



CCP Annual Inspection Report

Brickhaven No. 2 Mine Tract A Structural Fill
DWM Permit 1910, DEMLR Permit 19-25

Charah, Inc.

Moncure, North Carolina

February 2018



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Introduction

This report summarizes the findings for the third annual inspection conducted on January 16, 2018, of the Brickhaven No.2 Mine Tract “A” structural fill located off Moncure-Flatwood Road in Chatham County, North Carolina. The site is owned by Green Meadow, LLC and operated by Charah, Inc. under North Carolina Department of Environmental Quality (NCDEQ) Division of Waste Management (DWM) Structural Fill Permit 1910 issued June 5, 2015, in conjunction with the NCDEQ Division of Energy, Mineral and Land Resources (NCDEMLR) Mining Permit 19-25 also issued June 5, 2015. The Brickhaven No. 2 Mine Tract “A” structural fill project has been permitted and constructed in accordance with the North Carolina Coal Ash Management Act of 2014 (CAMA) and NCDEQ structural fill rules. The structural fill will be developed in six cells. As of the date of this inspection, the areas that have been constructed and granted permits to operate are Cell 1 (Subcells A, B, C and D) and Cell 2 (Subcells A, B, C, D, E, F and G).

Inspection Report

The goal of this inspection is to ensure the design, construction, operation, and maintenance of the structural fill unit is consistent with recognized good engineering practices and to ensure a detailed level of engineering analysis of operating conditions are evaluated which could lead to recommendations to address design or operating issues that need attention. This inspection includes the following.

- A discussion of the findings and remedies for any issues found in the document review.
- A discussion of the findings and remedies for any issues found in the site inspection.
- Any changes in the geometry of the structure since the previous annual inspection and related documentation submitted to regulators.
- The approximate volume of the coal combustion products (CCP) contained in the unit at the time of the inspection.
- Any appearance of an actual or potential structural weakness of the CCP unit.
- Any existing conditions that are disrupting, or have the potential to disrupt, the operation and safety of the CCP unit.

The inspection report below discusses the document and visual inspection review.

Document Review

HDR reviewed the availability of complete and up to date permit documents as well as Charah’s adherence to required recordkeeping. Operating Record documents include the following.

Permit Documents

- NCDEQ structural fill permit and modification(s)
- NCDEQ mine permit and modification(s)
- Construction Certifications
- Erosion control permit and modification(s)
- Erosion control plans

- NPDES permit
- Leachate discharge permit
- Leachate pump and haul permit
- Waterline permit
- NCDEQ inspection reports
- Stormwater pollution prevention plan

Operational Documents

- Operations plan
- Safety reports
- Groundwater reports
- Leachate collection and discharge records
- Leachate analysis reports
- Site inspection (weekly) reports
- CCP tonnage reports
- CCP source analysis reports
- Compaction test reports
- Topographic surveys
- As-built drawings
- Training records for the qualified person(s) performing the weekly inspections
- Records/receipts for all (liner, leachate, and groundwater) system repairs.
- Incident reports (safety, delivery of non-CCP materials, spills, etc.)
- Documentation of cover placement

Weekly inspections were performed and documented by site personnel regarding operations, safety, maintenance of the groundwater wells, run-on and run-off controls, wind dispersal control systems, liner systems, and leachate collection systems. Where deficiencies were identified follow up corrective actions were also documented. Review of the above documents did not reveal any indications of operation, or safety concerns regarding the CCP structural fill.

The CCP volume contained in the unit as of July 17, 2018, is 4,549,539 cubic yards based on the as-built survey provided by McAdams Company.

Visual Site Inspection

A visual inspection, conducted on January 16, 2018, of the CCP structural fill was performed to identify signs of distress, malfunction, or threats to safety not identified in the document review or weekly inspection records. The weather during the site visit was sunny with an approximate temperature of 40 degrees Fahrenheit. HDR staff conducted the site inspection traversing on foot from the leachate enclosure located at the southern end of Cell 1 in a counterclockwise direction around the cells. This inspection was limited to the CCP placement area and leachate systems but does not address other site operations including existing stockpiling, excavations, and the rail unloading area. The previous annual inspection was conducted on January 17, 2017 and covered CCP placement in Cell 1, (Subcells A, B, C and D) and Cell 2 (Subcells B, C

and D). The in-place amount of CCP at that time was 2,179,304 cubic yards. Since that time, the structural fill has expanded into Cell 2, Subcells A, E, F and G and the in-place volume has increased to 4,549,539 cubic yards. Refer to the cross-section drawings in Appendix A to see the changes in the geometry of the structural fill. The site inspection included an evaluation of the following site features.

