Inspection Report

To: **Steve Brown (New Castle Generating Station)**

From: **Richard Southorn, P.E., P.G., CPSWQ**

Re: **New Castle Plant Ash Landfill – Annual CCR Unit Inspection Report No. 2**

Inspection Date: **November 17, 2016**

Report Date: **January 16, 2017**

INTRODUCTION

Title 40 Code of Federal Regulations (CFR) Part 257 addresses, in part, the management of Coal Combustion Residuals (CCR Rule, or Rule) in regulated units, including landfills. Specific to §257.84(b) of the Rule, existing and new CCR landfills must be inspected on an annual basis by a qualified professional engineer. For the New Castle Generating Station (operated by NRG Power Midwest LP), this inspection requirement applies to the existing New Castle Plant Ash Landfill (Ash Landfill). In support of this obligation, Mr. Richard Southorn (a qualified professional engineer with CB&I Environmental & Infrastructure, Inc. [CB&I]) conducted an on-site inspection of the Ash Landfill on November 17, 2016. The findings from this second annual inspection are summarized in the remaining sections of this correspondence.

As required, this report will be placed in the New Castle facility's operating record per §257.105(g)(9), noticed to the State Director per §257.106(g)(7), and posted to the publicly accessible internet site per §257.107(g)(7). Placement of the first annual inspection report into the facility's operating record was accomplished on January 18, 2016, satisfying the entry date deadline per §257.84(b)(3)(i). Accordingly and per §257.84(b)(4), the current report will be entered into the facility's operating record no later than January 18, 2017.

BACKGROUND

The Ash Landfill is situated north of the main generating station. Originally in this portion of the property, an impoundment existed (occupying an area of approximately 120 acres) which was used for the disposal of sluiced fly ash and bottom ash; these operations took place from approximately 1939 to 1978. From 1978 to 1984 and following the installation of electrostatic precipitators at the station, "dry" fly ash was disposed on the dewatered impoundment area. Beginning in 1984, CCR materials (including "dry" fly ash and dredged bottom ash) have been placed in this area.

In 1997, the Pennsylvania Department of Environmental Protection (PADEP) issued Solid Waste Permit No. 300818 for the Ash Landfill, addressing Stages 1, 2, and 3A. In April 2008, a permit modification was issued for Stages 4, 5, 6, and 7, which together comprise a vertical expansion of the Ash Landfill over top of the previously PADEP permitted stages.

From 2008 through 2010, approximately 16.8 acres of layover liner system (liner between Stages 4 and underlying Stages 1, 2, and 3A) was placed within Stage 4. Approximately 17.9 acres of final cover cap liner system was installed over the lower landfill slopes (southern and eastern perimeters) in 2008/2009; approximately 11.6 acres installed over Stage 1, 2, and/or 3A beneath the area designated for Stage 5 (not active) in 2010; and approximately 10.2 acres installed over Stage 1, 2, and/or 3A beneath the area designated for Stage 6 (not active) in 2013. Therefore, Stages 1, 2, and 3A were entirely capped and/or closed by 2013 with the layover liner system installation in Stage 4 and final cover cap placement in the areas designated for Stages 5 and 6.

Stage 4 is currently the active disposal area. The currently permitted Ash Landfill occupies an area of approximately 60 acres (see Figure in Attachment 1), and is operated/maintained in accordance with Permit No. 300818.

In June 2016, the New Castle Generating Station successfully completed a natural gas addition project and began operating with this new fuel source (the ability to run on coal has still been maintained). As a result, disposal of solid waste materials in the Stage 4 area has been curtailed since approximately May 2016.

With respect to the Ash Landfill, CB&I's evaluation has focused on the following items as outlined in §257.84(b)(1)(i-ii):

- *A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record; and*
- *A visual inspection of the CCR unit to identify signs of distress or malfunction.*

Specific to CB&I's preparation of the annual inspection report, and per §257.84(b)(2) (i-iv), the following aspects have been addressed:

- *Any changes in geometry of the structure since the previous annual inspection;*
- *The approximate volume of CCR contained in the unit at the time of the inspection;*
- *Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit; and*
- *Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.*

OPERATING RECORDS REVIEW

Principal items reviewed as part of this year's inspection included, but were not limited to: Design Drawings, 2016 Weekly and Periodic Landfill Inspection Reports, 2015 Annual Landfill Operations Report (dated, June 2016), and Solid Waste Permit No. 300818. During the site inspection, Mr. Southorn interviewed facility personnel (Mr. Steve Brown) to verify the information contained within the operating record.

Environmental Control System Overview

i. Bottom Liner System

a. The active disposal area overlies the previous disposal areas (Stages 1, 2, and 3A). An over liner consisting of the subbase layer, geosynthetic clay liner, and an engineered 60-mil textured HDPE geomembrane with a geocomposite drainage layer and leachate detection system was installed above Stages 1, 2, and 3A prior to placement of CCR materials in Stage 4. The top of Stages 1, 2, and 3A that was beneath the designated areas of Stages 5 and 6 was capped using two feet of final cover soil with vegetative cover; double-sided bonded geocomposite consisting of 220-mil geonet and 6 oz. geonet drainage layer; a 40-mil textured HDPE flexible membrane liner; and compacted subgrade.

ii. Leachate Collection System

a. An underdrain system is used to collect leachate from the Ash Landfill; leachate collected in the underdrain system is routed to the Leachate Pond via dedicated perimeter ditches. From the Leachate Pond, the flows are discharged to the Beaver River via Outfall 009 in accordance with the New Castle Station's National Pollutant Discharge Elimination System (NPDES) Permit. There is a leachate leak detection system in place, located beneath the over liner

iii. Stormwater Management

a. "Non-contact" stormwater and surface water is drained downslope. The slopes drain to perimeter stormwater ditches (separate from the leachate ditches) which convey the water to a Sedimentation Pond. From this pond, the waters are discharged to the Beaver River via NPDES-permitted Outfall 006.

b. "Contact" stormwater from within the active disposal area is collected in the leachate underdrain system and routed to the Leachate Pond as described above.

iv. Cover System

a. The perimeter slopes have a final cover installed and established vegetation where final cover is present.

Summary of Landfill Construction

i. The active disposal area (Stage 4) has not received any solid waste materials since approximately May 2016. Exterior slopes have a final cover in place, and final cover areas have an established vegetative layer.

Review of Prior Inspections

i. Weekly inspections: A review of weekly inspections has concluded that no significant deficiencies occurred at the facility that required remedial actions. Animal burrows are noted on multiple inspection reports, but are addressed through backfilling in a timely manner.

ii. Annual inspections: A review of the previous annual inspection report has determined that there were no deficiencies or releases, actual or potential structural weaknesses, or concern to the stability of the land form. All environmental control systems were in good operating condition and functioning as intended.

