

May 23, 2011

**AMARILLO** 921 North Bivins Amarillo, Texas 79107 Phone 806.467.0607 Fax 806.467.0622

Mr. Mike Bratcher NMOCD District 2 1301 West Grand Avenue

RECEIVED MAY **26** 2011 NMOCD ARTESIA

ARTESIA

408 West Texas Ave. Artesia, New Mexico 88210 Phone 575.746.8768 Fax 575.746.8905

AUSTIN

9II West Anderson Lane Suite 202 Austin, Texas 78757 Phone 512,989,3428 Fax 512.989.3487

HOBBS

318 East Taylor Street Hobbs, New Mexico 88240 Phone 575 393 4261 Fax 575.393.4658

MIDLAND

290I State Hwy 349 Midland, Texas 79706 Phone 432.522.2133 Fax 432.522.2180

SAN ANTONIO

II Commercial Place Schertz, Texas 78154 Phone 210.265.8025 Fax 210.568.2191

TULSA

525 South Main Street Suite 535 Tulsa, Oklahoma 74103 Phone 918.742.0871 Fax 918.382.0232

ENVIRONMENTAL CONSULTING **ENGINEERING** 

DRILLING CONSTRUCTION SPILL MANAGEMENT **GENERAL CONTRACTING**  Artesia, NM 88210

Subject:

Soil Assessment and Remediation Work Plan

Linn Operating, New Mexico Keel A No. 34 release API No. 30-015-28233

Dear Mr. Bratcher,

Linn Operating has contracted Talon/LPE (Talon) to perform soil assessment and remediation services at the referenced Keel A No. 34 release. The results of Talon's soil assessment and our proposed remediation activities consist of the following:

### **Incident Date**

September 23, 2010

### **Background Information**

The Keel A No. 34 release is located approximately thirty-one (31) miles east of Artesia, New Mexico. The legal location for the site is Section 7, Township 17S and Range 31E in Eddy County, New Mexico. More specifically, the latitude & longitude for the release are 32.84473 North and -103.90761 West.

This site lies on undulating plains and low hills consisting of wind worked sandy deposits. Drainage courses in this area are normally dry. The local surface and shallow geology includes silty and clayey soils under lain by dense caliche and sand stone layers. The New Mexico State Engineer web site indicates the nearest ground water data to be in S19-T16S-R32E. The ground water in Section 19 is reported to be at an average depth of 220' below ground surface (bgs). A copy is attached as Appendix I.

The ranking for this site is 0 based on the as following:

Depth to ground water >100' Wellhead Protection Area >1000' Distance to surface water body >1000°

Toll Free: 866.742.0742 www.talonipe.com

### **Incident Description**

On October 23, 2010 a below grade, 2-inch high pressure fiberglass injection line ruptured. The injection system was shut-in, excavated and repaired. Eighty (80) barrels of produced water were released. A vacuum truck was brought to the location and sixty (60) barrels of produced water were subsequently recovered. The release flowed to the south of the injection line in a narrow flow path estimated to be eight (8) feet wide by fifty-nine (59) feet long. The produced water then pooled between the sand dunes located south of the injection line. The pooling area was measured to be eighty-seven feet (87') long by forty-seven feet (47') wide.

### **Actions Taken**

On October 21, 2010 Talon personnel and a geoprobe rig were on site to begin the assessment and soil sampling for the construction of a work plan. A Geoprobe unit is a small skid-mounted drill rig that utilizes direct-push sampling technology to collect undisturbed soil samples. Two (2) soil borings were advanced into the impacted area. Soil boring S-1 was drilled and then abandoned after the core barrel was stuck in the borehole. A second soil boring, S-2, was then advanced to a depth of thirty-two feet (32') bgs. Soil samples were collected from soil boring S-2 by Talon personnel wearing clean nitrile gloves. The soil samples were placed in laboratory provided sample containers, stored on ice and transported to Cardinal Lab in Hobbs, New Mexico for analysis. The chlorides were tested using method SM4500CL-B. All analytical testing was performed on a standard turn-around basis. The complete laboratory report is attached as Appendix II.

