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REPORTS

DATE:

JAN. 17, 2002

2R-34

Cypress Engineering

10235 West Little York Road, Suite 256
Houston, Texas 77040
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January 17, 2002

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JAN 29 2002
ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Mr. William C. Olson
Environmental Bureau
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Report of Ground Water Remediation Activities
Transwestern Pipeline Company - Atoka-1 Compressor Station
Eddy County, New Mexico

Dear Bill,

The attached report is submitted pursuant to the NMOCD's requirements for reporting of ground water remediation activities at the subject facility.

If you have any questions or comments regarding this report, please contact me at (713) 646-7327 or Larry Campbell at (505) 625-8022.

Sincerely,

George C. Robinson, PE
President/Principal Engineer

xc w/attachment: Larry Campbell — Transwestern Pipeline Company
Bryan Arrant — NMOCD Artesia District Office

ANNUAL REPORT OF GROUNDWATER REMEDIATION ACTIVITIES AT THE ATOKA -1 COMPRESSOR STATION

RECEIVED
JAN 29 2002
ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Prepared for:
Transwestern Pipeline Company

Prepared by:
Cypress Engineering Services, Inc.
10235 West Little York Road, Suite 256
Houston, TX 77040

January 17, 2002

Report of Groundwater Remediation Activities

Transwestern Pipeline Company

Atoka-1 Compressor Station

I. Groundwater Monitoring Activities

Groundwater Sampling Events

Four semi-annual sampling events have been completed since the last report of groundwater remediation activities. These events were completed in February 2000, August 2000, February 2001, and August 2001. In addition to the routine groundwater sampling events, selected wells were sampled in April 2000 and June 2000.

Prior to sampling, the depth to water, and the depth to hydrocarbon where phase separated hydrocarbon (PSH) was present, was determined for each monitor well. The measured depths and the corresponding water table elevation for each monitor well are presented in Table 1. The measured depths and the corresponding water table elevation for each soil vapor extraction (SVE) well are presented in Table 2.

Groundwater samples were collected from seven monitor wells in the course of the February 2000 and August 2000 sampling events. Samples were collected from all eight monitor wells in the course of the February 2001 and August 2001 sampling events. Groundwater samples were not collected from monitor well MW-1 in the course of the February 2000 and August 2000 sampling events due to the presence of PSH previously measured in this well. PSH was not present in well MW-1 during the August 2000 sampling event and therefore this well was added to the sampling analysis plan for subsequent sampling events.

Groundwater samples were delivered to a laboratory for analysis by EPA Method 8021B for benzene, toluene, ethylbenzene, and xylenes (BTEX). A summary of the laboratory results and field-measured parameters is presented in Table 3. A copy of the laboratory results for each of the sampling events is included as an attachment to this report.

Results/Conclusions from Groundwater Sampling Events

Occurrence and Direction of Groundwater Flow

A groundwater surface elevation map, based on measurements obtained on August 13, 2001 is included as Figure 2. The elevation of shallow groundwater measured in the monitor wells does not define a consistent groundwater table. This observation is consistent with previous sampling events and is likely because there is very little shallow groundwater present.

The apparent direction of groundwater flow, based on elevations measured in monitor wells MW-3, MW-5, MW-6, and MW-7, is toward to south-southwest. This is consistent with what would be expected based upon ground surface topography.

Lateral Extent of Phase Separated Hydrocarbon

Prior sampling events identified the presence of PSH in wells MW-1, MW-2 and SVE-13; however, PSH has not been detected in these wells in the course of the last three sampling events. Based on the information currently available, the SVE system appears to have been effective in the removal of PSH from above the perched water zone.

Condition of Affected Groundwater

A diagram indicating the relative distribution of BTEX concentrations in groundwater, based on measurements obtained during the August 2001 sampling event, is included as Figure 3. The condition of affected groundwater has improved since the last report of remediation activities. A diagram indicating the trend of benzene concentrations at each monitor well is presented in Figure 4.

II. Planned Changes to the Groundwater Monitoring Program

Frequency of Groundwater Monitoring

Groundwater sampling events will continue on a semi-annual basis until site closure is approved. The next sampling event will occur in February 2002.

Routine Reporting of Monitoring Activities

Routine reporting will continue on an annual basis until site closure is approved. The next annual report will be submitted to the OCD by January 2003.

III. Status of Remediation Activities

Remediation Activities Completed

The following remediation activities were completed through December 2001:

1) Three vapor samples were collected and analyzed for total VOCs. The concentration of VOCs in soil vapor continue to decline (see Table 4).
2) Four groundwater-sampling events were completed.
3) Routine O&M of the SVE system continued through October 2001. The system was shut down in October 2001 due to problems associated with operating the system in cold weather conditions.
4) A water recovery system operated on a limited basis between December 1999 and October 2001. The purpose was to establish a maximum sustainable recovery rate for the perched water zone and to evaluate the effect that water recovery would have on the dissolved phase plume. The maximum sustainable recovery rate from any of the three wells utilized (MW-5, MW-6, and MW-7) was about 60 gallons per day (gpd). There was no noticeable effect on the dissolved phase plume concentrations. As a result, the recovery of water has been discontinued.

Current Status of Remediation Activities

The SVE system was shut down in October 2001 due to problems associated with operating the system in cold weather conditions.

Remediation Activities Planned

The SVE system will be placed back in service in April 2002. There are no plans at this time to re-activate the water recovery system.

A proposal for site closure will be prepared and submitted to the NMOCD by July 1, 2002. In general, the proposal will present the position that water contained within the shallow perched water zone should be classified as non-protectable groundwater based upon the limited capacity of the water zone to produce water to a well.

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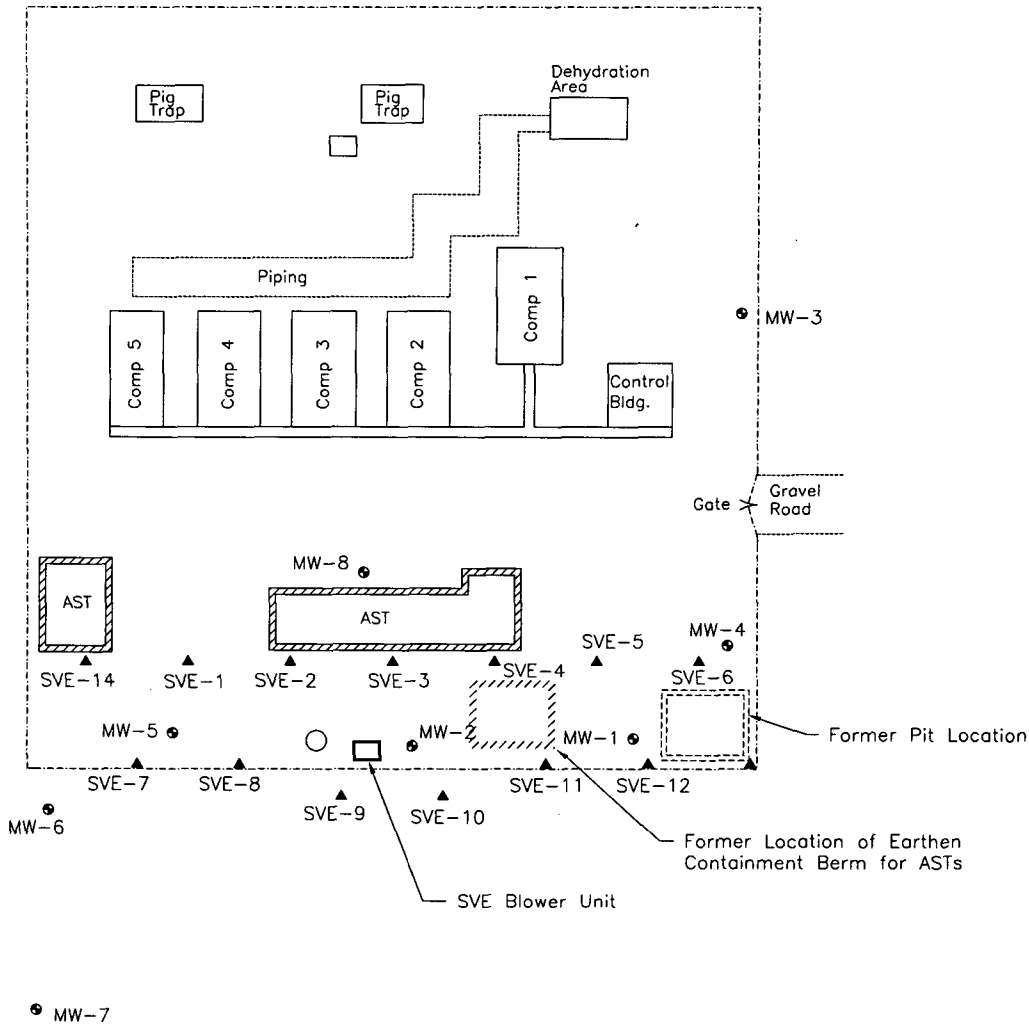

N

0 75 Feet

Explanation

Containment wall

Fence

Monitor well

Soil vapor extraction well

SITE MAP

ATOKA-1 COMPRESSOR STATION

TRANSWESTERN PIPELINE COMPANY

CYPRESS ENGINEERING SERVICES, INC.