CCR Disposal

i. Based on review of the 2015 Annual Landfill Operations Report and subsequent information provided by NRG, the total in-place disposal quantity of CCR materials was estimated at approximately 1,373,897 tons (1,361,292 tons through December 2015 plus an additional 12,605 tons through May 2016). No disposal has taken place since May 2016, as a result of the natural gas-fired operations which commenced in June 2016.

SITE INSPECTION

The site inspection was performed on November 17, 2016 by Mr. Southorn, and during which time efforts were focused on identification of standard geotechnical signs of distress or malfunction. Specific aspects such as slumping at the toe of slope, tensile cracking, abnormal or excessive erosion on the side slopes, slope bulging, groundwater/surface water seepage or ponding were assessed. If present, these readily visible signs are potential indicators of structural weakness of the CCR Landfill unit.

Visual Signs of Distress or Malfunction

i. No visual signs of distress or malfunction were observed during the inspection. Stormwater drainage features, slope appearance and stability, leachate conveyance mechanisms, and overall site conditions were assessed. Capped portions of the Ash Landfill exhibited well established vegetative cover.

Review of Environmental Control Systems

i. With no evidence to the contrary, the bottom liner system at the active Stage 4 disposal area is believed to be in good operating condition and functioning as intended. At the time of the inspection, leachate and stormwater conveyance systems were operating as designed.

CONCLUSIONS

Changes in geometry

i. As of the date of this inspection, CCR materials had not been placed in the active disposal area since May 2016. During the previous annual inspection, CCR materials were being placed within the active disposal area at approximate elevations ranging between 829 and 840 feet mean sea level. No significant changes have been made to the geometry of the Ash Landfill since the previous annual inspection.

In-Place CCR Disposal Quantities

ii. Based on review of the 2015 Annual Landfill Operations Report and subsequent information provided by NRG, the total in-place disposal quantity of CCR materials was estimated at approximately 1,373,897 tons (1,361,292 tons through December 2015 plus an additional 12,605 tons through May 2016). No disposal has taken place since May 2016, as a result of the natural gas-fired operations which commenced in June 2016.

Appearances of an Actual or Potential Structural Weakness of CCR Unit

i. At the time of inspection, there were no signs of distress or malfunction that would indicate actual or potential structural weakness at the Ash Landfill.

Changes that may affect the stability or operation of the CCR Unit

i. There have been no changes to the Ash Landfill area that pose a threat or concern to the stability of the land form.

RECOMMENDATIONS

1. Place intermediate cover on top of Stage 4 disposal area if anticipated to remain generally inactive throughout the coming year.

2. As an ongoing maintenance item, continue to fill any animal burrows or holes observed during weekly inspections to prevent instability.

3. Ensure adequate access to the closed portions of the landfill to maintain the ability to perform weekly visual site structural inspections.

4. Continue operations and maintenance of stormwater drainage features and leachate collection systems.

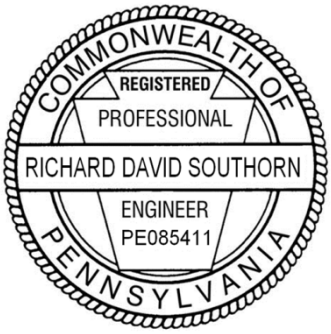
There were no deficiencies or releases identified during the 2016 annual inspection that required the owner or operator to perform corrective actions per §257.84(b)(5).

PROFESSIONAL ENGINEER'S CERTIFICATION

In accordance with §257.84(b) of the Rule, I hereby certify based on a review of available information within the facility's operating records and observations from my personal on-site inspection (including the photographs contained in Attachment 2), that the New Castle Plant Ash Landfill does not exhibit any appearances of actual/potential structural weakness that would be disruptive to the normal operations of the CCR Unit. The unit is being operated and maintained consistent with recognized and generally accepted good engineering standards and practices.

Certified by: _____

Date: 1/16/17



Richard Southorn, P.E., P.G, CPSWQ

Professional Engineer Registration No. PE085411

CB&I Environmental & Infrastructure, Inc.

