From:	andrew@rthicksconsult.com
To:	Yu, Olivia, EMNRD; "Groves, Amber"
Cc:	taylorp@pride-energy.com; mattp@pride-energy.com; "Randall Hicks"; Billings, Bradford, EMNRD
Subject:	RE: Pride Energy NM 87 State #001 Tank Battery (1RP-4625)
Date:	Friday, January 5, 2018 1:04:42 PM
Attachments:	image002.png image001.png Playa Response.pdf

Ms. Yu and Ms Groves:

Attached is our rational for not installing a borehole in the depression/playa along with a short discussion of playa vs rangeland hydrogeology.

As stated in the attachment, we will characterize the depression to 12-feet below ground surface or to the extent practical using a backhoe. We understands that further vertical delineation may be necessary and will be a topic of a forthcoming Corrective Action or Remediation Plan that will require approval from NMOCD.

Andrew Parker
R.T. Hicks Consultants
Durango Field Office
Cell: (970) 570-9535

From: Yu, Olivia, EMNRD [mailto:Olivia.Yu@state.nm.us]
Sent: Thursday, January 4, 2018 3:31 PM
To: Groves, Amber <agroves@slo.state.nm.us>; 'Andrew Parker' <andrew@rthicksconsult.com>
Cc: taylorp@pride-energy.com; mattp@pride-energy.com; 'Randall Hicks' <r@rthicksconsult.com>; Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Subject: RE: Pride Energy NM 87 State #001 Tank Battery (1RP-4625)

Mr. Parker:

Please keep in mind that that the purpose of a delineation plan is to characterize the current release and any previously unresolved releases on a specified lease. Therefore, NMOCD requires the following items for 1RP-4625 to move towards corrective remedial actions:

1. Despite the disagreement on the authoritative assessment of a playa, data from soil bores ensure that vertical delineation is completed. As the playa- or depressed area West of the tank battery- was considered affected, a soil bore will vertically characterize this portion of the release area.
2. To complete delineation for the 2017 release, in addition to the 4 proposed in Figure 2, NMOCD requires that one more trench location be established to the West of the tank battery.
3. To complete release characterization for the area outlined in Figure 3, at least 2 more trenches are required: 1 West of the Plugged SWD well and 1 to the center of the release

area.

4. There is already a drilling rig on location, so the establishment of one or more soil bores is not impractical nor infeasible. Please be advised that additional soil bores may be necessary to complete vertical delineation of the historic release area (pre 2017).
5. Delineation sample locations should be no greater than 50 ft. apart. In a tabulated format or marked on an appropriately scaled map, include GPS coordinates for each sample location. Keep sample IDs consistent among the text, figures, tables, and laboratory reports.

Please confirm or inform for clarification.

Thanks,
Olivia

From: Groves, Amber [mailto:agroves@slo.state.nm.us]
Sent: Tuesday, January 2, 2018 4:58 PM
To: 'Andrew Parker' <andrew@rthicksconsult.com>; Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Cc: taylorp@pride-energy.com; mattp@pride-energy.com; 'Randall Hicks' <r@rthicksconsult.com>; Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Subject: RE: Pride Energy NM 87 State #001 Tank Battery (1RP-4625)

Mr. Parker,

What is the rationale for the refusal to do a soil bore in the playa as it is stated that it is required by NMOCD? This area is very clearly a playa and NMSLO agrees with NMOCD's assessment in requiring a borehole.

Thank you,

Amber Groves
Remediation Specialist
Field Operations Division
(575)392-3697
(575)263-3209 cell
New Mexico State Land Office
2827 N. Dal Paso Suite 117
Hobbs, NM 88240

From: Andrew Parker [mailto:andrew@rthicksconsult.com]
Sent: Friday, December 29, 2017 12:44 PM
To: 'Yu, Olivia, EMNRD' <Olivia.Yu@state.nm.us>
Cc: taylorp@pride-energy.com; mattp@pride-energy.com; 'Randall Hicks' <r@rthicksconsult.com>; Groves, Amber <agroves@slo.state.nm.us>; 'Billings, Bradford, EMNRD' <Bradford.Billings@state.nm.us>
Subject: RE: Pride Energy NM 87 State #001 Tank Battery (1RP-4625)

Ms. Yu:

As we stated in the workplan, "*Pride Energy understands that additional actions may be necessary to supplement the data collected by the program outlined below*." Additional actions for horizontal and vertical delineation will be determined after a review of analytical data collected during the proposed sampling program. We believe the proposed trenches and borehole will provide adequate characterization to determine if further horizontal and vertical delineation of the 2017 and historic 2000 releases is necessary according .

In response to your concerns (blue and underlined text):

- As the release area includes the portion inside the berm for the tank battery, at least one sample location be established within the berm.
  We will relocate the 2017 southwest trench to within the bermed area.
- There is a discrepancy between the text and Figure 2. Sample trenches need to be established to characterize the impacted area, although one or more sample trenches should also be outside of the impacted area for background data.
  A 2017 aerial photograph clearly shows the release extent (see Figure 2 and below screenshot). The proposed trench locations shown on Figure 2 is within the 2017 release extent. We will use chloride field titration concentrations to determine if the proposed northeast trench is below 250 mg/kg chloride from the surface to approximately 12-ft. As stated above, additional delineation may be necessary.
- Due to the geology of a playa, NMOCD requires that a borehole, rather than a sample trench, be established for delineation.
  Neither the USGS Topographic Map nor the Geologic Map of New Mexico references this area as a playa. The USA Wetland Inventory does not recognize this as a playa or wetland of any type. The Geologic Map of NM maps the area as Tertiary-Ogallala Formation. Regardless of the classification as a "playa" or not, trench sampling the area will provide characterization down to at least 12-feet. As stated in the introductory paragraph, further delineation may be required.
- The laboratory results from July 5, 2017, were for samples taken at the **well** not tank battery.
  Thank you for the clarification
  …There is no aerial imagery from 2017 supporting the location of the proposed borehole. If in disagreement, please submit documentation. Based on the latest Google Earth imagery from September 30, 2014, NMOCD recommends that the proposed soil bore location be relocated to the north of the tank battery.

As stated in the workplan, the purpose of the proposed borehole is to vertically delineate the 2017 and historic 2000 release with one borehole. As shown on Figure 2 and reproduced below without the cross-hatching, the 2017 Bing Hybrid Map (source: esri.com) clearly shows the July 2017 release. The proposed borehole is on the southern edge of the release area. We will move the borehole north 20-feet to capture more of the 2017 release.

- For each sample location, at least 2 depths (depth obtained permissible levels and depth maintained at least 5 ft. further in depth) must be submitted for laboratory analyses of BTEX, TPH extended, and chlorides. All laboratory analyses must have accompanying field data.
  Understood.
- Please be advised that soil bore logs need to be included in the subsequent delineation report. Also, all sample locations need to be demarcated with GPS coordinates on an appropriately scaled map.
  Understood.

Andrew Parker
R.T. Hicks Consultants
Durango Field Office
970-570-9535

From: Yu, Olivia, EMNRD [mailto:Olivia.Yu@state.nm.us]
Sent: Thursday, December 28, 2017 8:20 AM
To: Andrew Parker
Cc: taylorp@pride-energy.com; mattp@pride-energy.com; Randall Hicks; agroves@slo.state.nm.us; Billings, Bradford, EMNRD
Subject: RE: Pride Energy NM 87 State #001 Tank Battery (1RP-4625)

Mr. Parker:

Please address these concerns regarding the delineation workplan for 1RP-4625:

- As the release area includes the portion inside the berm for the tank battery, at least one sample location be established within the berm.
- There is a discrepancy between the text and Figure 2. Sample trenches need to be established to characterize the impacted area, although one or more sample trenches should also be outside of the impacted area for background data.
- Due to the geology of a playa, NMOCD requires that a borehole, rather than a sample trench, be established for delineation.
- The laboratory results from July 5, 2017, were for samples taken at the **well** not tank battery. There is no aerial imagery from 2017 supporting the location of the proposed borehole. If in disagreement, please submit documentation. Based on the latest Google Earth imagery from September 30, 2014, NMOCD recommends that the proposed soil bore location be relocated to the north of the tank battery.
- For each sample location, at least 2 depths (depth obtained permissible levels and depth maintained at least 5 ft. further in depth) must be submitted for laboratory analyses of BTEX, TPH extended, and chlorides. All laboratory analyses must have accompanying field data.
- Please be advised that soil bore logs need to be included in the subsequent delineation report. Also, all sample locations need to be demarcated with GPS coordinates on an appropriately scaled map.

Please confirm or inform for clarification.

Thanks,

Olivia Yu
Environmental Specialist
NMOCD, District I
Olivia.yu@state.nm.us
575-393-6161 x113

From: Andrew Parker [mailto:andrew@rthicksconsult.com]
Sent: Wednesday, December 27, 2017 5:58 PM
To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Cc: taylorp@pride-energy.com; mattp@pride-energy.com; Randall Hicks <r@rthicksconsult.com>; agroves@slo.state.nm.us; Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>

Subject: RE: Pride Energy NM 87 State #001 Tank Battery (1RP-4625)

Ms. Yu:

Attached is a revised characterization plan for the above referenced site. A few items were clarified:

- Differentiation between NM 87 State #001 tank battery (1RP-4625) and NM 87 State #001 (1RP-4624) wellhead.
- Added a trench sampling point in the depression ("playa") west-northwest of the tank battery per discussions with Ms. Groves (SLO).