FIGURE 1

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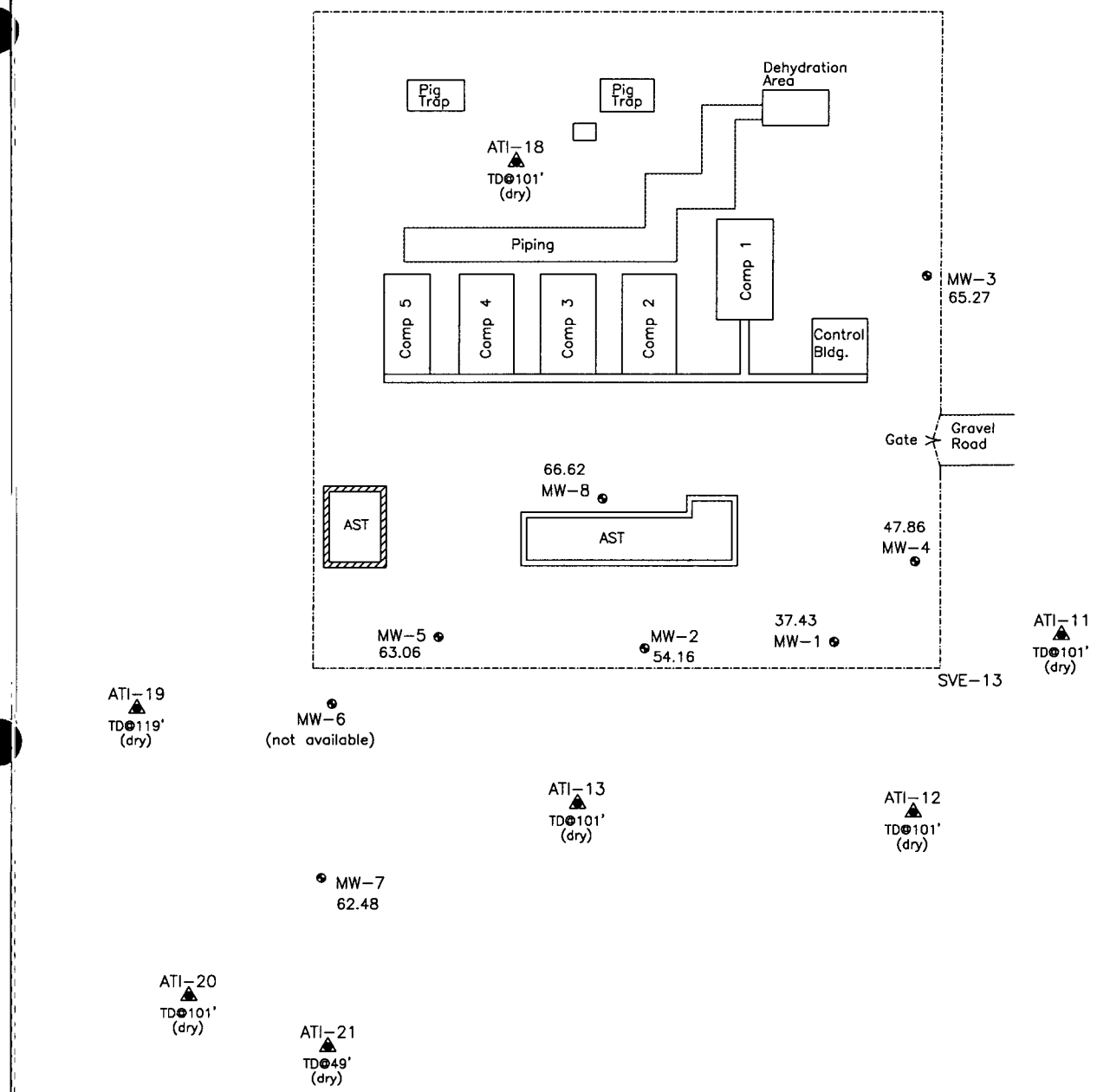


N

0 75 Feet

Explanation

- Containment wall
- Fence
- Monitor well
- Soil boring location (11/94)
- 63.28 Ground water elevation
- 39.52* Corrected for PSH

GROUNDWATER ELEVATIONS

August 13, 2001

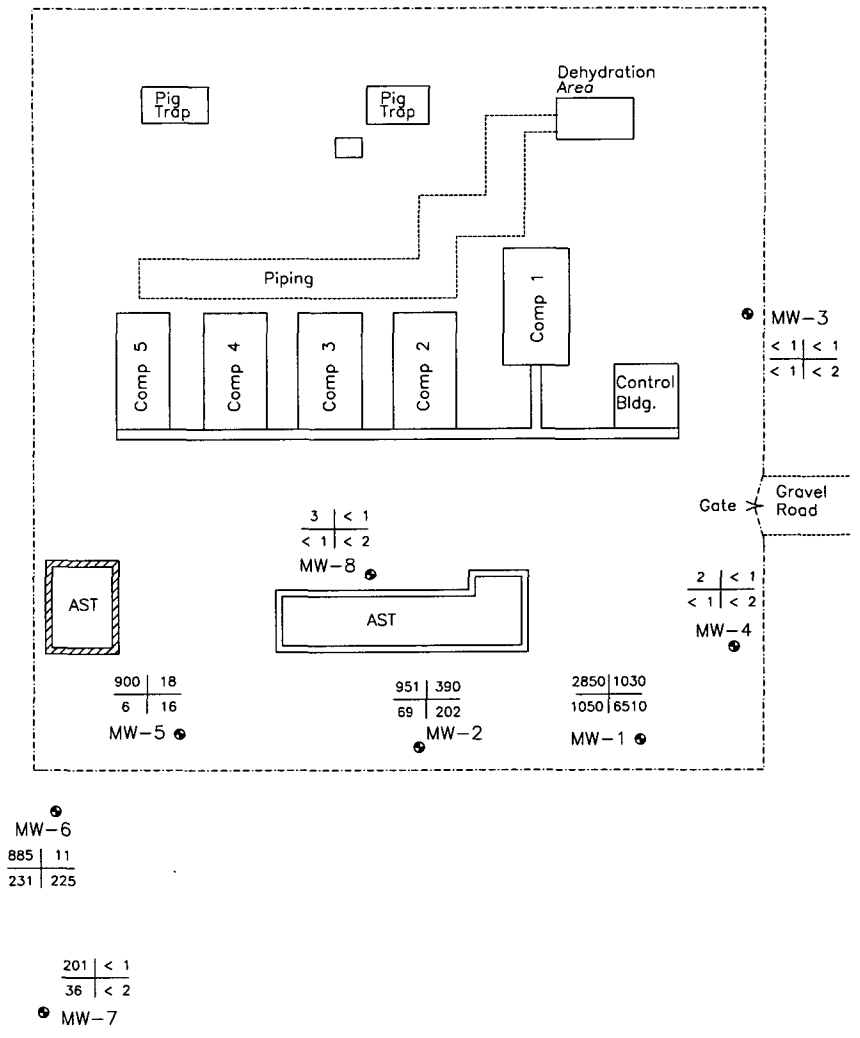
ATOKA-1 COMPRESSOR STATION

TRANSWESTERN PIPELINE COMPANY

CYPRESS ENGINEERING SERVICES, INC.

