



October 21, 2020

Mr. Jarrod Zweifel, P.G.
Associate Director
Office of Land Resources
Arkansas Energy and Environment
Division of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118
zweifel@adeq.state.ar.us

AFIN: 03-00051
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TO: JZ > FILE < OR

Subject: NABORS Landfill – Three Brothers, Baxter County, Arkansas
AFIN: 03-00051

Mr. Zweifel,

Thank you for relaying the information about the current condition of the ClosureTurf® system at the NABORS Landfill located in Three Brothers, Arkansas in your letter dated October 7, 2020 (provided as Attachment A). Your letter states the Division of Environmental Quality, Office of Land Resources (DEQ) contracted engineering consultant firm (Harbor Environmental, Inc.) conducted a site visit September 23, 2019, and documented an apparent tear along a seam of the ClosureTurf lining on the south slope of Area 1-2 or near the LCS-4 control panel. To address this, Watershed Geo® (WG) proposes:

- 1) WG will conduct a site inspection and determine the course of action to quickly repair the compromised seam on the south slope of Area 1-2 near the LCS-4 control panel.

WG will look for a notice to proceed (NTP) by DEQ. The WG Maintenance Manager, Mr. Jeff Albright, has already reached out to Ms. Rebecca White, Mr. Clark McWilliams and Mr. Mo Shafii to determine current policies and procedures for visiting the site in anticipation of scheduling a visit as soon as possible. Once the NTP is received, WG will coordinate to gain access, schedule a site visit and implement repairs. In the interim, the ClosureTurf system continues to perform the intended purpose of landfill closure. Based on the documentation provided and multiple site visits, the system appears to be performing well with only minor maintenance items occurring.

Watershed Geo appreciates the opportunity to address your concerns. If you have any questions, please do not hesitate to contact me by email at ctimpson@watershedgeo.com or phone at 470.456.0027.

Sincerely,

Christopher Timpson
Southeast Region, Market Director

cc: Mike Ayers, Watershed Geo
Kyle Ehman, Watershed Geo

11400 Atlantis Place, Ste 200
Alpharetta, GA 30022
770-777-0386
www.watershedgeo.com

Attachment A



ARKANSAS

ENERGY & ENVIRONMENT

October 7, 2020

Mr. David Cieply
Vice President, Solid Waste Market
WatershedGeo
11400 Atlantis Place, Suite 200
Alpharetta, GA 30022

RE: NABORS Landfill – Three Brothers, Baxter County, Arkansas
AFIN: 03-00051

Dear Mr. Cieply:

The Division of Environmental Quality, Office of Land Resources (DEQ) would like to relay information about the current conditions of the ClosureTurf at the NABORS Landfill located in Three Brothers, Arkansas. On September 23, 2020, DEQ's contracted engineering consultant firm (Harbor Environmental, Inc.) conducted a site visit at the NABORS Landfill and reported an issue related to the ClosureTurf and the geomembrane liner at the site.

Specifically, Harbor Environmental reported that an apparent tear had developed along a seam of the ClosureTurf lining on the south slope of Area 1-2 or near the LCS-4 control panel. While no intrusive activity is apparent at this time, this issue may impact the integrity of the ClosureTurf cover if not addressed promptly.

DEQ requests, pursuant to your letter dated April 16, 2019, that you respond to this correspondence by October 21, 2020, and provide a plan for inspecting, evaluating, and resolving this issue. Should you have any questions regarding the contents of this letter, please feel free to contact Rebecca White, (501) 682-0837 | rebecca.white@adeq.state.ar.us, or Clark McWilliams, (501) 682-0510 | mckilliamsc@adeq.state.ar.us.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jarrod Zweifel'.

Jarrod Zweifel, P.G.
Associate Director, Office of Land Resources
5301 Northshore Drive, North Little Rock, AR 72118

Enclosures: Pictures of ClosureTurf tear
April 16, 2019 Letter from WatershedGeo to ADEQ

ARKANSAS DEPARTMENT OF ENERGY AND ENVIRONMENT



Photograph 7: Tear in ClosureTurf® near LCS-4.



Photograph 8: Additional view of tear in ClosureTurf®.



