1R - 425-38

WORKPLANS

DATE:
4-28-08

L. Peter Galusky, Jr. Ph.D., P.G.
Texerra

IR425-38

May 28th, 2008

Mr. Edward Hansen
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87504

RE: **Investigation and Characterization Plan**
Rice Operating Company – Vacuum SWD System
VAC Jct M-5 Unit M Sec 5 T18S R35E

Sent via E-mail & U.S. Certified Mail w/ Return Receipt 7007 0710 0003 0305 3736

Dear Mr. Hansen:

RICE Operating Company (ROC) has retained Texerra to address potential environmental concerns at the above-referenced site. ROC is the service provider (agent) for the Vacuum SWD System and has no ownership of any portion of the pipeline, well, or facility. The System is owned by a consortium of oil producers, System Partners, who provide all operating capital on a percentage ownership/usage basis. Environmental projects of this magnitude require System Partner AFE approval, and work begins as funds are received. In general, project funding is not forthcoming until NMOCD approves the work plan. Therefore, your timely review of this submission would be greatly appreciated.

For all such environmental projects, ROC will choose a path forward that:

- protects public health,
- provides the greatest net environmental benefit,
- complies with NMOCD Rules, and
- is supported by good science.

Each site shall generally have three submissions, as described below:

1. This Investigation and Characterization Plan (ICP) is proposed for data gathering and site characterization and assessment.

2. Upon evaluating the data and results from the ICP, a recommended remedy will be submitted in a Corrective Action Plan (CAP) if this is warranted.

3. Finally, after implementing the remedy, a Closure Report with final documentation will be submitted.

Background and Previous Work

The site is located approximately one mile southeast of Buckeye, New Mexico (Figure 1). The topography is gently sloping toward the southeast. Soils on the site are mapped (as KO) in the Lea County Soil Survey as belonging to the Kimbrough gravelly loam soil series. These are characterized by gravelly loam to a depth of approximately 6 inches, and this is underlain by several feet of calcium indurated caliche. NM OSE records indicate that groundwater is likely to be encountered at a depth of approximately 77+/- feet, occurring in unconsolidated Tertiary alluvium of the Ogallala Formation.

As part of the abandonment and closure of the Vacuum SWD system, Rice Operating Company (ROC) investigated soils beneath the former wood junction box at this location; (See Appendix A: Rice Junction Box Disclosure Report). The wood junction box was removed and soils were sampled using a trackhoe, creating a 30 by 20 by 12 ft deep excavation. Potential organic contaminants were ruled out, based upon low PID readings (< 50 ppm) and low DRO levels (< 1,000 ppm) in composite samples taken from the sidewalls of the excavation. However, chloride concentrations exceeded 1,000 ppm throughout most of the 20 ft of depth sampled. The excavated soil was blended on site and then returned to the hole up to 6 ft below ground surface, where a one foot thick clay barrier was installed. The remaining fill was then placed on top of the clay. Some additional, clean fill was imported to provide enough material to fill the excavation to the ground surface (allowing some overage for settling). The disturbed surface was then seeded with a native vegetation mix. OCD was notified that this site has potential for groundwater impact (Figure 2).

The surface (ecological) impact of this release was relatively small. However, as the potential for groundwater contamination exists further evaluation is warranted for chlorides, the constituent of concern. Therefore, ROC proposes additional investigative work, as outlined below, to more definitively evaluate the extent of residual chlorides, and to then evaluate the potential for groundwater degradation. Yet, it should be noted that the source of this impact is historical. There is no longer a threat of continued, compounded impact at this site as the former junction box has been removed and a clay barrier installed to impeded downward migration of chlorides. Further, the Vacuum SWD system has been closed.

Proposed Work Elements

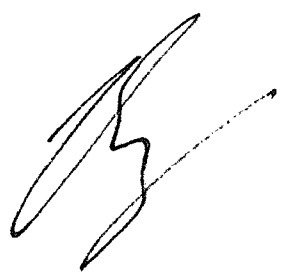
1. Summarize information and data collected by ROC to date.
2. Summarize additional, publicly available regional and local hydrological information.
3. Conduct vertical and lateral delineation of soil chlorides. If warranted, install one or more monitor wells to provide a direct measurement of potential groundwater impact. [All monitoring wells will be constructed (with the annular space sealed with a cement/bentonite mix) per NM Dept. Environment standards].
4. Evaluate the risk of groundwater impact in light of the information obtained.

If the evaluation demonstrates that residual constituents pose no threat to ground water quality, then only a surface restoration plan will be proposed to OCD. If this work indicates that there is a present or future risk of impacting groundwater quality from past operations at this location, then a corrective action plan (CAP) will be developed and proposed to OCD.

I appreciate the opportunity to work with you and your staff on this project. Please call either myself, at the number below, or Hack Conder (ROC) at 505-393-9174, if you have any questions or wish to discuss these matters.

Thank you for your consideration.

