3R - 77

REPORTS

DATE:

March 28, 1996

REPORT
GROUNDWATER QUALITY MONITORING RESULTS
MAVERIK REFINERY TANK FARM
KIRTLAND, NEW MEXICO
MAVERIK COUNTRY STORES, INC.

RECEIVED
APR 0 1 1996
Environmental Bureau
Oil Conservation Division

March 28, 1996

Prepared by:

TriTechnics Corporation
Salt Lake City, Utah

Job No. MAVKL027

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

Maverik Country Stores, Inc. (Maverik) retained TriTechnics Corporation (formerly Ecova) to conduct reporting and groundwater monitoring activities at its former refinery and tank farm located in Kirtland, New Mexico. Results of monitoring and related activities have been submitted to OCD in several reports since the removal of tanks and ancillary equipment at the refinery and tank farm and construction of the slurry wall. Numerous earlier reports presented results of site investigation dating back to 1987.

In accordance with the scope of work (discussed in Section 2.0) presented in the April 26, 1993 monitoring report and agreed upon in a letter from NMDEQ dated May 17, 1993, this Annual Report presents the results of groundwater monitoring conducted at the site on May 17, 1995 and October 18-19, 1995.

2.0 SCOPE OF WORK

2.1 General

The agreed Scope of Work for the site involves the following:

1. Perform groundwater monitoring (groundwater quality sampling and groundwater level measurements) twice per year. Groundwater monitoring is to be conducted once at the beginning of the primary biodegradation season (May or June) and once at the end of the season (October or November).

2. Both monitoring events are to include the following wells:

   MW-10, MW-19, MW-20 (on-site, down-gradient of the slurry wall impoundment)

   MW-18 (up-gradient of the slurry wall impoundment)

   MW-21 (outside of slurry wall impoundment, down-gradient of MW-18)

   MW-17, MW-22 (within the confines of the slurry wall impoundment)

3. During one of the two semi-annual sampling events (in addition to the measurements and samples required under item 2 above) groundwater monitoring will include off-site monitoring wells MW-9, MW-13, MW-14, MW-15, and MW-16.

4. On an annual basis, add nutrients to the area within the confines of the slurry wall impoundment to enhance in-situ biodegradation of remaining hydrocarbons.

3.0 GROUNDWATER MONITORING

Groundwater monitoring at the site included well gauging and sampling of the wells listed in Section 2.0 during the respective May and October groundwater monitoring events. Groundwater monitoring was conducted on May 17, 1995 and October 18-19, 1995. TriTechnics (Ecova) personnel conducted both sampling events.

Groundwater monitoring activities were conducted in accordance with standard United States Environmental Protection Agency (EPA) sampling protocol. For all wells, depth to water and total depth measurements were taken using a Keck electronic water level measuring device or a Marine Moisture Company Oil-Water Interface probe. Measurements were utilized to calculate well evacuation requirements. Wells were evacuated using a disposable weighted HDPE bailer until a minimum of three casing volumes of water were removed, and pH and specific conductance measurements stabilized. In an attempt to minimize the impact of free-phase hydrocarbon on analytical results, wells exhibiting a hydrocarbon sheen (MW-17, MW-22) were purged utilizing a peristaltic pump during the May 1995 sampling event. Field parameter measurements and water quality observations were recorded on monitoring well field data forms. After well evacuation, samples which did not exhibit free-phase hydrocarbon were collected using a disposable bailer and poured into three clean, preserved 40 ml vials supplied by the analytical laboratory.

In an effort to avoid the potential source of analytical error associated with the presence of free-phase hydrocarbon, during the May 1995 event wells exhibiting a hydrocarbon sheen were sampled using a sampling device consisting of a disposable 50 ml syringe mounted at the end of a length of decontaminated 1-inch diameter PVC, which could be activated from the surface. Samples were removed from about half way down the water column in these wells. In a further effort to improve field sampling procedures to avoid potential analytical error associated with free-phase hydrocarbons in wells MW-17 and MW-22, one duplicate sample during May and all groundwater samples during

October were collected using another alternative sampling method. This method involved the use of a disposable VOC sampler mounted on the bottom of the standard disposable bailer used for sampling.

Although not required by the OCD, piezometers installed near the inside corners of the slurry wall have been previously sampled and analyzed to provide further insight into the contaminant concentrations inside the slurry wall (other than that which is provided by MW-17 and MW-22). These 2-inch diameter peizometers are completed as monitor wells to a total depth of 8 feet below grade and are screened from 3 to 8 feet below grade. Samples were not collected from the piezometers during 1995 because they were found to contain free-phase hydrocarbons.

4.0 BIOREMEDIATION

As requested in the May 17, 1993 letter from OCD to Maverik, nutrient addition operations to stimulate hydrocarbon biodegradation were again conducted within the area enclosed by the slurry wall. The nutrient addition activities were conducted by Rosenbaum Construction of Farmington, NM, during June 1995. The area was leveled using a dozer blade and the ground surface ripped to a depth of 4 feet by ripping teeth on the back of the dozer. Some 4,000 lbs of 16-20-0 ammonium phosphate granular fertilizer were applied to the area and disked into the soil; this fertilizer formulation and application rate had been determined during the 1990 nutrient addition study 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 two-day period using a commercial, impulse-type water applicator. Approximately 150,000 gallons of water was applied during this period. Documentation of these procedures and quantities of materials is included in Appendix A.

5.0 RESULTS

5.1 Static Water Level Evaluation

Water level evaluation data, collected as part of semiannual groundwater monitoring activities performed at the site are presented in Tables 1 through 3. Table 1 summarizes groundwater elevation data (relative to mean sea level) since January 1992. Table 2 summarizes the level of groundwater relative to the ground surface. Groundwater gradients between selected wells are summarized in Table 3. Groundwater monitoring wells and piezometers are shown on Figures 1 and 2.

The water level data illustrate the same pattern which has been evident during several years of investigations at this site. The direction of flow is toward the southwest, the water table is typically 1-4 feet below grade, and the groundwater level normally fluctuates 2-3 feet over an annual cycle reaching its maximum elevation in mid-winter. The shallow groundwater has been shown in the past to be significantly influenced by the operation of the Farmers' Mutual Irrigation Ditch located along the northern property boundary.

The water level data during the present and previous reporting periods indicate an overall shallow groundwater gradient to the southwest of about 1 ft/100 ft between the north and south property boundaries, steepening somewhat adjacent to and down-gradient of the slurry wall. Previous measurements indicated the presence of a gradient within the slurry wall not too dissimilar to that outside the slurry wall. The four piezometers installed within the slurry wall boundaries were installed specifically to provide further insight into this observation.

Distances between various pairs of wells/piezometers were measured in the field or determined from the surveyed coordinates and the gradients determined for the last eight monitoring events (Table 3). The water level data were evaluated to assess temporal

groundwater level and gradient fluctuations in wells representative of conditions inside of the slurry wall vs. those outside of the slurry wall.

Using the data in Table 3, the average gradient between wells/piezometers located inside the slurry wall during the eight comparison periods has been 0.671/100 ft while the gradient between wells located outside the slurry wall has been 0.936/100 ft.

As was explained in some detail in the April 26, 1993 report, the differential between the gradients inside and outside the slurry wall is apparently due to the differential evapotranspiration rates between the up-gradient and down-gradient portion of the area within the confines of the slurry wall. It is likely that the presence of a gradient within the confines of the slurry wall will continue on a permanent basis since it appears to be the result of natural climatic phenomena. It is concluded on the basis of both the hydrologic data and the water quality results that the slurry wall is maintaining its integrity and is performing its function of containing the contaminated groundwater.

5.2 Water Quality Analyses

Water quality monitoring results for the May and October 1995 sampling events are summarized in Table 4 along with results from the 12 previous sampling events which have taken place in most wells since the slurry wall was installed in June, 1990. The laboratory data sheets for the two 1995 events are included as Appendix B.

Figures 1 and 2 show the concentrations of DCA, benzene, and total BTEX detected in each well sampled during the May and October 1995 sampling events.

The five off-site monitor wells (MW-9, 13, 14, 15 and 16) were sampled only during the October sampling event. No detectable concentrations (above the 1 mg/l detection limit) of DCA or BTEX were found in any of the off-site wells during 1995.

Five on-site wells located outside the confines of the slurry wall were sampled during both May and October. In the three down-gradient wells (MW-10, 19 and 20) the samples were below detection limits for BTEX. DCA was detected at concentrations of 8.6 and 8.8 mg/l in MW-19 during the May and October periods, respectively. These values are consistent with the results of previous recent sampling events.

In well MW-21, adjacent to but outside the slurry wall, only DCA was detected at 2.1 mg/l during the October sampling period. This is also consistent with previous values.

In the other on-site well, MW-18, located up-gradient of the slurry wall, no DCA was detected but relatively low concentrations of BTEX constituents were detected. While benzene (at 128 and 118 mg/l during the two sampling events) was in excess of drinking water standards, toluene, ethylbenzene and xylenes were below EPA MCL's. The non-detection of BTEX components in MW-21 down-gradient of MW-18 and the inverse trend of DCA and BTEX concentrations between MW-18 and MW-21 suggest that the BTEX constituents in groundwater sampled at MW-18 are attenuated or biodegraded in transit around the east side of the slurry wall before they reach the area sampled at MW-21, and do not pose an off-site threat.

The two monitor wells located within the confines of the slurry wall (MW-17 and 22) are designed primarily to assess the progress of biodegradation taking place within the highly contaminated portion of the site. The original MW-17 was destroyed during removal of the tankage during the fall of 1991 and was replaced by an identical well during June 1992.

The concentration of BTEX and DCA have been high in both interior wells. Previous sulfate analyses showed low levels of sulfate in interior wells vs. much higher levels in exterior wells. This difference is indicative of ongoing biodegradation inside the slurry wall. Time series plots of organic constituents (Figures 3 and 4) show erratic trends

with an overall downward slope indicating progress in bioremediation of contaminants over the long term.

The variability in contaminant concentrations over short distances is evident by comparison of historical concentrations in MW-17 and MW-22 to those in the piezometers located in the corners of the impoundment. These piezometers were not sampled during 1995 due to the presence of free-phase hydrocarbons intermittently in the piezometers.

Overall, concentrations of organic constituents within the confines of the slurry wall have been highly variable. This variability has been attributed to the inclusion of free-phase droplets into the analytical samples. Alternative sampling techniques have been attempted, including the use of "drop-pipes" and syringe samples to sample below the free-phase layer.

During the May and October 1995 sampling periods, another alternative sampling technique incorporating use of a VOC sampler attached to a disposable bailer (discussed previously in Section 3.0) was utilized in addition to the sample collected using the syringe sampling method during the May event. Results from the two methods are comparable; organic constituent concentrations were lower in the bailed samples collected with the VOC sampling method during 1994, while slightly higher during 1995 in comparison with the syringe samples. Overall, however, the two sampling methods return comparable results, and the VOC sampling method requires less sampling time and effort. Because it is easier to perform, the VOC sampling method will be used in future sampling events for the wells located inside the slurry wall.

Because of the high variability in sample results, analytical results from MW-17 and MW-22 are still not considered a reliable indicator by which to estimate the progress of hydrocarbon biodegradation within the slurry wall.

6.0 CONCLUSIONS AND RECOMMENDATIONS

All data indicate that the slurry wall has maintained its integrity and is performing its function of containing the contaminated groundwater. Groundwater samples from all monitor wells downgradient from the slurry wall exhibit concentrations of BTEX and DCA either below the detection limit or below New Mexico drinking water standards.

There is evidence that the organic contaminants in the groundwater within the slurry wall are undergoing biodegradation, but the rate at which this is occurring is slow.

Maverik recommends that the current Scope of Work as decribed in Section 2.0 at the facility be continued. This approach includes: semi-annual water quality and water level monitoring of on-site wells; annual monitoring of off-site wells; and, annual addition of nutrients to the contaminated area within the slurry wall.

Maverik proposes that, as per the 1993 Scope of Work, results of the first sampling of the year be transmitted to OCD within 4 weeks of receipt of final laboratory results via a transmittal letter and a summary table in the format of Table 4. The results of the second sampling will be transmitted in a more formal interpretive report by February 15 of the following year. This annual report will also include the previously collected data. Maverik will notify OCD at least one week in advance of sampling activities.

TABLES

TABLE 1

GROUNDWATER ELEVATIONS

Former Maverik Refinery, Kirtland, NM

Well	Ground Elevation	Datum Elevation	GWE 1/92	GWE 6/92	GWE 8/92	GWE 12/92	GWE 3/93	GWE 5/93	GWE 11/93	GWE 5/94	GWE 10/94	GWE 5/95	GWE 10/95
MW-1	5205.75	5207.24	5194.89	5197.38	5199.8	5197.81	5193.54	NM	NM	NM	NM	NM	NM
MW-2	5195.25	5196.93	5191.49	5190.88	5191.46	5192.73	5190.75	NM	NM	NM	NM	NM	NM
MW-9	5189.33	5191.22	5188.03	5187.25	5187.7	5188.87	5187.64	NM	5188.13	NM	5187.30	NM	5187.00
MW-10	5187.47	5189.30	5185.87	5184.74	5184.59	5186.63	5185.94	5184.77	5185.76	5183.00	5184.50	5184.88	5184.70
MW-13	5194.62	5187.76	NM	5184.74	5184.83	5186.45	5185.88	NM	5186.19	NM	5184.65	NM	5184.53
MW-14	5190.70	5194.47	5188.58	5186.6	5186.48	5189.99	5188.49	NM	5188.99	NM	5186.43	NM	5186.38
MW-15	5185.40	5188.80	5184.64	5183.19	5182.99	5185.26	5184.73	NM	5184.47	NM	5183.54	NM	5183.01
MW-16	5193.74	5194.98	5190.33	5188.47	5190.4	5191.79	5189.69	NM	5190.65	NM	5189.21	NM	5188.95
MW-17	5193.43	5195.91	NM	5190.84	5188.77	5190.05	5189.06	5188.22	5189.23	5187.72	5187.96	5187.61	5187.62
MW-18	5199.14	5201.75	NM	5186.37	5192.9	5193.44	5191.25	5190.84	5192.75	5189.56	5190.54	5189.93	5191.06
MW-19	5188.58	5189.54	5187.33	5186.57	5186.47	5188.07	5187.12	5186.12	5187.34	5185.15	5186.10	5186.04	5186.10
MW-20	5190.10	5191.05	5187.47	5189.32	5186.53	5188.22	5187.33	5186.32	5187.42	5184.34	5186.27	5186.27	5186.34
MW-21	5193.62	5194.81	5190.81	5189.28	5188.98	5191.36	5190.34	5188.86	5190.21	5187.62	5188.58	5188.52	5188.59
MW-22	5194.58	5195.86	5190.07	5190.36	5189.88	5191.06	5189.56	5188.86	5190.14	5186.96	5188.68	5188.22	5188.70
P-1	5195.74	5197.66	NM	5190.36	5191.57	5192.48	5190.31	5189.70	5191.43	5188.53	5190.09	5189.04	5189.84
P-2	5190.50	5192.32	NM	5187.4	5188.2	5189.47	5188.27	5187.33	5188.54	5186.30	5187.51	5187.02	5187.46
P-3	5191.44	5193.21	NM	5188.04	5187.81	5189.78	5188.75	5187.80	5188.81	5186.58	5187.44	5187.27	5187.33
P-4	5197.06	5198.82	NM	5190.06	5190.89	5191.99	5190.01	5189.49	5189.88	5188.97	5189.89	5188.97	5189.69

TABLE 2

DEPTH TO GROUNDWATER BELOW SURFACE (FT)

Former Maverik Refinery, Kirtland, NM

Location	Jan. 1992	June 1992	Aug. 1992	Dec. 1992	Mar. 1993	May 1993	Nov. 1993	May 1994	Oct. 1994	May 1995	Oct. 1995
Inside Slurry Wall											
MW-17	NM	3.7	3.4	2.1	3.1	3.9	2.9	5.71	5.47	8.30	8.29
MW-22	4.5	5.3	4.7	3.5	5.0	5.7	4.4	7.62	7.18	7.64	7.16
P-1	NM	5.4	4.2	3.3	5.5	6.1	4.4	7.21	7.57	8.62	7.82
P-2	NM	3.1	2.3	1.0	2.2	3.1	1.9	4.20	4.81	5.30	4.86
P-3	NM	3.4	3.6	1.6	2.6	3.6	2.6	4.86	5.77	5.94	5.88
P-4	NM	7.0	6.2	5.1	7.1	7.6	6.1	8.09	8.93	9.85	9.13
Outside Slurry Wall											
MW-1	10.9	8.4	6.0	8.0	12.3	NM	NM	NM	NM	NM	NM
MW-2	3.8	4.4	3.8	2.5	4.5	NM	NM	NM	NM	NM	NM
MW-9	1.5	2.3	1.8	0.6	1.8	NM	1.3	NM	2.03	NM	4.22
MW-10	1.6	2.7	2.9	0.9	1.6	2.8	1.8	4.47	2.97	4.42	4.60
MW-13	NM	2.8	2.7	1.1	1.7	NM	1.4	NM	2.91	NM	3.23
MW-14	2.1	4.1	4.2	0.7	2.2	NM	1.7	NM	4.27	NM	8.09
MW-15	0.8	2.2	2.4	0.1	0.6	NM	0.6	NM	1.86	NM	5.79
MW-16	3.4	4.5	3.3	1.9	4.0	NM	3.0	NM	4.53	NM	6.03
MW-18	NM	7.1	5.0	4.5	6.7	7.1	5.2	9.58	8.60	11.82	10.69
MW-19	1.0	2.0	1.9	0.3	1.2	2.2	1.0	3.43	2.48	3.50	3.44
MW-20	2.6	3.5	3.5	1.8	2.7	3.7	2.6	5.76	3.83	4.78	4.71
MW-21	2.8	4.3	4.6	2.2	3.2	4.7	3.3	6.00	5.04	6.29	6.22

NOTES:
1) NM = Not Measured
2) Groundwater depth and elevation in P-4 (for the Oct. 1994 sampling event) corrected for the presence of 0.28 feet of product using a product density of 0.8

TABLE 3

GROUNDWATER GRADIENTS

Former Maverik Refinery, Kirtland, NM

Wells and Date	Distance (ft)	Elevation Difference (ft)	Gradient (ft/100 ft)	Mean Gradient (ft/100 ft)
Inside Slurry Wall				
P4 → P3	338			
Jun 92		2.02	0.598	
Aug 92		3.08	0.911	
Dec 92		2.21	0.654	
Mar 93		1.26	0.372	
May 93		1.69	0.500	
Nov 93		2.14	0.633	
May 94		2.39	0.707	
Oct 94		2.44	0.722	
May 95		1.70	0.503	
Oct 95		2.36	0.698	0.630
P4 → P2	360			
Jun 92		2.66	0.739	
Aug 92		2.69	0.747	
Dec 92		2.52	0.700	
Mar 93		1.74	0.483	
May 93		2.16	0.600	
Nov 93		2.41	0.669	
May 94		2.67	0.742	
Oct 94		2.37	0.658	
May 95		1.95	0.542	
Oct 95		2.23	0.619	0.650
P1 → P2	393			
Jun 92		2.96	0.753	
Aug 92		3.36	0.855	
Dec 92		3.01	0.766	
Mar 93		2.04	0.519	
May 93		2.37	0.603	
Nov 93		2.89	0.735	
May 94		2.23	0.567	
Oct 94		2.50	0.656	
May 95		2.02	0.514	
Oct 95		2.38	0.606	0.657

TABLE 3 (Continued)

GROUNDWATER GRADIENTS
Former Maverik Refinery, Kirtland, NM

Wells and Date	Distance (ft)	Elevation Difference (ft)	Gradient (ft/100 ft)	Mean Gradient (ft/100 ft)
P4 → MW22	106			
Jun 92		0.78	0.736	
Aug 92		1.01	0.953	
Dec 92		0.93	0.877	
Mar 93		0.45	0.424	
May 93		0.63	0.594	
Nov 93		0.81	0.764	
May 94		2.01	1.896	
Oct 94		1.20	1.132	
May 95		0.75	0.708	
Oct 95		0.99	0.934	0.902
MW22 → MW17	153			
Jun 92		0.81	0.529	
Aug 92		1.11	0.725	
Dec 92		1.01	0.660	
Mar 93		0.50	0.326	
May 93		0.64	0.594	
Nov 93		0.91	0.764	
May 94		0.76	-0.497*	
Oct 94		0.72	0.471	
May 95		0.61	0.399	
Oct 95		1.08	0.706	0.575
MW-17 → P2	118			
Jun 92		1.07	0.906	
Aug 92		0.57	0.483	
Dec 92		0.58	0.491	
Mar 93		0.79	0.669	
May 93		0.89	0.754	
Nov 93		0.69	0.585	
May 94		1.42	1.203	
Oct 94		0.45	0.381	
May 95		0.59	0.500	
Oct 95		0.16	0.136	0.611

TABLE 3 (Continued)

GROUNDWATER GRADIENTS
Former Maverik Refinery, Kirtland, NM

Wells and Date	Distance (ft)	Elevation Difference (ft)	Gradient (ft/100 ft)	Mean Gradient (ft/100 ft)
Outside Slurry Wall				
MW21 → MW20	300			
Jun 92		2.75	0.917	
Aug 92		2.45	0.817	
Dec 92		3.14	1.047	
Mar 93		3.01	1.003	
May 93		2.54	0.847	
Nov 93		2.79	0.930	
May 94		3.28	1.093	
Oct 94		2.31	0.770	
May 95		2.25	0.750	
Oct 95		2.25	0.750	0.892
MW16 → MW13	420			
Jun 92		4.51	1.070	
Aug 92		5.57	1.326	
Dec 92		5.34	1.271	
Mar 93		3.81	0.907	
May 93		NM	-----	
Nov 93		4.46	1.062	
May 94		NM	-----	
Oct 94		4.56	1.086	
May 95		NM	-----	
Oct 95		4.42	1.052	1.111
MW16 → MW9	275			
Jun 92		2.88	1.047	
Aug 92		2.70	0.982	
Dec 92		2.92	1.062	
Mar 93		2.05	0.745	
May 93		NM	-----	
Nov 93		2.52	0.916	
May 94		NM	-----	
Oct 94		1.91	0.695	
May 95		NM	-----	
Oct 95		1.95	0.709	0.879

TABLE 3 (Continued)

GROUNDWATER GRADIENTS
Former Maverik Refinery, Kirtland, NM

Wells and Date	Distance (ft)	Elevation Difference (ft)	Gradient (ft/100 ft)	Mean Gradient (ft/100 ft)
MW21 → MW10	370			
Jun 92		4.58	1.238	
Aug 92		4.39	1.186	
Dec 92		4.73	1.278	
Mar 93		4.40	1.189	
May 93		4.09	1.105	
Nov 93		4.45	1.202	
May 94		4.62	1.249	
Oct 94		4.08	1.103	
May 95		3.64	0.984	
Oct 95		3.89	1.051	1.159
MW18 → MW21	331			
Jun 92		1.52	0.459	
Aug 92		3.92	1.184	
Dec 92		2.58	0.779	
Mar 93		0.91	0.275	
May 93		1.98	0.598	
Nov 93		2.54	0.767	
May 94		1.94	0.586	
Oct 94		1.96	0.592	
May 95		1.41	0.426	
Oct 95		2.47	0.746	0.641

NOTE: 1) *Anomalous value not utilized in calculation of mean gradient

TABLE 4

SUMMARY OF GROUNDWATER QUALITY MONITORING RESULTS (SINCE INSTALLATION OF SLURRY WALL)

Former Maverik Refinery, Kirtland, NM

Location	Sampling Period	DCA	B	T	E	X	Total BTEX	pH	SC
Within Slurry Wall									
	1 (9/90)	360*	11,000*	15,000*	1,160*	13,000*	40,000	7.01	2,500
MW-17	2 (3/91)	400*	11,000*	10,000*	1,900*	15,000*	37,900	7.04	2,700
	3 (6/91)	420*	9,800*	6,300*	1,800*	16,000*	33,900	7.04	2,650
	4 (1/92)	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
	6 (8/92)	27*	7,710*	1,920*	669	5,130*	15,429	7.23	2,810
	7 (12/92)	17.3*	7,990*	4,740*	638	4,600*	17,968	7.54	2,970
	8 (3/93)	16.8*	13,800*	6,830*	1,110*	6,930*	28,670	7.37	2,610
	9 (5/93)	12.5*	13,700*	6,360*	993*	10,530*	31,583	7.33	2,470
	10 (11/93)	30.9*	8,590*	2,820*	636	4,880*	16,926	7.39	2,360
	11 (5/94)	8.3	10,900*	4,340*	823*	5,660*	21,723	7.30	2,830
	12a (10/94)	4.9	5,130*	1,160*	409	2,818*	9,517	7.04	2,470
	12b (10/94)	<1	2,070*	807*	350	2,013*	5,240	7.04	2,470
	13a (5/95)	<10	9,320*	2,510*	694	3,782*	16,306	7.49	2,480
	13b (5/95)	<10	12,800*	4,460*	944*	5,710*	23,914	7.49	2,480
	14 (10/95)**	2.3	3,000*	464	244	1,079*	4,787	7.09	2,430
MW-22	1 (9/90)	7,200*	21,000*	20,000*	1,100*	8,300*	50,400	7.00	1,500
	2 (3/91)	2,200*	17,000*	9,500*	910*	6,600*	34,010	6.87	1,900
	3 (6/91)	3,600*	15,000*	3,200*	760*	3,000*	21,960	7.06	1,700
	4 (1/92)	5,400*	36,000*	27,000*	1,900*	13,500*	78,400	6.86	1,600
	5 (6/92)	3,170*	21,200*	7,540*	1,040*	5,730*	35,510	7.13	1,690
	6 (8/92)	568*	20,500*	4,610*	588	3,280*	28,978	7.28	1,545
	7 (12/92)	908*	12,100*	4,220*	514	3,254*	20,088	7.43	1,508
	8 (3/93)	1,930*	29,800*	14,100*	1,170*	7,030*	52,100	7.26	1,408
	9 (5/93)	28*	17,000*	6,520*	1,100*	6,150*	30,770	7.61	6,550
	10 (11/93)	2,780*	18,400*	8,480*	1,150*	7,300*	35,330	8.01	1,610
	11 (5/94)	379*	9,340*	2,250*	845*	3,725*	16,160	7.15	1,505
	12 (10/94)	566*	10,500*	5,890*	1,390*	8,350*	26,330	7.24	1,710
	13a (5/95)	62*	7,510*	1,750*	1,000*	6,520*	16,780	7.15	1,517
	13b (5/95)	67*	9,020*	2,620*	1,230*	7,310*	20,180	7.15	1,517
	14 (10/95)**	41.9*	5,700*	2,430*	1,580*	9,000*	18,710	7.25	1,820
	14 (10/95) dup. **	<1	5,120*	2,130*	1,540*	8,320*	17,110	7.25	1,820
P-1	9 (5/93)	<1	4,110*	18.8	361	2,522*	7,012	7.04	2,290
	10 (11/93)	<1	3,580*	10.2	506	3,215*	7,311	7.22	1,460
	11 (Dry)	NS	NS	NS	NS	NS	NS	NS	NS
	12 (10/94)	<1	8.9	<1	1.9	11.8	22.60	7.04	2,210
	13 (5/95)	NS	NS	NS	NS	NS	NS	NS	NS
	14 (10/95)	NS	NS	NS	NS	NS	NS	NS	NS
P-2	9 (5/93)	3.2	5.2*	<1	<1	<1	5.2	7.36	3,910
	10 (11/93)	<1	<1	<1	<1	<1	<1	7.92	3,540
	11 (5/94)	1.3	<1	<1	<1	<1	<1	7.48	3,980
	12 (10/94)	3.6	<1	<1	<1	<1	<1	7.12	3,480
	13 (5/95)	NS	NS	NS	NS	NS	NS	NS	NS
	14 (10/95)	NS	NS	NS	NS	NS	NS	NS	NS

TABLE 4 (Continued)

SUMMARY OF GROUNDWATER QUALITY MONITORING RESULTS (SINCE INSTALLATION OF SLURRY WALL)

Former Maverik Refinery, Kirtland, NM

Location	Sampling Period	DCA	B	T	E	X	Total BTEX	pH	SC
P-3	9 (5/93)	10.6*	<1	<1	<1	<1	<1	7.24	11,160
	10 (11/93)	11.5*	<1	<1	<1	<1	<1	7.31	9,140
	11 (5/94)	12.1*	<1	<1	<1	<1	<1	7.28	8,070
	12 (10/94)	12.6*	<1	<1	<1	<1	<1	7.06	5,550
	13 (5/95)	NS	NS	NS	NS	NS	NS	NS	NS
	14 (10/95)	NS	NS	NS	NS	NS	NS	NS	NS
P-4	9 (5/93)	8.3	6,690*	4,090*	559	6,260*	17,599	NA	NA
	10 (11/93)	2.1	6,400*	4,420*	900*	7,700*	19,420	NA	NA
	11 (Dry)	NS	NS	NS	NS	NS	NS	NS	NS
	12 (10/94)	NS	NS	NS	NS	NS	NS	NS	NS
	13 (5/95)	NS	NS	NS	NS	NS	NS	NS	NS
	14 (10/95)	NS	NS	NS	NS	NS	NS	NS	NS
On-Site									
MW-10	1 (9/90)	1.4	<0.5	<0.5	<0.5	<1	<1	6.95	1,550
	2 (3/91)	<1	<0.5	<0.5	<0.5	<0.5	<0.5	7.29	1,700
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	<5	<5	<5	<5	<5	<5	7.31	1,840
	5 (6/92)	1.6	<1	<1	<1	<1	1.6	7.65	1,400
	6 (8/92)	<1	<1	<1	<1	<1	<1	7.85	1,160
	7 (12/92)	<1	<1	<1	<1	<1	<1	7.64	6,110
	8 (3/93)	<1	<1	<1	<1	<1	<1	7.22	9,060
	9 (5/93)	1	<1	<1	<1	<1	<1	7.93	2,320
	10 (11/93)	<1	<1	<1	<1	<1	<1	7.73	1,320
	11 (5/94)	<1	<1	<1	<1	<1	<1	7.75	1,335
	12 (10/94)	2.1	<1	<1	<1	<1	<1	7.56	1,159
	13 (5/95)	<1	<1	<1	<1	<1	<1	7.64	1,695
	14 (10/95)	<1	<1	<1	<1	<1	<1	7.41	1,453
MW-18	1 (9/90)	<1	17*	<12	84	880*	981	7.00	1,500
	2 (3/91)	<1	26*	<12	85	770*	881	7.24	1,200
	3 (6/91)	<1	<25	<25	78	930*	1,008	6.77	1,200
	4 (1/92)	MSG	MSG	MSG	MSG	MSG	MSG	MSG	MSG
	5 (6/92)	<1	313*	1.1	200	1,710*	2,224	7.07	1,480
	6 (8/92)	<1	527*	10.8	258	2,075*	2,871	7.26	2,100
	7 (12/92)	<25	294*	<25	224	1,460*	1,978	7.31	1,930
	8 (3/93)	<1	117*	8	96	226	447	7.07	2,780
	9 (5/93)	<1	73*	<1	31.2	259	363	7.15	2,220
	10 (11/93)	<1	337*	4.9	261	1,352*	1,955	7.00	1,870
	11 (5/94)	<1	51*	10.0	7	99	167	7.00	1,510
	12 (10/94)	<1	210*	10.9	46	482.8	749.7	7.10	1,530
	13 (5/95)	<1	128*	<1	10.4	274	412.4	6.84	1,370
	14(10/95)**	<1	118*	12.2	20.0	296.4	446.6	7.03	1,299

TABLE 4 (Continued)

SUMMARY OF GROUNDWATER QUALITY MONITORING RESULTS (SINCE INSTALLATION OF SLURRY WALL)

Former Maverik Refinery, Kirtland, NM

Location	Sampling Period	DCA	B	T	E	X	Total BTEX	pH	SC
MW-19	1 (9/90)	45*	<0.5	<0.5	1.1	1.9	3	6.95	3,000
	2 (3/91)	35*	<0.5	<0.5	<0.5	<0.5	<0.5	7.22	2,500
	3 (6/91)	44*	<0.5	<0.5	5.9	<0.5	5.9	7.10	2,400
	4 (1/92)	14*	<5	<5	<5	<5	<5	7.66	460
	5 (6/92)	11.4*	<1	<1	<1	<1	<1	7.76	1,970
	6 (8/92)	9.0	<1	<1	<1	<1	<1	7.72	1,320
	7 (12/92)	6.6	<1	<1	<1	<1	<1	7.70	1,620
	8 (3/93)	2.4	<1	<1	<1	<1	<1	7.74	1,750
	9 (5/93)	7.9	<1	<1	<1	<1	<1	7.73	1,630
	10 (11/93)	6.6	<1	<1	<1	<1	<1	7.78	1,380
	11 (5/94)	8.0	<1	<1	<1	<1	<1	7.65	1,762
	12 (10/94)	7.9	<1	<1	<1	<1	<1	7.44	1,258
	13 (5/95)	8.6	<1	<1	<1	<1	<1	7.52	1,624
	14 (10/95)	8.8	<1	<1	<1	<1	<1	7.31	1,411
MW-20	1 (9/90)	<1	<0.5	<0.5	<0.5	<1	<1	7.01	1,350
	2 (3/91)	2.0	<0.5	<0.5	<0.5	0.7	1	7.39	3,000
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	<5	<5	<5	<5	<5	<5	7.54	3,750
	5 (6/92)	<1	<1	<1	<1	<1	<1	7.62	1,600
	6 (8/92)	<1	<1	<1	<1	<1	<1	6.97	1,310
	7 (12/92)	<1	<1	<1	<1	<1	<1	7.87	1,340
	8 (3/93)	2.1	<1	<1	<1	<1	2	7.10	6,740
	9 (5/93)	<1	<1	<1	<1	<1	<1	7.86	1,430
	10 (11/93)	<1	<1	<1	<1	<1	<1	7.69	1,230
	11 (5/94)	<1	<1	<1	<1	<1	<1	7.38	1,292
	12 (10/94)	<1	<1	<1	<1	<1	<1	7.57	1,308
	13 (5/95)	<1	<1	<1	<1	<1	<1	7.65	1,434
	14 (10/95)	<1	<1	<1	<1	<1	<1	7.35	1,525
MW-21	1 (9/90)	67*	<0.5	1.5	1.1	5	8	7.01	1,500
	2 (3/91)	44*	<0.5	<0.5	<0.5	<0.5	<0.5	7.62	1,700
	3 (6/91)	40*	<0.5	<0.5	<0.5	<0.5	<0.5	7.44	1,700
	4 (1/92)	8.8	<5	<5	<5	<5	<5	8.31	5,110
	5 (6/92)	21.9*	<1	<1	<1	<1	<1	7.37	2,400
	6 (8/92)	8.3	<1	<1	<1	<1	<1	6.96	1,730
	7 (12/92)	1.7	<1	<1	<1	<1	<1	7.69	2,030
	8 (3/93)	5.9	<1	<1	<1	<1	<1	7.58	1,590
	9 (5/93)	14.8*	<1	<1	<1	<1	<1	7.63	2,530
	10 (11/93)	3.7	<1	<1	<1	<1	<1	7.58	1,580
	11 (5/94)	8.3	<1	<1	<1	<1	<1	7.66	1,592
	12 (10/94)	5.5	<1	<1	<1	<1	<1	7.55	1,760
	13 (5/95)	<1	<1	<1	<1	<1	<1	7.59	1,819
	13 (5/95) dup.	5.4	<1	<1	<1	<1	<1	7.59	1,819
	14 (10/95)	2.1	<1	<1	<1	<1	<1	7.52	2,060

TABLE 4 (Continued)

SUMMARY OF GROUNDWATER QUALITY MONITORING RESULTS (SINCE INSTALLATION OF SLURRY WALL)

Former Maverik Refinery, Kirtland, NM

Location	Sampling Period	DCA	B	T	E	X	Total BTEX	pH	SC
Off-Site									
MW-9	1 (9/90)	2.1	<0.5	<0.5	<0.5	<1	<1	6.97	1,550
	2 (3/91)	1.8	<0.5	<0.5	<0.5	1.2	1.2	7.57	2,000
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	<5	<5	<5	<5	<5	<5	7.31	4,360
	5 (6/92)	1.5	<1	<1	<1	<1	<1	7.58	1,680
	6 (8/92)	<1	<1	<1	<1	<1	<1	7.81	1,325
	7 (12/92)	<1	<1	<1	<1	<1	<1	7.33	1,827
	8 (3/93)	1.5	<1	<1	<1	<1	<1	7.63	1,640
	9 (5/93)	NA	NA	NA	NA	NA	NA	NA	NA
	10 (11/93)	<1	<1	<1	<1	<1	<1	7.62	1,460
	11 (5/94)	NS	NS	NS	NS	NS	NS	NS	NS
	12 (10/94)	1.2	<1	<1	<1	<1	<1	7.80	1,610
	13 (5/95)	NS	NS	NS	NS	NS	NS	NS	NS
	14 (10/95)	<1	<1	<1	<1	<1	<1	7.38	1,523
MW-13	1 (9/90)	<1	<0.5	1.5	<0.5	<1	1.5	7.02	2,950
	2 (3/91)	<1	<0.5	<0.5	<0.5	<0.5	<0.5	7.84	3,250
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	NA	NA	NA	NA	NA	NA	NA	NA
	5 (6/92)	<1	<1	<1	<1	<1	<1	7.11	4,260
	6 (8/92)	<1	<1	<1	<1	<1	<1	7.06	2,910
	7 (12/92)	NA	NA	NA	NA	NA	NA	NA	NA
	8 (3/93)	<1	<1	<1	<1	<1	<1	7.72	3,410
	9 (5/93)	NA	NA	NA	NA	NA	NA	NA	NA
	10 (9/93)	<1	<1	<1	<1	<1	<1	7.45	4,150
	11 (5/94)	NS	NS	NS	NS	NS	NS	NS	NS
	12 (10/94)	<1	<1	<1	<1	<1	<1	7.38	3,160
	13 (5/95)	NS	NS	NS	NS	NS	NS	NS	NS
	14 (10/95)	<1	<1	<1	<1	<1	<1	7.41	3,600
MW-14	1 (9/90)	2.0	<0.5	<0.5	<0.5	<1	<1	6.97	5,450
	2 (3/91)	<1	<0.5	<0.5	<0.5	1.7	<0.5	7.51	8,400
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	<5	<5	<5	<5	<5	<5	7.20	19,380
	5 (6/92)	2.3	<1	<1	<1	<1	<1	7.62	4,520
	6 (8/92)	<1	<1	<1	<1	<1	<1	7.38	5,760
	7 (12/92)	<1	<1	<1	<1	<1	<1	7.40	9,090
	8 (3/93)	<1	<1	<1	<1	<1	<1	7.02	15,280
	9 (5/93)	NA	NA	NA	NA	NA	NA	NA	NA
	10 (11/93)	1.2	<1	<1	<1	<1	<1	7.61	6,030
	11 (5/94)	NS	NS	NS	NS	NS	NS	NS	NS
	12 (10/94)	1.9	<1	<1	<1	<1	<1	7.34	4,560
	13 (5/95)	NS	NS	NS	NS	NS	NS	NS	NS
	14 (10/95)	<1	<1	<1	<1	<1	<1	7.15	6,760

TABLE 4 (Continued)

SUMMARY OF GROUNDWATER QUALITY MONITORING RESULTS (SINCE INSTALLATION OF SLURRY WALL)