ATTACHMENTS

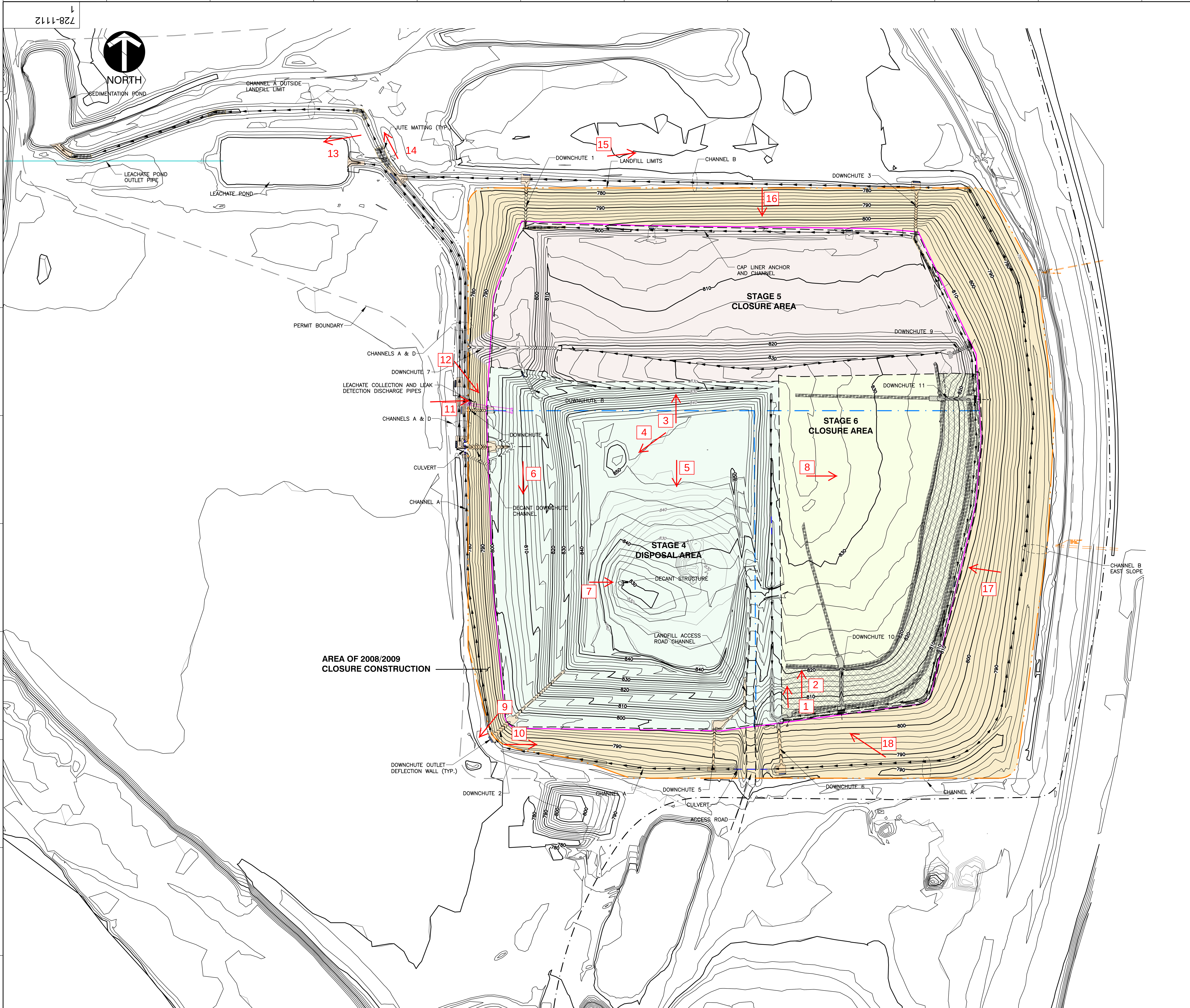
1. Site Map
2. Inspection Photo Log

REFERENCES

1. Application for Major Permit Modification and Permit Renewal, New Castle Plant Ash Landfill, April 2007 (including subsequent revisions).
2. PADEP Solid Waste Permit 300818, New Castle Plant Ash Landfill, April 23, 2008.
3. 2015 New Castle Generating Station Annual Landfill Operations Report, June 2016.
4. Weekly and Periodic Landfill Inspection Reports, 2016.
5. 40 Code of Federal Regulations Part 257.

Attachment 1

Site Map



REFERENCE

810	EXISTING CONTOUR (MARCH 12, 2015)
780	EXISTING CONTOUR (MARCH 8, 2016)
	EXISTING EDGE OF ROAD
	EXISTING STREAM OR RIVER
	EXISTING TREELINE
×778.3	EXISTING SPOT EL.
	EXISTING STREAM OR RIVER
	EXISTING PERMIT BOUNDARY
	EXISTING WETLAND
	PROPERTY LINE
	PERMITTED LIMIT OF ASH LANDFILL
	LIMIT OF LANDFILL / PERMIT BOUNDARY
	STAGE LIMITS
	PERMITTED STAGE LIMITS
	LIMITS OF 2008/2009 CLOSURE CONSTRUCTION (17.9 ACRES)
	LIMITS OF STAGE 6 CLOSURE AREA (10.2 ACRES)
	LIMITS OF STAGE 5 CLOSURE AREA (11.6 ACRES)
	LIMITS OF STAGE 4 LINER SYSTEM (16.8 ACRES)
	CHANNEL
	CULVERT
	GABION DEFLECTOR WALL
	CONCRETE REVETMENT
	JUTE MATTING
	EROSION MATTING
	RIP-RAP LINED DOWNCHUTE
	LEACHATE POND OUTLET PIPE

1 — 2016 ANNUAL INSPECTION PHOTOGRAPH (ARROW DENOTES DIRECTION OF VIEW)

REFERENCE

TOPOGRAPHY PROVIDED BY AERIAL DESIGN DATA FROM PHOTOGRAPHY TAKEN 1-11-07, 1"=100', 2' CONTOUR INTERVAL; NUMEROUS FIELD SURVEYS MADE BY GENON AND R&L DEVELOPMENT CO. BETWEEN 3-12-15 AND 3-8-16.

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL ENGINEER — DUANE LANOUE — PE076388

SCALE IN FEET: 0 — 100 — 200

NEW CASTLE PLANT ASH LANDFILL
UNIT NO.

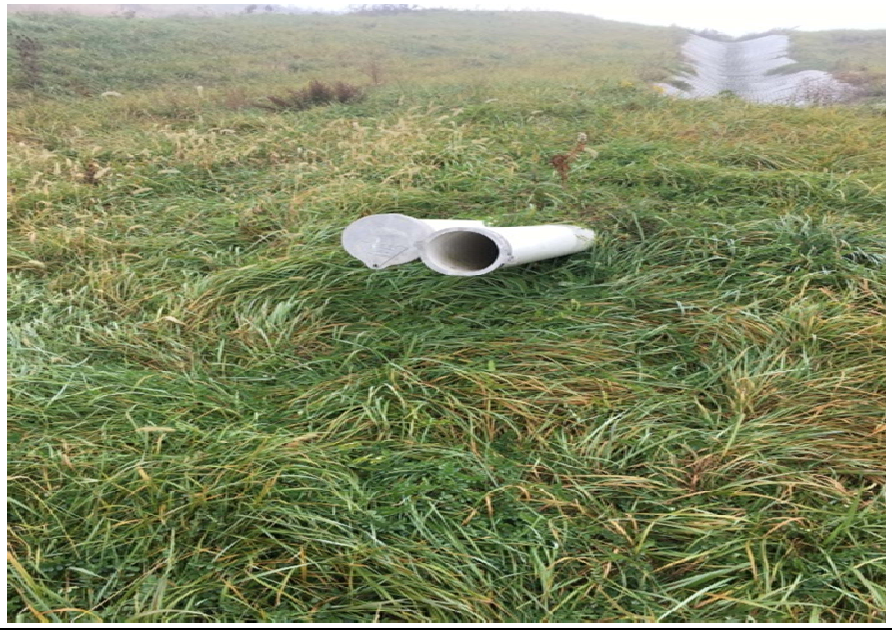
2015 RESIDUAL WASTE LANDFILL ANNUAL OPERATION REPORT
MARCH 12, 2015 THRU MARCH 8, 2016
CONTOUR COMPARISON

