1R - 498

WORKPLANS

DATE:
9-12-08

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

1R498

September 12, 2008

Mr. Ed Hansen
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505
Via E-Mail

RE: GLADIOLA NE RELEASE SITE, T 12S R~~37~~38E SECTION 25 18 UNIT A O, NMOCD # ~~NOT ASSIGNED~~ 1R498

Dear Ed:

The attached documents and an electronic version of the same comprise the most salient elements of the file for the above-referenced site. Some miscellaneous e-mails may not included in this submittal due to a hard-drive issue with my old computer. You may wish to contact Larry Johnson for communications that are not included herein.

A time-line of the most important communications from Hicks Consultants (blue highlight) are presented below. For this site, there have been no communications from NMOCD.

Date	Description of Correspondence and Submittals
4/8/08	Submitted letter to Larry Johnson that described the soil boring characterization of the site.
8/15/08	Submitted final report to OCD Larry Johnson and Dean Kinsolving. Proposed to remediate spill area with gypsum and straw.
9/9/08	Email sent to Ed Hansen concerning both Purvis sites

We would be pleased to meet with NMOCD technical staff in Santa Fe to discuss a path forward for this site that will result in full compliance with NMOCD Rules. We look forward to working with you.

RECEIVED
2008 SEP 26 PM 2 29

Sincerely,

Randall Hicks
R.T. Hicks Consultants, Ltd.

Cc without enclosures
Purvis Operating Company
Ocean Munds-Dry, Holland and Hart
Mr. Dean Kinsolving
Mr. Larry Johnson, NMOCD

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

August 15, 2008

Mr. Larry Johnson
Oil Conservation Division
1625 North French Drive
Hobbs, New Mexico 88240
Via E-Mail and US Mail

RE: GLADIOLA NE RELEASE SITE, T 12S R38E SECTION 18 UNIT LETTER O, NMOCD # ~~NOT ASSIGNED~~ 1R498

Mr. Johnson:

On behalf of Purvis Operating (Purvis), R.T. Hicks Consultants, Ltd. (Hicks Consultants) is submitting this corrective action proposal for the above referenced site. The investigations conducted to date demonstrate that neither salt nor hydrocarbons represent a threat to the ground water quality, however near surface remediation will be required to return the 1.4-acre spill area to productive quality with respect to pasture.

We have provided this plan to Mr. Dean Kinsolving and propose that we proceed after we resolve any questions or comments first from Mr. Kinsolving then from NMOCD. The most important aspects of our findings and our recommendations are summarized below:

1. A continuous, low-permeability quartzite layer at a depth of about 20 feet below grade supports a saturated soil zone beneath the site.
2. The recent Purvis spill area is approximately 0.7 acres in size and is located within a 1.4 acre historic spill area that is believed to have occurred between 1979 and 1991.
3. Chloride concentrations of deep soil samples do not exceed 500 mg/kg below the 15-foot depth.
4. Neither analyses nor field observations suggest that the release contained petroleum hydrocarbons.

Location
The Gladiola NE Site is located approximately 10 miles east and 1 mile north of the city of Tatum at T-12-S, R-38-E, Section 18, in Unit O. The surface elevation of the site is approximately 3,871 feet above mean sea level (Latitude 33° 16' 18.9" North, Longitude 103° 08' 11.1" West, NAD 83). Plate 1 is a site overview map which depicts the location with respect to area landmarks.

Background and Previous Submissions
A small release from the Gladiola SWD pipeline was identified on March 11, 2008 and repaired the following day. On March 13, 2008 a much larger release was identified immediately east of the repaired section. Standing fluid was removed on March 13-14 and the repairs to the line were made on March 14. A C-141 form was submitted by Purvis on March 18, 2008.

Corrective actions have been designed to address the entire affected area. Purvis and Hicks Consultants submitted a letter dated April 8, 2008 to the NMOCD which included recommendations for characterization soil borings with the option for a down gradient monitoring well if the vertical extent of the chloride-impacted soil could not be determined by the borings.

Field Program
On May 5, 2008 Hicks Consultants supervised a deep soil sampling program to delineate the vertical extent of the chloride-impacted soil within the recent and historic spill area. A hollow-stem auger rig was utilized to advance four soil borings to a maximum depth of 24 feet below the ground surface. Plate 2 shows the locations of these borings.

Recovered soil samples were placed in 4-ounce glass jars, sealed with a Teflon-lined lid, immediately chilled to 4° C, and transported to the Xenco Laboratory in Odessa, Texas for analysis of benzene, toluene, ethylbenzene, xylenes, and naphthalene using method SW 8260B (selected samples) and chloride using method EPA 300. In addition composite samples from the surface and the 5-foot depth were submitted to Ward Laboratories, Inc. of Kearney, Nebraska to evaluate the potential for re-vegetation. Laboratory reports and chain-of-custody documentation are provided in Attachment B.

Characterization Results
Texture of the Vadose Zone Soil
Underlying a 1- to 2-foot thick top soil layer was a soft caliche and silt layer with interbedded hard caliche which was generally more massive and dominant with depth. A very hard quartzite layer was encountered at a depth of 19 to 23 feet across the site. Soil samples were recovered at 5-foot intervals for laboratory analysis of hydrocarbons and chloride.

The drilling rig encountered saturated soil in each of the borings at approximately 20 feet below the surface (3,851 ft). The quartzite formation apparently serves as the lower confining layer for the thin "perched" saturated zone. The Hicks Consultants field supervisor decided to terminate each boring prior to fully penetrating the hard zone in an effort to protect the underlying soil and ground water from the elevated chloride concentrations above. A water sample from the "perched" zone in SB-1 was recovered for laboratory analysis. Each soil boring was plugged with hydrated bentonite. Attachment A provides soil lithology logs, which include the laboratory chloride and hydrocarbon results.

Chemistry of the Vadose Zone Soil

All hydrocarbon sample results were below the method detection concentration and the chloride concentrations are depicted on the adjacent table and on Plate 2. Each of the soil borings contains chloride concentrations from 2,570 to 8,380 mg/kg in the surface soil (0 to 1.0 ft) and from 1,180 to 8,950 mg/kg in the 5-foot sample. SB-2 contains chloride concentrations below 125 mg/kg from ten feet below the surface to the total depth of the boring. The deepest sample from each boring contains less than 500 mg/kg chloride. The "perched" water sample from SB-1 contained 1,370 mg/L chloride. Re-vegetation parameters in the soil are depicted in the table below.

Soil Boring	Sample Depth	Chloride (mg/kg)
SB-1	0-1'	8,380
	5'	8,950
	10'	340
	15'	3,360
	20'	387
SB-2	0-1'	3,260
	5'	2,890
	10'	121
	15'	46.3
	20'	72.5
	24'	105
SB-3	0-1'	6,690
	5'	1,180
	10'	766
	15'	553
	20'	331
	24'	162
SB-4	0-1'	2,570
	5'	1,820
	10'	1,450
	15'	1,250
	20'	244

Sample Location	Composite Soil	
Depth (ft)	0 to 12"	5'
Sample Date	5/5/08	5/5/08
Saturation (%)	47	29
Saturated Paste pH	7.5	7.8
Extract EC (mmho/cm)	**28.2**	**20.3**
HCO_3 (ppm)	70	23
Cl (ppm)	9,710	7,960
Ca (ppm)	632	408
Mg (ppm)	96	140
Na (ppm)	6,116	4,060
Sodium Adsorption Ration	59.8	44.1
Calculated TDS	22,560	16,240
Calculated ESP (%)	**46.5**	**38.9**

Depth to Ground Water

Because a ground water monitoring well was not installed at the site, the public records were examined in an effort to verify that the saturated zone encountered by the soil borings was not simply the uppermost portion of the shallow aquifer, which is used primarily for area livestock and irrigation.

Hicks Consultants reviewed the available records and determined that the most complete potentiometric data was from measurements taken in 1991 and to a much lesser extent in 1996. Regional potentiometric surface maps from 1991 and 1996 are provided in Plate 3A and 3B respectively. They indicate that the ground water elevation at the Gladiola NE site was approximately 3,850 feet in 1991 and 3,835 in 1996.

An estimate of the current ground water elevation was made using ten area water wells for which potentiometric data is available from at least three measurement events between 1991 and 2007. These water wells, as shown on Figure 1, are located south of the Gladiola SE spill site. Figure 2 is a graph of the historic water elevations from each of these wells. The average annual rate of decrease in water level per year from each of the wells was determined to be from 0 to 2.9 ft/yr. The average for all of the wells (1.6 ft/yr) was applied to the estimates made from the 1991 and 1996 potentiometric maps for the Gladiola NE site and it was determined that the current ground water elevation at the site should be approximately 3,817 to 3,824 feet.

Since the estimated current ground water elevation is approximately 30 feet below the saturated zone encountered during the installation of the soil borings at the

Gladiola NE site, we conclude that the water encountered is not part of the shallow aquifer but is a "perched" zone. We further conclude that the quartzite aquitard will effectively prevent the small amount of deep percolation caused by precipitation or irrigation from impairing ground water quality.

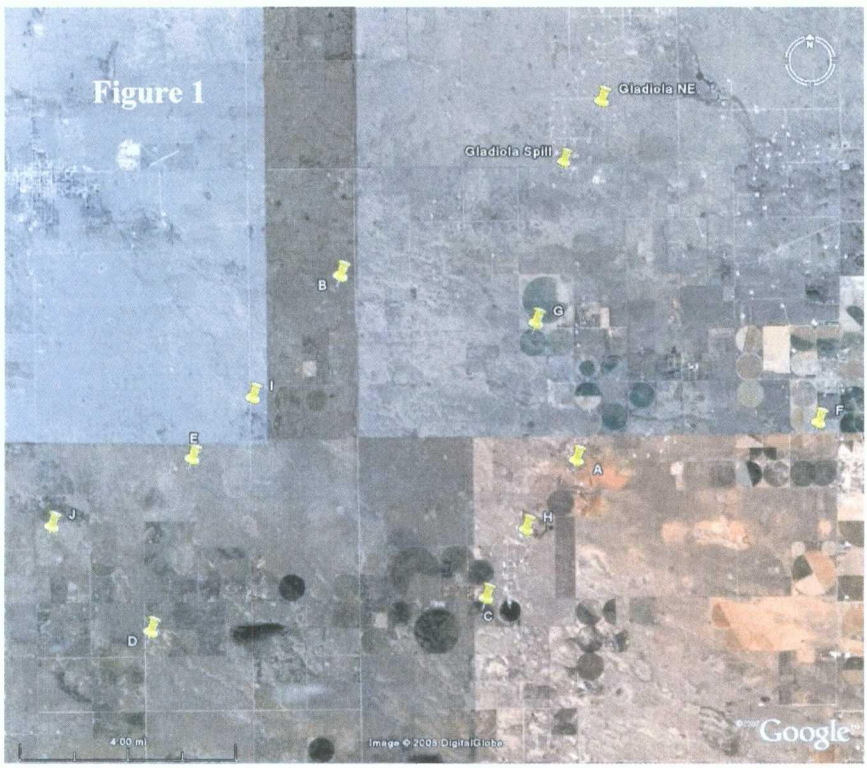
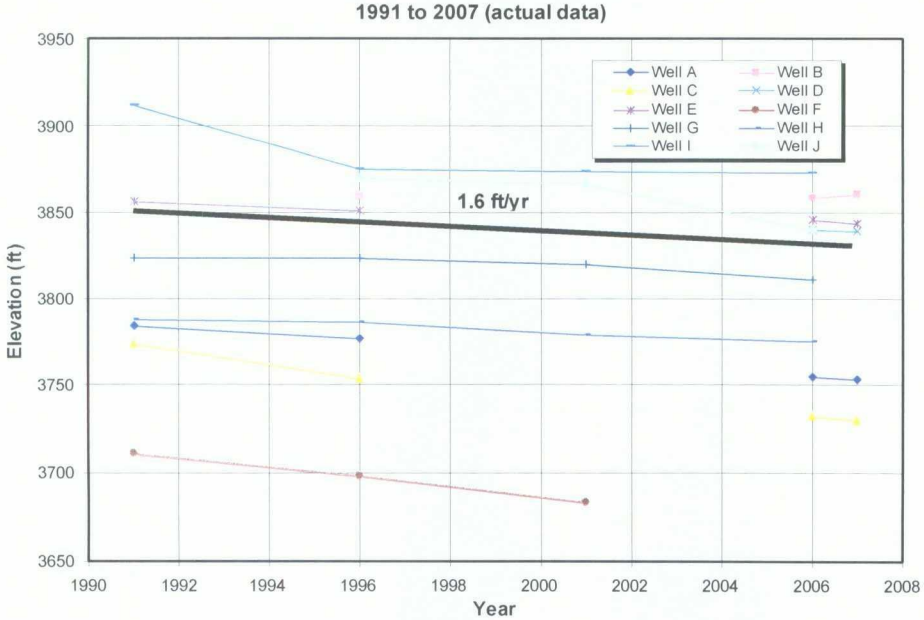


Figure 2
Ground Water Elevation Decline
1991 to 2007 (actual data)



Proposed Remedy
By copy of this letter to Mr. Dean Kinsolving, Purvis is stating that they will compensate the land owner $2,500 for the temporary loss of the productive capacity of the land impacted by this spill.