1. Structural fill access
2. Leachate management system
3. Stormwater segregation and erosion control
4. Active CCP fill areas (CCP placement, spreading, and compaction)
5. Structural fill visual stability

Structural Fill Access

Facility access from Moncure-Flatwood road is controlled by a staffed gate requiring check in and check out of visitors. CCP arrives via railroad and is unloaded onto off-road dump trucks in a lined area and then hauled to the active CCP containment area. Stone access ramps are constructed and maintained to provide access from the unloading area to the lined containment area. Currently the structural fill has one access road entering the Cell 2, subcell G area.

Leachate Management

The leachate management system for the cells includes a series of perforated HDPE pipes within the lined area that drain to a sump in Cell 1 with two pumps installed to pump leachate to three onsite storage tanks. A third tank was constructed in 2017. The leachate enclosure and tanks exhibited no signs of leakage at the time of the inspection and the leachate collection pipes were in good working order. The leachate tanks contained leachate and were actively being drained into tanker trucks for transportation to one of the approved disposal locations. Pump 1 turned on during the inspection, pumped the liquid level down and shut off at the preset level. Refer to photos 27 through 30 to see the leachate enclosure at the sump. The flowmeter display showed a total flow of 30,316,376 gallons pumped to date. The system was operating within its pressure range and the transducers were reading within their range.

Operationally Charah minimizes leachate generation by limiting the area of exposed CCP to rain through the placement of interim cover soils. When final CCP grades have been reached on exterior slopes Charah covers the area with a minimum 1 foot thick interim soil cover. This soil may be removed prior to final cap installation. Additionally, Charah constructs soil berms around the top of the slopes to prevent leachate runoff from active placement areas as seen on photo 16. Additionally, Charah has placed geocomposite wick drains with stone in the CCP fill area to collect and transmit leachate to the leachate system as shown in photo 15. Charah has also initiated closure activities in the Cell 1 and 2 areas where final CCP grades have been achieved. Photos 21 and 22 show the closure activities.

Stormwater Segregation and Erosion Control

Stormwater for newly constructed cell areas are managed by the installation of rain cover on the subcell divider berms and valves installed in the leachate piping that connects the subcells which allow Charah to isolate the stormwater generated in each subcell and pump to the site

stormwater management system. Photos 31 and 32 show stormwater segregation in the newly constructed Cell 6, Subcells A and B.

Charah uses the application of interim cover in the CCP active areas to segregate stormwater from leachate. Perimeter diversion berms constructed at the top of the exterior slopes direct stormwater runoff to slope drain inlets. These pipes discharge outside of the lined structural fill into stormwater conveyance measures that drain to either the mine lake or sediment basins onsite. Photos 11, 19, and 20 show the inlets of drainage pipes collecting runoff from the interim or final cover soil area. At the time of this inspection, all slopes draining outside of the containment were covered with soil as shown in photos 2 through 4. Overall, the areas with interim cover appeared to have adequate soil cover and showed no signs of operational or structural concern. Soils placed on final slopes were seeded to prevent erosion and exhibited a good stand of vegetation that was functioning as intended. No signs of CCP release were observed. Interim cover had been placed on the top of the Cell 1 and 2 area where final CCP grades had been reached as shown in photos 5 through 8. This area exhibited no signs of erosion and had vegetation established. Some minor ponding was observed on the top of Cell 1 after the recent rain event which will be corrected prior to the upcoming closure work. No instabilities were observed as a result of the minor ponding. At the time of this inspection, the stormwater runoff was being directed to the mine lake area as shown in photo 1 where Charah was actively treating the ponded water to required discharge turbidity levels.