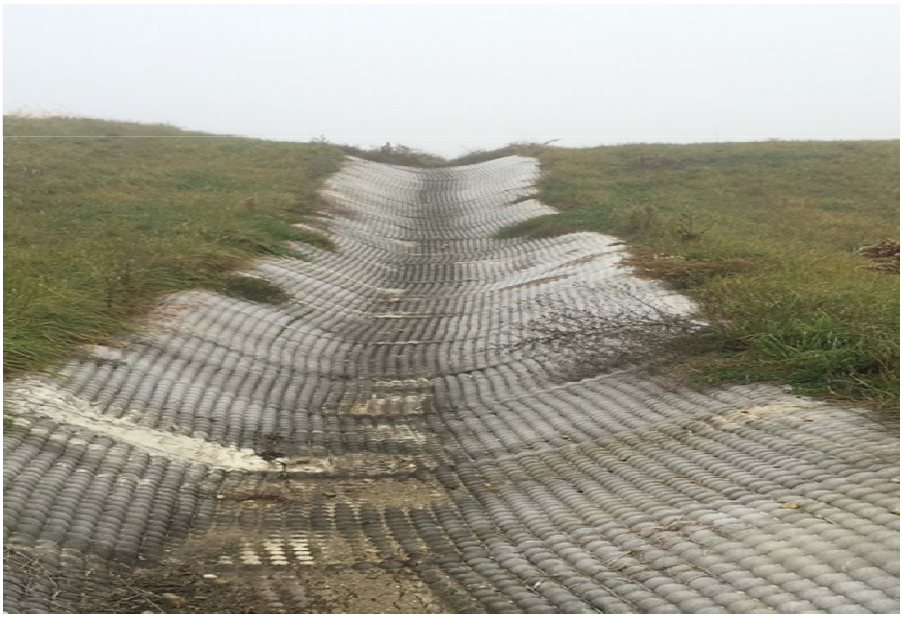
DRAWN: 4/1/2016	RJB	DRAWING NUMBER
CHECKED	JMC	728-1112
APPROVED	DRL	SHEET: 1
SIZE: 30x42		REV: 0
DISCIPLINE:	SCALE: AS SHOWN	FILE:

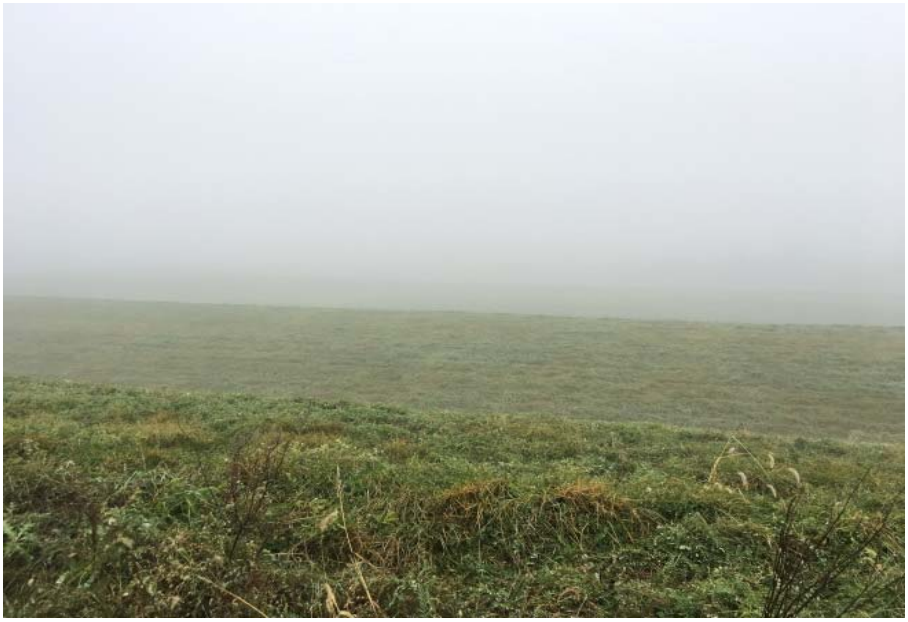
NO.	DATE	REVISION	BY	CHK.	APP.