In addition, if approved by the landowner, Purvis will perform the corrective actions listed below which have been reviewed and endorsed by Dr. Robert Flynn of NMSU and Dr. Kerry Sublette of the University of Tulsa (see Attachment C).

1. Grade the surface during plowing to prevent run-off and ensure uniform flushing by natural rainfall across the entire 1.4 acre site. Additionally, rotted hay will be added during the plowing to enhance the soil permeability. Because the sodium absorption ratio (SAR) and exchangeable sodium percentage (ESP) are high, it is necessary to apply a calcium additive to the soil. Hicks Consultants recommends that approximately 31,000 lbs of gypsum (or an equivalent volume of calcium amendment) be mixed into the soil during the plowing operation.

2. A 2-inch monitoring well will be installed at the down slope (eastern) edge of the project area which will be completed with five feet of screen to a depth not to exceed 24 feet such that the water from the "perched" zone can be monitored to determine the effect from the treatment area. Plate 4 depicts the project area and location of the monitoring well.

3. Following the initial project start-up additional plowing of the site, installation of jute netting, and the installation of fencing may be required during the treatment period to insure penetration of the fresh water, protection from wind erosion, and prevent the grazing of any new vegetation by livestock or small animals.

4. While re-vegetation of the site could be accelerated by flushing the soil with fresh water, the transport volume necessary to make a significant impact (6 inches per year) would require approximately 30 truck loads and is not believed to be justified at this time.

Project Monitoring and Reporting
Purvis and Hicks Consultants propose that the following monitoring and reporting schedule be adopted in order to provide verification of the success for the selected remedy:

Baseline Conditions – Following the initial plowing and soil amendment operation a 10-point composite soil sample will be recovered from the surface for laboratory salinity evaluation. A water sample will be recovered from the monitoring well for analysis of chloride. Start-up operations will be documented with photographs.

Treatment and Post-Treatment Monitoring – Local weather conditions will be monitored on a weekly basis using internet sources. Quarterly monitoring well water samples will be recovered for chloride analysis and quarterly composite soil samples will be recovered for salinity evaluation.

When the electrical conductivity (EC) in the root zone (0-2 feet) soil decreases to <4.0 mmho/cm then the deeper soil will be tested for SAR and ESP. If these levels indicate that the site will support long-term vegetation, then the area will be re-seeded with native vegetation or a mixture selected by the landowner. If requested by the landowner the area may be re-seeded at a point prior to the achievement of the EC goal with more salt-tolerant species. Following re-seeding the monitoring will continue on an annual basis and the progress of the remedy will be documented photographically.

Reporting – Hicks Consultants will submit monitoring reports to the landowner and the NMOCD on a quarterly to annual basis until the vegetation is re-established or it is determined that the remedy has failed to achieve the desired results. Recommendations for additional treatment of the area will be provided with each monitoring report as necessary.

Please contact me if you have any questions or require additional information.

Sincerely,

Dale T. Littlejohn

Dale Littlejohn
R.T. Hicks Consultants, Ltd.

cc: Purvis Operating Company
Mr. Dean Kinsolving


N
Scale - Feet
0
300
600
0
100
200
Scale - Meters
March 2008
Spill Area
Sabre
Tank
Battery
Historic
Spill Area
10-inch Pipeline
County Road 168
Houston
Resident
Plate 1
Site Overview Map
Gladiola NE Pipeline Spill Site
T-12-S, R-38-E, Sec. 18 "O"
Lea County, NM

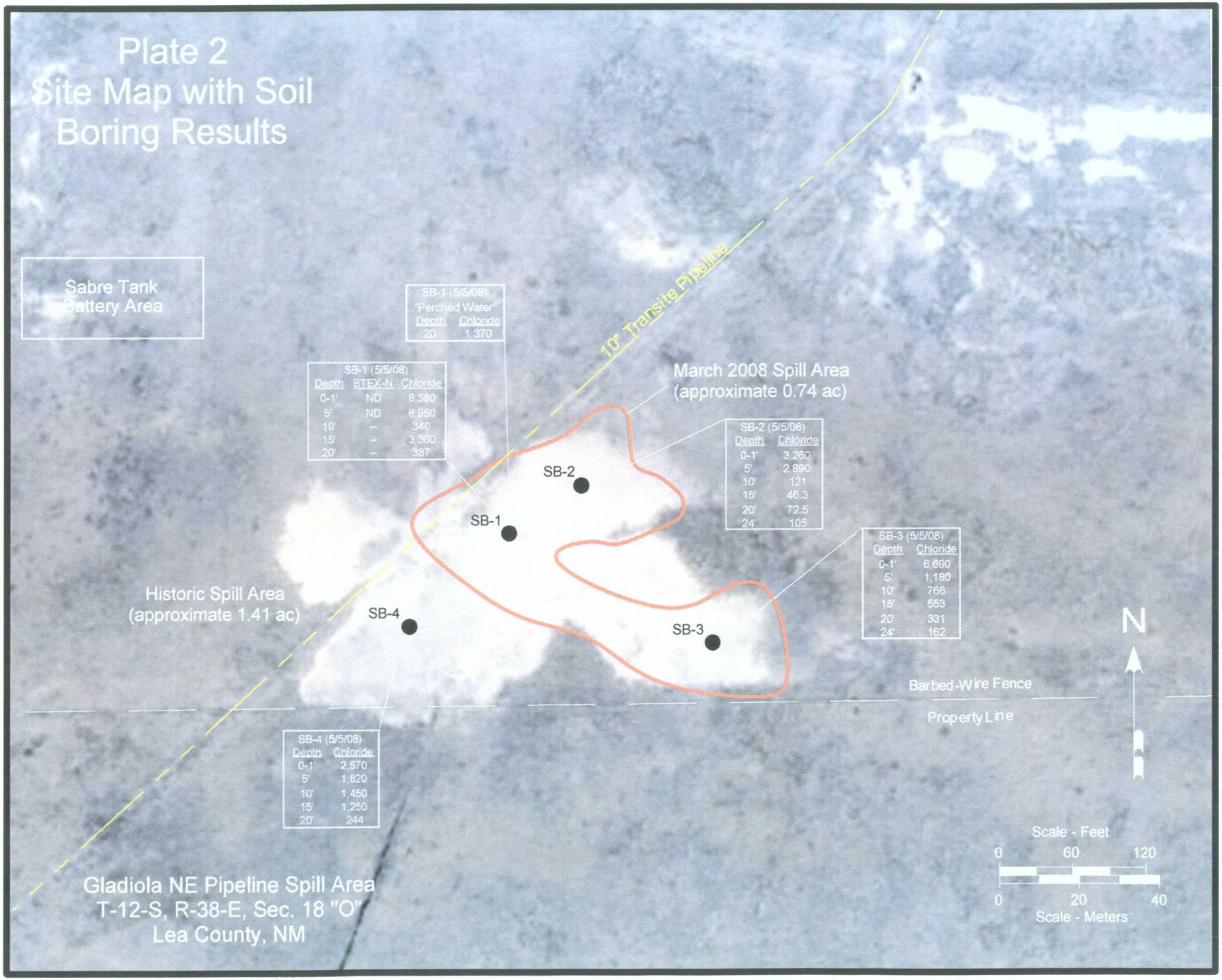
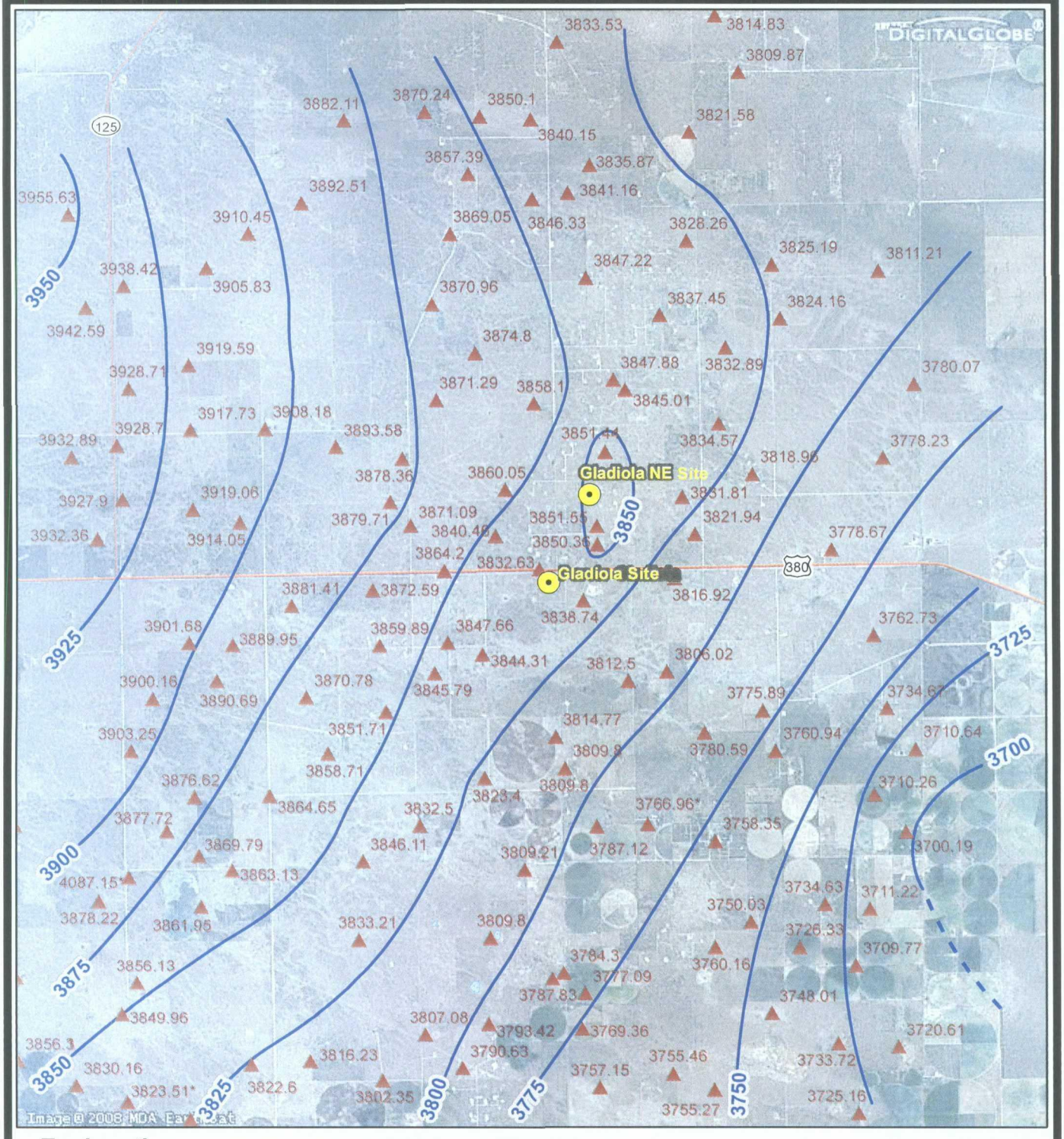


Plate 2
Site Map with Soil Boring Results
Sabre Tank Battery Area
10" Transite Pipeline
March 2008 Spill Area (approximate 0.74 ac)
Historic Spill Area (approximate 1.41 ac)
SB-1 (5/5/08) "Perched Water"
Depth Chloride
20 1,370
SB-1 (5/5/08)
Depth BTEX-N Chloride
0-1' ND 8,380
5' ND 8,950
10' -- 340
15' -- 3,360
20' -- 387
SB-2 (5/5/08)
Depth Chloride
0-1' 3,260
5' 2,890
10' 121
15' 46.3
20' 72.5
24' 105
SB-3 (5/5/08)
Depth Chloride
0-1' 6,690
5' 1,180
10' 766
15' 553
20' 331
24' 162
SB-4 (5/5/08)
Depth Chloride
0-1' 2,570
5' 1,820
10' 1,450
15' 1,250
20' 244
SB-1
SB-2
SB-3
SB-4
Barbed-Wire Fence
Property Line
N
Scale - Feet
0 60 120
0 20 40
Scale - Meters
Gladiola NE Pipeline Spill Area
T-12-S, R-38-E, Sec. 18 "O"
Lea County, NM