Former Maverik Refinery, Kirtland, NM

Location	Sampling Period	DCA	B	T	E	X	Total BTEX	pH	SC
MW-15	1 (9/90)	<1	<0.5	<0.5	<0.5	<1	<1	7.00	3,250
	2 (3/91)	<1	<0.5	<0.5	<0.5	<0.5	<0.5	7.02	8,500
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	<5	<5	<5	<5	<5	<5	7.15	12,120
	5 (6/92)	<1	<1	<1	<1	<1	<1	7.27	3,430
	6 (8/92)	<1	<1	<1	<1	<1	<1	7.39	2,450
	7 (12/92)	NA	NA	NA	NA	NA	NA	NA	NA
	8 (3/93)	<1	<1	<1	<1	<1	<1	7.42	9,810
	9 (5/93)	NA	NA	NA	NA	NA	NA	NA	NA
	10 (11/93)	<1	<1	<1	<1	<1	<1	8.01	1,630
	11 (5/94)	NS	NS	NS	NS	NS	NS	NS	NS
	12 (10/94)	<1	<1	<1	<1	<1	<1	7.54	2,500
	13 (5/95)	NS	NS	NS	NS	NS	NS	NS	NS
	14 (10/95)	<1	<1	<1	<1	<1	<1	7.48	2,260
MW-16	1 (9/90)	<1	<0.5	<0.5	<0.5	<1	<1	6.97	1,370
	2 (3/91)	<1	<0.5	<0.5	<0.5	<0.5	<0.5	7.57	1,200
	3 (6/91)	NA	NA	NA	NA	NA	NA	NA	NA
	4 (1/92)	<5	<5	<5	<5	<5	<5	7.30	2,050
	5 (6/92)	<1	<1	<1	<1	<1	<1	7.50	1,430
	6 (8/92)	<1	<1	<1	<1	<1	<1	7.76	1,230
	7 (12/92)	<1	<1	<1	<1	<1	<1	7.12	1,735
	8 (3/93)	<1	<1	<1	<1	<1	<1	7.23	2,400
	9 (5/93)	NA	NA	NA	NA	NA	NA	NA	NA
	10 (11/93)	<1	<1	<1	<1	<1	<1	7.31	1,760
	11 (5/94)	NS	NS	NS	NS	NS	NS	NS	NS
	12 (10/94)	<1	<1	<1	<1	<1	<1	7.44	1,253
	13 (5/95)	NS	NS	NS	NS	NS	NS	NS	NS
	14 (10/95)	<1	<1	<1	<1	<1	<1	7.26	1,421
Water Quality Stds.									
New Mexico		10	10	750	750	620		6-9	-----
EPA MCL		5	5	1,000	700	10,000		-----	-----

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; NS = not sampled

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

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; 10 = November 29 & 30, 1993; 11 = May 25, 1994; 12 = October 2-3, 1994; 13 = May 17, 1995; 14 = October 18-19, 1995

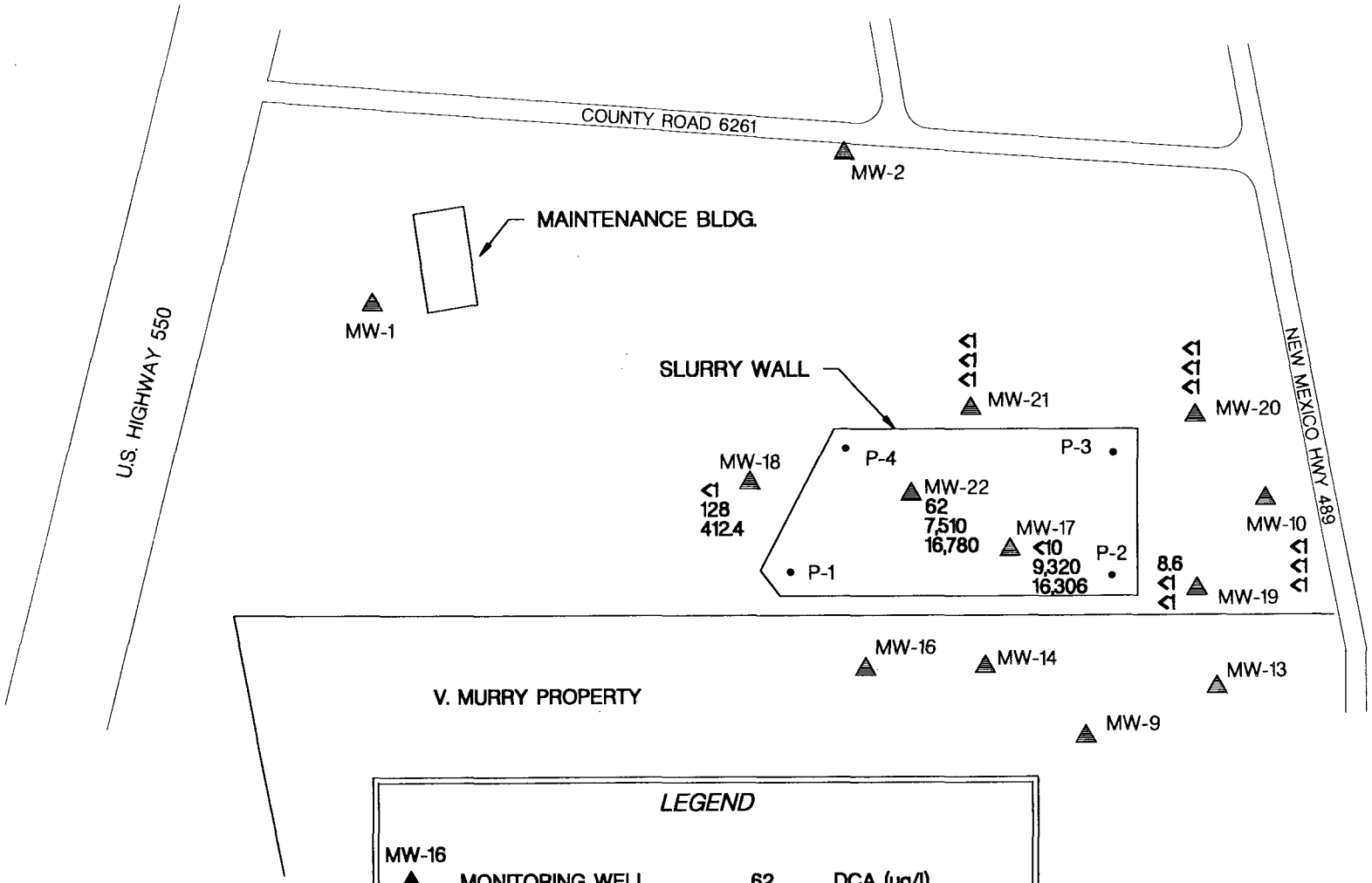
* = exceeds New Mexico MCL for drinking water

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

** = laboratory exceeded holding time before completing sample analysis

FIGURES

File Name: 131AN951 Date: 3/15/96 Drawn By: E.S.S. Checked By: D.R.R.



LEGEND

MW-16 ▲	MONITORING WELL	62	DCA (ug/l)
		7,510	BENZENE (ug/l)
• P-1	PIEZOMETER	16,780	BTEX (ug/l)

0 200 400

Scale in feet

North

TriTechnics CORPORATION
Air, Water and Soil Management

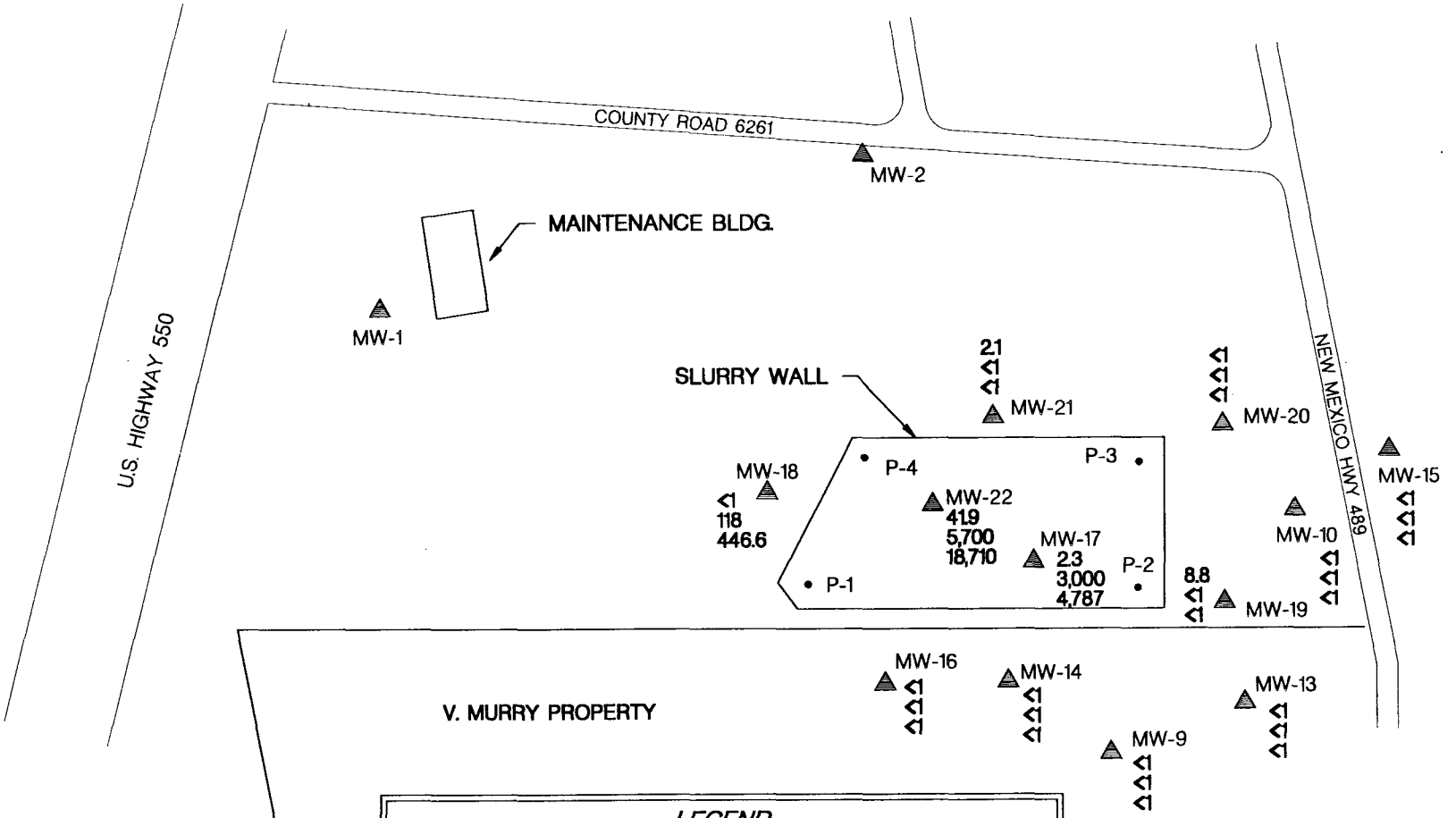
1995 Annual Report

ORGANICS IN GROUNDWATER MAY, 1995

Kirkland Refinery
Kirkland, NM

FIGURE 1

File Name: 131AN952 Date: 3/15/96 Drawn By: E.S.S. Checked By: D.R.R.



LEGEND

MW-16 ▲	MONITORING WELL	41.9	DCA (ug/l)
		5,700	BENZENE (ug/l)
• P-1	PIEZOMETER	18,710	BTEX (ug/l)

0 200 400

Scale in feet

North

TriTechnics CORPORATION
Air, Water and Soil Management

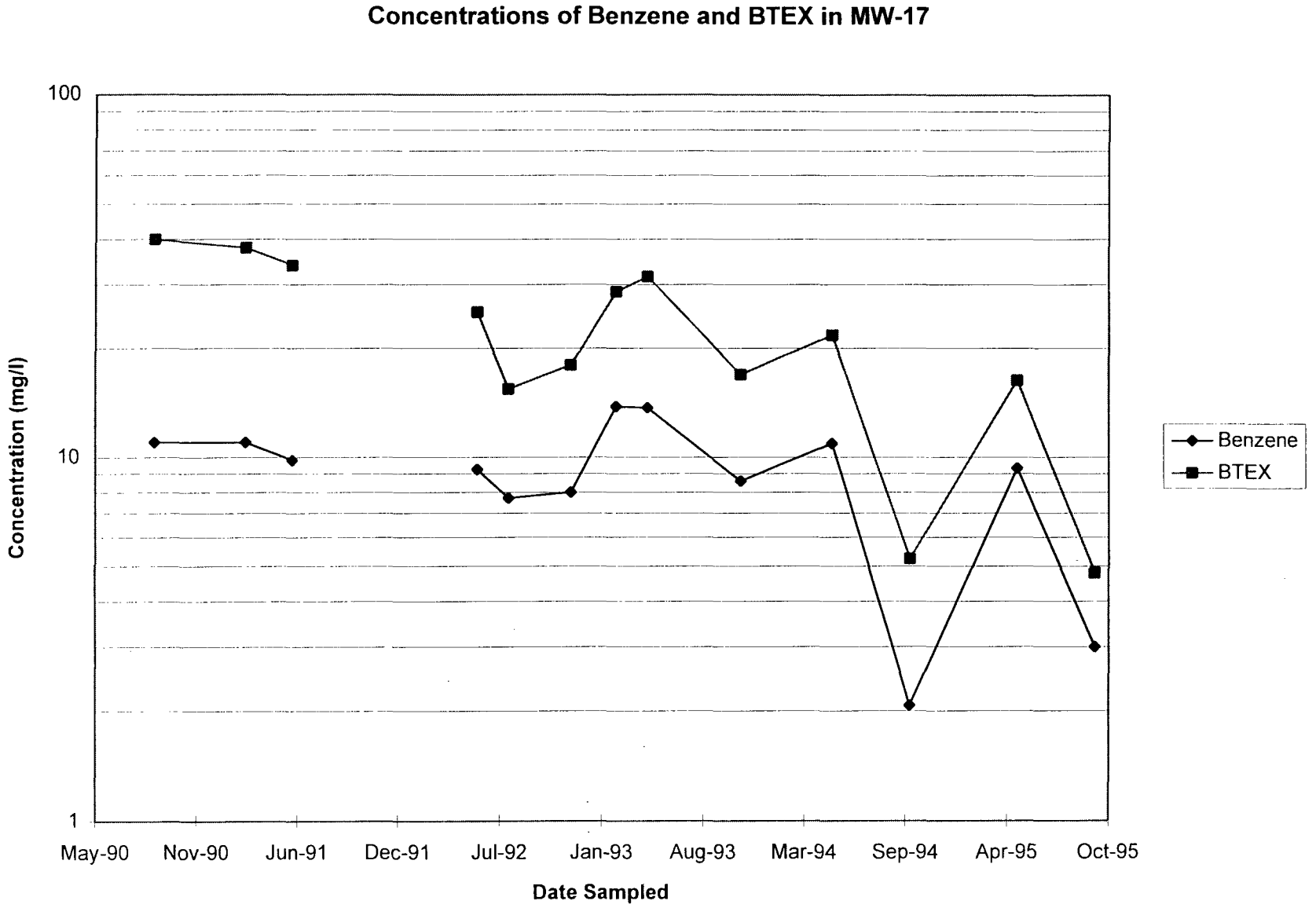
1995 Annual Report

ORGANICS IN GROUNDWATER OCTOBER, 1995

Kirkland Refinery
Kirkland, NM

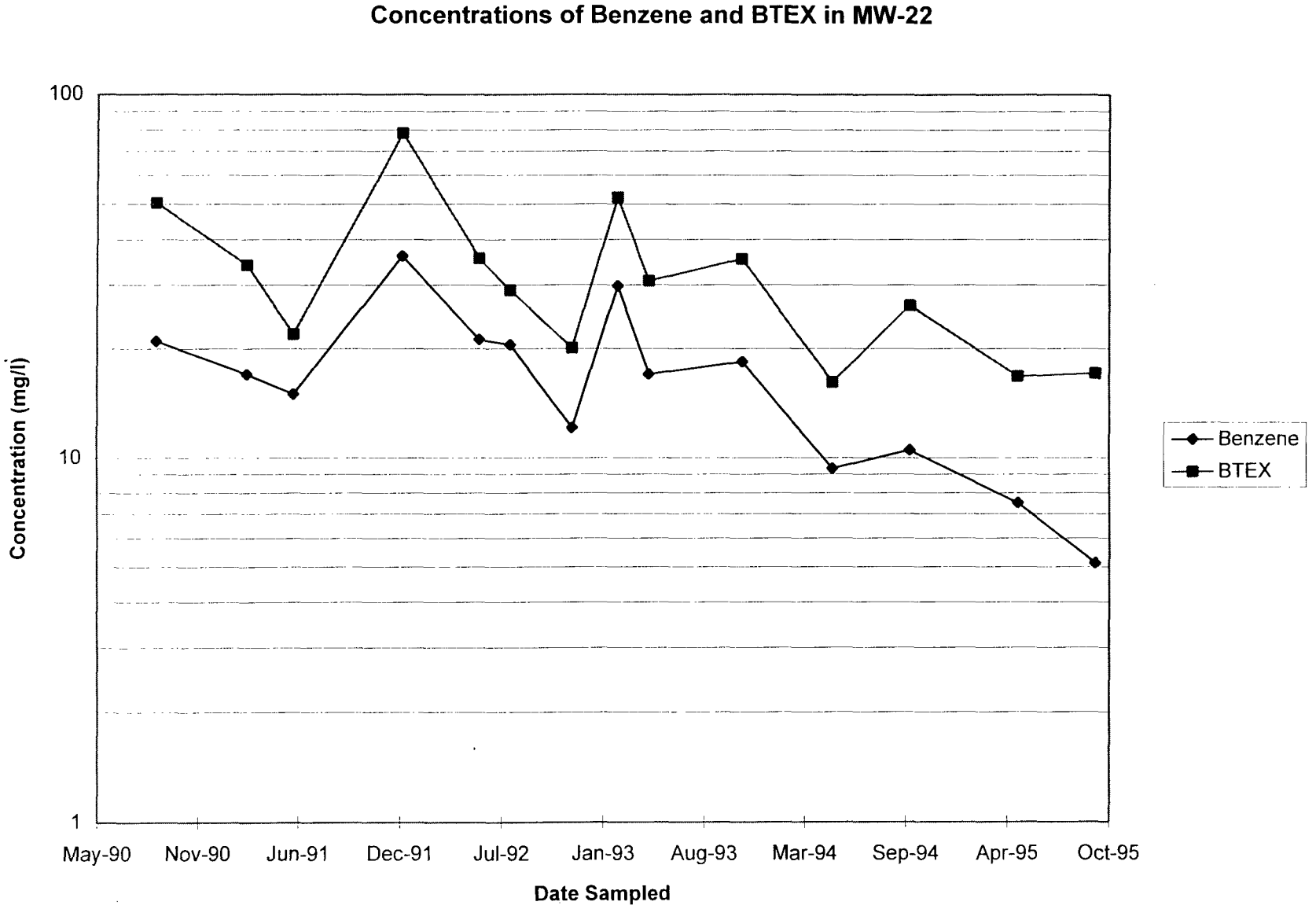
FIGURE 2

Figure 3



MAVKL027\DB\BTEX.XLS

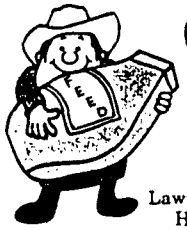
Figure 4



MAVKL027\DB\BTEX.XLS

APPENDIX A

BIOREMEDIATION FIELD NOTES



GENERAL SUPPLY

201 East Main
Farmington, New Mexico 87401
(505) 325-7533

Lawn & Garden Supplies, Specialty Feeds, Hay, Grain, Tack, Canning Supplies, Enamelware, Stoneware & Much More!

PET FOOD CENTER
Feed & Supplies for Animals from Birds to Elephants

PURINA CHOW

NAME Riverdale Construction DATE 6/29/[illegible]

ADDRESS _____ PHONE _____

CLERK _____

P.O. NO. ☐ CASH ☐ CHARGE ☐ ON ACCT. ☐ MDSE. RET'D.

QTY.	DESCRIPTION	UNIT PRICE	EXTENSION
2 ton	16-20-6	270 00	780 00

TERMS : Net 10th E.O.M.

SUBTOTAL	
TAX	
TOTAL	

REC'D. BY X [signature] Thank You!

CUSTOMER COPY

G 01798

LOWER VALLEY WATER USERS COOPERATIVE ASSOCIATION

Post Office Box 193
Kirtland New Mexico 87417

THIS SHALL SERVE AS AN AGREEMENT BETWEEN LOWER VALLEY WATER USERS COOPERATIVE ASSOCIATION AND Rosenbaum Construction FOR THE USE OF OUR FIRE HYDRANT METER TO OBTAIN WATER FROM THE FIRE HYDRANT LOCATED AT old Caribou Refinery AT THE PRICE OF $2.00 PER THOUSAND GALLONS.

THE READING ON THE METER IS 0055150.

THE FITTINGS INCLUDED WITH THE METER ARE:

3" MALE I.P.T. x 2 1/2" FEMALE F.H.T.
3" x 6" SCH 80 NIPPLE I.P.T.
3" BRASS GATE VALVE
3" MALE I.P.T. x 2 1/2" MALE F.H.T.
FIRE HYDRANT WRENCH

THE HYDRANT METER AND ALL FITTINGS ARE TO BE RETURNED TO LOWER VALLEY WATER AS SOON AS THE ABOVE NAMED COMPANY IS FINISHED WITH THE JOB THIS METER IS BEING USED FOR.

DATED THIS 28 DAY OF June 1995.

M Duane Meeder
AUTHORIZED SIGNATURE FOR

Rosenbaum Construction
COMPANY NAME

Box 2308
MAILING ADDRESS

Farmington NM 87499
CITY, STATE AND ZIP

TELEPHONE NUMBER

149,900

299.80
16.86
$316.66

7-5-95
DATE METER RETURNED

007014.00
METER READING

Ecaur Corp.

Kirtland Maverick Refinery Site

Job Summary.

wed 6 29 95

Safety meeting, Gathered Sprinkler and hose. and wet dry weeds + Grass. moved D8 Dozer To Site

Thur. 6·30·95

Ripped area North + South 4' deep. applied 4000 16 16·20·6 fertilizer. Delivered by General Supply, Ripped East To west 4' deep, and started watering.

Fri 7·1·95

Run Sprinkler All day. moved. 3 Times. (Rained also)

Sat. 7·2·95

Ran Sprinkler all day. moved 4 Times. moved dozer out. and gathered all Hoses + Sprinkler.

APPENDIX B

ANALYTICAL LABORATORY DATA REPORTS

Mountain States Analytical

May 24, 1995

Mr. Paul Weissenborn
Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Reference:
Project: Kirtland, NM
MSAI Group: 8292

Dear Mr. Weissenborn:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

MW-10	MW-17	MW-17A
MW-18	MW-19	MW-20
MW-21	MW-22	MW-22A
MW-25	Trip Blank	EQB

All holding times were met for the tests performed on these samples.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

Mark W. Bostrom
Project Manager

Mountain States Analytical
The Quality Solution

Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Paul Weissenborn
Project: Kirtland, NM

Sample ID: MW-10
Matrix: Waste Water

MSAI Sample: 33493
MSAI Group: 8292
Date Reported: 05/24/95

Discard Date: 06/23/95
Date Submitted: 05/18/95
Date Sampled: 05/17/95
Collected by: DA
Purchase Order: 6561
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
5515	Purgeable Aromatics/Halocarbons Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	1.0	05/19/95	PWK
	Benzene	ND	ug/l	1.0	05/19/95	PWK
	Toluene	ND	ug/l	1.0	05/19/95	PWK
	Ethylbenzene	ND	ug/l	1.0	05/19/95	PWK
	m,p-Xylene	ND	ug/l	1.0	05/19/95	PWK
	o-Xylene	ND	ug/l	1.0	05/19/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

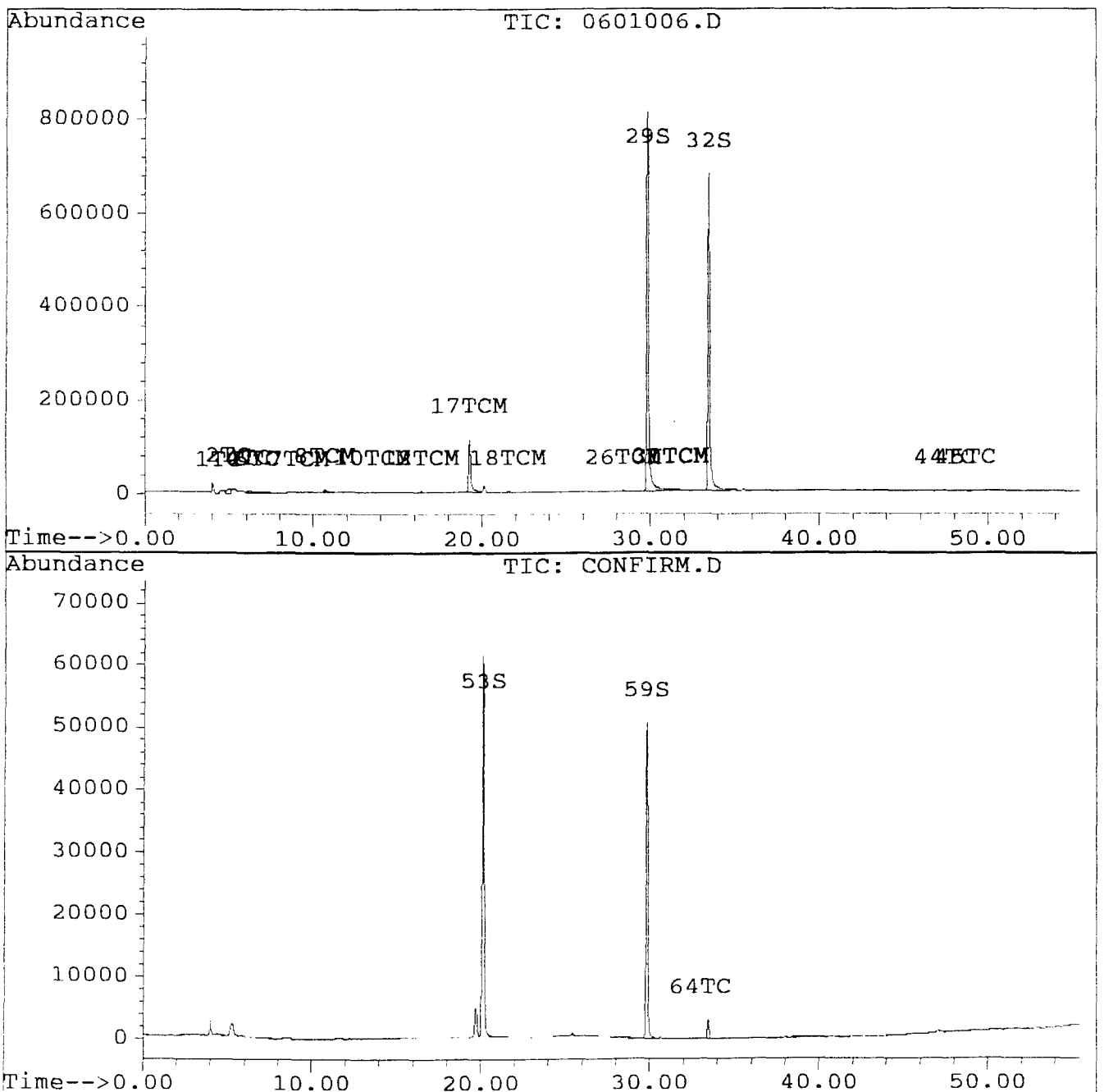
Mark W. Bostrom
Project Manager

Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\0601006.D Vial: 6
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\0601006.D\CONFIRM.D
Acq On : 19 May 95 11:47 PM Operator: PK
Sample : 33493 DF1 Inst : P&T #1
Misc : Multiplr: 1.00
Quant Time: May 20 0:44 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Wed May 17 18:52:38 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



Mountain States Analytical
The Quality Solution

Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Paul Weissenborn
Project: Kirtland, NM

Sample ID: MW-17
Matrix: Waste Water

MSAI Sample: 33494
MSAI Group: 8292
Date Reported: 05/24/95

Discard Date: 06/23/95
Date Submitted: 05/18/95
Date Sampled: 05/17/95
Collected by: DA
Purchase Order: 6561
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
5515	Purgeable Aromatics/Halocarbons Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	10	05/20/95	PWK
	Benzene	9,320	ug/l	200	05/23/95	PWK
	Toluene	2,510	ug/l	200	05/23/95	PWK
	Ethylbenzene	694	ug/l	200	05/23/95	PWK
	m,p-Xylene	2,880	ug/l	200	05/23/95	PWK
	o-Xylene	902	ug/l	200	05/23/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

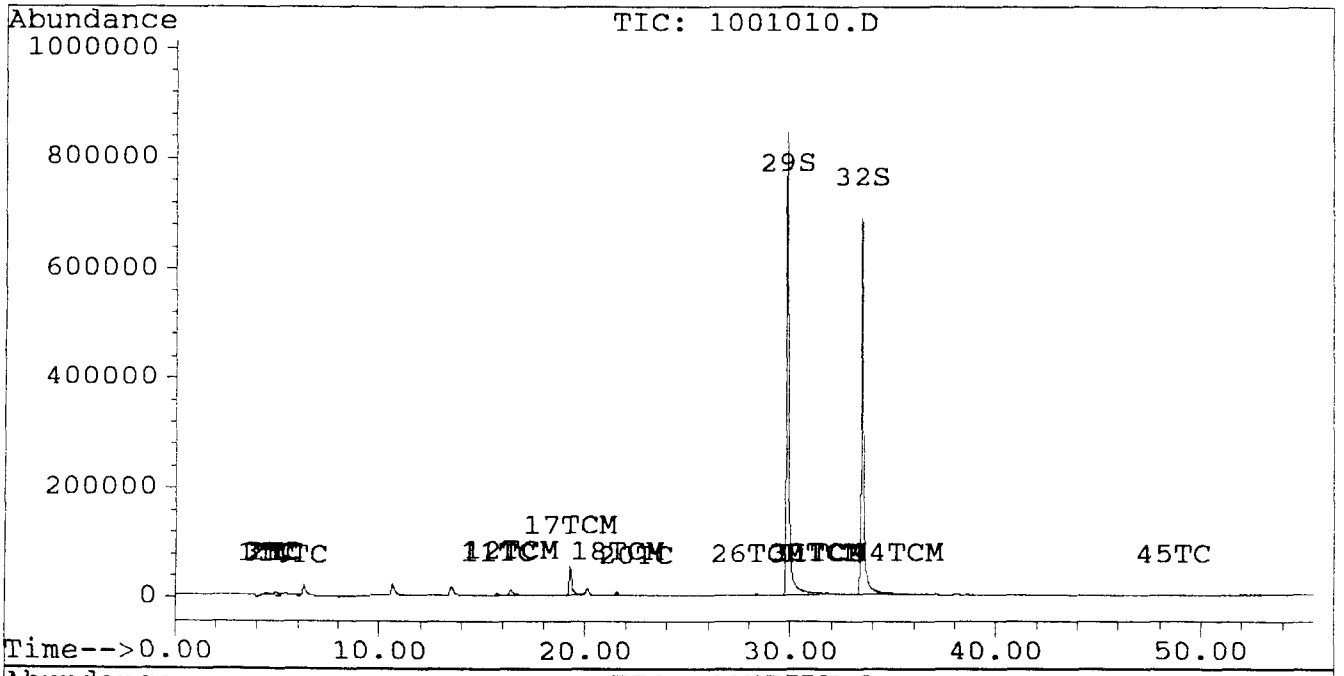
Mark W. Bostrom
Project Manager

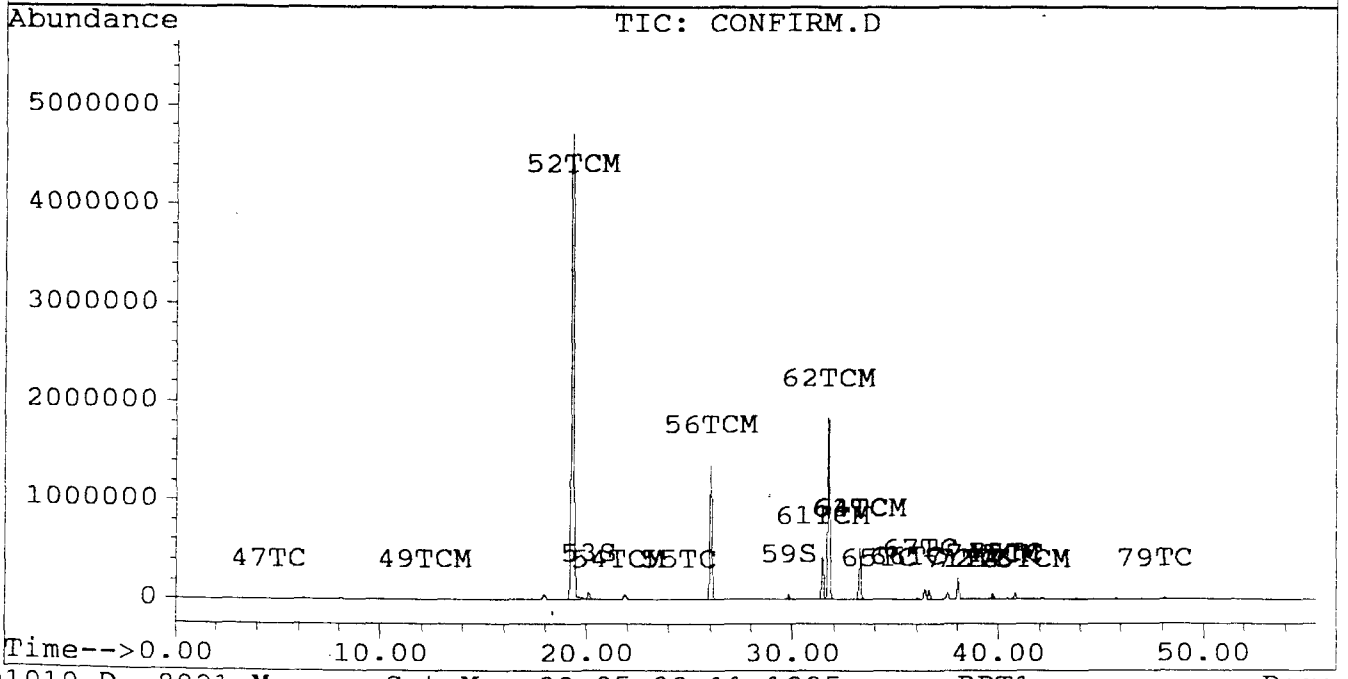
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\1001010.D Vial: 10
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\1001010.D\CONFIRM.D
Acq On : 20 May 95 04:23 AM Operator: PK
Sample : 33494 DF10 Inst : P&T #1
Misc : Multiplr: 10.00
Quant Time: May 20 5:20 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Wed May 17 18:52:38 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



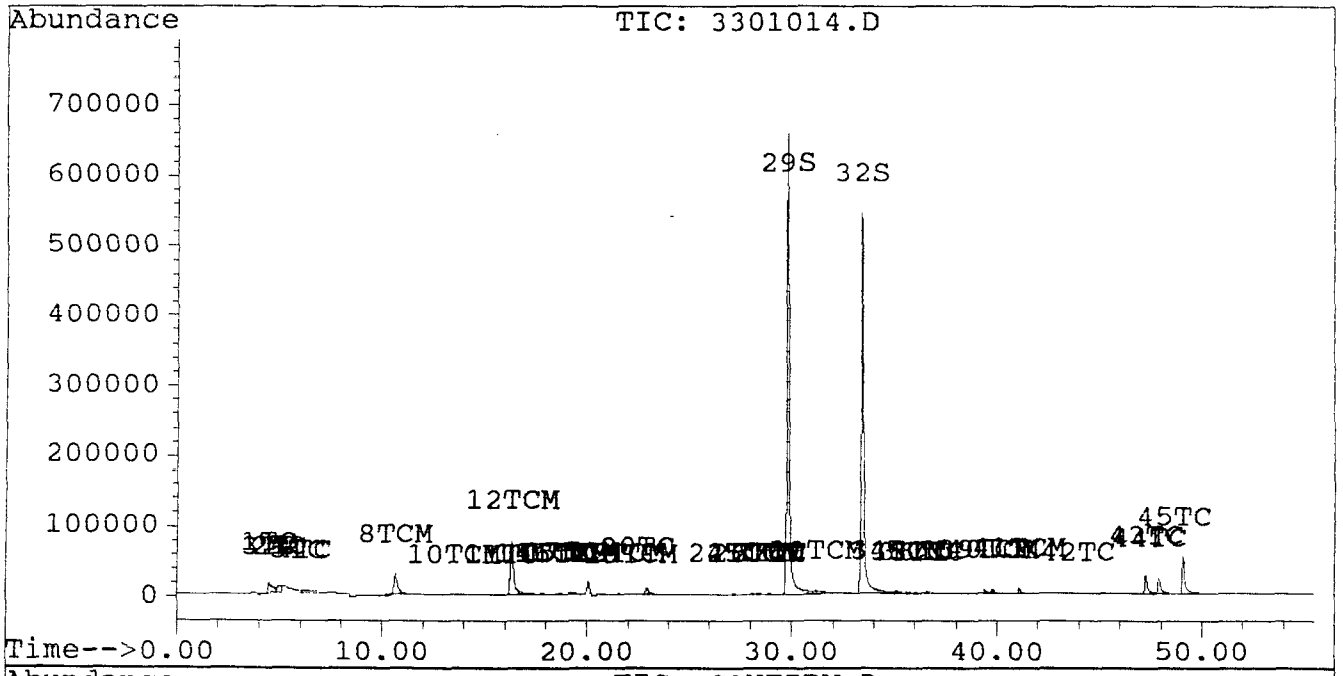


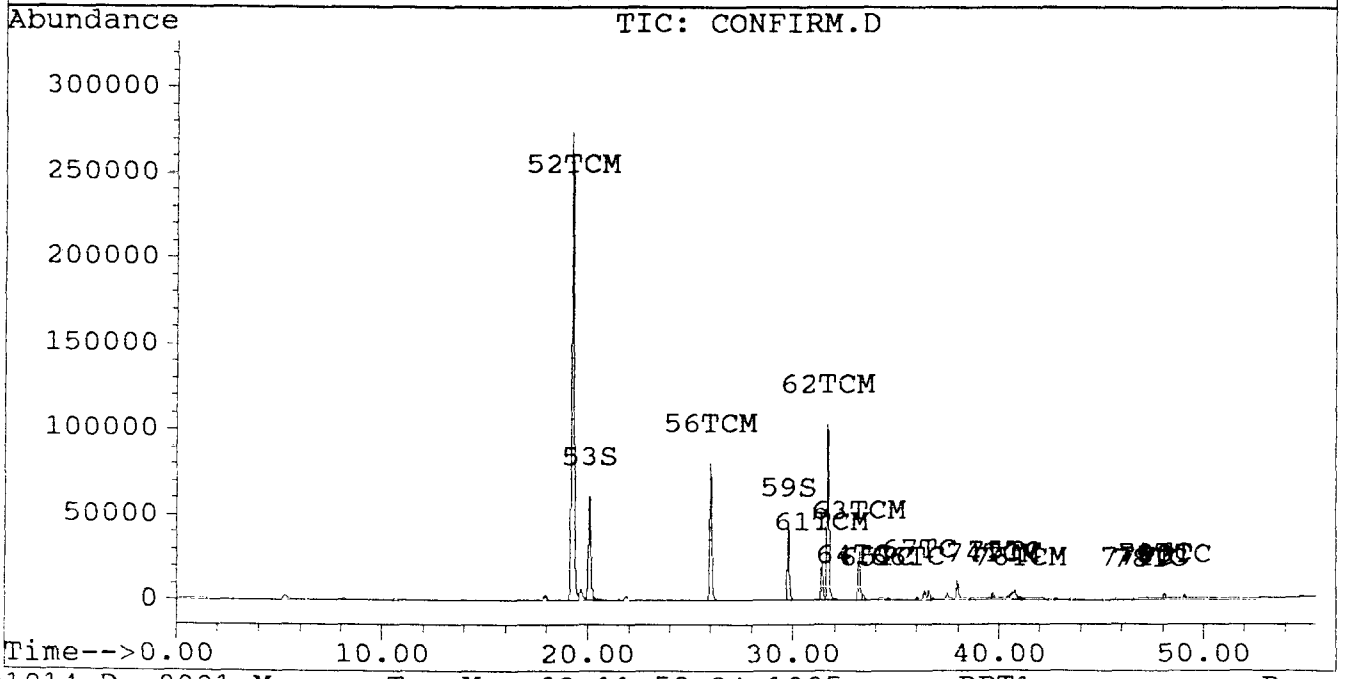
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\3301014.D Vial: 33
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\3301014.D\CONFIRM.D
Acq On : 23 May 95 11:00 AM Operator: PK
Sample : 33494RE DF200 Inst : P&T #1
Misc : Multiplr: 200.00
Quant Time: May 23 11:57 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Mon May 22 14:36:22 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Paul Weissenborn
Project: Kirtland, NM