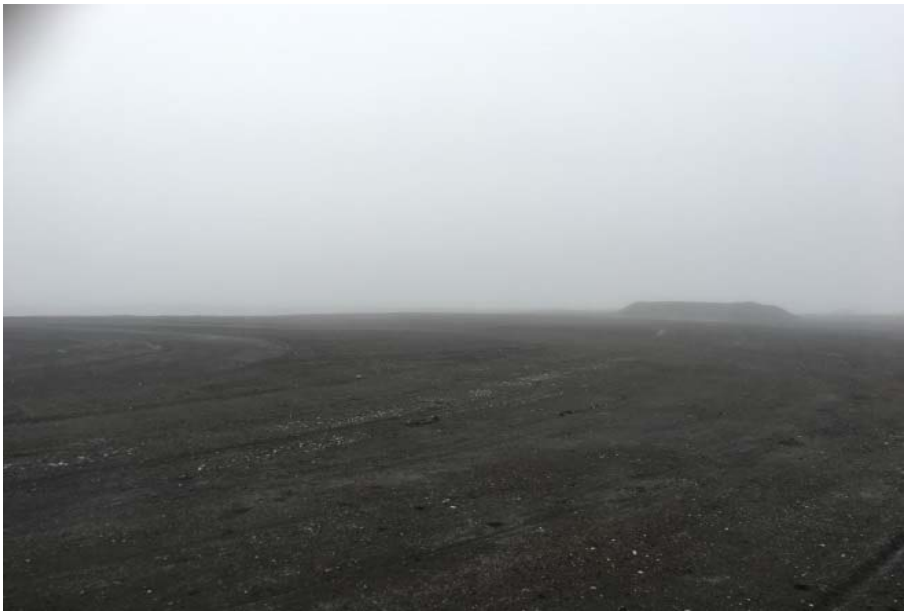
Attachment 2

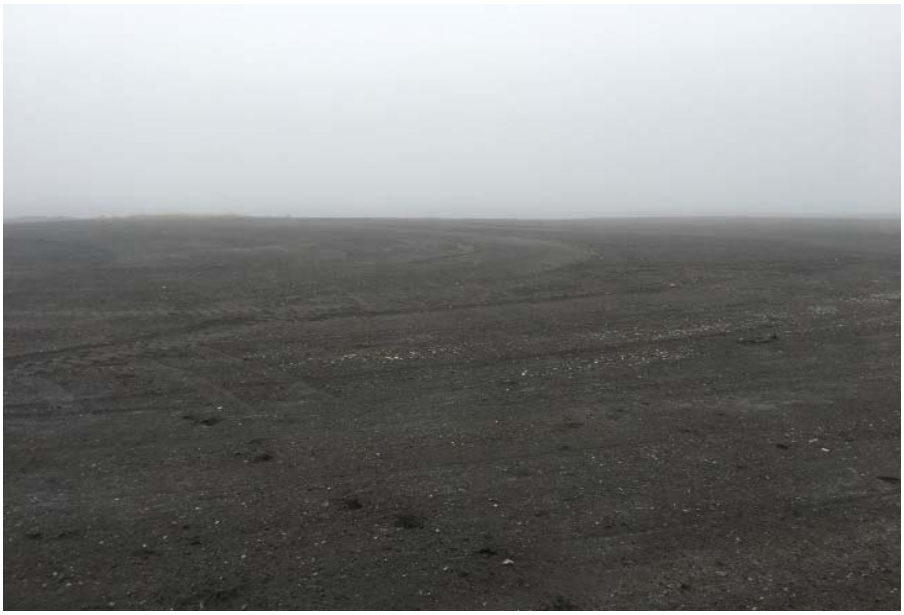
Photo Log

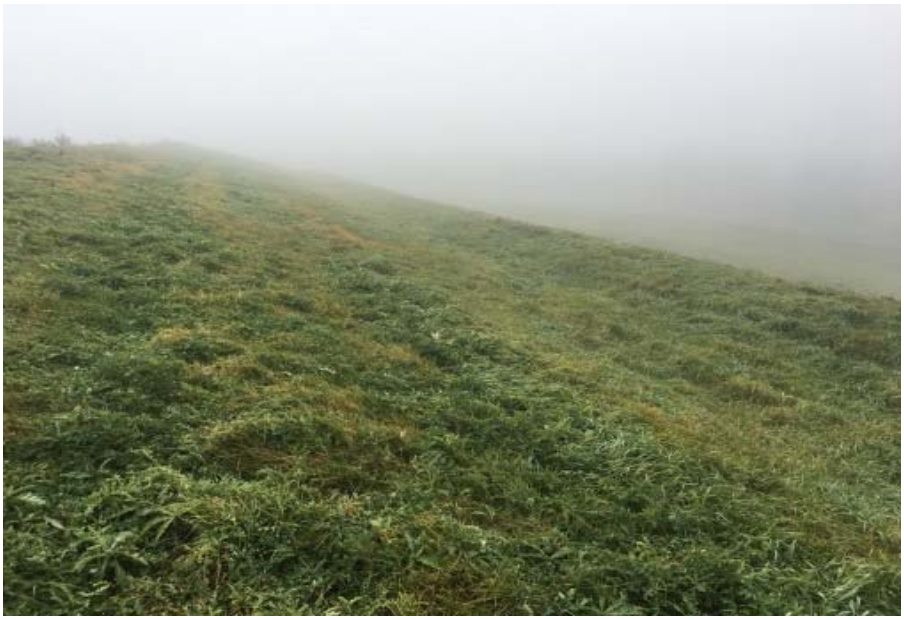
Photograph No. 1 **Date:** November 17, 2016 **Direction:** North	
Description: Leachate cleanout pipe with "non-contact" stormwater downchute in background.	

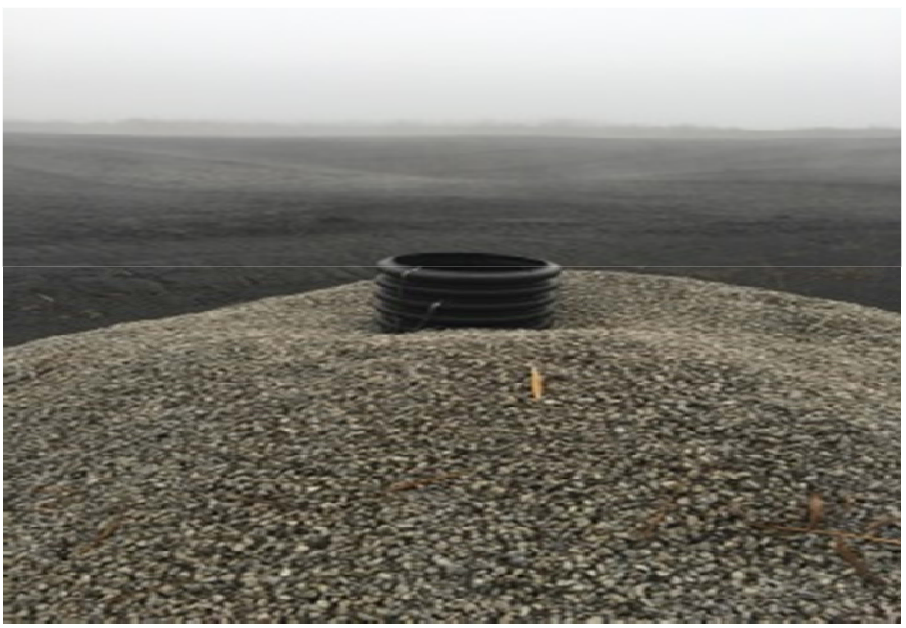
Photograph No. 2 **Date:** November 17, 2016 **Direction:** North	
Description: "Non-contact" stormwater downchute. No evidence of erosion or obstruction.	

Photograph No. 3 **Date:** November 17, 2016 **Direction:** North	
Description: Closed portions of Stage 4 disposal area. Vegetation is well established and maintained. No evidence of erosion or sloughing.	

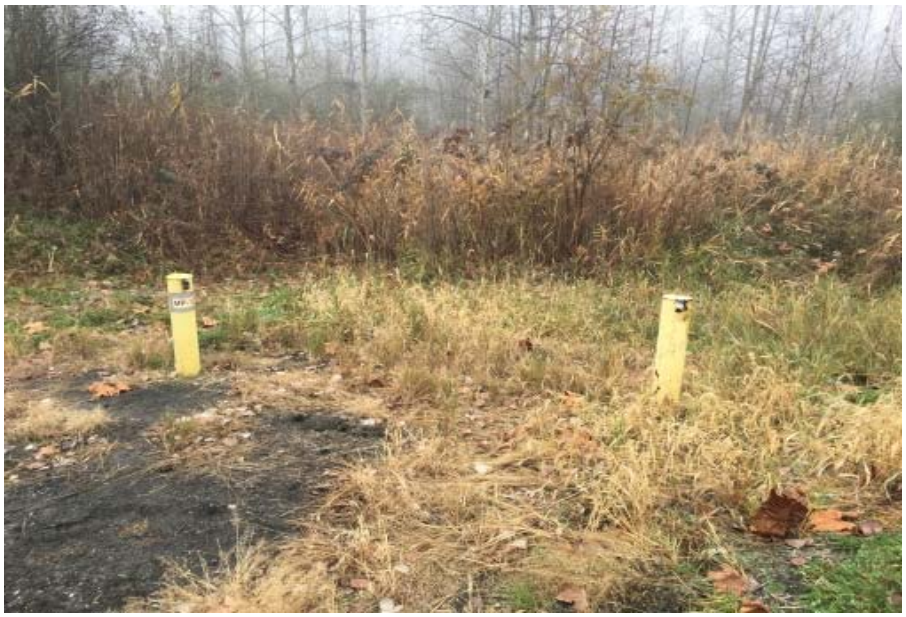
Photograph No. 4 **Date:** November 17, 2016 **Direction:** Southwest	
Description: Active filling area in Stage 4 (no disposal since approx. May 2016). No evidence of erosion or airborne dust.	

