Closure Plan

CCR Surface Impoundment System
James DeYoung Power Plant
Holland, Michigan

Holland Board of Public Works
Holland, MI

October 17, 2016
NTH Project No. 73-160017-01

NTH Consultants, Ltd.
41780 Six Mile Road
Northville, MI 48168

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INTRODUCTION

The Holland Board of Public Works (BPW) owns and operates the James DeYoung (JDY) plant located in Holland, Michigan, on the eastern end of Lake Macatawa. JDY was initially built in 1939 with a generating capacity of 15 MW. Between 1953 and 1968, three new boilers were added. Since the late 1970's, the plant has consisted of three coal-fired boilers capable of producing up to 62.5 MW (Unit 3 is 11.5 MW; Unit 4 is 22 MW; and Unit 5 is 29 MW). BPW has discontinued the use of Unit 3, and coal is no longer utilized in Units 4 and 5 as of May 20, 2016. Units 4 and 5 are now operating only on natural gas. Bottom ash from these boiler units was historically sluiced to three surface impoundments throughout operations of the plant when Units 3-5 were operating on coal. The surface impoundments are located to the south of the plant, as shown on Figure 1.

These surface impoundments are considered CCR units and regulated under the recently promulgated rules regulating ash disposal from coal-fired power plants (40 CFR Part 257). In June 2016, BPW initiated removal of CCR material from the CCR units and closure of the CCR units will be completed in accordance with 40 CFR §257.101 and 40 CFR §257.103.

This Closure Plan (Plan) has been prepared for the facility in accordance with 40 CFR §257.102(b), and describes the process that BPW plans to follow in closing the CCR units at the JDY plant. The closure of a CCR surface impoundment must be completed either by leaving the CCR in-place and installing a final cover system, or through removal of the CCR and decontamination of the CCR unit in accordance with 40 CFR §257.102(a). The objectives of this Plan are to describe the methods and procedures for closure and provide a schedule for completion of closure activities. The Plan also provides methods BPW will employ in determining whether the CCR closure goals have been achieved.

Initial Investigation

Representatives from NTH Consultants, Ltd. (NTH) and Engineering and Environmental Solutions, LLC (E&E) conducted a field investigation on June 23-24, 2016 to estimate the horizontal and vertical extent of CCR managed as part of the ash pond system. The field investigation consisted of both a topographical survey and collection of soil borings for visual observation. Field data collected during this investigation provided a better understanding of current conditions in and around the CCR units and was used to assist in the evaluation of the volume of CCR in-place, along with developing a closure strategy of the CCR units in accordance with 40 CFR §257.102.

NTH and E&E also completed an on-site review of available site documentation on May 18, 2016 and a historical aerial imagery review of the JDY plant from publicly-available sources. Images were obtained dating back to 1938 through 2014. This information was used to help estimate the horizontal extent of the CCR units. The historical imagery assisted in showing probable horizontal extent and locations of the ash pond systems since 1961. Boring locations were selected along certain traverses, as outlined in Figure 2, based on historical imagery of locations that CCR was likely to have been stored or managed. The borings were utilized to develop cross sections A-A, B-B, C-C, D-D, and E-E (Figures 3 and 4). Soil borings were obtained using a Geoprobe® rig for most cross sections; however, due to proximity of underground utilities along the northern portion of Pond 1, hand augers were required for cross section A-A.

Regulatory Basis

Closure of CCR units must be completed either by leaving the CCR in-place and installing a final cover system or through removal of the CCR and decontamination of the CCR units in accordance with 40 CFR §257.102(a). Holland BPW is currently considering closure options, and is initially planning to implement a closure strategy utilizing a clean closure approach. Preliminary evaluation of the available data indicates that removal of the CCR and decontamination of the CCR units might be the most appropriate closure strategy for the facility. At a minimum, the facility will ensure that the closure of the CCR units meets the performance standards established in 40 CFR §257.102(c) and is consistent with recognized and generally accepted good engineering practices.

