PIT MINIMIZATION SIZE

Leking, Geoffrey R, EMNRD

From: Randall Hicks <r@rthicksconsult.com>
Sent: Thursday, February 20, 2014 2:26 PM
To: Leking, Geoffrey R, EMNRD; Martin, Ed, EMNRD
Cc: 'Greg Boans'; 'Chace Walls'; kristin@rthicksconsult.com; 'Cindy Cottrell'
Subject: RE: Murchison - Pit Closures - minimizing surface area of geomembrane cover
Attachments: Pages from RevisedClosurePlan-Atoka.pdf

Geoff and Ed

No action is required on your part unless OCD finds a regulatory or technical flaw with the proposed closure protocol for the Mogi 2H pit. Ed, you get this note because the Pit Rule is relatively new and operators and OCD need to work together to be sure we are all interpreting the rule in the same way – and you were the expert witness for OCD.

Murchison will not install the geomembrane or soil cover over the stabilized waste at the Mogi 2H pit until we speak to Geoff 2-3 days prior to placing the liner.

Here is the proposed closure protocol in summary:

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3. used welded liner seams to construct a continuous sheet of geomembrane to cover the stabilized solids

The portion of the Rule relating to the geomembrane cover for the closure of temporary pits is presented below with emphasis in highlight.

> **(b)** install a geomembrane cover over the waste material in the lined trench or temporary pit; the operator shall install the
> geomembrane cover in a manner that prevents the collection of infiltration water in the lined trench or temporary pit and on the geomembrane cover
> after the soil cover is in place; the geomembrane cover shall consist of a 20-mil string reinforced LLDPE liner or equivalent cover that the
> appropriate division district office approves; the geomembrane cover shall be composed of an impervious, synthetic material that is resistant to
> petroleum hydrocarbons, salts and acidic and alkaline solutions; cover compatibility shall comply with EPA SW-846 Method 9090A;

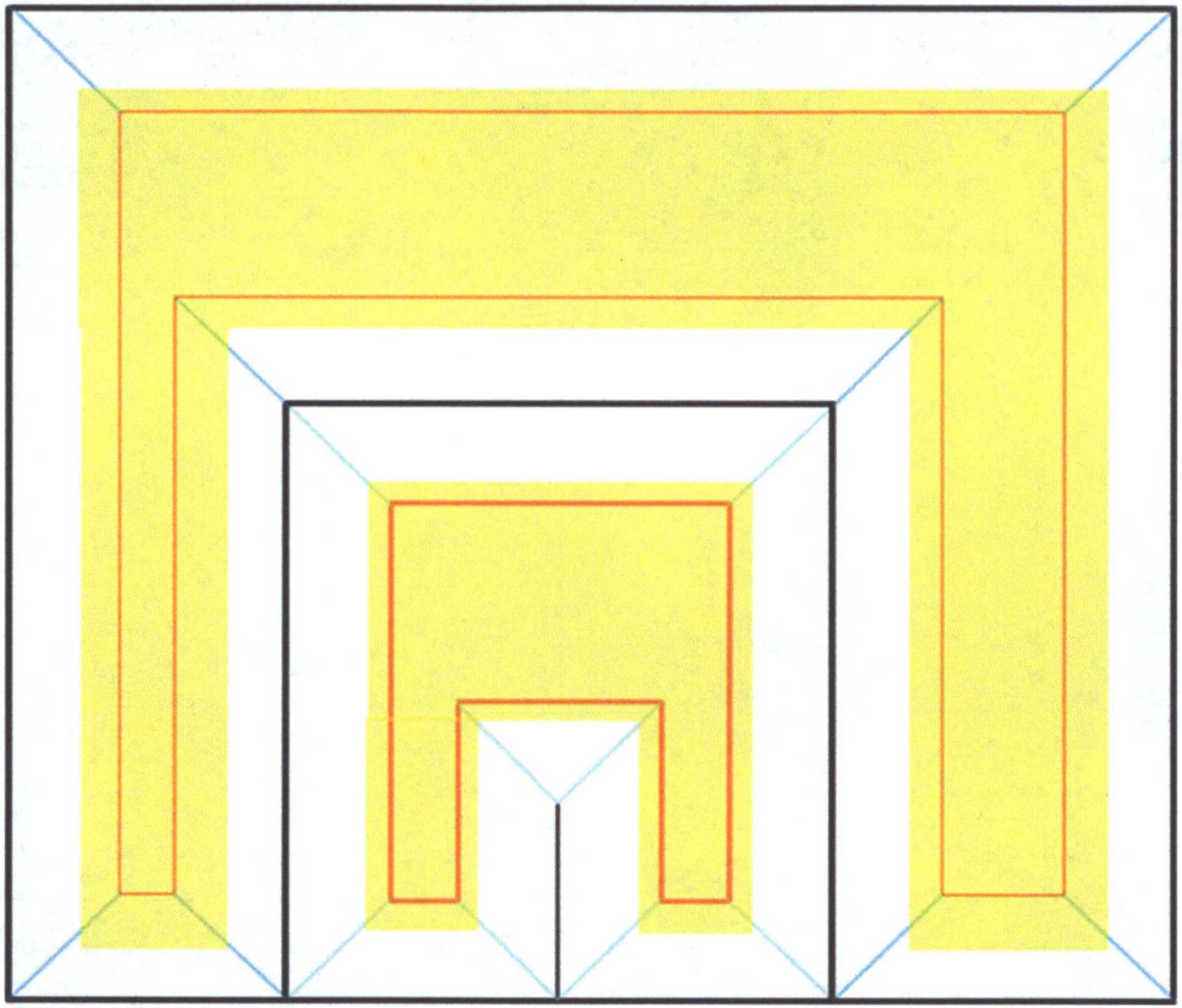
For the most recent closure by Murchison (Jackson 24H), the geomembrane cover was placed over the entire footprint of the former pit, as the entire footprint held the stabilized waste. For the Mogi 2H pit, we have instructed the contractors to minimize the surface area of stabilized cuttings/solids. The attached contractor instructions are modified from the January 25 revised closure plan to OCD for the Yates Atoka Bank BDJ State Com 2H permit.