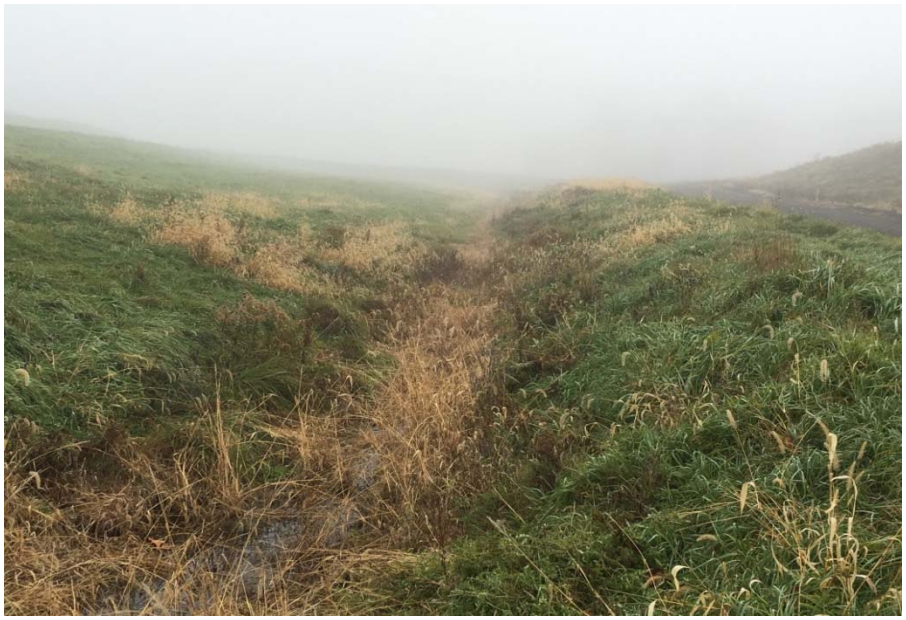
Photograph No. 5 **Date:** November 17, 2016 **Direction:** South	
Description: Active filling area in Stage 4 (no disposal since approx. May 2016). No evidence of erosion or airborne dust.	

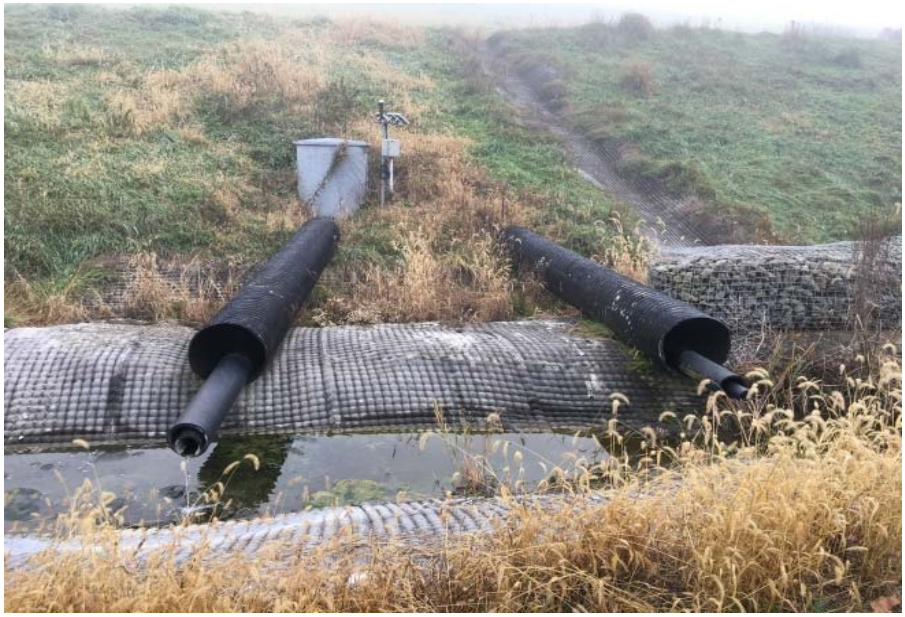
Photograph No. 6 **Date:** November 17, 2016 **Direction:** South	
Description: Observing the closed portions of Stage 4 along western perimeter. Vegetation is well established and maintained. No evidence of erosion or sloughing.	

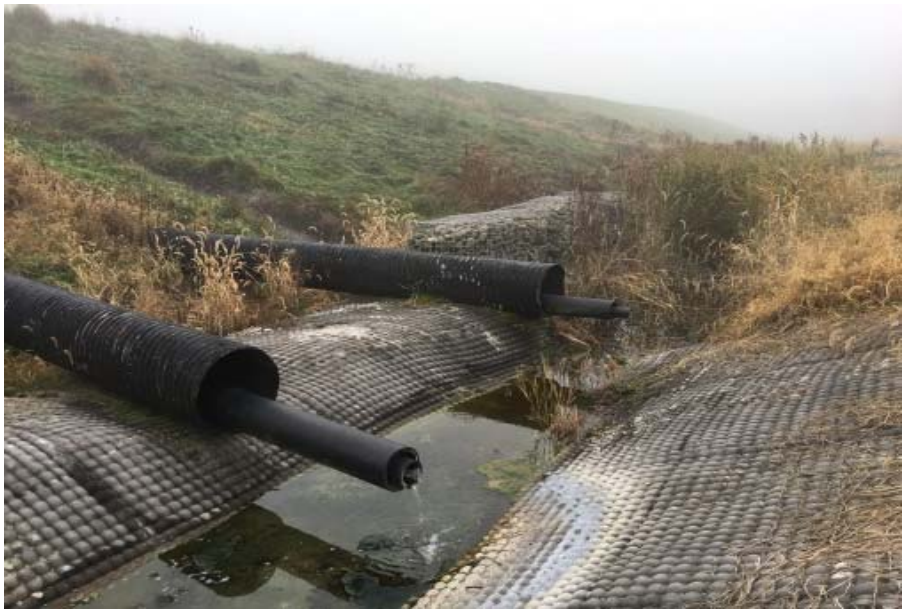
Photograph No. 7 **Date:** November 17, 2016 **Direction:** East	
Description: "Contact" stormwater decant structure within the active filling area of Stage 4. No evidence of malfunction.	