Sample ID: MW-17A
Matrix: Waste Water

MSAI Sample: 33495
MSAI Group: 8292
Date Reported: 05/24/95

Discard Date: 06/23/95
Date Submitted: 05/18/95
Date Sampled: 05/17/95
Collected by: DA
Purchase Order: 6561
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
5515	Purgeable Aromatics/Halocarbons Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	10	05/20/95	PWK
	Benzene	12,800	ug/l	500	05/23/95	PWK
	Toluene	4,460	ug/l	500	05/23/95	PWK
	Ethylbenzene	944	ug/l	500	05/23/95	PWK
	m,p-Xylene	4,340	ug/l	500	05/23/95	PWK
	o-Xylene	1,370	ug/l	500	05/23/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

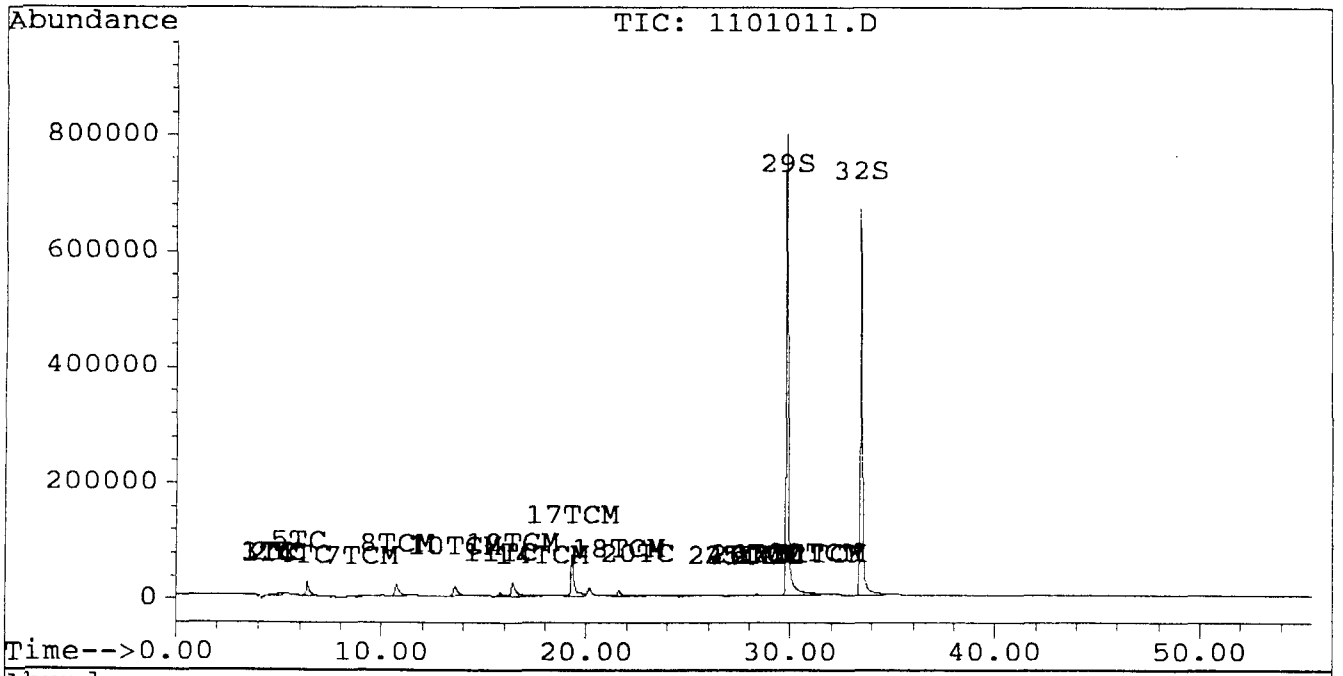
Mark W. Bostrom
Project Manager

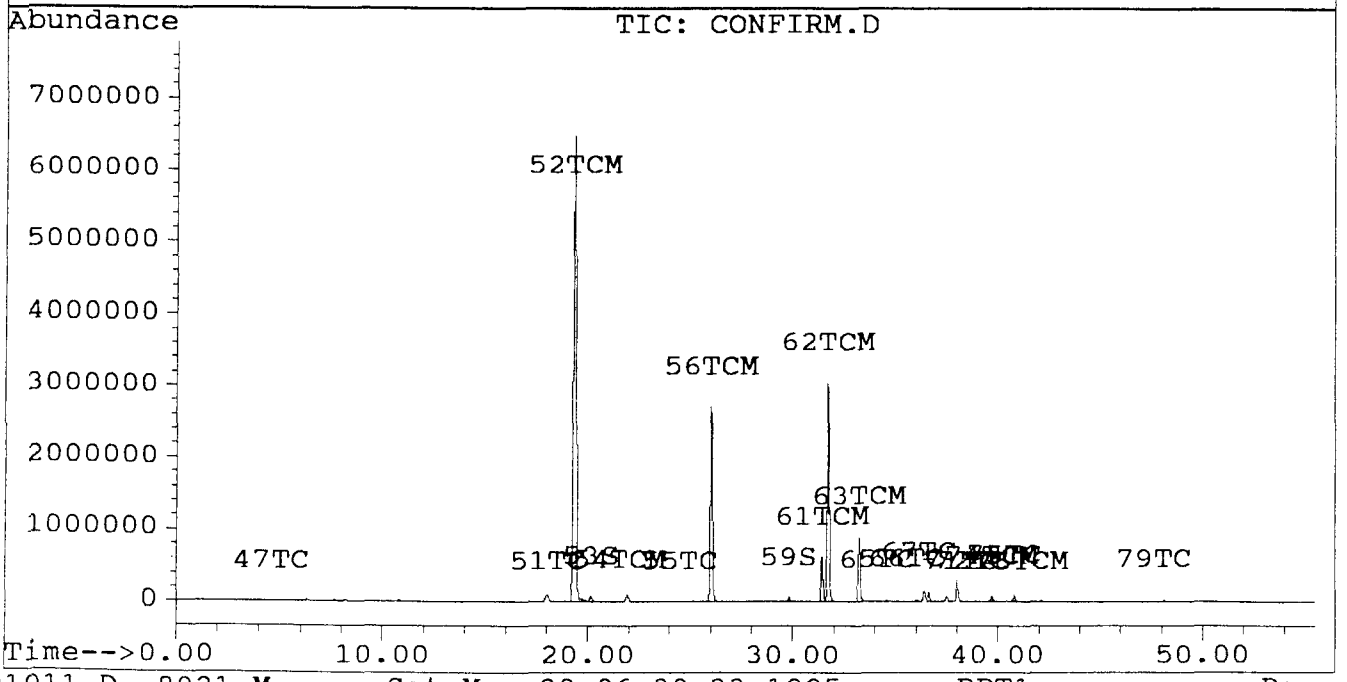
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\1101011.D Vial: 11
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\1101011.D\CONFIRM.D
Acq On : 20 May 95 05:32 AM Operator: PK
Sample : 33495 DF10 Inst : P&T #1
Misc : Multiplr: 10.00
Quant Time: May 20 6:29 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Wed May 17 18:52:38 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



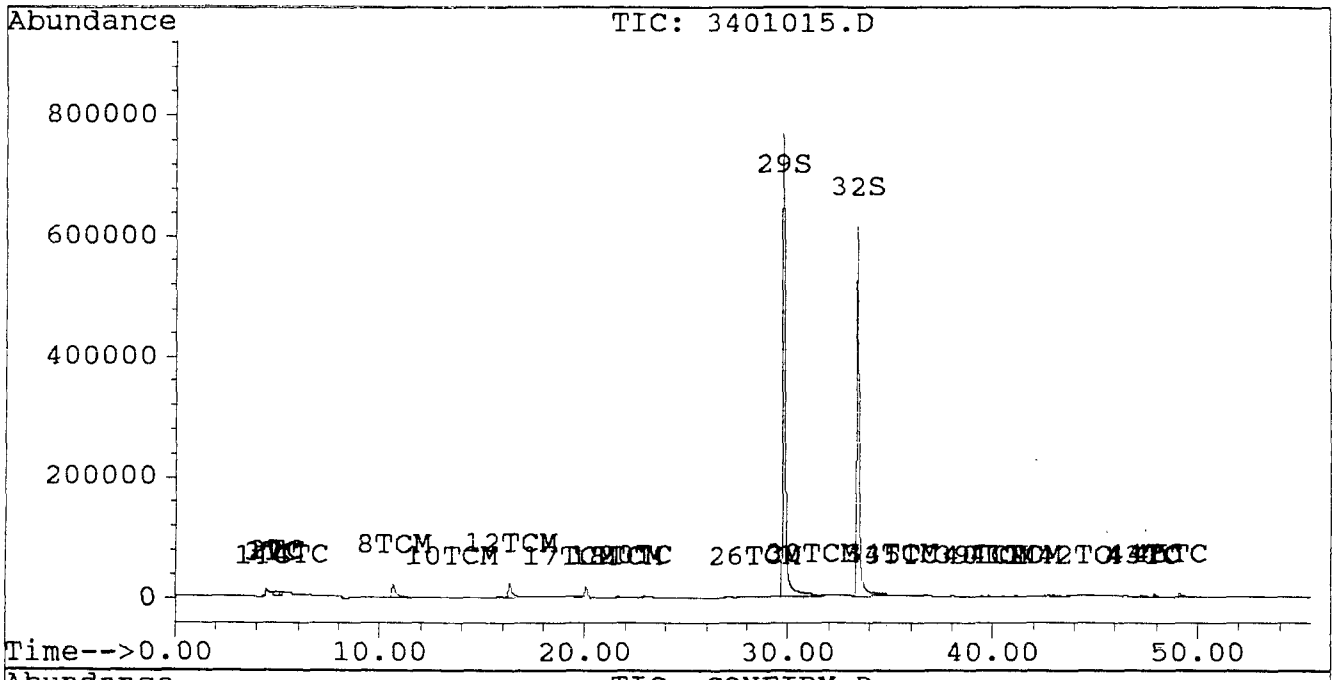


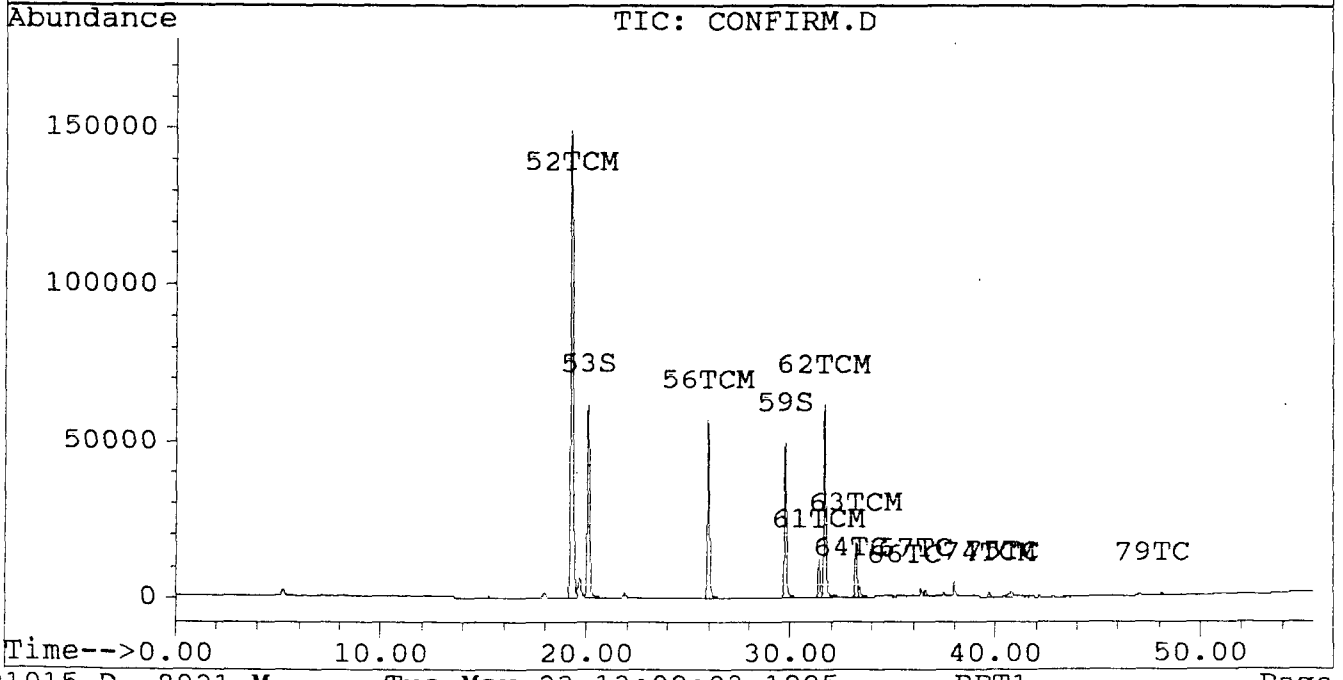
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\3401015.D Vial: 34
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\3401015.D\CONFIRM.D
Acq On : 23 May 95 12:10 PM Operator: PK
Sample : 33495RE DF500 Inst : P&T #1
Misc : Multiplr: 500.00
Quant Time: May 23 13:07 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Mon May 22 14:36:22 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Paul Weissenborn
Project: Kirtland, NM

Sample ID: MW-18
Matrix: Waste Water

MSAI Sample: 33496
MSAI Group: 8292
Date Reported: 05/24/95

Discard Date: 06/23/95
Date Submitted: 05/18/95
Date Sampled: 05/17/95
Collected by: DA
Purchase Order: 6561
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
5515	Purgeable Aromatics/Halocarbons Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	1.0	05/20/95	PWK
	Benzene	128	ug/l	20	05/22/95	PWK
	Toluene	ND	ug/l	1.0	05/20/95	PWK
	Ethylbenzene	10.4	ug/l	1.0	05/20/95	PWK
	m,p-Xylene	274	ug/l	20	05/22/95	PWK
	o-Xylene	ND	ug/l	1.0	05/20/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

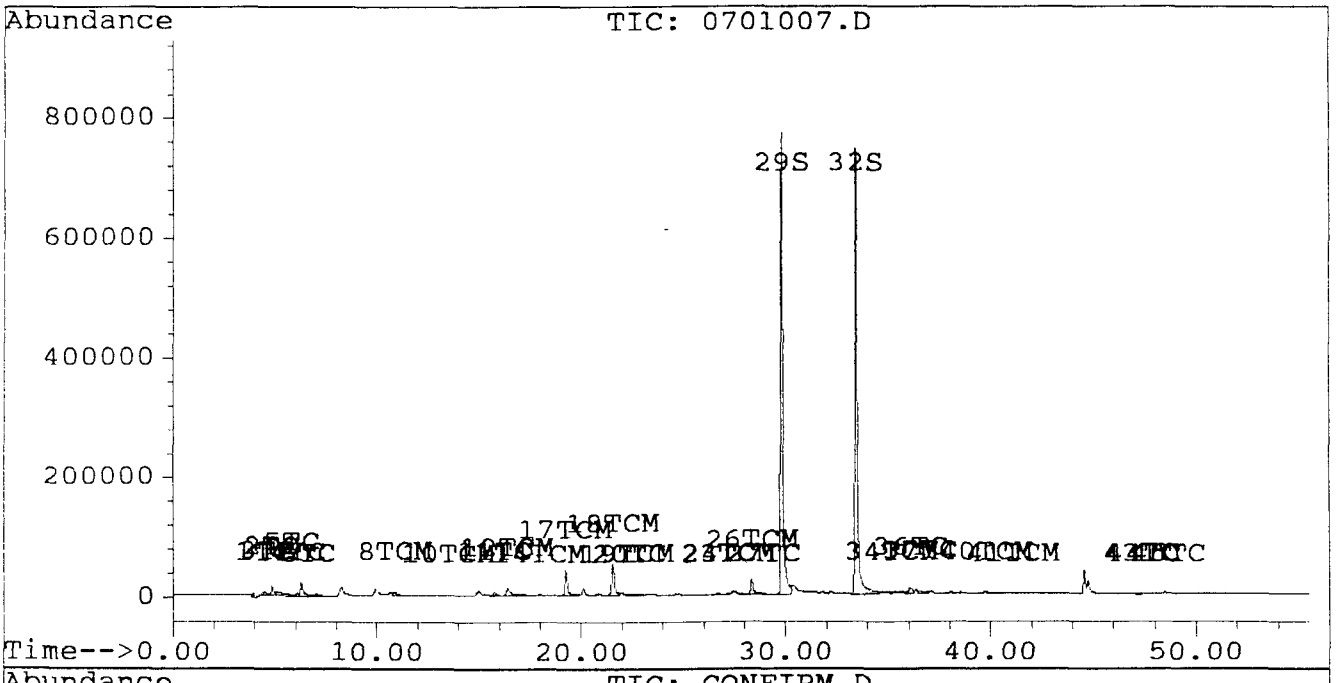
Mark W. Bostrom
Project Manager

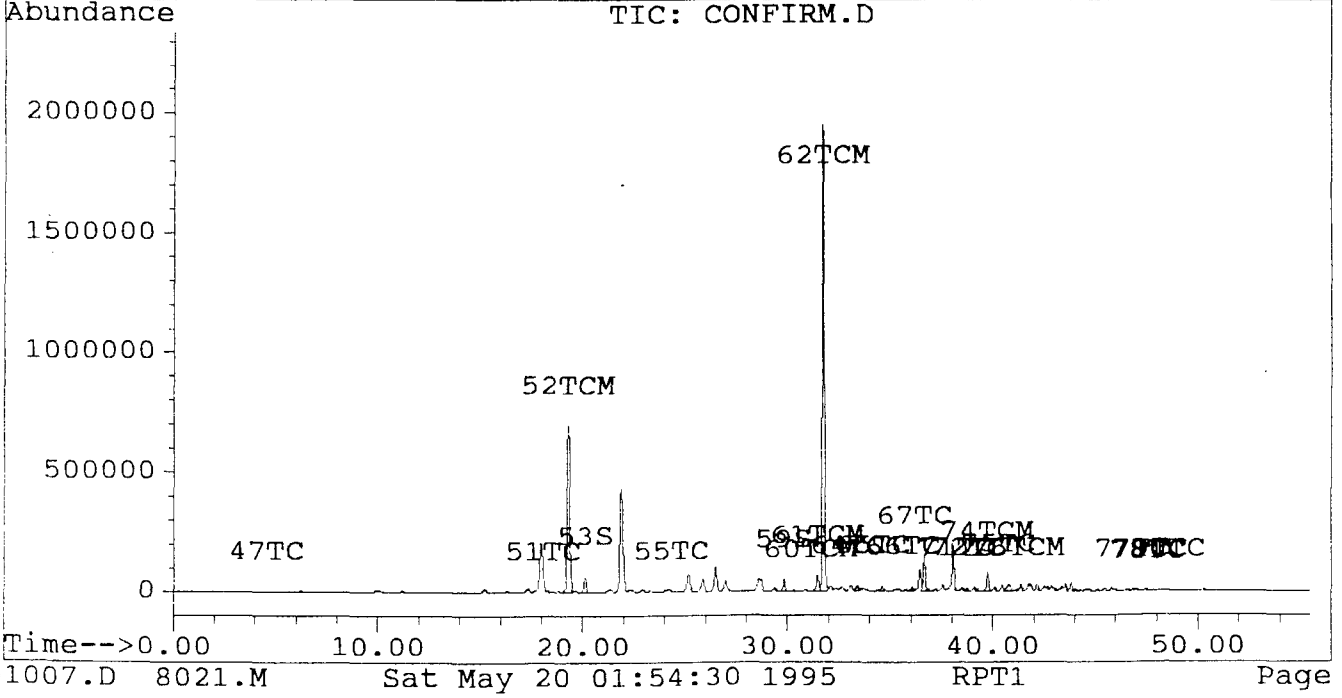
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\0701007.D Vial: 7
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\0701007.D\CONFIRM.D
Acq On : 20 May 95 00:55 AM Operator: PK
Sample : 33496 DF1 Inst : P&T #1
Misc : Multiplr: 1.00
Quant Time: May 20 1:52 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Wed May 17 18:52:38 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



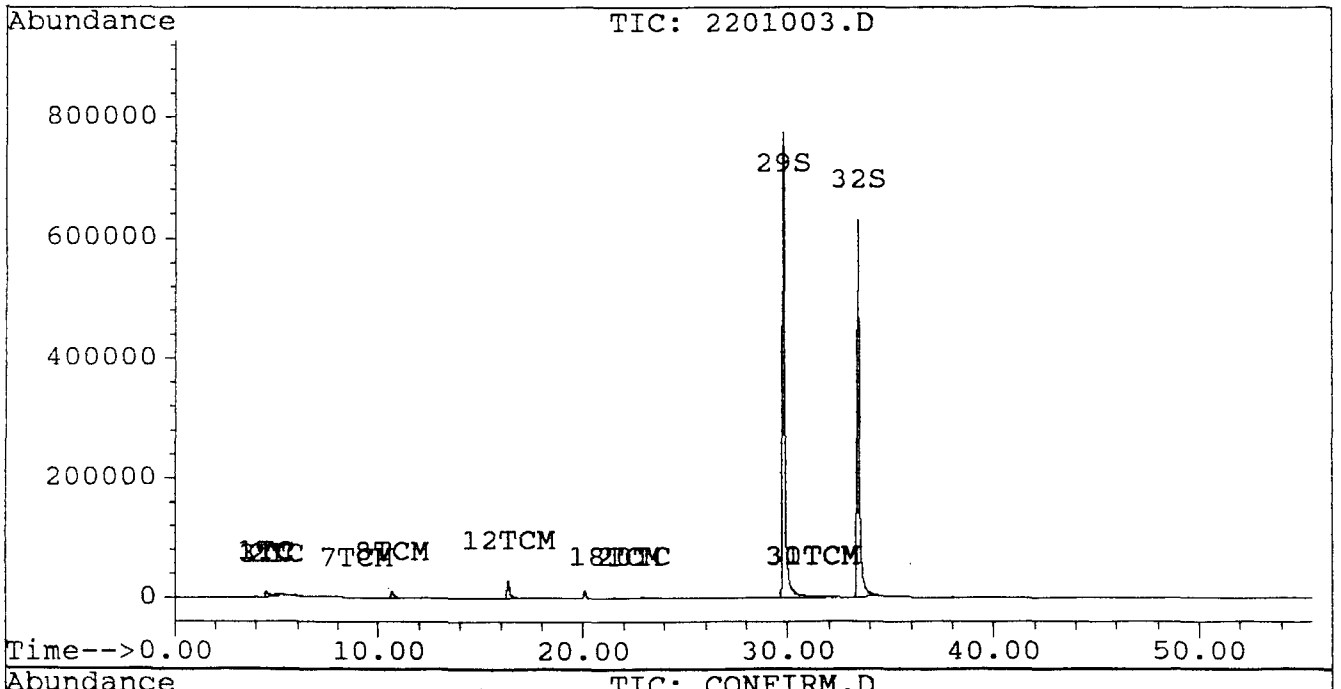


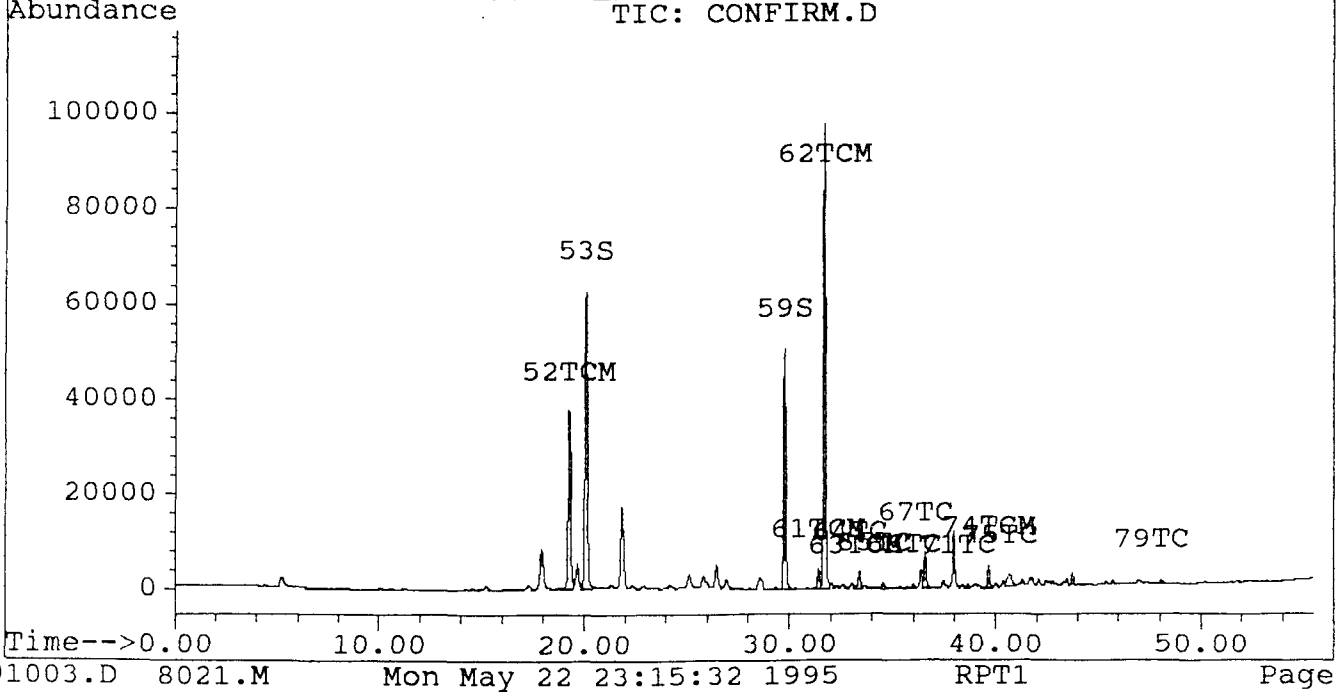
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\2201003.D Vial: 22
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\2201003.D\CONFIRM.D
Acq On : 22 May 95 10:17 PM Operator: PK
Sample : 33496RE DF20 Inst : P&T #1
Misc : Multiplr: 20.00
Quant Time: May 22 23:14 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Mon May 22 14:36:22 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Paul Weissenborn
Project: Kirtland, NM

Sample ID: MW-19
Matrix: Waste Water

MSAI Sample: 33497
MSAI Group: 8292
Date Reported: 05/24/95

Discard Date: 06/23/95
Date Submitted: 05/18/95
Date Sampled: 05/17/95
Collected by: DA
Purchase Order: 6561
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
5515	Purgeable Aromatics/Halocarbons Method: 600 SERIES 601/602					
	1,2-Dichloroethane	8.6	ug/l	1.0	05/20/95	PWK
	Benzene	ND	ug/l	1.0	05/20/95	PWK
	Toluene	ND	ug/l	1.0	05/20/95	PWK
	Ethylbenzene	ND	ug/l	1.0	05/20/95	PWK
	m,p-Xylene	ND	ug/l	1.0	05/20/95	PWK
	o-Xylene	ND	ug/l	1.0	05/20/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

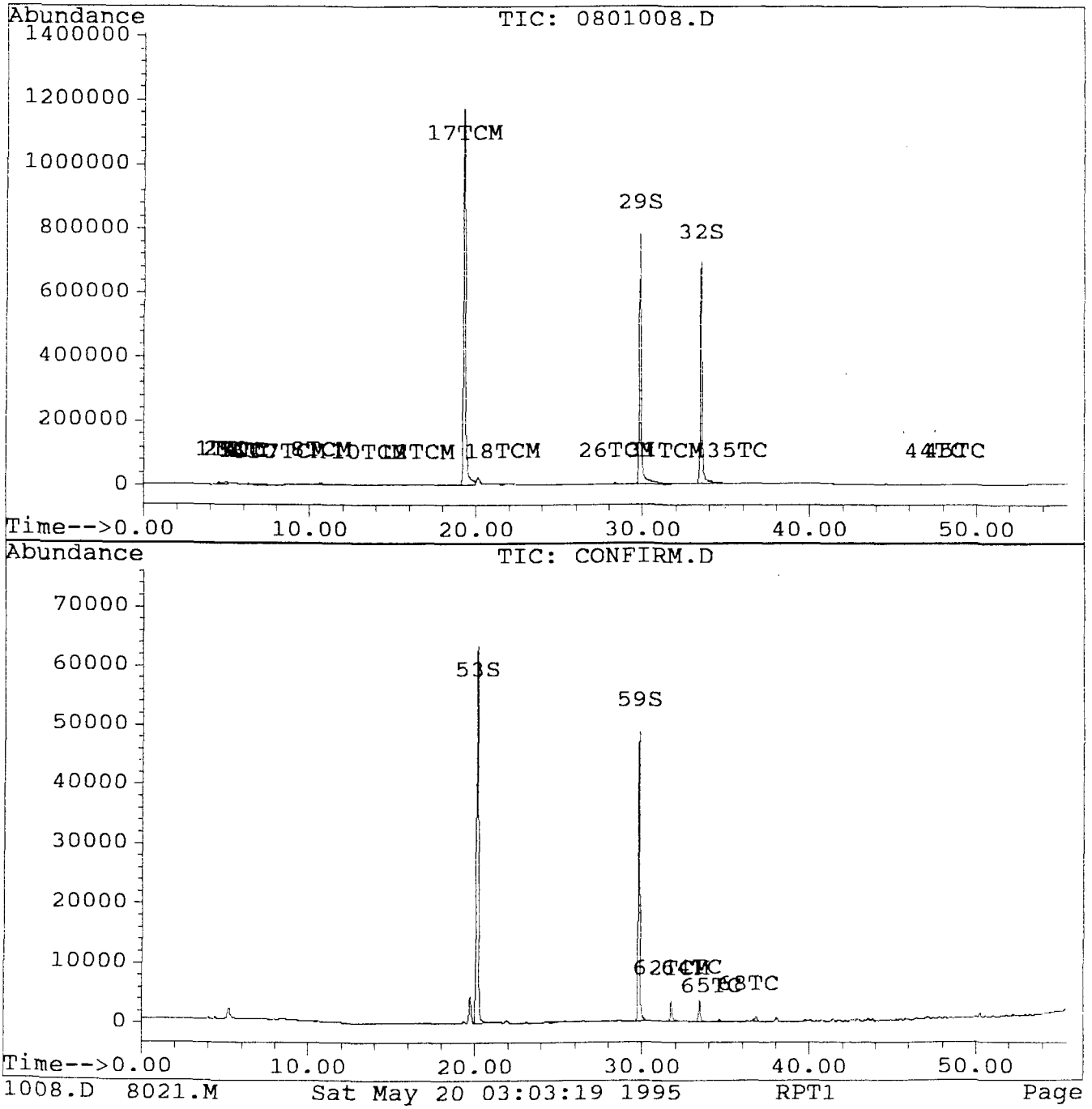
Mark W. Bostrom
Project Manager

Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\0801008.D Vial: 8
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\0801008.D\CONFIRM.D
Acq On : 20 May 95 02:04 AM Operator: PK
Sample : 33497 DF1 Inst : P&T #1
Misc : Multiplr: 1.00
Quant Time: May 20 3:01 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Wed May 17 18:52:38 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



Mountain States Analytical
The Quality Solution

Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Paul Weissenborn
Project: Kirtland, NM

Sample ID: MW-20
Matrix: Waste Water

MSAI Sample: 33498
MSAI Group: 8292
Date Reported: 05/24/95

Discard Date: 06/23/95
Date Submitted: 05/18/95
Date Sampled: 05/17/95
Collected by: DA
Purchase Order: 6561
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
5515	Purgeable Aromatics/Halocarbons Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	1.0	05/23/95	PWK
	Benzene	ND	ug/l	1.0	05/23/95	PWK
	Toluene	ND	ug/l	1.0	05/23/95	PWK
	Ethylbenzene	ND	ug/l	1.0	05/23/95	PWK
	m,p-Xylene	ND	ug/l	1.0	05/23/95	PWK
	o-Xylene	ND	ug/l	1.0	05/23/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

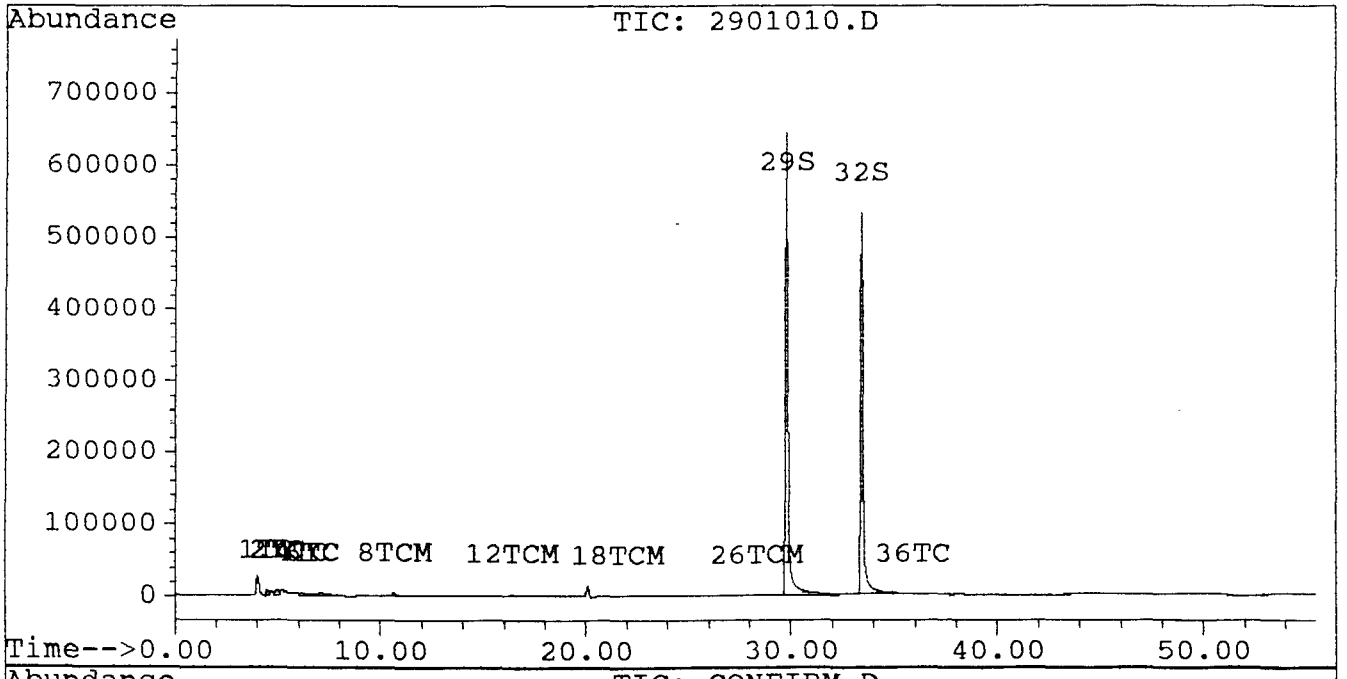
Mark W. Bostrom
Project Manager

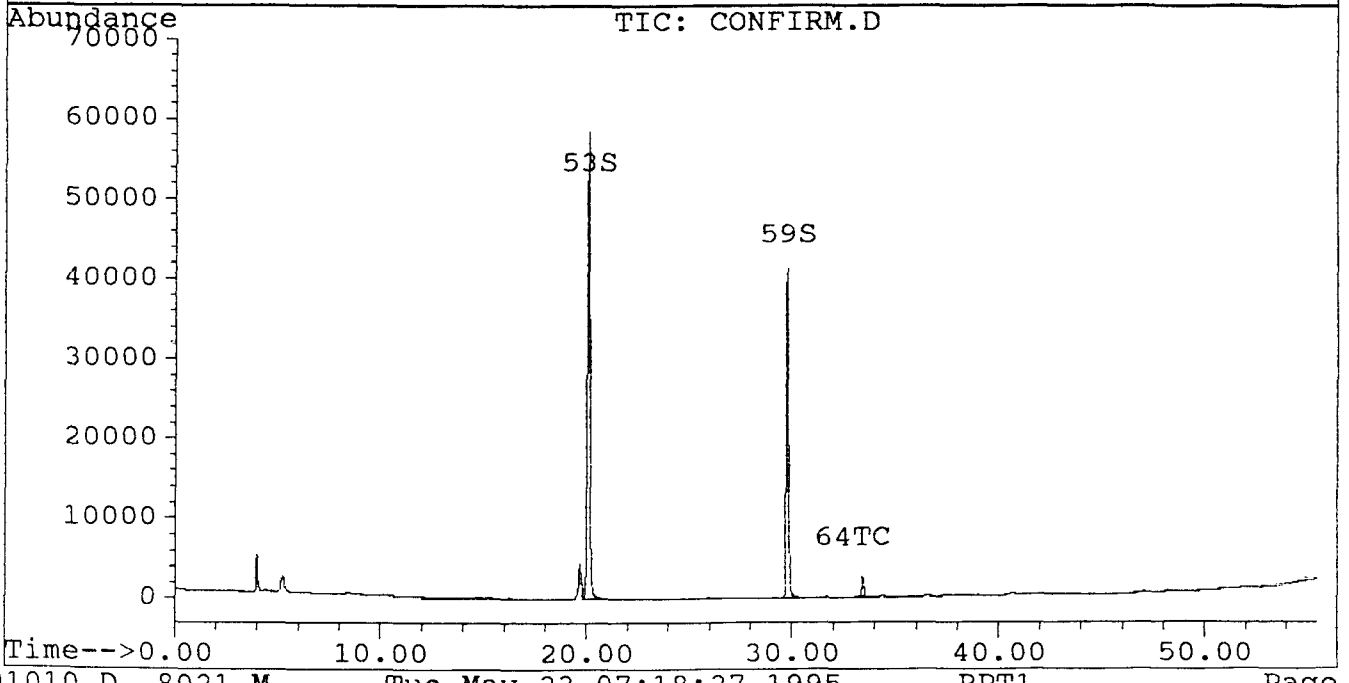
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\2901010.D Vial: 29
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\2901010.D\CONFIRM.D
Acq On : 23 May 95 06:20 AM Operator: PK
Sample : 33498 DF1 Inst : P&T #1
Misc : Multiplr: 1.00
Quant Time: May 23 7:17 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Mon May 22 14:36:22 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Paul Weissenborn
Project: Kirtland, NM

Sample ID: MW-21
Matrix: Waste Water

MSAI Sample: 33499
MSAI Group: 8292
Date Reported: 05/24/95

Discard Date: 06/23/95
Date Submitted: 05/18/95
Date Sampled: 05/17/95
Collected by: DA
Purchase Order: 6561
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
5515	Purgeable Aromatics/Halocarbons Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	1.0	05/23/95	PWK
	Benzene	ND	ug/l	1.0	05/23/95	PWK
	Toluene	ND	ug/l	1.0	05/23/95	PWK
	Ethylbenzene	ND	ug/l	1.0	05/23/95	PWK
	m,p-Xylene	ND	ug/l	1.0	05/23/95	PWK
	o-Xylene	ND	ug/l	1.0	05/23/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