### **Analytical Results**

Analytical results received from Cardinal Laboratories are summarized below:

Sample, Depth	<u>Chlorides</u>	Sample, Depth	Chlorides
S-2, 0'-feet	2400 mg/kg	S-2, 12'	4080 mg/kg
S-2, 2'	5440	S-2, 16'	4840
S-2, 4'	4080	S-2, 20'	6000
S-2, 6'	2560	S-2, 24'	5200
S-2, 8'	6320	S-2, 32'	7720
S-2, 10'	1340		

### **Summary and Conclusions**

- Ground water in the project vicinity is greater than 100-feet below land surface per the New Mexico State Engineer Database.
- Refusal occurred at 32-feet below ground surface when a hard rock barrier was encountered.
- Based on the depth to groundwater and the hard rock barrier encountered, it is unlikely that the chloride impacts from this release will pose at threat to groundwater.

### **Proposed Remedial Actions**

- The chloride impacted soil will be excavated to a deep of four feet (4') bgs. The removed soil will be transported to an NMOCD approved solid waste disposal facility (Lea Land, LLC) for disposal. A compacted 1-foot thick clay barrier will be installed into the excavated area. The excavated area will be backfilled to grade using new soil from a local borrow pit.
- A final report including Form C-141 will be provided to the NMOCD Artesia Office.

If we can be of further assistance or if additional information is required, please contact our office at 575-746-8768 or by email at mstubblefield@talonlpe.com

Respectfully submitted,

TALON/LPE

Mike Stubblefield Project Manager

milestablefield

David J. Adkins District Manager

### APPENDIX I

### INITIAL C-141 FORM GROUND WATER DATA

District I 1625 N. French Dr., Hobbs, NM 88240 District II District III
1000 Rio Brazos Road, Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

a.w 12-165-31E 788 551

### State of New Mexico Energy Minerals and Natural Resources

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back

Form C-141

Revised October 10, 2003

side of form

### Release Notification and Corrective Action

						<b>OPERA</b>	ГOR	$\boxtimes$	Initi	al Report		Final	Report				
		inn operatin				Contact De	ennis Potter										
Address 13	3694 Lovin	gton hwy. Le	oco Hills	, N.M. 88255		Telephone No. 505-206-7673											
Facility Nat	me Keel A	# 34				Facility Type Producing well											
Surface Ow	mer B.L.N	1.		Mineral O	)wner	Fed. Gov't	•		.ease l	No. API#:	30-01	5-2823	33				
30.010	* ***			E OCA	TTO	N OF REI	FACE										
Unit Letter	Section	Township	Range	Feet from the		South Line		East/West	Lina	County			· · · · · · ·				
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	Dennis Pott					Date and H											
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regulations all public health of should their of	operators are or the environ perations have ment. In add	re required to a nment. The a re failed to ad- lition, NMOC	report and cceptance equately i D accepta	l/or file certain rel of a C-141 report nvestigate and rer	lease no t by the mediate	tifications and NMOCD may contamination	mowledge and und d perform correctiv rked as "Final Repo n that pose a threat the operator of resp	e actions to ort" does r to ground	for rele tot relic l water.	ases which reve the opera surface wat	nay end tor of l er, hun	langer liability nan healt	th				
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Den	و نس	. Post															
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Printed Name:	Dennis J.	Potter				-hbro one of p	rearior output visor.										
Title: Product	tion Speciali	st / Ass't. Pro	duction F	oreman.	^	pproval Date:		Expir	ation D	Pate:							
E-mail Address	s: dpotter(	@linnenengy.c	com		c	onditions of A	Approval:			Attached							
Date:			Phone:	505-206-7673													
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# New Mexico Office of the State Engineer Water Column/Average Depth to Water