S:/PROJECTS/PURVIS/GLADIOLA/SWD/PLATES/USGS_1991_POTENTIOMETRIC.MXD



Explanation

Potentiometric Surface (feet msl)

Equipotential line

Equipotential line (inferred)

Purvis Gladiola Site

USGS Gauging Station showing 1991 ground water elevation (feet msl)

Notes:
* station not used in potentiometric surface calculation

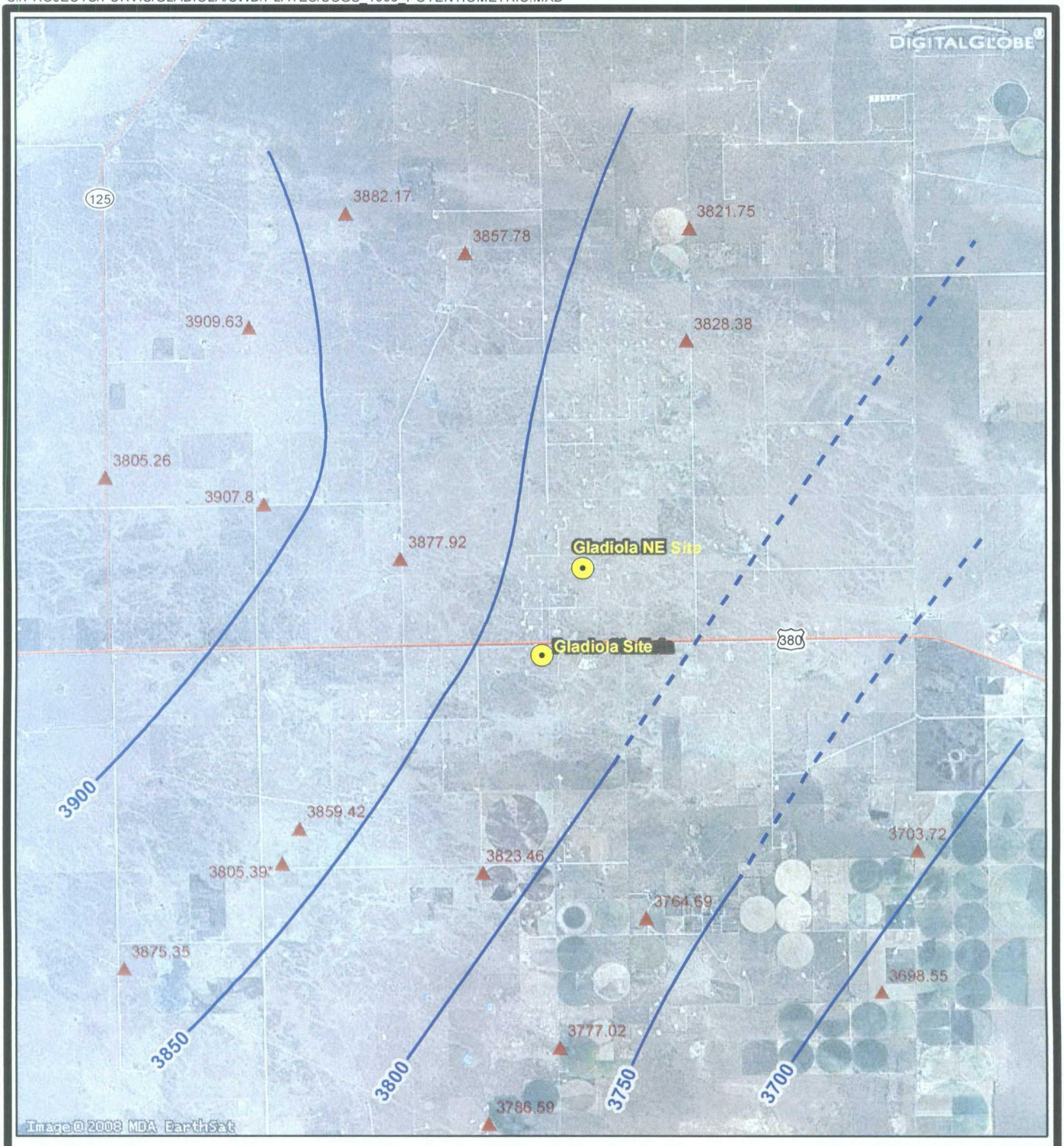
N
W
E
S

0 1 2 Miles

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	1991 Potentiometric Surface	Plate 3A
	Purvis - Galdiola SWD	June 2008

6/13/2008

S:/PROJECTS/PURVIS/GLADIOLA/SWD/PLATES/USGS_1996_POTENTIOMETRIC.MXD



Explanation

Potentiometric Surface (feet msl)

Equipotential line

Equipotential line (inferred)

Purvis Gladiola Site

USGS Gauging Station showing 1996 ground water elevation (feet msl)

Notes:
* station not used in potentiometric surface calculation

N W E S

0 1 2 Miles

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	1996 Potentiometric Surface	Plate 3B
	Purvis - Galdiola SWD	June 2008

6/13/2008

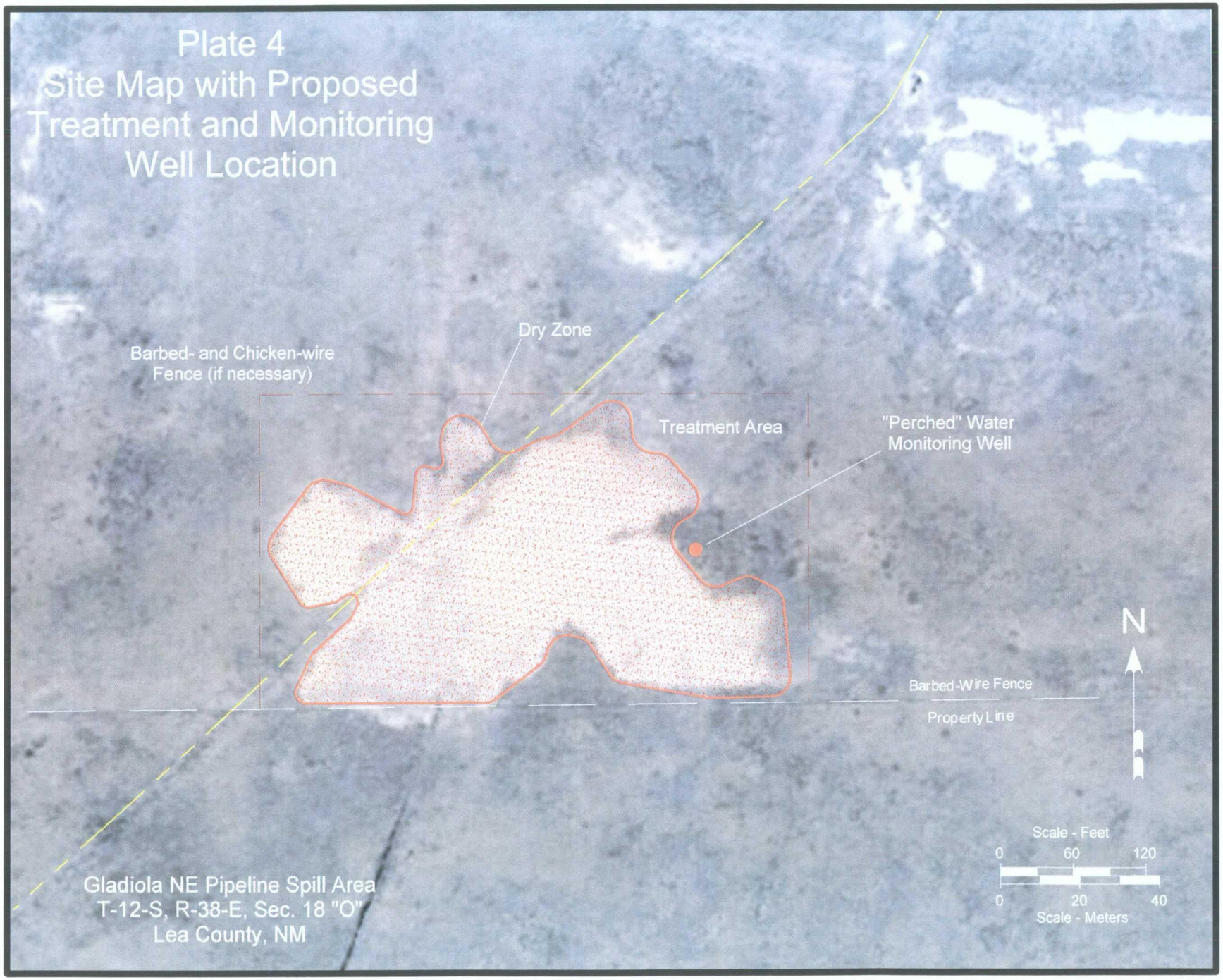


Plate 4
Site Map with Proposed
Treatment and Monitoring
Well Location
Dry Zone
Barbed- and Chicken-wire
Fence (if necessary)
Treatment Area
"Perched" Water
Monitoring Well
N
Barbed-Wire Fence
Property Line
Scale - Feet
0
60
120
0
20
40
Scale - Meters
Gladiola NE Pipeline Spill Area
T-12-S, R-38-E, Sec. 18 "O"
Lea County, NM

ATTACHMENT A

Lithology Logs from Soil Borings (Vertical Delineation)
Conducted by RTH in May 2008

LITHOLOGIC LOG (Soil Boring)

R T Hicks Consultants Ltd

P O Box 7624
Midland, TX 79708
(432) 528-3878

BORING NO.: SB-1
SITE ID: Gladiola Pipeline NE Spill
SURFACE ELEVATION: 3871 MSL
CONTRACTOR: Atkins Engineering
DRILLING METHOD: Hollow-Stem
INSTALLATION DATE: 5/5/08
WELL PLACEMENT: Nearest to Source Area
COMMENTS: Lat. 33° 16' 18.9" North, Long. 103° 08' 11.1" West

TOTAL DEPTH: 22.5 Ft
CLIENT: Purvis Operating
COUNTY: Lea County
STATE: New Mexico
LOCATION: T-12-S, R-38-E, Sec. 18 (O)
FIELD REP.: Dale Littlejohn
FILE NAME: \Lithlogs (5-08)

Completion	Lithology	SAMPLE DATA PHOTO	DEPTH	Type	Cl (F)	Cl (Lab)	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. DEATURES
Bentonite / No Casing			0-2	Split spoon	No Results	8,380		CLAY Dark brown, with some interbedded caliche (0-2.5'). BTEX-N Lab results all ND
			4-6	Split spoon	3,705	8,950	5	SILTY CALICHE Light brown, soft drilling. BTEX-N Lab results all ND
			10	Cutting	1,211	340	10	CALICHE Grayish brown, hard, with very hard interbedded white layers at 7-8', 9-10', and 16-17'.
			15	Cutting	2,644	3,360	15	
			20	Cutting	1,673	387	20	Moist soil at 19', saturated at 20' Perched water sample recovered. Chloride = 1,370 mg/L
								QUARTZITE Light grayish brown, medium xln, very hard with some cemented sand grains. (Did not penetrate)

TD = 22.5 Feet

LITHOLOGIC LOG (Soil Boring)

R T Hicks Consultants Ltd

P O Box 7624
Midland, TX 79708
(432) 528-3878

BORING NO.: SB-2
SITE ID: Gladiola Pipeline NE Spill
SURFACE ELEVATION: 3871 MSL
CONTRACTOR: Atkins Engineering
DRILLING METHOD: Hollow-Stem
INSTALLATION DATE: 5/5/08
WELL PLACEMENT: East of Source Area
COMMENTS: Lat. 33° 16' 19.3" North, Long. 103° 08' 10.1" West

TOTAL DEPTH: 24.0 Ft
CLIENT: Purvis Operating
COUNTY: Lea County
STATE: New Mexico
LOCATION: T-12-S, R-38-E, Sec. 18 (O)
FIELD REP.: Dale Littlejohn
FILE NAME: \Lithlogs (5-08)