Sincerely,



L. Peter (**Pete**) Galusky, Jr. Ph.D., P.G.
Principal

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E-mail: lpg@texerra.com
Web site: www.texerra.com

cc: Rice Operating Company

Attachments: Site Map, Junction Box Disclosure Report

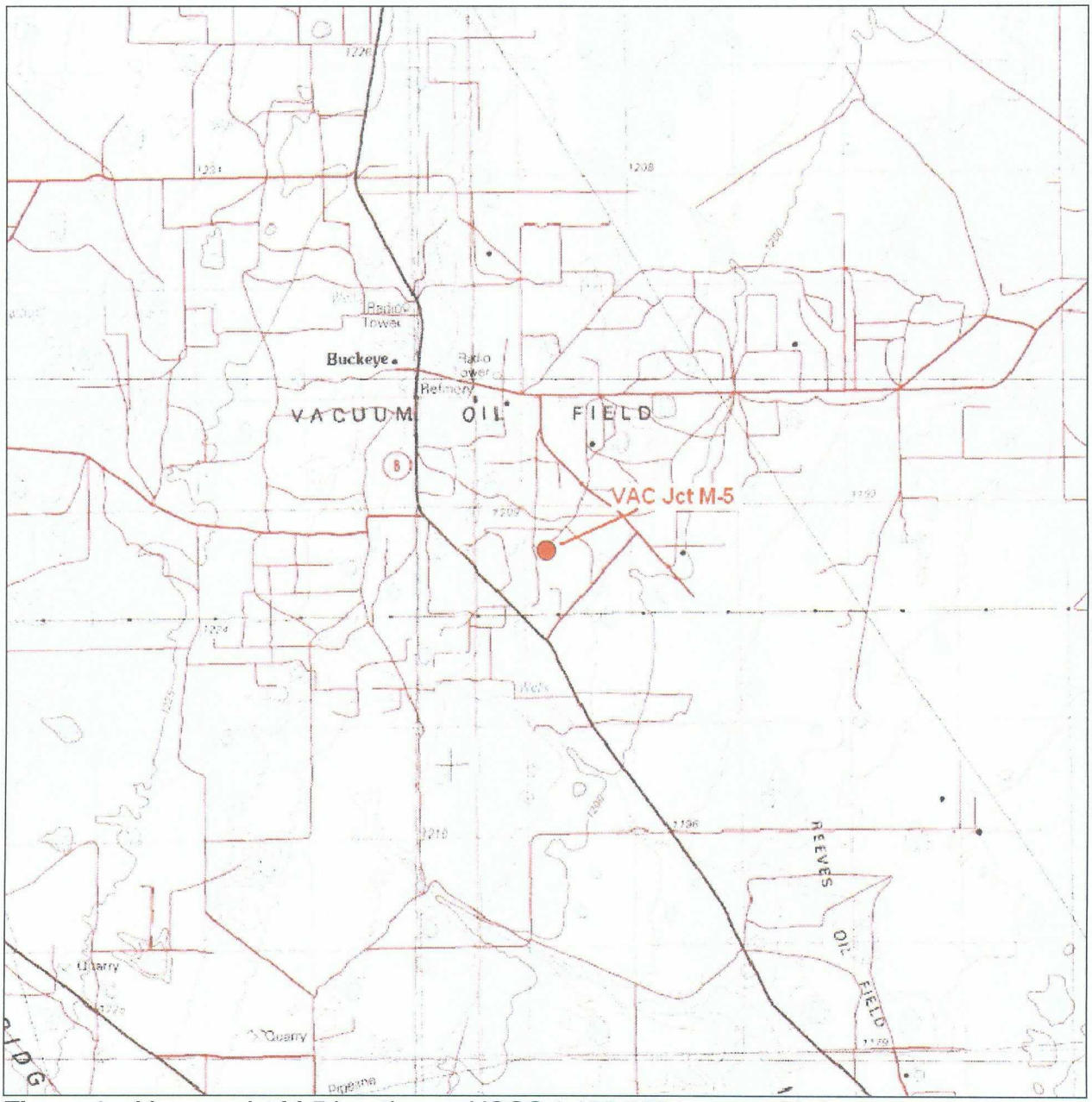

Figure 1 – Vacuum Jct M-5 location on USGS 1:100,000 topographic base map.

RICE OPERATING COMPANY
JUNCTION BOX DISCLOSURE* REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	NEW BOX DIMENSIONS - FEET		
							Length	Width	Depth
Vacuum	jct. M-5	M	5	18S	35E	Lea	no box. System Abandonment		

LAND TYPE: BLM ______ STATE X FEE LANDOWNER ______________ OTHER ______________

Depth to Groundwater [illegible] feet NMOCD SITE ASSESSMENT RANKING SCORE: 10

Date Started 9/14/2005 Date Completed 2/21/2007 NMOCD Witness [illegible]

Soil Excavated 400 cubic yards Excavation Length 30 Width 30 Depth 12 feet

Soil Disposed 0 cubic yards Offsite Facility n/a Location n/a

FINAL ANALYTICAL RESULTS: Sample Date 2/21/2007 Sample Depth 12 ft

5-point composite sample of bottom and 4-point composite sample of excavation sidewalls. TPH and chloride laboratory test results completed by using all approved laboratory and testing procedures pursuant to NMOCD guidelines.

