<1	<1	<1	<1	7.40	9,090	NA
	8 (3/93)	<1	<1	<1	<1	<1	<1	7.02	15,280	NA
	9 (5/93)	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-15	1 (9/90)	<1	<0.5	<0.5	<0.5	<1	<1	7.00	3,250	1,380*
	2 (3/91)	<1	<0.5	<0.5	<0.5	<0.5	<0.5	7.02	8,500	3,890*
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	<5	<5	<5	<5	<5	<5	7.15	12,120	3,970*
	5 (6/92)	<1	<1	<1	<1	<1	<1	7.27	3,430	NA
	6 (8/92)	<1	<1	<1	<1	<1	<1	7.39	2,450	NA
	7 (12/92)	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8 (3/93)	<1	<1	<1	<1	<1	<1	7.42	9,810	NA
	9 (5/93)	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 1 (continued)

SUMMARY OF GROUND WATER QUALITY MONITORING RESULTS SINCE INSTALLATION OF SLURRY WALL

Location	Sampling Period	DCA	B	T	E	X	Total BTEX	pH	SC	Sulfate
MW-16	1 (9/90)	<1	<0.5	<0.5	<0.5	<1	<1	6.97	1,370	292
	2 (3/91)	<1	<0.5	<0.5	<0.5	<0.5	<0.5	7.57	1,200	230
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	<5	<5	<5	<5	<5	<5	7.30	2,050	345
	5 (6/92)	<1	<1	<1	<1	<1	<1	7.50	1,430	NA
	6 (8/92)	<1	<1	<1	<1	<1	<1	7.76	1,230	NA
	7 (12/92)	<1	<1	<1	<1	<1	<1	7.12	1,735	NA
	8 (3/93)	<1	<1	<1	<1	<1	<1	7.23	2,400	NA
	9 (5/93)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Water Quality Stds.										
New Mexico		10	10	750	750	620		6-9	-----	600
EPA MCL		5	5	1,000	700	10,000		-----	-----	250

NOTES:

Abbreviations: DCA = 1,2-dichloroethane; B = benzene; T = toluene; E = ethylbenzene; X = xylenes; SC = specific conductivity; TDS = total dissolved solids; MSG = well missing; NA = not analyzed

Organic values in µg/l; pH in standard units; SC in µmhos/cm; sulfate in mg/l

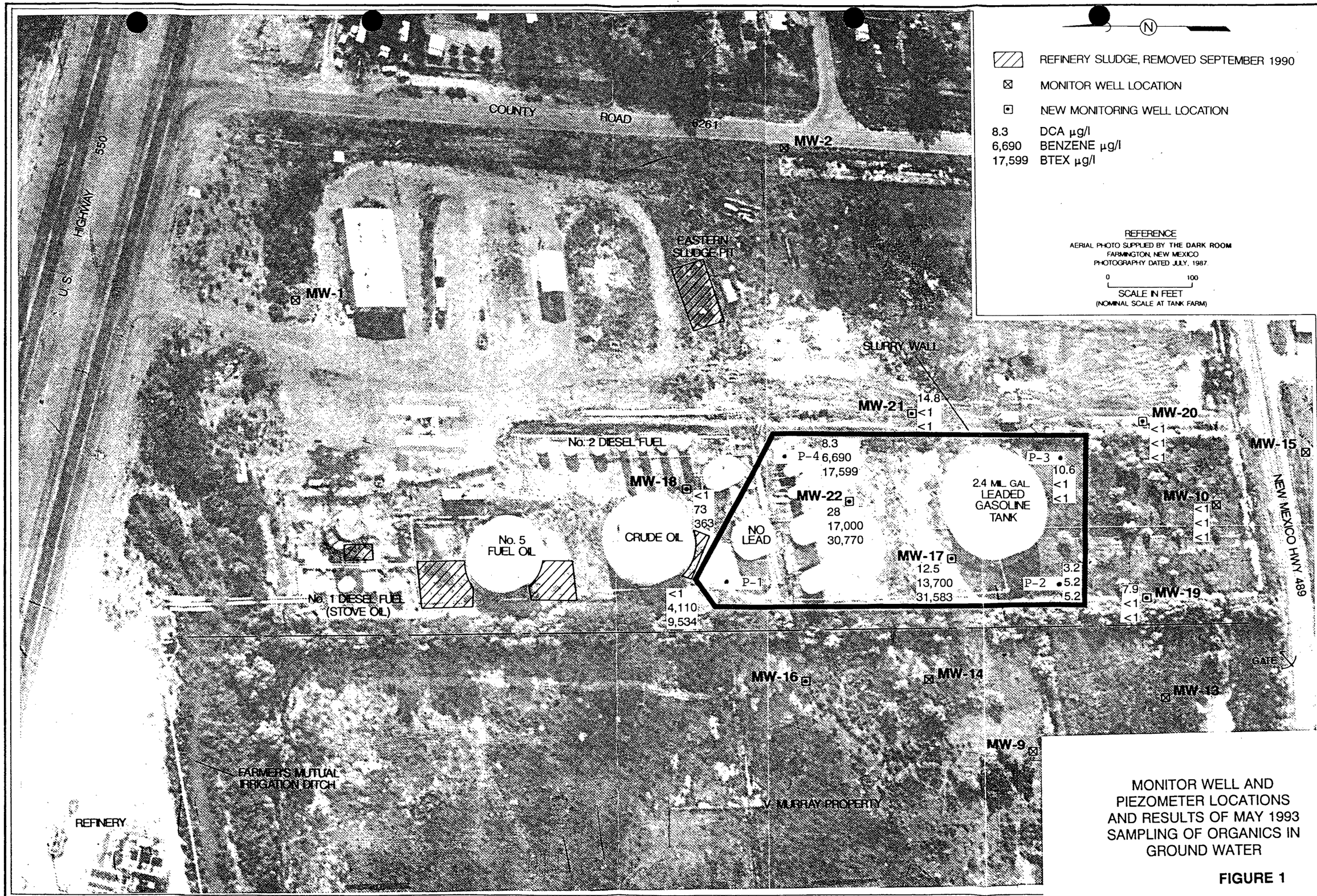
Sampling dates: 1 = Sept. 13 & 14, 1990; 2 = March 18 & 19, 1991; 3 = June 13, 1991; 4 = January 20 & 21, 1992; 5 = June 9 & 12, 1992; 6 = August 19 & 20, 1992; 7 = December 16, 1992; 8 = March 30, 1993; 9 = May 23, 1993

* = exceeds New Mexico MCL for drinking water

From sampling period 5 onward, samples were obtained from replacement wells at MW-17 and MW-18

DRAWN BY _____ DATE _____ CHECKED BY _____ DATE _____

FILE 14816.005



MONITOR WELL AND PIEZOMETER LOCATIONS AND RESULTS OF MAY 1993 SAMPLING OF ORGANICS IN GROUND WATER

FIGURE 1