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RA 11590 POD4		ED	4	1	1	32	178	31E	603308	3629253	5992	55		
RA 11590 POD3		ED	3	1	2	32	178	31E	603932	3629260	6113	60		
RA 11590 POD1		ED	2	7	3	32	178	31E	603315	3628545	6694	158		
L 10206	STK	LE		2	2	23	168	31E	609045	3642204*	9687	280		
L 10203	STK	LE	4	4	2	14	16 <b>S</b>	31E	609130	3643310*	10571	310		
L 03435 APPRO	PRO	LE		1	1	05	16S	31E	602954	3646955*	11794			
L 04639 APPRO	STK	LE		4	2	19	168	32E	612271	3641840*	11927	251	220	31
L 04671	PRO	LE	1	1	2	12	16S	31E	610114	3645538*	12931	340	288	52
L 04671 APPRO	PRO	LE	1	î	2	12	165	31E	610114	3645538*	12931	340	288	52
RA 10175	SAN	LE		2	1	28	178	32E	614814	3631005*	13114	158		
CP 00896	STK	ED	1	4	4	14	185	31E	609166	3623396*	13591	400		
RA 08855	DOM	LE	4	1	1	10	178	32E	616061	3635742*	13692	158		
L 04974	PRO	LE		3	3	16	165	32E	614272	3642664*	14054	330	280	50
L 04974 (3)	PRO	LE		3	3	16	168	32E	614272	3642664*	14054	300	97	203
RA 09505	PDL	LE	2	2	1	10	175	32E	616462	3635944	14103	147		
RA 09505 S	PDL	LE	2	2	1	10	178	32E	616463	3635945*	14104	144		
L 06557	STK	LE		1	4	21	165	32E	615089	3641466*	14181	295	210	85
CP 00672	STK	LE		4	4	07	18\$	32E	612475	3624947*	14370	540	460	80
L 04021	MUN	LE		3	4	03	178	32E	616761	3636252*	14421	247		
L 10208	DOM	LE		2	3	32	158	31E	607822	3648614*	14499	313		
L 10205	STK	LE		4	1	80	168	32E	613038	3645066*	14541	330		
L 04021 S	MUN	LE	4	3	2	03	175	32E	616850	3636955*	14579	260		
L 08084	IND	LE	1	1	1	16	168	32E	614157	3643970*	14699	317	260	57
CP 00566	DOM	LE	4	4	1	04	185	32E	614960	3627280*	14851	133	65	68
CP 00818	STK	LE		1	4.	26	185	30E	599289	3620364*	15129	240		
L 07823	PRO	LE	2	1	2	16	165	32E	615160	3643977*	15518	269	247	22
L 10207	STK	LE		2	2	32	158	31E	608619	3649425*	15556	310		
RA 11684 POD1	COM	LE	1	1	4	11	17S	32E	618216	3635124	15836	275		
L 02752	DOM	LE		1	3	26	165	32E	617521	3639880*	15855	324	280	44
"UTM location was derived from PLS:	5 - see He	lp.												

### APPENDIX II

### LABORATORY REPORT



November 19, 2010

MIKE STUBBLEFIELD

TALON LPE

408 W. TEXAS AVE.

ARTESIA, NM 88210

RE: J. L. KEEL A #34

Enclosed are the results of analyses for samples received by the laboratory on 11/16/10 10:15.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021

Benzene, Toluene, Ethyl Benzene, and Total Xylenes

Method SW-846 8260

Benzene, Toluene, Ethyl Benzene, and Total Xylenes

Method TX 1005

Total Petroleum Hydorcarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2

Haloacetic Acids (HAA-5)

Method EPA 524.2

Total Trihalomethanes (TTHM)

Method EPA 524.4

Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

Celey D. Keine



### Analytical Results For:

TALON LPE MIKE STUBBLEFIELD 408 W. TEXAS AVE. ARTESIA NM, 88210 Fax To: (575) 745-8905

Received:

11/16/2010

Reported:

11/19/2010

Project Name: Project Number: J. L. KEEL A #34 700813.003.01

Project Location:

SEC. 7-17S-31E

Sampling Date:

11/04/2010

Sampling Type:

Soil

Sampling Condition: Sample Received By: Cool & Intact

Hope S. Moreno

### Sample ID: 001 S-2 0' BGS (H021309-01)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2400	16.0	11/18/2010	ND	432	108	400	3.64	
Sample ID: 002 S-2 2' BG	•	-							
Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	5440	16.0	11/18/2010	ND	432	108	400	3.64	
Sample ID: 003 S-2 4' B0	SS (H021309	-03)							
Chloride, SM4500Cl-B	mg	-	Analyze	d By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	4080	16.0	11/18/2010	ND	432	108	400	0.00	
Chloride Sample ID: 004 S-2 6' BG			11/18/2010	ND	432	108	400	0.00	
Sample ID: 004 S-2 6' BG		-04)	i	ND d By: HM	432	108	400	0.00	
Sample ID: 004 S-2 6' BG	SS (H021309	-04)	i		432 BS	108 % Recovery	400 True Value QC	0.00 RPD	Qualifier
Sample ID: 004 S-2 6' BC Chloride, SM4500Cl-B Analyte	GS (H021309 mg	-04) /kg	Analyze	d By: HM					Qualifier
Sample ID: 004 S-2 6' BC Chloride, SM4500Cl-B Analyte Chloride	GS (H021309 mg Result 2560	-04) /kg Reporting Limit 16.0	Analyze Analyzed	d By: HM Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sample ID: 004 S-2 6' BC Chloride, SM4500Cl-B	GS (H021309 mg Result 2560	Reporting Limit	Analyze Analyzed 11/18/2010	d By: HM Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sample ID: 004 S-2 6' BG Chloride, SM4500Cl-B  Analyte Chloride  Sample ID: 005 S-2 8' BG	Result 2560 GS (H021309	Reporting Limit	Analyze Analyzed 11/18/2010	<b>d By: HM</b> Method Blank  ND	BS	% Recovery	True Value QC	RPD	Qualifier Qualifier

### Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keine



### Analytical Results For:

TALON LPE MIKE STUBBLEFIELD 408 W. TEXAS AVE. ARTESIA NM, 88210 (575) 745-8905 Fax To:

Received:

11/16/2010

Reported: Project Name: 11/19/2010

J. L. KEEL A #34

Project Number: Project Location: 700813.003.01 SEC. 7-17S-31E Sampling Date:

11/04/2010

Sampling Type:

BS

432

Soil

Sampling Condition:

Cool & Intact

Sample Received By:

Hope S. Moreno

Sample ID: 006 S-2 10' BGS (H021309-06)

Chloride,	SM4500CI-B
-----------	------------

Analyzed By: HM

Analyte

Result

1340

Reporting Limit

16.0

Analyzed 11/18/2010 Method Blank ND

% Recovery

True Value OC

RPD

Qualifier

Sample ID: 007 S-2 12' BGS (H021309-07)

Chloride, SM4500CI-B

Analyte

Analyte

mg/kg

Analyzed By: HM

400

0.00

Analyzed

Method Blank

% Recovery

Qualifier

Chloride

Chloride

Result 4080

16.0

Reporting Limit

11/18/2010

ND

BS 432

108

108

True Value QC 400

RPD

0.00

Sample ID: 008 S-2 16' BGS (H021309-08)

Chloride, SM4500Cl-B

Analyzed By: HM

Method Blank

BS % Recovery

RPD

Qualifier

Chloride

Result 4840

Result

6000

Result

5200

16.0

Reporting Limit

Analyzed 11/18/2010

432

108

True Value OC 400

Analyte

Analyte

Analyzed By: HM

0.00

Sample ID: 009 S-2 20' BGS (H021309-09)

Chloride, SM4500Cl-B

Reporting Limit

16.0

Reporting Limit

16.0

Analyzed 11/18/2010

Analyzed

11/18/2010

Method Blank ND

Method Blank

ND

ND

BS 432

BS

432

% Recovery

% Recovery

108

True Value OC

RPD

Qualifier

Chloride

Chloride

Sample ID: 010 S-2 24' BGS (H021309-10)

Chloride, SM4500Cl-B

mg/kg

Analyzed By: HM

108

400

True Value QC

400

0.00

RPD

0.00

Qualifier

Cardinal Laboratories

\*=Accredited Analyte

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### Analytical Results For:

TALON LPE MIKE STUBBLEFIELD 408 W. TEXAS AVE. ARTESIA NM, 88210

Fax To: (575)

(575) 745-8905

Received:

11/16/2010

Reported:

11/19/2010

Project Name: Project Number: J. L. KEEL A #34 700813.003.01

Project Location:

SEC. 7-17S-31E

Sampling Date:

11/04/2010

Sampling Type:

Soil

Sampling Condition:

Cool & Intact

Sample Received By:

Hope S. Moreno

### Sample ID: 011 S-2 32' BGS (H021309-11)

Chloride, SM4500CI-B	mg,	/kg	Analyze	d By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	7720	16.0	11/18/2010	ND	432	108	400	0.00	

Cardinal Laboratories

\*=Accredited Analyte

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Celuy D. Keine



#### **Notes and Definitions**

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

\*\* Samples not received at proper temperature of 6°C or below.

\*\*\* Insufficient time to reach temperature.

Chloride by SM4500Cl-B does not require samples be received at or below 6°C

Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keine

## ARDINAL LABORATORII

### CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

(5)	05) 393-2326 FAX (5	05) 393-2476																						1-1	1
many Name:	Talon 1 LPE								翻網	_	BIL	LTO		}				ANA	LYS	IS R	EQU	EST		<del></del>	<u> </u>
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Page 6 of 7

# ARDINAL LABORATORIES 101 East Marland, Hobbs, NM 88240

### CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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