Griswold, Jim, EMNRD

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

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

From: Chase Acker [mailto:chase.acker@chk.com]
Sent: Thursday, December 26, 2013 10:21 AM
To: Griswold, Jim, EMNRD
Cc: hsncpbm@leaco.net; Larry Wooten; Steve Melton; Bruce E. McKenzie (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 $1x10^{-8}$ 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 indicted 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 research 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 $5x10^{-9}$ 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
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Mobile: (717) 303-4358
E-mail: 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[1]	ASTM D 5890	1 per 50 tonnes	24 mL/2g min.
Bentonite Fluid Loss[1]	ASTM D 5891	1 per 50 tonnes	18 mL/2g min.
Bentonite Mass/Area[2]	ASTM D 5993	40,000 ft^2 (4,000 m^2)	0.75 lb/ft^2 (3.6 kg/m^2) min.
GCL Tensile Strength[3]	ASTM D 6768	200,000 ft^2 (20,000 m^2)	30 lb/in (53 N/cm) MARV
GCL Peel Strength[3]	ASTM D 6496	40,000 ft^2 (4,000 m^2)	1 lb/in (1.75 N/cm) min.
GCL Index Flux[4]	ASTM D 5887	Weekly	1 X 10^{-8} m^3/m^2/sec max.
GCL Hydraulic Conductivity[4]	ASTM D 5887	Weekly	5 X 10^{-9} cm/sec max.
GCL Hydrated Internal Shear Strength[5]	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

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