The principal environmental benefit of minimizing the surface area of stabilized waste is the ability to create a relatively steep slope on the geomembrane cover of about 3H:1V (we will not be measuring this slope in the field as it is a contractor instruction, not a closure requirement). Obviously covering clean dirt with geomembrane (the sides and berms of the pit exposed after cutting and removing the liner at the mud line and did not contact the stabilized cuttings) is not required by the Rule and is consistent with the general environmental standard of reducing the use of material (Reduce-Reuse-Recycle is the slogan I remember).

Again, no action is required on your part unless you find a regulatory or technical flaw in this process. This closure protocol is consistent with the approved plans for Murchison temporary pits.

Thanks for reading this!

Randall T. Hicks
505-266-5004 (office)
505-238-9515 (cell and best number to use)



- Black lines are at ground surface .
- Red lines are the pit floors.
- Yellow area is approximate location of geomembrane cover placed over stabilized cuttings (at least 4 ft below ground surface) during closure as prescribed in Paragraph 8 of Subsection D of 19.15.17.13 NMAC

R.T. Hicks Consultants 901 Rio Grande Blvd. NW Suite F-142 Albuquerque, N. M. 87104	**Approximate Orientation of Geomembrane Cover Over Stabilized Cuttings**	**Plan View**
	Typical Pit Design with 2 Drilling Cells (not to scale)	**February 2014**

Leking, Geoffrey R, EMNRD

From: Kristin Pope <kristin@rthicksconsult.com>
Sent: Tuesday, February 25, 2014 4:05 PM
To: Leking, Geoffrey R, EMNRD; Martin, Ed, EMNRD
Cc: 'Greg Boans'; 'Chace Walls'; 'Cindy Cottrell'; Randy Hicks
Subject: RE: Murchison - Pit Closures - minimizing surface area of geomembrane cover
Attachments: ClosureCoverExample.pdf

Please find the attached schematic as an example of what we have in mind for the placement of the geomembrane cover. We are working on a photographic story of the closure but we are still stabilizing the solids at the Murchison Mogi 9 St. Com 2H at this time so of course, it's not complete. Randy will visit the site on Thursday to check the progress and take more photos.

