

## Griswold, Jim, EMNRD

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**From:** Chase Acker <chase.acker@chk.com>  
**Sent:** Friday, January 03, 2014 9:40 AM  
**To:** Griswold, Jim, EMNRD  
**Subject:** RE: State L-2 and M-1 Sites, Lea County, New Mexico

Mr. Griswold,

It has also been our frustration that the Stage 2 Abatement Plans have yet to be undertaken. Chesapeake has been working with ARCADIS US, Inc. regarding the implementation of the Plans, however due to their lack of responsiveness, Chesapeake removed ARCADIS from the project towards the end of November and brought on Enviro Clean Services. Enviro Clean was ready to begin work on the Plans shortly thereafter, but it was determined that the week of January 13, 2014 would be a better start date.

The liners will all be placed at a depth of 5 feet below ground surface to insure an adequate root zone.

Thank you,  
Chase

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**From:** Griswold, Jim, EMNRD [mailto:Jim.Griswold@state.nm.us]  
**Sent:** Friday, January 03, 2014 9:31 AM  
**To:** Chase Acker  
**Cc:** hsncpbm@leaco.net; Larry Wooten; Steve Melton; Bruce E. McKenzie (bmckenzie@envirocleanps.com)  
**Subject:** RE: State L-2 and M-1 Sites, Lea County, New Mexico

Chase,

The Stage 2 Abatement Plans for both the State M-1 (AP-72) and State L-2 (AP-73) sites were approved by the OCD via emails of June 27, 2013. I'm a bit surprised the fieldwork associated with those plans has yet to be undertaken. Nonetheless, the change from compacted clay to the described geosynthetic clay liners is approved. Please ensure the liner materials are placed no shallower than 4 feet beneath the backfilled grade such that subsequent vegetation will have an adequate root zone. Thanks.

**Jim Griswold**  
*Senior Hydrologist*  
EMNRD/Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505  
505.476.3465  
email: [jim.griswold@state.nm.us](mailto:jim.griswold@state.nm.us)

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**From:** Chase Acker [mailto:chase.acker@chk.com]  
**Sent:** Thursday, December 26, 2013 10:21 AM  
**To:** Griswold, Jim, EMNRD  
**Cc:** [hsncpbm@leaco.net](mailto:hsncpbm@leaco.net); Larry Wooten; Steve Melton; Bruce E. McKenzie ([bmckenzie@envirocleanps.com](mailto:bmckenzie@envirocleanps.com))  
**Subject:** State L-2 and M-1 Sites, Lea County, New Mexico

Dear Mr. Griswold:

On March 27, 2012, ARCADIS US, Inc. on behalf of Chesapeake Energy Corporation (CHK) submitted to the New Mexico Oil Conservation Division (NMOCD) Stage 2 Abatement Plans (Plans) for the State L-2 (AP-73) and State M-1 (AP-72) sites located in Lea County, New Mexico (Sites). In these Plans, ARCADIS proposed that in remediation areas of these Sites where concentrations of chloride and/or total petroleum hydrocarbons (TPH) exceed 1,000 mg/kg at depths greater than 5 feet below ground level (bgl), those areas would be excavated to a depth of 5 feet bgl and a 12-inch compacted clay layer having a permeability equal to or less than  $1 \times 10^{-8}$  cm/s be installed into the excavated areas prior to backfilling to mitigate future leaching of the impacts to groundwater in these areas. In correspondence dated March 7, 2013, the NMOCD indicated that the Stage 2 Abatement Plans for the Sites were administratively complete.

Because this region of New Mexico lacks an abundance of native clay materials that would meet the permeability specifications proposed in the Plans, CHK has researched alternatives and become aware of a geosynthetic clay liner (GCL) material having better hydraulic characteristics than the clay layer currently proposed in the Plans. Bentomat 200R is manufactured by CETCO Lining Technologies Group (Hoffman Estates, Illinois) and is comprised of a layer of sodium bentonite encapsulated between a woven geotextile (lower) panel and a light-weight non-woven (upper) geotextile panel. The specifications of the GCL are provided as an attachment to this email. As is shown in the attached CETCO specifications, the GCL being considered for use at the Sites has a permeability of  $5 \times 10^{-9}$  cm/sec which exceeds the permeability specified in the Plans (i.e., the GCL is less permeable) by approximately one order of magnitude. This liner material will prevent upward wicking of impacts as well as downward leaching of impacts to groundwater.