Photograph 9: Additional view of tear in ClosuresTurf®.



Photograph 10: Additional view of tear in ClosuresTurf®.



Photograph 11: Additional view of tear in ClosuresTurf®.



Photograph 12: Additional view of tear in ClosuresTurf®.



April 16, 2019

Robert Blanz, PhD, P.E.
Chief Technical Officer

Mr. Mo Shafii
Project Manager
Director's Office
ADEQ
5301 Northshore Drive
Little Rock, AR 72118

**RE: Nabors Landfill
Response to ADEQ Letters and
Request for Information**

Dear Gentlemen,

As mentioned during our site visit and referenced in our letter dated March 22, 2019, Watershed Geosynthetics LLC ("WG") has provided in this submittal the estimated costs of the perimeter channel stone and financial comparison model of ClosureTurf to traditional closure methods.

WG has identified an aggregate material (similar to a #4 stone) that would satisfy what was discussed during the March 12, 2019 site visit. The aggregate would provide additional UV protection and improve aesthetics. The price for the material required to cover the perimeter channels for both Area 1-2 and Area 1-3 delivered to the facility is estimated to be approximately \$20,000. Please note, the price quoted above includes only the material to be delivered to the site and does not include the placement in the perimeter channel.

Regarding the financial comparison analysis requested by the ADEQ, please find the referenced model as an attachment titled "Financial Impact Calculation Nabors Landfill". The model reflects a savings of \$2,719,333 million in long-term care. Additionally, we have observed in various publications and documents that the upfront construction costs of ClosureTurf provided an estimated savings of approximately \$2.9 million dollars.

We would also like to confirm that the following information has been received in previous correspondence from WG to the ADEQ office:

1. GSI and WG have agreed to repair (i) the turf at the east perimeter ditch discharge since it has come apart at the concrete flared-end section; (ii) at the northwest mid slope area, there is a horizontal turf seam requiring corrective measures; and (iii), approximately 200 linear feet of vertical wrinkles located on Area 1-2 south, north and west slopes.

- Confirmed by Watershed Geo (4.12.19)

2. During our visit on March 12, 2019, WG observed and agreed that large turf wrinkles were located approximately midpoint along the north slope and west slope areas in Area 1-2. Area 1-3 has a series of smaller wrinkles located at the lower sections of the east and south slopes. Because Areas 1-2 and 1-3 are expected to continue to settle, WG has agreed to monitor the situation of wrinkles for the next 5-year period. During that time, WG would perform annual site visit/inspection and if any exposed geotextile backing is found, work to immediately reapply protection as needed. After the 5-year period, WG will repair any wrinkles that have exposed textiles by correcting the exposed conditions or reducing the size of the wrinkle to allow for the infill to stay in place.

- Confirmed by Watershed Geo (4.12.19)

3. WG has provided one option for the perimeter channels; having rock applied in the perimeter channels due to wrinkles of various sizes in a large portion of the perimeter channels, primarily in area 1-2 and area 1-3. ADEQ will evaluate this option and discuss it with all parties.

- Estimated rock quantities and pricing listed in narrative above.


4. ADEQ understands that the observed wrinkling and irregularities of the turf and geomembrane are believed to be caused by the soft, saturated subgrade. No immediate action to the turf or geomembrane is required unless the geotextile backing is exposed due to wrinkling. Exposed geotextile backing would be handled as in other similar cases by applying protective measures.

- Confirmed by Watershed Geo (4.12.19)

WG would like to reiterate that based on our observations during our site visit the closure system's integrity is not being impacted by any non-completed construction items (i.e. ripple and wrinkle correction). The site closure component (geomembrane) in its' current condition has adequate protection for long-term performance for the mandatory regulatory period. The suggested maintenance cost and schedule of site monitoring discussed and used in the attached model are to increase the performance to 100+ years of protection.

We trust that the above documented and subsequent attachment satisfy recent requests by the ADEQ. Please let us know if there is anything else that might be needed at this time, or if you would like to meet again to discuss any further.

Best Regards,

A handwritten signature in black ink, appearing to read 'David Cieply', with a stylized flourish at the end.

David Cieply
VP, Solid Waste Market