FIGURE 2

F:\...\drawings\atoka\atksite.dwg (01/14/02)



N

0 75 Feet

Explanation

- Containment wall
- Fence
- Monitor well
- PSH — Phase Separated Hydrocarbon
- NS — No Sample
- B | T / E | X — BTEX concentration, ppb

BTEX DISTRIBUTION

August 13, 2001

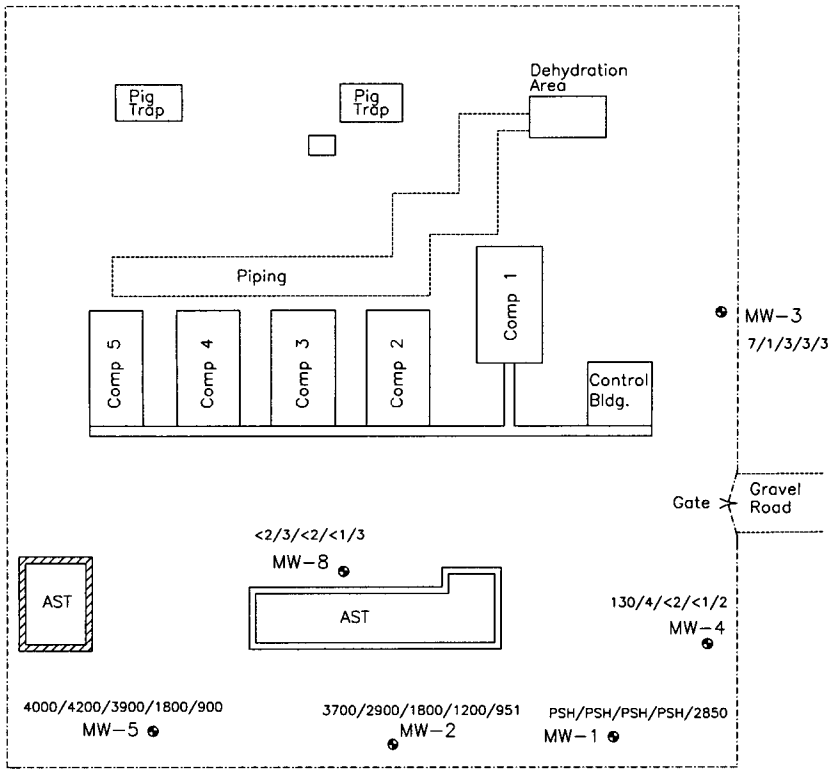
ATOKA-1 COMPRESSOR STATION

TRANSWESTERN PIPELINE COMPANY

CYPRESS ENGINEERING SERVICES, INC.

FIGURE 3

F:\...\drawings\atoka\atksite.dwg (01/14/02)



N

0 75 Feet

Explanation

- Containment wall
- Fence
- Monitor well
- PSH — Phase Separated Hydrocarbon
- NS — No Sample
- 860 — Benzene concentration, ppb (Aug. '97/Aug. '98/Aug. '99/Feb. '00)

BENZENE DISTRIBUTION TREND

Aug. '97, Aug. '98, Aug. '99, Aug. '00, & Aug. '01

ATOKA-1 COMPRESSOR STATION

TRANSWESTERN PIPELINE COMPANY

CYPRESS ENGINEERING SERVICES, INC.

FIGURE 4

Table 1. Summary of Ground Water Surface Elevations
TW Atoka-1 Compressor Station

Well	Sampling Date	Top of Casing (ft)	Depth to PSH (ft)	Depth to Water (ft)	PSH (ft)	Surface Elevation (ft)
MW-1	07/21/93	94.65	(b)	(b)	(b)	(b)
	12/02/94		56.12	56.82	0.70	38.36
	10/30/95		(b)	56.83	(b)	(b)
	02/23/96	95.66 (d)	57.52	57.89	0.37	38.05
	05/14/96		57.50	57.83	0.33	38.08
	08/12/96		57.61	57.98	0.37	37.96
	11/11/96		56.11	56.25	0.14	39.52
	02/03/97		56.67	56.82	0.15	38.95
	08/04/97		57.41	57.75	0.34	38.17
	02/23/98		(a)	54.75	(a)	40.91
	08/05/98		57.08	57.30	0.22	38.53
	02/12/99		59.42	59.74	0.32	36.16
	08/12/99		61.71	61.88	0.17	33.91
	02/13/00		57.74	57.81	0.07	37.90
	08/16/00		(a)	58.05	(a)	37.61
	02/06/01		(a)	58.09	(a)	37.57
	08/13/01		(a)	58.23	(a)	37.43
MW-2	07/21/93	96.45	(a)	42.38	(a)	54.07
	12/02/94		42.31	42.35	0.04	54.13
	10/30/95		(b)	42.54	(b)	(b)
	02/23/96	97.29 (d)	43.34	43.36	0.02	53.95
	05/14/96		43.33	43.34	0.01	53.96
	08/12/96		43.32	43.33	0.01	53.97
	11/11/96		(a)	43.11	(a)	54.18
	02/03/97		(a)	43.12	(a)	54.17
	08/04/97		(a)	43.15	(a)	54.14
	02/23/98		(a)	43.07	Sheen	54.22
	08/05/98		(a)	43.00	(a)	54.29
	02/12/99		(a)	43.07	(a)	54.22
	08/12/99		(a)	42.74	(a)	54.55
	02/13/00		(a)	42.62	(a)	54.67
	08/16/00		(a)	42.77	(a)	54.52
	02/06/01		(a)	42.85	(a)	54.44
	08/13/01		(a)	43.13	(a)	54.16
MW-3	07/21/93	95.00	(a)	36.55	(a)	58.45
	12/02/94		(a)	32.23	(a)	62.77
	10/30/95		(a)	31.80	(a)	63.20
	02/23/96		(a)	31.33	(a)	63.67
	05/14/96		(a)	31.28	(a)	63.72
	08/12/96		(a)	31.28	(a)	63.72
	11/11/96		(a)	30.50	(a)	64.50
	02/03/97		(a)	30.20	(a)	64.80
	08/04/97		(a)	30.41	(a)	64.59
	02/23/98		(a)	29.78	(a)	65.22
	08/05/98		(a)	28.81	(a)	66.19
	02/12/99		(a)	29.91	(a)	65.09
	08/12/99		(a)	29.44	(a)	65.56
	02/13/00		(a)	29.34	(a)	65.66

Table 1. Summary of Ground Water Surface Elevations
TW Atoka-1 Compressor Station

Well	Sampling Date	Top of Casing (ft)	Depth to PSH (ft)	Depth to Water (ft)	PSH (ft)	Surface Elevation (ft)
	08/16/00		(a)	29.94	(a)	65.06
	02/06/01		(a)	29.38	(a)	65.62
	08/13/01		(a)	29.73	(a)	65.27
MW-4	07/21/93	94.02	(a)	49.92	(a)	44.10
	12/02/94		(a)	46.38	(a)	47.64
	10/30/95		(a)	46.05	(a)	47.97
	02/23/96	95.21 (d)	(a)	47.64	(a)	47.57
	05/14/96		(a)	47.58	(a)	47.63
	08/12/96		(a)	47.05	(a)	48.16
	11/11/96		(a)	46.72	(a)	48.49
	02/03/97		(a)	47.10	(a)	48.11
	08/04/97		(a)	46.85	(a)	48.36
	02/23/98		(a)	46.90	(a)	48.31
	08/05/98		(a)	47.51	(a)	47.70
	02/12/99		(a)	47.35	(a)	47.86
	08/12/99		(a)	46.10	(a)	49.11
	02/13/00		(a)	47.34	(a)	47.87
	08/16/00		(a)	47.20	(a)	48.01
	02/06/01		(a)	47.14	(a)	48.07
	08/13/01		(a)	47.35	(a)	47.86
MW-5	12/02/94	98.22	(a)	34.40	(a)	63.82
	10/30/95		(a)	34.80	(a)	63.42
	02/23/96		(a)	34.88	(a)	63.34
	05/14/96		(a)	34.88	(a)	63.34
	08/12/96		(a)	34.61	(a)	63.61
	11/11/96		(a)	34.37	(a)	63.85
	02/03/97		(a)	34.25	(a)	63.97
	08/04/97		(a)	34.21	(a)	64.01
	02/23/98		(a)	34.00	(a)	64.22
	08/05/98		(a)	34.05	(a)	64.17
	02/12/99		(a)	34.29	(a)	63.93
	08/12/99		(a)	34.27	(a)	63.95
	02/13/00		(a)	34.42	(a)	63.80
	08/16/00		(a)	35.05	(a)	63.17
	02/06/01		(a)	35.11	(a)	63.11
	08/13/01		(a)	35.16	(a)	63.06
MW-6	12/02/94	99.62	(a)	36.00	(a)	63.62
	10/30/95		(a)	36.34	(a)	63.28
	02/23/96		(a)	36.46	(a)	63.16
	05/14/96		(a)	36.38	(a)	63.24
	08/12/96		(a)	36.22	(a)	63.40
	11/11/96		(a)	36.03	(a)	63.59
	02/03/97		(a)	35.90	(a)	63.72
	08/04/97		(a)	35.86	(a)	63.76
	02/23/98		(a)	35.71	(a)	63.91
	08/05/98		(a)	35.70	(a)	63.92
	02/12/99		(a)	35.91	(a)	63.71

Table 1. Summary of Ground Water Surface Elevations
TW Atoka-1 Compressor Station

Well	Sampling Date	Top of Casing (ft)	Depth to PSH (ft)	Depth to Water (ft)	PSH (ft)	Surface Elevation (ft)
	08/12/99		(a)	35.94	(a)	63.68
	02/13/00		(a)	36.09	(a)	63.53
	02/06/01		(a)	37.42	(a)	62.20
MW-7	12/02/94	99.14	(a)	45.58	(a)	53.56
	10/30/95		(a)	35.87	(a)	63.27
	02/23/96		(a)	35.86	(a)	63.28
	05/14/96		(a)	35.91	(a)	63.23
	08/12/96		(a)	35.76	(a)	63.38
	11/11/96		(a)	35.59	(a)	63.55
	02/03/97		(a)	35.46	(a)	63.68
	08/04/97		(a)	35.42	(a)	63.72
	02/23/98		(a)	35.28	(a)	63.86
	08/05/98		(a)	35.27	(a)	63.87
	02/12/99		(a)	35.45	(a)	63.69
	08/12/99		(a)	35.47	(a)	63.67
	02/13/00		(a)	35.56	(a)	63.58
	08/16/00		(a)	36.42	(a)	62.72
	02/06/01		(a)	36.35	(a)	62.79
	08/13/01		(a)	36.66	(a)	62.48
MW-8	12/02/94	95.98	(a)	28.70	(a)	67.28
	10/30/95		(a)	29.16	(a)	66.82
	02/23/96		(a)	29.19	(a)	66.79
	05/14/96		(a)	29.30	(a)	66.68
	08/12/96		(a)	29.39	(a)	66.59
	11/11/96		(a)	29.07	(a)	66.91
	02/03/97		(a)	28.73	(a)	67.25
	08/04/97		(a)	28.75	(a)	67.23
	02/23/98		(a)	28.67	(a)	67.31
	08/05/98		(a)	29.62	(a)	66.36
	02/12/99		(a)	29.16	(a)	66.82
	08/12/99		(a)	29.40	(a)	66.58
	02/13/00		(a)	29.11	(a)	66.87
	08/16/00		(a)	29.65	(a)	66.33
	02/06/01		(a)	29.49	(a)	66.49
	08/13/01		(a)	29.36	(a)	66.62

Notes:

(a) Not applicable since no measurable thickness of hydrocarbon is present

(b) Information not available

(c) Corrections to ground water surface elevation for presence of hydrocarbon is calculated assuming a specific gravity of 0.76

(d) 2/23/96 onward - values reflect corrections made to TOC elevations for MW-1 (+1.01'), MW-2 (+0.84') and MW-4 (+1.19')

Table 2. Summary of Ground Water Surface Elevations at SVE Wells and Monitor Wells MW-1 and MW-2 TW Atoka-1 Compressor Station

Well	Sampling Date	Top of Casing (ft)	Depth to PSH (ft)	Depth to Water (ft)	PSH (ft)	Surface Elevation (ft)
SVE-1	05/14/96	(b)	(a)	dry	(a)	(a)
	02/12/99		(a)	30.87	(a)	(a)
	08/12/99		(a)	30.53	(a)	(a)
	02/13/00		(a)	31.24	(a)	(a)
	08/16/00		(a)	29.30	(a)	(a)
	02/06/01		(a)	31.82	(a)	(a)
	08/13/01		(a)	30.91	(a)	(a)
SVE-2	05/14/96	(b)	(a)	dry	(a)	(a)
	02/12/99		(a)	30.89	(a)	(a)
	08/12/99		(a)	31.25	(a)	(a)
	02/13/00		(a)	32.51	(a)	(a)
	08/16/00		(a)	28.73	(a)	(a)
	02/06/01		(a)	32.89	(a)	(a)
	08/13/01		(a)	32.78	(a)	(a)
SVE-3	05/14/96	(b)	(a)	dry	(a)	(a)
	02/12/99		(a)	29.52	(a)	(a)
	08/12/99		(a)	30.60	(a)	(a)
	02/13/00		(a)	30.85	(a)	(a)
	08/16/00		(a)	29.10	(a)	(a)
	02/06/01		(a)	31.61	(a)	(a)
	08/13/01		(a)	30.88	(a)	(a)
SVE-4	05/14/96	(b)	(a)	42.84	(a)	(a)
	02/12/99		(a)	43.35	(a)	(a)
	08/12/99		(a)	43.18	(a)	(a)
	02/13/00		(a)	43.1	(a)	(a)
	08/16/00		(a)	43.09	(a)	(a)
	02/06/01		(a)	43.28	(a)	(a)
	08/13/01		(a)	43.51	(a)	(a)
SVE-5	05/14/96	(b)	(a)	dry	(a)	(a)
	02/12/99		(a)	44.91	(a)	(a)
	08/12/99		(a)	44.78	(a)	(a)
	02/13/00		(a)	dry	(a)	(a)
	08/16/00		(a)	dry	(a)	(a)
	02/06/01		(a)	dry	(a)	(a)
	08/13/01		(a)	dry	(a)	(a)
SVE-6	05/14/96	(b)	(a)	dry	(a)	(a)
	02/12/99		(a)	42.26	(a)	(a)
	08/12/99		(a)	39.88	(a)	(a)
	02/13/00		(a)	38.59	(a)	(a)
	08/16/00		(a)	37.74	(a)	(a)
	02/06/01		(a)	40.45	(a)	(a)
	08/13/01		(a)	39.47	(a)	(a)

Table 2. Summary of Ground Water Surface Elevations at SVE Wells and Monitor Wells MW-1 and MW-2 TW Atoka-1 Compressor Station

Well	Sampling Date	Top of Casing (ft)	Depth to PSH (ft)	Depth to Water (ft)	PSH (ft)	Surface Elevation (ft)
SVE-7	05/14/96	(b)	(a)	35.00	(a)	(a)
	02/12/99		(a)	35.22	(a)	(a)
	08/12/99		(a)	35.28	(a)	(a)
	02/13/00		(a)	35.41	(a)	(a)
	08/16/00		(a)	35.90	(a)	(a)
	02/06/01		(a)	36.10	(a)	(a)
	08/13/01		(a)	36.26	(a)	(a)
SVE-8	05/14/96	(b)	(a)	34.50	(a)	(a)
	02/12/99		(a)	33.80	(a)	(a)
	08/12/99		(a)	34.60	(a)	(a)
	02/13/00		(a)	34.82	(a)	(a)
	08/16/00		(a)	33.73	(a)	(a)
	02/06/01		(a)	35.48	(a)	(a)
	08/13/01		(a)	35.60	(a)	(a)
SVE-9	05/14/96	(b)	(a)	35.44	(a)	(a)
	02/12/99		(a)	33.33	(a)	(a)
	08/12/99		(a)	34.07	(a)	(a)
	02/13/00		(a)	35.49	(a)	(a)
	08/16/00		(a)	32.41	(a)	(a)
	02/06/01		(a)	36.33	(a)	(a)
	08/13/01		(a)	36.10	(a)	(a)
SVE-10	05/14/96	(b)	(a)	dry	(a)	(a)
	02/12/99		(a)	dry	(a)	(a)
	08/12/99		(a)	dry	(a)	(a)
	02/13/00		(a)	dry	(a)	(a)
	08/16/00		(a)	dry	(a)	(a)
	02/06/01		(a)	dry	(a)	(a)
	08/13/01		(a)	dry	(a)	(a)
SVE-11	05/14/96	(b)	(a)	dry	(a)	(a)
	02/12/99		(a)	44.02	(a)	(a)
	08/12/99		(a)	44.13	(a)	(a)
	02/13/00		(a)	43.75	(a)	(a)
	08/16/00		(a)	43.72	(a)	(a)
	02/06/01		(a)	dry	(a)	(a)
	08/13/01		(a)	dry	(a)	(a)
SVE-12	05/14/96	(b)	(a)	dry	(a)	(a)
	02/12/99		(a)	42.59	(a)	(a)
	08/12/99		(a)	45.11	(a)	(a)
	02/13/00		(a)	43.52	(a)	(a)
	08/16/00		(a)	41.23	(a)	(a)
	02/06/01		(a)	44.86	(a)	(a)
	08/13/01		(a)	43.27	(a)	(a)

Table 2. Summary of Ground Water Surface Elevations at SVE Wells and Monitor Wells MW-1 and MW-2 TW Atoka-1 Compressor Station

Well	Sampling Date	Top of Casing (ft)	Depth to PSH (ft)	Depth to Water (ft)	PSH (ft)	Surface Elevation (ft)
SVE-13	05/14/96	(b)	(a)	dry	(a)	(a)
	02/12/99		34.41	35.00	0.59	(a)
	08/12/99		(a)	51.87	(a)	(a)
	08/23/99		(a)	51.95	(a)	(a)
	09/05/99		(a)	52.08	(a)	(a)
	09/20/99		45.15	45.18	0.03	(a)
	10/11/99		(a)	31.65	(a)	(a)
	10/18/99		(a)	30.88	(a)	(a)
	11/02/99		(a)	30.32	(a)	(a)
	11/14/99		(a)	30.00	(a)	(a)
	11/30/99		(a)	29.50	(a)	(a)
	02/13/00		(a)	31.87	(a)	(a)
	08/16/00		(a)	31.47	(a)	(a)
	02/06/01		(a)	34.44	(a)	(a)
	08/13/01		(a)	33.66	(a)	(a)
SVE-14	05/14/96	(b)	(a)	dry	(a)	(a)
	02/12/99		(a)	33.11	(a)	(a)
	08/12/99		(a)	33.11	(a)	(a)
	02/13/00		(a)	33.92	(a)	(a)
	08/16/00		(a)	32.20	(a)	(a)
	02/06/01		(a)	34.32	(a)	(a)
	08/13/01		(a)	33.41	(a)	(a)
MW-1	07/21/93	94.65	(b)	(b)	(b)	(b)
	12/02/94		56.12	56.82	0.70	38.36
	10/30/95		(b)	56.83	(b)	(b)
	02/23/96	95.66	57.52	57.89	0.37	38.05
	05/14/96		57.50	57.83	0.33	38.08
	08/12/96		57.61	57.98	0.37	37.96
	11/11/96		56.11	56.25	0.14	39.52
	02/03/97		56.67	56.82	0.15	38.95
	08/04/97		57.41	57.75	0.34	38.17
	02/23/98		(a)	54.75	(a)	40.91
	08/05/98		57.08	57.30	0.22	38.53
	12/05/98		57.75	57.95	0.20	37.86
	12/06/98		58.45	58.58	0.13	37.18
	01/07/99		57.75	57.80	0.05	37.90
	01/15/99		57.78	57.80	0.02	37.88
	01/27/99		58.18	58.36	0.18	37.44
	02/12/99		59.42	59.74	0.32	36.16
	08/12/99		61.71	61.88	0.17	33.91
	08/23/99		57.35	57.37	0.02	38.31
	09/05/99		(a)	56.75	(a)	38.91
	09/20/99		(a)	56.62	(a)	39.04
	10/11/99		(a)	56.64	(a)	39.02
	10/18/99		(a)	56.69	(a)	38.97
	11/02/99		(a)	57.00	(a)	38.66
	11/14/99		(a)	57.20	(a)	38.46
	11/30/99		57.42	57.45	0.03	38.23

Table 2. Summary of Ground Water Surface Elevations at SVE Wells and Monitor Wells MW-1 and MW-2 TW Atoka-1 Compressor Station

Well	Sampling Date	Top of Casing (ft)	Depth to PSH (ft)	Depth to Water (ft)	PSH (ft)	Surface Elevation (ft)
	02/13/00		57.74	57.81	0.07	37.90
	08/16/00		(a)	58.05	(a)	37.61
	02/06/01		(a)	58.09	(a)	37.57
	08/13/01		(a)	58.23	(a)	37.43
MW-2	07/21/93	96.45	(a)	42.38	(a)	54.07
	12/02/94		42.31	42.35	0.04	54.13
	10/30/95		(b)	42.54	(b)	(b)
	02/23/96	97.29	43.34	43.36	0.02	53.95
	05/14/96		43.33	43.34	0.01	53.96
	08/12/96		43.32	43.33	0.01	53.97
	11/11/96		(a)	43.11	(a)	54.18
	02/03/97		(a)	43.12	(a)	54.17
	08/04/97		(a)	43.15	(a)	54.14
	02/23/98		(a)	43.07	Sheen	54.22
	08/05/98		(a)	43.00	(a)	54.29
	12/05/98		(a)	43.00	(a)	54.29
	12/06/98		(a)	43.01	(a)	54.28
	01/07/99		(a)	42.98	(a)	54.31
	01/15/99		(a)	42.99	(a)	54.30
	01/27/99		(a)	43.08	(a)	54.21
	02/12/99		(a)	43.07	(a)	54.22
	08/12/99		(a)	42.74	(a)	54.55
	08/23/99		(a)	42.89	(a)	54.40
	09/05/99		(a)	42.83	(a)	54.46
	09/20/99		(a)	42.81	(a)	54.48
	10/11/99		(a)	42.80	(a)	54.49
	10/18/99		(a)	42.80	(a)	54.49
	11/02/99		(a)	42.80	(a)	54.49
	11/14/99		(a)	42.75	(a)	54.54
	11/30/99		(a)	42.72	(a)	54.57
	02/13/00		(a)	42.62	(a)	54.67
	08/16/00		(a)	42.77	(a)	54.52
	02/06/01		(a)	42.85	(a)	54.44
	08/13/01		(a)	43.13	(a)	54.16

Notes:
(a) Not Applicable
(b) No elevation data available

Table 3. Summary of Ground Water Analyses
TW Atoka-1 Compressor Station

Well	Sampling Date	Field Measured Parameters				BTEX Concentration - (ug/L)			
		DO (mg/l)	pH (Units)	Temp. (C)	Conductivity (µs/cm)	Benzene	Toluene	Ethylbenzene	Total Xylenes
NMWQCC Standard		none	6-9	none	none	10	750	750	620
MW-1	02/20/01	0.0	6.7	21.9	5940	**2,960**	**1,090**	**1,040**	**7,230**
	08/13/01	1.3	6.88	22.1	6240	**2,850**	**1,030**	**1,050**	**6,510**
MW-2	07/21/93	-	-	-	-	**3,600**	**9,800**	400	**3,170**
	08/04/97	0.0	6.95	22.2	3760	**3,700**	**4,900**	620	**1,600**
	08/06/98	-	-	-	-	**2,900**	**3,600**	550	**1,300**
	02/12/99	1.0	7.18	18.4	3790	**2,000**	**2,300**	330	**750**
	08/12/99	-	-	-	-	**1,800**	**2,500**	350	**890**
	02/13/00	-	-	-	-	**1,200**	**1,200**	270	460
	04/23/00	-	-	-	-	**1,100**	**970**	250	430
	06/20/00	-	-	-	-	**1,200**	**1,000**	220	350
	08/16/00	2.6	7.19	21.3	3300	**1,200**	**1,900**	280	**650**
	02/20/01	-	7.22	21.0	3340	**1,240**	745	138	451
	08/13/01	1.3	7.38	21.0	3570	**951**	390	69.1	201.5
MW-3	07/21/93	-	-	-	-	7	<2	6	<2
	12/02/94	-	-	-	-	**14**	<2	<2	<4
	10/30/95	-	-	-	-	8.8	<0.5	<0.5	<0.5
	02/23/96	-	7.58	19.9	4800	6	3	<2	<2
	05/14/96	-	7.27	25.7	5380	6	<2	<2	<2
	08/12/96	-	7.25	27.1	5070	8	<2	<2	<2
	11/11/96	-	7.17	18.8	-	<2	<2	<2	<2
	02/03/97	-	-	-	-	<2	<2	<2	<2
	08/04/97	-	7.22	23.2	6130	7.4	<2	<2	<2
	02/23/98	3.5	7.32	19.6	5770	6.93	< 5.00	< 5.00	< 5.00
	08/05/98	3.7	7.21	20.1	6160	1.4	< 1.0	< 1.0	< 1.0
	02/12/99	3.4/3.4	7.36	18	6130	2	< 1.0	< 1.0	< 1.0
	08/12/99	6.7	7.35	20.5	6020	3	<2	<2	<2
	02/13/00	3.9	7.21	20	6270	7.2	<1	<1	<1
	08/16/00	5.1	7.33	21.5	5560	3	<2	<2	<4
	02/20/01	4.8	7.30	19.4	5500	3.16	<0.500	<0.500	<0.10
	08/13/01	4.4	7.51	20.3	5930	<1	<1	<1	<2
MW-4	07/21/93	-	-	-	-	**61**	4	20	68
	12/02/94	-	-	-	-	**230**	<2	60	130
	10/30/95	-	-	-	-	**240**	2.1	<0.5	92
	02/23/96	-	6.61	20.2	3500	**83**	5	<2	36
	05/14/96	-	6.75	27.4	4140	**171**	17	<2	54
	08/12/96	-	6.6	26.9	3790	**170**	11	7	43
	11/11/96	-	6.66	19.1	-	**180**	10	<2	120
	02/03/97	-	-	-	-	**170**	<2	<2	<2
	08/04/97	-	6.68	24.0	4470	**130**	3.3	<2	4.7
	02/23/98	2.0	6.74	20.8	3930	**13.9**	< 5.00	< 5.00	< 5.00
	08/06/98	2.5	6.74	19.8	4400	3.7	< 1.0	< 1.0	< 1.0
	02/12/99	3.7	6.87	18.7	4250	< 1.0	< 1.0	< 1.0	< 1.0

Table 3. Summary of Ground Water Analyses
TW Atoka-1 Compressor Station

Well	Sampling Date	Field Measured Parameters				BTEX Concentration - (ug/L)			
		DO (mg/l)	pH (Units)	Temp. (C)	Conductivity (µs/cm)	Benzene	Toluene	Ethylbenzene	Total Xylenes
NMWQCC Standard		none	6-9	none	none	10	750	750	620
	08/12/99	5.25/5.0	6.92	21.0	3820	<2	<2	<2	<2
	02/13/00	6.3	6.95	20.3	3960	<1	<1	<1	<1
	08/16/00	6.5	6.99	22.6	3560	<1	<2	<2	<4
	02/20/01	5.6	7.03	21.5	3390	<0.500	<0.500	<0.500	<0.10
	08/13/01	7.4	7.27	21.1	3790	1.54	<1	<1	<2
MW-5	12/02/94	-	-	-	-	**6,200**	**13,000**	**1,100**	**7,400**
	11/02/95	-	-	-	-	**6,800**	**4,500**	**930**	**3,500**
	02/23/96	-	6.92	21.8	4110	**4,490**	**1,820**	388	**1,235**
	05/14/96	-	7.02	26.6	5380	**4,630**	573	**775**	**1,600**
	08/12/96	-	7.04	25.3	3630	**4,000**	<82	500	99
	11/11/96	-	7.12	19.6	-	**6,100**	<200	430	<200
	02/03/97	-	-	-	-	**3,200**	<100	590	550
	08/04/97	3.5	7.05	23.5	4580	**4,000**	**1,100**	420	250
	02/23/98	1.6	7.12	19.8	5110	**3,980**	52.5	373	15.0
	08/06/98	1.6	7.04	21.3	5530	**4,200**	130	390	60
	02/12/99	4.9/3.2	7.18	18.5	5150	**4,500**	280	240	46
	08/12/99	2.0	7.1	20.7	5310	**3,900**	68	220	31
	02/13/00	2.6	6.86	20.3	4480	**2,000**	**750**	72	**760**
	04/23/00	-	-	-	-	**3,100**	60	110	45
	06/20/00	-	-	-	-	**2,100**	130	72	**690**
	08/16/00	2.7	6.92	21.7	4170	**1,800**	240	100	91
	02/20/01	-	7.04	21.7	4490	**3,650**	349	145	93.5
	08/13/01	1.2	7.30	21.6	4360	**900**	17.7	5.86	15.68
MW-6	12/02/94	-	-	-	-	**360**	<10	50	<20
	10/30/95	-	-	-	-	**4,600**	<5.0	190	<5.0
	02/23/96	-	7.34	21.1	3330	**1,000**	9	222	9
	05/14/96	-	7.01	25.2	2660	**3,700**	56	234	88
	08/12/96	-	6.67	26.4	4650	**2,300**	8	250	<15
	11/11/96	-	7.38	18.9	-	**3,700**	<10	220	<10
	02/03/97	-	-	-	-	**2,900**	<100	250	230
	08/04/97	3.9	6.99	24.2	2720	**2,100**	<100	390	<100
	02/23/98	3.1	7.2	20.2	2980	**2,080**	< 5.00	320	5.71
	08/06/98	4.9	7.14	20.7	3250	**2,100**	< 5.0	370	< 5.0
	02/12/99	2.3	7.29	19.1	4330	**1,700**	< 1.0	280	2
	08/12/99	4.5	7.32	20.8	3460	**1,100**	<2	310	2
	02/13/00	3.2	7.16	20.1	3850	**1,800**	<25	460	77
	04/23/00	-	-	-	-	**2,300**	20	410	100
	06/20/00	-	-	-	-	**1,300**	18	280	96
	08/16/00	-	-	-	-	**850**	3	180	75
	02/20/01	3.8	7.22	27.1	2570	**1,440**	<25.0	282	433
	08/13/01	5.8	7.24	27.1	2780	**885**	10.5	231	225

Table 3. Summary of Ground Water Analyses
TW Atoka-1 Compressor Station

Well	Sampling Date	Field Measured Parameters				BTEX Concentration - (ug/L)			
		DO (mg/l)	pH (Units)	Temp. (C)	Conductivity (µs/cm)	Benzene	Toluene	Ethylbenzene	Total Xylenes
NMWQCC Standard		none	6-9	none	none	10	750	750	620
MW-7	12/02/94	-	-	-	-	**620**	170	**1,100**	**1,100**
	10/30/95	-	-	-	-	**2,200**	440	460	270
	02/23/96	-	-	-	-	**832**	463	318	422
	05/14/96	-	6.76	25.8	2890	**1,610**	**2,880**	649	**3,030**
	08/12/96	-	6.83	27.6	3150	**850**	**850**	360	**720**
	11/11/96	-	7.07	19.6	-	**720**	**970**	170	390
	02/03/97	-	-	-	-	**620**	**870**	300	**1,000**
	08/04/97	0.8	6.81	24.1	2830	**1,200**	710	330	490
	02/23/98	0.9	6.91	21.2	2510	**860**	**770**	312	**748**
	08/06/98	1.1	6.90	20.3	2610	**870**	**900**	440	**1,000**
	02/12/99	1.7	6.99	18.7	2550	**970**	**820**	380	**730**
	08/12/99	1.8	7.02	20.9	2410	**860**	**850**	420	**830**
	02/13/00	3.5	7.04	20.5	2520	**650**	670	350	**740**
	04/23/00	-	-	-	-	**1,200**	93	240	**690**
	06/20/00	-	-	-	-	**1,100**	340	320	340
	08/16/00	5	7.09	22.1	4250	**1,100**	20	310	28
	02/20/01	-	7.15	21.7	4440	**1,650**	<25.0	404	<50.0
	08/13/01	1.7	7.10	21.4	4660	**201**	<1	36.2	<2
MW-8	01/01/95	-	-	-	-	<2	<2	<2	<4
	10/30/95	-	-	-	-	**110**	1.3	<0.5	130
	02/23/96	-	7.15	20.9	4810	6	<2	<2	<2
	05/14/96	-	6.96	23.3	5260	2	<2	<2	3
	08/12/96	-	7.17	26.7	5370	<2	<2	<2	<3
	11/11/96	-	6.93	18.8	-	**11**	<2	<2	19
	02/03/97	-	-	-	-	6	<2	<2	<2
	08/04/97	-	7.14	25.6	5920	<2	<2	<2	<2
	02/23/98	3.8	7.14	20.5	5960	9.25	< 5.00	< 5.00	< 5.00
	08/05/98	3.8	7.14	21.3	6120	2.7	< 1.0	< 1.0	< 1.0
	02/12/99	3.5	7.16	19.3	6150	2	< 1.0	< 1.0	< 1.0
	08/12/99	5.3/5.0	7.14	21.3	6050	<2	<2	<2	<2
	02/13/00	4.9/4.4	6.99	20.3	6140	<1	<1	<1	<1
	08/16/00	4.9	7.09	21.8	5580	<1	<2	<2	<4
	02/20/01	2.7	6.99	21.2	5420	<0.500	<0.500	<0.500	<0.10
	08/13/01	2.5	7.29	21.3	5920	2.81	<1	<1	<2

Table 4. Summary of VOC Concentrations at Individual Extraction Points
TW Atoka-1 Compressor Station

SVE Well	Date	PID Reading	Gasoline Range VOCs		< C5	C5-C6	C6-C7	C7-C8	C8-C9	C9-C10	C10-C11	C11-C12	C12-C14	C14+
		(ppmv)	(ug/L)	(ppmv) [a]	(%)									
SVE-1	08/12/98		36,000	8,942	0.0	1.4	12.3	49.1	26.1	7.9	2.6	0.4	0.2	0.0
SVE-2	08/12/98		120	30	0.1	0.5	4.9	22.3	29.3	23.1	12.6	5.2	2.0	0.0
SVE-3	08/12/98		460	114	0.0	0.0	0.3	1.4	4.0	28.9	36.7	21.5	7.0	0.2
SVE-4	11/08/97		81,000	20,120	0.0	2.4	20.3	48.8	21.9	5.9	0.5	0.1	0.1	0.0
	08/12/98		16,000	3,974	0.0	0.3	6.0	37.3	33.6	18.8	3.1	0.8	0.1	0.0
SVE-5	11/08/97		720	179	0.0	0.9	4.5	27.1	33.2	26.2	6.0	1.9	0.2	0.0
	08/12/98		110	27	0.0	0.4	1.7	16.5	33.0	24.7	15.1	5.5	2.7	0.4
SVE-6	08/12/98		6,400	1,590	0.0	0.0	3.0	28.8	33.5	21.3	6.3	5.0	1.9	0.2
SVE-7	08/12/98		3,800	944	0.0	0.6	9.3	47.4	29.4	8.0	4.8	0.5	0.0	0.0
SVE-8	08/12/98		1,600	397	0.1	13.7	18.9	39.6	16.9	7.6	2.5	0.6	0.1	0.0
SVE-9	08/12/98		2,200	546	0.0	12.5	28.0	45.1	11.0	2.7	0.5	0.2	0.0	0.0
SVE-10	11/08/97		2,900	720	0.0	2.5	11.8	41.8	27.9	13.3	2.0	0.7	0.0	0.0
	08/12/98		640	159	0.0	2.5	10.0	43.5	26.6	13.6	3.3	0.5	0.0	0.0
SVE-11	11/08/97		22,000	5,465	0.0	1.1	13.4	50.7	25.7	8.0	0.9	0.2	0.0	0.0
	08/12/98		9,700	2,409	0.0	0.5	7.2	38.9	32.2	17.8	2.6	0.7	0.1	0.0
SVE-12	08/12/98		23,000	5,713	0.0	0.7	12.8	40.4	28.7	13.8	2.9	0.4	0.2	0.1
SVE-13	08/12/98		25,000	6,210	0.0	0.6	20.5	51.1	21.0	5.7	1.0	0.1	0.0	0.0
SVE-14	08/12/98		18,000	4,471	0.0	1.0	12.1	53.3	22.3	8.8	2.1	0.4	0.0	0.0
Total	11/08/97		17,000	4,223	0.0	1.9	15.8	48.9	24.3	7.9	0.9	0.2	0.0	0.1
(dup)	11/08/97		17,000	4,223	0.0	1.9	15.9	47.8	24.2	8.1	1.1	0.5	0.2	0.3
	08/12/98		5,700	1,416	0.0	1.9	13.7	41.0	27.8	12.1	2.7	0.5	0.3	0.0
(dup)	08/12/98		5,400	1,341	0.0	1.9	14.1	40.4	27.8	12.5	2.6	0.7	0.0	0.0
	04/19/99		3,600	894	0.2	1.5	14.0	38.0	27.3	14.0	4.0	0.8	0.2	0.0
	05/26/00		2,700	671	0.1	1.6	11.7	46.9	27.5	8.3	2.6	0.5	0.2	0.6
	08/16/00		2,400	596	0.0	1.4	6.5	40.0	30.7	16.2	3.7	1.0	0.1	0.4
	06/03/01		1,420	353	0.0	1.3	5.1	36.8	31.9	14.8	7.4	1.9	0.7	0.1

All air samples analyzed by Hall Laboratory of Albuquerque, NM
PID = Photoionization detector
[a] Conversion Factor:
P = 0.88 atm, MW = 110 g/mole, R = 0.08205 L*atm/(K*mole), T = 293°K
C ppmv = C ug/L * ((R * T)/(MW*P))
C ppmv = C ug/L * 0.2484

Table 5. Summary of Completion Details for Soil Borings Completed as Wells
TW Atoka-1 Compressor Station

Well	Source[a]	Date of Completion	Measuring Point Elevation (ft)[b]	North (ft)	West (ft)	Total Depth of Boring (ft bgs)	Measured Depth of Well (ft from TOC)	Surface Completion Type	Casing Diameter (in.)	Screen Interval (ft bgs)	Top of Sand Pack (ft bgs)
MW-1	Layne Enviro/B&R	06/26/93	95.66	11.91	48.25	63.9	64.20	Flush Mount	2	53.5-63.5	51.5
MW-2	Layne Enviro/B&R	06/28/93	97.29	9.08	134.61	49.6	50.34	Flush Mount	2	39-49	37.0
MW-3	Layne Enviro/B&R	07/18/93	95.00	177.53	6.45	55.0	55.11	Flush Mount	2	45-55	42.5
MW-4	Layne Enviro/B&R	07/20/93	95.21	48.27	11.49	57.0	56.18	Flush Mount	2	45-55	43.0
MW-5	GeoProjects/B&C	11/20/94	98.22	14.15	228.64	79.0	53.88	Flush Mount	2	29-54	27.0
MW-6	GeoProjects/B&C	11/30/94	99.62	-15.91	277.03	46.5	46.60	Flush Mount	2	31-46	29.0
MW-7	GeoProjects/B&C	11/30/94	99.14	-94.61	281.61	46.0	45.62	Flush Mount	2	31-46	29.0
MW-8	GeoProjects/B&C	11/29/94	95.98	76.73	153.96	59.0	53.90	Flush Mount	2	24-54	22.0
SVE-1	Eades/DBS	10/30/95	na	41.80	222.60	36.5	35.65	Flush Mount	2	15-35	13.0
SVE-2	Eades/DBS	10/31/95	na	41.80	182.60	43.0	43.33	Flush Mount	2	18-43	16.0
SVE-3	Eades/DBS	10/31/95	na	41.80	142.60	45.0	45.56	Flush Mount	2	25-45	23.0
SVE-4	Eades/DBS	10/31/95	na	41.80	102.60	53.0	53.32	Flush Mount	2	28-53	25.0
SVE-5	Eades/DBS	11/01/95	na	41.80	62.60	46.0	44.92	Flush Mount	2	26-46	22.5
SVE-6	Eades/DBS	11/01/95	na	41.80	22.60	43.0	43.86	Flush Mount	2	23-43	21.5
SVE-7	Eades/DBS	10/31/95	na	1.80	242.60	39.5	40.28	Flush Mount	2	19.5-39.5	17.5
SVE-8	Eades/DBS	10/31/95	na	1.80	202.60	41.0	41.15	Flush Mount	2	21-41	19.0
SVE-9	Eades/DBS	10/31/95	na	-10.65	162.60	45.0	43.95	Flush Mount	2	24-44	21.0
SVE-10	Eades/DBS	10/31/95	na	-10.65	122.60	58.0	54.88	Flush Mount	2	28-58	26.0
SVE-11	Eades/DBS	10/30/95	na	1.80	82.60	45.0	44.33	Flush Mount	2	24-44	22.0
SVE-12	Eades/DBS	11/01/95	na	1.80	42.60	45.0	45.93	Flush Mount	2	24-45	23.0
SVE-13	Eades/DBS	11/01/95	na	1.80	2.60	58.0	59.31	Flush Mount	2	28-58	24.0
SVE-14	Eades/DBS	11/02/95	na	41.80	262.60	40.0	40.20	Flush Mount	2	15-40	14.0