CLOSURE PROCEDURES

BPW intends to close the CCR surface impoundments by removing and decontaminating areas affected by releases from the CCR units (clean closure). CCR removal and decontamination of the CCR units will be considered complete when constituent concentrations throughout the CCR units and areas affected by releases from the CCR units have been removed. As discussed in the preamble of the final rule (FR, Vol. 80.No 74, pp 21412), removal means "contaminants left in the subsoils (i.e., contaminated groundwater left in soils below the former landfill or impoundment) will not impact any environmental media including groundwater, surface water, or the atmosphere in excess of Agency recommended limits or factors. Typically, any metals in these 'subsoils' in excess of background levels are allowed to either naturally attenuate, or are removed by flushing. Once the facility has removed all of the assessment monitoring constituents listed in appendix IV to background levels or MCLs, the groundwater is considered to be 'clean' and closure is complete." In other words, removal of contaminated media until groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to 40 CFR §257.95(h) for constituents listed in Appendix IV, or statistically developed background concentrations. The procedures described below have been developed to achieve the performance standards specified in 40 CFR §257.102(c) and to ensure that the CCR impoundment closure goals are attained.

Contaminated materials will be removed from the CCR units following recognized and generally accepted good engineering practices. In general, closure of the CCR units will proceed with the following major steps:

1. Drainage and stabilization
2. Excavation and removal
3. Confirmation of clean closure
4. Groundwater evaluation, decontamination, and analysis
5. Backfilling
6. Erosion and storm water control

Drainage and Stabilization

The facility will eliminate free liquids by removing liquid waste through agitating and pumping to the extent that conventional pumping equipment will allow, or solidifying the remaining wastes not affected by a release from the CCR units. Should groundwater be encountered in sufficient quantities, the contractor will remove the groundwater or surface water for proper disposal and take necessary measures to minimize groundwater from coming in contact with the CCR material. The remaining wastes will be sufficiently stabilized to support construction activities and for the long-term, final configuration. The closure construction documentation will stipulate appropriate methods to dewater areas of the CCR units, including the installation of pumps or well points to control surface water and groundwater flow into the CCR units, or other means. The water removed from the ash during drainage and stabilization will be discharged under an authorized permit from the appropriate authority having jurisdiction, and meet the applicable contaminant loading limits set forth in the permit and 40 CFR §257.95(h), Appendix IV, or statistically-defined background levels by pre-treatment, if necessary.

Excavation and Removal

The CCR material will be mechanically excavated from the CCR units to the level of the underlying existing native soils. Excavation and removal of contaminated media will be completed such that groundwater left in soils below the former landfill or impoundment will not impact environmental media in excess of Agency recommended limits or factors. The closure construction documentation will stipulate the appropriate procedures for excavation and removal. Material removed from the impoundments will be dewatered before disposal at a licensed disposal facility.

Fugitive Dust Control

If airborne dust/particulates are observed during removal of the CCR, the areas of non-vegetative ground surface, open excavations, or stockpiled material will be sprayed with water or an approved dust suppressant agent, as necessary, to prevent airborne dispersion and off-site migration of particulates.

Fugitive dust on site roads will be minimized through the use and enforcement of a speed limit of 10 miles per hour on site. On-site dust generation may also be reduced by temporarily paving or placing gravel on the primary construction roads.

Measures will also be taken to prevent "track-out" of soil from the site onto nearby streets. Possible methods may include avoiding over-watering unpaved areas (which creates mud and promotes more track-out), installing a gravel access road, using paved aprons or wheel washers to remove materials from vehicles before they leave the site, and cleaning any track-out with vacuum sweepers.

Confirmation of Clean Closure

In accordance with 40 CFR §257.102(c), any areas are affected by releases from CCR units will be decontaminated. The facility will make a determination regarding potential releases from the CCR units after a review of the results of the additional investigative activities is completed and, if merited, will decontaminate the underlying and surrounding soils, by additional soil excavation, flushing, pumping and/or treating of the aquifer.