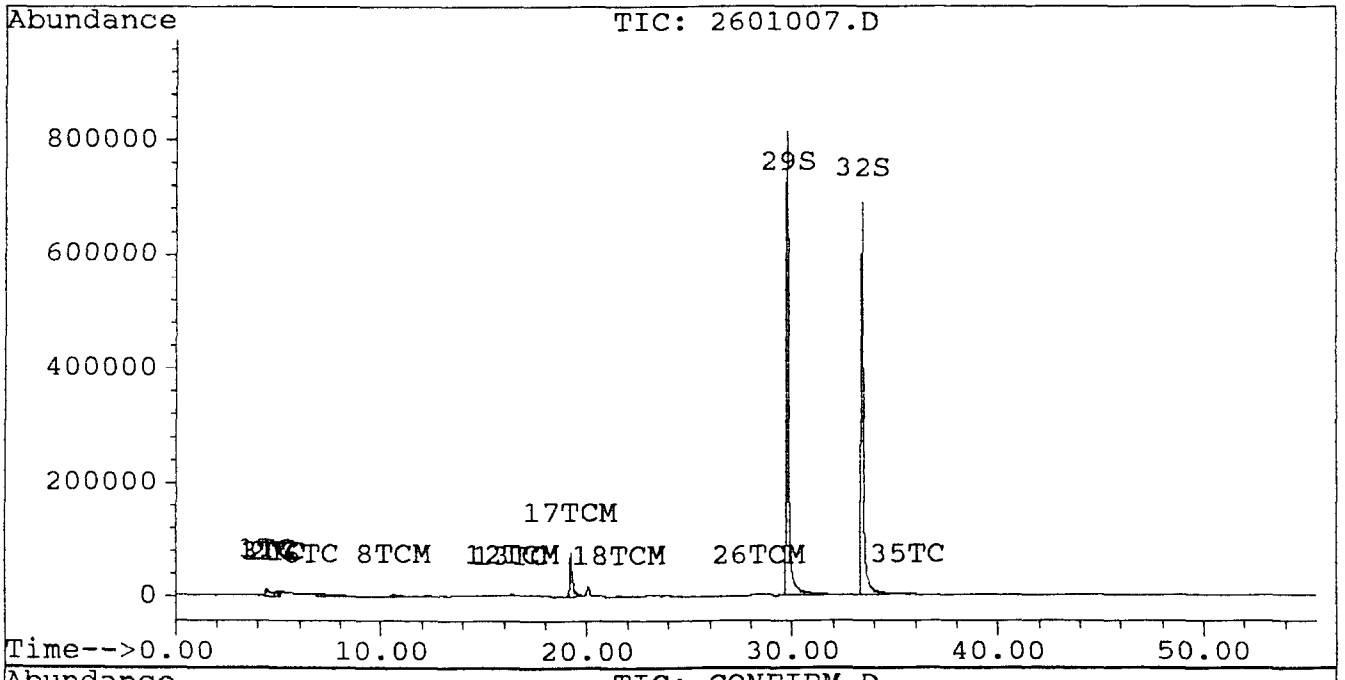
Mark W. Bostrom
Project Manager

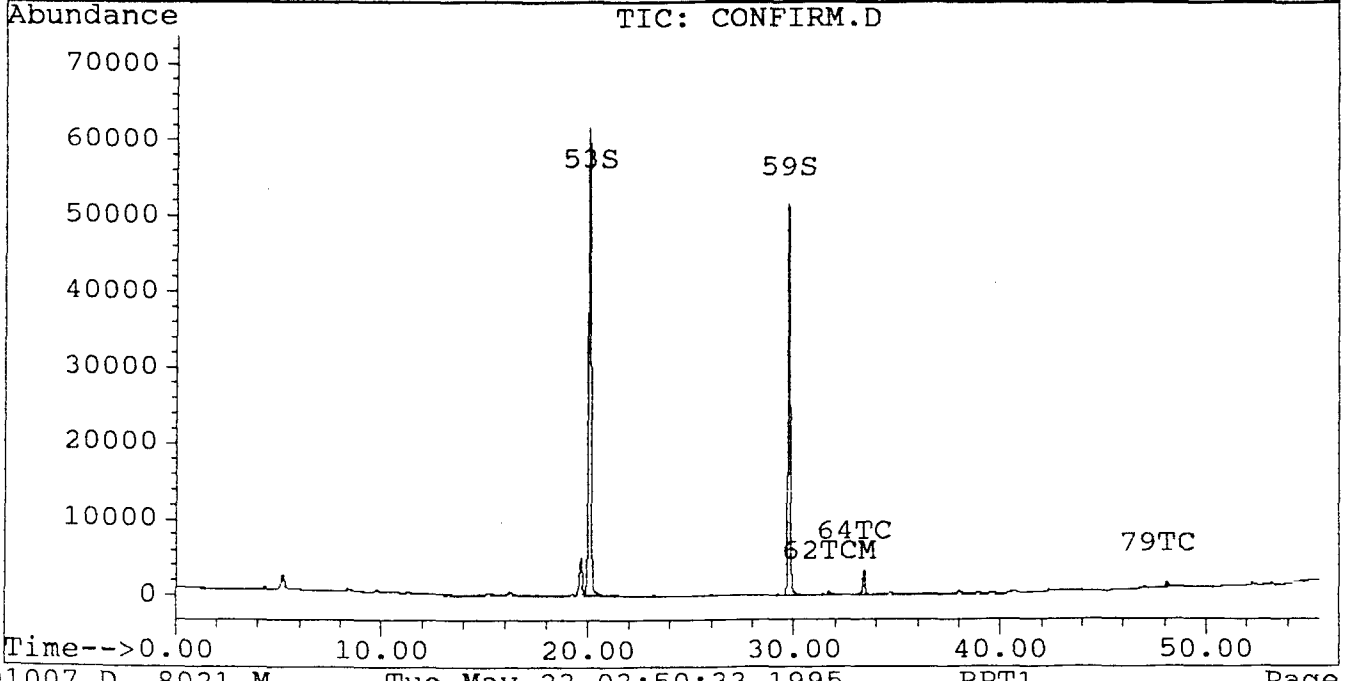
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\2601007.D Vial: 26
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\2601007.D\CONFIRM.D
Acq On : 23 May 95 02:52 AM Operator: PK
Sample : 33499 DF1 Inst : P&T #1
Misc : Multiplr: 1.00
Quant Time: May 23 3:49 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Mon May 22 14:36:22 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Paul Weissenborn
Project: Kirtland, NM

Sample ID: MW-22
Matrix: Waste Water

MSAI Sample: 33500
MSAI Group: 8292
Date Reported: 05/24/95

Discard Date: 06/23/95
Date Submitted: 05/18/95
Date Sampled: 05/17/95
Collected by: DA
Purchase Order: 6561
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
5515	Purgeable Aromatics/Halocarbons Method: 600 SERIES 601/602					
	1,2-Dichloroethane	62	ug/l	20	05/22/95	PWK
	Benzene	7,510	ug/l	200	05/23/95	PWK
	Toluene	1,750	ug/l	200	05/23/95	PWK
	Ethylbenzene	1,000	ug/l	200	05/23/95	PWK
	m,p-Xylene	4,890	ug/l	200	05/23/95	PWK
	o-Xylene	1,630	ug/l	200	05/23/95	PWK

Respectfully Submitted,
Reviewed and Approved by:

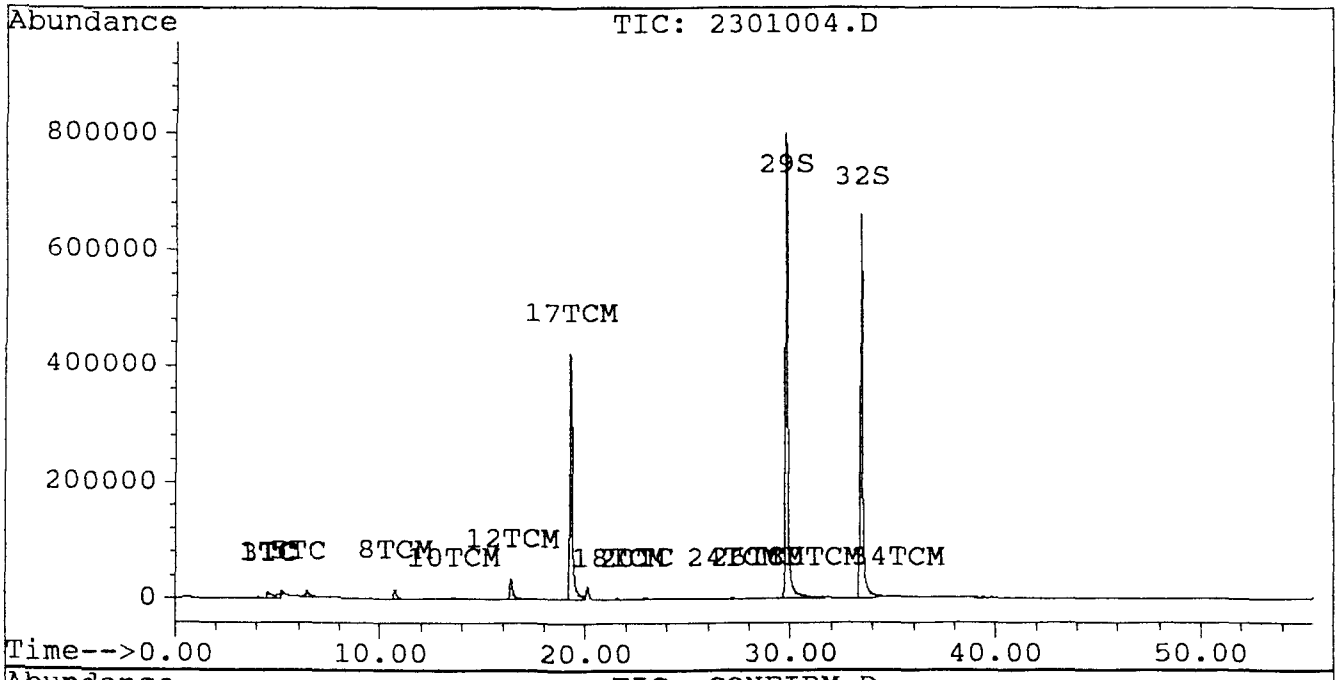
Mark W. Bostrom
Project Manager

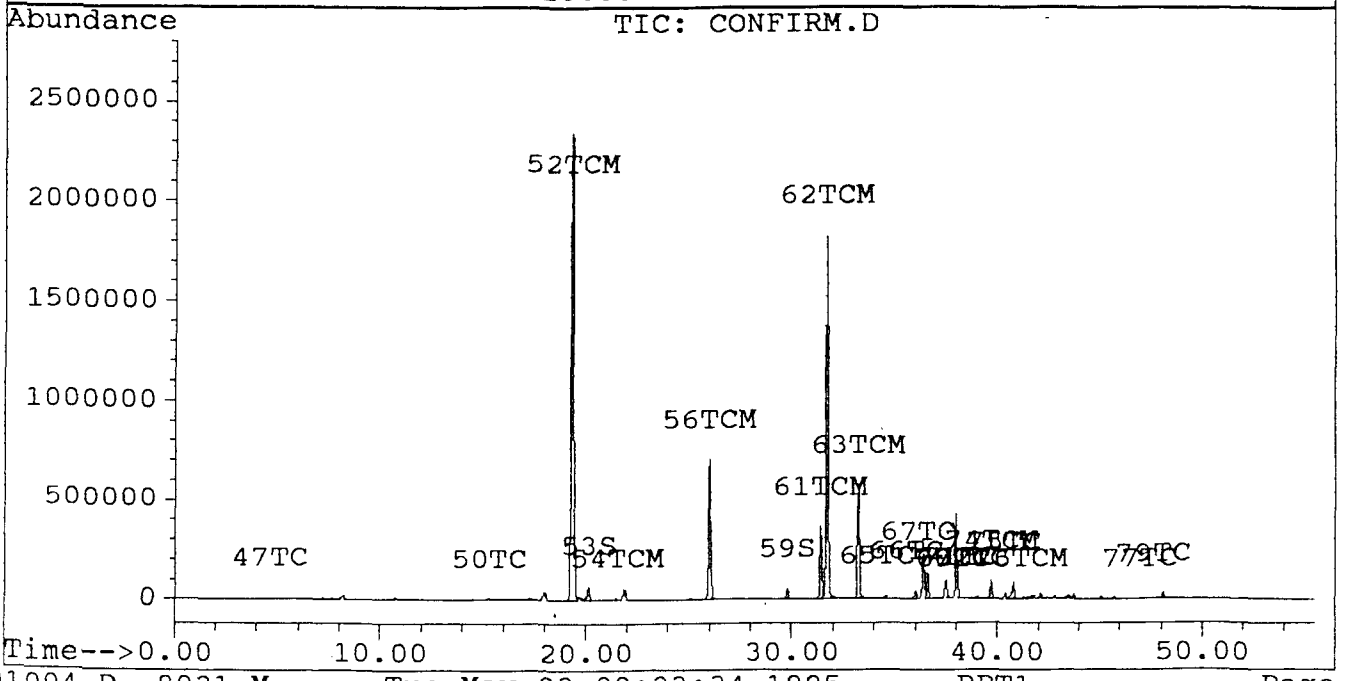
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\2301004.D Vial: 23
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\2301004.D\CONFIRM.D
Acq On : 22 May 95 11:25 PM Operator: PK
Sample : 33500 DF20 Inst : P&T #1
Misc : Multiplr: 20.00
Quant Time: May 23 0:22 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Mon May 22 14:36:22 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



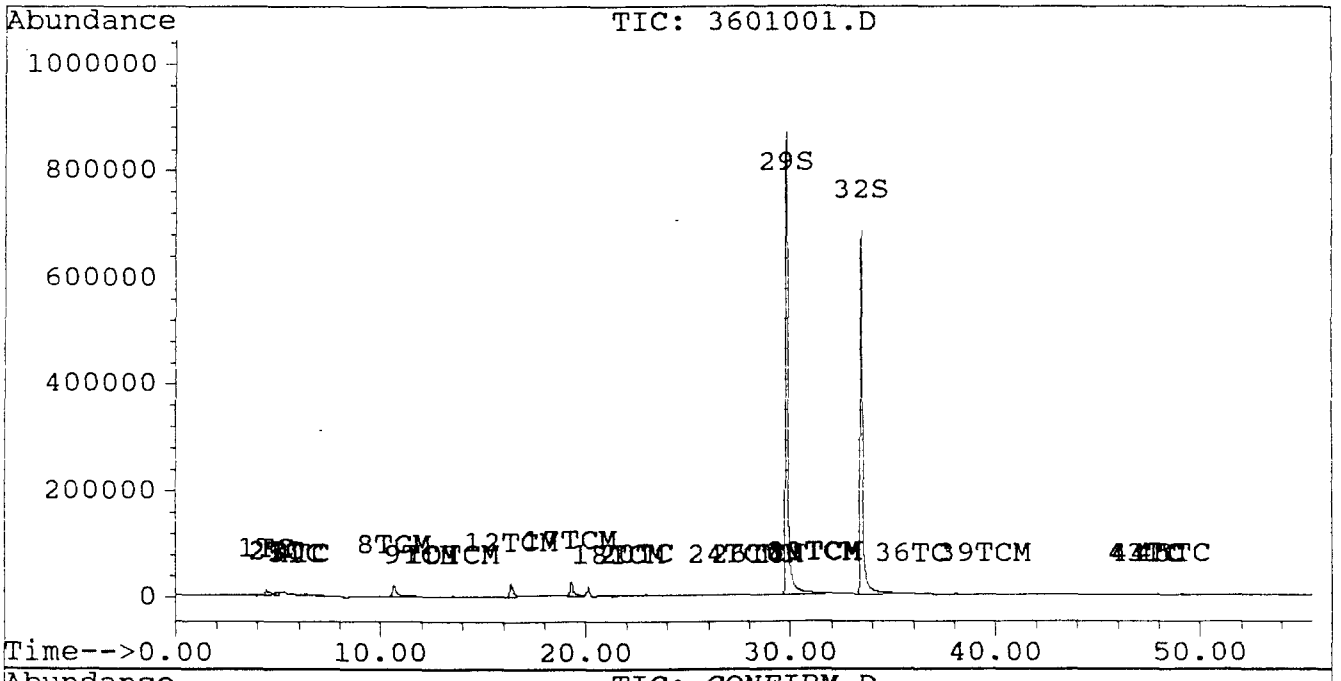


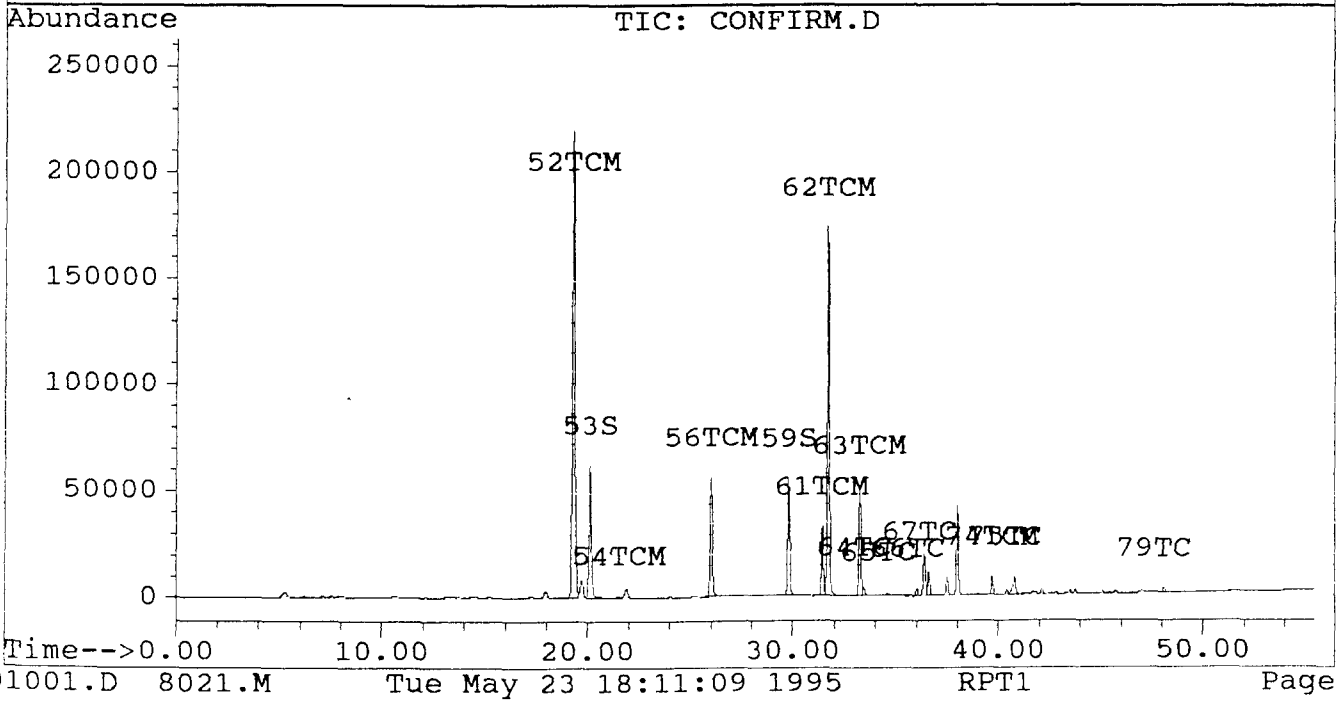
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\3601001.D Vial: 36
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\3601001.D\CONFIRM.D
Acq On : 23 May 95 05:12 PM Operator: PK
Sample : 33500 DF200 Inst : P&T #1
Misc : Multiplr: 200.00
Quant Time: May 23 18:09 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Mon May 22 14:36:22 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Paul Weissenborn
Project: Kirtland, NM

Sample ID: MW-22A
Matrix: Waste Water

MSAI Sample: 33501
MSAI Group: 8292
Date Reported: 05/24/95

Discard Date: 06/23/95
Date Submitted: 05/18/95
Date Sampled: 05/17/95
Collected by: DA
Purchase Order: 6561
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
5515	Purgeable Aromatics/Halocarbons Method: 600 SERIES 601/602					
	1,2-Dichloroethane	67	ug/l	20	05/23/95	PWK
	Benzene	9,020	ug/l	500	05/23/95	PWK
	Toluene	2,620	ug/l	500	05/23/95	PWK
	Ethylbenzene	1,230	ug/l	500	05/23/95	PWK
	m,p-Xylene	5,420	ug/l	500	05/23/95	PWK
	o-Xylene	1,890	ug/l	500	05/23/95	PWK

Respectfully Submitted,
Reviewed and Approved by:

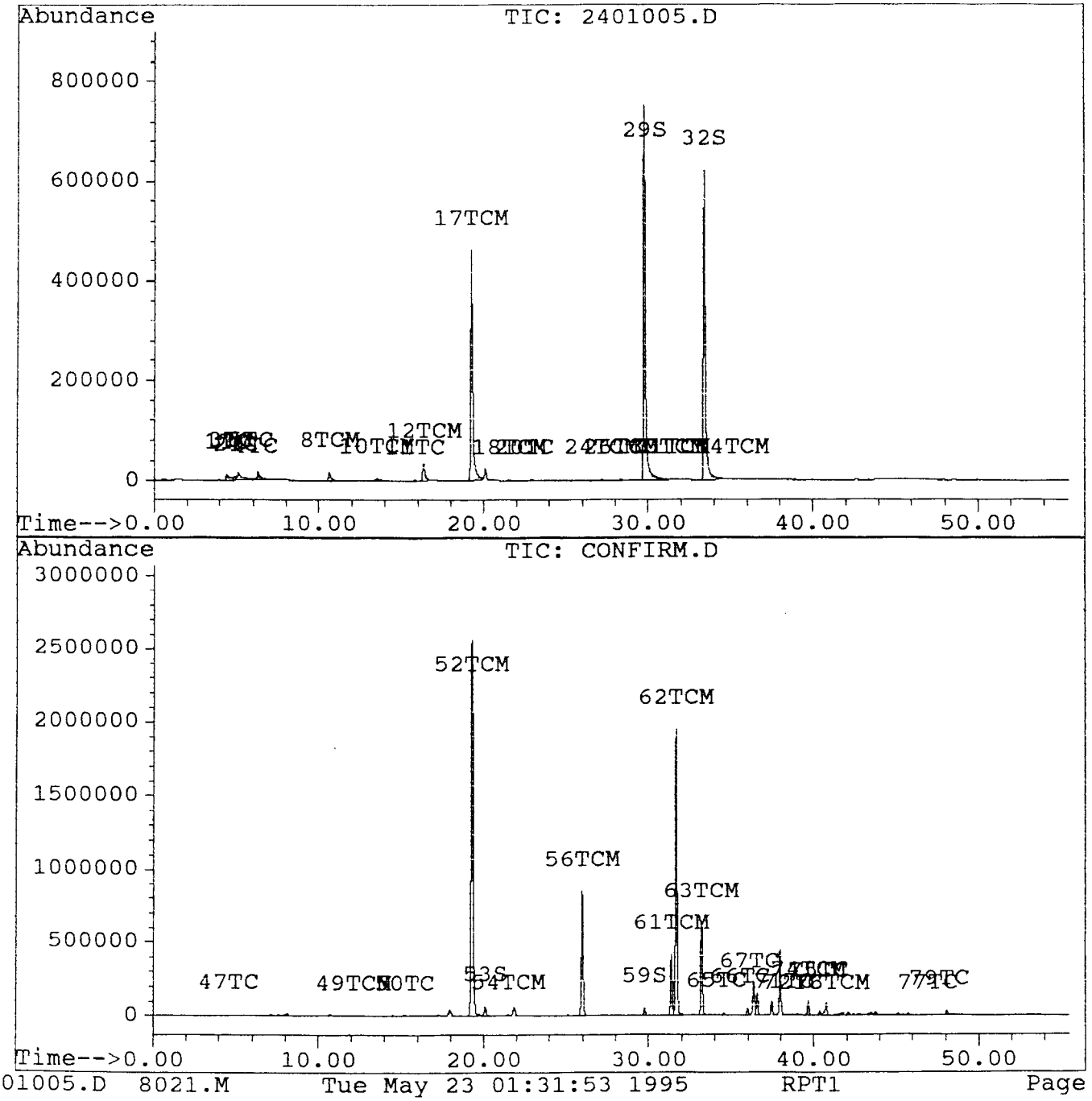
Mark W. Bostrom
Project Manager

Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\2401005.D Vial: 24
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\2401005.D\CONFIRM.D
Acq On : 23 May 95 00:33 AM Operator: PK
Sample : 33501 DF20 Inst : P&T #1
Misc : Multiplr: 20.00
Quant Time: May 23 1:30 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Mon May 22 14:36:22 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm

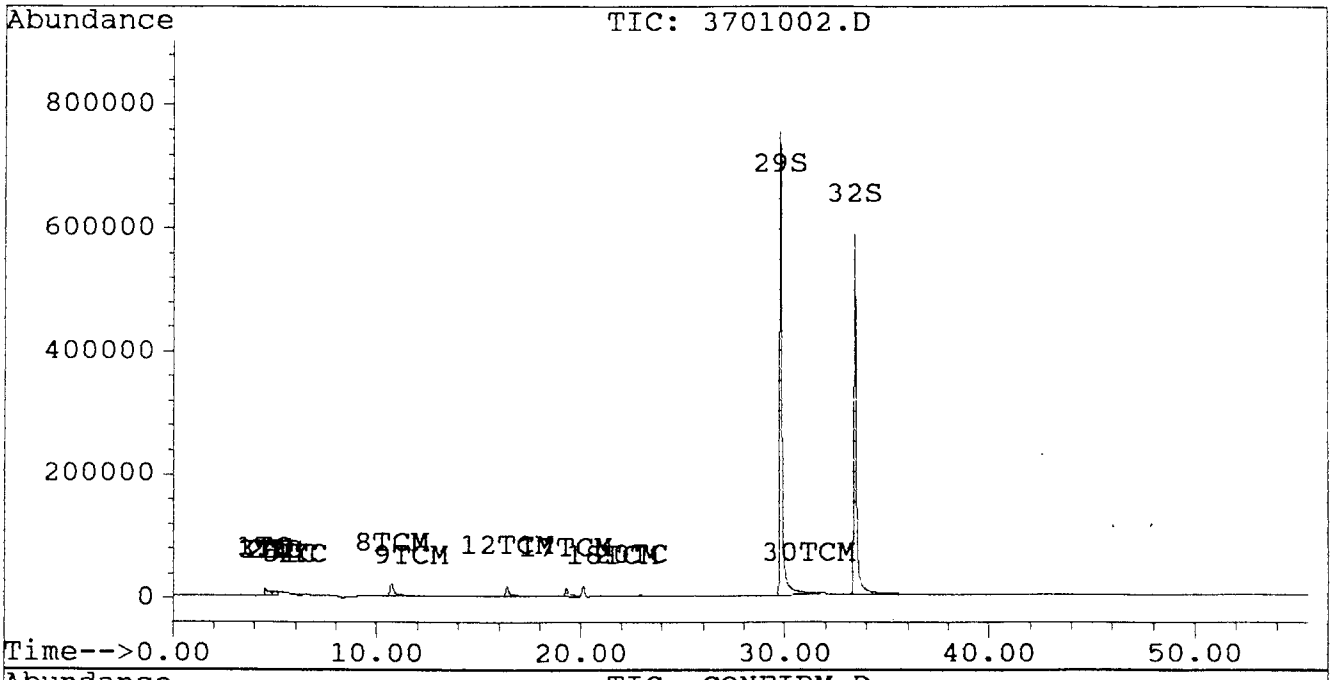


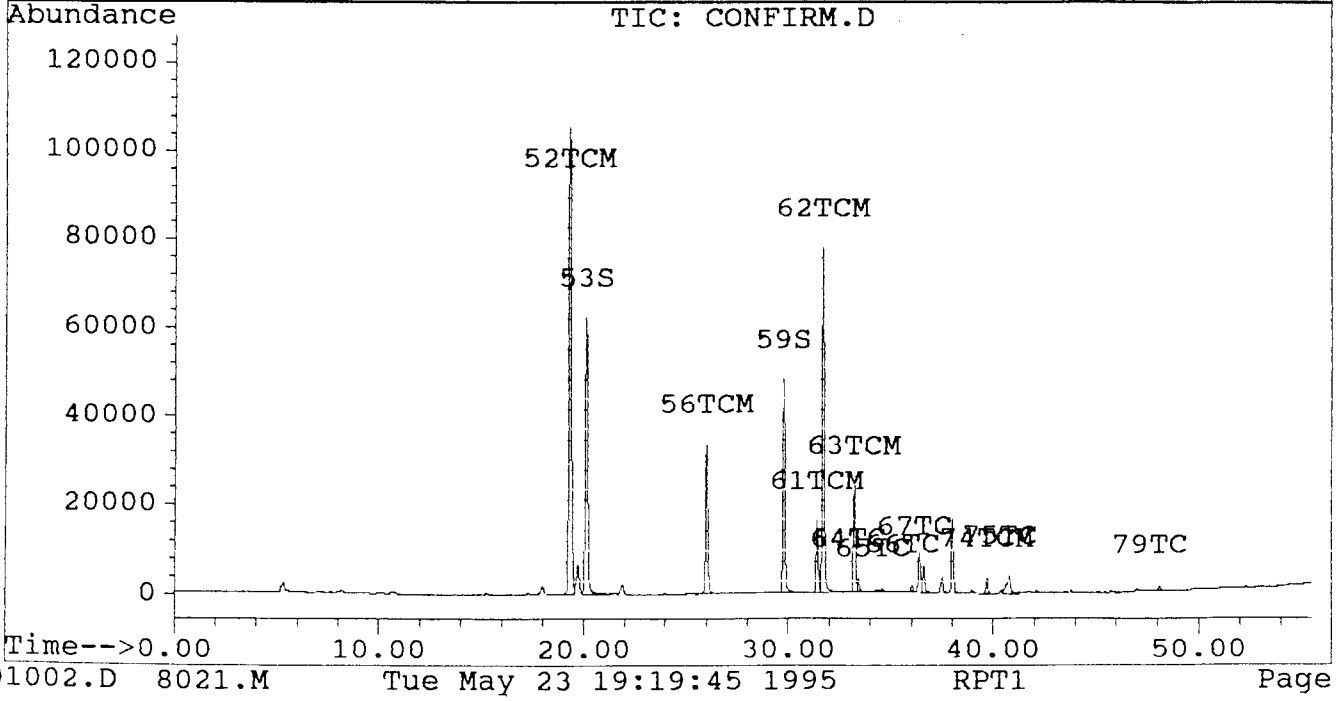
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\3701002.D Vial: 37
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\3701002.D\CONFIRM.D
Acq On : 23 May 95 06:21 PM Operator: PK
Sample : 33501 DF500 Inst : P&T #1
Misc : Multiplr: 500.00
Quant Time: May 23 19:18 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Mon May 22 14:36:22 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Paul Weissenborn
Project: Kirtland, NM

Sample ID: MW-25
Matrix: Waste Water

MSAI Sample: 33502
MSAI Group: 8292
Date Reported: 05/24/95

Discard Date: 06/23/95
Date Submitted: 05/18/95
Date Sampled: 05/17/95
Collected by: DA
Purchase Order: 6561
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
5515	Purgeable Aromatics/Halocarbons Method: 600 SERIES 601/602					
	1,2-Dichloroethane	5.4	ug/l	1.0	05/23/95	PWK
	Benzene	ND	ug/l	1.0	05/23/95	PWK
	Toluene	ND	ug/l	1.0	05/23/95	PWK
	Ethylbenzene	ND	ug/l	1.0	05/23/95	PWK
	m,p-Xylene	ND	ug/l	1.0	05/23/95	PWK
	o-Xylene	ND	ug/l	1.0	05/23/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

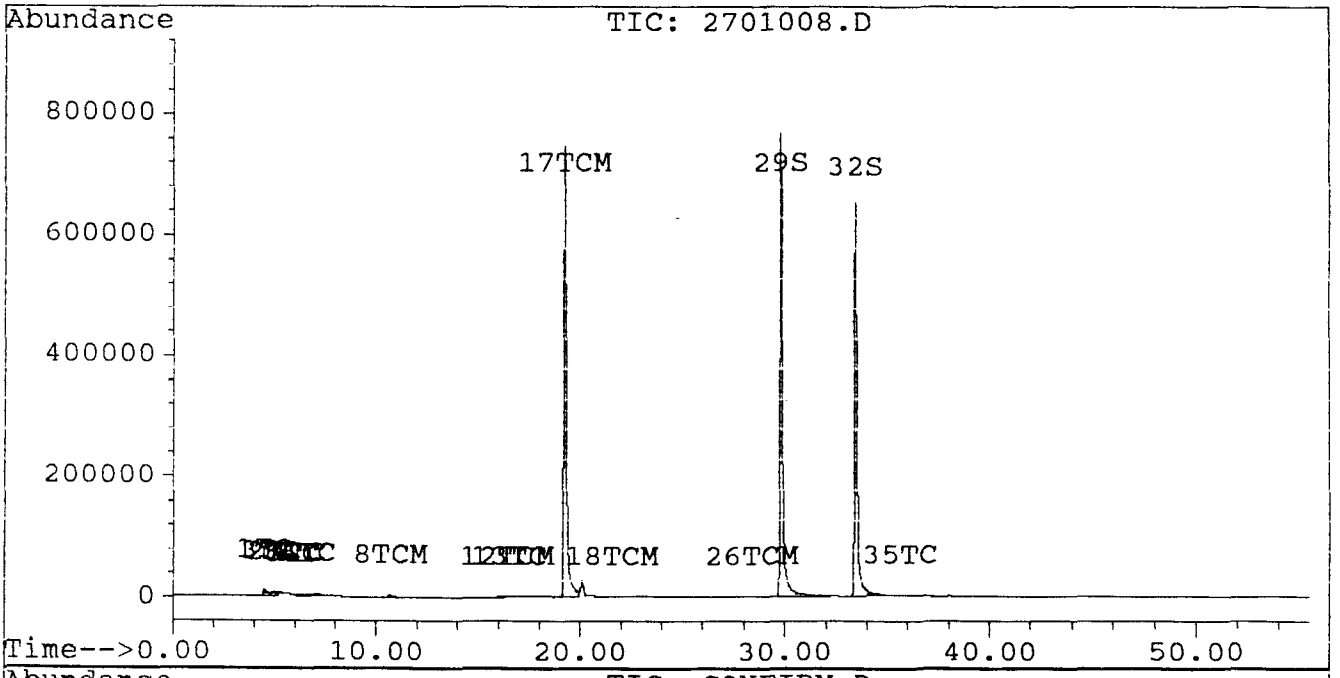
Mark W. Bostrom
Project Manager

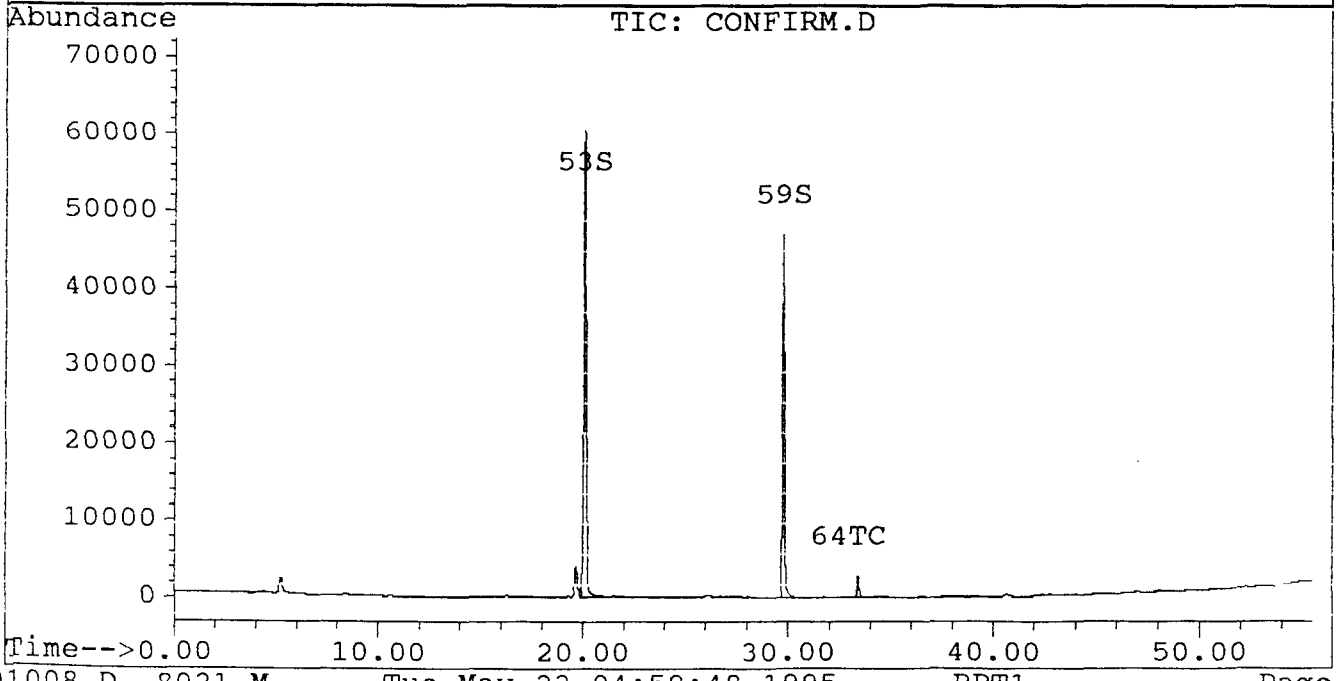
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\2701008.D Vial: 27
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\2701008.D\CONFIRM.D
Acq On : 23 May 95 04:01 AM Operator: PK
Sample : 33502 DF1 Inst : P&T #1
Misc : Multiplr: 1.00
Quant Time: May 23 4:58 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Mon May 22 14:36:22 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Paul Weissenborn
Project: Kirtland, NM

Sample ID: Trip Blank
Matrix: Waste Water

MSAI Sample: 33503
MSAI Group: 8292
Date Reported: 05/24/95

Discard Date: 06/23/95
Date Submitted: 05/18/95
Date Sampled: 05/18/95
Collected by: DA
Purchase Order: 6561
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
5515	Purgeable Aromatics/Halocarbons Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	1.0	05/23/95	PWK
	Benzene	ND	ug/l	1.0	05/23/95	PWK
	Toluene	ND	ug/l	1.0	05/23/95	PWK
	Ethylbenzene	ND	ug/l	1.0	05/23/95	PWK
	m,p-Xylene	ND	ug/l	1.0	05/23/95	PWK
	o-Xylene	ND	ug/l	1.0	05/23/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