The characterization plan for NM 87 State 001 (wellhead; 1RP-4624) will be submitted under a separate workplan. We plan to perform sampling on Jan 8th. I will email NMOCD/SLO 48-hours in advanced.

Andrew Parker
R.T. Hicks Consultants
Durango Field Office
970-570-9535

From: Andrew Parker [mailto:andrew@rthicksconsult.com]
Sent: Thursday, December 14, 2017 10:00 AM
To: 'Olivia.yu@state.nm.us'
Cc: 'taylorp@pride-energy.com'; 'mattp@pride-energy.com'; Randall Hicks (r@rthicksconsult.com); 'agroves@slo.state.nm.us'; 'bradford.billings@state.nm.us'
Subject: Pride Energy NM 83 State #001 Charactrization Plan (1RP-4625)

Ms. Yu:

On the behalf of Pride Energy, attached is the characterization plan for the above referenced location. We elected to characterize the 2017 release along with a historic release that occurred sometime between 1996 and 2003 per review of aerial photographs. The trench sample location showed evidence of the historic release at 12-feet below ground surface and is discussed further in the attached workplan.

I would like to conduct the field work mid-January. Please contact me at 970-570-9535 with any questions.

Andrew Parker
R.T. Hicks Consultants
Durango Field Office
970-570-9535

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Since 1996
Artesia ▲ Carlsbad ▲ Durango ▲ Midland

January 4th, 2018

Olivia Yu
NMOCD District 1
1625 N. French Dr.
Hobbs, NM 88240

RE: Pride Energy Company, January 11, 2017 Battery Release, 1RP-4625
Lea County, New Mexico

Dear Ms. Yu:

On behalf of Pride Energy, Hicks Consultants presents the rationale for not drilling a boring in the closed depression ("playa") adjacent to the location of New Mexico 83 State #001 SWD, where the tank battery for the NM 87 State #001 is located. There are several reasons why we strongly believe that characterization of the area of the closed depression is unnecessary relative to characterization of the area nearer to the battery where the impact is more pronounced.

First, current and historic aerial images and our foot survey demonstrate that the depression exhibits rangeland vegetation. This observation suggests that the salinity of the uppermost soil horizon is not impaired by produced water releases to the point of causing stunted vegetation. Thus, there is no evidence of a major impact by produced water.

Second, with the exception of a relatively small potential incursion of a release into the depression observed in a Google 1996 historic aerial photograph, there is no evidence of releases to the depression. Unlike many true playas in Lea County, this depression never served as a disposal facility for produced water, as was common prior to the 1960s. The well at the battery location in question (API 30-025-23516) was drilled in 1971 as a producing oil well and converted to injection in 1974. In the 1960s, OCD issued a prohibition of disposal of produced water in unlined pits in this area of Lea County.

Third, like a true playa, the depression is an area where storm water will collect and remain for short periods, which causes measurable recharge of fresh water. In the depression there will be significantly more recharge through and below the root zone than in the adjacent grassland. Recharge of fresh water in the closed depression will cause flushing of the root zone and migration of chloride molecules to groundwater at a much greater velocity than a release to the higher rangeland. The 2005 API study "Modeling Study of Produced Water Release Scenarios"[1] examined soil flushing and developed the following conclusion:

> **The Effects of Soil Flushing**
>
> A produced water release may stunt or kill vegetation. While the agricultural industry routinely applies excess irrigation water to remove salt from the root zone, this practice is not used in some oilfields because of perceived increased

[1] http://www.api.org/~/media/Files/EHS/Environmental_Performance/4734.pdf

> threat to ground water quality. Flushing soil with water to remove chloride can be an effective alternative to soil restoration by excavation, disposal, and soil importation. Soil flushing was simulated to determine if this action would exacerbate degradation of ground water quality due to produced water releases. On the contrary, simulations show that the application of water to flush chloride below the root zone results in chloride dilution that improves the quality of ground water when compared to the no flushing alternative. Therefore, if the model predicts that a release would not impair ground water quality, then soil flushing at this site will not cause degradation as a result of the addition of water.

Thus, we conclude that examination of the areas of impact outside of the closed depression will provide a more meaningful examination of the threat to groundwater quality than tests within the closed depression. Moreover, vegetation is established in the closed depression and, since remediation of soil is not required, testing with respect to development of a soil remedy is also not required. Nevertheless, as presented in our December 27, 2017 workplan, we voluntarily elect to evaluate shallow soil up to a depth of 12 feet at one location within the depression. As we stated in the workplan, additional horizontal and vertical delineation may be necessary after initial characterization.

I hope this addresses the question at hand.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall Hicks
Principal

Copy: Pride Energy
State Land Office, Ed Martin, Amber Groves