Active CCP Fill Areas

The site inspection included monitoring of CCP placement, spreading, and compacting in an active portion of the structural fill. Active filling was occurring in Cell 2, subcells E, F and G areas. The day of the inspection CCP material was being brought from the rail unloading area directly into the subcell 2G area. The CCP was saturated and being spread in thin lifts that sloped to two wick drains as shown in photo 15. No wind-blown CCP was observed during dumping and compacting operations. The lift sides were sloped at generally a 3 horizontal to 1 vertical slope with interim cover placed on compacted exterior slopes. The observed CCP operations appeared to be carried out in a safe and competent manner.

The January 17, 2018 as-built survey was provided by McAdams Company and shows the current development of the structural fill. HDR has provided cross-sections in the Appendix showing the changes in geometry between the 2017 and 2018 inspection reports.

Structural Fill Stability

Based on the site inspection, no structural weaknesses were observed in the compacted CCP material.

Summary

On January 16, 2018, HDR staff conducted the second annual CCP inspection for the Brickhaven No. 2 Mine Tract "A" CCP structural fill. The inspection included a file document review and a visual inspection of the structural fill operations. Site staff is performing and maintaining the permit documents and the routine maintenance and monitoring reports as required.

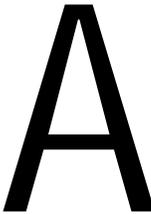


McAdams Company provided a top of CCP material survey dated January 17, 2018. HDR provided cross-sections to represent the changes in geometry between the 2016 and 2018 inspections. The total amount of CCP placed through January 17, 2018 has consumed 4,549,539 cubic yards of permitted airspace.

HDR's review of the means and methods and visual inspection of placement identified no apparent structural weaknesses in the CCP material placed as a part of the permanent structural fill.



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Appendix A – Drawings

- As-built
- Structural Fill Cross-Sections



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GENERAL NOTES

1. THIS IS A TOPOGRAPHIC SURVEY OF AN EXISTING PARCEL(S) OF LAND.
2. BEARINGS FOR THIS SURVEY ARE BASED ON NAD83.
3. ELEVATIONS FOR THIS SURVEY ARE BASED ON EXISTING MONITORING WELL PZ-21 AS SHOWN ON THE CONSTRUCTION DRAWINGS BY HDR ENTITLED "BRICKHAVEN No.2 MINE TRACT "A" MINE", ELEV. = 242.72
4. CELL LIMIT LINES ARE SHOWN PER CONSTRUCTION PLANS.



PB. 2014, PG. 263



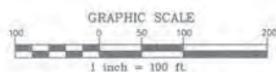
STRUCTURAL FILL VOLUME AS OF 1/17/2018 = 4,549,539 CU. YDS.

LEGEND

- CBL LIMIT
- CELL LIMIT LINE
- SURVEY DATE LINE
- MINOR CONTOUR
- MAJOR CONTOUR

I HEREBY CERTIFY THAT THE TOPOGRAPHIC SURVEY SHOWN HEREON IS BASED ON AN ACTUAL FIELD SURVEY MADE UNDER MY SUPERVISION AND ACCURATELY REPRESENTS THE PHYSICAL FEATURES THEREON AT THE TIME OF THIS SURVEY.

GREGORY C. BEWLEY, PLS L-4805
DATE 1/25/2018



PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

PROJECT NO.	CHP-15010
DATE	1/18/2018
SCALE	1" = 100'
BY	ARC
CHECKED BY	GOB
DATE	1/18/2018

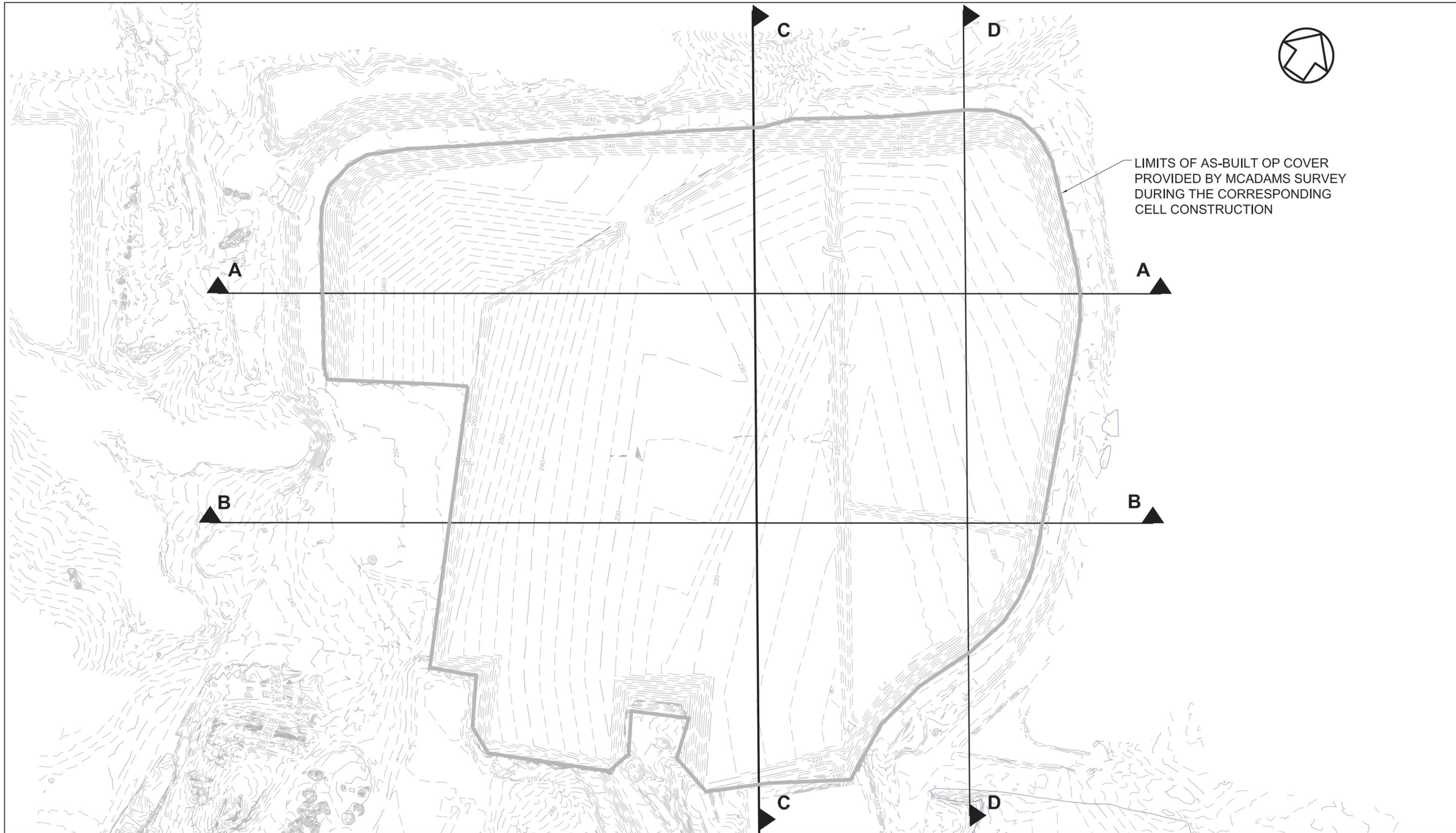
BRICKHAVEN
TO DATE STRUCTURE FILL SURVEY
MONCURE, NORTH CAROLINA
TOPOGRAPHIC SURVEY

SURVEY FOR:

REVISIONS:	
1	



THE JOHN R. McADAMS COMPANY, INC.
2905 Meridian Parkway
Durham, North Carolina 27713
License No.: C-0293
(800) 733-5646 • McAdamsCo.com