After removal of material is complete, as an example, when visible evidence of CCR is removed, we will conduct an evaluation to determine if potential impacts from CCR remain. Sample design will be consistent with applicable agency documents such as the Verification of Remediation procedures as described in the Michigan Department of Environmental Quality's 2002 Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria (S3TM document). For example, if the area to be evaluated is less than approximately one-quarter acre, verification of remediation will follow a biased sampling strategy and the number of samples will be consistent with those indicated in Tables 1.1 and 1.2 in Tab 4 of the S3TM document. Sample locations will be biased towards areas most likely to exceed cleanup criteria, and exclude areas with material designated as inert by the Department. A demonstration will be made that the remaining soil meets the appropriate standard by comparing the laboratory results to the applicable standard on a point-by- point basis, as described in Chapter 1.4 of Tab 4 of the S3TM document. Applicable standards may include the statewide default background level, regional background concentrations (for the appropriate glacial lobe and soil type) as indicated in the

Michigan Background Soil Survey (Updated 2015), or to a site-specific background concentration determined in accordance with Chapters 1.2.2 and 4.3 of Tab 4 of the S3TM document.

Alternatively, if the area to be evaluated is greater than one-quarter acre, a selected option for the verification of remediation may follow a statistical sampling strategy and the number of samples will be calculated based on the area of the excavation as described in Chapters 2.2.1.2 and 2.3.1 of Tab 4 of the S3TM document.

Groundwater Evaluation, Decontamination, and Analysis

Concurrent with excavation and removal of the CCR material, BPW will develop a groundwater monitoring program to comply with the requirements of 40 CFR §257.91. The design of the groundwater monitoring system will be representative of groundwater potentially affected by the CCR units and provide a determination of the quality of groundwater passing the waste boundary of the CCR units. At a minimum, four monitoring wells (one upgradient and three downgradient) will be installed by October 17, 2017 at appropriate locations and depths to yield representative groundwater samples from the uppermost aquifer.

Groundwater samples will be collected from the monitoring system and analyzed for constituents listed in Appendix IV of 40 CFR §257.95, after removal of the CCR material and decontamination of the CCR units have been completed. Results of the groundwater samples will be compared to groundwater standards for determination of clean closure.

The groundwater protection standards for each constituent in Appendix IV will be established in accordance with 40 CFR §257.95(h). For constituents for which a maximum contaminant level (MCL) has been established under 40 CFR §141.62 and 40 CFR §141.66, the groundwater protection standard will be the MCL for that constituent. Where MCLs have not been established for a constituent, the groundwater protections standard will be the statistically developed background concentration for that constituent in accordance with 40 CFR §257.91, or as previously referenced from the preamble to the rule “in excess of Agency-recommended limits or factors.” For those constituents for which the statistically developed background level is higher

than the MCL, the groundwater protection standard will be the statistically developed background concentration.

If results of groundwater analysis indicate exceedances of the groundwater protection standards, groundwater decontamination may be completed and monitoring continued on a semi-annual basis until groundwater protection standards are met.

Backfilling

After removal of the CCR material and dewatering of the CCR units, the CCR units will be backfilled with clean soil backfill or a stone/sand backfill material. The fill will be placed in general 12-inch thick lifts, compacted with equipment appropriate for the soil type to at least 90% of the modified proctor (ASTM D1557), or equivalent, or as determined suitable in the field for stable construction sequencing.

Slope Stability and Erosion Control Provisions

Given the site topographical characteristics and the nature of the incised CCR surface impoundments, major slope stability and/or erosion or sloughing concerns are not warranted at the facility. Since the impoundments are incised, subgrade preparation will include backfilling the impoundments with earthen material after removal of CCR material. Final topographical configuration of the area over the impoundments will consist of slopes likely not exceeding 10 percent grade and should not create concern for significant slope stability or sloughing. Additionally, the final site configuration will have an erosion control layer and vegetative cover consisting of grass that will preclude major erosion concerns. See Figures 5 and 6 for additional information.

Erosion and Storm Water Control

The removal of the CCR material will be conducted in a manner consistent with a Soil Erosion and Sedimentation Control (SESC) Plan prepared in accordance with local and state requirements.