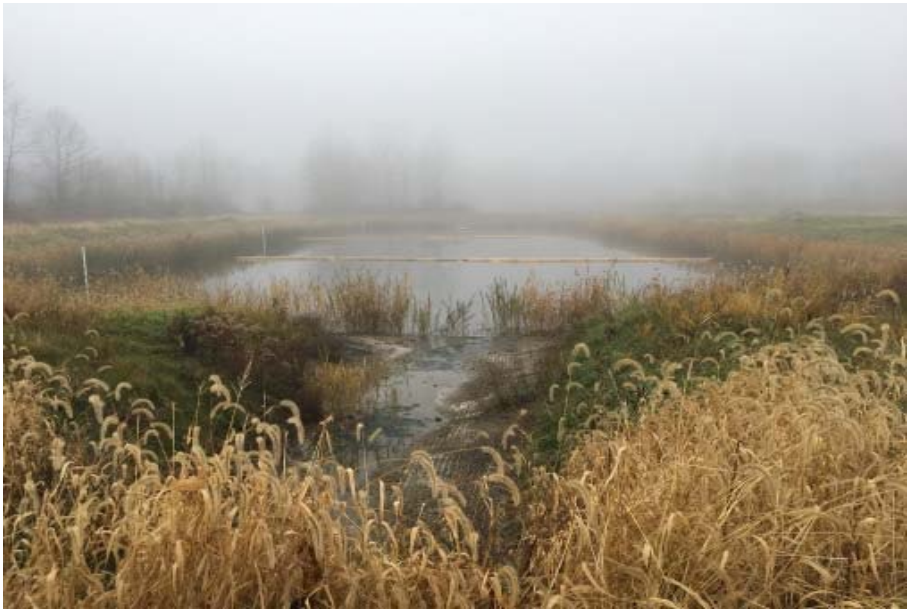
Photograph No. 8 **Date:** November 17, 2016 **Direction:** East	
Description: Final cover system on plateau area of Stage 6 (closed). Vegetation is well established and maintained. No evidence of erosion or sloughing.	

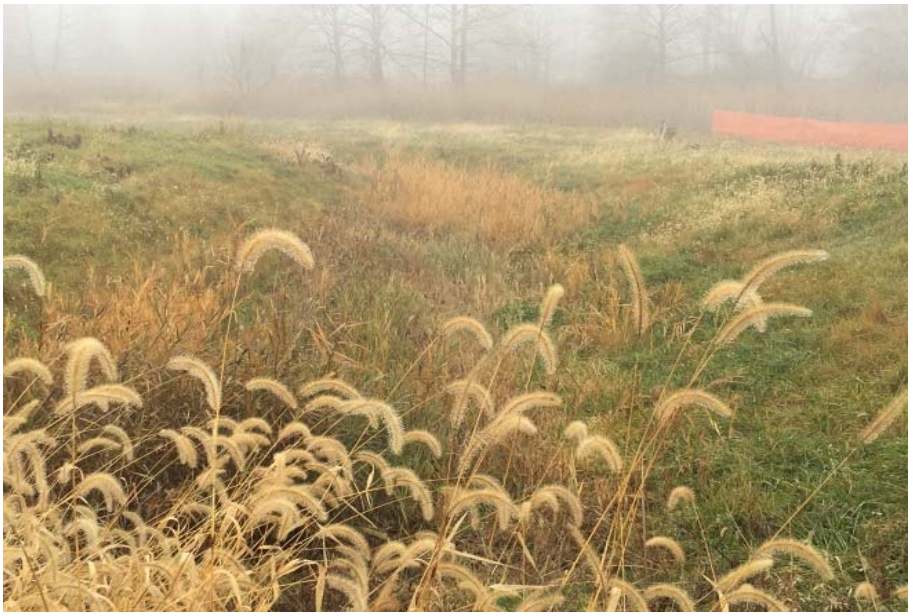
Photograph No. 9 **Date:** November 17, 2016 **Direction:** Southwest	
Description: Groundwater monitoring wells near the southwest corner of Stage 4 area.	

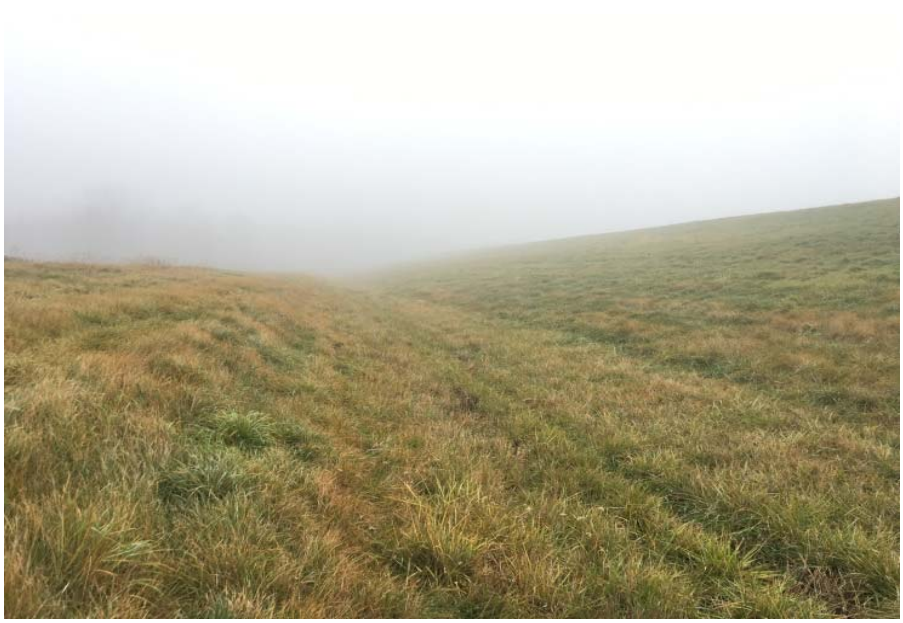
Photograph No. 10 **Date:** November 17, 2016 **Direction:** East	
Description: Perimeter "non-contact" stormwater ditch along southern border. No evidence of erosion.	