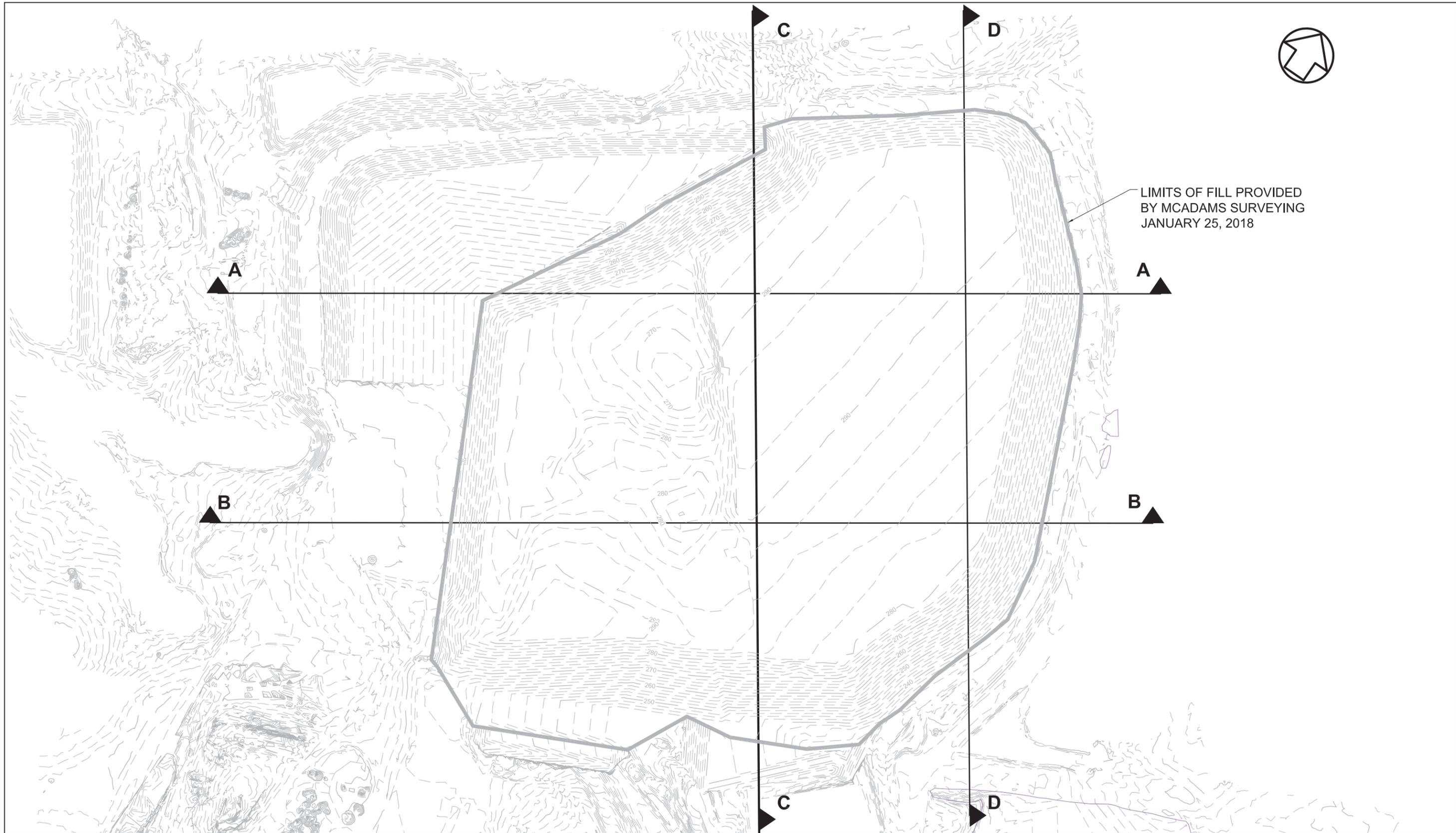


**SECTION LOCATION MAP
AS-BUILT TOP OF LINER**

MONCURE, NC