The SESC measures may include:

- A gravel tracking mat constructed at the Site exit to provide a zone through which loose material can dislodge from truck tires;
- The area immediately outside the Site will be periodically swept and scraped to prevent tracking of material and dispersion of dust from the Site at periodic intervals. Material will be swept back onto the Site;
- Silt fence will be installed around the perimeter of the Site to minimize the loss of soil to surrounding areas; and
- Additional measures may be utilized, if needed, to minimize erosion and help control the migration of sediments into surface water runoff.

An erosion layer consisting of four inches of earthen material that is capable of sustaining plant growth will be placed on top of the backfilled former CCR units to support vegetative growth. The erosion layer will be placed in one lift and physical thickness verification of the soil layer shall be performed at an interval stipulated in the project specifications. The entire area that has been covered will then be seeded, fertilized, and mulched per the project specifications.

The seed mixture in Table 1, or its equivalent to sustain vigorous and healthy growth, will be used for seeding the site after backfilling is complete:

Table 1: Seed Mixture

Seed Type	Percent of Seed
Perennial Rye Grass	50%
Kentucky Blue Grass	15%
Creeping Red Fescue Grass	35%

Storm Water Control and Miscellaneous Site Features

To minimize infiltration, the final grading will consist of gentle sloping grades (likely 10 percent grade or less) to promote surface water runoff drainage from the former CCR unit area to a network of perimeter storm water ditches and conveyance structures. The conveyance system will

be designed to handle the regulatory-required design storm event and discharge from the site under an appropriate jurisdictional authority storm water discharge permit.

Storm water diversion channels and conveyance ditches/structures will be constructed on top of and around the former CCR units as shown in the construction documentation. Additional features necessary for erosion control or other miscellaneous construction activities will be completed concurrent with the closure construction to ensure a complete system is installed and functional.

Documentation of construction activities for conformance with project specifications will be completed by BPW or their representative and certified by a professional engineer in the State of Michigan to have been completed in substantial conformance with the project specifications, construction documentation, and 40 CFR Part 257, as applicable.

ESTIMATE OF CCR ON-SITE AND AREA OF THE CCR UNITS

In accordance with 40 CFR §257.102(b)(iv), NTH completed an estimate of the maximum inventory of CCR on-site based on a review of the historical images, information obtained during the June 2016 field investigation, and preliminary volume calculations using AutoCAD Civil 3D®. We estimate the maximum volume of CCR that could have been in-place in all three units dating to 1961, as this is when historical imagery first indicated the presence of the ponds, was approximately as much as 26,900 cubic yards (cy).

We also completed an estimate of the largest area of CCR units requiring final cover based on a review of the historical images and estimation of the probable lateral extent of CCR obtained during the June 2016 field investigation. As required in 40 CFR §257.102(b)(v), NTH estimated the largest area of CCR units ever requiring final cover at any time during the active life to be approximately 2.0 acres using AutoCAD Civil 3D®. It should be noted that the probable largest horizontal extent of the CCR unit varied throughout plant's operational life, since the CCR was likely handled and moved as operations progressed. The estimated largest area of CCR units requiring final cover is based on the probable final disposition of CCR within the CCR surface impoundments.

CLOSURE SCHEDULE

Holland BPW is committed to closing the existing CCR impoundments as quickly as is feasible. Holland BPW anticipates that closure activities will begin in mid-2017 and that closure activities will be completed within five years of commencement, or by June 2022, pursuant to 40 CFR §257.102(f)(ii). Completion of closure activities will be dependent on the time of the year when closure occurs as seasonal variations and other unanticipated issues may delay the estimated schedule. Additional factors that can adversely impact closure schedule include complications resulting from climatic factors that result in a shortened construction season, the amount of time required to dewater due to the volume of CCR in the units or the characteristics of the CCR, geology and terrain surrounding the CCR units that will affect the amount of material needed to close the CCR units, and time delays caused by the need to coordinate with, and obtain necessary approval and permits from state and local agencies or construction vendors/ material suppliers. If any of these conditions are encountered during closure activities, the facility will provide a demonstration that completion of closure activities is not feasible due to factors beyond the facility's control and document a two-year time extension in accordance with 40 CFR 257.102(e)(2)(ii). The owner or operator will place the demonstration in the facility's operating record as required in 40 CFR 257.105(i)(5) prior to the end of the two-year period. It is estimated that all closure activities will be completed by December 2018 but no later than the regulatory prescribed deadline of June 2022. Table 2 includes the estimated closure schedule.