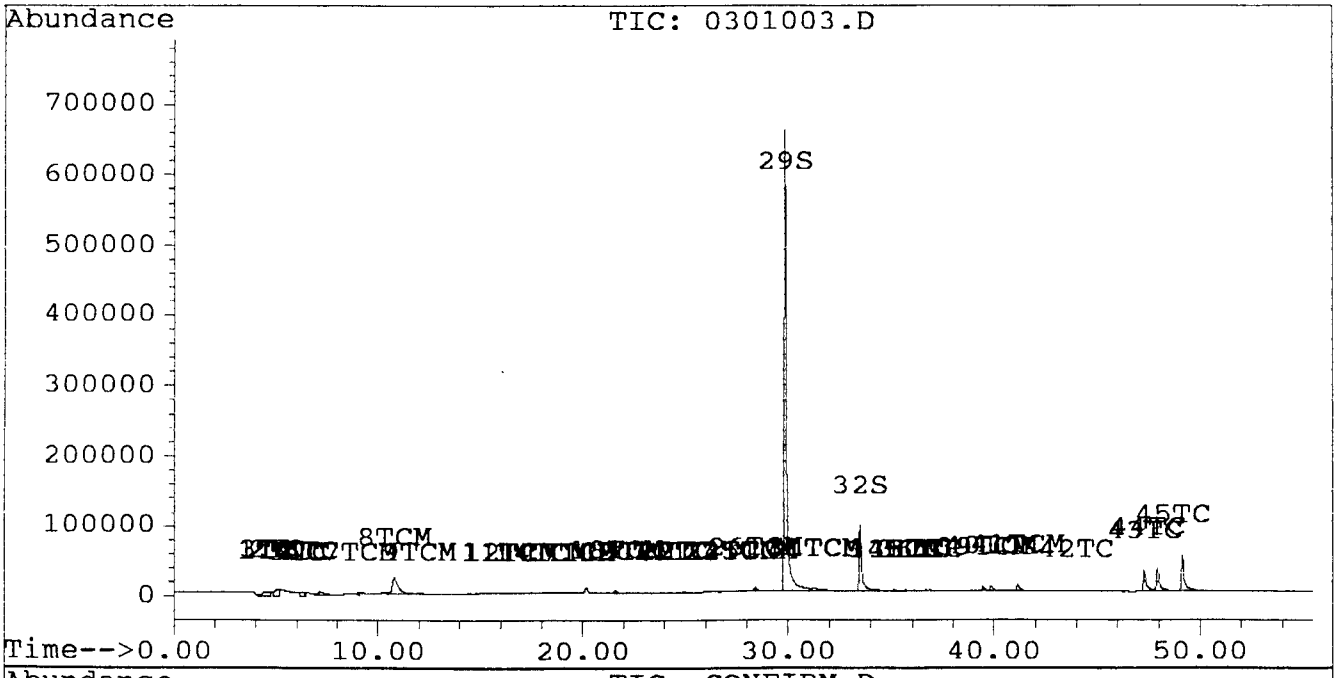
Mark W. Bostrom
Project Manager

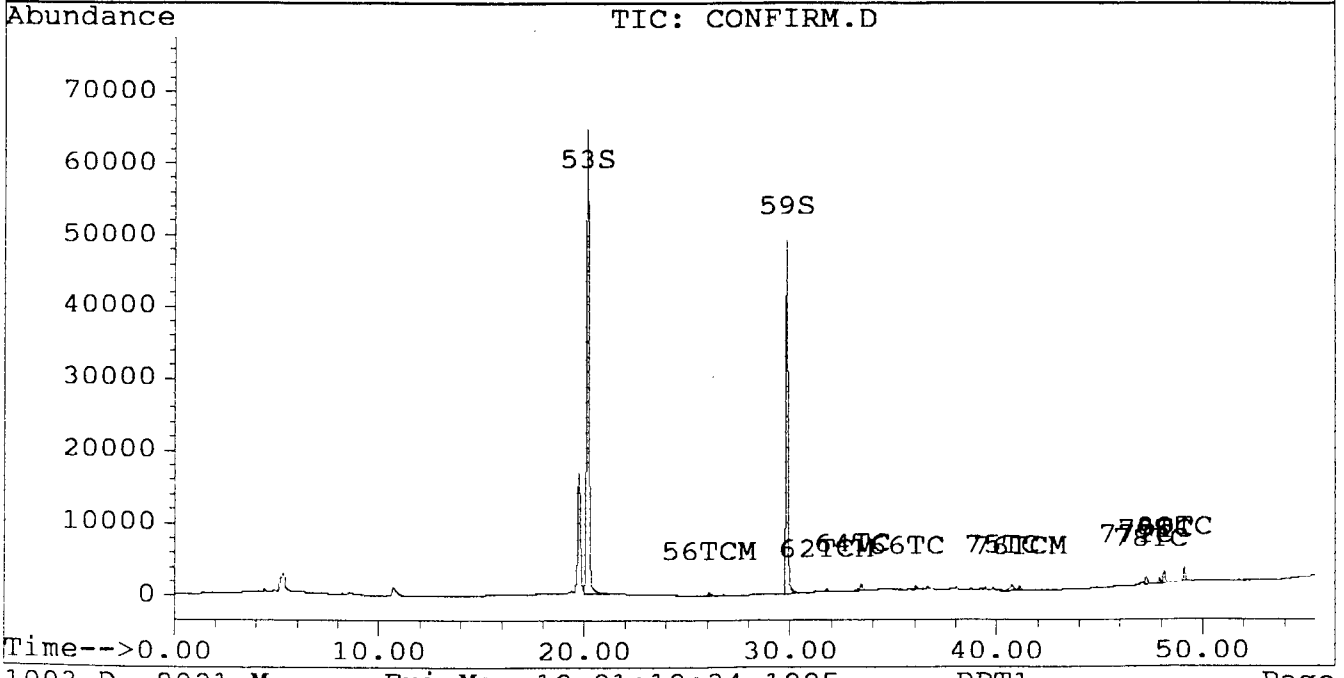
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\0301003.D Vial: 3
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\0301003.D\CONFIRM.D
Acq On : 19 May 95 08:21 PM Operator: PK
Sample : 33503 DF1 Inst : P&T #1
Misc : Multiplr: 1.00
Quant Time: May 19 21:18 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Wed May 17 18:52:38 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Ecova Corporation
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Paul Weissenborn
Project: Kirtland, NM

Sample ID: EQB
Matrix: Waste Water

MSAI Sample: 33504
MSAI Group: 8292
Date Reported: 05/24/95

Discard Date: 06/23/95
Date Submitted: 05/18/95
Date Sampled: 05/17/95
Collected by: DA
Purchase Order: 6561
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
5515	Purgeable Aromatics/Halocarbons Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	1.0	05/23/95	PWK
	Benzene	ND	ug/l	1.0	05/23/95	PWK
	Toluene	ND	ug/l	1.0	05/23/95	PWK
	Ethylbenzene	ND	ug/l	1.0	05/23/95	PWK
	m,p-Xylene	ND	ug/l	1.0	05/23/95	PWK
	o-Xylene	ND	ug/l	1.0	05/23/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

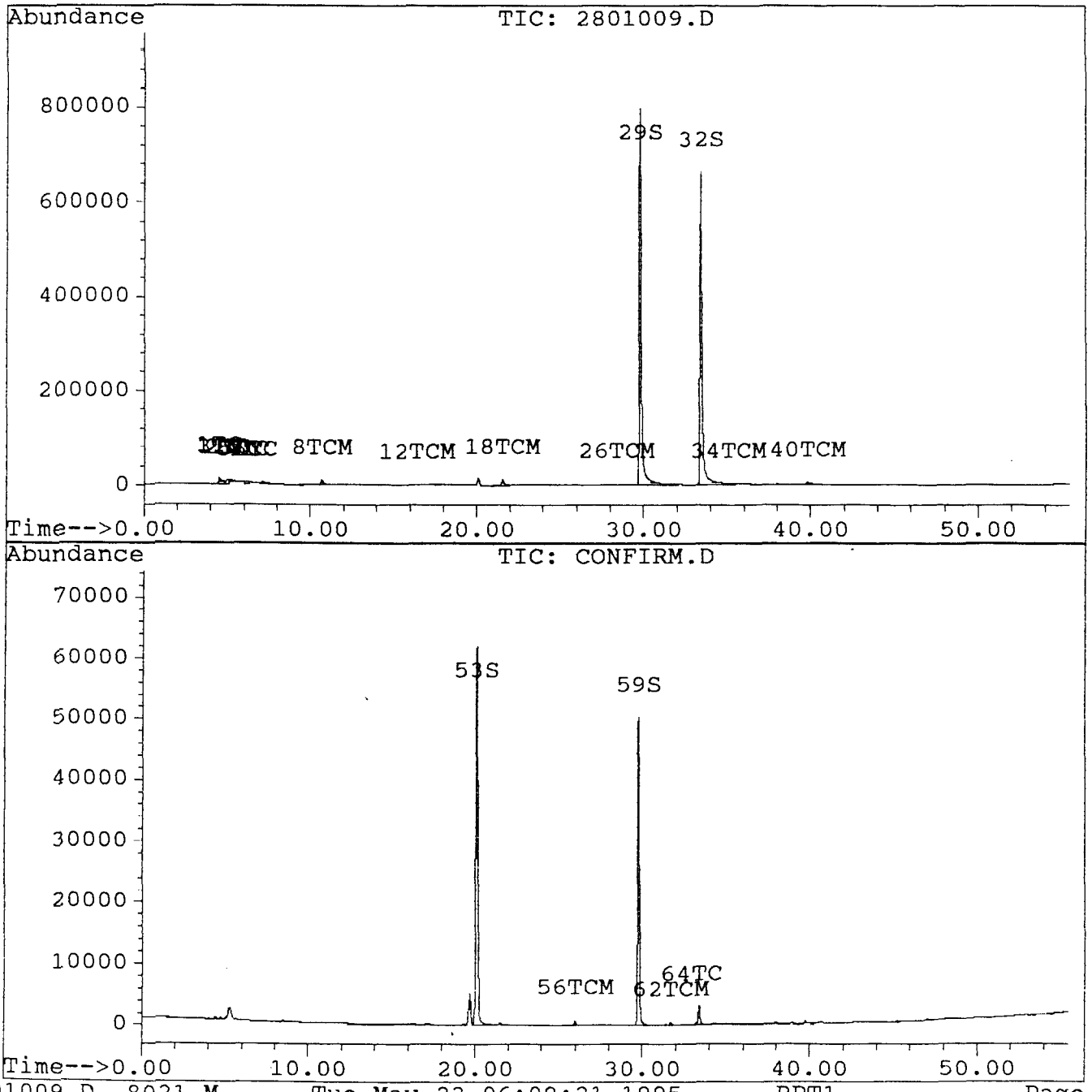
Mark W. Bostrom
Project Manager

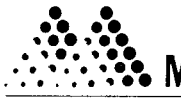
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\2801009.D Vial: 28
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\2801009.D\CONFIRM.D
Acq On : 23 May 95 05:11 AM Operator: PK
Sample : 33504 DF1 Inst : P&T #1
Misc : Multiplr: 1.00
Quant Time: May 23 6:08 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Mon May 22 14:36:22 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical

The Quality Solution

QC Summary

- 601/602

1645 West 2200 South, Salt Lake City, Utah 84119 (801) 973-0050 1-800-973-MSAI FAX (801) 972-6278

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: MOUNTAIN STATES ANALYTICAL Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

	EPA SAMPLE NO.	SMC1 #	SMC2 #	#	OTHER #	TOT OUT
01	BLANK	23	112			0
02	Trip Blank	13	106			0
03	MW-10	93	100			0
04	MW-18	103	105			0
05	MW-19	95	104			0
06	MW-17	94	119			0
07	MW-17A	92	124			0
08	ZZZZZ	78	100			0
09	ZZZZZ	102	103			0
10	MW-18	87	103			0
11	MW-22	91	113			0
12	MW-22A	85	109			0
13	MW-21	94	101			0
14	MW-25	90	99			0
15	EQB	91	102			0
16	MW-20	73	96			0
17	MW-17	74	100			0
18	MW-17A	84	103			0
19	MW-22	94	102			0
20	MW-22A	80	102			0
21	MW-10	122	103			0
22						
23						
24						
25						
26						
27						
28						
29						
30						

QC IN-HOUSE LIMITS

SMC1 = CHLOROCYCLOHEXANE 1 - 200

SMC2 = FLUOROBENZENE 71 - 129

Column to be used to flag recovery values

* Values outside of in-house QC limits

DL = Detection limit

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix Spike - EPA Sample No.: _____

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,1-DICHLOROETHENE #2	20.0	0.0	22.6	113	48 - 139
trans-1,2-DICHLOROETHENE #2	21.1	0.0	22.4	106	33 - 134
BENZENE #2	19.9	0.0	20.7	104	52 - 122
TRICHLOROETHENE #2	22.8	0.0	22.5	99	55 - 115
TOLUENE #2	22.1	0.0	22.8	103	58 - 118
TETRACHLOROETHENE(PCE) #2	25.6	0.0	27.0	105	48 - 122
CHLOROBENZENE #2	24.6	0.0	24.9	101	72 - 107
ETHYLBENZENE #2	22.5	0.0	23.5	104	69 - 115
m,p-XYLENE #2	22.6	0.0	23.5	104	67 - 112
o-XYLENE #2	21.7	0.0	20.3	94	56 - 105
1,3 DICHLOROBENZENE #2	21.3	0.0	21.3	100	78 - 105
1,4 DICHLOROBENZENE #2	29.8	0.0	29.2	98	78 - 106
1,2 DICHLOROBENZENE #2	22.6	0.0	21.7	96	76 - 110

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MS % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-DICHLOROETHENE #2	20.0	NA		*	11	48 - 139
trans-1,2-DICHLOROETHENE #2	21.1	NA		*	5	33 - 134
BENZENE #2	19.9	NA		*	3	52 - 122
TRICHLOROETHENE #2	22.8	NA		*	6	55 - 115
TOLUENE #2	22.1	NA		*	5	58 - 118
TETRACHLOROETHENE(PCE) #2	25.6	NA		*	6	48 - 122
CHLOROBENZENE #2	24.6	NA		*	4	72 - 107
ETHYLBENZENE #2	22.5	NA		*	5	69 - 115
m,p-XYLENE #2	22.6	NA		*	5	67 - 112
o-XYLENE #2	21.7	NA		*	5	56 - 105
1,3 DICHLOROBENZENE #2	21.3	NA		*	7	78 - 105
1,4 DICHLOROBENZENE #2	29.8	NA		*	8	78 - 106
1,2 DICHLOROBENZENE #2	22.6	NA		*	9	76 - 110

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside of in-house QC limits

Spike Recovery: 0 out of 24 outside of in-house QC limits

Comments: _____

_____

3A

WATER VOLATILE MATRIX SPIKE/MATRIX _ICATE RECOVERY

Lab Name: Mountain States Analytical Contract: ___ ___

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix Spike - MSAI Sample No.: 33493 MS DF1

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,1-DICHLOROETHENE	20.0	0.0	23.3	116	39 - 168
DICHLOROMETHANE	23.9	0.0	25.2	105	41 - 137
trans-1,2-DICHLOROETHENE	21.1	0.0	24.0	114	44 - 144
1,1-DICHLOROETHANE	21.8	0.0	25.9	119	50 - 138
CHLOROFORM	22.1	0.0	22.9	104	47 - 131
1,1,1-TRICHLOROETHANE	20.8	0.0	22.8	110	49 - 131
CARBON TETRACHLORIDE	20.7	0.0	22.0	106	47 - 130
1,2-DICHLOROETHANE	25.0	0.0	24.5	98	52 - 122
TRICHLOROETHENE	22.8	0.0	24.9	109	47 - 130
1,2-DICHLOROPROPANE	22.0	0.0	23.5	107	52 - 135
1,1,2-TRICHLOROETHANE	20.4	0.0	20.8	102	56 - 139
1,3-DICHLOROPROPANE	22.7	0.0	23.5	104	54 - 138
TETRACHLOROETHENE(PCE)	25.6	0.0	27.0	105	44 - 110
CHLOROBENZENE	24.6	0.0	27.8	113	41 - 124
1,1,1,2-TETRACHLOROETHANE	21.2	0.0	22.9	108	56 - 131
BROMOFORM	24.0	0.0	19.5	81	42 - 154
1,1,2,2-TETRACHLOROETHANE	22.6	0.0	22.6	100	42 - 155

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MS % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-DICHLOROETHENE	20.0	NA		*	19	39 - 168
DICHLOROMETHANE	23.9	NA		*	19	41 - 137
trans-1,2-DICHLOROETHENE	21.1	NA		*	13	44 - 144
1,1-DICHLOROETHANE	21.8	NA		*	12	50 - 138
CHLOROFORM	22.1	NA		*	18	47 - 131
1,1,1-TRICHLOROETHANE	20.8	NA		*	19	49 - 131
CARBON TETRACHLORIDE	20.7	NA		*	19	47 - 130
1,2-DICHLOROETHANE	25.0	NA		*	21	52 - 122
TRICHLOROETHENE	22.8	NA		*	18	47 - 130
1,2-DICHLOROPROPANE	22.0	NA		*	18	52 - 135
1,1,2-TRICHLOROETHANE	20.4	NA		*	27	56 - 139
1,3-DICHLOROPROPANE	22.7	NA		*	26	54 - 138
TETRACHLOROETHENE(PCE)	25.6	NA		*	19	44 - 110
CHLOROBENZENE	24.6	NA		*	19	41 - 124
1,1,1,2-TETRACHLOROETHANE	21.2	NA		*	19	56 - 131
BROMOFORM	24.0	NA		*	42	42 - 154
1,1,2,2-TETRACHLOROETHANE	22.6	NA		*	40	42 - 155

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside of in-house QC limits

Spike Recovery: 0 out of 34 outside of in-house QC limits

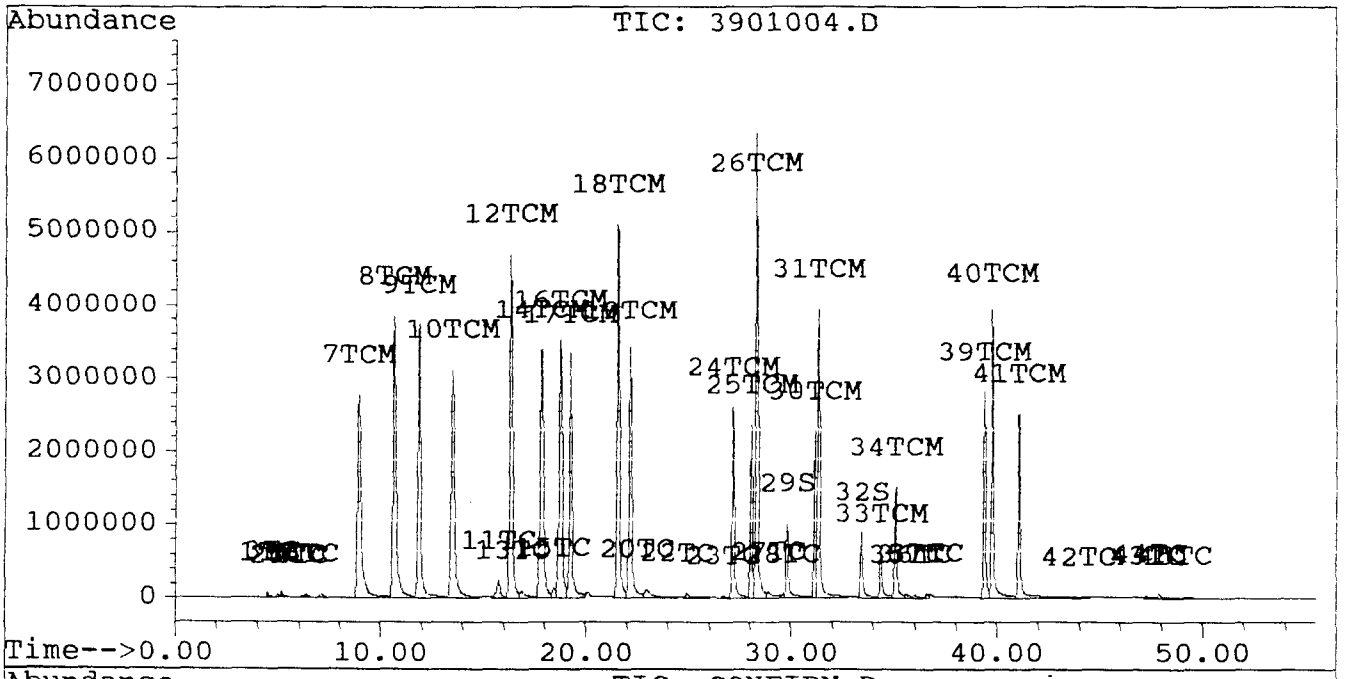
Comments: _____

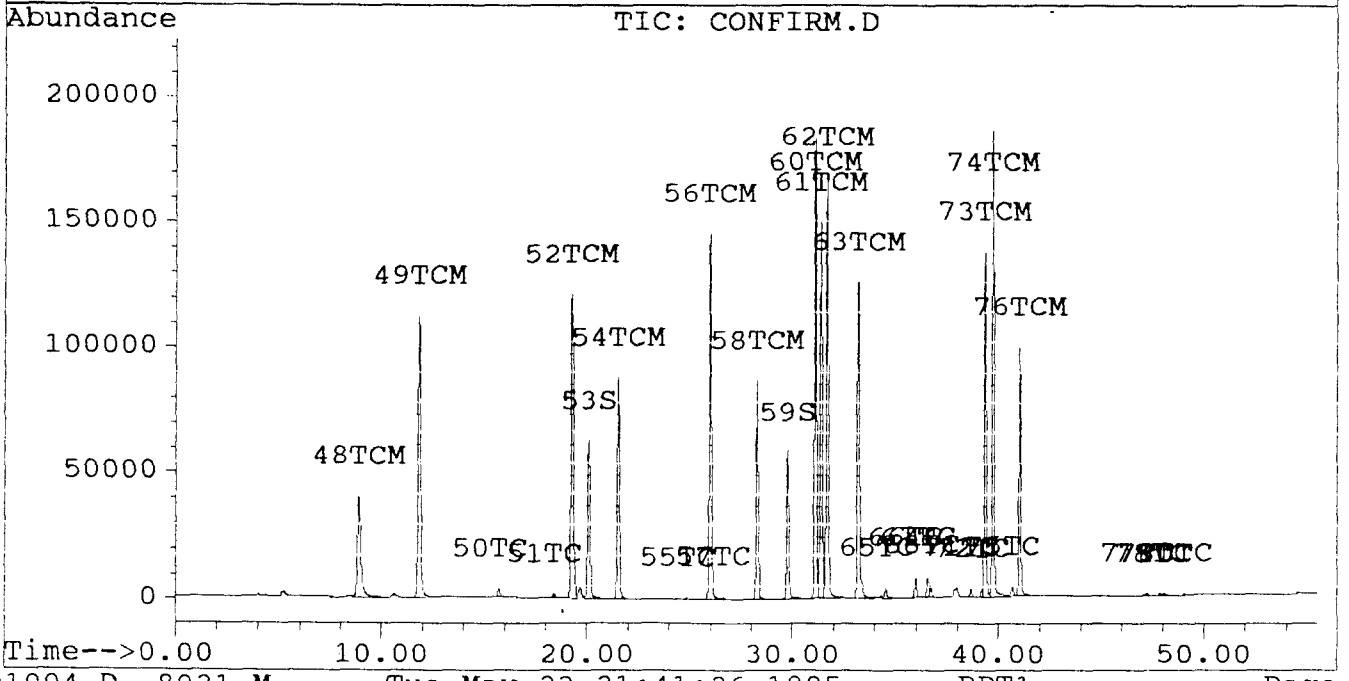
_____

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\3901004.D Vial: 39
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\3901004.D\CONFIRM.D
Acq On : 23 May 95 08:40 PM Operator: PK
Sample : 33493 MS DF1 Inst : P&T #1
Misc : Multiplr: 1.00
Quant Time: May 23 21:38 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Mon May 22 14:36:22 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Mountain States Analytical Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix Spike - MSAI Sample No.: 33520 DF1 Date Analyzed: 05/19/95

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,1-DICHLOROETHENE	20.0	0.0	23.0	115	43 - 166
DICHLOROMETHANE	23.9	0.0	25.0	105	44 - 138
trans-1,2-DICHLOROETHENE	21.1	0.0	23.9	113	45 - 148
1,1-DICHLOROETHANE	21.8	0.0	24.4	112	51 - 141
CHLOROFORM	22.1	0.0	21.9	99	49 - 131
1,1,1-TRICHLOROETHANE	20.8	0.0	21.9	105	51 - 133
CARBON TETRACHLORIDE	20.7	0.0	21.6	104	49 - 130
1,2-DICHLOROETHANE	25.0	0.0	23.2	93	54 - 120
TRICHLOROETHENE	22.8	0.0	24.6	108	49 - 132
1,2-DICHLOROPROPANE	22.0	0.0	23.5	107	55 - 135
1,1,2-TRICHLOROETHANE	20.4	0.0	20.9	103	59 - 137
1,3-DICHLOROPROPANE	22.7	0.0	24.3	107	57 - 137
TETRACHLOROETHENE(PCE)	25.6	0.0	27.1	106	40 - 121
CHLOROBENZENE	24.6	0.0	27.1	110	39 - 133
1,1,1,2-TETRACHLOROETHANE	21.2	0.0	22.6	107	58 - 131
BROMOFORM	24.0	0.0	20.3	85	35 - 155
1,1,2,2-TETRACHLOROETHANE	22.6	0.0	22.7	100	44 - 151

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MS % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-DICHLOROETHENE	20.0	23.9	119	3.7	18.2	43 - 166
DICHLOROMETHANE	23.9	25.9	108	3.4	17.7	44 - 138
trans-1,2-DICHLOROETHENE	21.1	25.7	122	7.4	12.2	45 - 148
1,1-DICHLOROETHANE	21.8	26.0	119	6.2	11.6	51 - 141
CHLOROFORM	22.1	23.3	105	5.9	17.0	49 - 131
1,1,1-TRICHLOROETHANE	20.8	23.1	111	5.1	18.2	51 - 133
CARBON TETRACHLORIDE	20.7	21.9	106	1.5	17.5	49 - 130
1,2-DICHLOROETHANE	25.0	24.0	96	3.6	19.2	54 - 120
TRICHLOROETHENE	22.8	25.3	111	2.5	17.2	49 - 132
1,2-DICHLOROPROPANE	22.0	24.4	111	3.8	17.2	55 - 135
1,1,2-TRICHLOROETHANE	20.4	21.5	105	2.5	25.1	59 - 137
1,3-DICHLOROPROPANE	22.7	24.6	108	1.2	24.8	57 - 137
TETRACHLOROETHENE(PCE)	25.6	28.4	111	4.9	17.9	40 - 121
CHLOROBENZENE	24.6	28.4	115	5.0	18.0	39 - 133
1,1,1,2-TETRACHLOROETHANE	21.2	23.0	108	1.7	18.0	58 - 131
BROMOFORM	24.0	16.7	70	19.2	40.1	35 - 155
1,1,2,2-TETRACHLOROETHANE	22.6	23.2	103	2.2	38.3	44 - 151

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 17 outside of in-house QC limits

Spike Recovery: 0 out of 34 outside of in-house QC limits

Comments: _____

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix Spike - MSAI Sample No.: 33520 DF1 Date Analyzed: 05/19/95

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,1-DICHLOROETHENE #2	20.0	0.0	24.5	123	49 - 143
trans-1,2-DICHLOROETHENE #2	21.1	0.0	24.3	115	33 - 141
BENZENE #2	19.9	0.0	22.1	111	52 - 127
TRICHLOROETHENE #2	22.8	0.0	24.1	106	54 - 119
TOLUENE #2	22.1	0.0	24.2	110	57 - 123
TETRACHLOROETHENE(PCE) #2	25.6	0.0	28.1	110	47 - 127
CHLOROBENZENE #2	24.6	0.0	26.0	106	70 - 111
ETHYLBENZENE #2	22.5	0.0	24.7	110	67 - 119
m,p-XYLENE #2	22.6	0.0	24.5	108	66 - 117
o-XYLENE #2	21.7	0.0	21.5	99	56 - 109
1,3 DICHLOROBENZENE #2	21.3	0.0	22.0	103	77 - 107
1,4 DICHLOROBENZENE #2	29.8	0.0	30.6	103	77 - 108
1,2 DICHLOROBENZENE #2	22.6	0.0	23.0	102	76 - 111

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MS % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-DICHLOROETHENE #2	20.0	24.0	120	2.3	11	49 - 143
trans-1,2-DICHLOROETHENE #2	21.1	24.6	117	1.2	5	33 - 141
BENZENE #2	19.9	22.2	112	0.6	4	52 - 127
TRICHLOROETHENE #2	22.8	24.0	105	0.5	6	54 - 119
TOLUENE #2	22.1	24.5	111	1.1	5	57 - 123
TETRACHLOROETHENE(PCE) #2	25.6	28.3	111	0.9	6	47 - 127
CHLOROBENZENE #2	24.6	26.2	107	0.8	4	70 - 111
ETHYLBENZENE #2	22.5	24.9	111	1.0	5	67 - 119
m,p-XYLENE #2	22.6	24.6	109	0.3	5	66 - 117
o-XYLENE #2	21.7	21.6	99	0.1	5	56 - 109
1,3 DICHLOROBENZENE #2	21.3	22.0	103	0.3	7	77 - 107
1,4 DICHLOROBENZENE #2	29.8	30.5	102	0.5	7	77 - 108
1,2 DICHLOROBENZENE #2	22.6	22.7	100	1.2	8	76 - 111

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 13 outside of in-house QC limits

Spike Recovery: 0 out of 26 outside of in-house QC limits

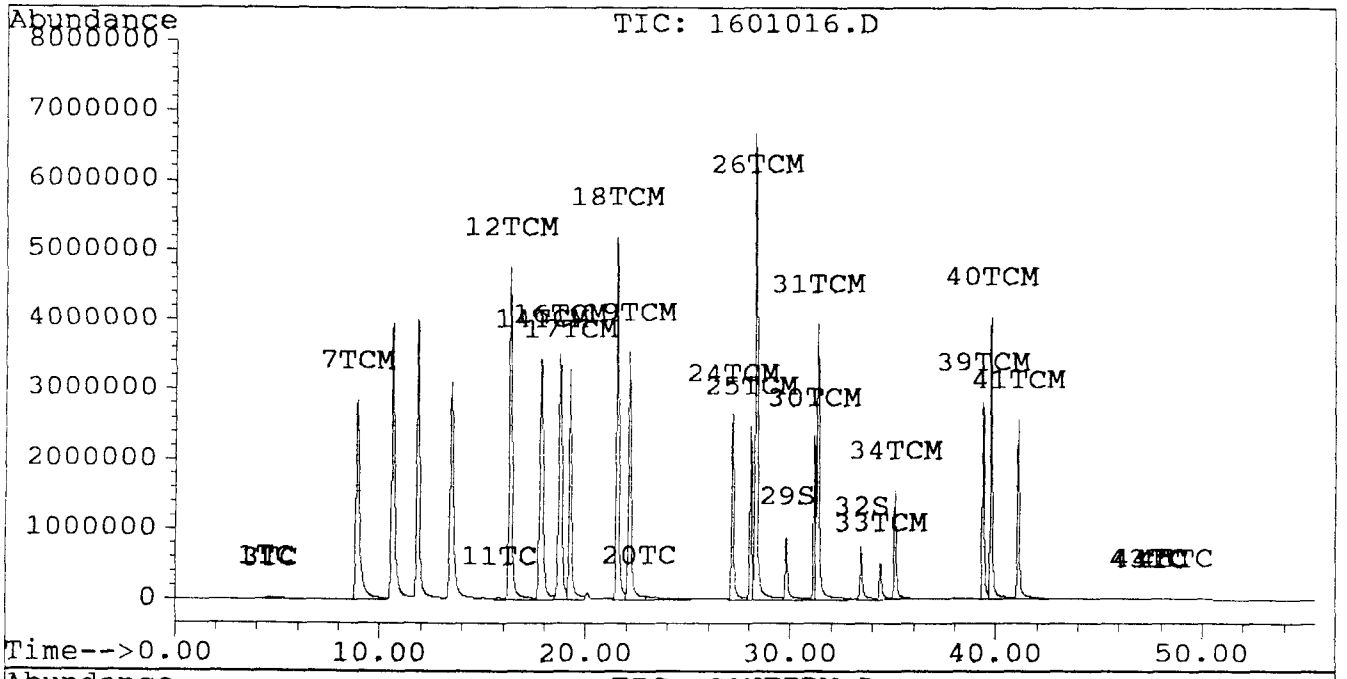
Comments: _____

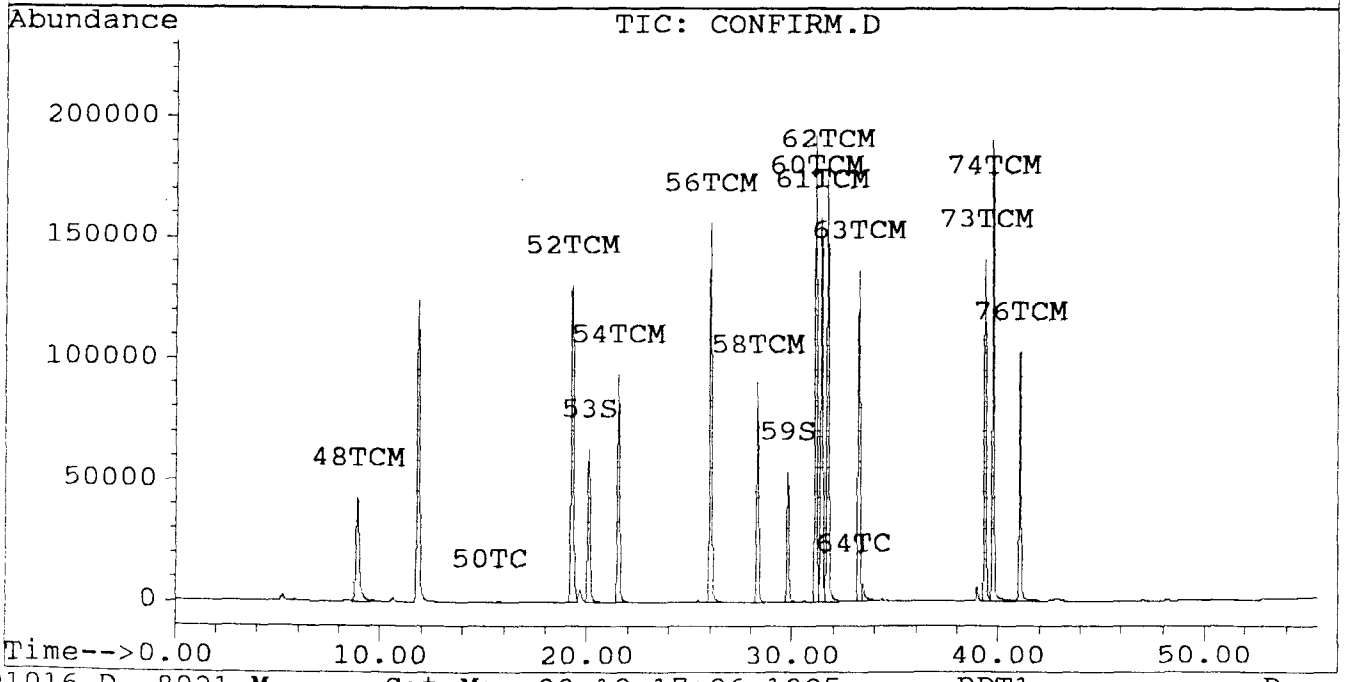
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\1601016.D Vial: 16
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\1601016.D\CONFIRM.D
Acq On : 20 May 95 11:19 AM Operator: PK
Sample : 33520 MSD DF1 Inst : P&T #1
Misc : Multiplr: 1.00
Quant Time: May 20 12:15 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Wed May 17 18:52:38 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



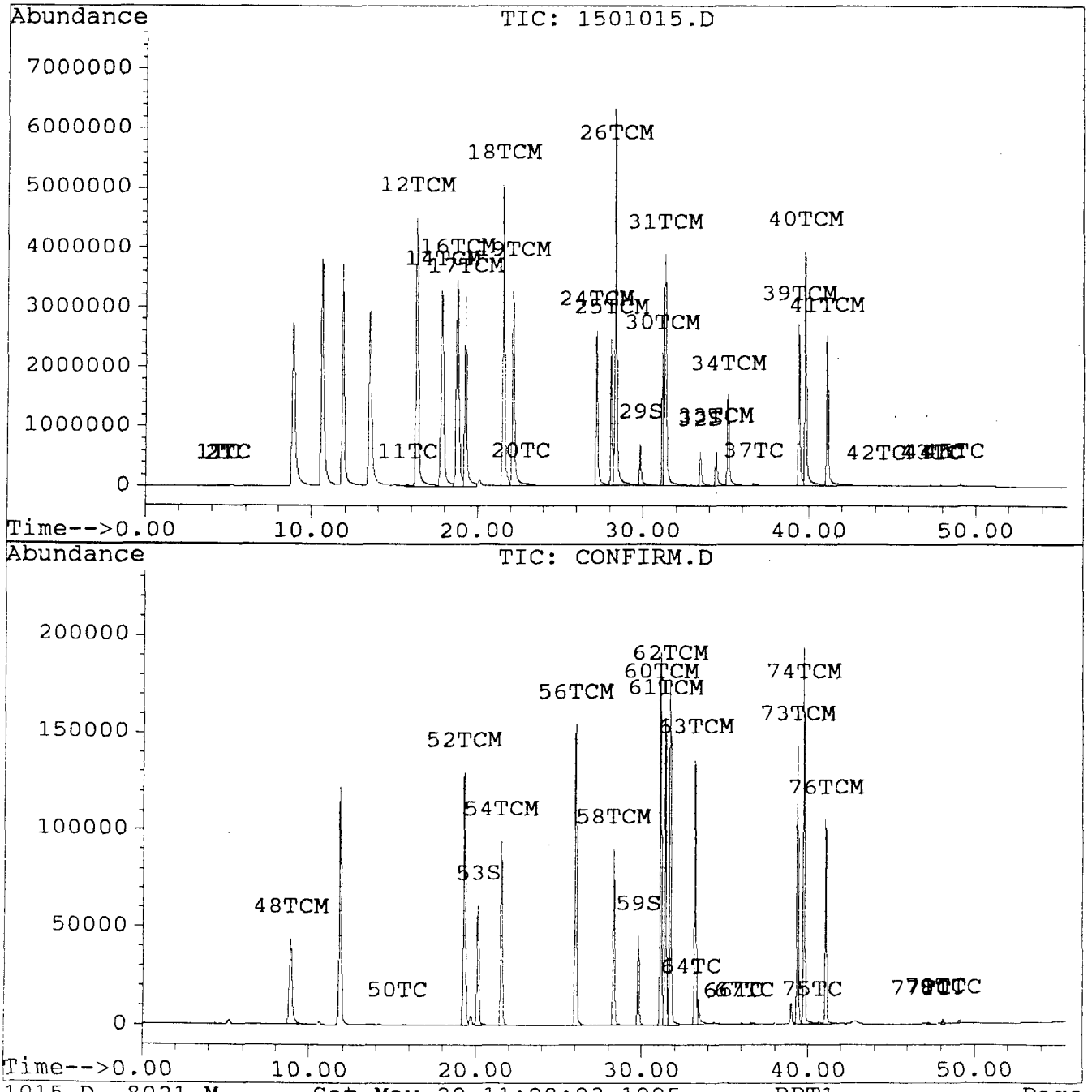


Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\1501015.D Vial: 15
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\1501015.D\CONFIRM.D
Acq On : 20 May 95 10:09 AM Operator: PK
Sample : 33520 MS DF1 Inst : P&T #1
Misc : Multiplr: 1.00
Quant Time: May 20 11:06 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Wed May 17 18:52:38 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm

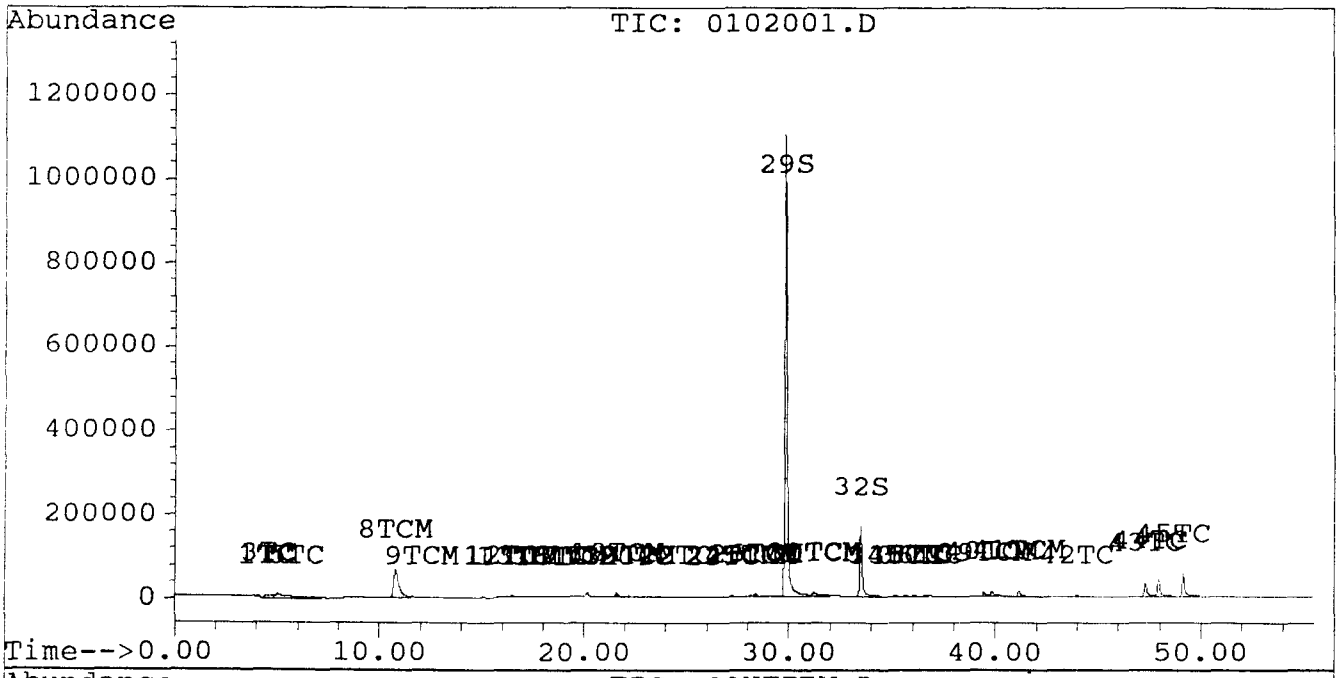


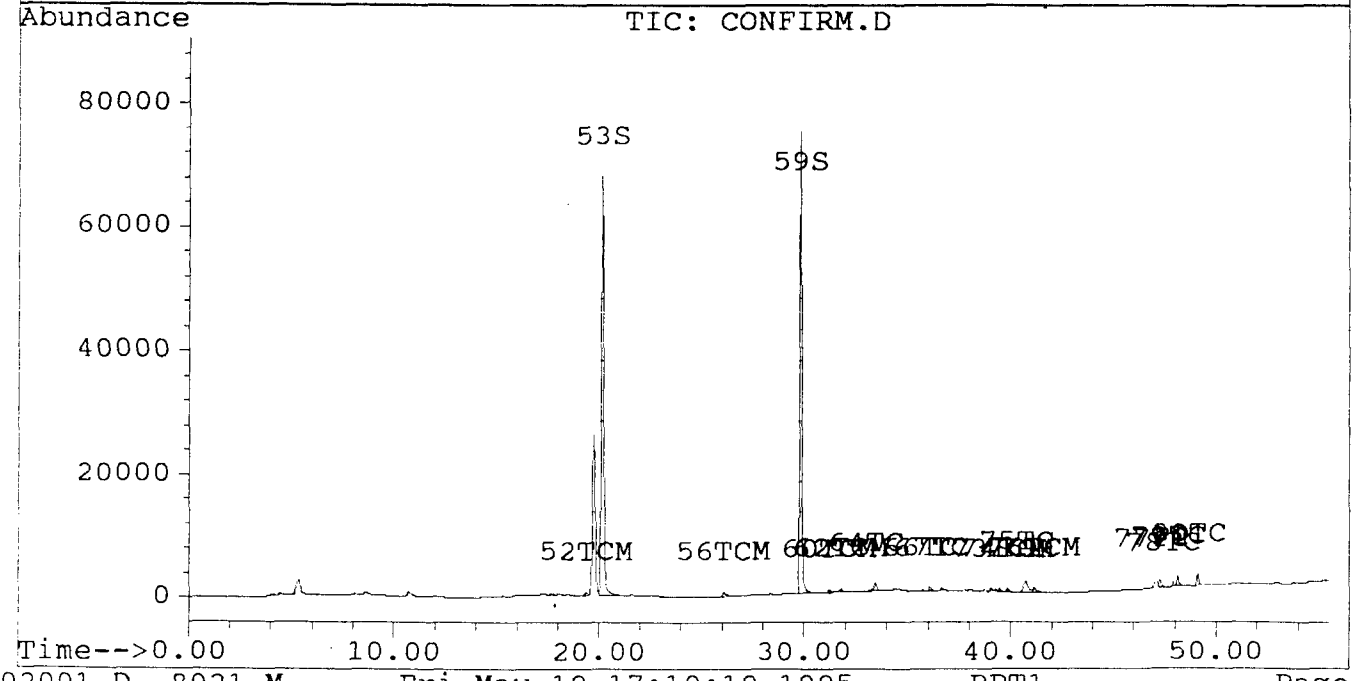
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\19MAYVOL\0102001.D Vial: 1
Signal #2 : C:\HPCHEM\5\DATA\19MAYVOL\0102001.D\CONFIRM.D
Acq On : 19 May 95 04:11 PM Operator: PK
Sample : BLANK Inst : P&T #1
Misc : Multiplr: 1.00
Quant Time: May 19 17:08 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Wed May 17 18:52:38 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





V-204

4526

Mountain States Analytical

The Quality Solution

Sample Chain of Custody

Client Name: ECOVA/Maverik P.O. # 6561

Phone #: 359 3059 Fax #: 359 3307

Project Name/#: Kirtland, NM

Sampler: Darrell Anderson

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Total of Containers	601/602 BTEX	1,2 Dichloroethane DCA	Analysis Required					Rush?	Remarks	Temp. of Samples Upon Receipt
MW-10	5-17	1000	X			X		3	X	X	pH<2						Report: BTEX + DCA Only	7°C 05/18/95 JF
MW-17		1350	X			X		3	X	X	pH=4 *							
MW-17A		1345	X			X		3	X	X	pH=4 *							
MW-18		1230	X			X		3	X	X	pH<2							
MW-19		0915	X			X		3	X	X								
MW-20		1035	X			X		3	X	X								
MW-21		1110	X			X		3	X	X								
MW-22		1535	X			X		3	X	X								
MW-22A		1520	X			X		3	X	X								
MW-25		1135	X			X		3	X	X								

Name of Shipper	Airbill No.	Date	Time

Received By (Lab)	Date	Time	Seals Intact?
Jennifer Ford	05/18/95	0910	yes

custody

Turnaround Time Requested (please circle): (Normal) Rush

(Rush TAT is subject to MSAI approval and surcharge)

Report Results By: (Date) _____

Rush results requested by (please circle): Phone Fax

Report Results to: Paul Weesmbrom

Sample relinquished by:	Date	Time	Sample received by:	Date	Time
Darrell R Anderson	5-17	1620			

Type of Disposal:	Authorized for Disposal by:
Date/Time of Disposal:	Disposed of by:

1645 West 2200 South, Salt Lake City, Utah 84119 (801) 973-0050 FAX (801) 972-6278

White Copy - Original Retain by Lab Yellow Copy - Return to Customer Pink Copy - Retain by Sampler

V-20K

Mountain States Analytical

The Quality Solution

5568

Sample Chain of Custody

Client Name: ECOVA/Maverik P.O. # 6561

Phone #: 359-3059 Fax #: 359-3307

Project Name/#: Kirtland NM

Sampler: Darrell Anderson

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Total of Containers	Analysis Required: BTEX	Rush?	Remarks	Temp. of Samples Upon Receipt
TRIP BLANK									X		no ph taken (1 vial only) Report	7°C
EQB	5-17	1500	X			X		2	X		ph<2 BTEX + DCA only	JF 05/18/95

Wet ice

Name of Shipper	Airbill No.	Date	Time

Received By (Lab)	Date	Time	Custody Seals Intact?
Jennifer Todd	05/18/95	0910	YES

Sample relinquished by:	Date	Time	Sample received by:	Date	Time
Darrell Anderson	5-17	1620			

Turnaround Time Requested (please circle): (Normal) Rush

(Rush TAT is subject to MSAI approval and surcharge)

Report Results By: (Date) _____

Rush results requested by (please circle): Phone Fax

Report Results to: Paul Weissenborn

Type of Disposal: | Authorized for Disposal by:

Date/Time of Disposal: | Disposed of by:

1645 West 2200 South, Salt Lake City, Utah 84119 (801) 973-0050 FAX (801) 972-6278

White Copy - Original Retain by Lab Yellow Copy - Return to Customer Pink Copy - Retain by Sampler

Mountain States Analytical

The Quality Solution

November 9, 1995

Mr. Dennis Riding
Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Reference:
Project: Kitland Refinery
MSAI Group: 10125

Dear Mr. Riding:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

MW-9	MW-10	MW-13
MW-14	MW-15	MW-16
MW-18	MW-19	MW-20
MW-21	MW-22	MW-27
Trip Blank	MW-17	

All holding times were met for the tests performed on these samples except:

Sample - (Sample Date) Test Description	Expiration Date	Date Analyzed	Days Past Holding Time
MW-22 - (10/18/95) TTO, Aromatics/Halocarbons, GC	11/01/95	11/02/95	1
MW-17 - (10/19/95) TTO, Aromatics/Halocarbons, GC	11/02/95	11/03/95	1

All original analyses performed within EPA required holding times. The above samples required dilution to meet calibration range of instrument. Dilutions were analyzed on the day following holding time expiration.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

Mark W. Bostrom
Project Manager

Mountain States Analytical
The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

MSAI Sample: 40938
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/18/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Sample ID: MW-9
Matrix: Waste Water

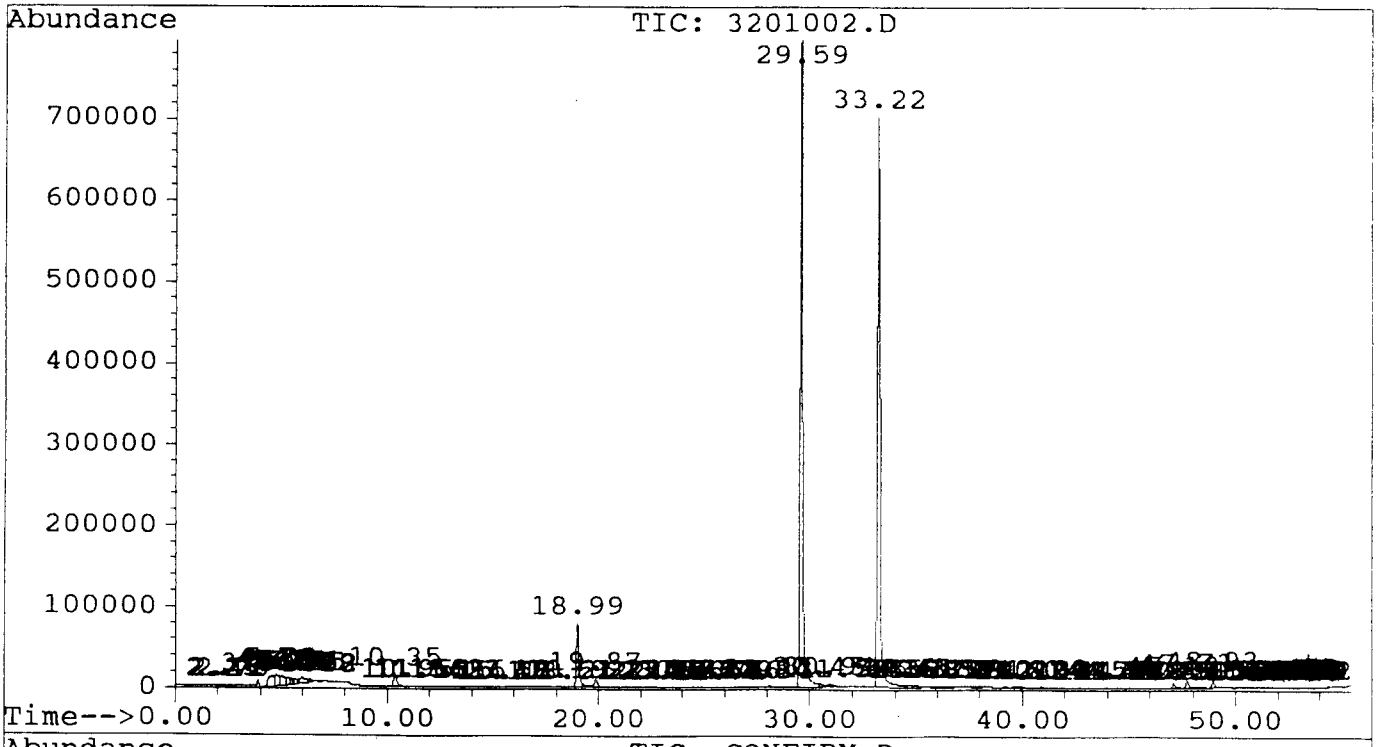
Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0515S	TTO, Aromatics/Halocarbons, GC Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	1.0	11/01/95	PWK
	Benzene	ND	ug/l	1.0	11/01/95	PWK
	Toluene	ND	ug/l	1.0	11/01/95	PWK
	Ethylbenzene	ND	ug/l	1.0	11/01/95	PWK
	m,p-Xylene	ND	ug/l	1.0	11/01/95	PWK
	o-Xylene	ND	ug/l	1.0	11/01/95	PWK
6159	Chromatograms - GC Method: IN HOUSE MSAI	Complete			11/06/95	PWK

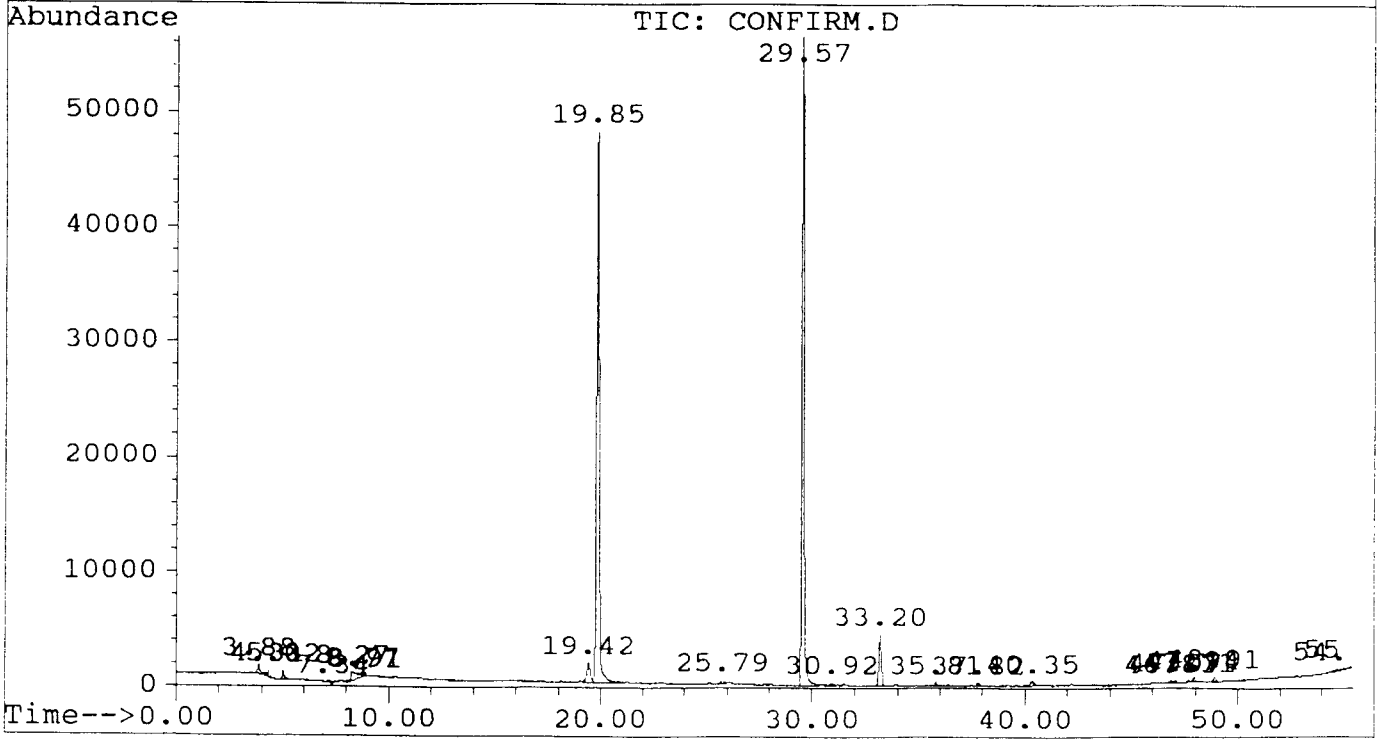
ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

Mark W. Bostrom
Project Manager

File : C:\HPCHEM\5\DATA\26OCTVOL\3201002.D
Operator : PK
Acquired : 01 Nov 95 12:59 PM using AcqMethod 8021.MTH
Instrument : P&T #1
Sample Name: 40938 DF1
Misc Info : MW-9
Vial Number: 32





Mountain States Analytical
The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

MSAI Sample: 40939
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/18/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Sample ID: MW-10
Matrix: Waste Water

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0515S	TTO, Aromatics/Halocarbons, GC Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	1.0	11/01/95	PWK
	Benzene	ND	ug/l	1.0	11/01/95	PWK
	Toluene	ND	ug/l	1.0	11/01/95	PWK
	Ethylbenzene	ND	ug/l	1.0	11/01/95	PWK
	m,p-Xylene	ND	ug/l	1.0	11/01/95	PWK
	o-Xylene	ND	ug/l	1.0	11/01/95	PWK
6159	Chromatograms - GC Method: IN HOUSE MSAI	Complete			11/06/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

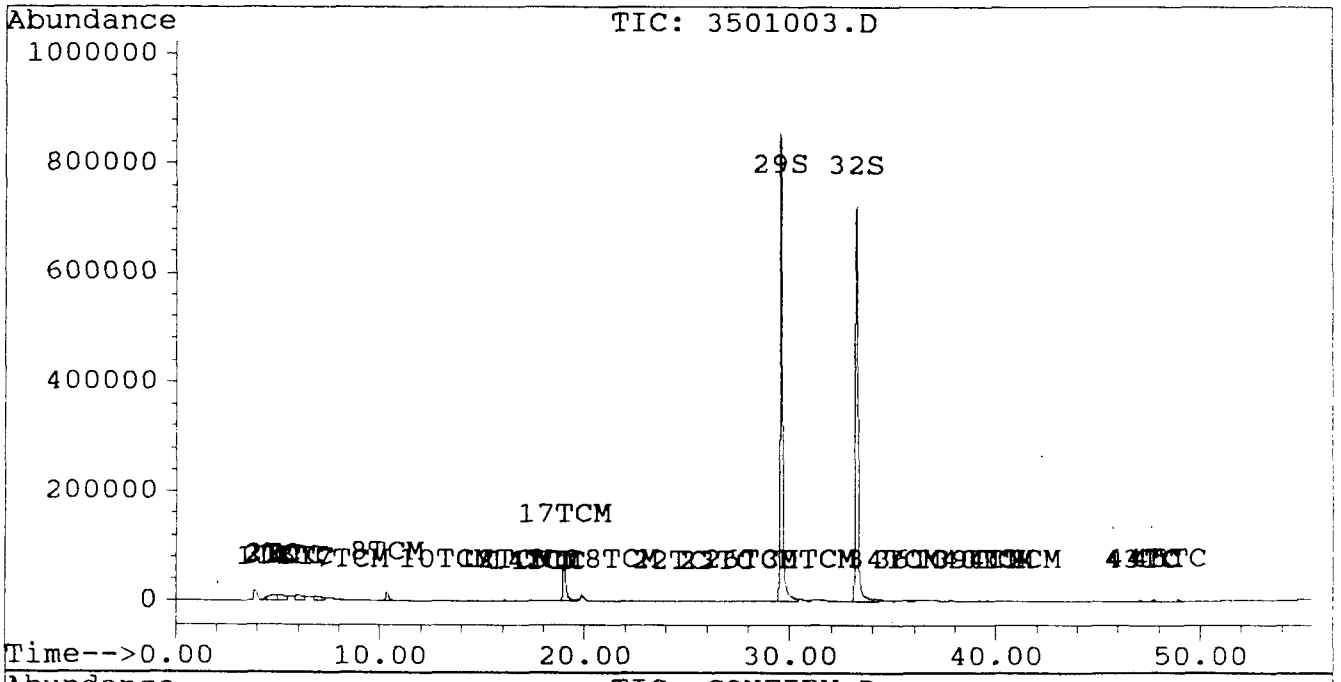
Mark W. Bostrom
Project Manager

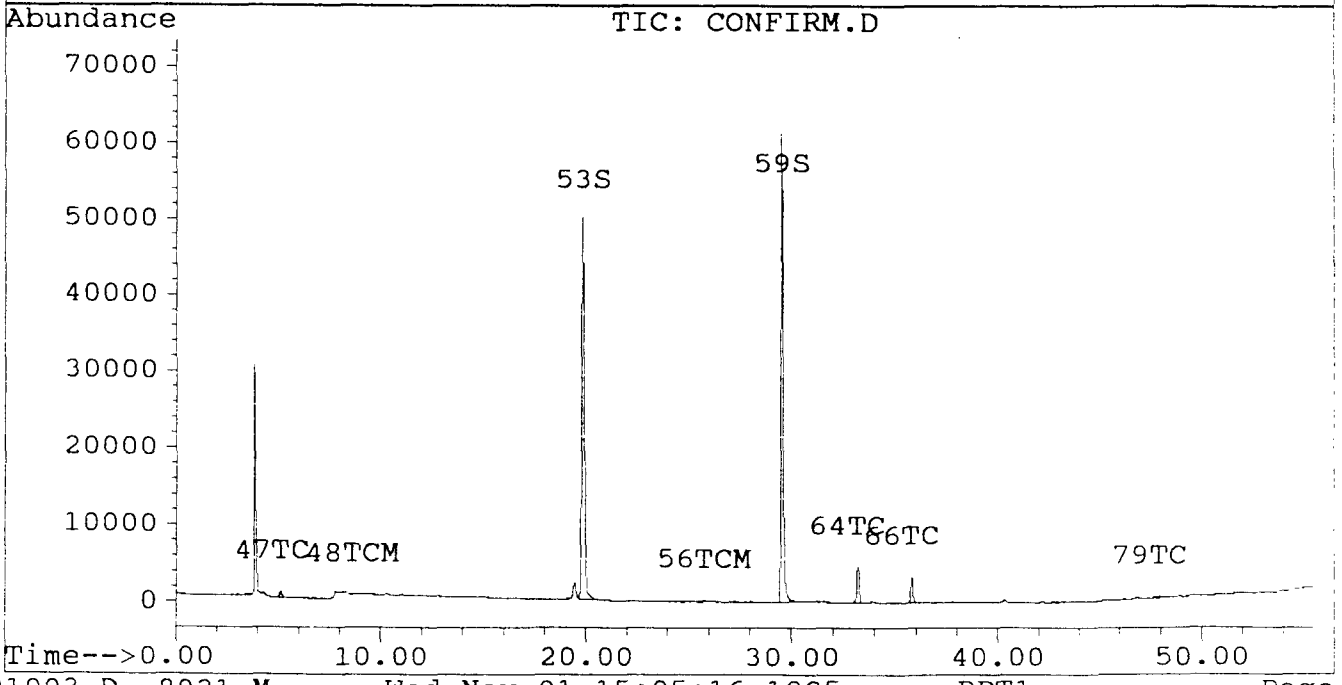
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\3501003.D Vial: 35
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\3501003.D\CONFIRM.D
Acq On : 01 Nov 95 02:06 PM Operator: PK
Sample : 40939 DF1 Inst : P&T #1
Misc : MW-10 Multiplr: 1.00
Quant Time: Nov 1 15:03 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Tue Oct 24 22:54:16 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

MSAI Sample: 40941
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/18/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Sample ID: MW-14
Matrix: Waste Water

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0515S	TTO, Aromatics/Halocarbons, GC Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	1.0	11/01/95	PWK
	Benzene	ND	ug/l	1.0	11/01/95	PWK
	Toluene	ND	ug/l	1.0	11/01/95	PWK
	Ethylbenzene	ND	ug/l	1.0	11/01/95	PWK
	m,p-Xylene	ND	ug/l	1.0	11/01/95	PWK
	o-Xylene	ND	ug/l	1.0	11/01/95	PWK
6159	Chromatograms - GC Method: IN HOUSE MSAI	Complete			11/06/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

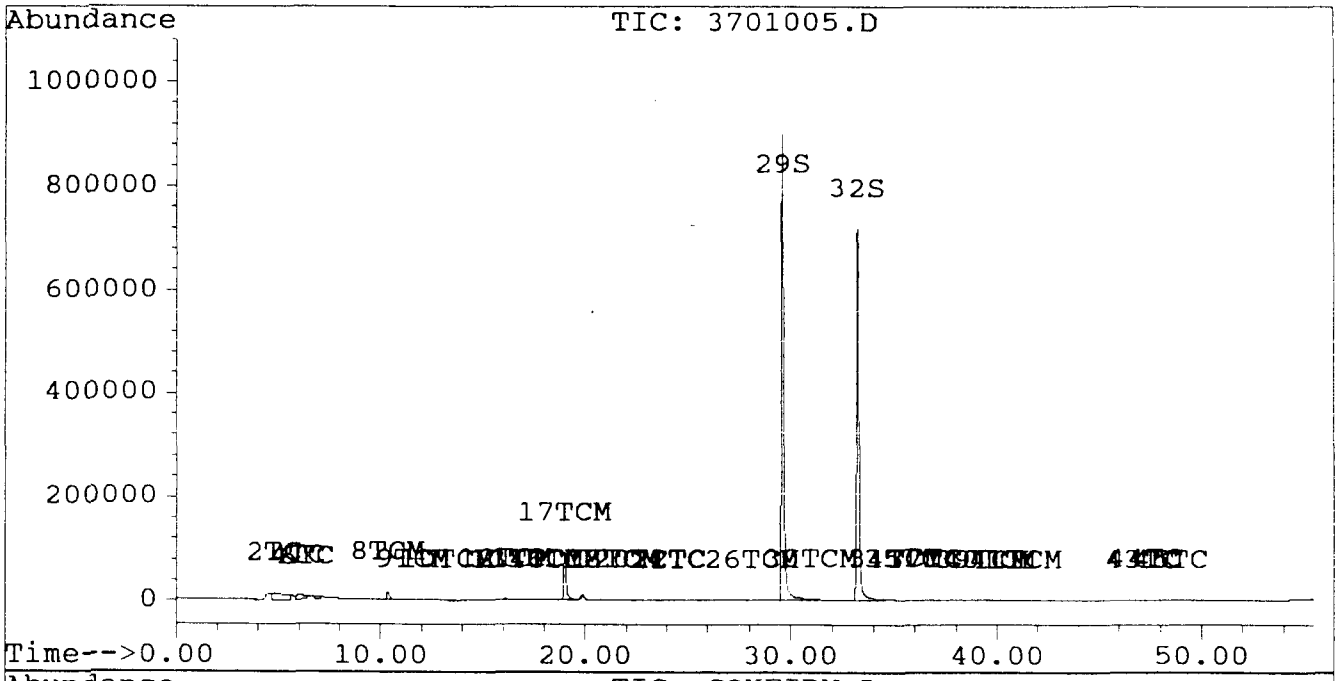
Mark W. Bostrom
Project Manager

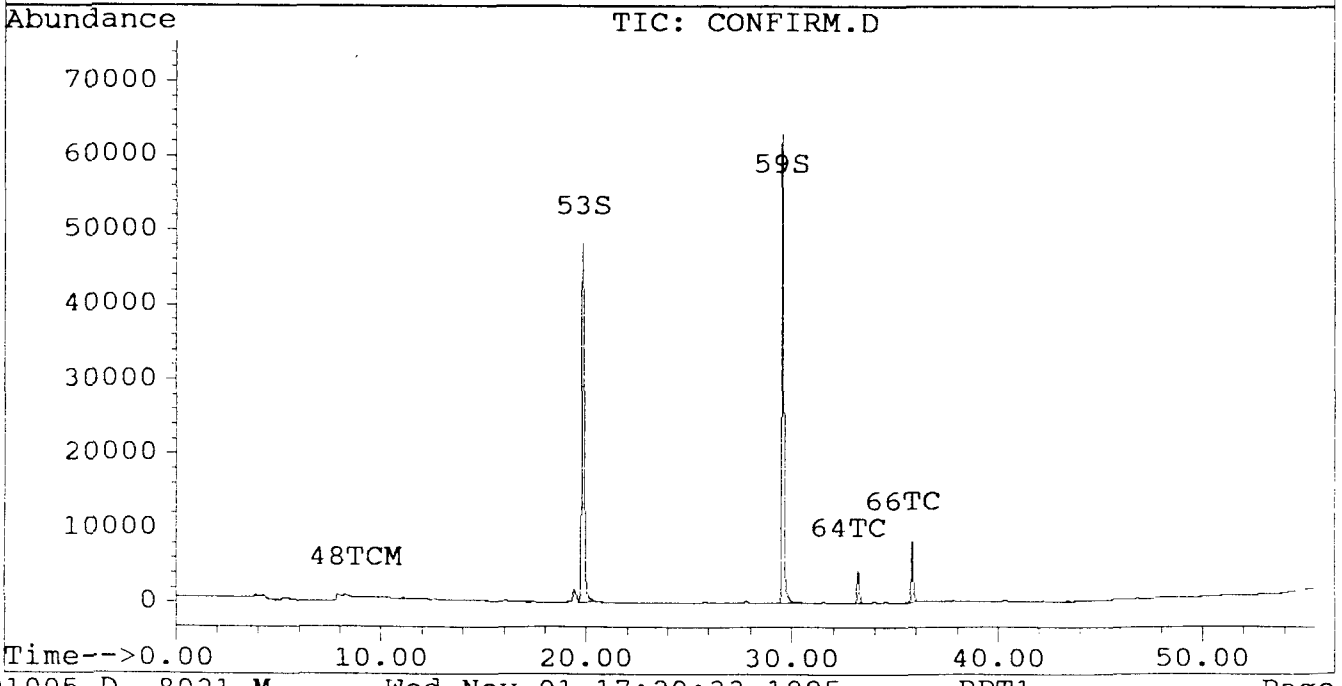
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\3701005.D Vial: 37
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\3701005.D\CONFIRM.D
Acq On : 01 Nov 95 04:22 PM Operator: PK
Sample : 40941 DF1 Inst : P&T #1
Misc : MW-14 Multiplr: 1.00
Quant Time: Nov 1 17:19 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Tue Oct 24 22:54:16 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

MSAI Sample: 40942
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/18/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Sample ID: MW-15
Matrix: Waste Water

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0515S	TTO, Aromatics/Halocarbons, GC Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	1.0	11/01/95	PWK
	Benzene	ND	ug/l	1.0	11/01/95	PWK
	Toluene	ND	ug/l	1.0	11/01/95	PWK
	Ethylbenzene	ND	ug/l	1.0	11/01/95	PWK
	m,p-Xylene	ND	ug/l	1.0	11/01/95	PWK
	o-Xylene	ND	ug/l	1.0	11/01/95	PWK
6159	Chromatograms - GC Method: IN HOUSE MSAI	Complete			11/06/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

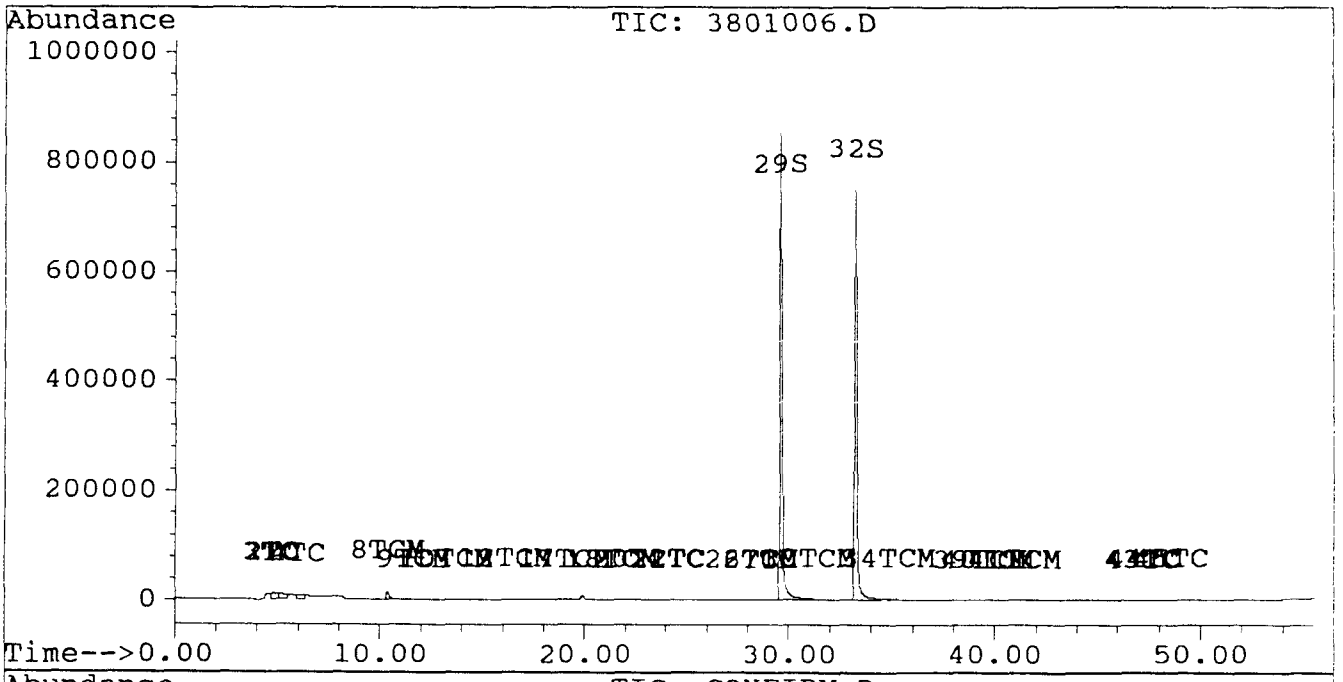
Mark W. Bostrom
Project Manager

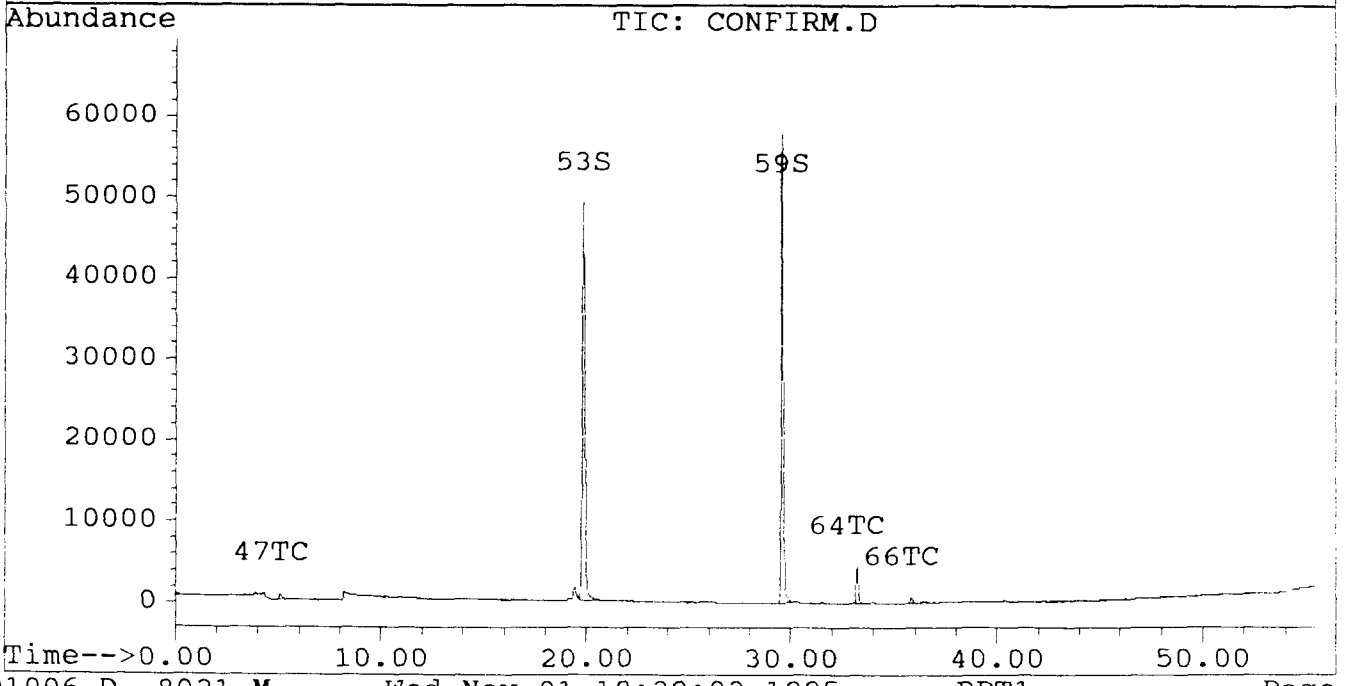
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\3801006.D Vial: 38
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\3801006.D\CONFIRM.D
Acq On : 01 Nov 95 05:30 PM Operator: PK
Sample : 40942 DF1 Inst : P&T #1
Misc : MW-15 Multiplr: 1.00
Quant Time: Nov 1 18:27 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Tue Oct 24 22:54:16 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

MSAI Sample: 40943
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/18/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Sample ID: MW-16
Matrix: Waste Water

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0515S	TTO, Aromatics/Halocarbons, GC Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	1.0	11/01/95	PWK
	Benzene	ND	ug/l	1.0	11/01/95	PWK
	Toluene	ND	ug/l	1.0	11/01/95	PWK
	Ethylbenzene	ND	ug/l	1.0	11/01/95	PWK
	m,p-Xylene	ND	ug/l	1.0	11/01/95	PWK
	o-Xylene	ND	ug/l	1.0	11/01/95	PWK
6159	Chromatograms - GC Method: IN HOUSE MSAI	Complete			11/06/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

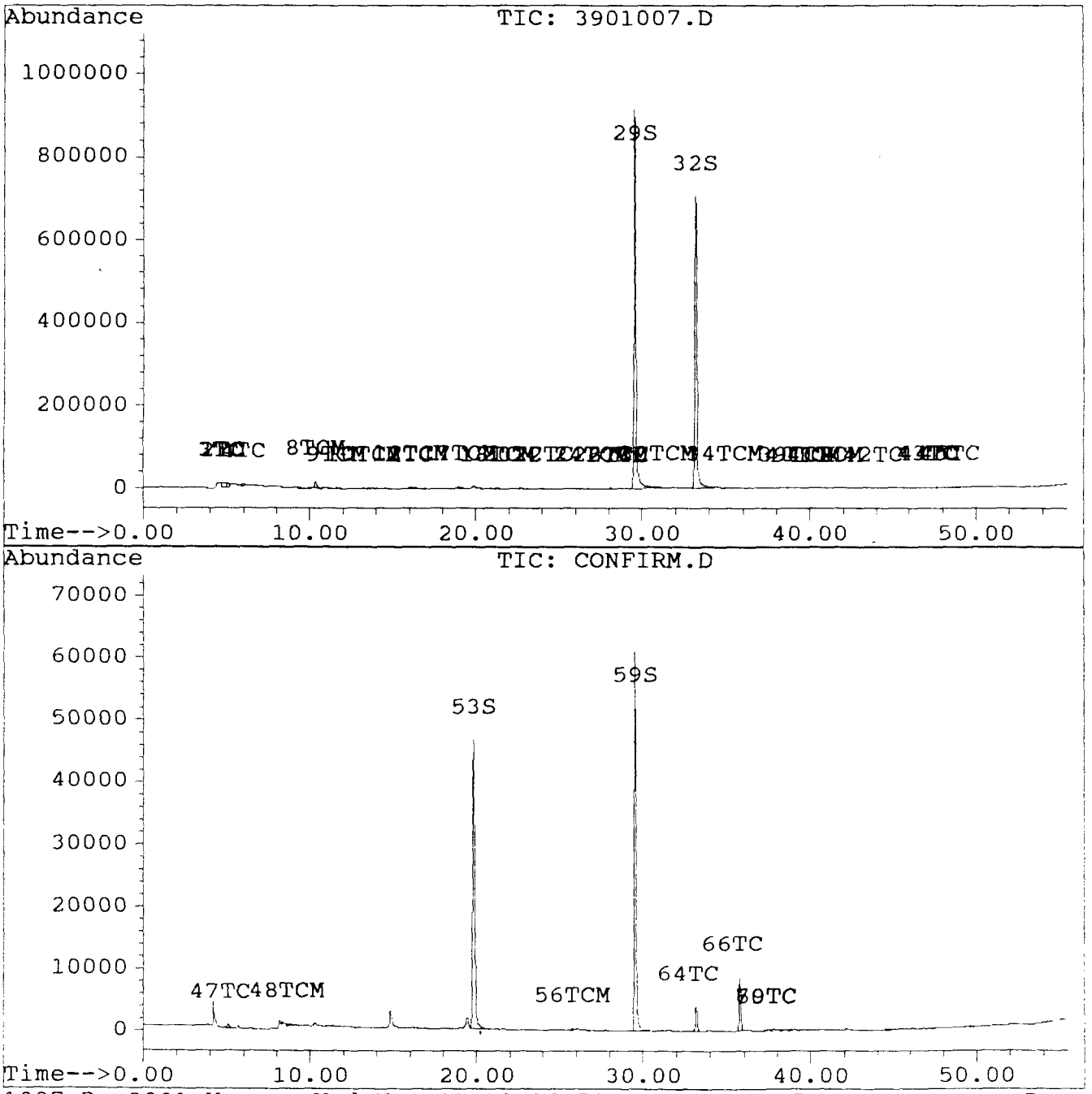
Mark W. Bostrom
Project Manager

Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\3901007.D Vial: 39
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\3901007.D\CONFIRM.D
Acq On : 01 Nov 95 06:38 PM Operator: PK
Sample : 40943 DF1 Inst : P&T #1
Misc : MW-16 Multiplr: 1.00
Quant Time: Nov 1 19:35 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Tue Oct 24 22:54:16 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



Mountain States Analytical
The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

MSAI Sample: 40944
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/18/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Sample ID: MW-18
Matrix: Waste Water

Test	Analysis	Results as Received	Units		Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0515S	TTO, Aromatics/Halocarbons, GC Method: 600 SERIES 601/602						
	1,2-Dichloroethane	ND	ug/l		1.0	11/01/95	PWK
	Benzene	118	ug/l	(1)	10	11/02/95	PWK
	Toluene	12.2	ug/l		1.0	11/01/95	PWK
	Ethylbenzene	20.0	ug/l		1.0	11/01/95	PWK
	m,p-Xylene	291	ug/l		10	11/02/95	PWK
	o-Xylene	5.4	ug/l		1.0	11/01/95	PWK
6159	Chromatograms - GC Method: IN HOUSE MSAI	Complete				11/06/95	PWK

(1) The analysis for Benzene and m,p-Xylene was conducted outside of holding times. These reults are therefore approximate.