We will give OCD at least 48 hours' notice prior to installing the geomembrane cover over the stabilized solids.

Kristin Pope
R.T. Hicks Consultants
Carlsbad Field Office
575.302.6755

From: Randall Hicks [mailto:r@rthicksconsult.com]
Sent: Friday, February 21, 2014 10:50 AM
To: 'Leking, Geoffrey R, EMNRD'; 'Martin, Ed, EMNRD'
Cc: 'Greg Boans'; 'Chace Walls'; kristin@rthicksconsult.com; 'Cindy Cottrell'
Subject: RE: Murchison - Pit Closures - minimizing surface area of geomembrane cover

Kristin and I will work on that and you will have it by Monday – or before.

Randall Hicks
RT Hicks Consultants
Office: 505-266-5004
Cell: 505-238-9515

From: Leking, Geoffrey R, EMNRD [mailto:GeoffreyR.Leking@state.nm.us]
Sent: Friday, February 21, 2014 10:47 AM
To: Randall Hicks; Martin, Ed, EMNRD
Cc: 'Greg Boans'; 'Chace Walls'; kristin@rthicksconsult.com; 'Cindy Cottrell'
Subject: RE: Murchison - Pit Closures - minimizing surface area of geomembrane cover

Randy

Provide some illustrations of what this will look like. Thank you.

Geoffrey Leking
Environmental Specialist
NMOCD-Hobbs

1625 N. French Drive
Hobbs, NM 88240
Office: (575) 393-6161 Ext. 113
Cell: (575) 399-2990
email: geoffreyr.leking@state.nm.us

From: Randall Hicks [mailto:r@rthicksconsult.com]
Sent: Thursday, February 20, 2014 2:26 PM
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Cc: 'Greg Boans'; 'Chace Walls'; kristin@rthicksconsult.com; 'Cindy Cottrell'
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Geoff and Ed

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> **(b)** install a geomembrane cover over the waste material in the lined trench or temporary pit; the operator shall install the
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The principal environmental benefit of minimizing the surface area of stabilized waste is the ability to create a relatively steep slope on the geomembrane cover of about 3H:1V (we will not be measuring this slope in the field as it is a contractor instruction, not a closure requirement). Obviously covering clean dirt with geomembrane (the sides and berms of the pit exposed after cutting and removing the liner at the mud line and did not contact the stabilized cuttings) is not required by the Rule and is consistent with the general environmental standard of reducing the use of material (Reduce-Reuse-Recycle is the slogan I remember).

Again, no action is required on your part unless you find a regulatory or technical flaw in this process. This closure protocol is consistent with the approved plans for Murchison temporary pits.

Thanks for reading this!

Randall T. Hicks
505-266-5004 (office)
505-238-9515 (cell and best number to use)

Leking, Geoffrey R, EMNRD

From: Randall Hicks <r@rthicksconsult.com>
Sent: Tuesday, March 18, 2014 5:05 PM
To: Leking, Geoffrey R, EMNRD; Martin, Ed, EMNRD
Cc: 'Greg Boans'; 'Chace Walls'; kristin@rthicksconsult.com; 'Cindy Cottrell'
Subject: RE: Murchison - Pit Closures - minimizing surface area of geomembrane cover
Attachments: Pit Closure Photos.pdf

Geoff and Ed

The Mogi 9 State 2H pit closure deadline is 3/27/14. We propose to meet this deadline unless OCD provides evidence of a flaw in our interpretation of the Rule or the logic of how we plan to install the geomembrane cover. The attached photographs from our Thursday visit to the Mogi 9 State 2H pit and associated text describe the placement of the geomembrane liner. We believe the photographs clearly demonstrate that placing a geomembrane cover over the stabilized cuttings as proposed will work significantly better than covering the entire footprint of the former pit. The Pit Rule states [emphasis added]:

(8) Upon achieving all applicable waste stabilization in the temporary pit or transfer of stabilized wastes to the temporary pit or burial
trench, the operator shall:
(a) fold the outer edges of the trench liner …
(b) install a geomembrane cover over the waste material in the lined trench or temporary pit; the operator shall install the
geomembrane cover in a manner that prevents the collection of infiltration water in the lined trench or temporary pit and on the geomembrane cover
after the soil cover is in place; the geomembrane cover shall consist of a 20-mil string reinforced LLDPE liner or equivalent cover that the
appropriate division district office approves; the geomembrane cover shall be composed of an impervious, synthetic material that is resistant to
petroleum hydrocarbons, salts and acidic and alkaline solutions; cover compatibility shall comply with EPA SW-846 Method 9090A;
(c) cover the pit/trench with non-waste containing, uncontaminated, earthen materials and construct a soil cover prescribed by
the division in Paragraph (3) of Subsection H of 19.15.17.13 NMAC.

This method of closure is fully consistent with the Pit Rule, provides an excellent means of preventing the collection of infiltrated water on the geomembrane cover and reduces the cost of closure versus covering the entire footprint – clean soil and all. Until OCD approves the Yates Petroleum closure plan for the Atoka Bank 2H closure plan (transmitted via e-mail to OCD on 1/25/14), Murchison will use new, welded 20-mil LLDPE liner. Given the slopes that we can achieve for the stabilized solids, recycled liner that is sewn together to form a continuous sheet will perform admirably – but we can discuss that another day, as it is part of the Yates Atoka closure plan, not a Murchison plan.

You should see this pit in person – the contractor did a great job.

Randall Hicks
RT Hicks Consultants
Office: 505-266-5004

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From: Randall Hicks [mailto:r@rthicksconsult.com]
Sent: Sunday, March 02, 2014 8:35 PM
To: 'Leking, Geoffrey R, EMNRD'; 'Martin, Ed, EMNRD'
Cc: 'Greg Boans'; 'Chace Walls'; kristin@rthicksconsult.com; 'Cindy Cottrell'
Subject: RE: Murchison - Pit Closures - minimizing surface area of geomembrane cover

Geoff

Before OCD makes a final policy decision regarding the proposed closure method, please come a take a look at stabilized solids in the Mogi 2H pit. I believe you will see that the methodology is

1. consistent with the approved closure plan
2. fully compliant with the mandates of the Pit Rule
3. a better environmental solution because
    a. the cover will not extend over clean dirt
    b. we can create a significantly better slope of the geomembrane cover

After a tour with Kristin, take a week to think about it and give me a call with any questions. OCD has extended the closure time to the end of March.

Randall T. Hicks
505-266-5004 (office)
505-238-9515 (cell and best number to use)

From: Leking, Geoffrey R, EMNRD [mailto:GeoffreyR.Leking@state.nm.us]
Sent: Wednesday, February 26, 2014 3:55 PM
To: Randall Hicks; Martin, Ed, EMNRD
Cc: 'Greg Boans'; 'Chace Walls'; kristin@rthicksconsult.com; 'Cindy Cottrell'
Subject: RE: Murchison - Pit Closures - minimizing surface area of geomembrane cover

Randy

Let's just do the whole pit area on this one until we have more time to look at the configuration of the waste, geomembrane etc. Thanks.

Geoffrey Leking
Environmental Specialist
NMOCD-Hobbs
1625 N. French Drive
Hobbs, NM 88240
Office: (575) 393-6161 Ext. 113
Cell: (575) 399-2990
email: geoffreyr.leking@state.nm.us

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If a concentration of a contaminant within the material mixed at a ratio not exceeding 3:1 is higher than the concentration given in Table II, closure will proceed in accordance with Subsection C of 19.15.17.13 NMAC. In the event that on-site closure standards cannot be achieved, the operator will remove the solid pit contents and transfer to the following division-approved facility:

Disposal Facility Name: R360 Permit Number: NM 01-0006

Protocols and Procedures for Earthwork

Stabilization of the residual cuttings and mud is accomplished by mixing dry earth material within the footprint of the solids in the temporary pit. Key elements of the stabilization process include:

- Cutting the pit liner at the solids line and reclaiming large panels of high-quality liner – discarding areas of the liner that do not exhibit integrity or appear damaged.
- An inspection by the operator's representative to
    - examine the condition of reclaimed liner panels and determine which are suitable for re-use and
    - examine the nature of the earth material exposed by the removal of the pit liner and determine which portions should be used for mixing with cuttings and which portions should be reserved for use in the soil cover
    - Discuss with the contractor the mechanics of redistributing the cuttings within the pit (e.g. movement from the inner shoe to the suction side of the outer shoe and the discharge side of the outer shoe to the inner shoe) in order to minimize the surface area of the footprint created by the stabilization of residual solids as much as possible
- Maintaining the ratio of dry earth material to residual solids of 3:1 or less
- Creating a upper surface of the stabilized cuttings that exhibits a slope of about 3H:1V that would cause any accumulation of infiltrated water to flow along the geomembrane surface to the adjacent area of clean earth material (e.g. the areas originally exposed beneath the cut liner)
- An inspection by the operator's representative to evaluate and document a 4-foot distance between the top-most point of the stabilized, sloped solids and the final grade of the reclaimed temporary pit to ensure sufficient soil cover can be placed over the geomembrane cover

At this point, the sloped and stabilized cuttings should fill much of the inner and outer shoes while most of the side slopes and interior berms are dry, native material. After a second inspection by the operator's representative, the qualified contractor will:

1. Place a geomembrane cover over the sloped stabilized waste material in a way to prevent infiltration of water and so that infiltrated water does not collect on the geomembrane cover after the upper soil cover has been placed.
2. The geomembrane cover must extend 2-feet beyond the footprint created by the stabilized cuttings
3. Use new ~~or recycled~~ geomembrane cover made of 20-mil string reinforced LLDPE liner (or an equivalent cover identified in the transmittal letter and approved by the district office) that is composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions and complies with EPA SW-846

Method 9090A.

4. The geomembrane cover ~~may~~ will be comprised of large panels of new mat~~erial and/or p~~anels ~~of high-quality material reclaimed from the sides of the drilling pit~~. The panels ~~(new and/or used material)~~ are ~~sewn~~ welded together, overlapping at least 6 inches, to form continuous sheets that are sufficiently large to cover the footprint of stabilized cuttings that lie within the inner and outer shoe of the former temporary pit.
5. Over the sloping, stabilized material and liner, place the **Soil Cover**:
   a. at least 3-feet of compacted, uncontaminated, non-waste containing earthen fill with chloride concentrations less than 600 mg/kg as analyzed by EPA Method 300.0.
   b. either the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater, over the 3-foot earth material.
6. Contour the cover to
   a. blend with the surrounding topography
   b. prevent erosion of the cover and
   c. prevent ponding over the cover.

Closure Notice

The operator will notify the surface owner by certified mail, return receipt requested, that the operator plans closure operations at least 72 hours, but not more than one week, prior to any closure operation. The notice will include the well name, API number, and location.

After approval for in-place burial, the operator shall notify the district office verbally and in writing at least 72 hours but not more than one week before any closure operation. Notice will include the operator's name and the location of the temporary pit. The location will include unit letter, section number, township and range. If the location is associated with a well, then the well's name, number and API number will be included.

Should onsite burial be on private land, the operator will file a deed notice including exact location of the burial with the county clerk of the county where the onsite burial is located.

Closure Report

Within 60 days of closure completion, the operator will submit a

i. closure report on form C-144, with necessary attachments
ii. a certification that all information in the report and attachments is correct, that the operator has complied with all applicable closure requirements and conditions specified in the approved closure plan
iii. a plat of the pit location on form C-l05
iv. if burial is in a nearby trench/pit, a separate C-105 showing the exact location

Unless the permit transmittal letter requests an alternative marker to comply with surface landowner specifications, the operator will place at the center of an onsite burial a steel marker that

- is not less than four inches in diameter
- is placed at the bottom of a three-foot deep hole (minimum) that is filled with cement to secure the marker
- is at least four feet above mean ground level
- permanently displays the operator name, lease name, well number, unit letter, section,