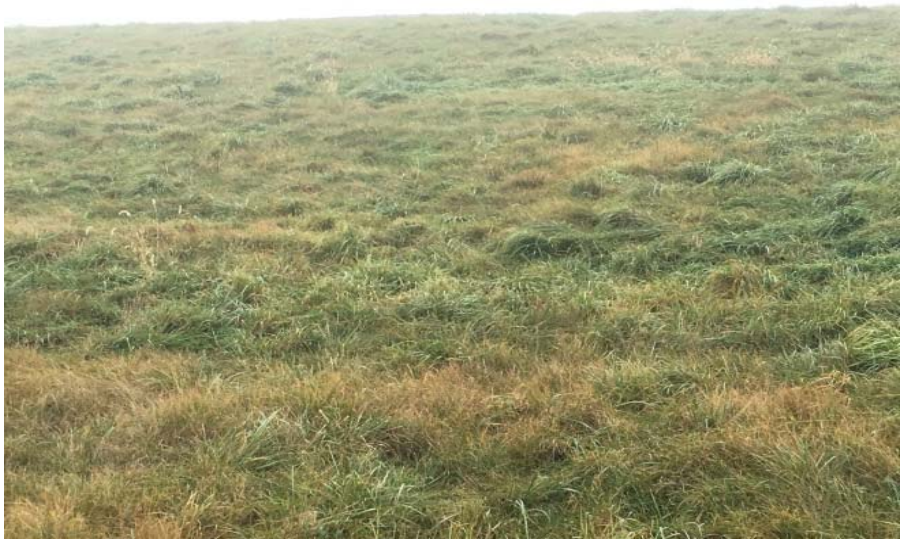
Photograph No. 11 **Date:** November 17, 2016 **Direction:** East	
Description: Leachate pipes discharging into "contact" stormwater ditch, which drains to leachate pond. "Non-contact" stormwater downchute (Downchute 4) is also shown (right). "Non-contact" stormwater drains to sedimentation pond.	

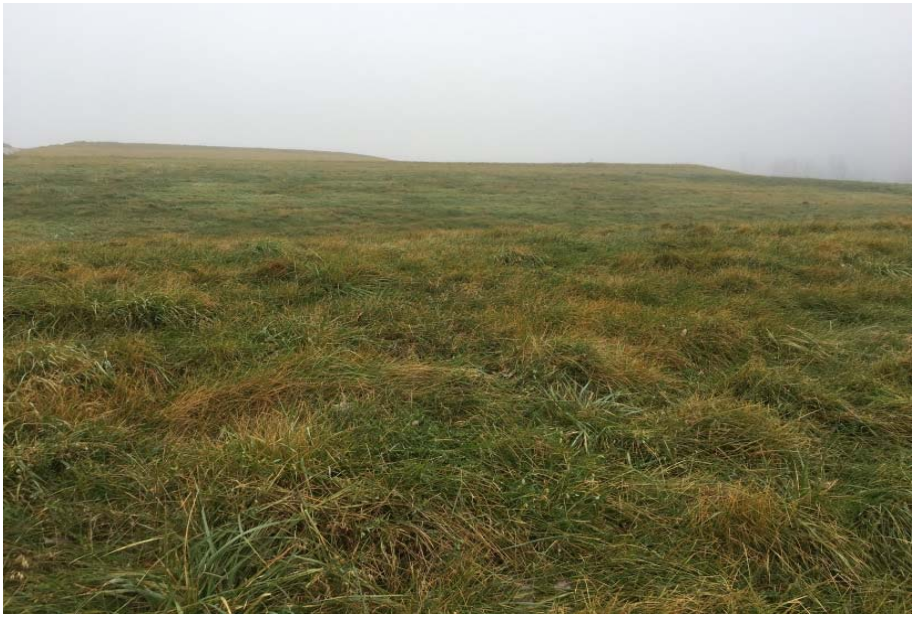
Photograph No. 12 **Date:** November 17, 2016 **Direction:** Southeast	
Description: Leachate pipes discharging into "contact" stormwater ditch, which drains to leachate pond.	

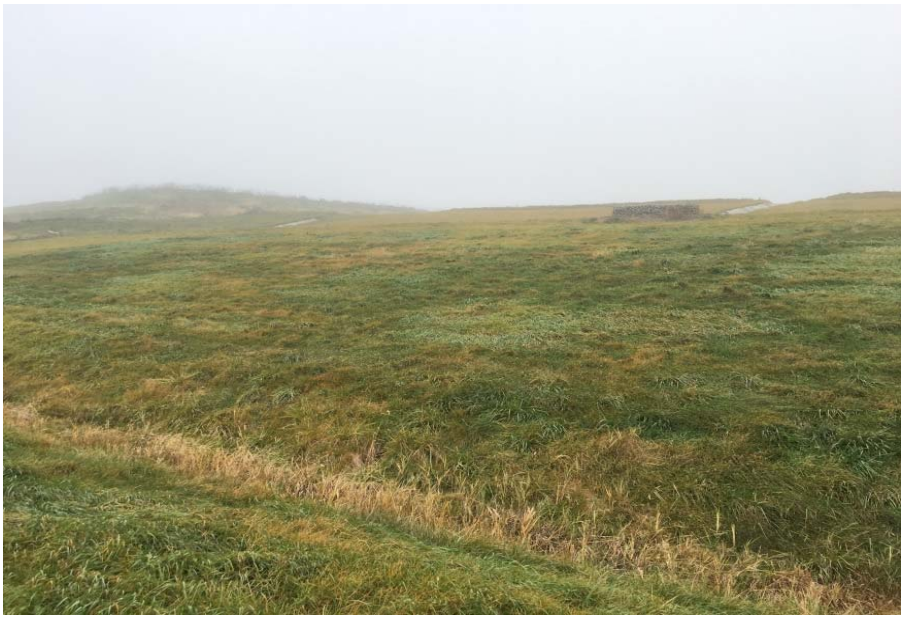
Photograph No. 13 **Date:** November 17, 2016 **Direction:** West	
Description: "Contact" stormwater ditch inlet location to the leachate pond. No evidence of erosion or malfunction.	

Photograph No. 14 **Date:** November 17, 2016 **Direction:** Northwest	
Description: "Non-contact" stormwater ditch which leads to sedimentation pond. No evidence of erosion or malfunction.	

Photograph No. 15 **Date:** November 17, 2016 **Direction:** East	
Description: "Non-contact" stormwater perimeter ditch along northern side of Stage 5 disposal area (closed). No evidence of erosion or malfunction.	

Photograph No. 16 **Date:** November 17, 2016 **Direction:** South	
Description: Toe of slope looking up at final cover on closed Stage 5 disposal area. Vegetation is well established and maintained. No evidence of erosion or sloughing.	

Photograph No. 17 **Date:** November 17, 2016 **Direction:** West	
Description: Toe of slope looking up at final cover on closed Stage 5 disposal area. Vegetation is well established and maintained. No evidence of erosion or sloughing.	

Photograph No. 18 **Date:** November 17, 2016 **Direction:** Northwest	
Description: Toe of slope looking up at final cover on closed Stage 5 disposal area; Stage 4 area in the background. Energy dissipator also visible at Downchute 10.	