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

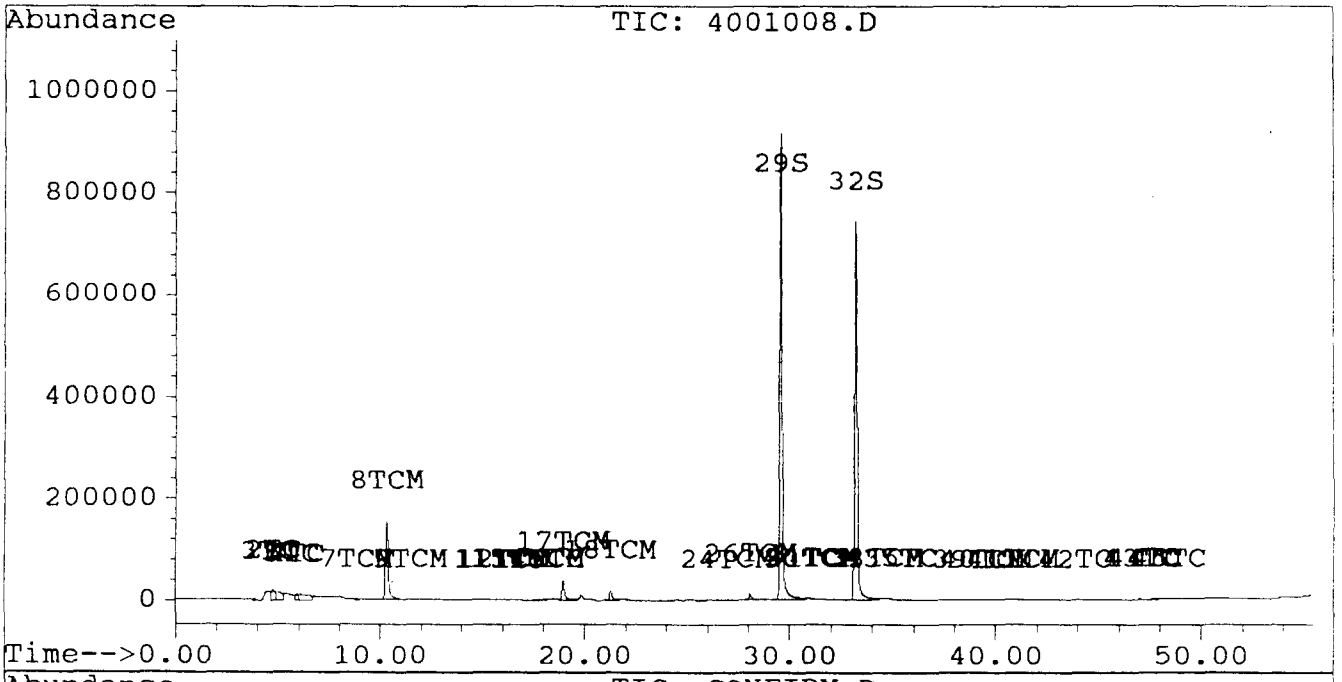
Mark W. Bostrom
Project Manager

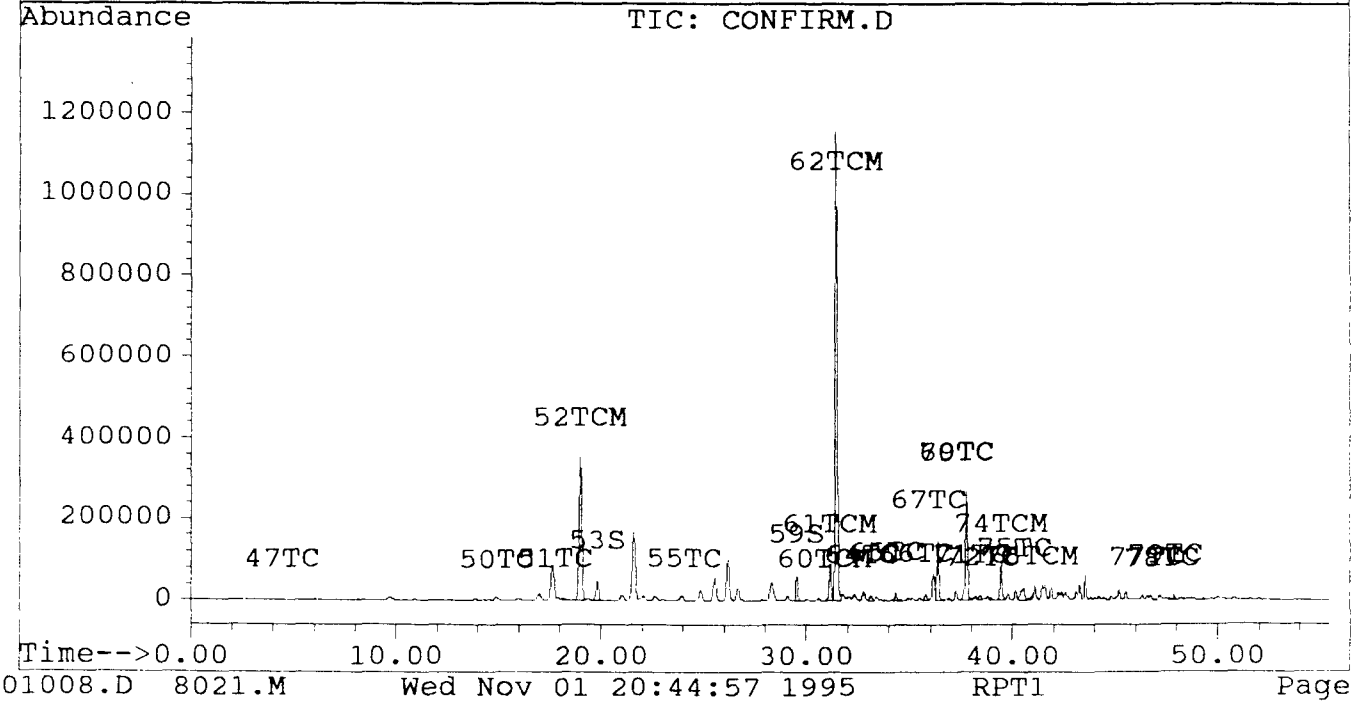
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\4001008.D Vial: 40
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\4001008.D\CONFIRM.D
Acq On : 01 Nov 95 07:46 PM Operator: PK
Sample : 40944 DF1 Inst : P&T #1
Misc : MW-18 Multiplr: 1.00
Quant Time: Nov 1 20:43 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Tue Oct 24 22:54:16 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



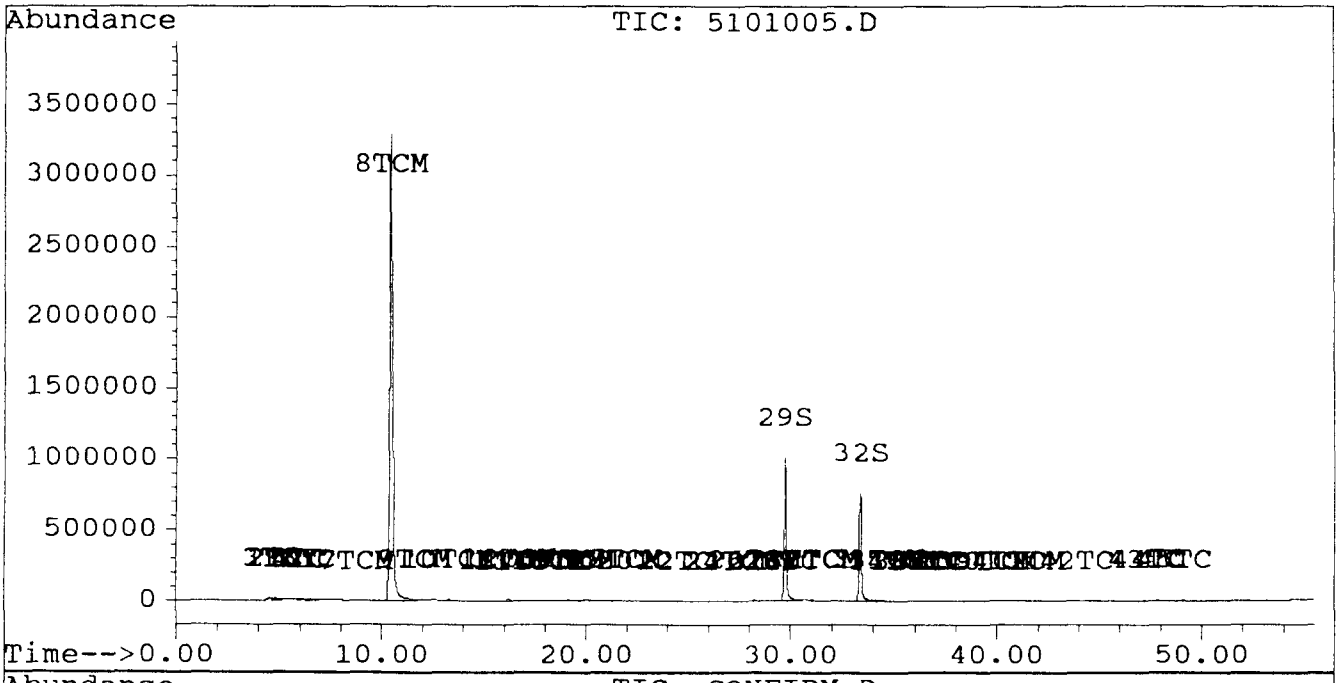


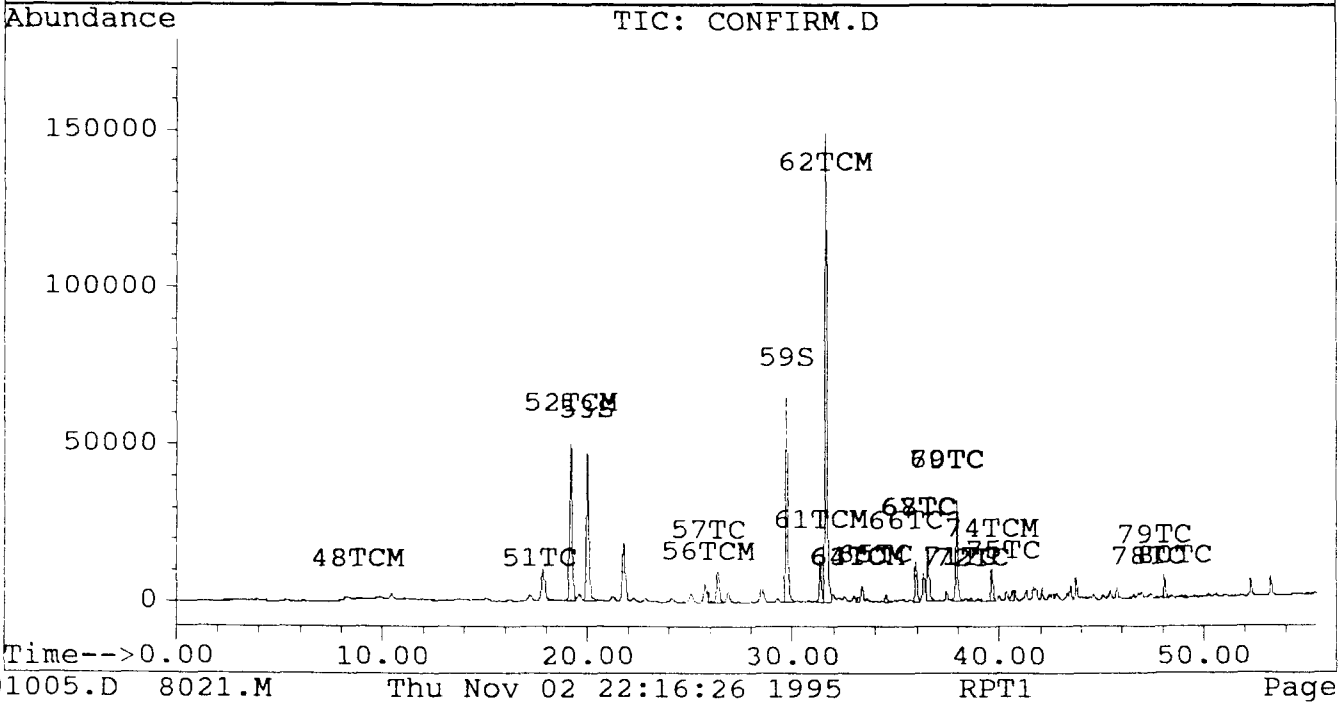
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\5101005.D Vial: 51
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\5101005.D\CONFIRM.D
Acq On : 02 Nov 95 09:17 PM Operator: PK
Sample : 40944RE DF10 Inst : P&T #1
Misc : MW-18 Multiplr: 10.00
Quant Time: Nov 2 22:14 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Thu Nov 02 22:05:42 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

Sample ID: MW-19
Matrix: Waste Water

MSAI Sample: 40945
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/18/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0515S	TTO, Aromatics/Halocarbons, GC Method: 600 SERIES 601/602					
	1,2-Dichloroethane	8.8	ug/l	1.0	11/01/95	PWK
	Benzene	ND	ug/l	1.0	11/01/95	PWK
	Toluene	ND	ug/l	1.0	11/01/95	PWK
	Ethylbenzene	ND	ug/l	1.0	11/01/95	PWK
	m,p-Xylene	ND	ug/l	1.0	11/01/95	PWK
	o-Xylene	ND	ug/l	1.0	11/01/95	PWK
6159	Chromatograms - GC Method: IN HOUSE MSAI	Complete			11/06/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

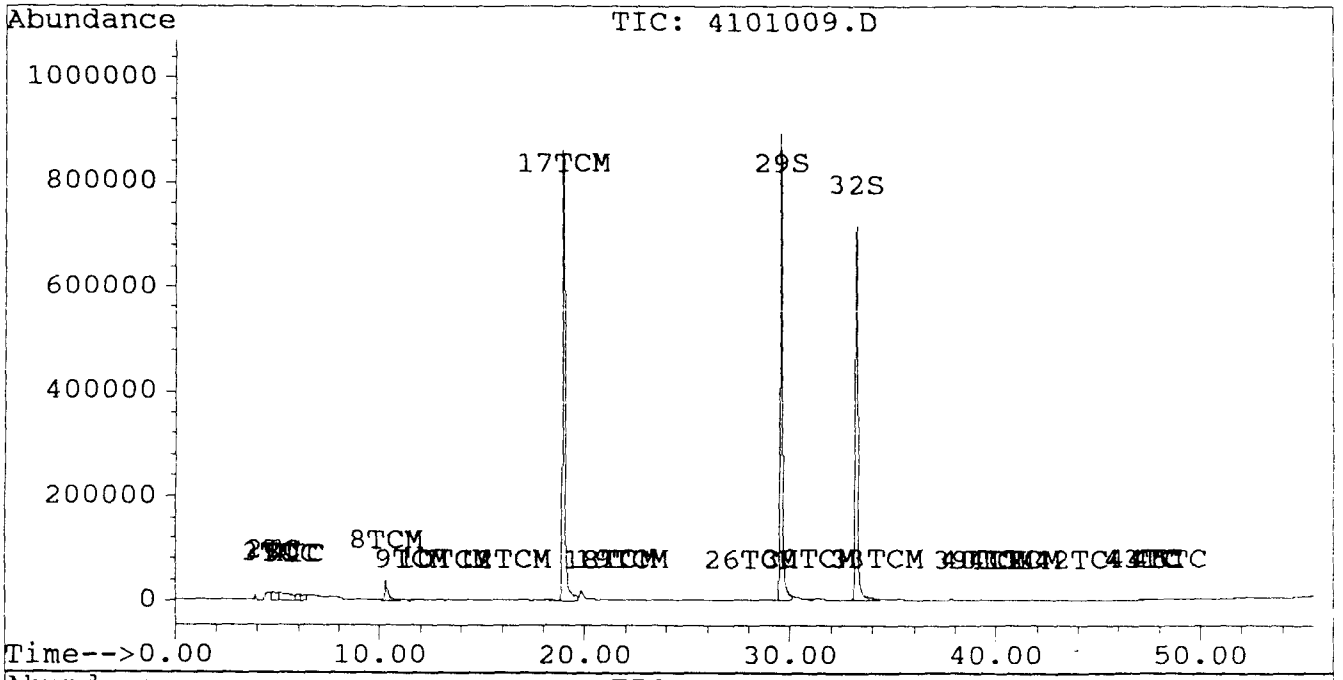
Mark W. Bostrom
Project Manager

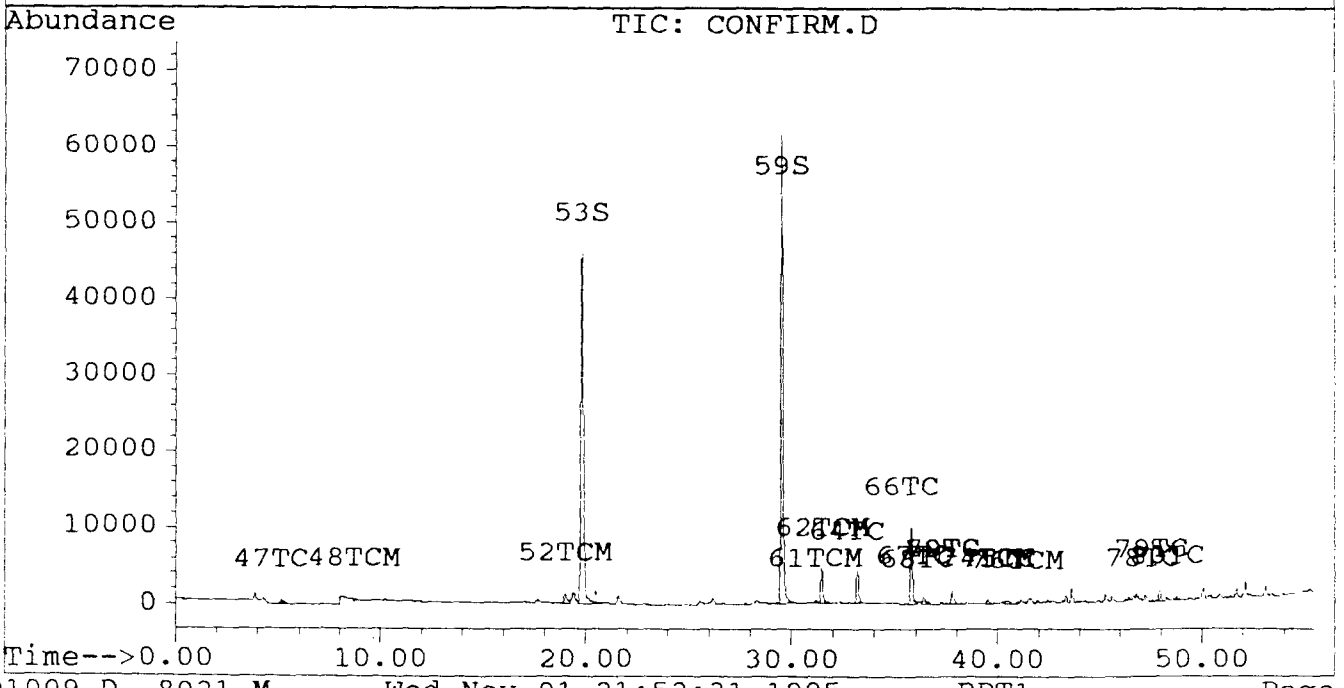
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\4101009.D Vial: 41
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\4101009.D\CONFIRM.D
Acq On : 01 Nov 95 08:54 PM Operator: PK
Sample : 40945 DF1 Inst : P&T #1
Misc : MW-19 Multiplr: 1.00
Quant Time: Nov 1 21:51 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Tue Oct 24 22:54:16 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical

The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

MSAI Sample: 40946
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/18/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Sample ID: MW-20
Matrix: Waste Water

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0515S	TTO, Aromatics/Halocarbons, GC Method: 600 SERIES 601/602					
	1,2-Dichloroethane	ND	ug/l	1.0	11/01/95	PWK
	Benzene	ND	ug/l	1.0	11/01/95	PWK
	Toluene	ND	ug/l	1.0	11/01/95	PWK
	Ethylbenzene	ND	ug/l	1.0	11/01/95	PWK
	m,p-Xylene	ND	ug/l	1.0	11/01/95	PWK
	o-Xylene	ND	ug/l	1.0	11/01/95	PWK
6159	Chromatograms - GC Method: IN HOUSE MSAI	Complete			11/06/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

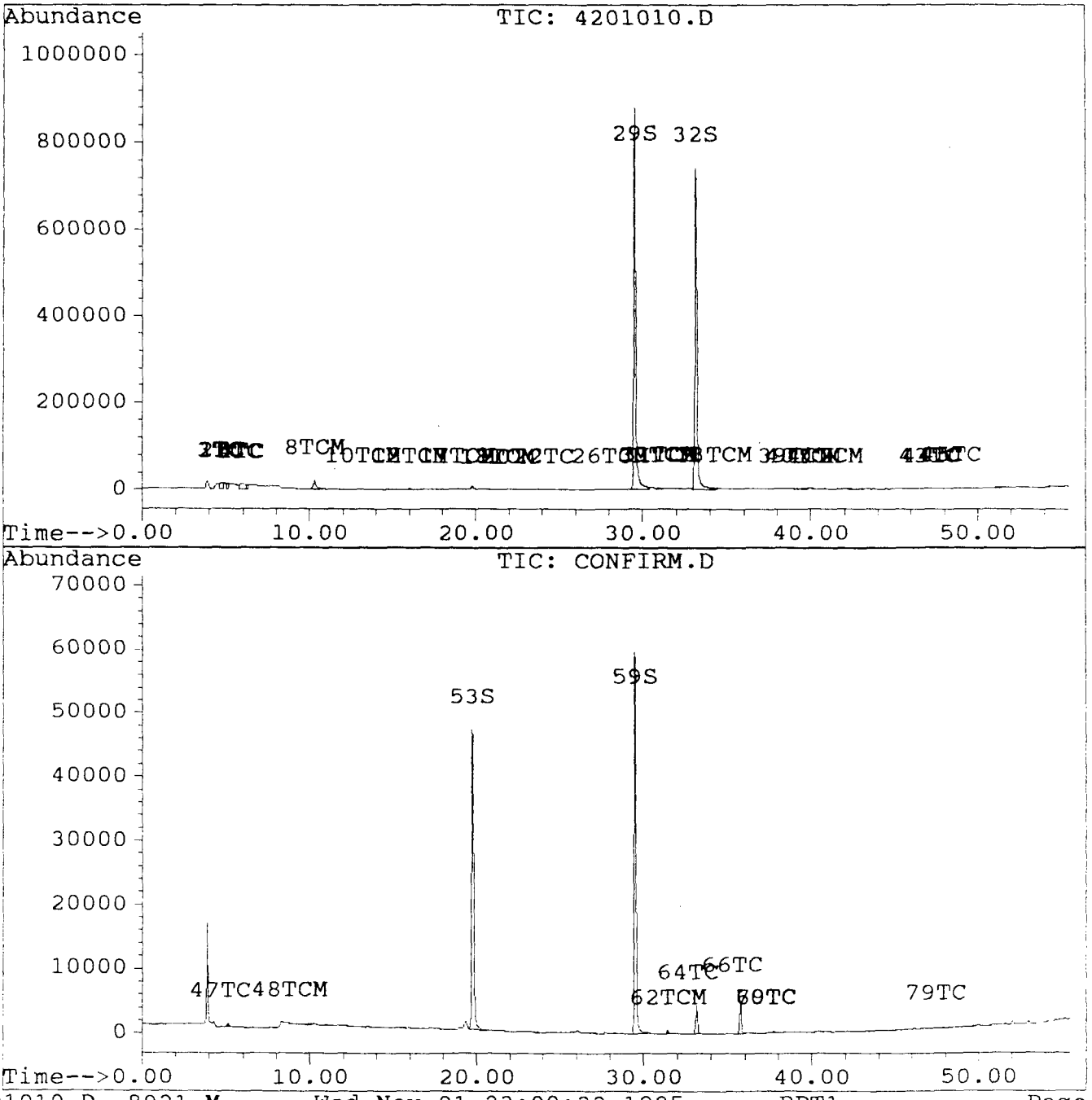
Mark W. Bostrom
Project Manager

Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\4201010.D Vial: 42
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\4201010.D\CONFIRM.D
Acq On : 01 Nov 95 10:02 PM Operator: PK
Sample : 40946 DF1 Inst : P&T #1
Misc : MW-20 Multiplr: 1.00
Quant Time: Nov 1 22:58 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Tue Oct 24 22:54:16 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



Mountain States Analytical
The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

MSAI Sample: 40947
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/18/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Sample ID: MW-21
Matrix: Waste Water

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0515S	TTO, Aromatics/Halocarbons, GC Method: 600 SERIES 601/602					
	1,2-Dichloroethane	2.1	ug/l	1.0	11/01/95	PWK
	Benzene	ND	ug/l	1.0	11/01/95	PWK
	Toluene	ND	ug/l	1.0	11/01/95	PWK
	Ethylbenzene	ND	ug/l	1.0	11/01/95	PWK
	m,p-Xylene	ND	ug/l	1.0	11/01/95	PWK
	o-Xylene	ND	ug/l	1.0	11/01/95	PWK
6159	Chromatograms - GC Method: IN HOUSE MSAI	Complete			11/06/95	PWK

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

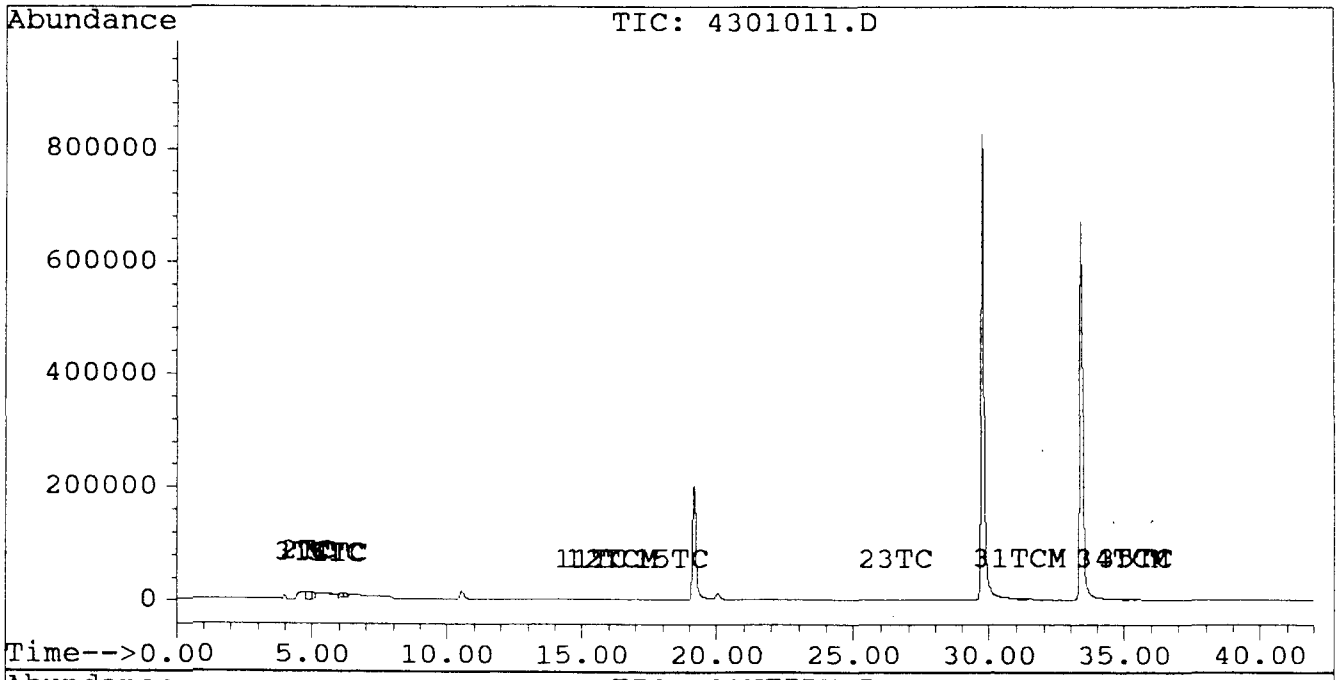
Mark W. Bostrom
Project Manager

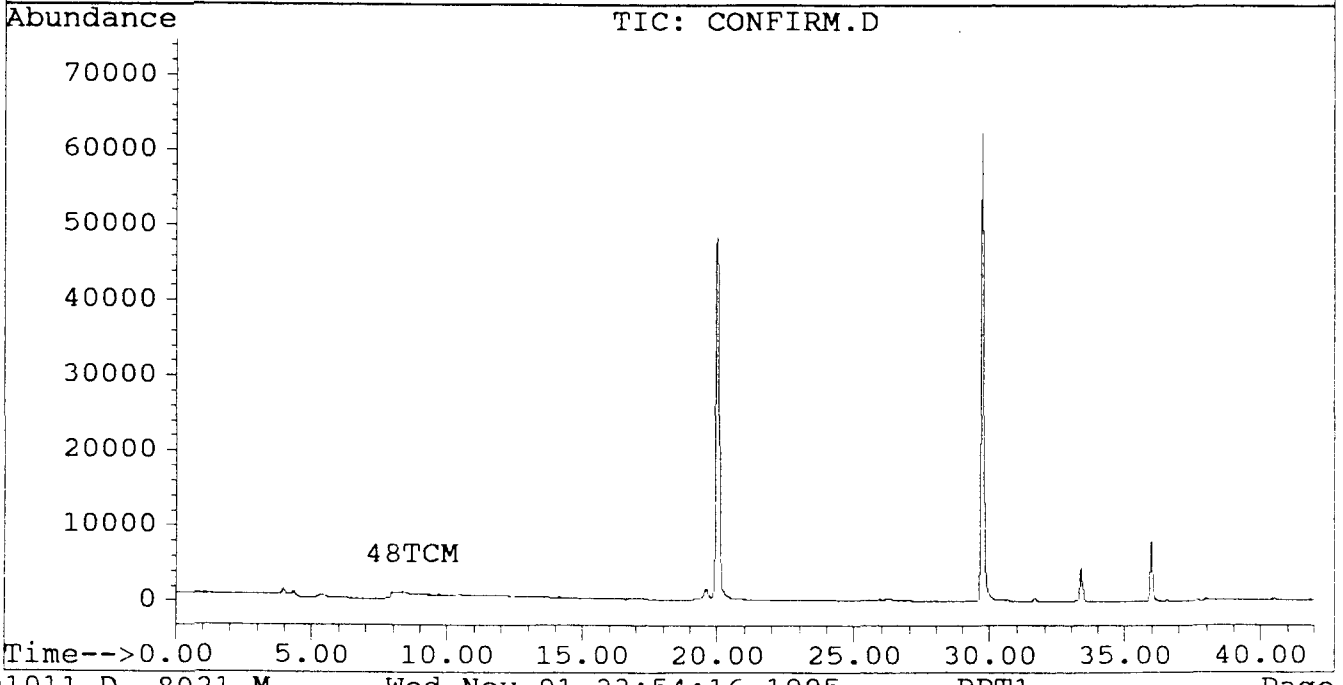
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\4301011.D Vial: 43
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\4301011.D\CONFIRM.D
Acq On : 01 Nov 95 11:09 PM Operator: PK
Sample : 40947 DF1 Inst : P&T #1
Misc : MW-21 Multiplr: 1.00
Quant Time: Nov 1 23:52 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Tue Oct 24 22:54:16 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

MSAI Sample: 40948
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/18/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Sample ID: MW-22
Matrix: Waste Water

Test	Analysis	Results as Received	Units		Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0515S	TTO, Aromatics/Halocarbons, GC						
	Method: 600 SERIES 601/602						
	1,2-Dichloroethane	41.9	ug/l		1.0	11/01/95	PWK
	Benzene	5,700	ug/l	(1)	100	11/02/95	PWK
	Toluene	2,430	ug/l		100	11/02/95	PWK
	Ethylbenzene	1,580	ug/l		100	11/02/95	PWK
	m,p-Xylene	6,160	ug/l		100	11/02/95	PWK
	o-Xylene	2,840	ug/l		100	11/02/95	PWK
6159	Chromatograms - GC	Complete				11/06/95	PWK
	Method: IN HOUSE MSAI						

(1) The analysis for BTEX in this sample was performed outside of holding times. These reults are therefore approximate.

Respectfully Submitted,
Reviewed and Approved by:

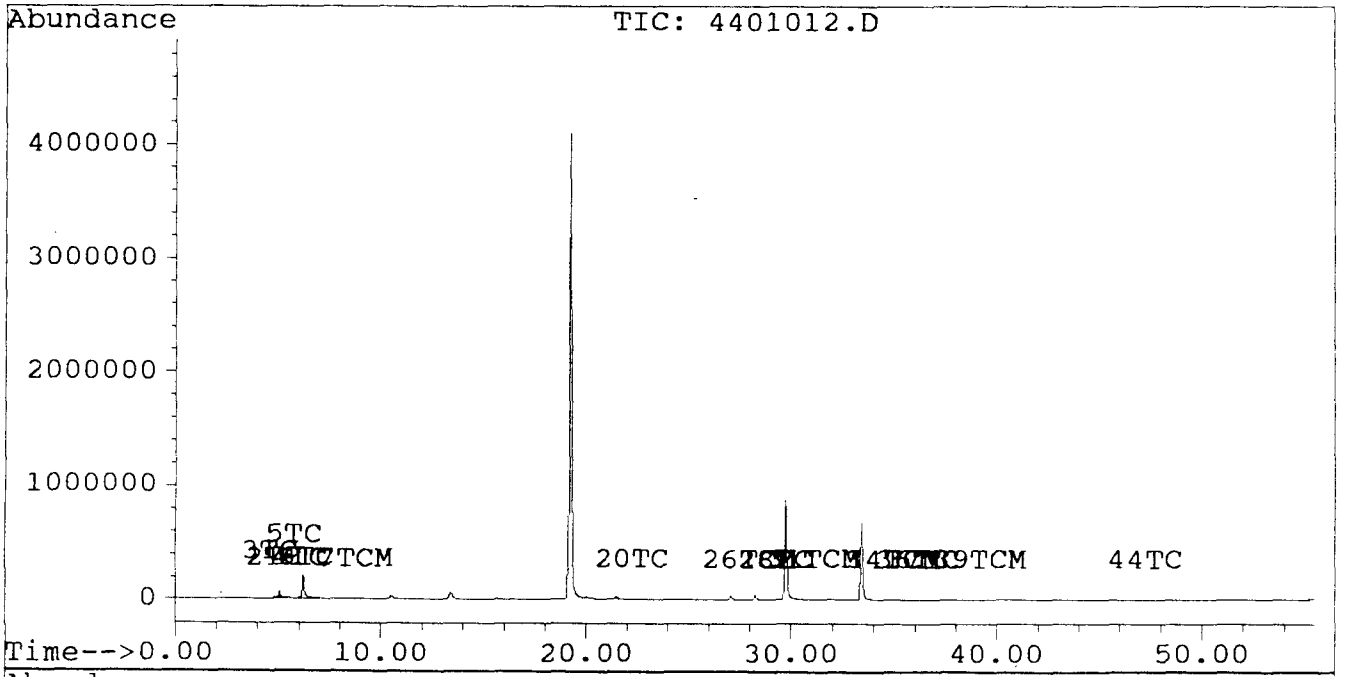
Mark W. Bostrom
Project Manager

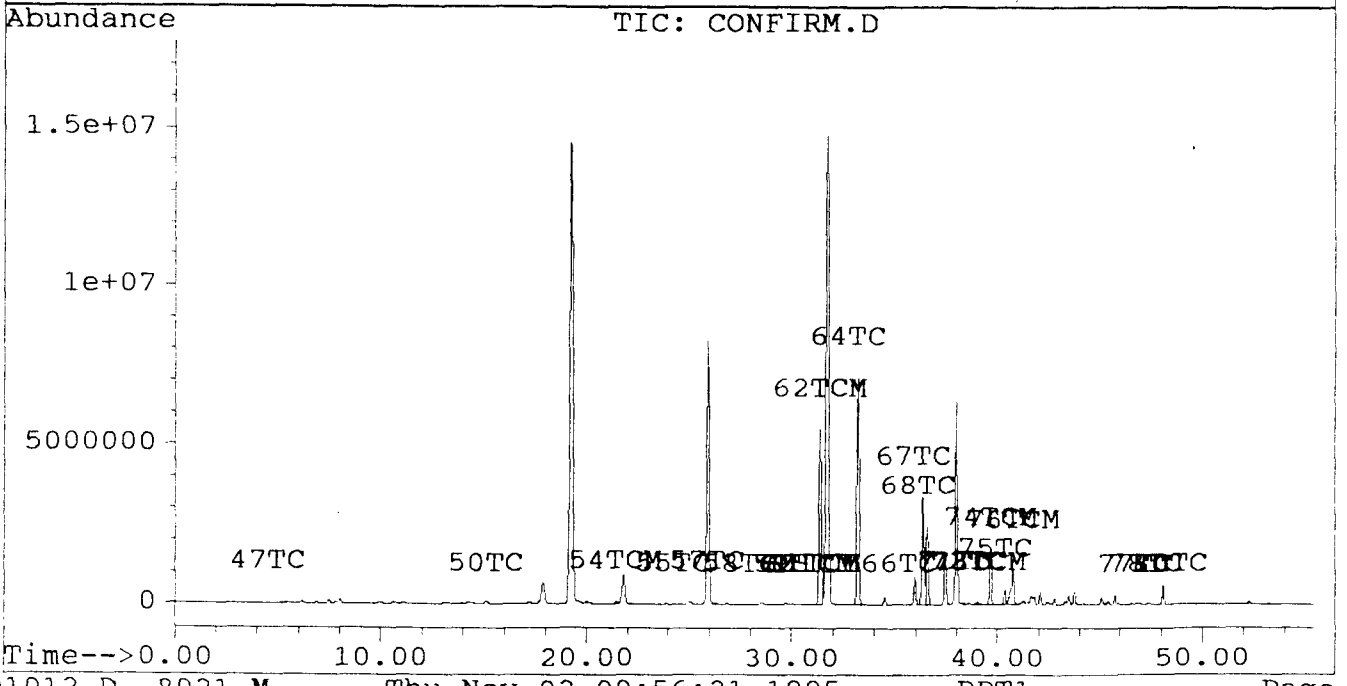
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\4401012.D Vial: 44
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\4401012.D\CONFIRM.D
Acq On : 01 Nov 95 11:57 PM Operator: PK
Sample : 40948 DF1 Inst : P&T #1
Misc : MW-22 Multiplr: 1.00
Quant Time: Nov 2 0:54 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Tue Oct 24 22:54:16 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



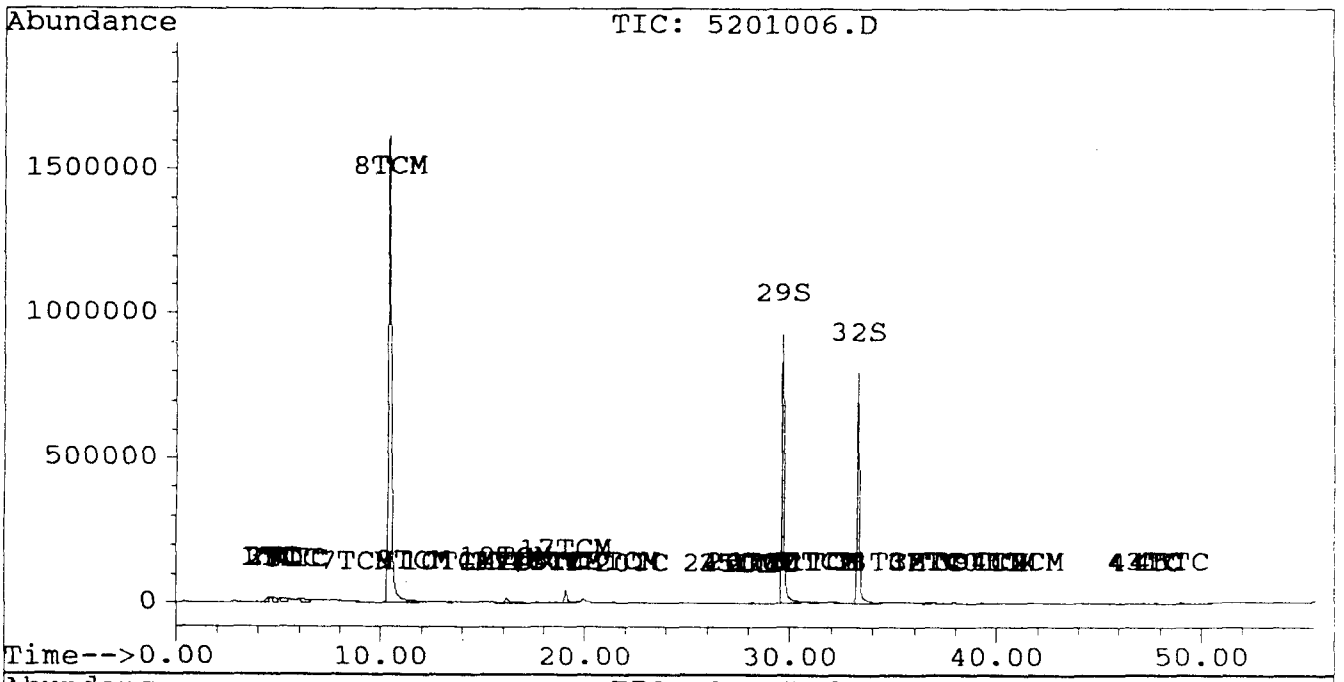


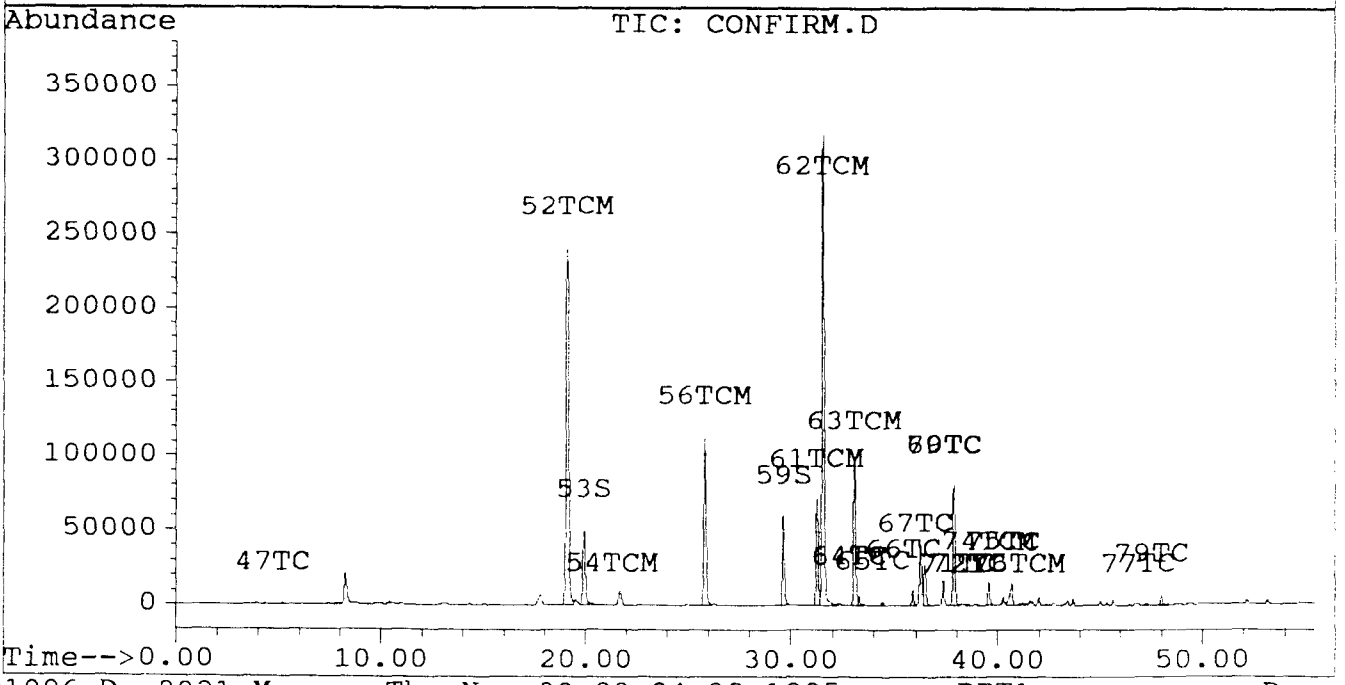
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\5201006.D Vial: 52
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\5201006.D\CONFIRM.D
Acq On : 02 Nov 95 10:26 PM Operator: PK
Sample : 40948RE DF100 Inst : P&T #1
Misc : MW-22 Multiplr: 100.00
Quant Time: Nov 2 23:23 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Thu Nov 02 22:05:42 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

Sample ID: MW-27
Matrix: Waste Water

MSAI Sample: 40949
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/19/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Test	Analysis	Results as Received	Units		Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0515S	TTO, Aromatics/Halocarbons, GC Method: 600 SERIES 601/602						
	1,2-Dichloroethane	ND	ug/l		1.0	11/01/95	PWK
	Benzene	5,120	ug/l	(1)	100	11/02/95	PWK
	Toluene	2,130	ug/l		100	11/02/95	PWK
	Ethylbenzene	1,540	ug/l		100	11/02/95	PWK
	m,p-Xylene	5,760	ug/l		100	11/02/95	PWK
	o-Xylene	2,560	ug/l		100	11/02/95	PWK
6159	Chromatograms - GC Method: IN HOUSE MSAI	Complete				11/06/95	PWK

(1) The results for BTEX were obtained outside of holding times and are therefore approximate.

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

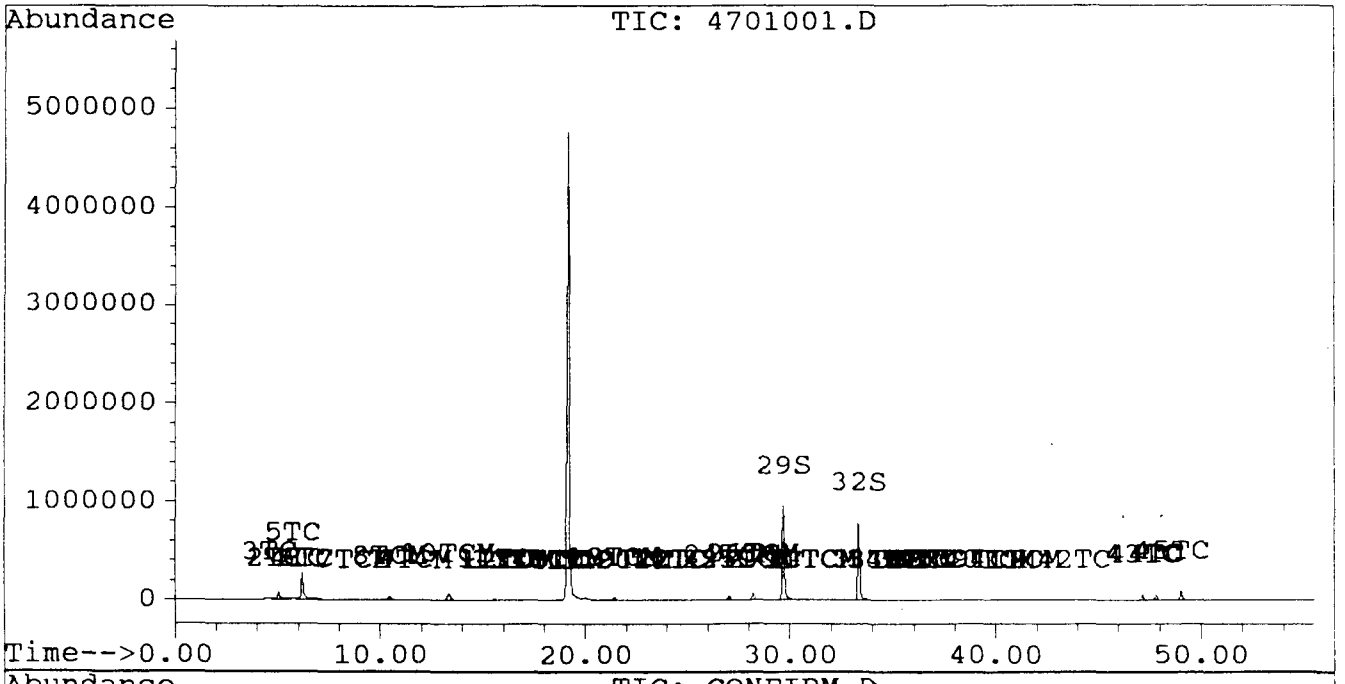
Mark W. Bostrom
Project Manager

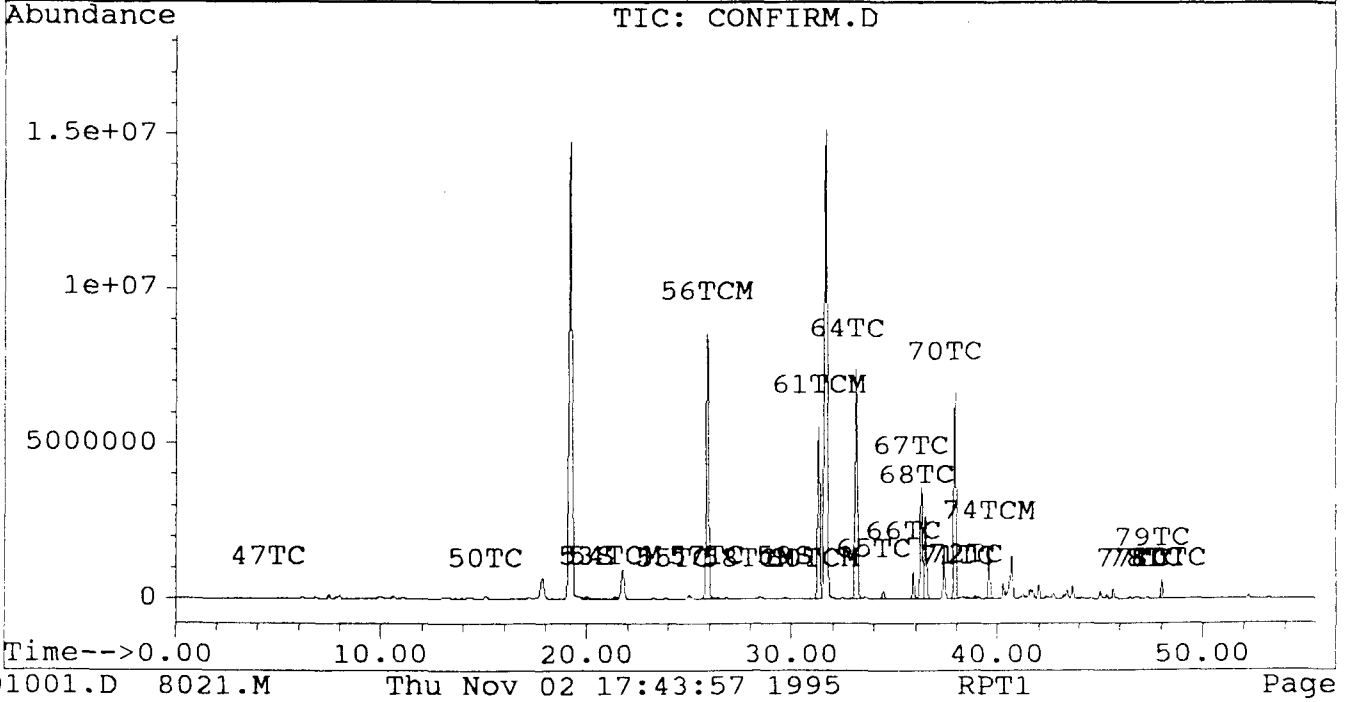
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\4701001.D Vial: 47
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\4701001.D\CONFIRM.D
Acq On : 02 Nov 95 04:45 PM Operator: PK
Sample : 40949 DF1 Inst : P&T #1
Misc : MW-27 Multiplr: 1.00
Quant Time: Nov 2 17:42 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Tue Oct 24 22:54:16 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



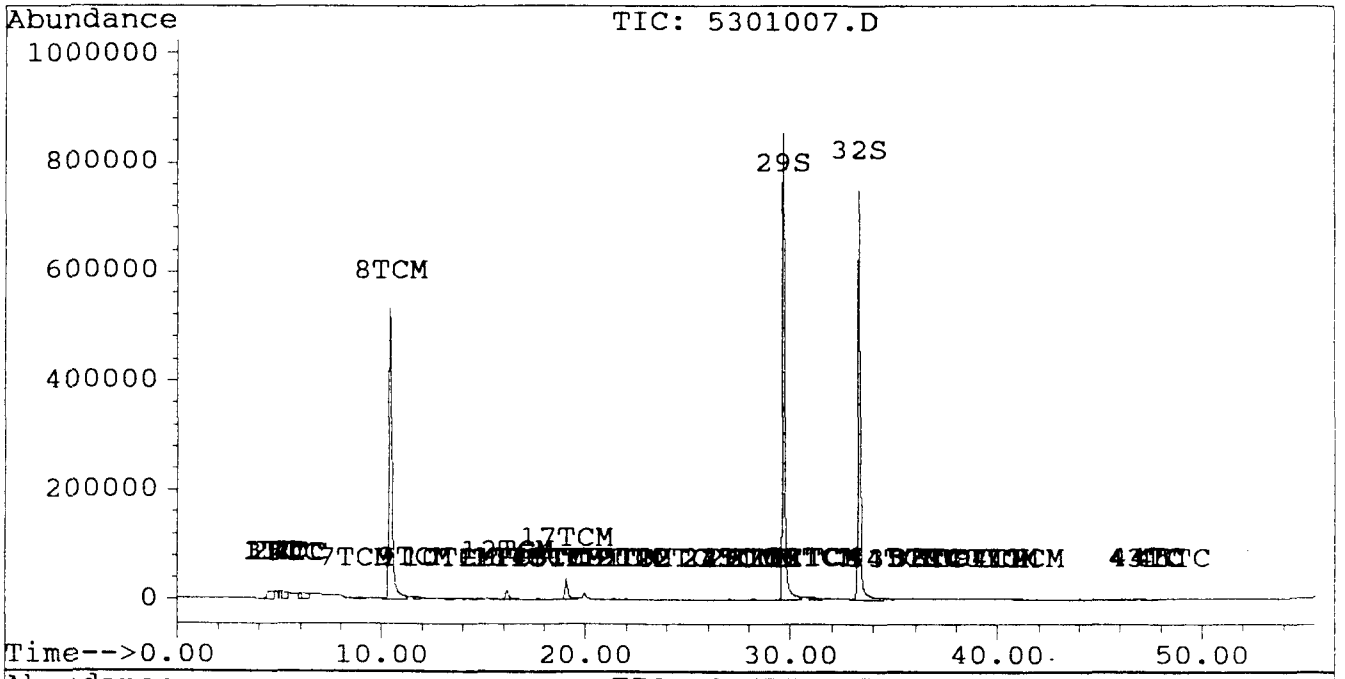


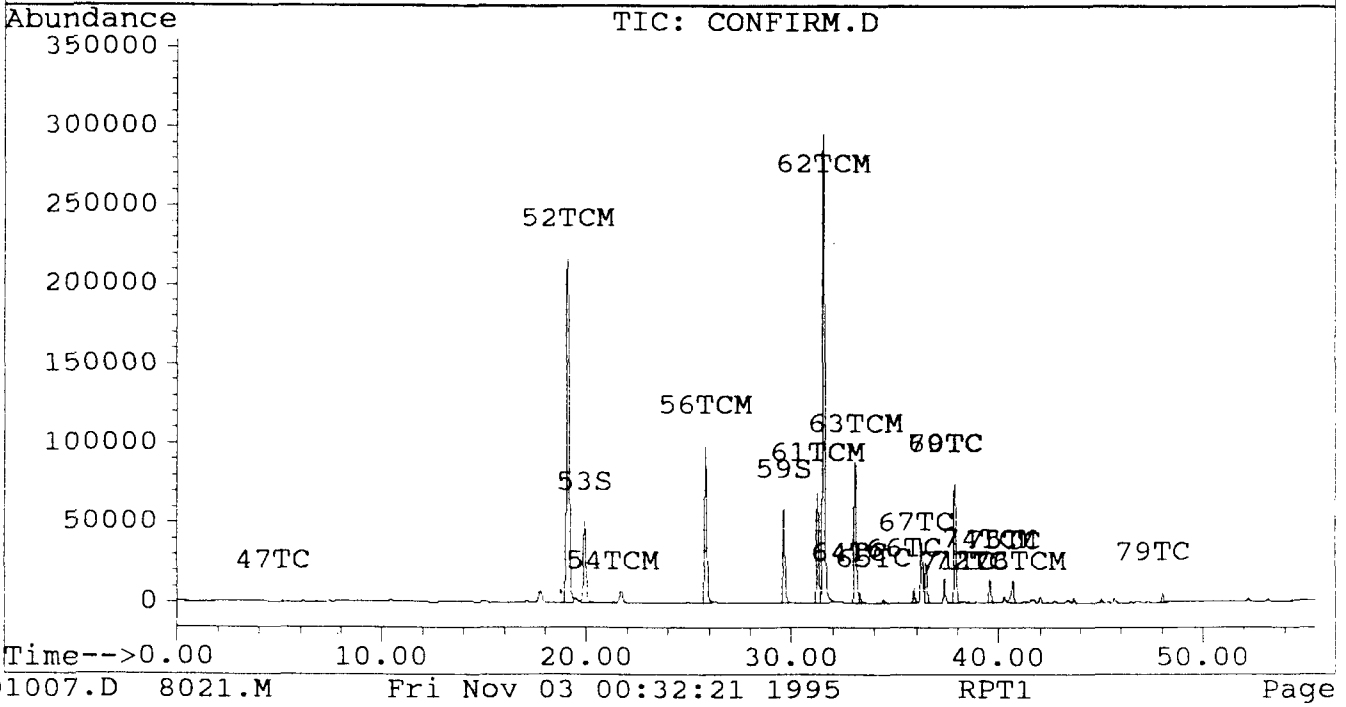
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\5301007.D Vial: 53
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\5301007.D\CONFIRM.D
Acq On : 02 Nov 95 11:33 PM Operator: PK
Sample : 40949RE DF100 Inst : P&T #1
Misc : MW-27 Multiplr: 100.00
Quant Time: Nov 3 0:30 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Thu Nov 02 22:05:42 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm





Mountain States Analytical
The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

MSAI Sample: 40950
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/19/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Sample ID: Trip Blank
Matrix: Waste Water

Test	Analysis	Results as Received	Units	Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0516	BTEX					
	Method: SW-846 8020					
	Benzene	ND	ug/l	1.0	11/02/95	JYB
	Toluene	ND	ug/l	1.0	11/02/95	JYB
	Ethylbenzene	ND	ug/l	1.0	11/02/95	JYB
	m,p-Xylene	ND	ug/l	1.0	11/02/95	JYB
	o-Xylene	ND	ug/l	1.0	11/02/95	JYB
6159	Chromatograms - GC	Complete			11/06/95	PWK
	Method: IN HOUSE MSAI					

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:

Mark W. Bostrom
Project Manager

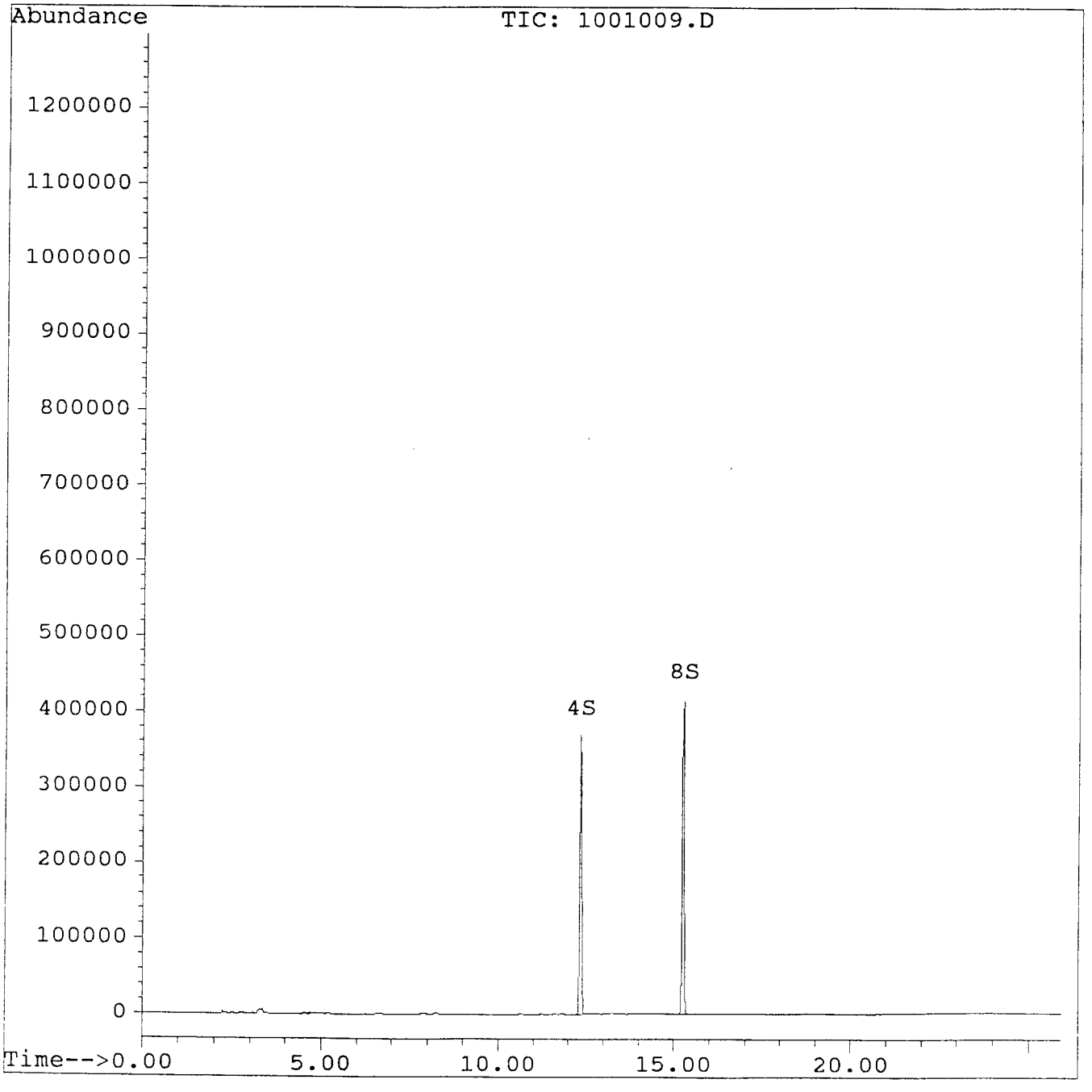
Quantitation Report

Data File : C:\HPCHEM\6\DATA\02NOVBTX\1001009.D
Acq On : 02 Nov 95 08:40 PM
Sample : 40950 DF1
Misc : Trip Blank
Quant Time: Nov 2 21:07 1995

Vial: 10
Operator: JB\TG
Inst : P&T #2
Multiplr: 1.00

Method : C:\HPCHEM\6\METHODS\BTEX.M
Title : MBTEXN
Last Update : Thu Nov 02 07:31:04 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 mL
Signal Phase : DB-624
Signal Info : .53



Mountain States Analytical
The Quality Solution

Tri Technics
175 West 200 South
Suite 2006
Salt Lake City, UT 84101

Attn: Mr. Dennis Riding
Project: Kitland Refinery

Sample ID: MW-17
Matrix: Waste Water

MSAI Sample: 40951
MSAI Group: 10125
Date Reported: 11/08/95

Discard Date: 12/08/95
Date Submitted: 10/20/95
Date Sampled: 10/19/95
Collected by: DA
Purchase Order: MAVKL02895
Project No.:

Test	Analysis	Results as Received	Units		Limit of Quantitation	Date Extracted/ Analyzed	Analyst
0515S	TTO, Aromatics/Halocarbons, GC Method: 600 SERIES 601/602						
	1,2-Dichloroethane	2.3	ug/l		1.0	11/01/95	PWK
	Benzene	3,000	ug/l	(1)	100	11/03/95	PWK
	Toluene	464	ug/l		100	11/02/95	PWK
	Ethylbenzene	244	ug/l		100	11/02/95	PWK
	m,p-Xylene	758	ug/l		100	11/02/95	PWK
	o-Xylene	321	ug/l		100	11/02/95	PWK
6159	Chromatograms - GC Method: IN HOUSE MSAI	Complete				11/04/95	PWK

(1) The results for BTEX were obtained outside of holding times and are therefore approximate.

Respectfully Submitted,
Reviewed and Approved by:

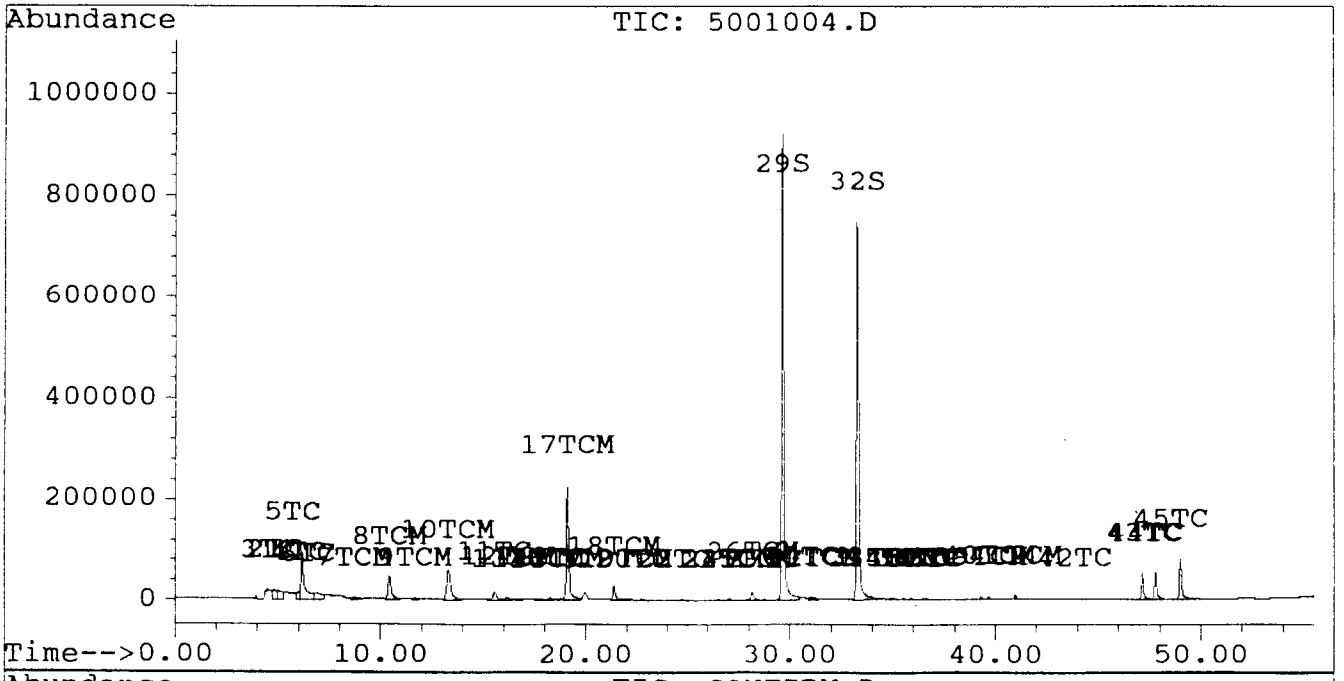
Mark W. Bostrom
Project Manager

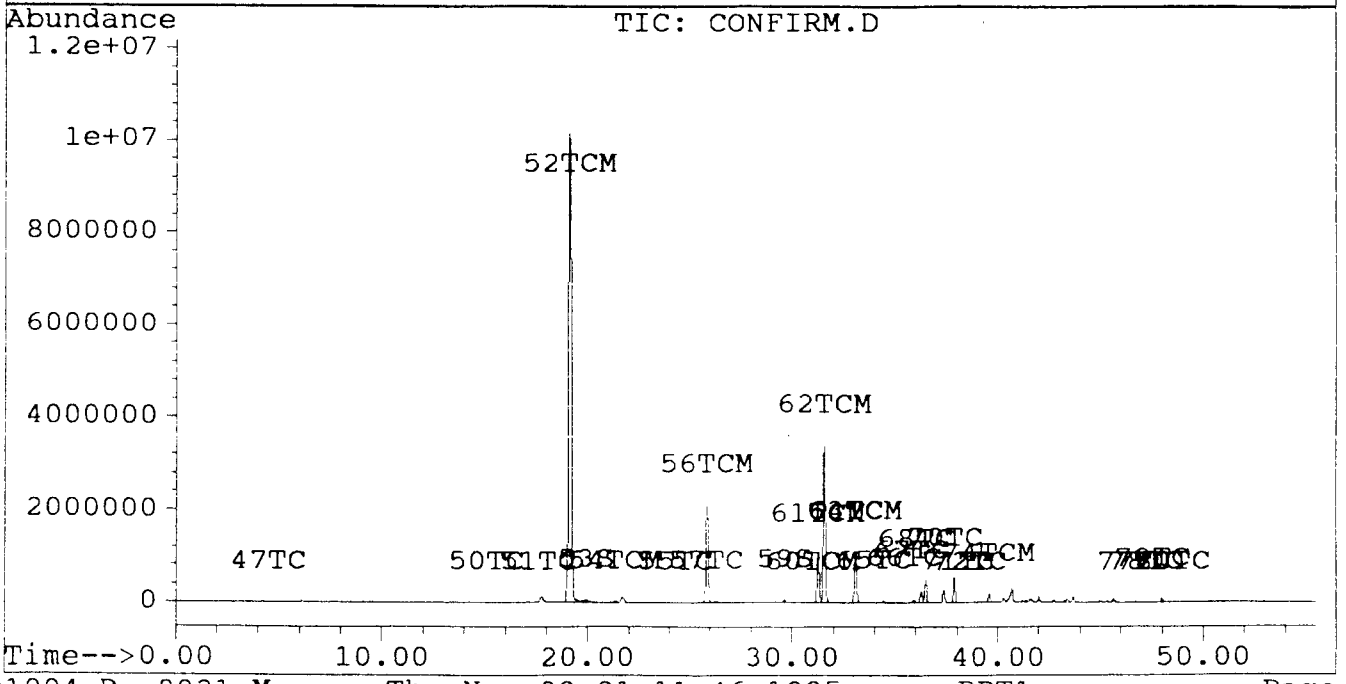
Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\5001004.D Vial: 50
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\5001004.D\CONFIRM.D
Acq On : 02 Nov 95 08:09 PM Operator: PK
Sample : 40951 DF1 Inst : P&T #1
Misc : MW-17 Multiplr: 1.00
Quant Time: Nov 2 21:07 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Tue Oct 24 22:54:16 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



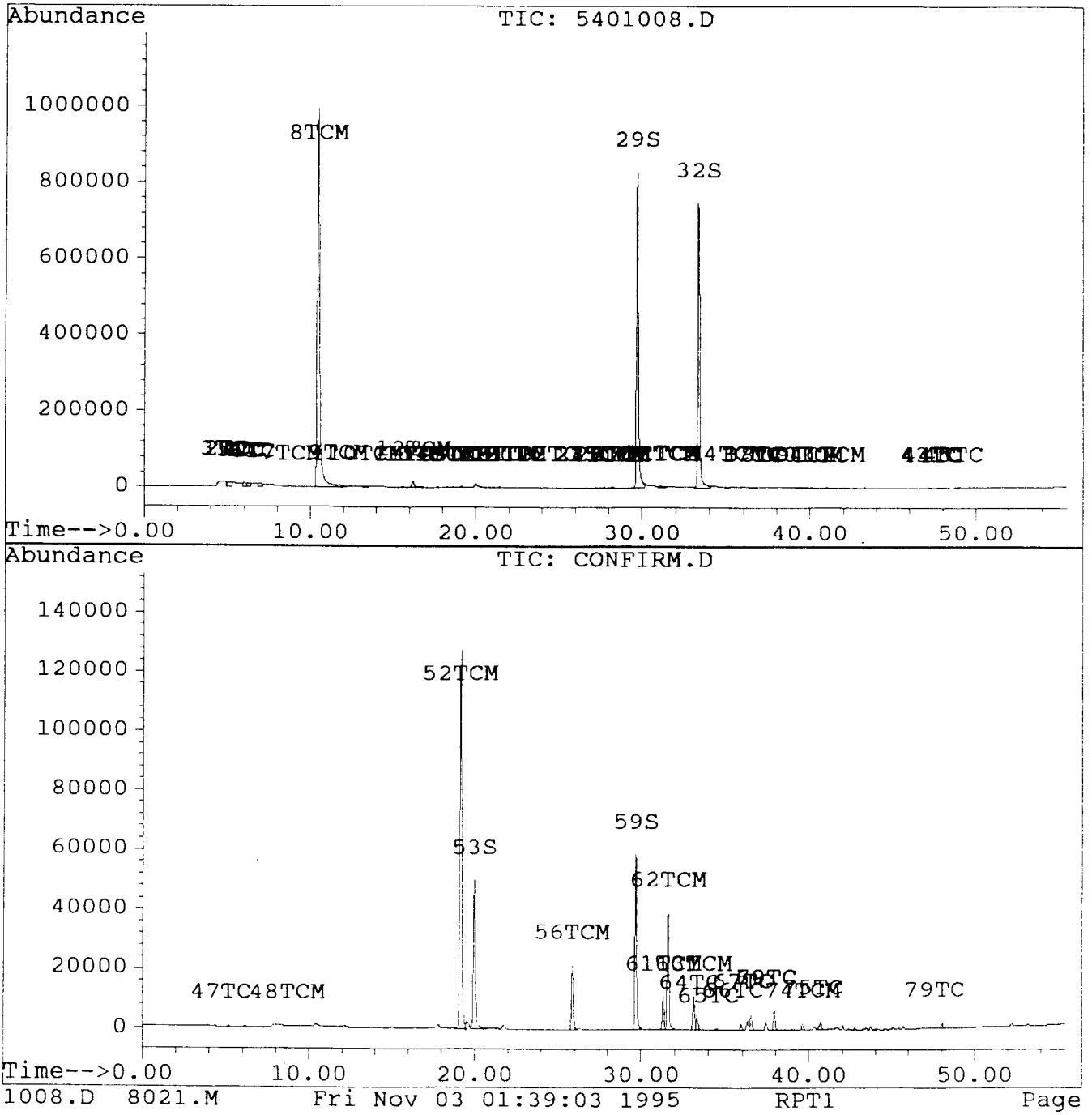


Quantitation Report

Signal #1 : C:\HPCHEM\5\DATA\26OCTVOL\5401008.D Vial: 54
Signal #2 : C:\HPCHEM\5\DATA\26OCTVOL\5401008.D\CONFIRM.D
Acq On : 03 Nov 95 00:40 AM Operator: PK
Sample : 40951RE DF100 Inst : P&T #1
Misc : MW-17 Multiplr: 100.00
Quant Time: Nov 3 1:37 1995

Method : C:\HPCHEM\5\METHODS\8021.M
Title : Purgeable Halocarbons/Aromatics
Last Update : Thu Nov 02 22:05:42 1995
Response via : Multiple Level Calibration

Volume Inj. : 5 ml
Signal #1 Phase : RTX 502.2 Signal #2 Phase: RTX 502.2
Signal #1 Info : 0.53mm Signal #2 Info : 0.53mm



7155

Mountain States Analytical

Sample Chain of Custody

Client Name: Tri Technics P.O. # MAVKL02895

Phone #: 359 3059 Fax #: 359 3307

Project Name/#: Kirtland Refinery

Sampler: Darrell

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Total of Containers	Analysis Required: BTEX 601	Analysis Required: DCA 602	Rush?	Remarks	Temp. of Samples Upon Receipt
MW-22	10-19	1445	X			X		3	X	X			11°C
MW-27	10-19	1500	X			X		3	X	X			JF
Trip Blank						X		2	X				10/20/95
MW-17	10-19	1400	X			X		3	X	X			

Name of Shipper	Airbill No.	Date	Time
Fed Ex	475379713	10-19	1645

Received By (Lab)	Date	Time	Seals Intact?
[signature]	10/20/95	0950	YES

Turnaround Time Requested (please circle): Normal Rush

(Rush TAT is subject to MSAI approval and surcharge)

Report Results By: (Date) _____

Rush results requested by (please circle): Phone Fax

Report Results to: Dennis Ridley

Sample relinquished by:	Date	Time	Sample received by:	Date	Time
Darrell Quale	10-19	1645			

Type of Disposal: Authorized for Disposal by:

Date/Time of Disposal: Disposed of by:

1645 West 2200 South, Salt Lake City, Utah 84119 (801) 973-0050 FAX (801) 972-6278

White Copy - Original Retain by Lab Yellow Copy - Return to Customer Pink Copy - Retain by Sampler

7154

Mountain States Analytical

Sample Chain of Custody

Client Name: Tri Technics P.O. # MAVKL02895

Phone #: 3593059 Fax #: 359 3307

Project Name/#: Kirtland Refinery

Sampler: Darrell

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Total of Containers	Analysis Required: BTEX 601 / DCA 602	Rush?	Remarks	Temp. of Samples Upon Receipt
MW-9	10-18	1540	X			X		3	X X			11°C JF 10/20/95
MW-10	10-18	1015	X			X		3	X X			
MW-13	10-18	1500	X			X		3	X X			
MW-14	10-18	1445	X			X		3	X X			
MW-15	10-18	1600	X			X		3	X X			
MW-16	10-18	1430	X			X		3	X X			
MW-18	10-18	1420	X			X		3	X X			
MW-19	10-18	1100	X			X		3	X X			
MW-20	10-18	1145	X			X		3	X X			
MW-21	10-18	1710	X			X		3	X X			

Name of Shipper	Airbill No.	Date	Time
FedEx	475379 7134	10-19	1645

Received By (Lab)	Date	Time	Seals Intact?
Jennifer Ford	10/20/95	0950	YES

Sample relinquished by: Darrell Cash — Date: 10-19 — Time: 1645

Sample received by: — Date: — Time:

Turnaround Time Requested (please circle): Normal Rush

(Rush TAT is subject to MSAI approval and surcharge)

Report Results By: (Date) _____

Rush results requested by (please circle): Phone Fax

Report Results to: _____

Type of Disposal: — Authorized for Disposal by:

Date/Time of Disposal: — Disposed of by:

1645 West 2200 South, Salt Lake City, Utah 84119 (801) 973-0050 FAX (801) 972-6278

White Copy - Original Retain by Lab Yellow Copy - Return to Customer Pink Copy - Retain by Sampler