TABLE 2
HOLLAND BOARD OF PUBLIC WORKS
JAMES DEYOUNG PLANT
CLOSURE PLAN SCHEDULE*

Task	Oct. 2016	Nov. 2016	Dec. 2016	Jan. 2017	Feb. 2017	Mar. 2017	Apr. 2017	May. 2017	Jun. 2017	July. 2017	Aug. 2017	Sept. 2017	Oct. 2017	Nov. 2017	Dec. 2017	Jan. 2018	Feb. 2018	Mar. 2018	Apr. 2018	May. 2018	Jun. 2018	July. 2018	Aug. 2018	Sept. 2018	Oct. 2018	Nov. 2018	Dec. 2018
Complete field investigation																											
Coordinate with, and obtain necessary approvals and permits from MDEQ																											
Issue Request for Proposal for construction activities																											
Excavation and Removal of CCR material																											
Confirmation of Clean Closure																											
Groundwater Evaluation, Decontamination, and Analysis**																											
Backfilling and Erosion Controls																											
Certification Report**																											

*Completion of closure activities will be dependent on seasonal variations, climatic factors, the amount of time required to dewater, the geology and terrain surrounding the CCR units that will affect the amount of material needed to close the CCR units, and time delays caused by the need to coordinate with and obtain necessary approval and permit from state and local agencies or construction vendors/material suppliers. This preliminary schedule is subject to modifications based upon these factors.

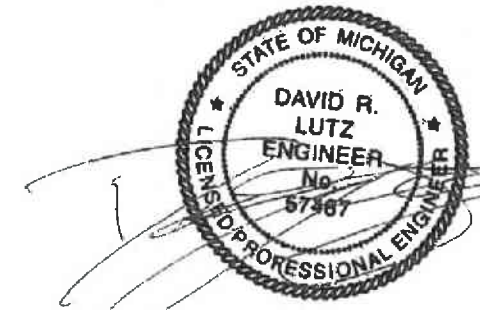
** Groundwater evaluation will be conducted as necessary during the closure period. Closure completion will be dependent on groundwater cleanup/confirmation samples.

AMENDMENT TO THE CLOSURE PLAN

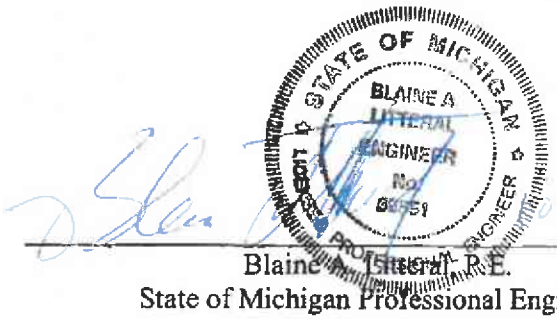
Amendments to this initial or any subsequent closure plan may be required if there are any substantial changes that will affect the written closure plan in effect. In accordance with 40 CFR §257.102(3)(iii), amendments to the plan will be completed at least 60 days prior to a planned change in the operation of the facility or CCR unit, or no later than 60 days after an unanticipated event requires the need to revise the existing written closure plan. If the closure plan is revised after closure activities have commenced for a CCR unit, the facility will amend the current closure plan no later than 30 days following the triggering event. In accordance with 40CFR §257.102(b)(4), any amendments to the plan will be certified by a qualified professional engineer.

STATEMENT OF CERTIFICATION

I, David R. Lutz and Blaine A. