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REPORTS

DATE:

2004

GeoTrans, Inc.
A TETRA TECH COMPANY

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July 1, 2004
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Mr. Wayne Price
Petroleum Engineer Specialist
New Mexico Oil Conservation District
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Data Transmittal
Request to Abandon/Plug Short-Term Wells
Former Axelson Facility
2703 W. Marland Boulevard, Hobbs, New Mexico

Dear Mr. Price:

On behalf of Beazer East, Inc., GeoTrans, Inc. (GeoTrans) presents the analytical data collected in April and May 2004 during investigation activities conducted downgradient of the former Axelson Facility, located at 2703 W. Marland Boulevard, Hobbs, New Mexico (Site). The downgradient investigation activities were performed in accordance with the recommendations in GeoTrans' September 6, 2001 *Site Investigation Report, Former Axelson Facility, 2703 W. Marland Boulevard, Hobbs, New Mexico.* This letter provides an overview of the downgradient investigation activities and analytical results. This letter also requests New Mexico Oil Conservation District (OCD) approval to stop additional downgradient monitoring. A report providing results of the on-site investigation of both soil and groundwater, also performed in April and May 2004 in accordance with the Site Investigation Report, will be provided under separate cover with a work plan to remediate impacted Site soils.

Petroleum hydrocarbons, associated with historic operations at the Site, are the primary constituents of concern in soil and groundwater at the Site. The purpose of the April and May 2004 downgradient investigations was to assess existing downgradient soil and groundwater conditions. One soil boring and two, short-term groundwater monitoring wells were completed and sampled in April and May 2004. The installation of short-term groundwater monitoring wells was approved by OCD via an e-mail, dated February 14, 2003.

GeoTrans attempted to investigate the soil and groundwater conditions at the downgradient property (2701 W. Marland Boulevard) immediately adjacent and east of the Site. GeoTrans was unable to negotiate an access agreement with Mr. Lewis Wright, the 2701 W. Marland Boulevard property owner. Therefore, the downgradient investigation was performed at the Key Energy Services Lease Yard located at 2625 W. Marland Boulevard (Key Facility). GeoTrans kept OCD apprised of the off-site access negotiations that took approximately 20 months to complete.

Downgradient Investigation Activities

One soil boring (KSB-1) and two short-term groundwater monitoring wells (KMW-1 and KMW-2) were installed at the Key Facility, located hydraulically downgradient of the Site. Figure 1 presents the location of the Key Facility relative to the Site. The soil boring was completed to approximately 35 feet below ground surface (bgs) and soil samples were collected at 5-foot intervals for lithologic purposes, field screening, and potential laboratory analysis. Selected soil samples were analyzed for petroleum hydrocarbons and percent solids. A list of soil analyses performed with the corresponding analytical methods is presented in Table 1.

Well KMW-1 was screened from 28 to 48 feet bgs and well KMW-2 was screened from 26 to 46 feet bgs. A summary of the monitor well construction details is presented in Table 2. Groundwater was initially encountered at approximately 36-40 feet bgs in KMW-1 and KMW-2. The well construction logs for KMW-1 and KMW-2 are attached.

The short-term wells were developed and surveyed prior to being sampled in April 2004. In accordance with OCD's request, GeoTrans re-sampled the short-term wells in May 2004, within 30 to 45 days after the initial sampling event. The short-term wells were sampled for petroleum hydrocarbons and New Mexico Water Quality Control Commission Ground Water Standard (WQCC) metals and major cations and anions. A list of groundwater analyses performed with the corresponding analytical methods is presented in Table 1.

Depth to water measurements were collected at the four wells located at the Site and two short-term wells at the Key Facility to calculate the groundwater flow direction. Samples were also collected at the four Site wells and submitted for laboratory analyses. The results for the on-site wells will be provided under separate cover.

Groundwater Flow Direction and Gradient

The groundwater elevations measured at the Site and Key Facility wells are presented in Table 3. These elevations were used to calculate the groundwater flow direction for April and May 2004, as shown on Figures 2 and 3. The groundwater flow direction was calculated to be southeast (S52°E to S61°E) with a flat gradient of 0.0011 to 0.0009 feet per foot (ft/ft). This is consistent with prior groundwater flow direction and gradient data collected at the Site. The groundwater surface elevation of the Key Facility wells is approximately 0.25 to 0.29 feet lower than the groundwater surface elevation of the Site wells.

Analytical Results

The soil analytical results for the eight soil samples collected during the downgradient investigation at the Key Facility are summarized in Table 4. No field indications of soil impacts (i.e., staining, odor, discoloration, etc.) were observed at borings KSB-1, KMW-1 and KMW-1. Petroleum hydrocarbons in the diesel, gasoline and motor oil ranges were not detected in the Key Facility soil samples.

The analytical results for the groundwater samples collected in April and May 2004 are summarized in Tables 5 through 9. No constituents of concern (petroleum hydrocarbons) were detected in the Key Facility short-term well samples collected during the April 2004 sampling event.

Very low concentrations of petroleum hydrocarbons and volatile organic compounds (VOCs) were detected in the short-term wells (KMW-1 and KMW-2) during the May 2004 sampling event. The detected concentrations of petroleum hydrocarbons and VOCs in wells KMW-1 and KMW-2 are below corresponding WQCCs and USEPA Maximum Contaminant Levels (MCLs), as shown in Tables 5 and 6.

Request to Stop Downgradient Monitoring

The eight soil samples collected from the Key Facility indicate no impacts from the former Axelson site. The groundwater samples collected from the Key Facility short-term wells do not appear to be impacted by the former Axelson site. The minor petroleum hydrocarbon and VOC detections at wells KMW-1 and KMW-2 are below corresponding WQCCs and MCLs. Therefore, in accordance with the February 14, 2003 e-mail, GeoTrans respectfully requests approval to properly abandon/plug wells KMW-1 and KMW-2 at the Key Facility.

Please contact me at (916) 853-1800 if you have any questions regarding this data transmittal letter and request to abandon/plug the short-term wells at the Key Facility.

Sincerely,
GEOTRANS, INC.,

Jennifer A. Abrahams, R.G.
Associate
Senior Hydrogeologist

Attachments: Figures
Data Summary Tables
Well Construction Logs (KMW-1 and KMW-2)

cc: Dan Gibson, Key Energy Services
Mitchell Brourman, Beazer East, Inc.
Jim McGinty, Halliburton
Bill Staggs, Site Owner

P:\PROJECTS\BEAZER\2201.019\Sampling Locations 0404.dwg, 7/1/2004 4:07:41 PM

W. MARLAND BLVD.

OFFICE

SHOP

Key Energy Services
Lease Yard

EQUIPMENT YARD

KMW-1

KSB-1

OXY USA, Inc.
Well

KMW-2

HEAVY EQUIPMENT STORAGE AREA

DIRT ROAD

Property owned by
Mr. Wright

CONCRETE PAD

HOUSE

SB-9

SB-10

SEPTIC TANK

PARKING AREA

OFFICE

SHOP

CATCH BASIN

MW-4 (SB-1)

MW-1

SLUDGE TANK

FORMER PIPE

SB-8

SB-7

SB-11

MW-5 (SB-2)

MW-2

MW-3

STORAGE (FENCED)

FORMER WASH VAT

MW-6 (SB-6)

FORMER STORAGE (1997)

MW-7 (SB-5)

FORMER SHACK (1997)

FORMER PUMP WASTE STORAGE

WATER WELL

FORMER PIPES & PARTS STORAGE

ABOVE GROUND STORAGE TANKS W/ SECONDARY CONTAINMENT

STORAGE

Property owned by
Mr. Wright

Explanation

- Monitor Well Location
- Soil Boring Location
- Short-Term Monitor Well Location

N

0 25 50

Scale: 1"=50'

TITLE:	Sampling Locations April 2004
LOCATION:	Former Axelson Facility 2703 West Morland Blvd., Hobbs, New Mexico
GeoTrans, Inc.	CHECKED: TRA DRAFTED: GHP DATE: 05-12-03
EXHIBIT:	1

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Explanation

MW-5*	Not used in groundwater contouring due to presence of free floating product
MW-4 (3587.05)	Monitor Well Location with groundwater elevation on 06/11/01 (ft msl)
S61°E 0.0009 ft/ft	Groundwater flow direction with bearing and gradient
———	Groundwater elevation contour (ft)

N

0 50 100

Scale: 1"=100'

(Base map surveyed by Basin Surveys, Inc.)

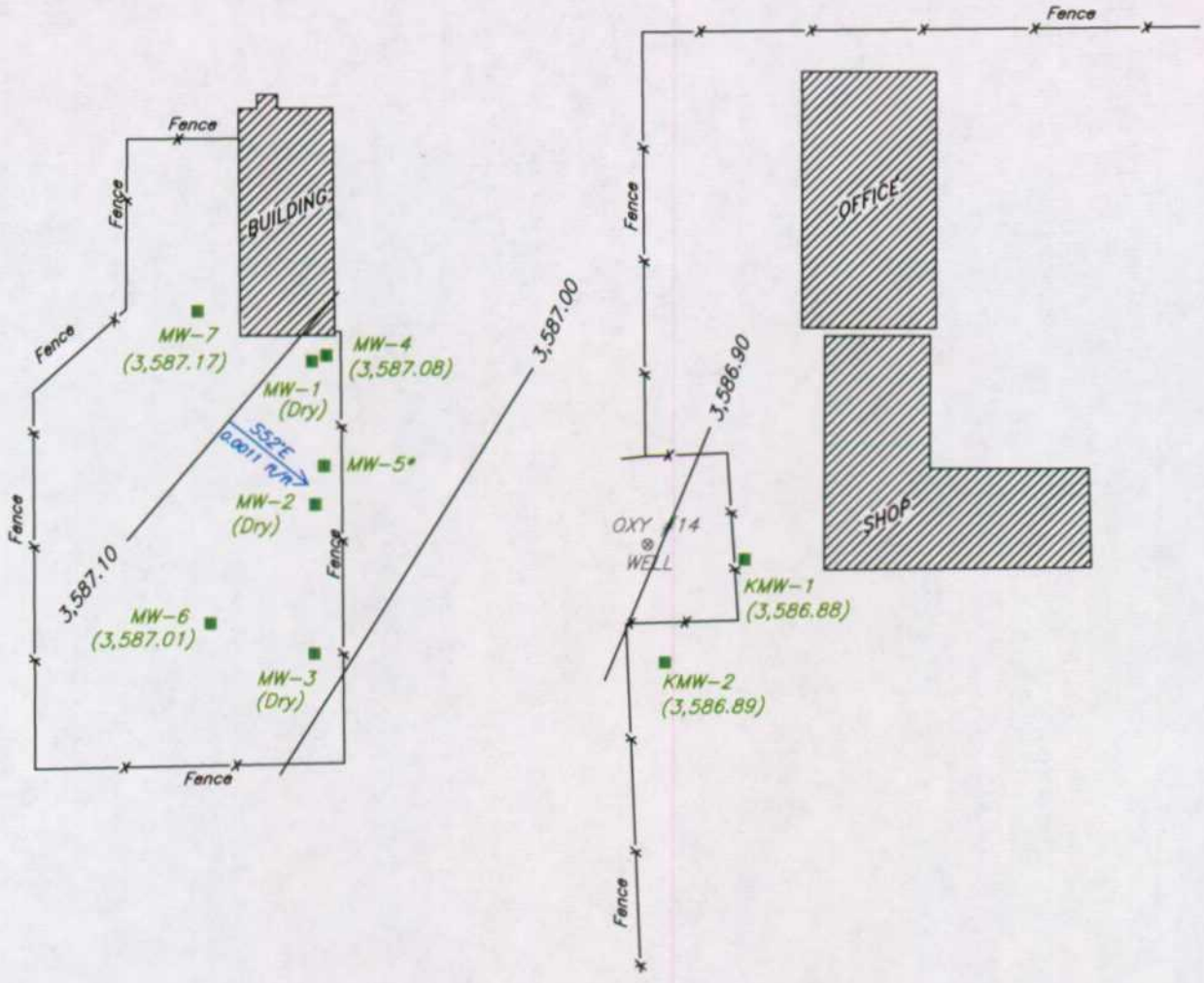
TITLE: Groundwater Elevations April 2004

LOCATION: Former Axelson Facility
2703 W. Marland Boulevard,Hobbs, New Mexico

GeoTrans, Inc.

CHECKED:	TRA
DRAFTED:	GHP
DATE:	06-30-04

FIGURE: 2



Explanation

MW-5*	Not used in groundwater contouring due to presence of free floating product
MW-4 (3587.05)	Monitor Well Location with groundwater elevation on 06/11/01 (ft msl)
S52E 0.0011 ft/ft	Groundwater flow direction with bearing and gradient
———	Groundwater elevation contour (ft)

N

0 50 100

Scale: 1"=100'

(Base map surveyed by Basin Surveys, Inc.)

TITLE: Groundwater Elevations May 2004			
LOCATION: Former Axelson Facility 2703 W. Marland Boulevard, Hobbs, New Mexico			
GeoTrans, Inc.	CHECKED:	TRA	FIGURE: 3
	DRAFTED:	GHP	
	DATE:	06-30-04	

Table 1
Summary of Downgradient Analyses and Analytical Methods
Former Axelson Facility, Hobbs, New Mexico

Rationale	Analyses Performed	EPA Method	Soil	Groundwater	
			KSB-1	KMW-1	KMW-2
Site Specific	Total Petroleum Hydrocarbons	8015 Modified	X	X	X
WQCC	Total Solids	160.3	X	---	---
	Volatile Organic Compounds	8260B	---	X	X
	Semi-volatile Organic Compounds	8270C	---	X	X
	Polynuclear Aromatic Hydrocarbons	8270 SIM	---	X	X
	Total Dissolved Solids	160.1	---	X	X
	Total Cyanide	335.2	---	X	X
	Flouride	300.0	---	X	X
	Nitrate as Nitrogen	300.0	---	X	X
	Polychlorinated biphenyls	8082	---	X	X
	Radium-226	903.1	---	X	X
	Radium-228	904	---	X	X
	Dissolved Metals: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, and Uranium	200 / 6000 / 7000 Series	---	X	X

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
--- = not applicable
X = analysis performed

Table 2
Summary of Monitor Well Construction Details
Former Axelson Facility, Hobbs, New Mexico

Well Number	Installation Date	Top of Casing Elevation (ft MSL)	Casing Diameter (inches)	Screen Interval (feet)	As Built Total Depth (feet)
On-site Wells					
MW-1	2/23/1995	3,624.76	2	25-35	35
MW-2	2/23/1995	3,624.34	2	25-35	35
MW-3	2/27/1995	3,623.94	2	25-35	35
MW-4	6/5/2001	3,624.74	2	30-45	45
MW-5	6/5/2001	3,624.46	2	29-44	44
MW-6	6/6/2001	3,623.97	2	30-45	45
MW-7	6/6/2001	3,625.32	2	30-45	45
Off-site Wells					
KMW-1	4/7/2004	3,625.26	2	28-48	48
KMW-2	4/8/2004	3,625.49	2	26-46	46

NOTE: All TOC elevations surveyed by Basin Surveys on June 8, 2001 and April 12, 2004.
Wells MW-1through MW-3 installed by Environmental Management & Engineering, Inc.
Wells MW-4 through MW-7, KMW-1 and KMW-2 installed by GeoTrans, Inc.

ft MSL = feet mean sea level

Table 3
Summary of
Water Level and Flow Direction Data
Former Axelson Facility, Hobbs, New Mexico

Well Number	Date	Measured Depth to Water (feet)	Measured Depth to Product (feet)	Top of Casing Elevation (ft MSL)	Calculated Groundwater Elevation (ft MSL)	Groundwater Gradient Direction	Groundwater Gradient (ft/ft)	Notes
MW-1	6/9/2001	dry *	---	3624.76	na	---	---	---
	6/11/2001	dry *	----	3624.76	na	---	---	---
	4/6/2004	dry	---	3624.76	na	---	---	very slight petroleum odor
MW-2	6/9/2001	dry *	---	3624.34	na	---	---	---
	6/11/2001	dry *	----	3624.34	na	---	---	---
	4/6/2004	dry	----	3624.34	na	---	---	very slight petroleum odor
MW-3	6/9/2001	34.65**	none	3623.94	na	---	---	---
	6/11/2001	34.65**	none	3623.94	na	---	---	---
	4/6/2004	dry	---	3623.94	na	---	---	no odor
MW-4	6/9/2001	35.35	none	3624.74	3589.39	---	---	---
	6/11/2001	35.36	none	3624.74	3589.38	S52^{0}E	0.0014	---
	4/6/2004	37.64	none	3624.74	3587.10	---	---	mild petroleum odor
	4/15/2004	37.69	none	3624.74	3587.05	S61^{0}E	0.0009	mild petroleum odor
	5/18/2004	37.66	none	3624.74	3587.08	S52^{0}E	0.0011	mild petroleum odor
MW-5	6/9/2001	35.15	none	3624.46	3589.31	---	---	---
	6/11/2001	35.15	none	3624.46	3589.31	S52^{0}E	0.0014	---
	4/6/2004	38.01	---	3624.46	3586.45	---	---	@ 2" free oil product in well
	4/15/2004	37.51	---	3624.46	3586.95	S61^{0}E	0.0009	@ 2" free oil product in well
	5/18/2004	38.60	38.55	3624.46	3585.86	S52^{0}E	0.0011	@ 0.5" free oil product in well
MW-6	6/9/2001	34.62	none	3623.97	3589.35	---	---	---
	6/11/2001	34.63	none	3623.97	3589.34	S52^{0}E	0.0014	---
	4/6/2004	36.99	none	3623.97	3586.98	---	---	no odor
	4/15/2004	36.95	none	3623.97	3587.02	S61^{0}E	0.0009	no odor
	5/18/2004	36.96	none	3623.97	3587.01	S52^{0}E	0.0011	no odor
MW-7	6/9/2001	35.62	none	3625.11	3589.49	---	---	---
	6/11/2001	35.63	none	3625.11	3589.48	S52^{0}E	0.0014	---
	4/6/2004	37.99	none	3625.11	3587.12	---	---	no odor
	4/15/2004	37.94	none	3625.11	3587.17	S61^{0}E	0.0009	no odor
	5/18/2004	37.94	none	3625.11	3587.17	S52^{0}E	0.0011	no odor
KMW-1	4/15/2004	38.34	none	3625.26	3586.92	---	---	no odor
	5/18/2004	38.38	none	3625.26	3586.88	S52^{0}E	0.0011	no odor
KMW-2	4/15/2004	38.55	none	3625.49	3586.94	---	---	no odor
	5/18/2004	38.60	none	3625.49	3586.89	S52^{0}E	0.0011	no odor

NOTE: Depth to water measured from mark or notch at top of well casing.

ft MSL = feet Mean Sea Level
na = not applicable
--- = data not available
* = approximately 0.5" to 2" of thick oily grease in bottom of well (no groundwater present).
**= Standing water collected in sump of well. Not representative of perched groundwater.

Table 4
Summary of Downgradient Soil Analytical Results
Petroleum Hydrocarbons and Total Solids
Former Axelson Facility, Hobbs, New Mexico

Sample ID	Sample Depth (feet)	TPH-d	TPH-g	TPH-mo	Total Solids (%)
April-01					
KSB-1	10	<12	<5.6	<28	87.3
	15	<11	<5.5	<27	90.9
	20	<11	<5.3	<27	91.6
	25	<11	<5.3	<27	91.8
	30	<11	<5.3	<26	95.2
	35	<11	<5.3	<27	94.9
KMW-1	35	<11	<5.2	<26	96.1
KMW-2	35	<11	<5.3	<26	94.8
NM OCD		100	100	100	---

Note: All results presented as milligrams per kilogram (mg/kg) unless otherwise noted.
Petroleum Hydrocarbons analyzed using EPA Method 8015 Modified.
Total Solids analyzed using EPA Method 160.3 Modified.
Concentrations in bold exceed the NM OCD recommended action level.

NM OCD = New Mexico Oil Conservation Division recommended remediation action level.
TPH-d = Total Petroleum Hydrocarbons as diesel range
TPH-g = Total Petroleum Hydrocarbons as gasoline range
TPH-mo = Total Petroleum Hydrocarbons as motor oil range
--- = not applicable

Table 5
Summary of Downgradient Groundwater Analytical Results
Petroleum Hydrocarbons
Former Axelson Facility, Hobbs, New Mexico

Sample ID	Date	TPH-d	TPH-g	TPH-mo
KMW-1	Apr-04	**<100**	**<50**	<100
	May-04	**<110**	**74**(1)	<110
KMW-2	Apr-04	**<110**	**<50**	<110
	May-04	**<110**	**<50**	<110
SNARL		100	5	---

Note: Results reported as micrograms per liter (µg/L=ppb)
TPH analyzed using EPA Method 8015 Modified
Concentrations in bold exceed SNARL

TPH-d = Total Petroleum Hydrocarbons as Diesel
TPH-g = Total Petroleum Hydrocarbons as Gasoline
TPH-mo = Total Petroleum Hydrocarbons as Motor Oil
SNARL = EPA Suggested No-Adverse Response Levels

(1) = lab data sheets indicate that sample result does not match calibration standard

Table 6
Summary of Downgradient Groundwater Analytical Results
BTEX Compounds, VOCs, and SVOCs
Former Axelson Facility, Hobbs, New Mexico

Sample ID	Date	BTEX Compounds	SVOCs	VOCs
KMW-1	Apr-04	---	nd	nd
	May-04	Benzene = 2.8 Toluene = 2.5 Ethyl benzene = 5.0 Total Xylenes = 8.2	nd	1,1-DCA = 0.51; Benzene = 3.8; Toluene = 3.1; Ethyl benzene = 4.9; Total Xylenes = 8.2; 1,2,4-Trimethylbenzene = 2.2
KMW-2	Apr-04	---	nd	nd
	May-04	nd	nd	1,1-DCA = 1.1; PCE = 0.92
MRL	---	Benzene = 0.5 Toluene = 1.0 Ethyl benzene = 1.0 Total Xylenes = 1.0	Compound Specific	1,1-DCA = 0.5; PCE = 0.5; BTEX = 0.5; 1,2,4-Trimethylbenzene = 2.0
WQCC	---	Benzene = 10 Toluene = 750 Ethyl benzene = 750 Total Xylenes = 620	Compound Specific	1,1-DCA = 25; PCE = 20; 1,2,4-Trimethylbenzene = ---
MCLs	---	Benzene = 5 Toluene = 1,000 Ethyl benzene = 70 Total Xylenes = 10,000	Compound Specific	1,1-DCA = ---; PCE = 5; 1,2,4-Trimethylbenzene = 70

Note: All results reported as micrograms per liter (µg/L = ppb). Only detected analytes listed.
BTEX Compounds analyzed using EPA Method 8021B
Volatile Organic Compounds analyzed using EPA Method 8260B
SVOCs analyzed using EPA Method 8270C.
Concentrations in bold exceed the WQCC or MCL values.
Most stringent comparison criteria used when both WQCC and MCL values exist.

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
MCLs = U.S. EPA Drinking Water Maximum Contaminant Levels
MRL = Method Reporting Limit

1,1-DCA = 1,1-Dichloroethane
PCE = Tetrachloroethene
nd = not detected above the laboratory reporting limit
--- = not applicable

Table 7
Summary of Downgradient Groundwater Analytical Results
Polynuclear Aromatic Hydrocarbons
Former Axelson Facility, Hobbs, New Mexico

Sample ID	Date	Naphthalene	2-Methylnaphthalene	Dibenzofuran	Fluorene	Phenantthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,I)perylene
KMW-1	Apr-04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	May-04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
KMW-2	Apr-04	0.024	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022
	May-04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
WQCC	---	30*	---	---	---	---	---	---	---	---	---	---	---	0.7	---	---	---
MCL	---	---	---	---	---	---	---	---	---	0.1	---	---	---	0.2	---	---	---

Note: All results reported as micrograms per liter (µg/L = ppb). Only detected analytes listed.
Polynuclear Aromatic Hydrocarbons analyzed using EPA Method 8270 SIM
Most stringent comparison criteria listed when both WQCC and MCL values exist.

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
MCL = U.S. EPA Drinking Water Maximum Contaminant Level
--- = not available
* = total naphthalene plus monomethylnapthalenes

Table 8
Summary of Downgradient Groundwater Analytical Results
New Mexico Water Quality Control Commission Groundwater Standards (WQCC)
Former Axelson Facility, Hobbs, New Mexico

Sample ID	Date	Total Cyanide (mg/L)	Fluoride (mg/L)	Nitrate as Nitrogen (mg/L)	TDS (mg/L)	PCBs (µg/L)	Radium 226 (pCi/L)		Radium 228 (pCi/L)		Total Radium (Ra-226 + Ra-228) (pCi/L)
							Result	Uncertainty	Result	Uncertainty	
KMW-1	Apr-04	<0.01	1.6	**13.7**	**2,740**	nd	5.39	0.6	6.28	0.7	**11.67**
	May-04	<0.01	1.4	**13.7**	**1,880**	nd	4.16	0.8	5.57	1.0	**9.73**
KMW-2	Apr-04	<0.01	**1.7**	3.9	**1,080**	nd	5.96	0.6	4.67	0.6	**10.63**
	May-04	<0.01	**1.4**	4.3	**1,100**	nd	3.63	0.8	3.6	0.9	**7.23**
WQCC		0.2	1.6	10	1000	0.001	---	---	---	---	30 pCi/L
MCLs		0.2	4	10	500	---	---	---	---	---	5 pCi/L

Note: All results reported as milligrams per liter (mg/L=ppm) unless noted otherwise.
Concentrations in bold exceed the WQCC or MCL values.

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
MCLs = U.S. EPA Drinking Water Maximum Contaminant Levels
TDS = Total Dissolved Solids using EPA Method 160.1
PCBs = Polychlorinated biphenyls using EPA Method 8082
Radium-226 analyzed using EPA Method 903.1
Radium-228 analyzed using EPA Method 904

µg/L = micrograms per liter (µg/L = ppb)
nd = not detected at or above the laboratory reporting limit
pCi/L = pico Curies per liter

Table 9
Summary of Downgradient Groundwater Analytical Results
Dissolved Metals
Former Axelson Facility, Hobbs, New Mexico

Sample ID	Date	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Uranium
KMW-1	Apr-04	<5.0	45.9	<5.0	<5.0	0.12	<0.20	<8.0	<10	25.4
	May-04	16.9	50.7	<5.0	<5.0	0.19	<0.20	<10	<10	20.5
KMW-2	Apr-04	<5.0	47.5	<5.0	<5.0	0.12	<0.20	<10	<10	21.8
	May-04	16	47.8	<5.0	<5.0	0.13	1.4	<10	<10	25.1
WQCC		*100*	*1,000*	*10*	*50*	*50*	2.0	*50*	*50*	*5,000*
MCLs		50	2000	5.0	100	15	2	50	50	30

Note: All results reported as micrograms per liter (µg/L = ppb).
Metals analyzed using EPA Method 6010B/7470B/7740/200.8
Concentrations in bold exceed the WQCC or MCL values.
Most stringent comparison criteria listed when both WQCC and MCL values exist.

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
MCLs = U.S. EPA Drinking Water Maximum Contaminant Levels

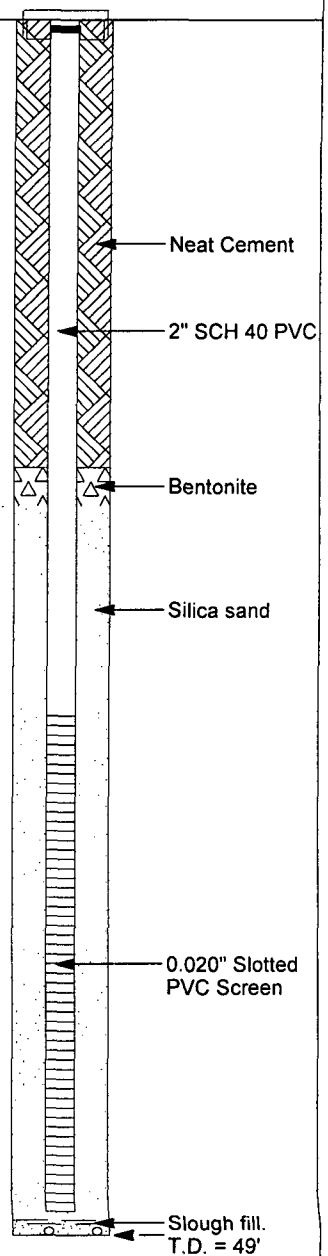
GeoTrans, Inc.

WELL CONSTRUCTION LOG

PROJECT NUMBER	2201.019.01	**BORING/WELL NUMBER**	KMW-1
PROJECT NAME	Former Axelson Facility (Site No. 2067)	**DATE DRILLING BEGAN**	4/7/2004
LOCATION	2703 West Marland Boulevard, Hobbs, New Mexico	**DATE DRILLING ENDED**	4/7/2004
DRILLING METHOD	Air Rotary	**NORTHING**	618780.938
SAMPLING METHOD	Grab	**EASTING**	899413.397
DEPTH TO SATURATED SOIL (ft)	36 to 40'	**GROUND SURFACE ELEVATION (ft, MSL)**	3625.50
STATIC WATER DEPTH (ft)	38.34	**TOC ELEVATION (ft, MSL)**	3625.26
LOGGED BY	Tanya Akkerman	**CASING DIAMETER/TYPE**	2" / SCH 40 PVC
REMARKS	Off-site monitor well located at Key Energy Services facility.		

PID (ppm)	BLOW COUNTS	RECOVERY (ft)	SAMPLE ID.	SAMPLE DEPTH	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION (% Gravel, Sand, Silt, Clay)
								Asphalt and roadbase material.
4.1			KMW-1-5'		5	ML SM		**SANDY SILT**: Pink (7.5YR 8/3) to Pinkish gray (7.5YR 7/2) ; (0,15,85,0); fine to medium sand; dry. No odor. Minor coarse sand present.
4.1			KMW-1-10'		10			
4.1			KMW-1-15'		15			
4.1			KMW-1-20'		20			
4.1			KMW-1-25'		25			
4.1			KMW-1-30'		30	ML SM		**SILTY SAND**: Pink (7.5YR 7/3) ; (0,90,10,0); fine to medium sand; dry. No odor.
4.1			KMW-1-35'		35	SP		**SAND**: Pink (7.5YR 7/4); (0,100,0,0); fine to medium sand; dry. No odor.
4.1			KMW-1-40'		40	ML SM		**SILTY SAND**: Pink (7.5YR 7/4) to Brown (7.5YR 5/4) ; (0,90,10,0); fine to medium sand; slightly damp to wet at depth. No odor.
4.1			KMW-1-45'		45			Hard pan layer present.

WELL DIAGRAM



GEOTRANS WELL BZRHOBBS.GPJ LAEWNN01.GDT 6/30/04

Tanya Akkerman
Signature of Geologist

Jennifer Grahams
Signature of Reviewer

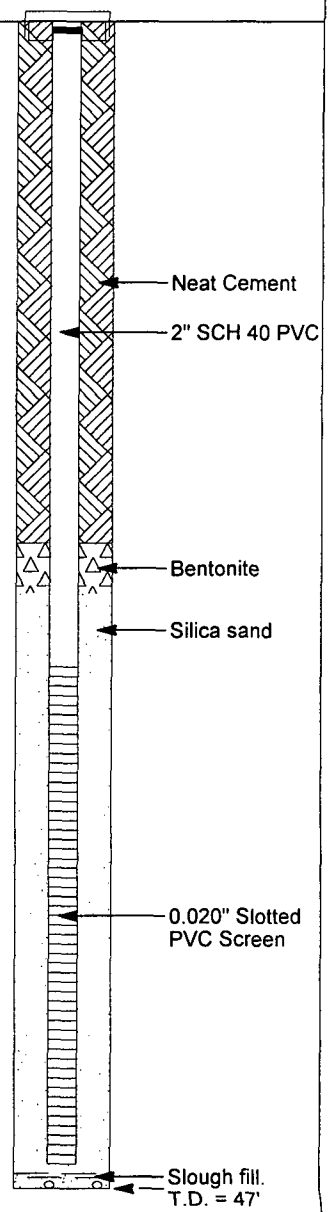
GeoTrans, Inc.

WELL CONSTRUCTION LOG

PROJECT NUMBER	2201.019.01	**BORING/WELL NUMBER**	KMW-2
PROJECT NAME	Former Axelson Facility (Site No. 2067)	**DATE DRILLING BEGAN**	4/8/2004
LOCATION	2703 West Marland Boulevard, Hobbs, New Mexico	**DATE DRILLING ENDED**	4/8/2004
DRILLING METHOD	Air Rotary	**NORTHING**	618726.415
SAMPLING METHOD	Grab	**EASTING**	899370.44
DEPTH TO SATURATED SOIL (ft)	36 to 40'	**GROUND SURFACE ELEVATION (ft, MSL)**	3625.70
STATIC WATER DEPTH (ft)	38.55	**TOC ELEVATION (ft, MSL)**	3625.49
LOGGED BY	Tanya Akkerman	**CASING DIAMETER/TYPE**	2" / SCH 40 PVC
REMARKS	Off-site monitor well located at Key Energy Services facility.		

PID (ppm)	BLOW COUNTS	RECOVERY (ft)	SAMPLE ID.	SAMPLE DEPTH	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION (% Gravel, Sand, Silt, Clay)
								Asphalt and roadbase material.
4.1			KMW-2-5'	G	5	ML SM		**SANDY SILT**: Pink (7.5YR 8/3) to Pinkish gray (7.5YR 7/2) ; (0,15,85,0); fine to medium sand; dry. No odor. Minor coarse sand present.
4.1			KMW-2-10'	G	10			
8			KMW-2-15'	G	15			
4.1			KMW-2-20'	G	20			Hard pan layer present.
4.1			KMW-2-25'	G	25	ML SM		**SILTY SAND**: Pink (7.5YR 7/3) ; (0,90,10,0); fine to medium sand; dry. No odor.
4.1			KMW-2-30'	G	30	SP		**SAND**: Pink (7.5YR 7/3); (0,100,0,0); fine to medium sand; dry. No odor.
0			KMW-2-35'	G	35	ML SM		**SILTY SAND**: Pink (7.5YR 7/3); (0,90,10,0); fine to medium sand; slightly damp to wet at depth. No odor.
0			KMW-2-40'	G	40			
---			KMW-2-45'	G	45			Hard pan layer present.

WELL DIAGRAM



GEOTRANS WELL BZRHOBBS.GPJ LAEWNN01.GDT 6/30/04

Tonya Akkerman
Signature of Geologist

Signature of Reviewer

GeoTrans, Inc.
A TETRA TECH COMPANY

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916-853-1800 FAX 916-853-1860

November 5, 2004
P:\PROJECTS\BEAZER\2201.019\Hobbs Soil remediation workplan2.doc

Mr. Wayne Price
Petroleum Engineer Specialist
New Mexico Oil Conservation District
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Soil Remediation Work Plan
Former Axelson Facility
2703 W. Marland Boulevard, Hobbs, New Mexico

Dear Mr. Price:

On behalf of Beazer East, Inc. (Beazer), this letter presents the results of the April and May 2004 investigation activities implemented at the Former Axelson Facility located at 2703 W. Marland Boulevard in Hobbs, New Mexico (Site). This letter also presents a remediation work plan for impacted soils at the Site in order to achieve a No Further Action (NFA) status for Site soils from the New Mexico Oil Conservation District (OCD).

Site soil and groundwater samples were collected and analyzed in the spring of 2004 to compliment the findings of the June 2001 and February 1995 Site investigations, reported in the *Site Investigation Report, Former Axelson Facility, 2703 W. Marland Boulevard, Hobbs, New Mexico,* (GeoTrans, September 2001). OCD approved the 2004 investigation activities by letter, dated June 19, 2002. The delay between OCD approval and implementation of the investigation activities was due to negotiating property access; OCD was kept apprised of the access issues.

Results of the previous investigations indicated that soil and groundwater impacts at the Site are primarily total petroleum hydrocarbons (TPH) associated with historic operations conducted at the Site. The investigations in 2004 confirmed that soil impacts are present to approximately 25 to 35 feet below ground surface (bgs) in a localized area at the south side of the Site building. The 2004 investigations also confirmed that impacted Site groundwater is present in the vicinity of the impacted soil. The upgradient extent of the groundwater impacts has been defined and the cross-gradient extent has been defined to the south. Groundwater 300 feet downgradient of the Site boundary appears to be unimpacted by Site constituents.

This letter compliments the July 1, 2004 Data Transmittal and Request to Abandon/Plug Short-Term Wells, Former Axeslon Facility, 2703 W. Marland Boulevard, Hobbs, New Mexico (GeoTrans). The July 1, 2004 letter presented the analytical data for the downgradient portion of the 2004 investigation activities, therefore, this Soil Remediation Work Plan letter will only refer to the data presented in the July 1, 2004 letter and will not duplicate the downgradient data.

BACKGROUND

The purpose of the April and May 2004 soil and groundwater investigation activities, as identified in the Site Investigation Report, was to supplement the previous investigation results, assess the horizontal extent of soil impacts at the Site, and assess existing downgradient soil and groundwater conditions. In addition, the Site Investigation Report identified the need to delineate the vertical and lateral extent of naturally occurring radioactive materials (NORMs) that exceed New Mexico Administrative Code Title 20, Chapter 3, Part 1, Subpart 14 (20 NMAC 3.1, Subpart 14) at the Site. The NORM activities and subsequent removal and disposal occurred in July and August 2004. The NORM work will be reported under separate cover.

The Site was leased by Axelson, Inc. (Axelson) from 1980 to approximately 1997 to repair submersible rod sucker oil pumps and rods. A figure presenting a plot plan of the Site, with the location of the 1995 and 2001 investigation activities is shown on Figure 1. The Site is currently leased by Reef Chemical, an oil field chemical distribution company.

An underground tank south of the Site building was identified in the Site Investigation Report as the septic tank for the building. A camera survey was performed in April 2004 to identify what piping was connected to the septic tank. The camera survey indicated that the restroom sanitary sewer line is connected to a septic tank located north of the building in the asphalt parking area, as shown on Figure 1. A shallow excavation north of the building confirmed the septic tank location. The two catch basins inside the Site building are connected to the tank located south of the building, this piping is separate and distinct from the restroom and septic piping. Accordingly, the tank located south of the building will be referred to as the catch basin tank in this Work Plan letter and no further work will be performed in the vicinity of the septic tank north of the building.

The 2004 investigation performed on Site included drilling and sampling five soil borings; sampling the groundwater monitoring wells and the former water supply well located at the Site; and sampling the concrete catch basin tank.

SOIL INVESTIGATION

The Site Investigation Report identified soils to be impacted by TPH at concentrations above the OCD action level. Samples were collected during the 2004 soil investigation to refine the understanding of the lateral and vertical extent of soil impacts on Site. Five soil borings (SB-7 through SB-11) were completed at the Site, as shown on Figure 1. The borings were completed using an air rotary drill rig and soil samples were collected at 5-foot intervals for lithologic purposes, field screening, and potential laboratory analysis. The soil borings were completed to approximately 35 feet below ground surface (bgs).

The lithology encountered generally consists of an 18 to 20 foot thick layer of sandy silt/silty sand overlying a 2 to 4-foot thick caliche layer (hard pan). A well to medium graded sand material underlies the caliche layer and is present from approximately 23 to 40 feet bgs. Groundwater was not encountered in any of the soil borings.

Field indications of impacts (petroleum odors) were identified in the Site soil samples at SB-8 (30-35 feet bgs), SB-9 (10-35 feet bgs), and SB-10 (10-35 feet bgs). Selected soil samples from each boring location were analyzed for TPH and total solids. The soil analytes and corresponding analytical methods are presented in Table 1.

The soil borings were backfilled to ground surface with hydrated bentonite chips. Boring logs for SB-7 through SB-11 are presented in Attachment A.

GROUNDWATER INVESTIGATION

Groundwater samples were collected at the Site to asses the current groundwater conditions and evaluate the potential of natural attenuation of the petroleum hydrocarbons constituents.

Seven groundwater monitoring wells and a former water supply well (WSW-1) are located at the Site (Figure 1). The screened intervals and total depths of each well are summarized on Table 2. Three groundwater monitoring wells (MW-1 through MW-3) were installed at the Site in 1995 and are screened from 25 to 35 feet bgs. However, due to decreases in static water levels at the Site (currently 38 feet bgs), MW-1 through MW-3 are no longer screened in the water table and are currently dry. Therefore, groundwater samples were only collected from wells MW-4 through MW-7 and WSW-1 during April 2004. The former water supply well was sampled to assess the chemical constituents present in the well and to evaluate groundwater conditions upgradient of the Site wells. A list of groundwater analyses performed for the Site wells along with the corresponding analytical methods is presented in Table 1.

The four groundwater monitoring wells at the Site were re-sampled in May 2004, the former water supply well was not re-sampled.

Depth to water was measured at the four Site groundwater monitoring wells to calculate the groundwater flow direction. The groundwater elevations measured at the Site wells are presented in Table 3. These elevations were used to calculate the groundwater flow direction for April and May 2004, as shown on Figures 2 and 3. The groundwater flow direction was calculated to be southeast (S52°E to S61°E) with a flat gradient of 0.0011 to 0.0009 feet per foot (ft/ft). This is consistent with prior groundwater flow direction and gradient data collected at the Site.

Approximately 2-inches of a light non-aqueous phase liquid (LNAPL) were present in well MW-5 during the April 2004 sampling event. However, only 0.5-inches of LNAPL were present in well MW-5 during the May 2004 sampling event. This is the first time NAPL has been detected at the Site and in well MW-5. A sample of the NAPL material was submitted for fuel fingerprinting analysis to evaluate the type, nature, and estimated age of the product present in the well.

CATCH BASIN TANK INVESTIGATION

In May 2004, a grab sample was collected from the concrete catch basin tank, at the exterior south side of the building. Liquid was not present in the catch basin tank during the May 2004 sampling event. A sample of semi-solid material was collected from the catch basin tank and

analyzed for TPH, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and polynuclear aromatic hydrocarbons (PAHs). The semi-solid sample was analyzed to assess the chemical constituents present for disposal profiling purposes and to evaluate if the chemical constituents had changed since the June 2001 sampling event.

DISCUSSION OF ANALYTICAL RESULTS

This section presents an evaluation of the analytical results from the April and May 2004 sampling events. The evaluation also includes the results from the 2001 investigation to identify areas proposed for remediation activities.

Soil Results

The analytical results for the soil samples collected during the on-site investigation are summarized in Table 4. Petroleum hydrocarbons in the diesel, gasoline, and motor oil ranges were not detected in borings SB-7 and SB-11. The analytical results confirmed the field indications of petroleum hydrocarbon soil impacts in borings SB-8, SB-9, and SB-10.

The detected concentrations of petroleum hydrocarbons in borings SB-8, SB-9, and SB-10 exceed the corresponding OCD recommended remediation action level of 100 milligrams per kilogram (mg/Kg). TPH concentrations ranged from 512 mg/Kg to 16,700 mg/Kg. All 12 samples collected from both SB-9 and SB-10 (10 to 35 feet bgs) had TPH concentrations above the recommended action level. The highest concentrations of TPH were detected in soils collected from 15 to 20 feet bgs in both the 2001 and 2004 samples.

Groundwater Results

The analytical results for the groundwater samples collected in 2001 and 2004 are summarized in Tables 5 through 9. Petroleum hydrocarbons in the diesel, gasoline, and motor oil ranges were detected in samples from MW-4 and MW-5. The petroleum hydrocarbon concentrations detected in well MW-4 in 2004 decreased by an order of magnitude compared to the June 2001 sampling event. However, the TPH concentrations in well MW-4 still exceed the corresponding EPA Suggested No-Adverse Response Level (SNARL), as shown in Table 5. LNAPL was present in well MW-5 during April and May 2004, and this is reflected in the elevated TPH concentrations (up to 230,900 micrograms per liter [µg/L]) in groundwater at this well. This concentration is not considered to reflect dissolved TPH concentrations in groundwater, but rather reflects the presence of emulsion in the water sample. Only motor oil range TPH was detected in well MW-7 (at 110 µg/L) and all ranges of TPH were below reporting limits in samples from MW-6.

Although minor concentrations of VOCs, SVOCs, and PAHs were detected in the wells, the only detection that exceeded the New Mexico Waster Quality Control Commission Groundwater Standards (WQCCs) and/or Maximum Contaminant Levels (MCLs) was the detection of naphthalene at 140 µg/L at MW-5.

The LNAPL product from MW-5 was submitted to Friedman & Bruya, Inc. for a fuel fingerprinting analysis; the results determined that the LNAPL was "Kerosene / Diesel #1". According to the analytical laboratory report, the product "has undergone little to no biological degradation.... the

extent of degradation in this fuel is consistent with releases that occurred within the last 5 years".

The former water supply well was detected to have a very low level of motor oil range TPH (150 µg/L) and of toluene (5.8 µg/L). These results are below the respective SNARL, MCL, and WQCC values.

Catch Basin Tank Results

The analytical results for the grab sample collected from the concrete catch basin tank are summarized in Table 10. The semi-solid sample analytical results indicate that the VOCs, SVOCs, and PAHs present in the catch basin tank have not changed significantly since the June 2001 sampling event. The concentrations of petroleum hydrocarbons detected in 2004 decreased approximately one order of magnitude compared to the June 2001 results. The New Mexico Environment Hazardous Waste Bureau reviewed the catch basin tank sample results from 2001 and stated in an April 16, 2002 letter that "the sludge is not considered to be characteristic hazardous waste as defined in 40 CFR 261 Subpart C. The sludge may be handled as nonhazardous solid waste providing the facility is in compliance with OCD regulations."

RECOMMENDED REMEDIATION WORKPLAN

The strategy to remediate the Site addresses soil impacts with the intent to obtain an NFA designation from OCD for Site soils. The Site groundwater impacts are limited to petroleum hydrocarbons and low level concentrations of VOCs in the vicinity of the impacted soil. Source removal through soil excavation will enhance the progress of natural attenuation processes in groundwater currently occurring at the Site.

The impacted soils in the vicinity of the concrete catch basin tank at the south side of the building will be excavated, including soil boring locations SB-3 and SB-4 and wells MW-1, MW-4 and MW-5. It is anticipated that OCD will require these wells to be properly plugged prior to beginning the excavation activities.

The soil TPH concentrations at the eastern Site boundary (SB-9 and SB-10) indicate that the TPH impacts above the OCD recommended action level of 100 mg/Kg extend off-site onto Mr. Lewis Wright's property. OCD has stated that Beazer will be considered responsible to remediate Mr. Wright's property. Upon remediation of Mr. Wright's property, OCD will issue a clean closure notice for Mr. Wright's property. Beazer is currently attempting to negotiate access to Mr. Wright's property.

All remediation work will be conducted in accordance with GeoTrans' Standard Operating Procedures (SOPs), presented in Attachment B, and in accordance with the Site Health and Safety Plan (HASP), presented in Attachment C.

Soil Remediation

The scope of work to remediate the Site includes cleaning and removing the concrete catch basin tank and cleaning and backfilling the concrete catch basins located within the building. Impacted soil in the vicinity of the concrete catch basin tank will also be removed, based on the June 2001 and April 2004 analytical results and confirmatory visual assessment in the field. Figure 4 presents the approximate extent of the area to be excavated.

It is anticipated that the soil will be excavated to approximately 25 to 35 feet in depth (west to east trend in depth) using an excavator with shoring and sloping entrances for depths greater than 20 feet bgs. Soil impacts greater than 35 feet in the eastern portion and 25 feet in the western portion of the excavation area are associated with chemical partitioning from the groundwater and will be addressed by remediation of the Site groundwater. Soil excavation activities near well MW-5 may be expanded to remove NAPL material (if present) in the vadose zone at this location. The excavation will extend as close as possible to the edge of the building without compromising the structural integrity of the building. Although the specifics of completing the excavation may vary from what is described in this Work Plan, the extent of the excavation will remain as identified in this Work Plan.

If impacted soils remain in place under the building, soil samples will be collected from under the building following remediation activities. These soil samples will be used in the Johnson-Ettinger model to evaluate the potential of constituents volatilizing into the building.

The eastern extent of the excavation will extend onto Mr. Wright's property, assuming assess can be negotiated with Mr. Wright. The extent of the excavation on Mr. Wright's property will be based on visual and olfactory assessment, with confirmation soil samples.

A maximum of 15 confirmatory soil samples will be collected from the bottom of the excavation and sidewalls for laboratory analysis. The sample locations will be based on field observations and conditions (i.e., staining, discoloration, etc.) of the exposed soils. The samples will be analyzed for TPH to verify the impacted soils were removed.

The catch basins will be cleaned and backfilled with concrete. The concrete catch basin tank will be cleaned and removed from the ground in conjunction with the soil excavation activities. The tank void will be observed for indications of leaks or potential piping from the tank. The excavated areas will be backfilled and compacted. The estimated total volume of soil to be excavated is approximately 4,500 to 5,000 cubic yards. The contents of the catch basins and concrete catch basin tank and the excavated soils will be disposed of in accordance with local, state, and federal requirements, subject to approval by Beazer and Halliburton.

To enhance bioremediation in the excavation area, an Oxygen Release Compound (ORC) material is proposed to be placed in the vadose zone below the bottom of the excavation. The vadose zone is currently present at 35 to 37 feet bgs (May 2004). Several trenches will be constructed in the bottom of the excavation and ORC will be added to the trenches. ORC is a proprietary formulation of phosphate-intercalated magnesium peroxide that time releases oxygen when hydrated. ORC enhances in-situ bioremediation of dissolved phase

hydrocarbons, chlorinated compounds, and other biodegradable materials in groundwater and soil by stimulating the growth and activity of naturally occurring microbes. ORC is a non-hazardous, food grade material composed of less than 10 microns in diameter magnesium peroxide powder. ORC converts to a weakly cemented magnesium hydroxide. ORC does not affect the dimensions of the contaminant plume or volatilize the pollutants. Once the ORC material is placed at the desired depth, the trenches will backfilled and compacted along with the excavation area.

Groundwater Remediation

Two replacement wells will be installed at the Site after completion of the soil excavation and backfilling activities. One well will be installed near the current location of the concrete catch basin tank and the other well will be installed near the current location of well MW-5. The wells will be installed to monitor post-excavation groundwater conditions at the Site. The wells will be constructed so that the screened interval crosses the water table, currently 37 to 38 feet bgs. The location of the replacement monitoring wells is shown in Figure 4. The new wells will be developed, surveyed and sampled for the same constituents as well WSW-1 (Table 1).

Monitoring wells MW-2 and MW-3 will be abandoned, as they are no longer screened in the perched groundwater. The former water supply well will also be abandoned as it is not properly sealed and is a potential conduit to the perched groundwater at the Site.

The Site groundwater conditions will be monitored based on the analytical results from the replacement wells and the existing wells. It is anticipated that monitored natural attenuation will be an appropriate remedial technology for the groundwater impacts (principally petroleum hydrocarbons) present at the Site, combined with the source removal performed through soil excavation and placement of ORC material in the vadose zone.

SCHEDULE

Preparation for the field activities will begin following OCD approval of the soil remediation work plan. Scheduling and mobilization of the subcontractors will require approximately 4 to 6 weeks, pending subcontractor availability. The Site remedial activities will require approximately 6 to 8 weeks to complete. Installation of the replacement wells, development, surveying, sampling, and well abandonment activities will require approximately two weeks, pending subcontractor availability. The groundwater monitoring well analytical results will be available within three weeks of completing the sampling activities.

OCD will be notified approximately five days prior to beginning the field activities. In addition, as the remediation activities proceed, OCD will be kept informed of the progress within a reasonable period of time.

A soil remediation report and request for No Further Action on soils will be prepared to document the field activities and submitted to OCD approximately 4 weeks after receipt of the analytical results for samples from the replacement wells. The report will include a description of the field activities, a map showing the excavation area and replacement well locations,

tabulated analytical results, well construction logs for the replacement wells, and analytical laboratory reports.

SUMMARY AND CONCLUSIONS

Soil samples collected from the Site in 2001 and 2004 characterize the limited extent of soil impacts; the impacts are mainly TPH and are localized to the vicinity of the catch basin tank located at the south side of the building. The soil impacts extend to approximately 25 to 35 feet in depth in this area and are associated with historic operations conducted at the Site. Groundwater impacts are limited to TPH impacts, and are directly associated with the impacted soils.

The recommended Site remediation includes cleaning and filling two catch basins inside the building, cleaning and removing the catch basin tank and excavating the impacted soil in the vicinity of the catch basin tank. Source removal through soil excavation combined with addition of ORC material in the vadose zone of the excavation is anticipated to enhance the natural attenuation processes in groundwater at the Site. The groundwater will continue to be monitored by sampling two replacement wells and existing on-site groundwater monitoring wells screened across the water table. A remediation report will be submitted to OCD documenting the soil remediation activities, and will request a No Further Action determination from OCD for soils at the Site.

Please contact GeoTrans at (916) 853-1800 if you have questions regarding this soil remediation work plan.

Sincerely,
GEOTRANS, INC.

Jennifer A. Abrahams, R.G.
Associate
Senior Hydrogeologist

Keith E. McIntyre
for
Tanya Akkerman
Senior Scientist

Attachments

cc: Mitchell Brourman, Beazer East, Inc.
Jim McGinty, Halliburton
Bill Staggs, Site Owner

Table 1
Summary of Analyses and Analytical Methods
Former Axelson Facility, Hobbs, New Mexico

April and May 2004

Rationale	Analyses Performed	EPA Method	Soil					Groundwater				
			SB-7	SB-8	SB-9	SB-10	SB-11	MW-4	MW-5	MW-6	MW-7	WSW-1
Site Specific	Total Petroleum Hydrocarbons	8015 Modified	X	X	X	X	X	X	X	X	X	X
WQCC	Total Solids	160.3	X	X	X	X	X	---	---	---	---	---
	Volatile Organic Compounds	8260B	---	---	---	---	---	O	X	X	O	X
	Semi-volatile Organic Compounds	8270C	---	---	---	---	---	O	X	O	O	X
	Polynuclear Aromatic Hydrocarbons	8270 SIM	---	---	---	---	---	O	X	X	X	X
	Total Dissolved Solids	160.1	---	---	---	---	---	X	X	X	X	X
	Total Cyanide	335.2	---	---	---	---	---	O	O	O	O	X
	Fluoride	300.0	---	---	---	---	---	X	X	X	X	X
	Nitrate as Nitrogen	300.0	---	---	---	---	---	X	X	X	X	X
	Polychlorinated biphenyls	8082	---	---	---	---	---	O	O	O	O	X
	Radium-226	903.1	---	---	---	---	---	X	X	X	X	X
	Radium-228	904	---	---	---	---	---	X	X	X	X	X
	Dissolved Metals: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, and Uranium	200 / 6000 / 7000 Series	---	---	---	---	---	X	X	X	X	X

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
WSW-1 = Samples collected from former water supply at the former Axelson facility

--- = not applicable
X = analysis performed
O = Approved by OCD to discontinue monitoring based on prior analytical results

Table 2
Summary of Monitor Well Construction Details
Former Axelson Facility, Hobbs, New Mexico

Well	Installation Date	Top of Casing Elevation (ft MSL)	Casing Diameter (inches)	Screen Interval (feet)	As Built Total Depth (feet)
On-site Wells					
MW-1	2/23/1995	3,624.76	2	25-35	35
MW-2	2/23/1995	3,624.34	2	25-35	35
MW-3	2/27/1995	3,623.94	2	25-35	35
MW-4	6/5/2001	3,624.74	2	30-45	45
MW-5	6/5/2001	3,624.46	2	29-44	44
MW-6	6/6/2001	3,623.97	2	30-45	45
MW-7	6/6/2001	3,625.32	2	30-45	45
Former water supply well (WSW-1)	unknown	unknown	7	unknown	53.60*

NOTE: All TOC elevations surveyed by Basin Surveys on June 8, 2001 and April 12, 2004.
Wells MW-1 through MW-3 installed by Environmental Management & Engineering, Inc.
Wells MW-4 through MW-7, KMW-1 and KMW-2 installed by GeoTrans, Inc.

ft MSL = feet Mean Sea Level
* as measured on 4/6/04

Table 3
Summary of Water Level and Flow Direction Data
Former Axelson Facility, Hobbs, New Mexico

Well	Date	Measured Depth to Water (feet)	Measured Depth to Product (feet)	Top of Casing Elevation (ft MSL)	Calculated Groundwater Elevation (ft MSL)	Groundwater Gradient Direction	Groundwater Gradient (ft/ft)	Notes
MW-1	6/9/2001	dry *	---	3624.76	na	---	---	---
	6/11/2001	dry *	---	3624.76	na	---	---	---
	4/6/2004	dry	---	3624.76	na	---	---	very slight petroleum odor
MW-2	6/9/2001	dry *	---	3624.34	na	---	---	---
	6/11/2001	dry *	---	3624.34	na	---	---	---
	4/6/2004	dry	---	3624.34	na	---	---	very slight petroleum odor
MW-3	6/9/2001	34.65**	none	3623.94	na	---	---	---
	6/11/2001	34.65**	none	3623.94	na	---	---	---
	4/6/2004	dry	---	3623.94	na	---	---	no odor
MW-4	6/9/2001	35.35	none	3624.74	3589.39	---	---	---
	6/11/2001	35.36	none	3624.74	3589.38	S52^{0}E	0.0014	---
	4/6/2004	37.64	none	3624.74	3587.10	---	---	mild petroleum odor
	4/15/2004	37.69	none	3624.74	3587.05	S61^{0}E	0.0009	mild petroleum odor
	5/18/2004	37.66	none	3624.74	3587.08	S52^{0}E	0.0011	mild petroleum odor
MW-5	6/9/2001	35.15	none	3624.46	3589.31	---	---	---
	6/11/2001	35.15	none	3624.46	3589.31	S52^{0}E	0.0014	---
	4/6/2004	38.01	---	3624.46	3586.45	---	---	@ 2" free product in well
	4/15/2004	37.51	---	3624.46	3586.95	S61^{0}E	0.0009	@ 2" free product in well
	5/18/2004	38.60	38.55	3624.46	3585.86	S52^{0}E	0.0011	@ 0.5" free product in well
MW-6	6/9/2001	34.62	none	3623.97	3589.35	---	---	---
	6/11/2001	34.63	none	3623.97	3589.34	S52^{0}E	0.0014	---
	4/6/2004	36.99	none	3623.97	3586.98	---	---	no odor
	4/15/2004	36.95	none	3623.97	3587.02	S61^{0}E	0.0009	no odor
	5/18/2004	36.96	none	3623.97	3587.01	S52^{0}E	0.0011	no odor
MW-7	6/9/2001	35.62	none	3625.11	3589.49	---	---	---
	6/11/2001	35.63	none	3625.11	3589.48	S52^{0}E	0.0014	---
	4/6/2004	37.99	none	3625.11	3587.12	---	---	no odor
	4/15/2004	37.94	none	3625.11	3587.17	S61^{0}E	0.0009	no odor
	5/18/2004	37.94	none	3625.11	3587.17	S52^{0}E	0.0011	no odor

NOTE: Depth to water measured from mark or notch at top of well casing.

ft MSL = feet Mean Sea Level
na = not applicable
ft/ft = feet per foot
--- = data not available
* = *approximately 0.5" to 2" of thick oily grease in bottom of well (no groundwater present).*

Table 4
Summary of Soil Analytical Results
Petroleum Hydrocarbons and Total Solids
Former Axelson Facility, Hobbs, New Mexico

Sample ID	Sample Depth (feet)	TPH-d	TPH-g	TPH-mo	Total Solids (%)
June-01					
SB-1 (MW-4)	5	21	<10	97	94.2
	10	**1,300**	**1,500**	**270**	86.4
	15	**2,400**	**2,300**	**370**	84.6
	20	**6,500**	**7,000**	**470**	85.9
	25	**2,100**	**1,100**	**190**	93.9
	30	**860**	**290**	94	95.1
	35	**1,100**	**490**	**110**	92.4
SB-2 (MW-5)	5	<10	<10	<26	94.8
	10	<11	<11	<28	86.3
	15	<11	<11	<27	89.4
SB-3	5	<11	<11	<26	91.5
	10	<11	<11	<26	92.9
	15	<12	<12	<29	86.2
SB-4	5	<10	<10	<25	97.2
	10	**2,700**	**1,000**	**120**	87.8
	15	**1,000**	**300**	46	89.6
	20	**100**	10	31	97.5
	25	<10	<10	<26	95.3
	30	**630**	**170**	58	95.2
	35	**300**	76	43	88.9
SB-5 (MW-7)	5	<10	<10	<25	95.7
SB-6 (MW-6)	5	<11	<11	<27	92.8
April-04					
SB-7	10	<12	<5.9	<30	82.5
	15	<11	<5.6	<27	88.9
	20	<10	<5.2	<25	95.9
	25	<10	<5.1	<25	97.9
	30	<10	<5.1	<25	95.4
	35	<11	<5.3	<26	94.7
SB-8	10	13	<6.0	<31	81.3
	15	<12	<5.8	<28	85.8
	20	<10	<5.1	<25	96.3
	25	<11	<5.2	<26	96.0
	30	**460**	23	29	96.6
	35	**610**	42	43	94.8

Table 4
Summary of Soil Analytical Results
Petroleum Hydrocarbons and Total Solids
Former Axelson Facility, Hobbs, New Mexico

Sample ID	Sample Depth (feet)	TPH-d	TPH-g	TPH-mo	Total Solids (%)
SB-9	10	**300**	7.1	**210**	91.7
	15	**7,100**	**700**	**510**	87.5
	20	**14,000**	**1,600**	**1,100**	86.4
	25	**1,900**	**180**	**170**	95.3
	30	**2,300**	**240**	**170**	95.2
	35	**750**	83	78	95.4
SB-10	10	**3,900**	81	**360**	86.5
	15	**6,100**	**640**	**130**	88.3
	20	**1,300**	73	46	96.8
	25	**3,300**	**370**	**130**	94.3
	30	**1,000**	82	69	95.4
	35	**1,400**	**250**	**100**	94.4
SB-11	10	<11	<5.5	<27	91.4
	15	<12	<5.5	<28	89.5
	20	<11	<5.6	<28	90.6
	25	<11	<5.3	<26	95.5
	30	<11	<5.2	<26	95.9
	35	<11	<5.3	<26	94.0
NMOCD		100	100	100	--

Note: All results presented as milligrams per kilogram (mg/kg) unless otherwise noted.
Petroleum Hydrocarbons analyzed using EPA Method 8015 Modified.
Total Solids analyzed using EPA Method 160.3 Modified.
Concentrations in bold exceed the NMOCD recommended action level.

NMOCD = New Mexico Oil Conservation Division recommended remediation action level.
TPH-d = Total Petroleum Hydrocarbons as diesel range
TPH-g = Total Petroleum Hydrocarbons as gasoline range
TPH-mo = Total Petroleum Hydrocarbons as motor oil range

Table 5
Summary of Groundwater Analytical Results
Petroleum Hydrocarbons
Former Axelson Facility, Hobbs, New Mexico

Well	Date	TPH-d	TPH-g	TPH-mo
MW-4	Jun-01	**13,000**	**4,500**	2,500
	Apr-04	**1,100**	**470**	370
	May-04	**2,000**	**560**	330
MW-5	Jun-01	**490**	**140**	410
	Apr-04*	**210,000**	**1,900**	19,000
	May-04*	**72,000**	**2,200**	7,400
MW-6	Jun-01	**<100**	**<100**	<260
	Apr-04	**<110**	**<50**	<110
Duplicate	Apr-04	**<110**	**<50**	<110
	May-04	**<110**	**<50**	<110
MW-7	Jun-01	**210**	**110**	380
Duplicate	Jun-01	**170**	**<100**	440
	Apr-04	**<110**	**<50**	<110
	May-04	**<100**	**<50**	110
WSW-1	Apr-04	**<110**	**<50**	150
SNARL	---	100	5	---

Note: Results reported as micrograms per liter (µg/L=ppb)
TPH analyzed using EPA Method 8015 Modified
Concentrations in bold exceed SNARL

TPH-d = Total Petroleum Hydrocarbons as Diesel
TPH-g = Total Petroleum Hydrocarbons as Gasoline
TPH-mo = Total Petroleum Hydrocarbons as Motor Oil
SNARL = EPA Suggested No-Adverse Response Levels

* = free product present in well

Table 6
Summary of Groundwater Analytical Results
BTEX Compounds, VOCs, and SVOCs
Former Axelson Facility, Hobbs, New Mexico

Well	Date	BTEX Compounds	Semi-volatile Organic Compounds (SVOCs)	Volatile Organic Compounds (VOCs)
MW-4	Jun-01	---	nd	nd
	Apr-04	---	na	na
	May-04	Ethyl benzene = 2.4 Total Xylenes = 3.7	na	na
MW-5	Jun-01	---	nd	nd
	Apr-04	---	na	na
(product present in well)	May-04	nd	Naphthalene = **140**; 2-Methylnaphthalene = 400; Dibenzofuran = 13; Fluorene = 17; Bis(2-ethylhexyl) Phthalate = 19	1,1-DCA = 0.87; 1,1,1-TCA = 0.76; PCE = 2.2; Total Xylenes = 0.73; Isopropylbenzene = 5.0; n-Propylbenzene = 9.4; 1,3,5-Trimethylbenzene = 74; 1,2,4-Trimethylbenzene = 210; sec-Butylbenzene = 12; 4-Isopropylbenzene = 13; n-Butylbenzene = 16; Naphthalene = **92**
MW-6	Jun-01	---	nd	1,1,1-TCA = 2.0; 1,2-DCA = **8.0;** PCE = 3.0
	Apr-04	---	nd	1,1,1-TCA = 2.1; 1,2-DCA = 4.1; PCE = 4.3
Duplicate	Apr-04	---	nd	1,1,1-TCA = 2.1; 1,2-DCA = 4.1; PCE = 4.5
	May-04	nd	nd	1,1,1-TCA = 2.2; 1,2-DCA = 3.4; PCE = 4.8
MW-7	Jun-01	---	nd	nd
Duplicate	Jun-01	---	nd	nd
	Apr-04	---	na	na
	May-04	nd	na	na
WSW-1	Apr-04	---	nd	Toluene = 5.8
MRL		Benzene = 0.5 Toluene = 1.0 Ethyl benzene = 1.0 Total Xylenes = 1.0	Naphthalene = 9.8; 2-Methylnaphthalene = 9.8; Dibenzofuran = 9.8; Fluorene = 9.8; Bis(2-ethylhexyl) Phthalate = 9.8	1,1-DCA = 0.5; 1,1,1-TCA = 0.5; 1,2-DCA = 0.5; PCE = 0.5; BTEX = 0.5; Isopropylbenzene = 2.0; n-Propylbenzene = 2.0; 1,3,5-Trimethylbenzene = 2.0; 1,2,4-Trimethylbenzene = 2.0; sec-Butylbenzene = 2.0; 4-Isopropylbenzene = 2.0; n-Butylbenzene = 2.0; Naphthalene = 2.0
WQCC		Benzene = 10 Toluene = 750 Ethyl benzene = 750 Total Xylenes = 620	Naphthalene = 30*; 2-Methylnaphthalene = ---; Dibenzofuran = --; Fluorene = ---; Bis(2-ethylhexyl) Phthalate = ---	1,1-DCA = 25; 1,1,1-TCA = 60; 1,2-DCA = 10; PCE = 20; Total Xylenes = 620; Isopropylbenzene = ---; n-Propylbenzene = ---; 1,3,5-Trimethylbenzene = ---; 1,2,4-Trimethylbenzene = ---; sec-Butylbenzene = ---; Toluene = 750; 4-Isopropylbenzene = ---; n-Butylbenzene = ---; Naphthalene = 30*
MCL		Benzene = 5 Toluene = 1,000 Ethyl benzene = 70 Total Xylenes = 10,000	Naphthalene = ---; 2-Methylnaphthalene = ---; Dibenzofuran = ---; Fluorene = ---; Bis(2-ethylhexyl) Phthalate = ---	1,1-DCA = ---; 1,1,1-TCA = 200; 1,2-DCA = 5; PCE = 5; Total Xylenes = 10,000; Isopropylbenzene = ---; n-Propylbenzene = ---; 1,3,5-Trimethylbenzene = ---; 1,2,4-Trimethylbenzene = 70; sec-Butylbenzene = ---; Toluene = 1,000; 4-Isopropylbenzene = ---; n-Butylbenzene = ---; Naphthalene = ---

Note: All results reported as micrograms per liter (µg/L = ppb). Only detected analytes listed.
BTEX Compounds analyzed using EPA Method 8021B
Volatile Organic Compounds analyzed using EPA Method 8260B
SVOCs analyzed using EPA Method 8270C.
Concentrations in bold exceed the WQCC or MCL values.
Most stringent comparison criteria used when both WQCC and MCL values exist.

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
MCL = U.S. EPA Drinking Water Maximum Contaminant Level
MRL = Method Reporting Limit

1,1-DCA = 1,1-Dichloroethane
1,1,1-TCA = 1,1,1-Trichloroethane
1,2-DCA = 1,2-Dichloroethane
PCE = Tetrachloroethene
nd = not detected above the laboratory reporting limit
na = not analyzed
--- = not applicable
* = Total naphthalene plus monomethylnaphthalenes

Table 7
Summary of Groundwater Analytical Results
Polynuclear Aromatic Hydrocarbons
Former Axelson Facility, Hobbs, New Mexico

Well	Date	Naphthalene	2-Methylnaphthalene	Dibenzofuran	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene
MW-4	Jun-01	nd	0.037	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	Apr-04	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	May-04	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-5	Jun-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	Apr-04	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
(product present in well)	May-04	140	490	13	11	7.2	0.82	0.39	0.63	<0.2	0.32	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
MW-6	Jun-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	Apr-04	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
Duplicate	Apr-04	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
	May-04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
MW-7	Jun-01	nd	nd	nd	nd	0.071	nd	nd	0.026	0.024	0.025	0.057	0.062	0.061	0.03	0.029	0.023
Duplicate	Jun-01	nd	nd	nd	nd	0.07	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	Apr-04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	May-04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
WSW-1	Apr-04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.033	0.031	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
WQCC		30*	---	---	---	---	---	---	---	---	---	---	---	0.7	---	---	---
MCL		---	---	---	---	---	---	---	---	0.1	---	---	---	0.2	---	---	---

Note: All results reported as micrograms per liter (µg/L = ppb). Only detected analytes listed.
Polynuclear Aromatic Hydrocarbons analyzed using EPA Method 8270 SIM
Concentrations in bold exceed the WQCC or MCL values.

--- = not available
nd = not detected above laboratory reporting limit
na = not analyzed
* = total naphthalene plus monomethylnaphthalenes

Most stringent comparison criteria listed when both WQCC and MCL values exist.

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
MCL = U.S. EPA Drinking Water Maximum Contaminant Level

Table 8
Summary of Groundwater Analytical Results
New Mexico Water Quality Control Commission Groundwater Standards (WQCC)
Former Axelson Facility, Hobbs, New Mexico

Well	Date	Total Cyanide (mg/L)	Fluoride (mg/L)	Nitrate as Nitrogen (mg/L)	TDS (mg/L)	PCBs (µg/L)	Radium 226 (pCi/L)		Radium 228 (pCi/L)		Total Radium (Ra-226 + Ra-228) (pCi/L)
							Result	Uncertainty	Result	Uncertainty	
MW-4	Jun-01	nd	1.5	7.2	**1,140**	nd	1.55	0.35	2.16	0.58	3.71
	Apr-04	na	1.4	6.5	**1,330**	na	6.34	0.8	0.07	0.3	**6.41**
	May-04	na	1.2	6.9	**1,280**	na	3.43	0.90	2.72	1.0	**6.15**
MW-5	Jun-01	nd	1.6	4.3	**916**	nd	2.42	0.52	3.60	0.84	**6.02**
	Apr-04	na	<1.0	4.0	**1,050**	na	3.78	0.4	5.77	0.7	**9.55**
	May-04	na	1.0	4.0	**1,060**	na	1.97	0.7	7.28	1.0	**9.25**
MW-6	Jun-01	nd	1.5	2.9	**676**	nd	2.06	0.45	2.14	0.57	4.20
	Apr-04	nd	1.3	4.6	**825**	na	2.53	0.4	7.17	0.6	**9.70**
Duplicate	Apr-04	nd	1.4	4.7	**825**	nd	3.07	0.4	4.76	0.6	**7.83**
	May-04	na	1.5	4.8	**885**	na	1.17	0.6	3.64	0.4	4.81
MW-7	Jun-01	nd	**2.2**	8.1	**908**	nd	1.81	0.4	2.39	0.61	4.20
Duplicate	Jun-01	nd	**2.1**	7.7	**800**	nd	2.4	0.52	3.19	0.76	**5.59**
	Apr-04	na	1.5	8.2	**990**	na	4.52	0.8	5.32	0.3	**9.84**
	May-04	na	**1.8**	7.9	**870**	na	2.93	0.7	2.73	0.3	**5.66**
WSW-1	Apr-04	<0.01	<1.0	<0.5	95	<0.4	0.91	0.4	0.41	0.3	1.32
WQCC		0.2	1.6	10	1,000	1.0	---	---	---	---	30 pCi/L
MCL		0.2	4	10	500	---	---	---	---	---	5 pCi/L

Note: All results reported a milligrams per liter (mg/L=ppm) unless noted otherwise.
Concentrations in bold exceed the WQCC or MCL values.

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
MCL = U.S. EPA Drinking Water Maximum Contaminant Level
TDS = Total Dissolved Solids using EPA Method 160.1
PCBs = Polychlorinated biphenyls using EPA Method 8082
Radium-226 analyzed using EPA Method 903.1
Radium-228 analyzed using EPA Method 904

µg/L = micrograms per liter (µg/L = ppb)
nd = not detected at or above the laboratory reporting limit
pCi/L = pico Curies per liter
na = not analyzed
--- = not available

Table 9
Summary of Groundwater Analytical Results
Dissolved Metals
Former Axelson Facility, Hobbs, New Mexico

Well	Date	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Uranium
MW-4	Jun-01	**<100**	55.2	<5.0	<5.0	**<100**	<0.20	<8.0	<10	18.1
	Apr-04	<5.0	59.8	<5.0	<5.0	0.56	<0.20	<8.0	<10	23.1
	May-04	12.2	56.7	<5.0	<5.0	0.59	<0.2	<2.0	<10	23.3
MW-5	Jun-01	**<100**	70.9	<5.0	<5.0	**<100**	<0.20	<8.0	<10	15.3
	Apr-04	<5.0	67.2	<5.0	<5.0	1.39	<0.20	<10	<10	18.8
	May-04	14.5	68.1	<5.0	<5.0	0.94	<0.2	<2.0	<10	20.3
MW-6	Jun-01	**<100**	162	<5.0	<5.0	**<100**	<0.20	<8.0	<10	11.9
	Apr-04	8.4	114	<5.0	<5.0	0.15	<0.20	<10	<10	8.78
Duplicate	Apr-04	8.5	114	<5.0	<5.0	0.10	<0.20	<10	<10	8.63
	May-04	17.7	116	<5.0	<5.0	0.43	<0.2	4.1	<10	9.27
MW-7	Jun-01	**<100**	57.5	<5.0	<5.0	**<100**	<0.20	<8.0	<10	11.3
Duplicate	Jun-01	**<100**	51.6	<5.0	<5.0	**<100**	<0.20	<8.0	<10	10.4
	Apr-04	<5.0	40.7	<5.0	<5.0	0.22	<0.20	<8.0	<10	13.7
	May-04	12.0	42.1	<5.0	<5.0	0.11	<0.2	<2.0	<10	14.8
WSW-1	Apr-04	<5.0	88.1	<5.0	<5.0	0.38	<0.20	<8.0	<10	1.04
WQCC		100	1,000	10	50	50	2.0	50	50	5,000
MCL		50	2,000	5.0	100	15	2	50	50	30

Note: All results reported as micrograms per liter (µg/L = ppb).
Metals analyzed using EPA Method 6010B/7470B/7740/200.8
Concentrations in bold exceed the WQCC or MCL values.
Most stringent comparison criteria listed when both WQCC and MCL values exist.

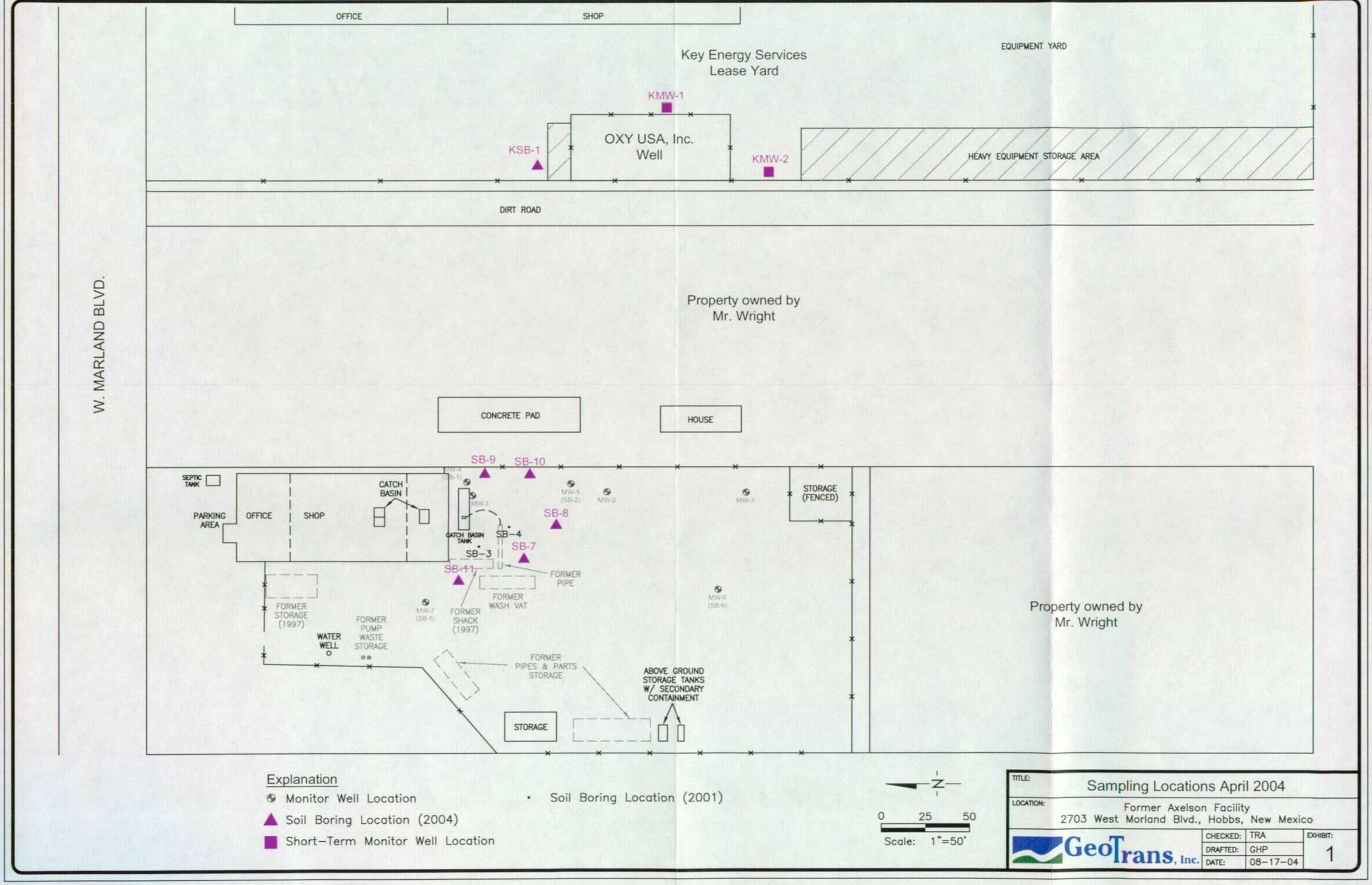
WQCC = New Mexico Water Quality Control Commission Groundwater Standards
MCL = U.S. EPA Drinking Water Maximum Contaminant Level

Table 10
Summary of Catch Basin Tank Analytical Results
Former Axelson Facility, Hobbs, New Mexico

Date	TPH-d	TPH-g	TPH-mo	Total Solids (%)	Volatile Organic Compounds (VOCs)	Semi-volatile Organic Compounds (SVOCs)	Polynuclear Aromatic Hydrocarbons (PAHs)
Jun-01	110,000	42,000	40,000	54.9	Acetone = 0.11 Methylene Chloride = 0.036 2-Butanone (MEK) = 0.026 Tetrachloroethene (PCE) = 0.01 Carbon Disulfide = 0.0052	Naphthalene = 15 2-Methylnaphthalene = 32 1,2-Dichlorobenzene = 79 Butyl Benzl Phthalate = 6.3 Bis(2-ethylhexyl) Phthalate = 62	na
May-04	24,000	200	10,000	62.6	Toluene = 2.2 Total Xylenes = 10.8 Ethyl Benzene = 1.6 Naphthalene = 14 sec-Butlybenzene = 1.8 n-Butylbenzene = 2.9 1,2-Dichlorobenzene = 1.3 1,2,4-Trimethylbenzene = 9.3 4-Isopropyltoluene = 2.0	Naphthalene = 8.6 2-Methylnaphthalene = 26 Bis(2-ethylhexyl) Phthalate = 6.6	Naphthalene = 23 2-Methylnaphthalene = 69 Acenaphthene = 0.53 Fluorene = 1.2 Dibenzofuran = 1.4 Phenantthrene = 1.7 Anthracene = 0.30 Fluoranthene = 0.34 Pyrene = 1.0 Benzo(b)fluoranthene = 0.22 Benzo(k)fluoranthene = 0.083 Benz(a)anthracene = 0.13 Chrysene = 0.50 Benzo(a)pyrene = 0.19 Indeno(1,2,3-cd)pyrene = 0.21 Benzo(g,h,I)perylene = 0.39

Note: Results reported as milligrams per kilogram (mg/kg=ppm) unless otherwise noted. Only detected analytes listed.
Petroleum Hydrocarbons analyzed using EPA Method 8015 Modified.
Percent Total Solids analyzed using EPA Method 160.3 Modified.
VOCs analyzed using EPA Method 8260B.
SVOCs analyzed using EPA Method 8270C.
Polynuclear Aromatic Hydrocarbons analyzed using EPA Method 8270 SIM

TPH-d = Total Petroleum Hydrocarbons as diesel range
TPH-g = Total Petroleum Hydrocarbons as gasoline range
TPH-mo = Total Petroleum Hydrocarbons as motor oil range
na = not analyzed



Explanation

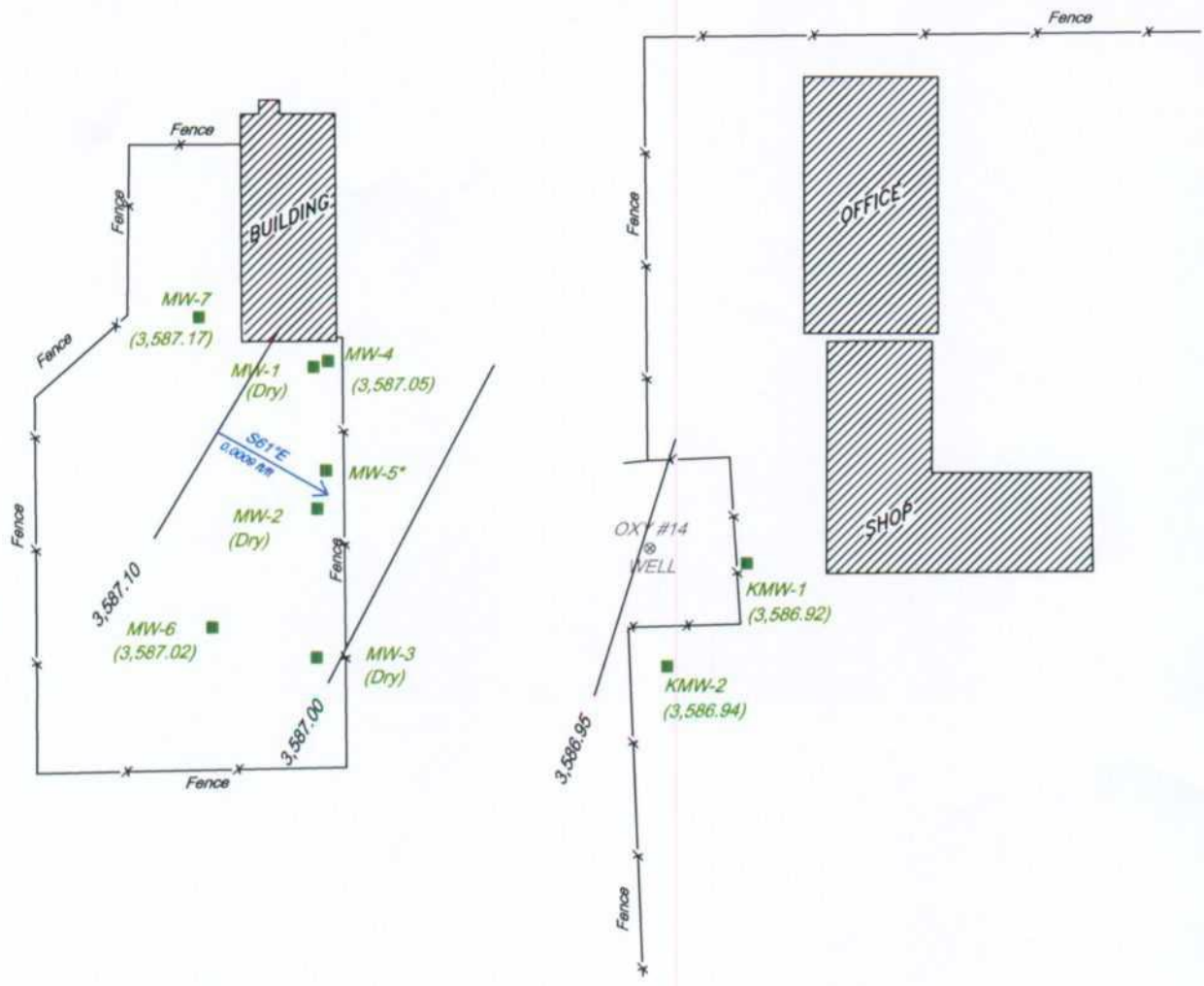
- Monitor Well Location
- Soil Boring Location (2004)
- Short-Term Monitor Well Location
- Soil Boring Location (2001)

N

0 25 50

Scale: 1"=50'

TITLE:	Sampling Locations April 2004
LOCATION:	Former Axelson Facility 2703 West Morland Blvd., Hobbs, New Mexico
GeoTrans, Inc.	CHECKED: TRA DRAFTED: GHP DATE: 08-17-04
EXHIBIT:	1



Explanation

MW-5*	Not used in groundwater contouring due to presence of free floating product
MW-4 (3587.05)	Monitor Well Location with groundwater elevation on 06/11/01 (ft msl)
S61°E 0.0009 ft/ft	Groundwater flow direction with bearing and gradient
———	Groundwater elevation contour (ft)

N

0 50 100

Scale: 1"=100'

(Base map surveyed by Basin Surveys, Inc.)

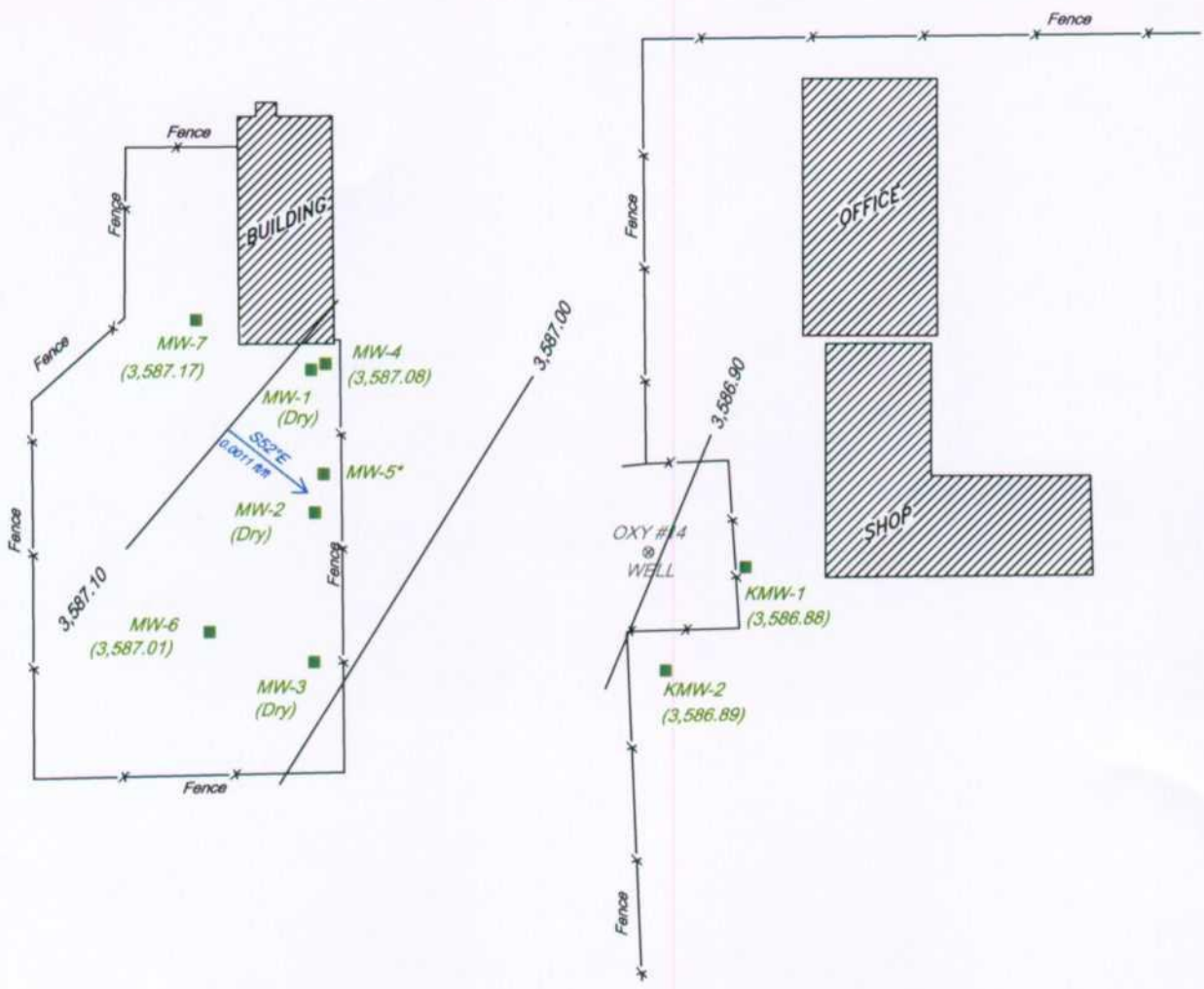
TITLE: Groundwater Elevations April 2004

LOCATION: Former Axelson Facility
2703 W. Marland Boulevard, Hobbs, New Mexico

GeoTrans, Inc.

CHECKED:	TRA
DRAFTED:	GHP
DATE:	08-17-04

FIGURE: 2



Explanation

MW-5*	Not used in groundwater contouring due to presence of free floating product
MW-4 (3587.05)	Monitor Well Location with groundwater elevation on 06/11/01 (ft msl)
S52°E 0.0011 ft/ft	Groundwater flow direction with bearing and gradient
———	Groundwater elevation contour (ft)

N

0 50 100

Scale: 1"=100'

(Base map surveyed by Basin Surveys, Inc.)

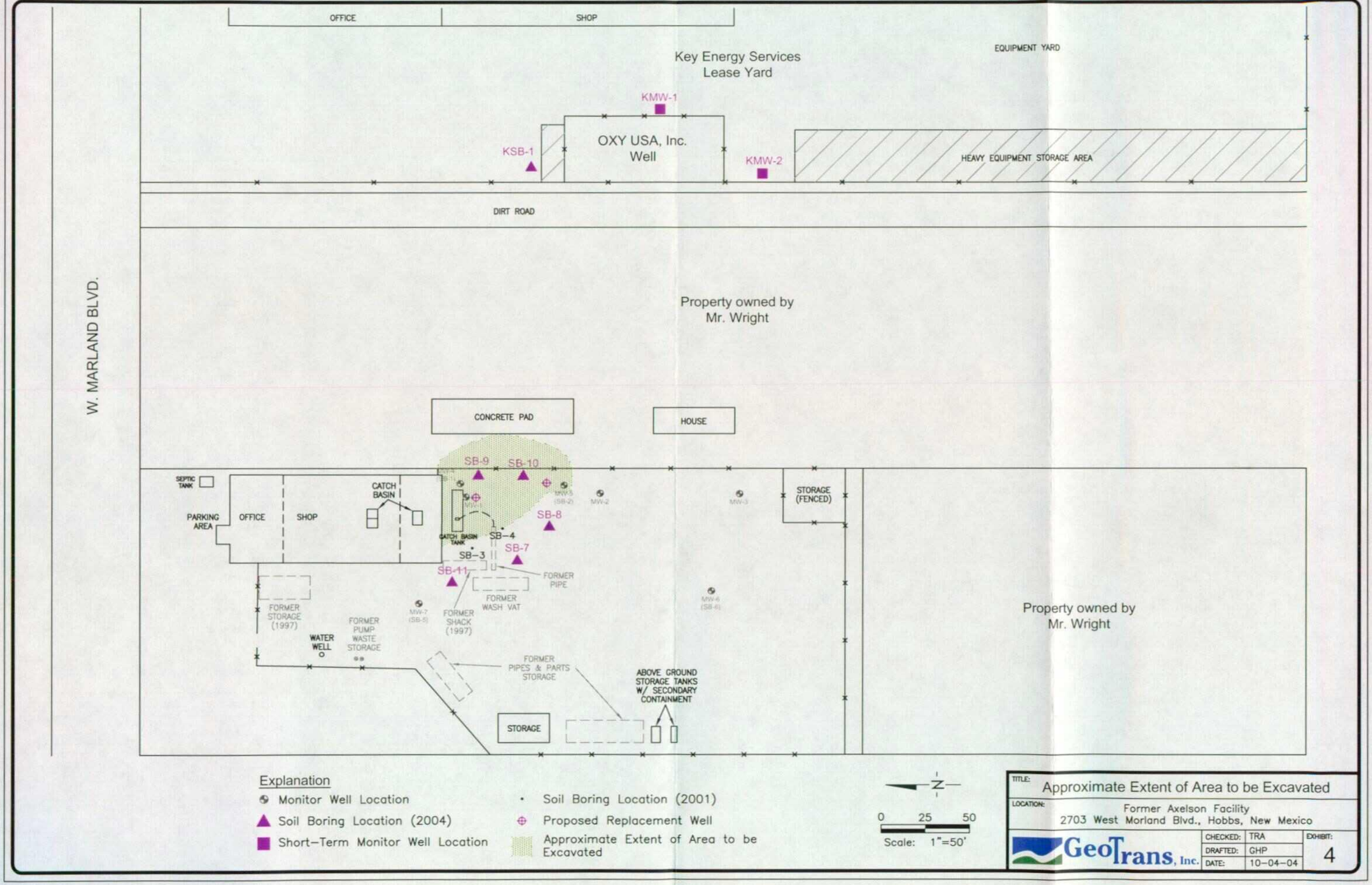
TITLE: Groundwater Elevations May 2004

LOCATION: Former Axelson Facility
2703 W. Marland Boulevard, Hobbs, New Mexico

GeoTrans, Inc.

CHECKED:	TRA
DRAFTED:	GHP
DATE:	08-17-04

FIGURE: 3



Explanation

- Monitor Well Location
- Soil Boring Location (2004)
- Short–Term Monitor Well Location
- Soil Boring Location (2001)
- Proposed Replacement Well
- Approximate Extent of Area to be Excavated

N

0 25 50

Scale: 1"=50'

TITLE: Approximate Extent of Area to be Excavated

LOCATION: Former Axelson Facility
2703 West Morland Blvd., Hobbs, New Mexico

GeoTrans, Inc.

CHECKED:	TRA
DRAFTED:	GHP
DATE:	10–04–04

EXHIBIT: 4

ATTACHMENT A

GeoTrans, Inc.

BORING LOG

PROJECT NUMBER 2201.019.01
PROJECT NAME Former Axelson Facility (Site No. 2067)
LOCATION 2703 West Marland Boulevard, Hobbs, New Mexico
DRILLING METHOD Air Rotary
SAMPLING METHOD Grab
DEPTH TO SATURATED SOIL (ft)
LOGGED BY Tanya Akkerman

BORING/WELL NUMBER SB-7
DATE DRILLING BEGAN 4/6/2004
DATE DRILLING ENDED 4/6/2004
NORTHING
EASTING
GROUND SURFACE ELEVATION (ft, MSL)
REMARKS Groundwater not encountered in soil boring.

PID (ppm)	BLOW COUNTS	RECOVERY (ft)	SAMPLE ID.	SAMPLE DEPTH / DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION (Percent Gravel, Sand, Silt, Clay)
0.0			SB-7-5'	5	CL ML		**SILTY CLAY:** Very dark brown (10YR 4/4); (0,5,40,55); fine sand; low plasticity; dry to slightly damp. No odor. Some minor gravel present near ground surface.
4.1			SB-7-10'	10	ML SM		**SANDY SILT**: Very pale brown (10YR 7/3); (0,10,90,0); fine to medium sand; dry. No odor.
4.1			SB-7-15'	15			
4.1			SB-7-20'	20			Hard pan layer present.
4.1			SB-7-25'	25	SP		**SAND**: Light reddish brown (5YR 6/4); (0,100,0,0); fine to medium sand; dry to wet at *depth. No odor, discoloration or staining present. Groundwater not encountered.*
4.1			SB-7-30'	30			
12.3			SB-7-35'	35			T.D. = 35 feet. Boring backfilled with hydrated bentonite chips.

GEOTRANS BZRHOBBS.GPJ LAEWNN01.GDT 7/6/04

Tanya Akkerman
Signature of Geologist

Signature of Reviewer

GeoTrans, Inc.

BORING LOG

PROJECT NUMBER 2201.019.01
PROJECT NAME Former Axelson Facility (Site No. 2067)
LOCATION 2703 West Marland Boulevard, Hobbs, New Mexico
DRILLING METHOD Air Rotary
SAMPLING METHOD Grab
DEPTH TO SATURATED SOIL (ft)
LOGGED BY Tanya Akkerman

BORING/WELL NUMBER SB-8
DATE DRILLING BEGAN 4/6/2004
DATE DRILLING ENDED 4/6/2004
NORTHING
EASTING
GROUND SURFACE ELEVATION (ft, MSL)
REMARKS Groundwater not encountered in soil boring.

PID (ppm)	BLOW COUNTS	RECOVERY (ft)	SAMPLE ID.	SAMPLE DEPTH	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION (Percent Gravel, Sand, Silt, Clay)
4.1			SB-8-5'	G	5	CL ML		**SILTY CLAY:** Very dark brown (10YR 4/4); (0,5,40,55); fine sand; low plasticity; dry to slightly damp. No odor. Some minor gravel present near ground surface.
4.1			SB-8-10'	G	10	ML SM		**SANDY SILT**: Very pale brown (10YR 7/3); (0,10,90,0); fine to medium sand; dry. No odor.
4.1			SB-8-15'	G	15			
---			SB-8-20'	G	20			Hard pan layer present.
4.1			SB-8-25'	G	25	SP		**SAND**: Light reddish brown (5YR 6/4); (0,100,0,0); fine to medium sand; dry to wet at depth. No discoloration or staining present. Groundwater not encountered.
70.1			SB-8-30'	G	30			Mild petroleum odor present at 30 and 35 feet in depth.
111.3			SB-8-35'	G	35			T.D. = 35 feet. Boring backfilled with hydrated bentonite chips.

GEOTRANS BZRHOBBS GPJ LAEWNN01.GDT 7/6/04

Tanya Akkerman
Signature of Geologist

Signature of Reviewer

GeoTrans, Inc.

BORING LOG

PROJECT NUMBER	2201.019.01	**BORING/WELL NUMBER**	SB-9
PROJECT NAME	Former Axelson Facility (Site No. 2067)	**DATE DRILLING BEGAN**	4/7/2004
LOCATION	2703 West Marland Boulevard, Hobbs, New Mexico	**DATE DRILLING ENDED**	4/7/2004
DRILLING METHOD	Air Rotary	**NORTHING**	
SAMPLING METHOD	Grab	**EASTING**	
DEPTH TO SATURATED SOIL (ft)		**GROUND SURFACE ELEVATION (ft, MSL)**	
LOGGED BY	Tanya Akkerman	**REMARKS**	Groundwater not encountered in soil boring.

PID (ppm)	BLOW COUNTS	RECOVERY (ft)	SAMPLE ID.	SAMPLE DEPTH	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION (Percent Gravel, Sand, Silt, Clay)
0			SB-9-5'		5	ML SM		**SANDY SILT**: White (10YR 8/1) to Light gray (10YR 7/2); (0,10,90,0) to (0,15,85,0); very fine to fine sand; dry.
32.9			SB-9-10'		10			Mild turpentine odor present at 10 feet in depth.
243			SB-9-15'		15			Mild to strong turpentine ordor present at 15 feet in depth.
400			SB-9-20'		20			Mild to strong turpentine odor along with mild petroleum odor present at 20 feet in depth.
								Hard pan layer present.
136			SB-9-25'		25	SP		**SAND**: Pink (7.5YR 7/4) to Light brown (7.5YR 6/3); (0,100,0,0); fine to medium sand; dry. Mild to strong petroleum odor present. No discoloration or staining present. Groundwater not encountered.
173			SB-9-30'		30			
140			SB-9-35'		35			
								T.D. = 35.5 feet. Boring backfilled with hydrated bentonite chips.

GEOTRANS BZRHOBBS.GPJ LAEWNN01.GDT 7/6/04

Tanya Akkerman
Signature of Geologist

Signature of Reviewer

GeoTrans, Inc.

BORING LOG

PROJECT NUMBER 2201.019.01
PROJECT NAME Former Axelson Facility (Site No. 2067)
LOCATION 2703 West Marland Boulevard, Hobbs, New Mexico
DRILLING METHOD Air Rotary
SAMPLING METHOD Grab
DEPTH TO SATURATED SOIL (ft)
LOGGED BY Tanya Akkerman

BORING/WELL NUMBER SB-10
DATE DRILLING BEGAN 4/7/2004
DATE DRILLING ENDED 4/7/2004
NORTHING
EASTING
GROUND SURFACE ELEVATION (ft, MSL)
REMARKS Groundwater not encountered in soil boring.

PID (ppm)	BLOW COUNTS	RECOVERY (ft)	SAMPLE ID.	SAMPLE DEPTH	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION (Percent Gravel, Sand, Silt, Clay)
0			SB-10-5'		5			**SANDY SILT**: *Very pale brown* (10YR 7/4 to 10YR 8/2); (0,10,90,0) to (0,20,80,0); fine to medium sand; dry.
78			SB-10-10'		10			Mild turpentine odor present at 10 and 15 feet in depth.
169			SB-10-15'		15			
107			SB-10-20'		20			Hard pan layer present.
206			SB-10-25'		25			**SAND**: Pink (7.5YR 8/3) to Light brown (7.5YR 6/3); (0,100,0,0); fine to medium sand; dry. Mild petroleum odor present. No discoloration or staining present. Groundwater not encountered.
78			SB-10-30'		30	SP		
280			SB-10-35'		35			T.D. = 35 feet. *Boring backfilled with hydrated bentonite chips.*

GEOTRANS BZRHOBBS.GPJ LAEWNN01.GDT 7/6/04

Tanya Akkerman
Signature of Geologist

Signature of Reviewer

GeoTrans, Inc.

BORING LOG

PROJECT NUMBER 2201.019.01
PROJECT NAME Former Axelson Facility (Site No. 2067)
LOCATION 2703 West Marland Boulevard, Hobbs, New Mexico
DRILLING METHOD Air Rotary
SAMPLING METHOD Grab
DEPTH TO SATURATED SOIL (ft)
LOGGED BY Tanya Akkerman

BORING/WELL NUMBER SB-11
DATE DRILLING BEGAN 4/6/2004
DATE DRILLING ENDED 4/6/2004
NORTHING
EASTING
GROUND SURFACE ELEVATION (ft, MSL)
REMARKS Groundwater not encountered in soil boring.

PID (ppm)	BLOW COUNTS	RECOVERY (ft)	SAMPLE ID.	SAMPLE DEPTH	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION (Percent Gravel, Sand, Silt, Clay)
4.1			SB-11-5'		5	CL ML		**SILTY CLAY:** Very dark brown (10YR 4/4); (0,5,40,55); fine sand; low plasticity; dry to slightly damp. No odor. Some minor gravel present near ground surface.
8.2			SB-11-10'		10			**SANDY SILT**: Very pale brown (10YR 7/3); (0,10,90,0); fine to medium sand; dry. No odor.
8.2			SB-11-15'		15	ML SM		
4.1			SB-11-20'		20			Hard pan layer present.
4.1			SB-11-25'		25			**SAND**: Light reddish brown (5YR 6/4); (0,100,0,0); fine to medium sand; dry to wet at depth. No odor, discoloration or staining present. Groundwater not encountered.
12.3			SB-11-30'		30	SP		
4.1			SB-11-35'		35			
					40			T.D. = 40 feet. Boring backfilled with hydrated bentonite chips.

GEOTRANS BZRHOBBS.GPJ LAEWNN01.GDT 7/6/04

Tanya Akkerman
Signature of Geologist

Signature of Reviewer

ATTACHMENT B

GEOTRANS, INC.

STANDARD OPERATING PROCEDURES: EXCAVATION PRACTICES

This standard operating procedure (SOP) outlines minimum requirements to protect employees who may be exposed to hazards during trenching and excavation activities and to provide general guidance for compliance with Title 29 of the *Code of Federal Regulations* (CFR), Part 1926, Subpart P, "Excavations."

Project managers shall ensure that all excavation, shoring, and trenching activities are conducted in accordance with the requirements outlined in this document and Subpart P of 29 CFR 1926. Project managers must also ensure that projects involving trenching and excavation are staffed by an individual capable of performing "competent person" duties as described in this procedure.

The site safety coordinator (SSC) is responsible for on-site enforcement of this SOP. Definitions and procedures used for excavations are discussed below.

1.0 DEFINITIONS

The following definitions apply to this SOP:

Benching: Forming one or a series of horizontal levels or steps in the sides of an excavation to protect employees from cave-ins

Competent Person: One capable of identifying existing or predictable hazards in the work environment that are unsanitary or dangerous to employees and who has authorization to take prompt corrective measures to eliminate the hazards

Excavation: Any manmade cut, cavity, trench, or depression in an earth surface formed by earth removal

Shoring: Metal, hydraulic, mechanical, or timber system that supports the sides of an excavation and that is designed to prevent cave-ins

Sloping: Sloping the sides of an excavation at an incline away from the excavation to protect employees from cave-ins

Trench: A narrow excavation (in relation to its length) that is usually deeper than it is wide but less than 15 feet wide

2.0 PROCEDURES

Described below are the general safety requirements and protective system requirements for trenching and excavation activities.

2.1 GENERAL SAFETY REQUIREMENTS

General safety requirements that must be in place before work begins are as follows:

- Utility companies or a utilities locating service in the area must be notified **before excavation or trenching activities begin** to arrange for locating and protecting underground utilities.
- Access to trenching areas must be controlled and limited to authorized personnel. Prior to entering a trench or excavation, workers must notify the project manager, SSC, and nearby equipment operators whose activities could affect the trench or excavation.
- No person may enter a trench or work at the foot of the face of an excavation until a qualified, competent person has inspected the excavation and determined whether sloping or shoring is required to protect against cave-in or subsidence and the appropriate protection has subsequently been installed.
- Trenches and excavations must be assessed by a qualified, competent person, even in the absence of working personnel, whenever heavy equipment will be operating nearby in order to ensure that the trench or excavation will support the weight of the equipment without subsistence or causing the accidental overturning of machinery.
- Trenches and excavations must be inspected regularly (daily at a minimum) to ensure that changes in temperature, precipitation, shallow groundwater, overburden, nearby building weight, vibration, or nearby equipment operation have not caused weakening of the sides, faces, and floors and to ensure that personnel protection is being maintained.
- When subsidence or tension cracks are apparent anywhere in an excavation, all work should be stopped until the problem is corrected.
- The competent person must inspect trenches or excavations after any precipitation event to ensure integrity has been maintained.
- Sufficient ramps or ladders must be provided in excavations 4 or more feet deep to allow quick egress. Ramps or ladders may be placed no more than 25 feet apart, must be secured from shifting, and must extend at least 3 feet above the top of the trench or excavation. Structural ramps must be designed by a competent person.
- Material removed from an excavation or trench must be placed far enough from the edge (at least 2 feet) to prevent it from sliding into the excavation or trench or from stressing the trench or excavation walls. Worker protection must also be provided from loose rock or soil on the excavation faces.

- If trenches or excavations are near walkways or roadways, guards or warning barriers must be placed to alert pedestrians and drivers of the presence of the trench or excavation.

- If possible, trenches or excavations should be covered or filled in when unattended. Otherwise, strong barriers must be placed around the trench or excavation and lighting must be provided at night if the trench or excavation is near a walkway or roadway.

- When a hazardous atmosphere could exist, the excavation must be tested for appropriate hazardous substances and oxygen level before personnel entry. Excavation where hazardous atmospheres exist must be treated as a confined space. Entry must follow procedures outlined in "Confined Spaced Entry Program," Document Control No. 2-5.

- Entry is not allowed into excavations where water has accumulated.

2.2 PROTECTIVE SYSTEM REQUIREMENTS

Protective systems protect employees from cave-ins, material that could fall in or roll off the face of the excavation, and collapse of adjacent structures. Protective systems include shoring, shielding, sloping and benching, and other systems. Sloping and benching and shoring system requirements are described below.

2.2.1 Sloping and Benching Requirements

Sloping and benching system construction must follow the guidelines established in Appendix B to Subpart P of 29 CFR 1926. Maximum allowable slopes for excavations are summarized below. All slopes indicated are expressed as the ratio of horizontal distance (H) to vertical rise (V).

Soil or Rock Type	Maximum Allowable Slope (H:V) for Excavations Less than 20 Feet Deep
Stable Rock	Vertical (90°)
Type A	0.75:1 (53°)
Type B	1:1 (45°)
Type C	1.5:1 (34°)

Soil types are defined in Appendix A to Subpart P of 29 CFR 1926 and are summarized below.

Type A: Cohesive soils with an unconfined compression strength of 1.5 tons per square foot (ton/ft^2) or greater (such as clay, silty clay, sandy clay, or clay loam)

Type B: Cohesive soils with an unconfined compression strength of greater than 0.5 but less than 1.5 ton/ft^2 (such as angular gravel, silt, silt loam, or sandy loam)

Type C: Cohesive soils with an unconfined compression strength of less than 0.5 ton/ft^2 (such as gravel, sand, loamy sand, submerged soil, or unstable submerged rock)

Sloping and benching for excavations greater than 20 feet deep must be designed by a registered professional engineer.

Soil types must be determined by the competent person using at least one visual and one manual test. Manual tests include plasticity, dry strength, thumb penetration, and drying tests.

2.2.2 Shoring System Requirements

Appendixes C, D, and E to Subpart P of 29 CFR 1926 outline requirements for timber shoring for trenches, aluminum hydraulic shoring for trenches, and alternatives to timber shoring, respectively. Guidelines for shoring systems are listed below.

- If it is not economically feasible or there are space restrictions to prevent cutting the trench or excavation walls back to a safe angle of repose, all trenches or excavations 5 feet deep or more must be shored.
- Shoring should be erected as trenching or excavation progresses and as closely as possible to the excavation floor.
- Shoring timber dimensions must meet the minimum timber requirements specified in Tables C1.1 through C1.3 of Appendix C to Subpart P 29 CFR 1926. Aluminum hydraulic shoring must be constructed using the guidelines and dimension requirements specified in Appendix D of the same standard.
- Trench shields may be used instead of shoring or bracing. Shields must be constructed of steel flat sides welded to a heavy framework of structural pipe. Shields should be moved along by the excavator as trenching or excavation proceeds.

GEOTRANS, INC.

STANDARD OPERATING PROCEDURES: GENERAL SAFE WORK PRACTICES

To prevent injuries and adverse health effects, the following general standard operating procedures (SOPs) are to be followed when conducting work involving known and unknown site hazards. These SOPs establish a pattern of general precautions and measures for reducing risks associated with hazardous site operations. This list is not inclusive and may be amended as necessary.

- Do not eat, drink, chew gum or tobacco, take medication, or smoke in contaminated or potentially contaminated areas or where the possibility for the transfer of contamination exists.
- Wash hands and face thoroughly upon leaving a contaminated or suspected contaminated area. A thorough shower and washing must be conducted as soon as possible if excessive skin contamination occurs.
- Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, or other such areas. Avoid, whenever possible, kneeling on the ground or leaning or sitting on drums, equipment, or the ground. Do not place monitoring equipment on potentially contaminated surfaces.
- Remove beards or facial hair that interfere with a satisfactory qualitative respirator fit test or routine pre-entry positive and negative pressure checks.
- Be familiar with and knowledgeable of and adhere to all instructions in the site-specific health and safety plan (HASP). At a minimum, a safety meeting will be held at the start of each project to discuss the HASP. Additional meetings will be held, as necessary, to address new or continuing safety and health concerns.
- Be aware of the location of the nearest telephone and all emergency telephone numbers.
- Attend a briefing on the anticipated hazards, equipment requirements, SOPs, emergency procedures, and communication methods before going on site.
- Plan and delineate entrance, exit, and emergency escape routes.
- Rehearse unfamiliar operations prior to implementation.
- Use the "buddy system" whenever respiratory protection equipment is in use. Buddies should establish hand signals or other means of emergency communication in case radios break down or are unavailable.
- Buddies should maintain visual contact with each other and with other on-site team members by remaining in close proximity in order to assist each other in case of emergency.

- Minimize the number of personnel and equipment in contaminated areas (such as the exclusion zone). Nonessential vehicles and equipment should remain within the support zone.
- Establish appropriate support, contamination reduction, and exclusion zones.
- Establish appropriate decontamination procedures for leaving the site.
- Immediately report all injuries, illnesses, and unsafe conditions, practices, and equipment to the site safety coordinator (SSC).
- Maintain a portion of the site field logbook as a project safety log. The project safety log will be used to record the names, entry and exit dates, and times on site of all GeoTrans, subcontractor, and project site visitor personnel; air quality and personal exposure monitoring data; and other information related to safety matters. Form SSC-1, Daily Site Log, may be used to record names of on-site personnel.
- A portable eyewash station should be located in the support zone if chemical splashes to eyes are possible.
- Do not bring matches and lighters in the exclusion zone or contamination reduction zone.
- Observe coworkers for signs of toxic exposure and heat or cold stress.
- Inform coworkers of nonvisual effects of illness if you experience them, such as headaches, dizziness, nausea, or blurred vision.

GEOTRANS, INC.

STANDARD OPERATING PROCEDURES:

OIL AND PETROLEUM DISTILLATE FUEL PRODUCT HAZARDS

This safe work practice (SOP) establishes minimum procedures for protecting GeoTrans personnel against the hazardous properties of oil and petroleum distillate fuel products during the performance of field work, including known and suspected releases of such materials. The SOP was developed to enable health and safety personnel and project managers to quickly prepare and issue site-specific health and safety plans (HASP) for investigations of such releases. A completed short form HASP and this SOP can comprise a site-specific HASP for sites where oil and petroleum distillate fuel products may be encountered. Forms HSP-3A and HSP-3B in Volume III, "Forms," should be used as checklists for site preparation activities. These forms should be attached to the HASP. Safety procedures for drilling, trenching, and other construction operations should be attached as necessary. Anticipated physical hazards associated with site activities should be discussed in the HASP.

This SOP must not be used for confined space entry (including trench entry) or for installing or operating full-scale fuel recovery systems. The applicability of this SOP, hazard evaluation, health and safety requirements, air monitoring, area controls, decontamination, emergency response, and accident reporting associated with work involving oil and petroleum distillate fuel products are discussed below.

1.0 APPLICABILITY

This SOP is applicable to field investigations involving any of the substances listed below and involving any of the activities listed below.

SUBSTANCES

- Motor oil (used and unused)
- Leaded and unleaded gasoline
- Fuel oil No. 1 (kerosene and JP-1)
- Fuel oil No. 1-D (light diesel)
- Fuel oil No. 2 (home heating oil)
- Fuel oil No. 2-D (medium diesel)
- Fuel oil No. 4 (residual fuel oil)
- Fuel oil No. 5 (residual fuel oil)
- Fuel oil No. 6 (Bunker C fuel oil)

- JP-3, JP-4, and JP-5 (Jet fuels)
- Gasohol

ACTIVITIES

- Collection of subsurface soil samples using a truck-mounted drill rig, hand-held power auger, or hand auger
- Construction, completion, and testing of groundwater monitoring wells
- Collection of groundwater samples from new and existing wells
- Observation of removal of underground fuel pipes and USTs
- Small-scale removal of contaminated soils

2.0 HAZARD EVALUATION

Oil and petroleum distillate fuel products are mixtures of aliphatic and aromatic hydrocarbons. The predominant classes of compounds in motor oil, gasoline, kerosene, and jet fuels are paraffins (such as hexane and octane), naphthenes (such as cyclohexane), and aromatics (such as benzene and toluene). For example, gasoline contains about 80 percent paraffins, 6 percent naphthenes, and 14 percent aromatics. Kerosene and jet fuels contain 42 to 48 percent paraffins, 36 to 68 percent naphthenes, and 16 to 20 percent aromatics. Diesel fuels and heating oils contain 14 to 23 percent naphthenes, 68 to 78 percent nonvolatile aromatics, and less than 10 percent paraffins. Heavier fuels contain almost no volatile aromatic compounds. Chemicals may be added to automotive and aviation fuels to improve their burning properties. Examples are tetraethyl-lead and ethylene dibromide. Flammability, toxicity, and exposure limits of oil and petroleum distillate fuel products are discussed below.

2.1 FLAMMABILITY

Oil and petroleum distillate fuel products possess two intrinsic hazardous properties—flammability and toxicity. The flammable property of oils and fuels presents a far greater hazard to field personnel than toxicity. Vapors of volatile components of oils and fuels can therefore also be explosive when confined.

Oil and petroleum distillate fuel products will not burn in liquid form. Only the vapors burn and then only if (1) the vapor concentration is between the compound-specific upper explosive limit (UEL) and lower explosive limit (LEL), (2) sufficient oxygen is present, and (3) an ignition source is present. The probability of fire and explosion can be minimized by eliminating any of the three factors needed to produce combustion. Two of the factors, ignition source and vapor concentration, can be controlled in many cases. Ignition can be controlled by the following:

- Open fires and smoking should be prohibited on site.

- Spark arresters should be installed on drill rig engines.
- Engines should be turned off when any compound's LEL is approached.

Vapor concentrations can be reduced by using fans and portable ventilation systems. In fuel storage tanks, vapor concentrations in head spaces can be reduced by introducing dry ice (solid carbon dioxide) into the tank because the carbon dioxide gas displaces combustible vapors and oxygen.

The LELs (in air) of the fuels discussed in this section range from 0.6 percent for JP-5 to 1.4 percent for gasoline. Flash points range from -36 °F for gasoline to greater than 150 °F for fuel oil No. 6. JP-5 has a flashpoint of 140 °F. Although it has a lower LEL than gasoline, JP-5 is usually considered less hazardous than gasoline because its vapors must be heated to a higher temperature to ignite.

2.2 TOXICITY

Oil and petroleum distillate fuel products exhibit relatively minor acute inhalation and dermal toxicity effects. Concentrations of 160 to 270 parts per million (ppm) gasoline vapor have been reported to cause eye, nose, and throat irritation after several hours of exposure. Gasoline vapor concentrations of 500 to 900 ppm can cause irritation and dizziness in 1 hour, and levels of 2,000 ppm or above have produced mild anesthesia in 30 minutes. Most fuels, particularly gasoline, kerosene, and jet fuels, are capable of causing skin irritation after several hours of contact.

Some gasoline additives, such as ethylene dichloride, ethylene dibromide, and tetraethyl and tetramethyl lead, are highly toxic; however, the additives are present in gasoline at low concentrations and their contribution to the overall toxicity of gasoline and other fuels is therefore negligible in most cases.

2.3 EXPOSURE LIMITS

In 1989, the Occupational Safety and Health Administration (OSHA) developed a permissible exposure limit (PEL) of 300 ppm for gasoline. However, this PEL was subsequently vacated. OHSA has also established PELs for individual components, such as benzene. The American Conference of Governmental Industrial Hygienists has established a threshold limit value (TLV) of 300 ppm for gasoline. This TLV takes into consideration the average concentration of benzene in gasoline (1 percent), as well as gasoline's common additives. Oil mist has a PEL of 5 milligrams per cubic meter of air. Exposure limits have been established for some of the other petroleum constituents.

3.0 HEALTH AND SAFETY REQUIREMENTS

This section discusses medical surveillance, training, and personal protective equipment (PPE) requirements for personnel working at sites where oil or petroleum distillate fuel products may be encountered.

3.1 MEDICAL SURVEILLANCE REQUIREMENTS

On-site personnel must participate in a medical surveillance program and be certified by an occupational health physician as being physically fit to wear respiratory protective devices and to perform their assigned field work.

3.2 TRAINING REQUIREMENTS

On-site personnel potentially exposed to site health and safety hazards must successfully complete 40 hours of initial, off-site training and receive a certificate from a course meeting the requirements of Title 29 of the *Code of Federal Regulations* (CFR), Part 1910.120 (e). Supervisory and refresher training must also have been completed, as necessary, for applicable site personnel.

Before field work begins, the site safety coordinator (SSC) will brief all field personnel, including subcontractor employees, on their work assignments and site safety procedures. Each worker must read the site-specific HASP and sign a safety compliance agreement before commencing work. Individuals that refuse to sign the agreement will be prohibited from on-site work.

3.3 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

PPE for work at sites where oil or petroleum distillate fuel products may be encountered is summarized below.

- Chemical-resistant safety boots, such as neoprene or butyl boots with steel toe and shank, must be worn during the performance of work where surface soil is obviously contaminated with oil or fuel, when product quantities of oil or fuel are likely to be encountered, and within 10 feet of operating heavy equipment.

- National Institute for Occupational Safety and Health-approved full- or half-face respirator with organic vapor cartridges must be worn whenever total airborne hydrocarbon levels in the breathing zone of field personnel reach or exceed a 15-minute average of 11 ppm in summer and 25 ppm in winter. If total airborne hydrocarbons in the breathing zone exceed 100 ppm, work must be suspended, personnel directed to move a safe distance from the source, and the regional health and safety representative (RHSR) or subsidiary health and safety representative (SHSR) or designee consulted.

- Chemical-resistant gloves, such as nitrile or neoprene gloves, must be worn whenever soil or water known or suspected of containing oil or petroleum hydrocarbons is collected or otherwise handled.

- Chemical-resistant coveralls, such as Saranex or polyethylene-coated Tyvek coveralls, must be worn whenever product quantities of oil or fuel are actually encountered and when oil- or fuel-saturated soil is handled.

- Splash-proof safety goggles or glasses with full side shields must be worn when working within 10 feet of any operating heavy equipment (such as a drill rig or backhoe). Splash-proof goggles or face shields must also be worn whenever product quantities of oil or fuel are encountered.

- Hard hats must be worn when personnel work with or in the vicinity of an operating drill rig, backhoe, or other heavy equipment.

Operators of some sites such as refineries often require all personnel working within site boundaries to wear certain specified safety equipment. Such requirements shall be strictly observed by GeoTrans personnel and subcontractors.

4.0 AIR MONITORING

Air monitoring shall be performed to protect field personnel and prevent fires or explosions. Monitoring must be performed by individuals trained in the use and care of the monitoring equipment. Instruments used on site must be maintained and calibrated in accordance with manufacturer requirements. Instrument manuals with calibration instructions shall be transported to each site along with the instrument. The following equipment is required for monitoring for oil or petroleum distillate vapors:

- Organic vapor monitor using flame ionization or photoionization technology
- Combustible gas indicator (CGI)

During drilling operations, vapor emissions from boreholes must be measured whenever the auger is removed from the boring and whenever flights are added or removed from hollow-stem augers. This requirement does not apply to borings less than 5 feet deep and borings of any depth drilled to install monitoring wells in soil known to be uncontaminated. Measurements should first be made with an organic vapor monitor and then with a CGI if vapor levels exceed the highest concentration measurable with the organic vapor monitor. (For example, if the organic vapor monitor goes off the scale when set on the highest range.)

Initially, measurements shall be made about 12 inches from the borehole at both upwind and downwind positions. If the total hydrocarbon concentration 12 inches from the borehole exceeds the respirator use action level (11 ppm in summer and 25 ppm in winter averaged over 15 minutes), measurements must be made in the breathing zone of the individual(s) working closest to the borehole. Decisions regarding respiratory protection should be made based on vapor concentrations in the breathing zone.

If total organic vapor concentrations within 12 inches of the borehole exceed the capacity of the organic vapor monitor, a CGI must be used to determine if explosive conditions exist. If combustible gas concentrations reach 5-10 percent of the LEL, continuous monitoring is required and operations may proceed with caution. If combustible gas concentrations reach 10 percent of the LEL within a 12-inch radius of the borehole or 5 percent of the LEL at a distance greater than 24 inches from the borehole, operations must be suspended, the drill rig motor shut down, and corrective action taken. If corrective action cannot be taken, field personnel and all other individuals in the vicinity of the borehole must move to a safe area and the local fire department and project manager must be alerted.

5.0 AREA CONTROLS

Access to hazardous and potentially hazardous areas must be controlled to reduce the possibility of physical injury and chemical exposure to field personnel, site visitors, and the public. A hazardous or potentially hazardous area includes any area where field personnel are required to wear respirators, borings are being drilled with powered augers, or excavation with heavy equipment is being performed.

The boundaries of hazardous and potentially hazardous areas must be identified by cordons, barricades, or emergency traffic cones, depending on conditions. If such areas are left unattended, signs warning of danger and forbidding entry must be placed around the perimeter if the areas are accessible to the public. Trenches and other large holes must be guarded with wooden or metal barricades spaced no further than 20 feet apart and connected with yellow or yellow and black nylon tape not less than 0.75 inch wide. The barricades must be placed no less than 2 feet from the edge of the excavation or hole.

Entry to hazardous areas shall be limited to individuals who must work in these areas. Unofficial visitors must not be permitted to enter hazardous areas while work is in progress. Official visitors should be discouraged from entering hazardous areas but may be allowed to enter only if they agree to abide by the provisions of this document, follow orders issued by the SSC, and are informed of the potential dangers that could be encountered in these areas.

6.0 DECONTAMINATION

A mild detergent and hot water can be used to remove oil and petroleum distillate fuel products from skin. Liquid dishwashing detergent is more effective than hand soap, and hot water is more effective than cold. Mechanic's waterless hand cleaner is recommended for initial cleaning, followed by a detergent and water wash, for removing motor oil and heavier fuel oils (fuel oils No. 4 through 6) that are weathered to an asphaltic condition.

Detergent and hot water should also be used to clean gloves, respirators, hard hats, boots, and goggles. However, if boots do not come clean after washing with detergent and water, a strong solution of trisodium phosphate and hot water can be used. Split-spoon sampling equipment, augers, vehicle undercarriages, and tires should be steam cleaned.

7.0 EMERGENCY RESPONSE

Standard procedures to follow in the event of an emergency involving oil and petroleum distillate fuel products are summarized below. All responses should be coordinated through the designated SSC. First aid should be administered by trained first aid providers.

- *In the event of a fire,*
    - Stop work, shut off equipment, and evacuate to safe distance (a company vehicle should be kept at a reasonable distance from the work area to prevent fire hazards);

- Contact the fire department and then the appropriate GeoTrans office;
- Keep a safe distance away until emergency services arrive; and
- Do not attempt to fight fires that are not incipient fires

- In the event of an injury or illness,
  - Perform first aid, if possible, and call 911;
  - Do not move the victim if broken bones are suspected unless life is endangered; and
  - If the person is safe to move (has minor cuts or burns), transport the person to the hospital, but if injuries or illness are more serious, arrange for a rescue squad or ambulance.

- In the event of overexposure,
  - Remove the employee (only if there is no danger to rescuers) from the exposure source to a location with fresh air;
  - Contact a rescue squad or ambulance as necessary;
  - Do not continue work until the source of exposure is identified and controlled; and
  - Contact the appropriate GeoTrans office for technical assistance.

- In the event of a hazardous materials accident,
  - Stop equipment and work;
  - Relocate to a safe distance;
  - To the extent possible, determine the source of incident (such as a utility line, gas line, pipeline, or other);
  - Contact the appropriate GeoTrans office; and
  - Do not attempt to backout equipment from an underground utility strike without the guidance of the utility company.

8.0 ACCIDENT REPORTING

All accidents and near misses must be reported within 24 hours to the Project Manager as required by GeoTrans company policy. The Project Manager is responsible for informing the Corporate Health and Safety Officer of the accident and/or near miss on the job site.

GEOTRANS, INC.

STANDARD OPERATING PROCEDURES: USE OF HEAVY EQUIPMENT

Truck-mounted heavy equipment and field trucks are among the types of equipment that may be used during field work. Heavy equipment can present a substantial hazard to workers. General requirements for motor vehicles and material-handling equipment are provided in the Occupational Safety and Health Administration (OSHA) Construction Industry Standards, 29 CFR 1926, Subpart O. The following precautions will be followed when heavy equipment (such as drill rigs, front-end loaders, and backhoes) is in use:

1. Heavy equipment will be inspected by the operator before each work shift. The site safety coordinator (SSC) will ensure compliance with these precautions.

2. Equipment operators will be instructed to report any abnormalities, such as equipment failure, oozing liquids, and unusual odors, to their supervisors or the SSC.

3. Only qualified and licensed personnel will operate heavy equipment.

4. Hard hats, steel-toed boots, and safety glasses or goggles will be worn at all times around heavy equipment. Other personal protective equipment (PPE) specified in the site health and safety plan (HASP) will also be required.

5. Workers will not assume that the equipment operator is keeping track of their exact location. Workers will never walk directly behind or to the side of heavy equipment without the operator's knowledge.

6. Workers in close proximity to heavy equipment will maintain visual contact with equipment operators at all times.

7. When an operator must maneuver equipment in tight quarters, the presence of a second person will be required to ensure adequate clearance. If backing is required, two ground guides will be used: one in the direction the equipment is moving, and the other in the operators's normal field of vision to relay signals.

8. All heavy equipment used at a contaminated work site will be kept in the exclusion zone until the work has been completed. Such equipment will then be decontaminated within the designated decontamination area.

9. Hand-signal communications will be established when verbal communication is difficult. One person per work team will be designated to give hand signals to equipment operators.

10. Equipment with an obstructed rear view must have an audible alarm that sounds when the equipment is moving in reverse (unless a spotter guides the operator).

11. Parking brakes will be kept engaged when equipment is not in use.

12. Blades, buckets, dump bodies, and other hydraulic systems will be kept fully lowered when equipment is not in use.

13. Equipment cabs will be kept free of all nonessential and loose items.

14. Seat belts must be present in all vehicles having a rollover protective structure (ROPS).

15. With certain exceptions, all material-handling equipment must be equipped with ROPS.

16. Material-handling equipment that lacks a ROPS will not be operated on a grade unless the grade can safely accommodate the equipment involved.

17. Drilling auger sections and other equipment are extremely heavy. All precautions must be taken before moving heavy equipment. Appropriate equipment must be used to transport heavy equipment.

18. Only chains, hoists, straps, and other equipment that safely aids transport of heavy materials will be used.

19. Proper personal lifting techniques will be used. Workers will lift using their legs, not their backs.

20. A safety barrier will be used to protect workers when tires are inflated, removed, or installed on split rims.

21. An ongoing maintenance program for all tools and equipment must be in place. All tools and moving equipment will be inspected regularly to ensure that parts are secured, are intact, and have no cracks or areas of weakness. The equipment must turn smoothly without wobbling and must operate according to manufacturer specifications. Defective items will be promptly repaired or replaced. Maintenance and repair logs will be kept.

22. Tools will be stored in clean, secure areas to prevent damage, loss, or theft.

23. Workers will not use equipment with which they are not familiar. This precaution applies to heavy as well as light equipment.

24. Loose-fitting clothing and loose, long hair will be prohibited around moving machinery.

25. Workers will make sure that no underground or overhead power lines, sewer lines, gas lines, or telephone lines present a hazard in the work area.

26. All personnel who are not essential to work activities will be kept out of the work area.

27. Workers will be aware of their footing at all times.

28. Workers will remain alert at all times.

ATTACHMENT C

FORM HSP-3

GEOTRANS
LIMITED SCALE SITE
HEALTH AND SAFETY PLAN

1.0 GENERAL INFORMATION

Site/Location: Former Axelson facility, 2703 W. Marland Boulevard, Hobbs, New Mexico

Project #: 2201.019.01

Plan Prepared by: Tanya Akkerman **Date:** August 16, 2004

Hazard Assessment Prepared by: * Keith McIntyre **Date:** August 16, 2004

* I certify that I have assessed the type, risk level and severity of hazards for this project and have selected appropriate personal protective equipment for site personnel.

Plan Reviewed by: Keith McIntyre **Date:** _____

_____

Activity(s): 1) Contact ONE CALL for Lea County, New Mexico (1-800-321-2537).
2) Clean out concrete catch basins inside building and backfill with concrete.
3) Remove top of concrete sludge tank, cleanout tank, and then remove tank.
4) Install two 2-inch diameter monitor wells to 45 feet in depth using an air rotary drill rig.
5) Develop new monitor wells.
6) Have the new monitor wells professionally surveyed to the existing monitor well network.
7) Collect groundwater samples at new monitor wells.

Dates of work: To Be Determined.

GeoTrans personnel: **Signature**

Keith McIntyre * _____

Tanya Akkerman** _____

Jennifer Abrahams*** _____

* Safety coordinator/emergency coordinator
** On-site safety/emergency coordinator and designated First-Aid provider
*** Project Manager/contact

Description of Site: Axelson, Inc. formerly operated a parts and repair shop for submersible oil (rod sucker) pumps at the subject site from 1980 to approximately 1997. The subject site is currently occupied by Reef Chemical, an oil feild chemical storage and supply business. Pump repair activities are not currently conducted at the subject site. The Site layout is presented on the attached Figures.

A soil and groundwater investigation was conducted by GeoTrans at the subject site in June 2001 and April 2004. Four groundwater monitoring wells were installed and two soil borings were completed during the June 2001 investigation. In addition, Naturally Occurring Radioactive Materials (NORM) were present in surface soils. Five additional soil borings were completed at the subject site in April 2004. Grab groundwater samples were collected from the on-site water supply well and the groundwater monitoring wells in April and May 2004. Petroleum hydrocarbons and low concentrations of metals and VOCs were detected in the soil and groundwater at the subject site. In July and August 2004, NORM soil excavation and disposal activities were conducted at the subject site.

Description of Work:

Clean out the concrete catch basins located inside the shop building and backfill with concrete. After breaking and removing the concrete lid on the sludge tank, located south of the existing building, clean out the tank and then remove the concrete sidewalls and bottom. Excavate TPH impacted soil south of the building and in the vicinity of the concrete sludge tank to 25 to 35 feet in depth (east to west trend in depth). The excavated soil will be disposed in accordance with local and state regulations. Place Oxygen Release Compound (ORC) in the bottom of the excavation at the vadose zone prior to backfilling and compacting the excavation area.

Two replacement groundwater monitoring wells will be installed in the excavation area after completion of the backfilling and compaction activities. The replacement wells will be developed and surveyed prior to being sampled. Development and purge water will be temporarily stored in labeled, 55-gallon drums stored at the subject site.

Types of hazardous material: Petroleum hydrocarbons, low concentrations of metals in soil and groundwater and low concentrations of VOCs in soil and groundwater. See attached Tables for existing data.

Major safety/health hazards/risks:

1) Underground utilities.
2) Excavation equipment, sloping, and shoring activities.
3) Physical hazards associated with the air rotary drill rig.
4) On-site traffic associated with the haul trucks for the excavated soil.
5) On-site traffic associated with the heavy equipment for the excavation.

2.0 SAFETY PLAN

Protective Equipment/Instruments (specify type, as necessary)

Hard hat:	X	Boots:	X	Glasses (type): Safety	X
Suits:		Respirator:	X	First aid kit:	X
OVM:	X	CGI:		Hearing Protectors:	X

Detector tubes: _____

Safety Equipment Levels/Upgrades: Level D: steel-toed boots, hearing protection, safety glasses, hard hat, and gloves. Level C: add full- or half-face respirator with organic vapor and HEPA cartridge, and Tyvek.

Monitoring Requirements: Monitor perimeter of the excavation with OVM every 60 minutes, or if obvious odors are noted by personnel. Monitor breathing zone of personnel working inside the excavation with OVM every 30 minutes, or if obvious odors are noted by personnel. Upgrade to Level C if OVM detects 25 ppm for 15 minutes, or if personnel notice obvious chemical odors; in such a case contact Project Manager (Jennifer Abrahams) to confirm whether to continue with work. Cartridges will be changed and replaced with new cartridges on a daily basis in accordance with California Code of Regulations Title 8, Section 5218 (G: Respiratory Protection). Continue monitoring. Stop work and move away from source if level in breathing space exceeds 100 ppm. Contact Health & Safety Officer and Project Manager.

Monitoring Instruments: Organic Vapor Monitor (OVM).

Action Levels for Upgrades:	**Level of Protection:**
OVM Concentration in breathing zone: 25 ppm for 15 minutes	Upgrade to Level C; call PM
OVM Concentration in breathing zone: 100 ppm	Stop work, move out of source area.

Decontamination/Work Zone Requirements: A work zone and decontamination zone will be established at the site prior to performing excavation activities. After completing excavation and backfilling activities, decontaminate the excavation equipment by steam cleaning.

Decontaminate drilling equipment between borings by steam cleaning or washing with Alconox (or equivalent) and rinsing with clean water. Soil cuttings will be placed in 55-gallon drums, labeled,

and stored at the former Axelson facility. Dispose of contaminated personal protective equipment by placing in a 55-gallon drum.

Calibration Procedures: Calibrate OVM daily according to manufacturers specifications.

3.0 EMERGENCY PLANNING

Emergency Phone Numbers

Lea Regional Medical Center
3320 N. Dal Paso Street, Hobbs, New Mexico 88240
(505) 392-3314 or 911

Local Fire Department: 911

Local Police Department: 911

National Poison Control Center: (800) 222-1222

GeoTrans Rancho Cordova Office (916) 853-1800

Subcontractor: Eades Drilling and Pump Service (well installation subcontractor)

Phone Number: (505) 392-2457

Subcontractor: Basin Surveys (well surveying subcontractor)

Phone Number: (505) 393-7316

Excavation subcontractor to be determined at a later date.

Note: Map of route to hospital must be attached.

Directions to Hospital (approximately 6 miles away from site):

1. Turn right (east) on W. Marland Boulevard.
2. Turn left (north) at N. Morris Street.
3. Travel north on N. Morris Street (name changes to E. Glorietta Dr. and Dal Paso Street).
4. Hospital located at 3320 N. Dal Paso Street.

4.0 ATTACHMENTS

X Site Map	____ Heat Stress
X Site Standard Safety Operating Procedures	____ Cold Stress
X Route to Hospital	X Drill Rig Safety Procedures
X Chemical Hazard Information	____ UST Removal Safety Checklists
X Site Safety Plan Acknowledgment Form	____ Trenching Procedures

X Health & Safety Guidelines for Field Activities Involving Petroleum Distillate Products

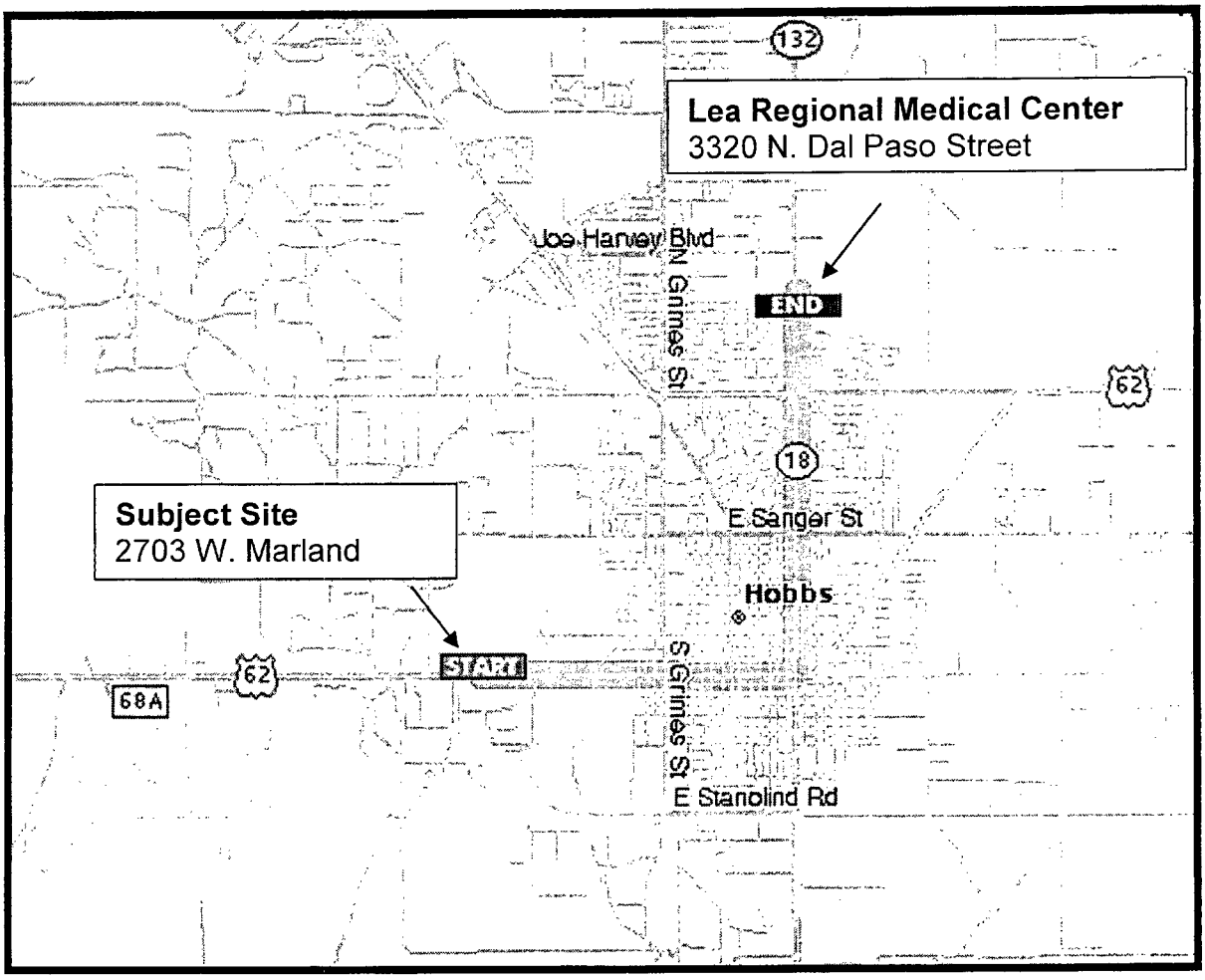
X Standard Operating Procedures for Excavation Activities

HOSPITAL ROUTE MAP

Lea Regional Medical Center (505) 392-3314 or 911

3320 N. Dal Paso Street

Hobbs, New Mexico



Directions to Hospital: Drive east on W. Marland Boulevard. Turn left on N. Morris Street. Street names changes to E. Glorietta Drive and then Dal Paso Street. Hospital is located at 3320 N. Dal Paso Street.

FORM 2
FIELD SAFETY BRIEFING ATTENDANCE SHEET

Date: _____

Location: _____

Presented by: _____

Topics Covered:

HEALTH AND SAFETY PLAN

- Hazardous/Toxic Substances
- On-Site Organization and Coordination
- Emergency Medical Care and Procedures
- Contingency Plan
- Additional Controls for Complex/Hazardous Jobs

SPECIFIC PRECAUTIONS FOR DAY'S ACTIVITIES

OTHER: _____

ATTENDEE LIST

Name (Print)	Company	Signature

New Mexico ONE CALL
LOCATION REQUEST INFORMATION

CALL TOLL FREE

800-321-2537 (Lea County)

TWO WORKING DAYS BEFORE YOU DIG

TICKET NUMBER:

JOB LOCATION & LIMITS:

CITY: CROSS STREET:

COUNTY:

NATURE OF WORK:

WORK DONE FOR:

WORK TO BEGIN: DATE: TIME:

FOREMAN:

CALLER: PHONE:

COMPANY:

ADDRESS:

CITY, STATE, ZIP:

PERMIT: TYPE: NUMBER:

NOTES:

Table 1
Summary of Analyses and Analytical Methods
Former Axelson Facility, Hobbs, New Mexico

April and May 2004

Rationale	Analyses Performed	EPA Method	Soil					Groundwater				
			SB-7	SB-8	SB-9	SB-10	SB-11	MW-4	MW-5	MW-6	MW-7	WSW-1
Site Specific	Total Petroleum Hydrocarbons	8015 Modified	X	X	X	X	X	X	X	X	X	X
WQCC	Total Solids	160.3	X	X	X	X	X	---	---	---	---	---
	Volatile Organic Compounds	8260B	---	---	---	---	---	O	X	X	O	X
	Semi-volatile Organic Compounds	8270C	---	---	---	---	---	O	X	O	O	X
	Polynuclear Aromatic Hydrocarbons	8270 SIM	---	---	---	---	---	O	X	X	X	X
	Total Dissolved Solids	160.1	---	---	---	---	---	X	X	X	X	X
	Total Cyanide	335.2	---	---	---	---	---	O	O	O	O	X
	Flouride	300.0	---	---	---	---	---	X	X	X	X	X
	Nitrate as Nitrogen	300.0	---	---	---	---	---	X	X	X	X	X
	Polychlorinated biphenyls	8082	---	---	---	---	---	O	O	O	O	X
	Radium-226	903.1	---	---	---	---	---	X	X	X	X	X
	Radium-228	904	---	---	---	---	---	X	X	X	X	X
	Dissolved Metals: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, and Uranium	200 / 6000 / 7000 Series	---	---	---	---	---	X	X	X	X	X

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
WSW-1 = Samples collected from former water supply at the former Axelson facility

--- = not applicable
X = analysis performed
O = Approved by OCD to discontinue monitoring based on prior analytical results

Table 2
Summary of Monitor Well Construction Details
Former Axelson Facility, Hobbs, New Mexico

Well	Installation Date	Top of Casing Elevation (ft MSL)	Casing Diameter (inches)	Screen Interval (feet)	As Built Total Depth (feet)
On-site Wells					
MW-1	2/23/1995	3,624.76	2	25-35	35
MW-2	2/23/1995	3,624.34	2	25-35	35
MW-3	2/27/1995	3,623.94	2	25-35	35
MW-4	6/5/2001	3,624.74	2	30-45	45
MW-5	6/5/2001	3,624.46	2	29-44	44
MW-6	6/6/2001	3,623.97	2	30-45	45
MW-7	6/6/2001	3,625.32	2	30-45	45
Former water supply well (WSW-1)	unknown	unknown	7	unknown	53.60*

NOTE: All TOC elevations surveyed by Basin Surveys on June 8, 2001 and April 12, 2004.
Wells MW-1 through MW-3 installed by Environmental Management & Engineering, Inc.
Wells MW-4 through MW-7, KMW-1 and KMW-2 installed by GeoTrans, Inc.

ft MSL = feet Mean Sea Level
* as measured on 4/6/04

Table 3
Summary of Water Level and Flow Direction Data
Former Axelson Facility, Hobbs, New Mexico

Well	Date	Measured Depth to Water (feet)	Measured Depth to Product (feet)	Top of Casing Elevation (ft MSL)	Calculated Groundwater Elevation (ft MSL)	Groundwater Gradient Direction	Groundwater Gradient (ft/ft)	Notes
MW-1	6/9/2001	dry *	---	3624.76	na	---	---	---
	6/11/2001	dry *	---	3624.76	na	---	---	---
	4/6/2004	dry	---	3624.76	na	---	---	very slight petroleum odor
MW-2	6/9/2001	dry *	---	3624.34	na	---	---	---
	6/11/2001	dry *	---	3624.34	na	---	---	---
	4/6/2004	dry	---	3624.34	na	---	---	very slight petroleum odor
MW-3	6/9/2001	34.65**	none	3623.94	na	---	---	---
	6/11/2001	34.65**	none	3623.94	na	---	---	---
	4/6/2004	dry	---	3623.94	na	---	---	no odor
MW-4	6/9/2001	35.35	none	3624.74	3589.39	---	---	---
	6/11/2001	35.36	none	3624.74	3589.38	S52^{0}E	0.0014	---
	4/6/2004	37.64	none	3624.74	3587.10	---	---	mild petroleum odor
	4/15/2004	37.69	none	3624.74	3587.05	S61^{0}E	0.0009	mild petroleum odor
	5/18/2004	37.66	none	3624.74	3587.08	S52^{0}E	0.0011	mild petroleum odor
MW-5	6/9/2001	35.15	none	3624.46	3589.31	---	---	---
	6/11/2001	35.15	none	3624.46	3589.31	S52^{0}E	0.0014	---
	4/6/2004	38.01	---	3624.46	3586.45	---	---	@ 2" free product in well
	4/15/2004	37.51	---	3624.46	3586.95	S61^{0}E	0.0009	@ 2" free product in well
	5/18/2004	38.60	38.55	3624.46	3585.86	S52^{0}E	0.0011	@ 0.5" free product in well
MW-6	6/9/2001	34.62	none	3623.97	3589.35	---	---	---
	6/11/2001	34.63	none	3623.97	3589.34	S52^{0}E	0.0014	---
	4/6/2004	36.99	none	3623.97	3586.98	---	---	no odor
	4/15/2004	36.95	none	3623.97	3587.02	S61^{0}E	0.0009	no odor
	5/18/2004	36.96	none	3623.97	3587.01	S52^{0}E	0.0011	no odor
MW-7	6/9/2001	35.62	none	3625.11	3589.49	---	---	---
	6/11/2001	35.63	none	3625.11	3589.48	S52^{0}E	0.0014	---
	4/6/2004	37.99	none	3625.11	3587.12	---	---	no odor
	4/15/2004	37.94	none	3625.11	3587.17	S61^{0}E	0.0009	no odor
	5/18/2004	37.94	none	3625.11	3587.17	S52^{0}E	0.0011	no odor

NOTE: Depth to water measured from mark or notch at top of well casing.

ft MSL = *feet Mean Sea Level*
na = not applicable
ft/ft = feet per foot
--- = data not available
* = approximately 0.5" to 2" of thick oily grease in bottom of well (no groundwater present).

Table 4
Summary of Soil Analytical Results
Petroleum Hydrocarbons and Total Solids
Former Axelson Facility, Hobbs, New Mexico

Sample ID	Sample Depth (feet)	TPH-d	TPH-g	TPH-mo	Total Solids (%)
June-01					
SB-1 (MW-4)	5	21	<10	97	94.2
	10	**1,300**	**1,500**	**270**	86.4
	15	**2,400**	**2,300**	**370**	84.6
	20	**6,500**	**7,000**	**470**	85.9
	25	**2,100**	**1,100**	**190**	93.9
	30	**860**	**290**	94	95.1
	35	**1,100**	**490**	**110**	92.4
SB-2 (MW-5)	5	<10	<10	<26	94.8
	10	<11	<11	<28	86.3
	15	<11	<11	<27	89.4
SB-3	5	<11	<11	<26	91.5
	10	<11	<11	<26	92.9
	15	<12	<12	<29	86.2
SB-4	5	<10	<10	<25	97.2
	10	**2,700**	**1,000**	**120**	87.8
	15	**1,000**	**300**	46	89.6
	20	**100**	10	31	97.5
	25	<10	<10	<26	95.3
	30	**630**	**170**	58	95.2
	35	**300**	76	43	88.9
SB-5 (MW-7)	5	<10	<10	<25	95.7
SB-6 (MW-6)	5	<11	<11	<27	92.8
April-04					
SB-7	10	<12	<5.9	<30	82.5
	15	<11	<5.6	<27	88.9
	20	<10	<5.2	<25	95.9
	25	<10	<5.1	<25	97.9
	30	<10	<5.1	<25	95.4
	35	<11	<5.3	<26	94.7
SB-8	10	13	<6.0	<31	81.3
	15	<12	<5.8	<28	85.8
	20	<10	<5.1	<25	96.3
	25	<11	<5.2	<26	96.0
	30	**460**	23	29	96.6
	35	**610**	42	43	94.8

Table 4
Summary of Soil Analytical Results
Petroleum Hydrocarbons and Total Solids
Former Axelson Facility, Hobbs, New Mexico

Sample ID	Sample Depth (feet)	TPH-d	TPH-g	TPH-mo	Total Solids (%)
SB-9	10	**300**	7.1	**210**	91.7
	15	**7,100**	**700**	**510**	87.5
	20	**14,000**	**1,600**	**1,100**	86.4
	25	**1,900**	**180**	**170**	95.3
	30	**2,300**	**240**	**170**	95.2
	35	**750**	83	78	95.4
SB-10	10	**3,900**	81	**360**	86.5
	15	**6,100**	**640**	**130**	88.3
	20	**1,300**	73	46	96.8
	25	**3,300**	**370**	**130**	94.3
	30	**1,000**	82	69	95.4
	35	**1,400**	**250**	**100**	94.4
SB-11	10	<11	<5.5	<27	91.4
	15	<12	<5.5	<28	89.5
	20	<11	<5.6	<28	90.6
	25	<11	<5.3	<26	95.5
	30	<11	<5.2	<26	95.9
	35	<11	<5.3	<26	94.0
NMOCD		100	100	100	---

Note: All results presented as milligrams per kilogram (mg/kg) unless otherwise noted.
Petroleum Hydrocarbons analyzed using EPA Method 8015 Modified.
Total Solids analyzed using EPA Method 160.3 Modified.
Concentrations in bold exceed the NMOCD recommended action level.

NMOCD = New Mexico Oil Conservation Division recommended remediation action level.
TPH-d = Total Petroleum Hydrocarbons as diesel range
TPH-g = Total Petroleum Hydrocarbons as gasoline range
TPH-mo = Total Petroleum Hydrocarbons as motor oil range

Table 5
Summary of Groundwater Analytical Results
Petroleum Hydrocarbons
Former Axelson Facility, Hobbs, New Mexico

Well	Date	TPH-d	TPH-g	TPH-mo
MW-4	Jun-01	**13,000**	**4,500**	2,500
	Apr-04	**1,100**	**470**	370
	May-04	**2,000**	**560**	330
MW-5	Jun-01	**490**	**140**	410
	Apr-04*	**210,000**	**1,900**	19,000
	May-04*	**72,000**	**2,200**	7,400
MW-6	Jun-01	**<100**	**<100**	<260
	Apr-04	**<110**	**<50**	<110
Duplicate	Apr-04	**<110**	**<50**	<110
	May-04	**<110**	**<50**	<110
MW-7	Jun-01	**210**	**110**	380
Duplicate	Jun-01	**170**	**<100**	440
	Apr-04	**<110**	**<50**	<110
	May-04	**<100**	**<50**	110
WSW-1	Apr-04	**<110**	**<50**	150
SNARL	---	100	5	---

Note: Results reported as micrograms per liter (µg/L=ppb)
TPH analyzed using EPA Method 8015 Modified
Concentrations in bold exceed SNARL

TPH-d = Total Petroleum Hydrocarbons as Diesel
TPH-g = Total Petroleum Hydrocarbons as Gasoline
TPH-mo = Total Petroleum Hydrocarbons as Motor Oil
SNARL = EPA Suggested No-Adverse Response Levels

* = free product present in well

Table 6
Summary of Groundwater Analytical Results
BTEX Compounds, VOCs, and SVOCs
Former Axelson Facility, Hobbs, New Mexico

Well	Date	BTEX Compounds	Semi-volatile Organic Compounds (SVOCs)	Volatile Organic Compounds (VOCs)
MW-4	Jun-01	---	nd	nd
	Apr-04	---	na	na
	May-04	Ethyl benzene = 2.4 Total Xylenes = 3.7	na	na
MW-5	Jun-01	---	nd	nd
	Apr-04	---	na	na
(product present in well)	May-04	nd	Naphthalene = **140**; 2-Methylnaphthalene = 400; Dibenzofuran = 13; Fluorene = 17; Bis(2-ethylhexyl) Phthalate = 19	1,1-DCA = 0.87; 1,1,1-TCA = 0.76; PCE = 2.2; Total Xylenes = 0.73; Isopropylbenzene = 5.0; n-Propylbenzene = 9.4; 1,3,5-Trimethylbenzene = 74; 1,2,4-Trimethylbenzene = 210; sec-Butylbenzene = 12; 4-Isopropylbenzene = 13; n-Butylbenzene = 16; Naphthalene = **92**
MW-6	Jun-01	---	nd	1,1,1-TCA = 2.0; 1,2-DCA = **8.0**; PCE = 3.0
	Apr-04	---	nd	1,1,1-TCA = 2.1; 1,2-DCA = 4.1; PCE = 4.3
Duplicate	Apr-04	---	nd	1,1,1-TCA = 2.1; 1,2-DCA = 4.1; PCE = 4.5
	May-04	nd	nd	1,1,1-TCA = 2.2; 1,2-DCA = 3.4; PCE = 4.8
MW-7	Jun-01	---	nd	nd
Duplicate	Jun-01	---	nd	nd
	Apr-04	---	na	na
	May-04	nd	na	na
WSW-1	Apr-04	---	nd	Toluene = 5.8
MRL		Benzene = 0.5 Toluene = 1.0 Ethyl benzene = 1.0 Total Xylenes = 1.0	Naphthalene = 9.8; 2-Methylnaphthalene = 9.8; Dibenzofuran = 9.8; Fluorene = 9.8; Bis(2-ethylhexyl) Phthalate = 9.8	1,1-DCA = 0.5; 1,1,1-TCA = 0.5; 1,2-DCA = 0.5; PCE = 0.5; BTEX = 0.5; Isopropylbenzene = 2.0; n-Propylbenzene = 2.0; 1,3,5-Trimethylbenzene = 2.0; 1,2,4-Trimethylbenzene = 2.0; sec-Butylbenzene = 2.0; 4-Isopropylbenzene = 2.0; n-Butylbenzene = 2.0; Naphthalene = 2.0
WQCC		Benzene = 10 Toluene = 750 Ethyl benzene = 750 Total Xylenes = 620	Naphthalene = 30*; 2-Methylnaphthalene = ---; Dibenzofuran = --; Fluorene = ---; Bis(2-ethylhexyl) Phthalate = ---	1,1-DCA = 25; 1,1,1-TCA = 60; 1,2-DCA = 10; PCE = 20; Total Xylenes = 620; Isopropylbenzene = ---; n-Propylbenzene = ---; 1,3,5-Trimethylbenzene = ---; 1,2,4-Trimethylbenzene = ---; sec-Butylbenzene = ---; Toluene = 750; 4-Isopropylbenzene = ---; *n-Butylbenzene* = ---; *Naphthalene* = 30*
MCL		Benzene = 5 Toluene = 1,000 Ethyl benzene = 70 Total Xylenes = 10,000	Naphthalene = ---; 2-Methylnaphthalene = ---; Dibenzofuran = ---; Fluorene = ---; Bis(2-ethylhexyl) Phthalate = ---	1,1-DCA = ---; 1,1,1-TCA = 200; 1,2-DCA = 5; PCE = 5; Total Xylenes = 10,000; Isopropylbenzene = ---; n-Propylbenzene = ---; 1,3,5-Trimethylbenzene = ---; 1,2,4-Trimethylbenzene = 70; sec-Butylbenzene = ---; Toluene = 1,000; 4-Isopropylbenzene = ---; n-Butylbenzene = ---; Naphthalene = ---

Note: All results reported as micrograms per liter (µg/L = ppb). Only detected analytes listed.
BTEX Compounds analyzed using EPA Method 8021B
Volatile Organic Compounds analyzed using EPA Method 8260B
SVOCs analyzed using EPA Method 8270C.
Concentrations in bold exceed the WQCC or MCL values.
Most stringent comparison criteria used when both WQCC and MCL values exist.

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
MCL = U.S. EPA Drinking Water Maximum Contaminant Level
MRL = Method Reporting Limit

1,1-DCA = 1,1-Dichloroethane
1,1,1-TCA = 1,1,1-Trichloroethane
1,2-DCA = 1,2-Dichloroethane
PCE = Tetrachloroethene
nd = not detected above the laboratory reporting limit
na = not analyzed
--- = not applicable
* = Total naphthalene plus monomethylnaphthalenes

Table 7
Summary of Groundwater Analytical Results
Polynuclear Aromatic Hydrocarbons
Former Axelson Facility, Hobbs, New Mexico

Well	Date	Naphthalene	2-Methylnaphthalene	Dibenzofuran	*Fluorene*	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene
MW-4	Jun-01	nd	0.037	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	Apr-04	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	May-04	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-5	Jun-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	Apr-04	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
(product present in well)	May-04	**140**	490	13	11	7.2	0.82	0.39	0.63	<0.2	0.32	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
MW-6	Jun-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	Apr-04	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
Duplicate	Apr-04	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
	May-04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
MW-7	Jun-01	nd	nd	nd	nd	0.071	nd	nd	0.026	0.024	0.025	0.057	0.062	0.061	0.03	0.029	0.023
Duplicate	Jun-01	nd	nd	nd	nd	0.07	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	Apr-04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	May-04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
WSW-1	Apr-04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.033	0.031	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
WQCC		30*	---	---	---	---	---	---	---	---	---	---	---	0.7	---	---	---
MCL		---	---	---	---	---	---	---	---	0.1	---	---	---	0.2	---	---	---

Note: All results reported as micrograms per liter (µg/L = ppb). Only detected analytes listed.
Polynuclear Aromatic Hydrocarbons analyzed using EPA Method 8270 SIM
Concentrations in bold exceed the WQCC or MCL values.

Most stringent comparison criteria listed when both WQCC and MCL values exist.

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
MCL = U.S. EPA Drinking Water Maximum Contaminant Level

--- = not available
nd = not detected above laboratory reporting limit
na = not analyzed
* = total naphthalene plus monomethylnaphthalenes

Table 8
Summary of Groundwater Analytical Results
New Mexico Water Quality Control Commission Groundwater Standards (WQCC)
Former Axelson Facility, Hobbs, New Mexico

Well	Date	Total Cyanide (mg/L)	Fluoride (mg/L)	Nitrate as Nitrogen (mg/L)	TDS (mg/L)	PCBs (µg/L)	Radium 226 (pCi/L)		Radium 228 (pCi/L)		Total Radium (Ra-226 + Ra-228) (pCi/L)
							Result	Uncertainty	Result	Uncertainty	
MW-4	Jun-01	nd	1.5	7.2	**1,140**	nd	1.55	0.35	2.16	0.58	3.71
	Apr-04	na	1.4	6.5	**1,330**	na	6.34	0.8	0.07	0.3	**6.41**
	May-04	na	1.2	6.9	**1,280**	na	3.43	0.90	2.72	1.0	**6.15**
MW-5	Jun-01	nd	1.6	4.3	**916**	nd	2.42	0.52	3.60	0.84	**6.02**
	Apr-04	na	<1.0	4.0	**1,050**	na	3.78	0.4	5.77	0.7	**9.55**
	May-04	na	1.0	4.0	**1,060**	na	1.97	0.7	7.28	1.0	**9.25**
MW-6	Jun-01	nd	1.5	2.9	**676**	nd	2.06	0.45	2.14	0.57	4.20
	Apr-04	nd	1.3	4.6	**825**	na	2.53	0.4	7.17	0.6	**9.70**
Duplicate	Apr-04	nd	1.4	4.7	**825**	nd	3.07	0.4	4.76	0.6	**7.83**
	May-04	na	1.5	4.8	**885**	na	1.17	0.6	3.64	0.4	4.81
MW-7	Jun-01	nd	**2.2**	8.1	**908**	nd	1.81	0.4	2.39	0.61	4.20
Duplicate	Jun-01	nd	**2.1**	7.7	**800**	nd	2.4	0.52	3.19	0.76	**5.59**
	Apr-04	na	1.5	8.2	**990**	na	4.52	0.8	5.32	0.3	**9.84**
	May-04	na	**1.8**	7.9	**870**	na	2.93	0.7	2.73	0.3	**5.66**
WSW-1	Apr-04	<0.01	<1.0	<0.5	95	<0.4	0.91	0.4	0.41	0.3	1.32
WQCC		0.2	1.6	10	1,000	1.0	---	---	---	---	30 pCi/L
MCL		0.2	4	10	500	---	---	---	---	---	5 pCi/L

Note: All results reported a milligrams per liter (mg/L=ppm) unless noted otherwise.
Concentrations in bold exceed the WQCC or MCL values.

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
MCL = U.S. EPA Drinking Water Maximum Contaminant Level
TDS = Total Dissolved Solids using EPA Method 160.1
PCBs = Polychlorinated biphenyls using EPA Method 8082
Radium-226 analyzed using EPA Method 903.1
Radium-228 analyzed using EPA Method 904

µg/L = micrograms per liter (µg/L = ppb)
nd = not detected at or above the laboratory reporting limit
pCi/L = pico Curies per liter
na = not analyzed
--- = not available

Table 9
Summary of Groundwater Analytical Results
Dissolved Metals
Former Axelson Facility, Hobbs, New Mexico

Well	Date	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Uranium
MW-4	Jun-01	**<100**	55.2	<5.0	<5.0	**<100**	<0.20	<8.0	<10	18.1
	Apr-04	<5.0	59.8	<5.0	<5.0	0.56	<0.20	<8.0	<10	23.1
	May-04	12.2	56.7	<5.0	<5.0	0.59	<0.2	<2.0	<10	23.3
MW-5	Jun-01	**<100**	70.9	<5.0	<5.0	**<100**	<0.20	<8.0	<10	15.3
	Apr-04	<5.0	67.2	<5.0	<5.0	1.39	<0.20	<10	<10	18.8
	May-04	14.5	68.1	<5.0	<5.0	0.94	<0.2	<2.0	<10	20.3
MW-6	Jun-01	**<100**	162	<5.0	<5.0	**<100**	<0.20	<8.0	<10	11.9
	Apr-04	8.4	114	<5.0	<5.0	0.15	<0.20	<10	<10	8.78
Duplicate	Apr-04	8.5	114	<5.0	<5.0	0.10	<0.20	<10	<10	8.63
	May-04	17.7	116	<5.0	<5.0	0.43	<0.2	4.1	<10	9.27
MW-7	Jun-01	**<100**	57.5	<5.0	<5.0	**<100**	<0.20	<8.0	<10	11.3
Duplicate	Jun-01	**<100**	51.6	<5.0	<5.0	**<100**	<0.20	<8.0	<10	10.4
	Apr-04	<5.0	40.7	<5.0	<5.0	0.22	<0.20	<8.0	<10	13.7
	May-04	12.0	42.1	<5.0	<5.0	0.11	<0.2	<2.0	<10	14.8
WSW-1	Apr-04	<5.0	88.1	<5.0	<5.0	0.38	<0.20	<8.0	<10	1.04
WQCC		100	1,000	10	50	50	2.0	50	50	5,000
MCL		50	2,000	5.0	100	15	2	50	50	30

Note: All results reported as micrograms per liter (µg/L = ppb).
Metals analyzed using EPA Method 6010B/7470B/7740/200.8
Concentrations in bold exceed the WQCC or MCL values.
Most stringent comparison criteria listed when both WQCC and MCL values exist.

WQCC = New Mexico Water Quality Control Commission Groundwater Standards
MCL = U.S. EPA Drinking Water Maximum Contaminant Level

Table 10
Summary of Catch Basin Tank Analytical Results
Former Axelson Facility, Hobbs, New Mexico

Date	TPH-d	TPH-g	TPH-mo	Total Solids (%)	Volatile Organic Compounds (VOCs)	Semi-volatile Organic Compounds (SVOCs)	Polynuclear Aromatic Hydrocarbons (PAHs)
Jun-01	110,000	42,000	40,000	54.9	Acetone = 0.11 Methylene Chloride = 0.036 2-Butanone (MEK) = 0.026 Tetrachloroethene (PCE) = 0.01 Carbon Disulfide = 0.0052	Naphthalene = 15 2-Methylnaphthalene = 32 1,2-Dichlorobenzene = 79 Butyl Benzl Phthalate = 6.3 Bis(2-ethylhexyl) Phthalate = 62	na
May-04	24,000	200	10,000	62.6	Toluene = 2.2 Total Xylenes = 10.8 Ethyl Benzene = 1.6 Naphthalene = 14 sec-Butlybenzene = 1.8 n-Butylbenzene = 2.9 1,2-Dichlorobenzene = 1.3 1,2,4-Trimethylbenzene = 9.3 4-Isopropyltoluene = 2.0	Naphthalene = 8.6 2-Methylnaphthalene = 26 Bis(2-ethylhexyl) Phthalate = 6.6	Naphthalene = 23 2-Methylnaphthalene = 69 Acenaphthene = 0.53 Fluorene = 1.2 Dibenzofuran = 1.4 Phenantthrene = 1.7 Anthracene = 0.30 Fluoranthene = 0.34 Pyrene = 1.0 Benzo(b)fluoranthene = 0.22 Benzo(k)fluoranthene = 0.083 Benz(a)anthracene = 0.13 Chrysene = 0.50 Benzo(a)pyrene = 0.19 Indeno(1,2,3-cd)pyrene = 0.21 Benzo(g,h,I)perylene = 0.39

Note: Results reported as milligrams per kilogram (mg/kg=ppm) unless otherwise noted. Only detected analytes listed.
Petroleum Hydrocarbons analyzed using EPA Method 8015 Modified.
Percent Total Solids analyzed using EPA Method 160.3 Modified.
VOCs analyzed using EPA Method 8260B.
SVOCs analyzed using EPA Method 8270C.
Polynuclear Aromatic Hydrocarbons analyzed using EPA Method 8270 SIM

TPH-d = Total Petroleum Hydrocarbons as diesel range
TPH-g = Total Petroleum Hydrocarbons as gasoline range
TPH-mo = Total Petroleum Hydrocarbons as motor oil range
na = not analyzed

NIOSH Pocket Guide to Chemical Hazards

Benzene	**CAS** 71-43-2
C_6H_6	**RTECS** CY1400000
Synonyms & Trade Names Benzol, Phenyl hydride	**DOT ID & Guide** 1114 130

Exposure Limits	NIOSH REL: Ca TWA 0.1 ppm ST 1 ppm See Appendix A
	OSHA PEL: [1910.1028] TWA 1 ppm ST 5 ppm See Appendix F

IDLH Ca [500 ppm] See: 71432	**Conversion** 1 ppm = 3.19 mg/m^3

Physical Description
Colorless to light-yellow liquid with an aromatic odor. [Note: A solid below 42°F.]

MW: 78.1	BP: 176°F	FRZ: 42°F	Sol: 0.07%
VP: 75 mmHg	IP: 9.24 eV		Sp.Gr: 0.88
Fl.P: 12°F	UEL: 7.8%	LEL: 1.2%	

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities
Strong oxidizers, many fluorides & perchlorates, nitric acid

Measurement Methods
NIOSH 1500, 1501, 3700, 3800; OSHA 12, 1005
See: NMAM or OSHA Methods

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation Provide: Eyewash, Quick drench	**First Aid** (See procedures) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Important additional information about respirator selection
Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, blood, central nervous system, bone marrow

Cancer Site [leukemia]

See also: INTRODUCTION See ICSC CARD: 0015 See MEDICAL TESTS: 0022

NIOSH Pocket Guide to Chemical Hazards

Gasoline

CAS 8006-61-9

RTECS LX3300000

Synonyms & Trade Names
Motor fuel, Motor spirits, Natural gasoline, Petrol [Note: A complex mixture of volatile hydrocarbons (paraffins, cycloparaffins & aromatics).]

DOT ID & Guide
1203 128

Exposure Limits

NIOSH REL: Ca See Appendix A

OSHA PEL†: none

IDLH Ca [N.D.] See: IDLH INDEX

Conversion 1 ppm 2.95 mg/m^3 (approx)

Physical Description
Clear liquid with a characteristic odor.

MW: 72 (approx)	BP: 102°F	FRZ: ?	Sol: Insoluble
VP: 38-300 mmHg	IP: ?		Sp.Gr(60°F): 0.72-0.76
Fl.P: -45°F	UEL: 7.6%	LEL: 1.4%	

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities
Strong oxidizers such as peroxides, nitric acid & perchlorates

Measurement Methods
OSHA PV2028
See: NMAM or OSHA Methods

Personal Protection & Sanitation
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap flush immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Important additional information about respirator selection
Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, mucous membrane; dermatitis; headache, lassitude (weakness, exhaustion), blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis (aspiration liquid); possible liver, kidney damage; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys

Cancer Site [in animals: liver & kidney cancer]

See also: INTRODUCTION

NIOSH Pocket Guide to Chemical Hazards

Kerosene

CAS 8008-20-6

RTECS OA5500000

Synonyms & Trade Names
Fuel Oil No. 1, Range oil [Note: A refined petroleum solvent (predominantly C9-C16), which typically is 25% normal paraffins, 11% branched paraffins, 30% monocycloparaffins, 12% dicycloparaffins, 1% tricycloparaffins, 16% mononuclear aromatics & 5% dinuclear aromatics.]

DOT ID & Guide
1223 128

Exposure Limits

NIOSH REL: TWA 100 mg/m^3

OSHA PEL: none

IDLH N.D. See: IDLH INDEX

Conversion

Physical Description
Colorless to yellowish, oily liquid with a strong, characteristic odor.

MW: 170 (approx)	BP: 347-617°F	FRZ: -50°F	Sol: Insoluble
VP(100°F): 5 mmHg	IP: ?		Sp.Gr: 0.81
Fl.P: 100-162°F	UEL: 5%	LEL: 0.7%	

Class II Combustible Liquid: Fl.P. at or above 100°F and below 140°F.

Incompatibilities & Reactivities
Strong oxidizers

Measurement Methods
NIOSH 1550
See: NMAM or OSHA Methods

Personal Protection & Sanitation
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap flush immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Important additional information about respirator selection
Respirator Recommendations NIOSH

Up to 1000 mg/m^3: (APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)/(APF = 10) Any supplied-air respirator

Up to 2500 mg/m^3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)

Up to 5000 mg/m^3: (APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and organic vapor cartridge(s)/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis

(aspiration liquid)
Target Organs Eyes, skin, respiratory system, central nervous system
See also: INTRODUCTION See ICSC CARD: 0663

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GEOTRANS
STANDARD SAFETY
PROCEDURES DURING DRILLING

1) Hard hat, safety glasses or goggles, shirt and full length pants and work shoes/boots are required for all personnel working with or near the rig. Tuck shirts at belt.

2) No eating, drinking or smoking is allowed near the rig if site has known of suspected contamination of soils or ground water.

3) Direct contact with contaminated or suspected contaminated surfaces should be avoided.

4) Tools, materials, cords, hoses or debris should be located so as not to cause tripping or to come into contact with moving rig parts.

5) Tools, materials and equipment subject to displacement or falling must be adequately secured.

6) Flammable materials must be stored free of ignition sources. Flammable liquids must be stored in an approved container.

7) All underground utility locations must be identified prior to drilling.

8) Maintain adequate clearance of drill from overhead transmission lines. Minimum clearance is 25 feet unless special permission is granted by utility company. Call local utility company for proper clearance.

9) Loose and frayed clothing, loose long hair, loose jewelry, rings or chains may not be worn while working with rotating equipment.

10) Machinery must be shut down prior to repairs or lubrication (except parts that must be in motion for lubrication).

11) Mechanical equipment must be shut down prior to and during fueling operations. When refueling or transferring fuel, containers/equipment must be bonded.

12) Appropriate respiratory and personal protective equipment must be worn when conditions warrant their use.

13) The drill rig, and any other machinery used, should be inspected daily by a competent, qualified individual.

GEOTRANS, INC.

GENERAL SAFE WORK PRACTICES

To prevent injuries and adverse health effects, the following general standard operating procedure (SOP) are to be followed when conducting work involving known and unknown site hazards. These SOPs establish a pattern of general precautions and measures for reducing risks associated with hazardous site operations. This list is not inclusive and may be amended as necessary.

- Do not eat, drink, chew gum or tobacco, take medication, or smoke in contaminated or potentially contaminated areas or where the possibility for the transfer of contamination exists.
- Wash hands and face thoroughly upon leaving a contaminated or suspected contaminated area. A thorough shower and washing must be conducted as soon as possible if excessive skin contamination occurs.
- Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, or other such areas. Avoid, whenever possible, kneeling on the ground or leaning or sitting on drums, equipment, or the ground. Do not place monitoring equipment on potentially contaminated surfaces.
- Remove beards or facial hair that interfere with a satisfactory qualitative respirator fit test or routine pre-entry positive and negative pressure checks.
- Be familiar with and knowledgeable of and adhere to all instructions in the site-specific health and safety plan (HASP). At a minimum, a safety meeting will be held at the start of each project to discuss the HASP. Additional meetings will be held, as necessary, to address new or continuing safety and health concerns.
- Be aware of the location of the nearest telephone and all emergency telephone numbers.
- Attend a briefing on the anticipated hazards, equipment requirements, SOPs, emergency procedures, and communication methods before going on site.
- Plan and delineate entrance, exit, and emergency escape routes.
- Rehearse unfamiliar operations prior to implementation.
- Use the "buddy system" whenever respiratory protection equipment is in use. Buddies should establish hand signals or other means of emergency communication in case radios break down or are unavailable.

- Buddies should maintain visual contact with each other and with other on-site team members by remaining in close proximity in order to assist each other in case of emergency.

- Minimize the number of personnel and equipment in contaminated areas (such as the exclusion zone). Nonessential vehicles and equipment should remain within the support zone.

- Establish appropriate support, contamination reduction, and exclusion zones.

- Establish appropriate decontamination procedures for leaving the site.

- Immediately report all injuries, illnesses, and unsafe conditions, practices, and equipment to the site safety coordinator (SSC).

- Maintain a portion of the site field logbook as a project safety log. The project safety log will be used to record the names, entry and exit dates, and times on site of all HSI GeoTrans, subcontractor, and project site visitor personnel; air quality and personal exposure monitoring data; and other information related to safety matters. Form SSC-1, Daily Site Log, may be used to record names of on-site personnel.

- A portable eyewash station should be located in the support zone if chemical splashes to eyes are possible.

- Do not bring matches and lighters in the exclusion zone or contamination reduction zone.

- Observe coworkers for signs of toxic exposure and heat or cold stress.

- Inform coworkers of nonvisual effects of illness if you experience them, such as headaches, dizziness, nausea, or blurred vision.

GEOTRANS, INC.

STANDARD OPERATING PROCEDURES: EXCAVATION PRACTICES

This standard operating procedure (SOP) outlines minimum requirements to protect employees who may be exposed to hazards during trenching and excavation activities and to provide general guidance for compliance with Title 29 of the *Code of Federal Regulations* (CFR), Part 1926, Subpart P, "Excavations."

Project managers shall ensure that all excavation, shoring, and trenching activities are conducted in accordance with the requirements outlined in this document and Subpart P of 29 CFR 1926. Project managers must also ensure that projects involving trenching and excavation are staffed by an individual capable of performing "competent person" duties as described in this procedure.

The site safety coordinator (SSC) is responsible for on-site enforcement of this SOP. Definitions and procedures used for excavations are discussed below.

1.0 DEFINITIONS

The following definitions apply to this SOP:

Benching: Forming one or a series of horizontal levels or steps in the sides of an excavation to protect employees from cave-ins

Competent Person: One capable of identifying existing or predictable hazards in the work environment that are unsanitary or dangerous to employees and who has authorization to take prompt corrective measures to eliminate the hazards

Excavation: Any manmade cut, cavity, trench, or depression in an earth surface formed by earth removal

Shoring: Metal, hydraulic, mechanical, or timber system that supports the sides of an excavation and that is designed to prevent cave-ins

Sloping: Sloping the sides of an excavation at an incline away from the excavation to protect employees from cave-ins

Trench: A narrow excavation (in relation to its length) that is usually deeper than it is wide but less than 15 feet wide

2.0 PROCEDURES

Described below are the general safety requirements and protective system requirements for trenching and excavation activities.

2.1 GENERAL SAFETY REQUIREMENTS

General safety requirements that must be in place before work begins are as follows:

- Utility companies or a utilities locating service in the area must be notified **before excavation or trenching activities begin** to arrange for locating and protecting underground utilities.
- Access to trenching areas must be controlled and limited to authorized personnel. Prior to entering a trench or excavation, workers must notify the project manager, SSC, and nearby equipment operators whose activities could affect the trench or excavation.
- No person may enter a trench or work at the foot of the face of an excavation until a qualified, competent person has inspected the excavation and determined whether sloping or shoring is required to protect against cave-in or subsidence and the appropriate protection has subsequently been installed.
- Trenches and excavations must be assessed by a qualified, competent person, even in the absence of working personnel, whenever heavy equipment will be operating nearby in order to ensure that the trench or excavation will support the weight of the equipment without subsistence or causing the accidental overturning of machinery.
- Trenches and excavations must be inspected regularly (daily at a minimum) to ensure that changes in temperature, precipitation, shallow groundwater, overburden, nearby building weight, vibration, or nearby equipment operation have not caused weakening of the sides, faces, and floors and to ensure that personnel protection is being maintained.
- When subsidence or tension cracks are apparent anywhere in an excavation, all work should be stopped until the problem is corrected.
- The competent person must inspect trenches or excavations after any precipitation event to ensure integrity has been maintained.
- Sufficient ramps or ladders must be provided in excavations 4 or more feet deep to allow quick egress. Ramps or ladders may be placed no more than 25 feet apart, must be secured from shifting, and must extend at least 3 feet above the top of the trench or excavation. Structural ramps must be designed by a competent person.
- Material removed from an excavation or trench must be placed far enough from the edge (at least 2 feet) to prevent it from sliding into the excavation or trench or from stressing the trench or excavation walls. Worker protection must also be provided from loose rock or soil on the excavation faces.

- If trenches or excavations are near walkways or roadways, guards or warning barriers must be placed to alert pedestrians and drivers of the presence of the trench or excavation.
- If possible, trenches or excavations should be covered or filled in when unattended. Otherwise, strong barriers must be placed around the trench or excavation and lighting must be provided at night if the trench or excavation is near a walkway or roadway.
- When a hazardous atmosphere could exist, the excavation must be tested for appropriate hazardous substances and oxygen level before personnel entry. Excavation where hazardous atmospheres exist must be treated as a confined space. Entry must follow procedures outlined in "Confined Spaced Entry Program," Document Control No. 2-5.
- Entry is not allowed into excavations where water has accumulated.

2.2 PROTECTIVE SYSTEM REQUIREMENTS

Protective systems protect employees from cave-ins, material that could fall in or roll off the face of the excavation, and collapse of adjacent structures. Protective systems include shoring, shielding, sloping and benching, and other systems. Sloping and benching and shoring system requirements are described below.

2.2.1 Sloping and Benching Requirements

Sloping and benching system construction must follow the guidelines established in Appendix B to Subpart P of 29 CFR 1926. Maximum allowable slopes for excavations are summarized below. All slopes indicated are expressed as the ratio of horizontal distance (H) to vertical rise (V).

Soil or Rock Type	Maximum Allowable Slope (H:V) for Excavations Less than 20 Feet Deep
Stable Rock	Vertical (90°)
Type A	0.75:1 (53°)
Type B	1:1 (45°)
Type C	1.5:1 (34°)

Soil types are defined in Appendix A to Subpart P of 29 CFR 1926 and are summarized below.

Type A: Cohesive soils with an unconfined compression strength of 1.5 tons per square foot (ton/ft^2) or greater (such as clay, silty clay, sandy clay, or clay loam)

Type B: Cohesive soils with an unconfined compression strength of greater than 0.5 but less than 1.5 ton/ft^2 (such as angular gravel, silt, silt loam, or sandy loam)

Type C: Cohesive soils with an unconfined compression strength of less than 0.5 ton/ft^2 (such as gravel, sand, loamy sand, submerged soil, or unstable submerged rock)

Sloping and benching for excavations greater than 20 feet deep must be designed by a registered professional engineer.

Soil types must be determined by the competent person using at least one visual and one manual test. Manual tests include plasticity, dry strength, thumb penetration, and drying tests.

2.2.2 Shoring System Requirements

Appendixes C, D, and E to Subpart P of 29 CFR 1926 outline requirements for timber shoring for trenches, aluminum hydraulic shoring for trenches, and alternatives to timber shoring, respectively. Guidelines for shoring systems are listed below.

- If it is not economically feasible or there are space restrictions to prevent cutting the trench or excavation walls back to a safe angle of repose, all trenches or excavations 5 feet deep or more must be shored.
- Shoring should be erected as trenching or excavation progresses and as closely as possible to the excavation floor.
- Shoring timber dimensions must meet the minimum timber requirements specified in Tables C1.1 through C1.3 of Appendix C to Subpart P 29 CFR 1926. Aluminum hydraulic shoring must be constructed using the guidelines and dimension requirements specified in Appendix D of the same standard.
- Trench shields may be used instead of shoring or bracing. Shields must be constructed of steel flat sides welded to a heavy framework of structural pipe. Shields should be moved along by the excavator as trenching or excavation proceeds.