DATE
2/2018

FIGURE
1

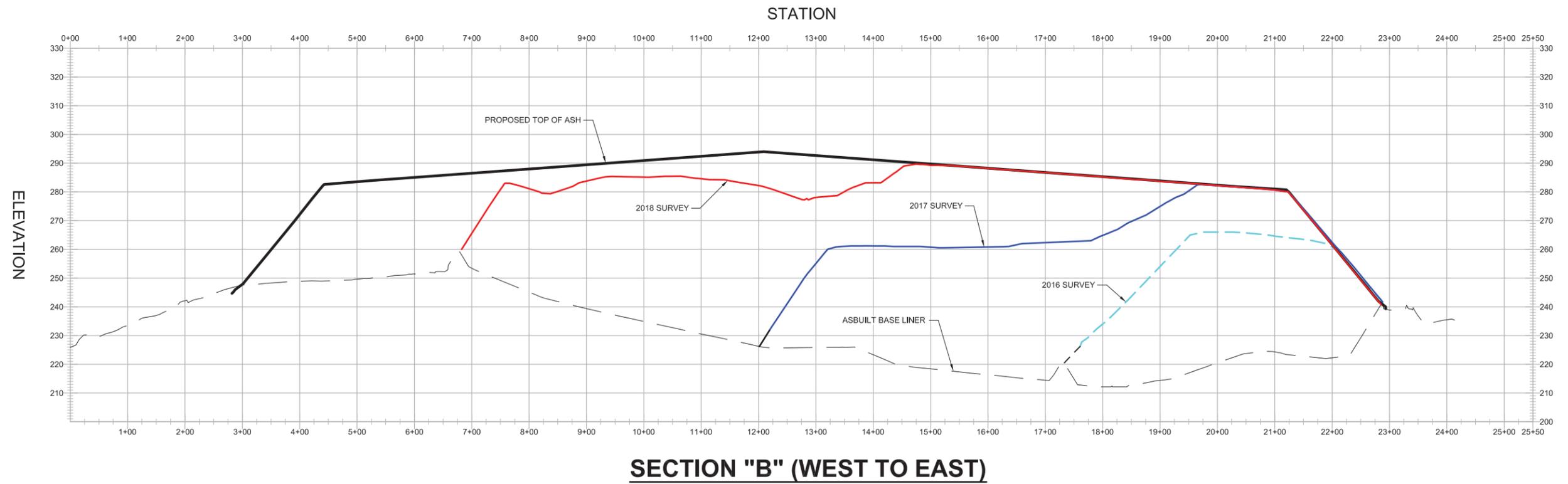
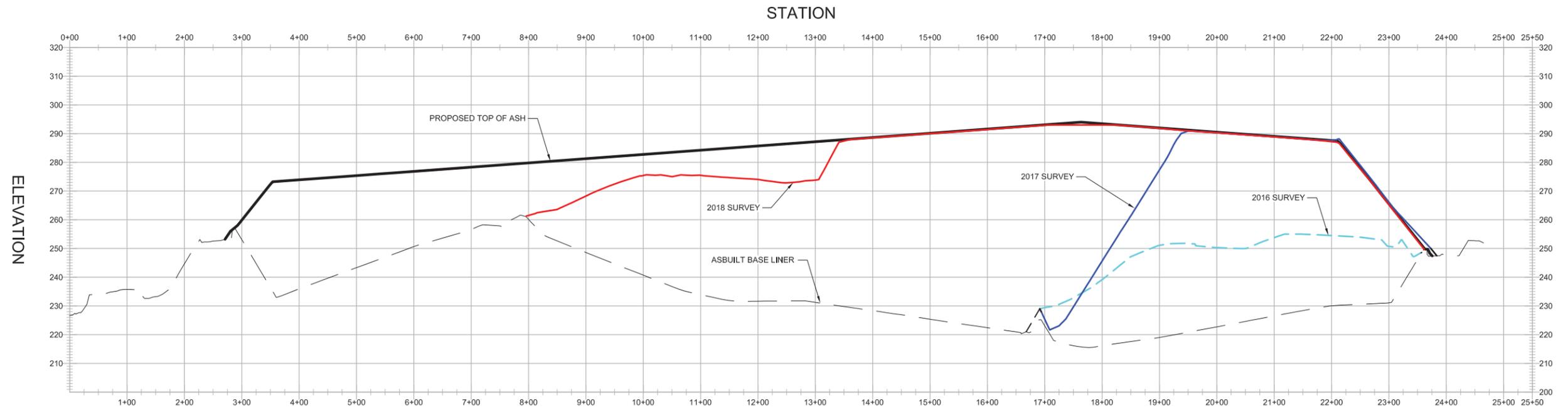


**SECTION LOCATION MAP
TOP OF FILL 2018**

MONCURE, NC

DATE
2/2018

FIGURE
2

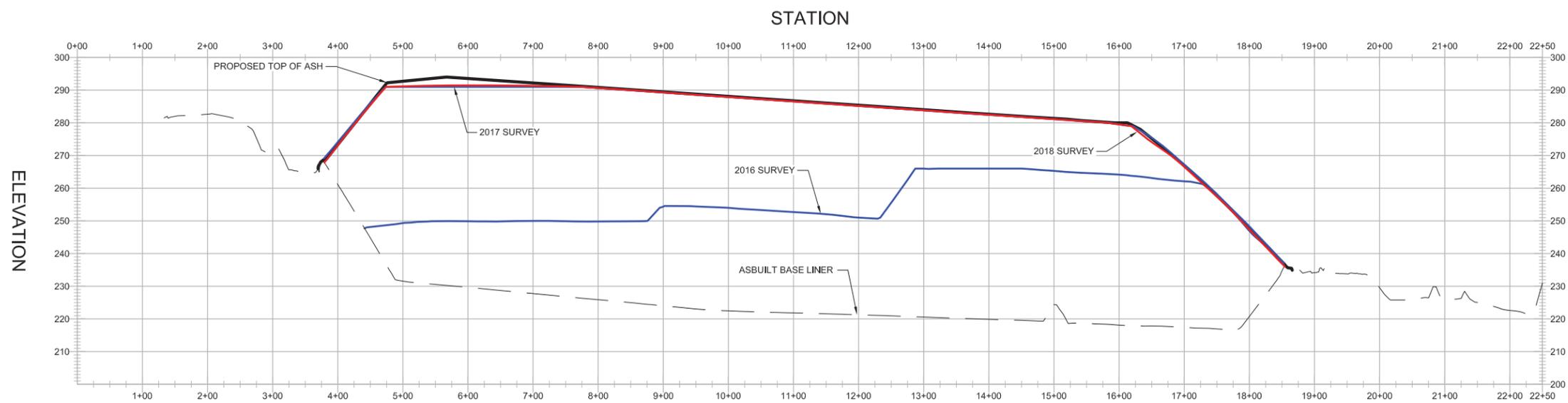
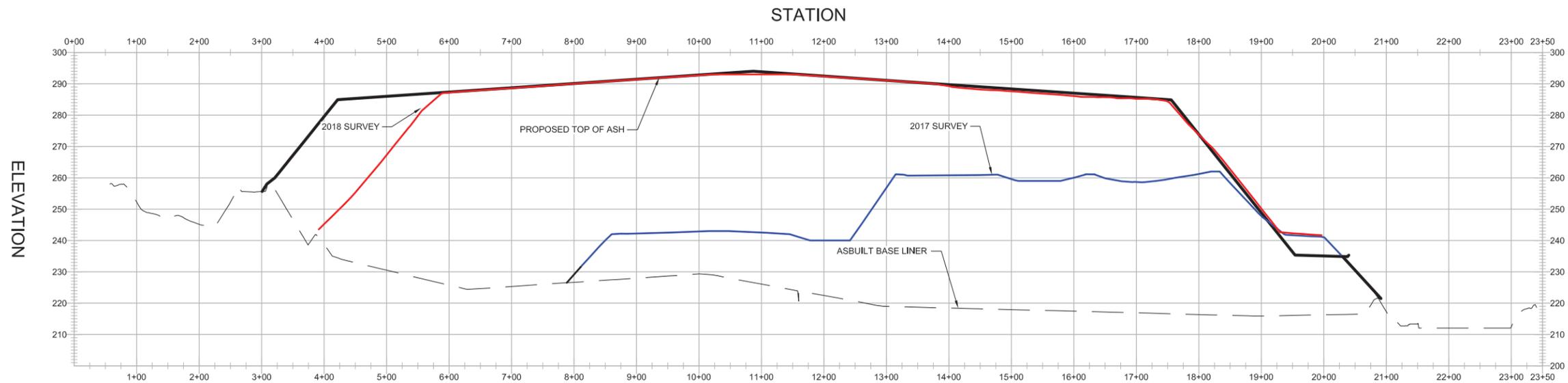


SECTIONS

MONCURE, NC

DATE
2/2018

FIGURE
3



SECTIONS
MONCURE, NC

DATE
2/2018
FIGURE
4

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Appendix B – Site Inspection
Photographs



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1. Closure extents near leachate enclosure



2. Vegetation on closed side slope above the leachate enclosure



3. Vegetation on closed side slope above the leachate enclosure



4. Looking south towards mine lake



5. Closure extents looking west



6. Closure extents looking west



7. Sub cell 2D area looking east



8. Sub cell 2D area looking north



9. Sub cell 2D area looking west



10. Soil cap placement above Cell 2



11. Stormwater drainage on top of Cell 2 capped areas



12. Ash placement in Cell 2



13. Ash placement in Cell 2



14. Ash placement in Cell 2



15. Leachate draining to a wick drain in Cell 2



16. Divider berm to prevent run-on from capped areas into the ash



17. Cap extents in Cell 2



18. Cell 2 looking west into Cell 6



19. Stormwater drainage from capped Cell 2 areas



20. Drainage pipe inlet on top of Cell 2



21. Cap soil placement in Cell 2



22. Cell 2 closure extents



23. Vegetation on closed areas



24. Vegetation on closed areas



25. Vegetation on closed slope



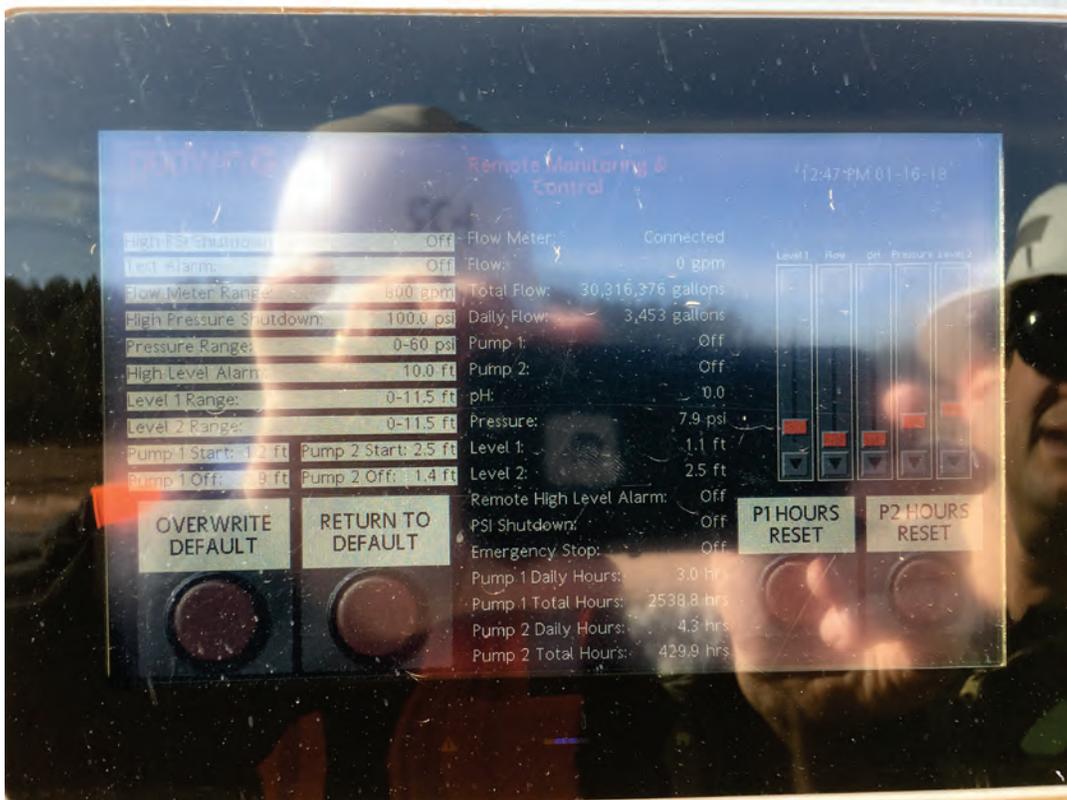
26. Vegetation on closed areas



27. Slight erosion at the leachate enclosure



28. Repaired areas on closed slopes



29. Leachate enclosure readout



30. Leachate enclosure flowmeter



31. Cell 6 sump looking east



32. Cell 6 sump looking south



33. Leachate tank readout



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