NOTES:
(a) Driller/Consultant
(b) The measuring point elevation is relative to an on-site datum assigned an elevation of 100 ft and was provided by Brown & Caldwell
na - Information not available

Table 6. Monitor Well Sampling Locations, Frequency, and Sample Analysis Plan
TW Atoka-1 Compressor Station

	Analytical Requirements			
Well ID	1st Semiannual Event	2nd Semiannual Event	Benzene (ppb) Latest Result	Comments
MW-1	BTEX	BTEX	2850	previously contained PSH
MW-2	BTEX	BTEX	951	previously contained PSH
MW-3	BTEX	BTEX	<1	
MW-4	BTEX	BTEX	2	
MW-5	BTEX	BTEX	900	
MW-6	BTEX	BTEX	885	
MW-7	BTEX	BTEX	201	
MW-8	BTEX	BTEX	3	

Notes:
1) na - not available
2) BTEX - BTEX Compounds by EPA Method 8021B
3) "Comments" are provided for wells that will not be sampled during one or more events

Hall Environmental
Analysis Laboratory

June 9, 2000

Hall Environmental Analysis Laboratory
4901 Hawkins NE, Ste. A
Albuquerque, NM 87109

Cypress Engineering
10235 W Little York, Ste. 256
Houston, TX 77040

Dear Mr. Robinson:

Enclosed are the results for the analyses that were requested. These were analyzed according to EPA procedures or equivalent.

Detection limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Nancy McDuffie
Assistant Laboratory Manager

Project: 0005144/SVE Sampling CES/ATOKA-1 Station

Hall Environmental Analysis Laboratory

Client:	Cypress Engineering	**Date Collected:**	5/26/00
Project:	SVE Sampling CES/ATOKA-1 Station	**Date Received:**	5/30/00
Project Manager:	George Robinson	**Sample Matrix:**	Air
Project Number:	Enron/TWP Atoka-1 Station	**Extraction Date:**	NA

EPA Method - 8015B Modified GRO

Units: ug/L

Client ID:	**SVE ATOKA-1**
HEAL#:	0005144-1
Analysis Date:	5/30/00

Compound	MRL	Result
Gasoline Range Organics	5.0	2,700
Hydrocarbon Ranges %	-	
<C5	-	0.1
C5-C6	-	1.6
C6-C7	-	11.7
C7-C8	-	46.9
C8-C9	-	27.5
C9-C10	-	8.3
C10-C11	-	2.6
C-11-C12	-	0.5
C12-C14	-	0.2
C14+	-	0.6
Dilution		10
BFB %		**

**Surrogate not recoverable due to matrix interference.

Hall Environmental Analysis Laboratory

Client:	Cypress Engineering	**Date Collected:**	NA
Project:	SVE Sampling CES/ATOKA-1 Station	**Date Received:**	NA
Project Manager:	George Robinson	**Sample Matrix:**	Aqueous
Project Number:	Enron/TWP Atoka-1 Station	**Extraction Date:**	NA

EPA Method - 8015B Modified GRO

HEAL ID	Client ID	Dilution	Gasoline Range (mg/L)	% BFB	Analysis Date
Reag. Blk.	-	1	ND	112	5/30/00

MRL	0.05

QA/QC:

Sample ID:	Sample Amt.	Spike	Rec.	%	Dup.	%	RPD
Blank Spike 6/5	<0.05	0.50	0.48	96	0.47	94	2

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite A
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

Client: MR. GEORGE ROBINSON, PE - CYPRESS ENGINEERING

Address: 10235 WEST LITTLE YORK SUITE 256 HOUSTON, TEXAS 77040-3229

Cypress@neosoft.com

Phone #: (713) 856-7980

Fax #: (713) 856-7981

Project Name: SUE Sampling CES / ATOKA-1 STATION

Project #: Enron / Twp ATOKA-1 STATION

Project Manager: GEORGE ROBINSON, PE

Sampler: CM BARNHILL, PG

Samples Cold?: ☐ Yes ☐ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative: $HgCl_2$	Preservative: HCl	Preservative:	HEAL No.
5/26/00	10:15	AIR	Enron / Twp SUE ATOKA-1	2 / TEDLAR BAGS				0005144

ANALYSIS REQUEST

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B MOD (Gas/Diesel)	TPH (Method 418.1)	Volatiles Full List (8021)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Cations (Na, K, Ca, Mg)	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260 (VOA)	8270 (Semi-VOA)			Air Bubbles or Headspace (Y or N)
		X														

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
5/26/00	14:16		5/30/00
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks: Analysis: TPH MOD 8015
Any Questions Please Call
George Robinson, PE

Hall Environmental
Analysis Laboratory

August 25, 2000

Hall Environmental Analysis Laboratory
4901 Hawkins NE, Ste. A
Albuquerque, NM 87109

Cypress Engineering
10235 W Little York, Ste. 256
Houston, TX 77040

Dear Mr. Robinson:

Enclosed are the results for the analyses that were requested. These were analyzed according to EPA procedures or equivalent.

Detection limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman
Senior Project Manager

Project: 0008102/Atoka-1 Station SVE Sampling Air

Hall Environmental Analysis Laboratory

Client:	Cypress Engineering	**Date Collected:**	8/16/00
Project:	Atoka-1 Station SVE Sampling Air	**Date Received:**	8/18/00
Project Manager:	George C. Robinson	**Sample Matrix:**	Air
Project Number:	TWP Atoka-1 Station	**Extraction Date:**	NA

EPA Method - 8015B Modified GRO

Units: ug/L

Client ID:	**SVE Total Air Sample**
HEAL#:	0008102-1
Analysis Date:	8/18/00

Compound	MRL	Result
Gasoline Range Organics	5.0	2,400
Hydrocarbon Ranges %	-	
<C5	-	0.00
C5-C6	-	1.4
C6-C7	-	6.5
C7-C8	-	40.0
C8-C9	-	30.7
C9-C10	-	16.2
C10-C11	-	3.7
C-11-C12	-	1.0
C12-C14	-	0.1
C14+	-	0.4
Dilution		50
BFB %		*121%

*Surrogate recovery high due to matrix interference.

Hall Environmental Analysis Laboratory

Client:	Cypress Engineering	**Date Collected:**	NA
Project:	Atoka-1 Station SVE Sampling Air	**Date Received:**	NA
Project Manager:	George C. Robinson	**Sample Matrix:**	Aqueous
Project Number:	TWP Atoka-1 Station	**Extraction Date:**	NA

EPA Method - 8015B Modified GRO

HEAL ID	Client ID	Dilution	Gasoline Range (mg/L)	% BFB	Analysis Date
Reag. Blk.	-	1	ND	102	8/18/00

MRL	0.05

QA/QC:

Sample ID:	Sample Amt.	Spike	Rec.	%	Dup.	%	RPD
Blank Spike 8/18	<0.05	0.50	0.47	94	0.47	94	0

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite A
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

Client: CYPRESS ENGINEERING SERVICES
ATTN: MR. GEORGE ROBINSON
Address: 10235 West Little York Rd.
SUITE 256
HOUSTON, TEXAS- 77040
Phone #: 713-646-7327
Fax #: 713-646-7867

Project Name: SVE Sampling Air ATOKA-1 STATION
Project #: TUP ATOKA-1 STATION
Project Manager: MR. GEORGE C. ROBINSON
Sampler: CM BARNHILL
Samples Cold?: ☐ Yes ☒ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative: $HgCl_2$	Preservative: HCl	Preservative:	HEAL No.
8/16/00		AIR	SVE TOTAL AIR Sample.	2 / 1 Liter TEDLAR BAGS				0008102-1

ANALYSIS REQUEST

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B MOD (Gas/Diesel)	TPH (Method 418.1)	Volatiles Full List (8021)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Cations (Na, K, Ca, Mg)	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260 (VOA)	8270 (Semi-VOA)	TPH 8015		Air Bubbles or Headspace (Y or N)
														X		

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	
8/17/00	10:42			8/18/00
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	

Remarks: If there are any questions with Analysis Please Call George Robinson @ 713-646-7327