



STATE OF
COLORADO

Allison - DNR, Rick <rick.allison@state.co.us>

Noble Energy Produced Water Vaults BMPs

Greg Deranleau - DNR <Greg.Deranleau@state.co.us>

Tue, Jul 9, 2013 at 12:44 PM

To: RBruner@nobleenergyinc.com

Cc: James Milne - DNR <james.milne@state.co.us>, John Noto - DNR <john.noto@state.co.us>, LPavelka@nobleenergyinc.com, mclark@nobleenergyinc.com, Rick Allison - DNR <rick.allison@state.co.us>, Rob Young - DNR <rob.young@state.co.us>, JLittle@nobleenergyinc.com

Ryan,

Thank you. The provided language clears up much previous confusion and I see that the double walled fiberglass tanks with interstitial leak detection was dropped. It sounds like the installation you have described will be sufficient for most sensitive area locations.

I will get the stagnant Form 2As moving along (although it will have to be tomorrow afternoon, due to existing commitments).

I will take a look at these Location Assessments and will get back to you with respect to when we would like to see Noble proactively place the BMPs on your submittals. However, bear in mind that the 2008 rule-making emphasized the importance of operators conducting site-specific analyses of proposed locations and determining their sensitivity based on a variety of inputs.

Thanks again; I'd definitely like to get together soon.

Greg Deranleau

Oil & Gas Location Assessment Supervisor

Colorado Oil and Gas Conservation Commission

[303-894-2100](tel:303-894-2100) ext. 5153

From: RBruner@nobleenergyinc.com [mailto:RBruner@nobleenergyinc.com]

Sent: Tuesday, July 09, 2013 11:58 AM

To: Greg Deranleau - DNR

Cc: James Milne - DNR; John Noto - DNR; LPavelka@nobleenergyinc.com; mclark@nobleenergyinc.com; Rick Allison - DNR; Rob Young - DNR; JLittle@nobleenergyinc.com

Subject: Re: Noble Energy Produced Water Vaults BMPs

Greg,

I apologize for any confusion on the water vault BMP. Here's what we'd like to do on these locations.

For the two already built Pioneer Locations here's the older liner design and water vault install:

- 1) *The inside of the cement water vault will be emptied and cleaned, then sprayed with a leak resistant liner on the inside of the vault from top to bottom including the lip.*
- 2) *A 30 mil rubber liner has been installed under the entire tank battery except where the water vault has been installed. The liner is bolted into a sized steel secondary containment ring surrounding the entire tank battery.*
- 3) *The water vault and associated piping has been attached and sealed, with mastic patching material, to the rubber liner to prevent potential leakage.*

For new locations including the proposed Seyler and Holman pads:

1. *A contiguous spray liner will be installed and will underlay the entire tank battery. The location of a partially buried cement water vault will be excavated prior to liner install.*
2. *A 60 bbl cement water vault will be utilized to collect excess produced water from oil tanks. Produced water in the vault will be removed as needed and disposed of in an approved UIC disposal well. The cement water vault is one piece with no seams designed to minimize potential for leaks. All piping associated with the use of the water vault will be aboveground and visually inspected on a regular basis.*
3. *The partially buried cement water vault will be installed above the spray in liner. Sand and gravel bedding will be installed surrounding the cement water vault.*
4. *A sized steel secondary containment ring will be installed surrounding the entire tank battery. Sand and gravel bedding will be installed to protect the liner prior to placing equipment in the containment area.*

Can you help us out with new locations going forward? What soils and depth to groundwater can we anticipate the need for the BMP language going forward? The Seyer and Holman locations all have differing soil types. I'd like to get ahead of this on permitting but we're not sure when these type of requests will come in.

Let's get together and discuss when you have some time. Thanks

Ryan Bruner
EHSR
Environmental and Regulatory
Supervisor

direct: 303.228.4158
cell: 303.552.6763
fax: 303.228.4286
nobleenergyinc.com



From: Greg Deranleau - DNR <Greg.Deranleau@state.co.us>
To: LPavelka@nobleenergyinc.com, mclark@nobleenergyinc.com, RBruner@nobleenergyinc.com
Cc: Rick Allison - DNR <rick.allison@state.co.us>, Rob Young - DNR <rob.young@state.co.us>, John Noto - DNR <john.noto@state.co.us>, James Milne - DNR <james.milne@state.co.us>
Date: 06/27/2013 07:33 AM
Subject: Noble Energy Produced Water Vaults BMPs

All,

There have been many conversations, e-mails and other correspondence over the last several months regarding Noble Energy's use of partially buried vessels for the storage of produced water. COGCC has expressed concern that these vessels often represent a threat to ground water, especially in areas where ground water is shallow and/or soil permeability is high. Noble has agreed with that concern and has reported spills and releases stemming from the use of concrete vaults for that purpose.

COGCC has requested that Noble provide written, site-specific best management practices (BMP) for several locations where partially buried produced water vessels have been proposed or installed. COGCC expects that the BMP would be brief enough to include on individual permit documents (using the BMP tab in eForms) and would contain sufficient detail to understand that the installation and use of the produced water vessel will not result in a release that could impact groundwater. COGCC has provided examples of similar BMPs used by other operators, and while example language has been used by Noble, it has not been made site-specific for the proposed locations.

On several occasions, various parties at Noble have provided language for COGCC staff to insert into pending applications and requested that COGCC pass the permits. However, in each case, the language submitted has not been clear, or has contained conflicts or omissions, and it has never been site-specific; COGCC has communicated that back to Noble. Noble staff have not been consistent in their communication efforts, so confusion has arisen from multiple parties being involved seemingly unaware of others' involvement.

Currently, the following Form 2As are ON HOLD pending resolution of this issue:

- Pioneer Y08-2 Tank – Form 2A doc #400356079 (built location)
- Pioneer Y08-03 Tank – Form 2A doc #400356150 (built location)
- Seyler B 15-69HN – Form 2A doc #400364157 (proposed location)
- Holman B15-65HNM Tank – Form 2A doc #400380172 (proposed location)

The latest proposed BMP for the two built Pioneer Locations is:

- 1) *The water vault will be sprayed with a spill resistant liner on the inside of the vault from top to bottom including the lip.*
- 2) *This 30 mil liner will be sprayed underlaying the entire tank battery. This is a contiguous liner which will underlay the entire tank battery.*
- 3) *The tank battery/water vault liner will be keyed into a galvanized steel containment ring installed surrounding the tank battery.*
4. *Sand bedding will be installed to protect the synthetic liner prior to placing equipment in the containment area.*

Although this proposed BMP primarily relies on the language provided by COGCC as an example, it is not acceptable for these locations, because the locations have already been built. Therefore it is not clear how Noble will spray a liner under the entire tank battery nor how the sand bedding will be installed. If that has already been done, then the language should be adjusted to fit the specifics of the site. Additionally, item #2 does not make it clear whether the 30-mil liner will be placed under the existing water vault. Is the water vault not part of the tank battery? It is also not clear how a spray on liner will be "Keyed into" the steel containment ring. In conversations, Noble also indicated that the water vaults would be cleaned prior to the spray on liner application, but that is not mentioned in the BMP.

The latest proposed BMP for the proposed Seyler and Holman pads were submitted with an option for COGCC to select as follows:

1. *Secondary containment for crude Oil and condensate tanks will be provided by steel berms and spray on liner.*
2. *The partially buried produced water vault will be a double walled fiberglass tank with leak detection sensors in between the double walls.*

If you would rather, the following language can also be used.

1. *A 30 mil spray liner will be installed on top of low permeability soil. The 30 mil liner will be a contiguous liner which will underlay the entire tank battery.*
2. *The tank battery liner will be keyed into a galvanized steel containment ring installed surrounding the tank battery.*
3. *The excavation will have a partially buried produced water vault with a double walled fiberglass tank lowered into it. This double walled tank will have leak detection sensors between the double walls. This tank has a double lip that will "snug" into the spray on liner.*

4. *Sand bedding will be installed to protect the synthetic liner prior to placing equipment in the containment area.* COGCC will not choose between the two; we are asking for Noble to provide a BMP. My suggestion on the first option would be to clarify whether or not the fiberglass vault will be above or below the liner. Conversations have indicated the vault will not have the liner beneath it but will have the liner somehow be tied into it. This would seem less protective than lining underneath the vault. The second option is confusing as the steps do not seem to be listed in the order they will be performed. Item #1 indicates a contiguous liner, but the other descriptions indicate that the fiberglass vault will penetrate a hole in the liner. Item #3 indicates that the liner will not be placed underneath the vault, but the vault will be connected to the liner. The language in Item #3 and #2 does not make clear how the connection is made nor is it clear how the spray on liner is "keyed into" the steel containment ring. If either of those points of connection is unsound or fails, the effort of lining the entire tank battery would be rendered wasted. In general, the use of double-walled fiberglass vaults with interstitial leak detection for subgrade produced water storage appears to be an improvement over concrete vaults especially in sensitive areas where there appears to be a pathway to groundwater, but a clear explanation of the system is still necessary.

In order to complete the review and approval process for the referenced Form 2As, please have 1 person provide a written site-specific BMP via separate e-mails for each proposed or built location that indicates how the water vaults will be installed to ensure the protection of shallow ground water (the e-mails may be sent to me). On future applications, Noble staff may identify locations where similar BMPs would be appropriate and may propose them at the time of submittal. Alternatively, COGCC would propose a COA prohibiting the subgrade storage of E&P waste for these locations.

If this does not make clear the position of COGCC, please contact me.

Greg Deranleau
Oil and Gas Location Assessment Supervisor

Colorado Oil & Gas Conservation Commission
1120 Lincoln Street, Suite 801
Denver, CO 80203
[303-894-2100](tel:303-894-2100), ext 5153



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