Because the Bentomat 200R GCL has a superior (lower) permeability than the clay material previously proposed, CHK formally requests a variance to the Plans allowing the use of Bentomat 200R as a substitute for the clay liner material at the State L-2 (AP-73) and State M-1 (AP-72) Sites.

Additionally, Chesapeake has replaced ARCADIS US, Inc. with Enviro Clean Services (ECS) who, in conjunction with Chesapeake, will begin the implementation of the Plans starting the week of January 13, 2014.

Thank you,  
*Chase Acker*  
Technician - Environmental  
Chesapeake Energy Corporation  
Office: (717) 230-8620  
Mobile: (717) 303-4358  
E-mail: [Chase.Acker@chk.com](mailto:Chase.Acker@chk.com)



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# TECHNICAL REFERENCE 401-BMR

## BENTOMAT® 200R

### CERTIFIED PROPERTIES

MATERIAL PROPERTY	TEST METHOD	TEST FREQUENCY	REQUIRED VALUES
Bentonite Swell Index <sup>1</sup>	ASTM D 5890	1 per 50 tonnes	24 mL/2g min.
Bentonite Fluid Loss <sup>1</sup>	ASTM D 5891	1 per 50 tonnes	18 mL/2g min.
Bentonite Mass/Area <sup>2</sup>	ASTM D 5993	40,000 ft <sup>2</sup> (4,000 m <sup>2</sup> )	0.75 lb/ft <sup>2</sup> (3.6 kg/m <sup>2</sup> ) min.
GCL Tensile Strength <sup>3</sup>	ASTM D 6768	200,000 ft <sup>2</sup> (20,000 m <sup>2</sup> )	30 lb/in (53 N/cm) MARV
GCL Peel Strength <sup>3</sup>	ASTM D 6496	40,000 ft <sup>2</sup> (4,000 m <sup>2</sup> )	1 lb/in (1.75 N/cm) min.
GCL Index Flux <sup>4</sup>	ASTM D 5887	Weekly	1 X 10 <sup>-8</sup> m <sup>3</sup> /m <sup>2</sup> /sec max.
GCL Hydraulic Conductivity <sup>4</sup>	ASTM D 5887	Weekly	5 X 10 <sup>-9</sup> cm/sec max.
GCL Hydrated Internal Shear Strength <sup>5</sup>	ASTM D 5321 ASTM D 6243	Periodic	150 psf (7.2 kPa) typical

**Bentomat 200R is a needle-punched GCL consisting of a layer of sodium bentonite between woven and nonwoven geotextiles, which are needlepunched together.**

#### Notes

- 1 Bentonite property tests performed at a bentonite processing facility before shipment to CETCO's GCL production facilities.
- 2 Bentonite mass/area reported at 0 percent moisture content.
- 3 All tensile strength testing is performed in the machine direction using ASTM D 6768. All peel strength testing is performed using ASTM D 6496. Upon request, tensile and peel results can be reported per modified ASTM D 4632 using 4 inch grips.
- 4 Index flux and permeability testing with deaired distilled/deionized water at 80 psi (551kPa) cell pressure, 77 psi (531 kPa) headwater pressure and 75 psi (517 kPa) tailwater pressure. Reported value is equivalent to 925 gal/acre/day. Actual flux values vary with field condition pressures. The last 20 weekly values prior the end of the production date of the supplied GCL may be provided.
- 5 Peak value measured at 200 psf (10 kPa) normal stress for a specimen hydrated for 48 hours. Site-specific materials, GCL products, and test conditions must be used to verify internal and interface strength of the proposed design.

CETCO has developed an edge enhancement system that eliminates the need to use additional granular sodium bentonite within the overlap area of the seams. We call this edge enhancement, SUPERGROOVE™, and it comes standard on both longitudinal edges of BENTOMAT® 200R. It should be noted that SUPERGROOVE™ does not appear on the end-of-roll overlaps and recommend the continued use of supplemental bentonite for all end-of-roll seams.

#### LAST UPDATED JULY 2008

*IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit [www.CETCO.com](http://www.CETCO.com). CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice.*



[www.CETCO.com](http://www.CETCO.com)

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## Griswold, Jim, EMNRD

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**From:** Griswold, Jim, EMNRD  
**Sent:** Thursday, March 21, 2013 8:58 AM  
**To:** 'Hall, Sharon'  
**Subject:** RE: Request for Public Notice Extension, AP-72 and AP-73

Sharon,

Your request for extension is approved. Please keep a copy of this email for your files as no hardcopy will be sent. Thanks.