Sample Location	PID (field) ppm	GRO mg/kg	DRO mg/kg	Chloride mg/kg
4 WALL COMP	1.5	<10.0	251.0	1200
BOTTOM COMP.	55.1	<10.0	919.0	1184
BACKFILL	5.1	<10.0	<10.0	597

CHLORIDE FIELD TESTS

LOCATION	DEPTH (ft)	ppm
5 ft EAST of former junction box site	5	1862
	6	1265
	7	1745
	8	684
	9	[illegible]
	10	[illegible]
	11	[illegible]
	12	[illegible]
	13	2085
	14	[illegible]
	15	596
	16	400
	17	375
	18	1519
	19	1143
	20	1175
4-wall comp	n/a	571
bottom comp	12	1079
backfill comp	n/a	571

General Description of Remedial Action: This junction box site was addressed as part of the Vacuum SWD System abandonment. After the box/junction was removed, the extent [illegible] by collecting soil samples [illegible] a 30 x 30 x 12-ft-deep excavation. [illegible] generally [illegible] laterally and vertically. Organic vapors were tested in the field using a photo-ionization detector. [illegible] ppm guidelines. The excavated soil was blended [illegible] [illegible] [illegible] [illegible] [illegible]

[illegible] PID field screenings, chloride graph, [illegible]

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

[illegible] Roy Rascon SIGNATURE *Roy R Rascon* COMPANY Rice Operating Company

REPORT ASSEMBLED BY [illegible] SIGNATURE [signature]

DATE [illegible] TITLE Project Scientist

* *This site is a "DISCLOSURE." It will be placed on a prioritized list of similar sites for further consideration.*

Figure 2 – Junction Box Disclosure Report

RICE OPERATING COMPANY
JUNCTION BOX **DISCLOSURE*** REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	NEW BOX DIMENSIONS - FEET		
							Length	Width	Depth
Vacuum	jct. M-5	M	5	18S	35E	Lea	no box--System Abandonment		

LAND TYPE: BLM ____ STATE X FEE LANDOWNER ____ OTHER ____

Depth to Groundwater 77 feet NMOCD SITE ASSESSMENT RANKING SCORE: 10

Date Started 9/14/2005 Date Completed 2/23/2007 NMOCD Witness no

Soil Excavated 400 cubic yards Excavation Length 30 Width 30 Depth 12 feet

Soil Disposed 0 cubic yards Offsite Facility n/a Location n/a

FINAL ANALYTICAL RESULTS:

Sample Date 2/21/2007 **Sample Depth** 12 ft

5-point composite sample of bottom and 4-point composite sample of excavation sidewalls. TPH and chloride laboratory test results completed by using an approved laboratory and testing procedures pursuant to NMOCD guidelines.

Sample Location	PID (field) ppm	GRO mg/kg	DRO mg/kg	Chloride mg/kg
4-WALL COMP.	1.5	<10.0	251.0	1200
BOTTOM COMP.	35.1	<10.0	918.0	1184
BACKFILL	3.1	<10.0	<10.0	592

CHLORIDE FIELD TESTS

LOCATION	DEPTH (ft)	ppm
5 ft EAST of former junction box site	5	1882
	6	1285
	7	1745
	8	594
	9	1367
	10	1072
	11	1170
	12	815
	13	2099
	14	1360
	15	896
	16	800
	17	935
	18	1519
	19	1143
	20	1175
4-wall comp.	n/a	921
bottom comp.	12	1039
backfill comp.	n/a	573

General Description of Remedial Action:

This junction box site was addressed as part of the Vacuum SWD System abandonment. After the box lumber was removed, the site was delineated by collecting soil samples at regular intervals using a backhoe to produce a 30 x 30 x 12-ft-deep excavation. Chloride field tests revealed concentrations that were generally consistent laterally and vertically. Organic vapors were tested in the field using a photo-ionization detector. Composite samples were collected for laboratory analysis to confirm field results; TPH concentrations meet OCD guidelines. The excavated soil was blended on site and tl backfilled into the hole to 6 ft BGS. At 6 ft, a clay barrier was installed to inhibit infiltration of remaining chloride. The remaining spoils were backfilled on top of the clay and contoured to the surrounding surface. The disturbed surface was seeded with a blend of native vegetation ai is expected to return to productive capacity at a normal rate. An identification plate has been placed on the surface of the site to mark the presence of clay below and also the former junction s for future environmental considerations. OCD was notified of potential groundwater impact at this site on 8/15/2007.

enclosures: photos, lab results, PID field screenings, chloride graph, cross-section

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

SITE SUPERVISOR Roy Rascon SIGNATURE Roy R. Rascon COMPANY RICE Operating Company

REPORT ASSEMBLED BY Kristin Farris Pope SIGNATURE Kristin Farris Pope

DATE 8/17/2007 TITLE Project Scientist

** This site is a "DISCLOSURE." It will be placed on a prioritized list of similar sites for further consideration.*