Completion	Lithology	SAMPLE DATA PHOTO	DEPTH	Type	Cl (F)	Cl (Lab)	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. DEATURES
			0	Cutting	NA	3,260		CLAY Dark brown, with some interbedded caliche.
								SILTY CALICHE Light brown, soft drilling.
							5	CALICHE Grayish brown, hard, no silt, very hard interbedded white layers.
			5	Cutting	NA	2,890		
							10	
Bentonite	No Casing		10	Cutting	338	121		
							15	
			15	Cutting	42.5	46.3		
							20	
			20	Cutting	66.3	72.5		Moist soil at 22', saturated at 23'
								QUARTZITE Light grayish brown, medium xln, very hard with some cemented sand grains. (Did not penetrate)
TD = 24.0 Feet			24	Cutting	NA	105		

LITHOLOGIC LOG (Soil Boring)

R T Hicks Consultants Ltd

P O Box 7624
Midland, TX 79708
(432) 528-3878

BORING NO.: SB-3
SITE ID: Gladiola Pipeline NE Spill
SURFACE ELEVATION: 3871 MSL
CONTRACTOR: Atkins Engineering
DRILLING METHOD: Hollow-Stem
INSTALLATION DATE: 5/5/08
WELL PLACEMENT: Southeast of Source Area
COMMENTS: Lat. 33° 16' 17.9" North, Long. 103° 08' 09.7" West

TOTAL DEPTH: 24.0 Ft
CLIENT: Purvis Operating
COUNTY: Lea County
STATE: New Mexico
LOCATION: T-12-S, R-38-E, Sec. 18 (O)
FIELD REP.: Dale Littlejohn
FILE NAME: \Lithlogs (5-08)

Completion	Lithology	SAMPLE DATA PHOTO	DEPTH	Type	CI (F)	CI (Lab)	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. DEATURES
Bentonite / No Casing			0	Cutting	NA	6,690		CLAY Dark brown, with some interbedded caliche.
			5	Cutting	995	1,180	5	SILTY CALICHE Light brown to gray with white caliche gravel, soft drilling.
			10	Cutting	671	766	10	
			15	Cutting	544	553	15	
			20	Cutting	417	331	20	CALICHE Grayish brown, hard, no silt, very hard interbedded white layers. Moist soil at 22', saturated at 23'
TD = 24.0 Feet			24	Cutting	NA	162		QUARTZITE Light grayish brown, medium xln, very hard with some cemented sand grains. (Did not penetrate)

LITHOLOGIC LOG (Soil Boring)

R T Hicks Consultants Ltd

P O Box 7624
Midland, TX 79708
(432) 528-3878

BORING NO.: SB-4
SITE ID: Gladiola Pipeline NE Spill
SURFACE ELEVATION: 3871 MSL
CONTRACTOR: Atkins Engineering
DRILLING METHOD: Hollow-Stem
INSTALLATION DATE: 5/5/08
WELL PLACEMENT: West of Recent Source Area
COMMENTS: Lat. 33° 16' 18.0" North, Long. 103° 08' 12.1" West

TOTAL DEPTH: 20.0 Ft
CLIENT: Purvis Operating
COUNTY: Lea County
STATE: New Mexico
LOCATION: T-12-S, R-38-E, Sec. 18 (O)
FIELD REP.: Dale Littlejohn
FILE NAME: \Lithlogs (5-08)

Completion	Lithology	SAMPLE DATA PHOTO	DEPTH	Type	CI (F)	CI (Lab)	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. DEATURES
			0	Cutting	NA	2,570		CLAY Dark brown, with some interbedded caliche.
Bentonite / No Casing			5	Cutting	1,337	1,820	5	SILTY CALICHE Light brown to gray with white caliche gravel, soft drilling with interbedded hard layers.
			10	Cutting	1,264	1,450	10	
			15	Cutting	1,276	1,250	15	Moist soil at 19', saturated at 20'
							20	QUARTZITE Light grayish brown, medium xln, very hard with some cemented sand grains. (Did not penetrate)
TD = 20.0 Feet			20	Cutting	NA	244		

ATTACHMENT B

Laboratory Reports and Chain-of-Custody Documentation From March to May 2008 Characterization Samples

Analytical Report 299611

for

R.T. Hicks Consultants, LTD

Project Manager: Dale Littlejohn

Gladiola NE Spill

L-152-0308

21-MAR-08

12600 West I-20 East Odessa, Texas 79765

Texas certification numbers:
Houston, TX T104704215

Florida certification numbers:
Houston, TX E871002 - Miami, FL E86678 - Tampa, FL E86675
Norcross(Atlanta), GA E87429

South Carolina certification numbers:
Norcross(Atlanta), GA 98015

North Carolina certification numbers:
Norcross(Atlanta), GA 483

Houston - Dallas - San Antonio - Austin - Tampa - Miami - Latin America
Midland - Corpus Christi - Atlanta

21-MAR-08

Project Manager: **Dale Littlejohn**
R.T. Hicks Consultants, LTD
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

Reference: XENCO Report No: **299611**
Gladiola NE Spill
Project Address: Lea Co., NM

Dale Littlejohn:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 299611. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 299611 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Brent Barron, II
Odessa Laboratory Manager

Sample Cross Reference 299611

R.T. Hicks Consultants, LTD, Albuquerque, NM

Gladiola NE Spill

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
Water From SWD Line	W	Mar-13-08 17:55		299611-001

ENVIRONMENTAL LAB OF

Certificate of Analysis Summary 299611

R.T. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Gladiola NE Spill

Project Id: L-152-0308
Contact: Dale Littlejohn
Project Location: Lea Co., NM

Date Received in Lab: Mar-14-08 09:56 am
Report Date: 21-MAR-08
Project Manager: Brent Barron, II

Analysis Requested						
	Lab Id:	299611-001				
	Field Id:	Water From SWD Line				
	Depth:					
	Matrix:	WATER				
	Sampled:	Mar-13-08 17:55				
Anions by EPA 300/300.1	***Extracted:***					
	Analyzed:	Mar-14-08 14:45				
	Units/RL:	mg/L	RL			
Chloride		30500	250			
Sulfate		1480	250			
Metals per ICP by SW846 6010B	***Extracted:***					
	Analyzed:	Mar-17-08 16:36				
	Units/RL:	mg/L	RL			
Calcium		1860	0.100			
Magnesium		314	0.010			
Potassium		619	0.500			
Sodium		14100	0.500			
TDS by SM2540C	***Extracted:***					
	Analyzed:	Mar-14-08 16:00				
	Units/RL:	mg/L	RL			
Total dissolved solids		43900	5.00			
Total Alkalinity by EPA 310.1	***Extracted:***					
	Analyzed:	Mar-20-08 15:20				
	Units/RL:	mg/L	RL			
Alkalinity, Total (as CaCO3)		470	4.00			

Brent Barron
Odessa Laboratory Director

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to effect the recovery of the spike concentration. This condition could also effect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the MQL(PQL) and above the SQL(MDL).

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

* Outside XENCO'S scope of NELAC Accreditation

Blank Spike Recovery

Project Name: Gladiola NE Spill

Work Order #: 299611 **Project ID:** L-152-0308

Lab Batch #: 717712 **Sample:** 717712-1-BKS **Matrix:** Water
Date Analyzed: 03/20/2008 **Date Prepared:** 03/20/2008 **Analyst:** WRU
Reporting Units: mg/L **Batch #:** 1

Total Alkalinity by EPA 310.1 Analytes	Blank Result [A]	BLANK /BLANK SPIKE RECOVERY STUDY Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
Alkalinity, Total (as CaCO3)	ND	200	172	86	80-120	

Lab Batch #: 717587 **Sample:** 717587-1-BKS **Matrix:** Water
Date Analyzed: 03/14/2008 **Date Prepared:** 03/14/2008 **Analyst:** IRO
Reporting Units: mg/L **Batch #:** 1

Anions by EPA 300/300.1 Analytes	Blank Result [A]	BLANK /BLANK SPIKE RECOVERY STUDY Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
Chloride	ND	10.0	9.52	95	85-115	
Sulfate	ND	10.0	8.63	86	90-110	L

Blank Spike Recovery [D] = 100*[C]/[B]
All results are based on MDL and validated for QC purposes.

Form 3 - MS Recoveries

Project Name: Gladiola NE Spill

Work Order #: 299611
Lab Batch #: 717587
Date Analyzed: 03/14/2008
QC- Sample ID: 299637-001 S
Reporting Units: mg/L

Date Prepared: 03/14/2008
Batch #: 1

Project ID: L-152-0308
Analyst: IRO
Matrix: Water

Inorganic Anions by EPA 300	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	82.1	100	193	111	85-115	
Sulfate	68.3	100	170	102	90-110	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

Sample Duplicate Recovery

Project Name: Gladiola NE Spill

Work Order #: 299611

Lab Batch #: 717587 **Project ID:** L-152-0308
Date Analyzed: 03/14/2008 **Date Prepared:** 03/14/2008 **Analyst:** IRO
QC- Sample ID: 299637-001 D **Batch #:** 1 **Matrix:** Water
Reporting Units: mg/L

Anions by EPA 300/300.1	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Chloride	82.1	84.4	3	20	
Sulfate	68.3	70.4	3	20	

Lab Batch #: 717329
Date Analyzed: 03/17/2008 **Date Prepared:** 03/17/2008 **Analyst:** LATCOR
QC- Sample ID: 299654-001 D **Batch #:** 1 **Matrix:** Water
Reporting Units: mg/L

Metals per ICP by SW846 6010B	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Calcium	45.1	45.8	2	25	
Magnesium	22.6	21.8	4	25	
Potassium	8.64	8.45	2	25	
Sodium	172	172	0	25	

Lab Batch #: 717285
Date Analyzed: 03/14/2008 **Date Prepared:** 03/14/2008 **Analyst:** RBA
QC- Sample ID: 299611-001 D **Batch #:** 1 **Matrix:** Water
Reporting Units: mg/L

TDS by SM2540C	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Total dissolved solids	43900	48900	11	30	

Lab Batch #: 717712
Date Analyzed: 03/20/2008 **Date Prepared:** 03/20/2008 **Analyst:** WRU
QC- Sample ID: 299611-001 D **Batch #:** 1 **Matrix:** Water
Reporting Units: mg/L

Total Alkalinity by EPA 310.1	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Alkalinity, Total (as CaCO3)	470	490	4	20	

Spike Relative Difference RPD 200 * | (B-A)/(B+A) |
All Results are based on MDL and validated for QC purposes.

Environmental Lab of Texas

12600 West I-20 East
Odessa, Texas 79765
Phone: 432-563-1800
Fax: 432-563-1713

CHAIN OF CU

Project Manager: Dale Littlejohn — Project

Company Name: RT Hicks Consultants Ltd — Pr

Company Address: P.O. Box 7624 — Proje

City/State/Zip: Midland, Texas 79708

Telephone No: (432) 528-3878 Fax No: (432) 689-4578 (Fax)

Sampler Signature: Dale Littlejohn

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	HNO_3	HCl	NaOH	H_2SO_4	None	Other (Specify)	Matrix: Water	Sludge	Soil	Other (specify):	TPH: 418.1 8015M 1005 1006
29161																
01	Water from SWD line	3/13/08	1755	1	X							X				

Special Instructions: Send Invoice to RT Hicks Consult. 901 Rio Grande Blvd. NW, Suite F-142, Albuquerque, NM 87104; Send results t Dale Littlejohn at the adress above.

Relinquished by:	Date	Time	Received by:	Date	Time
Dale Littlejohn	3/14/08				
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
			Andrea Fan	3.14.08	9:5

#1	Temperature of container/ cooler?				
#2	Shipping container in good condition?	Yes	No		
#3	Custody Seals intact on shipping container/ cooler?	Yes	No	Not Present	
#4	Custody Seals intact on sample bottles/ container?	Yes	No	Not Present	
#5	Chain of Custody present?	Yes	No		
#6	Sample instructions complete of Chain of Custody?	Yes	No		
#7	Chain of Custody signed when relinquished/ received?	Yes	No		
#8	Chain of Custody agrees with sample label(s)?	Yes	No	ID written on Cont./ bid	
#9	Container label(s) legible and intact?	Yes	No	Not Applicable	
#10	Sample matrix/ properties agree with Chain of Custody?	Yes	No		
#11	Containers supplied by ELOT?	Yes	No		
#12	Samples in proper container/ bottle?	Yes	No	See Below	
#13	Samples properly preserved?	Yes	No	See Below	
#14	Sample bottles intact?	Yes	No		
#15	Preservations documented on Chain of Custody?	Yes	No		
#16	Containers documented on Chain of Custody?	Yes	No		
#17	Sufficient sample amount for indicated test(s)?	Yes	No	See Below	
#18	All samples received within sufficient hold time?	Yes	No	See Below	
#19	Subcontract of sample(s)?	Yes	No	Not Applicable	
#20	VOC samples have zero headspace?	Yes	No	Not Applicable	

Variance Documentation

Contact: _____ Contacted by: _____ Date/ Time: _____

Regarding: _____

Corrective Action Taken:

Check all that Apply:

- ☐ See attached e-mail/ fax
- ☐ Client understands and would like to proceed with analysis
- ☐ Cooling process had begun shortly after sampling event

Analytical Report 303250

for

R.T. Hicks Consultants, LTD

Project Manager: Dale Littlejohn

Purvis-Gladiola NE Spill Site

L-152-0508

13-MAY-08

ENVIRONMENTAL LAB OF

12600 West I-20 East Odessa, Texas 79765

Texas certification numbers:
Houston, TX T104704215

Florida certification numbers:
Houston, TX E871002 - Miami, FL E86678 - Tampa, FL E86675
Norcross(Atlanta), GA E87429

South Carolina certification numbers:
Norcross(Atlanta), GA 98015

North Carolina certification numbers:
Norcross(Atlanta), GA 483

Houston - Dallas - San Antonio - Austin - Tampa - Miami - Latin America
Midland - Corpus Christi - Atlanta

13-MAY-08

Project Manager: **Dale Littlejohn**
R.T. Hicks Consultants, LTD
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

Reference: XENCO Report No: **303250**
Purvis-Gladiola NE Spill Site
Project Address: Lea Co., NM

Dale Littlejohn:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 303250. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 303250 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Brent Barron, II
Odessa Laboratory Manager

Sample Cross Reference 303250

R.T. Hicks Consultants, LTD, Albuquerque, NM

Purvis-Gladiola NE Spill Site

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SB-1 (0-1')	S	May-05-08 09:15		303250-001
SB-1 (4-6')	S	May-05-08 09:30		303250-002
SB-1 (10')	S	May-05-08 09:45		303250-003
SB-1 (15')	S	May-05-08 10:00		303250-004
SB-1 (20')	S	May-05-08 10:15		303250-005
SB-2 (0-1')	S	May-05-08 11:30		303250-006
SB-2 (5')	S	May-05-08 11:40		303250-007
SB-2 (10')	S	May-05-08 11:45		303250-008
SB-2 (15')	S	May-05-08 11:50		303250-009
SB-2 (20')	S	May-05-08 11:55		303250-010
SB-2 (24')	S	May-05-08 12:05		303250-011
SB-3 (0-1')	S	May-05-08 12:55		303250-012
SB-3 (5')	S	May-05-08 13:00		303250-013
SB-3 (10')	S	May-05-08 13:05		303250-014
SB-3 (15')	S	May-05-08 13:10		303250-015
SB-3 (20')	S	May-05-08 13:20		303250-016
SB-3 (24')	S	May-05-08 13:30		303250-017
SB-4 (0-1')	S	May-05-08 14:25		303250-018
SB-4 (5')	S	May-05-08 14:30		303250-019
SB-4 (10')	S	May-05-08 14:35		303250-020
SB-4 (15')	S	May-05-08 14:40		303250-021
SB-4 (20')	S	May-05-08 14:45		303250-022

Certificate of Analysis Summary 303250

R.T. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Purvis-Gladiola NE Spill Site

Project Id: L-152-0508
Contact: Dale Littlejohn
Project Location: Lea Co., NM

Date Received in Lab: May-06-08 04:05 pm
Report Date: 13-MAY-08
Project Manager: Brent Barron, II

Analysis Requested									
	Lab Id:	303250-001		303250-002		303250-003		303250-004	
	Field Id:	SB-1 (0-1')		SB-1 (4-6')		SB-1 (10')		SB-1 (15')	
	Depth:								
	Matrix:	SOIL		SOIL		SOIL		SOIL	
	Sampled:	May-05-08 09:15		May-05-08 09:30		May-05-08 09:45		May-05-08 10:00	
BTEX by SW 8260B	***Extracted:***	May-09-08 15:08		May-09-08 15:10					
	Analyzed:	May-09-08 18:35		May-09-08 18:57					
	Units/RL:	mg/kg	RL	mg/kg	RL				
Benzene		ND	0.0045	ND	0.0049				
Toluene		ND	0.0045	ND	0.0049				
Ethylbenzene		ND	0.0045	ND	0.0049				
m,p-Xylenes		ND	0.0091	ND	0.0098				
o-Xylene		ND	0.0045	ND	0.0049				
Naphthalene		ND	0.046	ND	0.049				
Total BTEX		ND		ND					
Total Xylenes		ND		ND					
Inorganic Anions by EPA 300	***Extracted:***								
	Analyzed:	May-07-08 16:52		May-07-08 16:52		May-07-08 16:52		May-07-08 16:52	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		8380	100	8950	100	340	25.0	3360	50.0

Brent Barron
Odessa Laboratory Director

Certificate of Analysis Summary 303250

R.T. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Purvis-Gladiola NE Spill Site

Project Id: L-152-0508
Contact: Dale Littlejohn
Project Location: Lea Co., NM

Date Received in Lab: May-06-08 04:05 pm
Report Date: 13-MAY-08
Project Manager: Brent Barron, II

Analysis Requested									
	Lab Id:	303250-005		303250-006		303250-007		303250-008	
	Field Id:	SB-1 (20')		SB-2 (0-1')		SB-2 (5')		SB-2 (10')	
	Depth:								
	Matrix:	SOIL		SOIL		SOIL		SOIL	
	Sampled:	May-05-08 10:15		May-05-08 11:30		May-05-08 11:40		May-05-08 11:45	
Inorganic Anions by EPA 300	***Extracted:***								
	Analyzed:	May-07-08 16:52		May-07-08 16:52		May-07-08 16:52		May-07-08 16:52	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		387	25.0	3260	50.0	2890	50.0	121	5.00

Brent Barron
Odessa Laboratory Director

Certificate of Analysis Summary 303250
R.T. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Purvis-Gladiola NE Spill Site

Project Id: L-152-0508
Contact: Dale Littlejohn
Project Location: Lea Co., NM

Date Received in Lab: May-06-08 04:05 pm
Report Date: 13-MAY-08
Project Manager: Brent Barron, II

Analysis Requested	*Lab Id:*	303250-009		303250-010		303250-011		303250-012	
	Field Id:	SB-2 (15')		SB-2 (20')		SB-2 (24')		SB-3 (0-1')	
	Depth:								
	Matrix:	SOIL		SOIL		SOIL		SOIL	
	Sampled:	May-05-08 11:50		May-05-08 11:55		May-05-08 12:05		May-05-08 12:55	
Inorganic Anions by EPA 300	*Extracted:*								
	Analyzed:	May-07-08 16:52		May-07-08 16:52		May-07-08 16:52		May-07-08 16:52	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		46.3	5.00	72.5	5.00	105	5.00	6690	200

Brent Barron
Odessa Laboratory Director

Certificate of Analysis Summary 303250
R.T. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Purvis-Gladiola NE Spill Site

Project Id: L-152-0508
Contact: Dale Littlejohn
Project Location: Lea Co., NM

Date Received in Lab: May-06-08 04:05 pm
Report Date: 13-MAY-08
Project Manager: Brent Barron, II

Analysis Requested	*Lab Id:*	303250-013		303250-014		303250-015		303250-016	
	Field Id:	SB-3 (5')		SB-3 (10')		SB-3 (15')		SB-3 (20')	
	Depth:								
	Matrix:	SOIL		SOIL		SOIL		SOIL	
	Sampled:	May-05-08 13:00		May-05-08 13:05		May-05-08 13:10		May-05-08 13:20	
Inorganic Anions by EPA 300	*Extracted:*								
	Analyzed:	May-07-08 16:52		May-07-08 16:52		May-07-08 16:52		May-07-08 16:52	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1180	25.0	766	10.0	553	10.0	331	10.0

Brent Barron
Odessa Laboratory Director

Certificate of Analysis Summary 303250

R.T. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Purvis-Gladiola NE Spill Site

Project Id: L-152-0508
Contact: Dale Littlejohn
Project Location: Lea Co., NM

Date Received in Lab: May-06-08 04:05 pm
Report Date: 13-MAY-08
Project Manager: Brent Barron, II

Analysis Requested									
	Lab Id:	303250-017		303250-018		303250-019		303250-020	
	Field Id:	SB-3 (24')		SB-4 (0-1')		SB-4 (5')		SB-4 (10')	
	Depth:								
	Matrix:	SOIL		SOIL		SOIL		SOIL	
	Sampled:	May-05-08 13:30		May-05-08 14:25		May-05-08 14:30		May-05-08 14:35	
Inorganic Anions by EPA 300	***Extracted:***								
	Analyzed:	May-07-08 16:52		May-07-08 16:52		May-07-08 16:52		May-07-08 16:52	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		162	5.00	2570	50.0	1820	50.0	1450	25.0

Brent Barron
Odessa Laboratory Director

Certificate of Analysis Summary 303250

R.T. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Purvis-Gladiola NE Spill Site

Project Id: L-152-0508
Contact: Dale Littlejohn
Project Location: Lea Co., NM

Date Received in Lab: May-06-08 04:05 pm
Report Date: 13-MAY-08
Project Manager: Brent Barron, II

Analysis Requested							
	Lab Id:	303250-021		303250-022			
	Field Id:	SB-4 (15')		SB-4 (20')			
	Depth:						
	Matrix:	SOIL		SOIL			
	Sampled:	May-05-08 14:40		May-05-08 14:45			
Inorganic Anions by EPA 300	*Extracted:*						
	Analyzed:	May-07-08 14:20		May-07-08 14:20			
	Units/RL:	mg/kg	RL	mg/kg	RL		
Chloride		1250	25.0	244	10.0		

Brent Barron
Odessa Laboratory Director

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to effect the recovery of the spike concentration. This condition could also effect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the MQL(PQL) and above the SQL(MDL).

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

* Outside XENCO'S scope of NELAC Accreditation

Form 2 - Surrogate Recoveries

Project Name: Purvis-Gladiola NE Spill Site

Work Order #: 303250 **Project ID:** L-152-0508

Lab Batch #: 722439 **Sample:** 303250-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg

BTEX by SW 8260B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
4-Bromofluorobenzene	0.0520	0.0500	104	74-121	
Dibromofluoromethane	0.0518	0.0500	104	80-120	
1,2-Dichloroethane-D4	0.0535	0.0500	107	80-120	
Toluene-D8	0.0507	0.0500	101	81-117	

Lab Batch #: 722439 **Sample:** 303250-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg

BTEX by SW 8260B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
4-Bromofluorobenzene	0.0494	0.0500	99	74-121	
Dibromofluoromethane	0.0464	0.0500	93	80-120	
1,2-Dichloroethane-D4	0.0516	0.0500	103	80-120	
Toluene-D8	0.0499	0.0500	100	81-117	

Lab Batch #: 722439 **Sample:** 303250-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg

BTEX by SW 8260B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
4-Bromofluorobenzene	0.0488	0.0500	98	74-121	
Dibromofluoromethane	0.0478	0.0500	96	80-120	
1,2-Dichloroethane-D4	0.0526	0.0500	105	80-120	
Toluene-D8	0.0504	0.0500	101	81-117	

Lab Batch #: 722439 **Sample:** 303250-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg

BTEX by SW 8260B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
4-Bromofluorobenzene	0.0498	0.0500	100	74-121	
Dibromofluoromethane	0.0509	0.0500	102	80-120	
1,2-Dichloroethane-D4	0.0542	0.0500	108	80-120	
Toluene-D8	0.0470	0.0500	94	81-117	

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Purvis-Gladiola NE Spill Site

Work Order #: 303250 **Project ID:** L-152-0508

Lab Batch #: 722439 **Sample:** 508930-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg

BTEX by SW 8260B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
4-Bromofluorobenzene	0.0490	0.0500	98	74-121	
Dibromofluoromethane	0.0482	0.0500	96	80-120	
1,2-Dichloroethane-D4	0.0496	0.0500	99	80-120	
Toluene-D8	0.0496	0.0500	99	81-117	

Lab Batch #: 722439 **Sample:** 508930-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg

BTEX by SW 8260B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
4-Bromofluorobenzene	0.0510	0.0500	102	74-121	
Dibromofluoromethane	0.0534	0.0500	107	80-120	
1,2-Dichloroethane-D4	0.0523	0.0500	105	80-120	
Toluene-D8	0.0502	0.0500	100	81-117	

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Blank Spike Recovery

Project Name: Purvis-Gladiola NE Spill Site

Work Order #: 303250 **Project ID:** L-152-0508

Lab Batch #: 722439 **Sample:** 508930-1-BKS **Matrix:** Solid
Date Analyzed: 05/09/2008 **Date Prepared:** 05/09/2008 **Analyst:** BRS
Reporting Units: mg/kg **Batch #:** 1

BTEX by SW 8260B Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
		BLANK /BLANK SPIKE RECOVERY STUDY				
Benzene	ND	0.0500	0.0511	102	66-142	
Toluene	ND	0.0500	0.0491	98	59-139	
Ethylbenzene	ND	0.0500	0.0559	112	75-125	
m,p-Xylenes	ND	0.1000	0.1102	110	75-125	
o-Xylene	ND	0.0500	0.0484	97	75-125	

Lab Batch #: 722046 **Sample:** 722046-1-BKS **Matrix:** Solid
Date Analyzed: 05/07/2008 **Date Prepared:** 05/07/2008 **Analyst:** LATCOR
Reporting Units: mg/kg **Batch #:** 1

Inorganic Anions by EPA 300 Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
		BLANK /BLANK SPIKE RECOVERY STUDY				
Chloride	ND	10.0	10.6	106	75-125	

Lab Batch #: 722064 **Sample:** 722064-1-BKS **Matrix:** Solid
Date Analyzed: 05/07/2008 **Date Prepared:** 05/07/2008 **Analyst:** LATCOR
Reporting Units: mg/kg **Batch #:** 1

Inorganic Anions by EPA 300 Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
		BLANK /BLANK SPIKE RECOVERY STUDY				
Chloride	ND	10.0	10.2	102	75-125	

Blank Spike Recovery [D] = 100*[C]/[B]
All results are based on MDL and validated for QC purposes.

Form 3 - MS Recoveries

Project Name: Purvis-Gladiola NE Spill Site

Work Order #: 303250
Lab Batch #: 722046
Project ID: L-152-0508
Date Analyzed: 05/07/2008
Date Prepared: 05/07/2008
Analyst: LATCOR
QC- Sample ID: 303250-001 S
Batch #: 1
Matrix: Soil
Reporting Units: mg/kg

Inorganic Anions by EPA 300 Analytes	MATRIX / MATRIX SPIKE RECOVERY STUDY					
	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	8380	2000	12400	201	75-125	X

Lab Batch #: 722064
Date Analyzed: 05/07/2008
Date Prepared: 05/07/2008
Analyst: LATCOR
QC- Sample ID: 303250-021 S
Batch #: 1
Matrix: Soil
Reporting Units: mg/kg

Inorganic Anions by EPA 300 Analytes	MATRIX / MATRIX SPIKE RECOVERY STUDY					
	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	1250	1000	2200	95	75-125	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

ENVIRONMENTAL LAB OF

Form 3 - MS / MSD Recoveries

Project Name: Purvis-Gladiola NE Spill Site

ACCREDITED IN ACCORDANCE WITH nelac

Work Order # : 303250 **Project ID:** L-152-0508

Lab Batch ID: 722439 **QC- Sample ID:** 303250-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 05/09/2008 **Date Prepared:** 05/09/2008 **Analyst:** BRS

Reporting Units: mg/kg

BTEX by SW 8260B Analytes	MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY										
	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	ND	0.2500	0.2854	114	0.2688	0.2944	110	4	66-142	25	
Toluene	ND	0.2500	0.2901	116	0.2688	0.2980	111	4	59-139	25	
Ethylbenzene	ND	0.2500	0.3058	122	0.2688	0.3131	116	5	75-125	25	
m,p-Xylenes	ND	0.5000	0.6013	120	0.5376	0.6123	114	5	75-125	25	
o-Xylene	ND	0.2500	0.2795	112	0.2688	0.2838	106	6	75-125	25	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*(D-G)/(D+G)

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not ApplicableN = See Narrative, EQL = Estimated Quantitation Limit

Sample Duplicate Recovery

Project Name: Purvis-Gladiola NE Spill Site

Work Order #: 303250

Lab Batch #: 722046 **Project ID:** L-152-0508
Date Analyzed: 05/07/2008 **Date Prepared:** 05/07/2008 **Analyst:** LATCOR
QC- Sample ID: 303250-001 D **Batch #:** 1 **Matrix:** Soil
Reporting Units: mg/kg

Inorganic Anions by EPA 300	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Chloride	8380	8750	4	20	

Lab Batch #: 722064
Date Analyzed: 05/07/2008 **Date Prepared:** 05/07/2008 **Analyst:** LATCOR
QC- Sample ID: 303250-021 D **Batch #:** 1 **Matrix:** Soil
Reporting Units: mg/kg

Inorganic Anions by EPA 300	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Chloride	1250	1240	1	20	

Spike Relative Difference RPD 200 * | (B-A)/(B+A) |
All Results are based on MDL and validated for QC purposes.

Environmental Lab of Texas

12600 West I-20 East
Odessa, Texas 79765

Phone: 432-563-1800
Fax: 432-563-1713

CHAIN OF CU

Project Manager: Dale Littlejohn

Company Name RT Hicks Consultants Ltd

Company Address: P O Box 7624

City/State/Zip: Midland, Texas 79708

Telephone No: (432) 528-3878

Fax No: (432) 689-4578 (Fax)

Sampler Signature: Dale Littlejohn

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Proj

LAB # (lab use only) 503250	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice - 0.2 °C / kys	HNO₃	HCl	NaOH	H_2SO_4	None	Other (Specify)	Matrix: Water	Sludge	Soil	Other (specify)	TPH: 418.1 8015M 1005 1006
01	SB-1 (0-1')	5/5/08	0915	1	X									X		
02	SB-1 (4-6')	5/5/08	0930	1	X									X		
03	SB-1 (10')	5/5/08	0945	1	X									X		
04	SB-1 (15')	5/5/08	1000	1	X									X		
05	SB-1 (20')	5/5/08	1015	1	X									X		
06	SB-2 (0-1')	5/5/08	1130	1	X									X		
07	SB-2 (5')	5/5/08	1140	1	X									X		
08	SB-2 (10')	5/5/08	1145	1	X									X		
09	SB-2 (15')	5/5/08	1150	1	X									X		
10	SB-2 (20')	5/5/08	1155	1	X									X		

Special Instructions: Send Invoice to RT Hicks Consult. 901 Rio Grande Blvd. NW, Suite F-142, Albuquerque, NM 87104; Send results t
Dale Littlejohn at the adress above.

Relinquished by:	Date	Time	Received by:	Date	Time
Dale Littlejohn	5/6/08	16:05			
Relinquished by:	Date	Time	Received by ELOT: Andrea Lam	5/6/08	16:0

Environmental Lab of Texas

12600 West I-20 East
Odessa, Texas 79765
Phone: 432-563-1800
Fax: 432-563-1713

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Project Manager: Dale Littlejohn

Company Name: RT Hicks Consultants Ltd

Company Address: P O Box 7624

City/State/Zip: Midland, Texas 79708

Telephone No: (432) 528-3878 Fax No: (432) 689-4578 (Fax)

Sampler Signature: Dale Littlejohn

LAB # (lab use only) 303250	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	HNO_3	HCl	NaOH	H_2SO_4	None	Other (Specify)	Matrix: Water	Sludge	Soil	Other (specify):	TPH: 418.1 8015M 1005 1006
11	SB-2-(24')	5/5/08	1205	1	X									X		
12	SB-3 (0-1')	5/5/08	1255	1	X									X		
13	SB-3 (5')	5/5/08	1300	1	X									X		
14	SB-3 (10')	5/5/08	1305	1	X									X		
15	SB-3 (15')	5/5/08	1310	1	X									X		
16	SB-3 (20')	5/5/08	1320	1	X									X		
17	SB-3 (24')	5/5/08	1330	1	X									X		
18	SB-4 (0-1')	5/5/08	1425	1	X									X		
19	SB-4 (5')	5/5/08	1430	1	X									X		
20	SB-4 (10')	5/5/08	1435	1	X									X		

Special Instructions: Send Invoice to RT Hicks Consult. 901 Rio Grande Blvd. NW, Suite F-142, Albuquerque, NM 87104; Send results to Dale Littlejohn at the adress above.

Relinquished by:	Date	Time	Received by:	Date	Time
Dale Littlejohn	5/6/08	16:05			
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
			Andrea Fam	5/6/08	16:0

Environmental Lab of Texas

12600 West I-20 East
Odessa, Texas 79765
Phone: 432-563-1800
Fax: 432-563-1713

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Project Manager: Dale Littlejohn

Company Name: RT Hicks Consultants Ltd

Company Address: P O Box 7624

City/State/Zip: Midland, Texas 79708

Telephone No: (432) 528-3878 Fax No: (432) 689-4578 (Fax)

Sampler Signature: Dale Littlejohn

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	HNO_3	HCl	NaOH	H_2SO_4	None	Other (Specify)	Matrix: Water	Sludge	Soil	Other (specify):	TPH 418.1 8015M 1005 1006
303250																
21	SB-4-(15')	5/5/08	1440	1	X									X		
22	SB-4 (20')	5/5/08	1445	1	X									X		

Special Instructions: Send Invoice to RT Hicks Consult. 901 Rio Grande Blvd. NW. Suite F-142, Albuquerque, NM 87104; Send results t Dale Littlejohn at the adress above.

Relinquished by:	Date	Time	Received by:	Date	Time
Dale Littlejohn	5/6/08	16:05			
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
			Andrea Sam	5/6/08	16:0

#2	Shipping container in good condition?	Yes	No		
#3	Custody Seals intact on shipping container/ cooler?	Yes	No	Not Present	
#4	Custody Seals intact on sample bottles/ container?	Yes	No	Not Present	
#5	Chain of Custody present?	Yes	No		
#6	Sample instructions complete of Chain of Custody?	Yes	No		
#7	Chain of Custody signed when relinquished/ received?	Yes	No		
#8	Chain of Custody agrees with sample label(s)?	Yes	No	ID written on Cont./ Lid	
#9	Container label(s) legible and intact?	Yes	No	Not Applicable	
#10	Sample matrix/ properties agree with Chain of Custody?	Yes	No		
#11	Containers supplied by ELOT?	Yes	No		
#12	Samples in proper container/ bottle?	Yes	No	See Below	
#13	Samples properly preserved?	Yes	No	See Below	
#14	Sample bottles intact?	Yes	No		
#15	Preservations documented on Chain of Custody?	Yes	No		
#16	Containers documented on Chain of Custody?	Yes	No		
#17	Sufficient sample amount for indicated test(s)?	Yes	No	See Below	
#18	All samples received within sufficient hold time?	Yes	No	See Below	
#19	Subcontract of sample(s)?	Yes	No	Not Applicable	
#20	VOC samples have zero headspace?	Yes	No	Not Applicable	

Variance Documentation

Contact: _____ Contacted by: _____ Date/ Time: _____

Regarding: _____

Corrective Action Taken:

Check all that Apply:

- ☐ See attached e-mail/ fax
- ☐ Client understands and would like to proceed with analysis
- ☐ Cooling process had begun shortly after sampling event

Analytical Report 303247

for

R.T. Hicks Consultants, LTD

Project Manager: Dale Littlejohn

Purvis-Gladiola NE Spill Site

L-152-0508

09-MAY-08

12600 West I-20 East Odessa, Texas 79765

Texas certification numbers:
Houston, TX T104704215

Florida certification numbers:
Houston, TX E871002 - Miami, FL E86678 - Tampa, FL E86675
Norcross(Atlanta), GA E87429

South Carolina certification numbers:
Norcross(Atlanta), GA 98015

North Carolina certification numbers:
Norcross(Atlanta), GA 483

Houston - Dallas - San Antonio - Austin - Tampa - Miami - Latin America
Midland - Corpus Christi - Atlanta

ENVIRONMENTAL LAB OF

09-MAY-08

Project Manager: **Dale Littlejohn**
R.T. Hicks Consultants, LTD
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

Reference: XENCO Report No: **303247**
Purvis-Gladiola NE Spill Site
Project Address: Lea Co., NM

Dale Littlejohn:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 303247. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 303247 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Brent Barron, II
Odessa Laboratory Manager

Sample Cross Reference 303247

R.T. Hicks Consultants, LTD, Albuquerque, NM

Purvis-Gladiola NE Spill Site

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SB-1	W	May-05-08 16:30		303247-001

Project Id: L-152-0508
Contact: Dale Littlejohn
Project Location: Lea Co., NM

Project Name: Purvis-Gladiola NE Spill Site

Date Received in Lab: Tue May-06-08 04:05 pm
Report Date: 09-MAY-08
Project Manager: Brent Barron, II

Analysis Requested							
	Lab Id:	303247-001					
	Field Id:	SB-1					
	Depth:						
	Matrix:	WATER					
	Sampled:	May-05-08 16:30					
Inorganic Anions by EPA 300	***Extracted:***						
	Analyzed:	May-07-08 11:33					
	Units/RL:	mg/L	RL				
Chloride		1370	25.0				

Brent Barron
Odessa Laboratory Director

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to effect the recovery of the spike concentration. This condition could also effect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the MQL(PQL) and above the SQL(MDL).

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

* Outside XENCO'S scope of NELAC Accreditation

Blank Spike Recovery

Project Name: Purvis-Gladiola NE Spill Site

Work Order #: 303247 **Project ID:** L-152-0508

Lab Batch #: 722039 **Sample:** 722039-1-BKS **Matrix:** Water

Date Analyzed: 05/07/2008 **Date Prepared:** 05/07/2008 **Analyst:** LATCOR

Reporting Units: mg/L **Batch #:** 1 **BLANK /BLANK SPIKE RECOVERY STUDY**

Inorganic Anions by EPA 300 Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
Chloride	ND	10.0	9.75	98	85-115	

Blank Spike Recovery [D] = 100*[C]/[B]
All results are based on MDL and validated for QC purposes.

Form 3 - MS Recoveries

Project Name: Purvis-Gladiola NE Spill Site

Work Order #: 303247
Lab Batch #: 722039
Date Analyzed: 05/07/2008
QC- Sample ID: 303249-001 S
Reporting Units: mg/L

Project ID: L-152-0508
Date Prepared: 05/07/2008
Analyst: LATCOR
Batch #: 1
Matrix: Water

Inorganic Anions by EPA 300	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	96.3	100	272	176	85-115	X

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

Sample Duplicate Recovery

Project Name: Purvis-Gladiola NE Spill Site

Work Order #: 303247

Lab Batch #: 722039 **Project ID:** L-152-0508

Date Analyzed: 05/07/2008 **Date Prepared:** 05/07/2008 **Analyst:** LATCOR

QC- Sample ID: 303249-001 D **Batch #:** 1 **Matrix:** Water

Reporting Units: mg/L

Inorganic Anions by EPA 300	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Chloride	96.3	94.9	1	20	

Spike Relative Difference RPD 200 * | (B-A)/(B+A) |
All Results are based on MDL and validated for QC purposes.

Environmental Lab of Texas

12600 West I-20 East
Odessa, Texas 79765
Phone: 432-563-1800
Fax: 432-563-1713

CHAIN OF CU

Project Manager: Dale Littlejohn — Projec

Company Name: RT Hicks Consultants Ltd — Pr

Company Address: P O Box 7624 — Proj

City/State/Zip: Midland, Texas 79708

Telephone No: (432) 528-3878 Fax No: (432) 689-4578 (Fax)

Sampler Signature: Dale Littlejohn

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	HNO_3	HCl	NaOH	H_2SO_4	None	Other (Specify)	Matrix: Water	Sludge	Soil	Other (specify):	TPH: 418.1 8015M 1005 1006
503247																
-01	SB-1	5/5/08	1630	1	X							X				

Special Instructions: Send Invoice to RT Hicks Consult. 901 Rio Grande Blvd. NW, Suite F-142. Albuquerque, NM 87104; Send results t Dale Littlejohn at the adress above.

Relinquished by:	Date	Time	Received by:	Date	Time
Dale Littlejohn	5/6/08	16:05			
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
			Andrea Law	5/6/08	16:0

#1	Temperature of container/ cooler?	Yes	No	2.0 °C	
#2	Shipping container in good condition?	Yes	No		
#3	Custody Seals intact on shipping container/ cooler?	Yes	No	Not Present	
#4	Custody Seals intact on sample bottles/ container?	Yes	No	Not Present	
#5	Chain of Custody present?	Yes	No		
#6	Sample instructions complete of Chain of Custody?	Yes	No		
#7	Chain of Custody signed when relinquished/ received?	Yes	No		
#8	Chain of Custody agrees with sample label(s)?	Yes	No	ID written on Cont./ Lid	
#9	Container label(s) legible and intact?	Yes	No	Not Applicable	
#10	Sample matrix/ properties agree with Chain of Custody?	Yes	No		
#11	Containers supplied by ELOT?	Yes	No		
#12	Samples in proper container/ bottle?	Yes	No	See Below	
#13	Samples properly preserved?	Yes	No	See Below	
#14	Sample bottles intact?	Yes	No		
#15	Preservations documented on Chain of Custody?	Yes	No		
#16	Containers documented on Chain of Custody?	Yes	No		
#17	Sufficient sample amount for indicated test(s)?	Yes	No	See Below	
#18	All samples received within sufficient hold time?	Yes	No	See Below	
#19	Subcontract of sample(s)?	Yes	No	Not Applicable	
#20	VOC samples have zero headspace?	Yes	No	Not Applicable	

Variance Documentation

Contact: _____ Contacted by: _____ Date/ Time: _____

Regarding: _____

_____

Corrective Action Taken:

_____

_____

_____

Check all that Apply:

- ☐ See attached e-mail/ fax
- ☐ Client understands and would like to proceed with analysis
- ☐ Cooling process had begun shortly after sampling event

WARD Laboratories, Inc.

Ag Testing - Consulting

Account No. : 27772

Soil Analysis Report

LITTLEJOHN, DALE T
RT HICKS CONSULTING LTD
PO BOX 7624
MIDLAND **TX** **79708-7624**

Invoice No. : 1033607
Date Received : 06/09/2008
Date Reported : 06/10/2008

Results For : PURVIS OPERATING CO
Location : GLADIOLA SWD SPILL

Lab No. : 44936	Depth : 0 - 1
ID : 0-1	
Saturated Soil Paste Analysis (SAR)	
Saturation, %	47
Sat Paste pH	7.5
Sat Paste ECe, mmho/cm	28.20
HCO_3, ppm	70
Cl, ppm	9710
Ca, ppm	632
Mg, ppm	96
Na, ppm	6116
Sodium Adsorption Ratio	59.8

Reviewed By : Raymond Ward **6/12/2008** **Copy : 1**

Bus: 308-234-2418
Fax: 308-234-1940
web site
www.wardlab.com
4007 Cherry Ave., P.O. Box 788
Kearney, Nebraska 68848-0788

WARD Laboratories, Inc.

Ag Testing - Consulting

Account No. : 27772

Soil Analysis Report

LITTLEJOHN, DALE T
RT HICKS CONSULTING LTD
PO BOX 7624
MIDLAND **TX** **79708-7624**

Invoice No. : 1033607
Date Received : 06/09/2008
Date Reported : 06/10/2008

Results For : PURVIS OPERATING CO
Location : GLADIOLA SWD SPILL

Lab No. : 44937 **Depth :** 5 ft
ID : 5

Saturated Soil Paste Analysis (SAR)	
Saturation, %	29
Sat Paste pH	7.8
Sat Paste ECe, mmho/cm	20.30
HCO_3, ppm	23
Cl, ppm	7960
Ca, ppm	408
Mg, ppm	140
Na, ppm	4060
Sodium Adsorption Ratio	44.1

Reviewed By : Raymond Ward **6/12/2008** **Copy : 1**

Bus: 308-234-2418
Fax: 308-234-1940
web site
www.wardlab.com
4007 Cherry Ave., P.O. Box 788
Kearney, Nebraska 68848-0788

RT Hicks Consultants Ltd

RT Hicks Consultants Ltd
P.O. Box 7624
Midland, Texas 79708
(432) 528-3878
(432) 689-4578 (Fax)
Email: dale@rthicksconsult.com

37772

L-152-5

Chain of Custody

Date 5-28-08 Page 1 of 1

Lab Name: Ward Laboratories, Inc.
Address: 4007 Cherry Ave.
Kearney, Nebraska 68848
Telephone: (308) 234-2418
Contact: Raymond C. Ward

Samplers (SIGNATURES): Dale Littlejohn

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005) Ext. to 35	TPH (TX-1006) * Highest	GRO (EPA 8015G)	DRO (EPA 8015G)	TDS (SM 2540C)	Anions/Cations	Total Metals	TCLP Metals	Chloride (EPA 300)	Salinity/Sodium Evaluation		TEG		Number of Containers
N934 Gladiola NE Spill (0 - 1' deep)	Soil	5/5/08	N/A	C																X				1
937 Gladiola NE Spill (5' deep)	Soil	5/5/08	N/A	C																X				1

Project Information		Sample Receipt	
Project Client:	Purvis Operating Co.	Total Containers:	
Project Name:	Gladiola SWD Spill	COC Seals:	
Project Location:	T-12-S, R-37-E, S-25-A	Rec'd Good Cond/Cold:	
Project Manager:	Dale Littlejohn	Conforms to Records:	
~~UPS~~ ~~FedEx~~ Tracking No.:	NE688 1-01	Lab No.:	
Template/Prelogin:		Cooler No.:	

Special Instructions/Comments:

Send Invoice to RT Hicks Consult, 901 Rio Grande Blvd. NW, Suite F-142, Albuquerque, NM 87104; Send results to Dale Littlejohn at the adress above.

	Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
(Company)	RT Hicks Consultants, Ltd	Ward Laboratories Inc	
(Printed Name)	Dale T. Littlejohn	Raymond Ward	
(Signature)	Dale Littlejohn	Raymond Ward	
(Date) / (Time)	5/28/08 1200	5-28-08 4pm	
	Received By: (1)	**Received By: (2)**	**Received By: (3)**
(Company)	Ward Laboratories Inc		
(Printed Name)	CS Coffee		
(Signature)			
(Date) / (Time)	5-28		

Copy signed original form for RT Hicks Consultants records

ATTACHMENT C

Review of Proposed Remedy:
Robert P. Flynn, Ph. D., New Mexico State University
and Kerry Sublette Ph. D., University of Tulsa

Dale Littlejohn

From: Dale Littlejohn [dale@rthicksconsult.com]

Sent: Friday, July 25, 2008 11:34 AM

To: 'Donnie Brown'; 'Sublette, Kerry'; Robert Flynn (rflynn@nmsu.edu); Randy Hicks (Randy Hicks)

Subject: Brine Spill in New Mexico

Gentleman,

The attached document is a proposal to remediate a brine water spill near Tatum, New Mexico. As discussed to some extent earlier, either with myself or Randy Hicks, we (and our client) would greatly appreciate your professional input for this project, particularly with respect to the proposed remedy. With you permission, we would like to include your comments, either as a response to this email or some other format of your preference, as an attachment to the final report to the NMOCD.

Please contact myself or Randy Hicks if you have any questions or require additional information. We look forward to hearing from you.

Thanks,

Dale T Littlejohn, PG
R T Hicks Consultants Ltd
(432) 528-3878 (office)
(432) 689-4578 (fax)

Dale Littlejohn

From: Robert Paul Flynn [rflynn@nmsu.edu]
Sent: Friday, August 01, 2008 7:47 AM
To: dale@rthicksconsult.com
Subject: Gladiola Report

The report looked good. I suspect it will be some time before the soil ec will drop to below 4 mmhos/cm.
Weeds will be a concern during this reclamation phase. There are a few warm-season grass species that have adequate salt tolerance that should be included in the establishment phase before the soil reaches 4 mmhos/cm. With any "luck" these species could help keep weedy species to a minimum.

-Robert Flynn

Robert P. Flynn, Ph.D.
Associate Professor, Ext. Plant Sci.
NMSU Agricultural Science Center
67 E. Four Dinkus Rd.
Artesia, NM 88210
575-748-1228 office, 575-748-1229 fax

Dale Littlejohn

From: Sublette, Kerry [kerry-sublette@utulsa.edu]
Sent: Tuesday, August 12, 2008 1:17 PM
To: Dale Littlejohn
Subject: RE: Gladiola and NE Gladiola Reports

Dale,

The following are comments on the proposed remediation plan for the Gladiola NE release site.

It is proposed to add 31,000 lbs of gypsum to this site as a calcium amendment. I agree that calcium is needed. I looked up the average annual rainfall for Tatum and its 16 inches. For a 1.4 acre site, that's enough water to dissolve only about 1500 lbs of gypsum per year assuming perfect contacting. I would suggest that the gypsum be added incrementally on an annual basis along with more hay and tilling to improve permeability.

I apologize for not getting these comments to you yesterday, I just got swamped with meetings. I'll have comments on the other proposal later today.

For your future consideration my company in cooperation with Bovaird Supply has developed a new amendment for brine spills that supplies soluble calcium in soil to fight sodicity which requires much less water than gypsum.

Kerry

From: Dale Littlejohn [mailto:dale@rthicksconsult.com]
Sent: Thursday, August 07, 2008 1:00 PM
To: 'Sublette, Kerry'
Subject: RE: Gladiola and NE Gladiola Reports

That would be great

Thanks,

Dale T Littlejohn, PG
R T Hicks Consultants Ltd
(432) 528-3878 (office)
(432) 689-4578 (fax)

From: Sublette, Kerry [mailto:kerry-sublette@utulsa.edu]
Sent: Thursday, August 07, 2008 11:56 AM
To: Dale Littlejohn
Subject: RE: Gladiola and NE Gladiola Reports

Dale,

I have just returned from an 8-day vacation. I can have comments to you by Monday. Is that OK?

Kerry

From: Dale Littlejohn [mailto:dale@rthicksconsult.com]
Sent: Thursday, August 07, 2008 11:31 AM
To: kerry-sublette@utulsa.edu
Cc: Randy Hicks (Randy Hicks)

Subject: Gladiola and NE Gladiola Reports

Randy asked me to check with you concerning the status of your review and comments of these projects as our client would like to have these sent to the OCD as soon as possible.

Please contact Randy or myself if you need anything in that regard.

Thanks,

Dale T Littlejohn, PG
R T Hicks Consultants Ltd
(432) 528-3878 (office)
(432) 689-4578 (fax)

Dale Littlejohn

From: Dale Littlejohn [dale@rthicksconsult.com]
Sent: Friday, August 15, 2008 5:26 PM
To: Larry Johnson
Cc: 'Donnie Brown'; Randy Hicks (Randy Hicks)
Subject: Purvis Operating Gladiola Northeast Spill Report NMOCD #not assigned

Larry,

Please find the attached report concerning proposed actions at the Purvis Northeast Gladiola site. A hard copy will follow via regular mail. Please contact me if you have any questions or require additional information.

Thanks,

Dale T Littlejohn, PG
R T Hicks Consultants Ltd
(432) 528-3878 (office)
(432) 689-4578 (fax)

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

April 8, 2008

Mr. Larry Johnson
Oil Conservation Division
1625 North French Drive
Hobbs, New Mexico 88240
Via E-Mail and US Mail

RE: Gladiola SWD (NE Release Site) T12S R38E Section 18 Unit Letter O
NMOCD # Not Assigned

Mr. Johnson:

On March 13, 2008 R T Hicks Consultants (RTH) was retained by Purvis Operating (Purvis) to investigate a release of produced water which occurred from the Gladiola SWD pipeline earlier that day. The location of the release is shown on Plate 1. Hicks Consultants proposes that the following corrective actions be performed to characterized the extent of the chloride-impacted soil and evaluate the potential threat to the underlying ground water. Before mid-May we plan to:

I. Collect soil samples at 2.5-foot intervals (from the surface to the ground water depth or the base of chloride impact as defined below) at three locations within the area of the recent spill and one location within the area of a historic spill that was not effected by the recent spill, as shown on Plate 2

II. Evaluate chloride mass in the vadose zone
   a. Use field evaluation methods to determine the chloride concentrations in the soil during the drilling operations and
   b. submit representative samples to the laboratory for verification of field chloride results and gravimetric soil moisture

III. Install a 2-inch monitoring well immediately southeast of the spill area if the following conditions are **not** met in one or more of the soil borings:
   a. The occurrence of five consecutive samples that exhibit decreasing concentrations with depth and the deepest sample containing less than 500 ppm chloride or
   b. The occurrence of three consecutive samples that exhibit concentrations of less than 500 ppm chloride

IV. Employ the data collected from the boring program to simulation the chloride transport relative to ground water and submit the results of the simulation and field program to NMOCD in a brief report.

Restoration of vegetation may not necessary as the recent release covered an area impacted by a spill that occurred between 1968 and 1997 (based on historic aerial photographs). However re-vegetation of native species may be recommended pending the results of the simulation modeling. Access to the site is subject to landowner approval and we have sent this plan to the landowner as a first step in gaining access.

We look forward to working with you to bring this site into full compliance with NMOCD Rules.

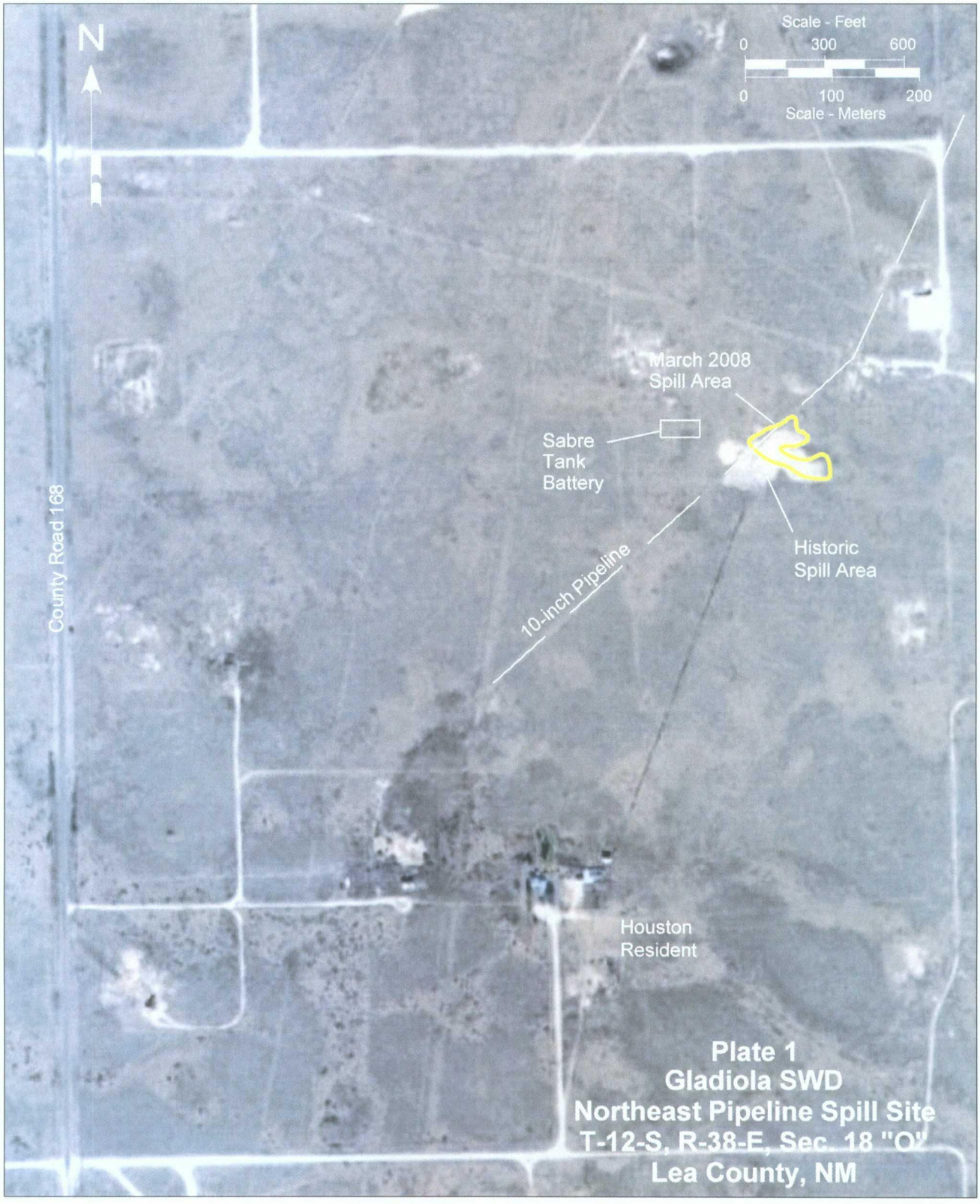
Sincerely,

Dale T. Littlejohn

Dale Littlejohn
R.T. Hicks Consultants, Ltd.

cc: Purvis Operating Company

Mr. Dean Kinsolving (Landowner)
P O Box 100
Crossroads, New Mexico 88114


N
Scale - Feet
0
300
600
0
100
200
Scale - Meters
March 2008
Spill Area
Sabre
Tank
Battery
Historic
Spill Area
10-inch Pipeline
County Road 168
Houston
Resident
Plate 1
Gladiola SWD
Northeast Pipeline Spill Site
T-12-S, R-38-E, Sec. 18 "O"
Lea County, NM

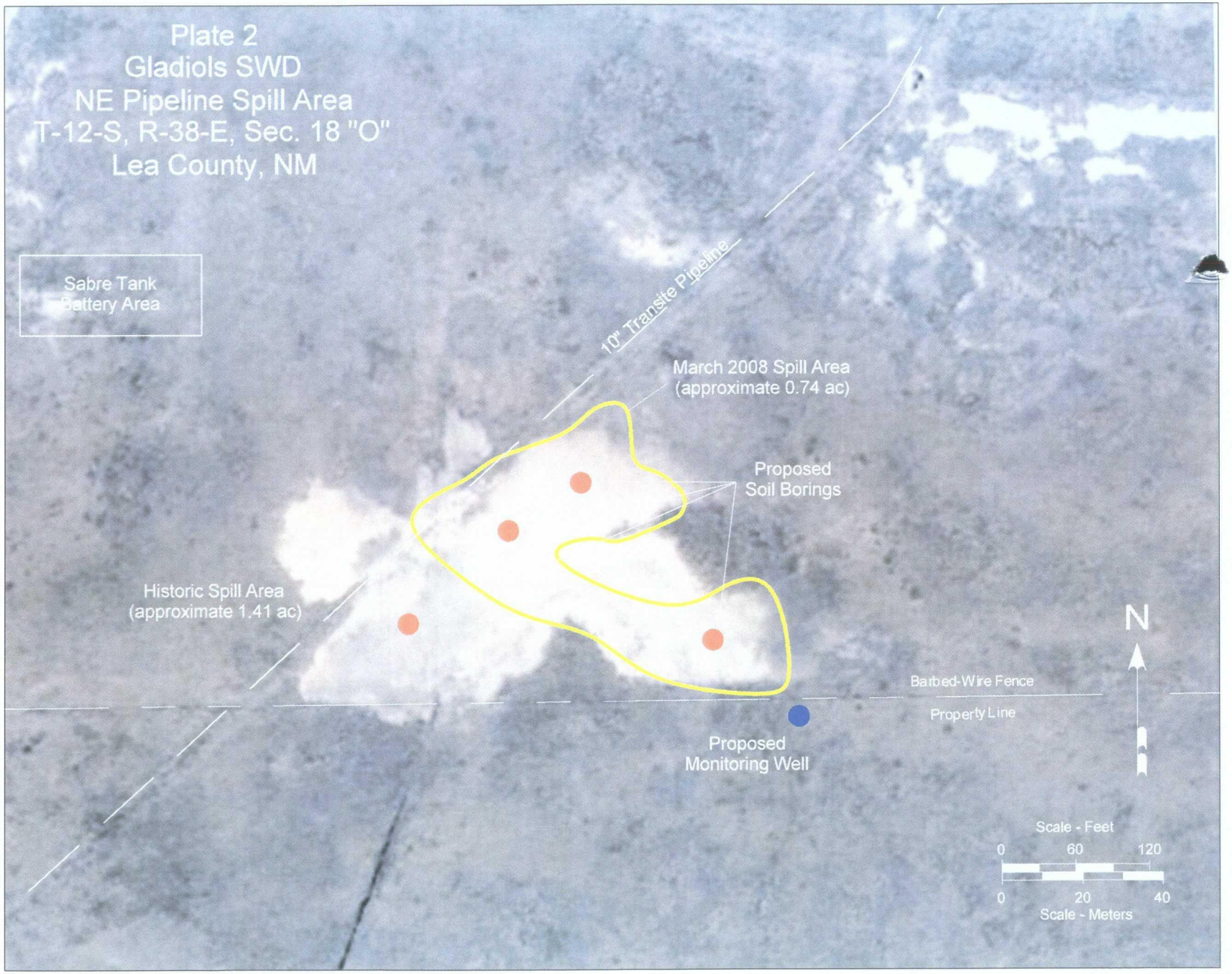


Plate 2
Gladiols SWD
NE Pipeline Spill Area
T-12-S, R-38-E, Sec. 18 "O"
Lea County, NM
Sabre Tank Battery Area
10" Transite Pipeline
March 2008 Spill Area (approximate 0.74 ac)
Proposed Soil Borings
Historic Spill Area (approximate 1.41 ac)
Barbed-Wire Fence
Property Line
Proposed Monitoring Well
N
Scale - Feet
0 60 120
0 20 40
Scale - Meters