**Jim Griswold**  
*Senior Hydrologist*  
EMNRD/Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505  
505.476.3465  
email: [jim.griswold@state.nm.us](mailto:jim.griswold@state.nm.us)

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**From:** Hall, Sharon [<mailto:Sharon.Hall@arcadis-us.com>]  
**Sent:** Thursday, March 21, 2013 8:35 AM  
**To:** Griswold, Jim, EMNRD  
**Cc:** Larry Wooten  
**Subject:** Request for Public Notice Extension, AP-72 and AP-73

Good morning Jim,

On behalf of Chesapeake I am respectfully requesting your approval of a three week extension to publish the Public Notice of the Stage 2 Abatement Plans for the AP-72 and AP-73 sites. Per Rule 19, the public notices were due to be published by tomorrow, March 22. Chesapeake personnel need to review and approve the proposed text of the notices before sending it to you for your approval prior to publication. In addition to the need for review and approval, the Lovington newspaper publishes on Tuesday, Thursday and Saturday which limits our ability for publication.

We would appreciate your approval of this extension request to publish the Public Notices on April 11, 2013.

Regards,  
Sharon Hall

**Sharon Hall** | Associate Vice President | [Sharon.Hall@arcadis-us.com](mailto:Sharon.Hall@arcadis-us.com)  
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## Griswold, Jim, EMNRD

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**From:** Griswold, Jim, EMNRD  
**Sent:** Monday, March 25, 2013 10:43 AM  
**To:** 'Hall, Sharon'  
**Subject:** RE: Revised Public Notices, M-1 and L-2

Sharon,

Your revised public notice are both hereby approved. Once they are running, please send me proof of publication both in the county and statewide, along with proof of notice to the surface owners within one mile, the Lea County Commission, and the NM Trustee for natural resources as required under 19.15.30.15 NMAC

**Jim Griswold**  
*Senior Hydrologist*  
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email: [jim.griswold@state.nm.us](mailto:jim.griswold@state.nm.us)

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**From:** Hall, Sharon [<mailto:Sharon.Hall@arcadis-us.com>]  
**Sent:** Monday, March 25, 2013 10:34 AM  
**To:** Griswold, Jim, EMNRD  
**Subject:** Revised Public Notices, M-1 and L-2

Jim,  
Respectfully submitted on behalf of Chesapeake are the revised Public Notices for the M-1 and L-2 sites. Please let me know if you have any comments.  
Regards,  
Sharon

**Sharon Hall** | Associate Vice President | [Sharon.Hall@arcadis-us.com](mailto:Sharon.Hall@arcadis-us.com)  
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**Griswold, Jim, EMNRD**

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**From:** Griswold, Jim, EMNRD  
**Sent:** Friday, June 21, 2013 3:29 PM  
**To:** sharon.hall@arcadis-us.com  
**Subject:** AP-72 Chesapeake/State M-1 Stage 2 Abatement Plan

Sharon,

In *Section 3.2 Groundwater Remediation and Monitoring* (page 3) of the proposal dated 3/27/13 it states that an additional monitoring well is to be installed downgradient of the former battery. Would you please provide more specific information in this regard. Perhaps an approximate location on a scaled site map. Thank you.

**Jim Griswold**  
*Senior Hydrologist*  
EMNRD/Oil Conservation Division  
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505.476.3465  
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**Griswold, Jim, EMNRD**

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**From:** Griswold, Jim, EMNRD  
**Sent:** Thursday, June 27, 2013 4:14 PM  
**To:** Larry Wooten  
**Cc:** 'Hall, Sharon'; Chase Acker  
**Subject:** Stage 2 Abatement Plan Approval: AP-72 Former State M-1 Tank Battery located in Unit Letter O of Section 18 in Township 17 South, Range 36 East, NMPPM in Lea County, NM

Mr. Wooten,

The Oil Conservation Division (OCD) has reviewed the Stage 2 Abatement Plan for the above-referenced site submitted on your behalf by Arcadis and dated 3/27/12. That plan has substantially met the requirements of 19.15.30 NMAC and is hereby approved. Please proceed with field activities.

Be advised this approval does not relieve Chesapeake of responsibility should the situation continue to pose a threat to groundwater, surface water, human health, or the environment. Furthermore, this approval does not relieve your responsibility for compliance with any federal, state, or local laws and/or regulations. Please retain a copy of this email for your files, as no hardcopy will be sent. If you have any questions, please feel free to contact me at any time.

**Jim Griswold**

*Senior Hydrologist*

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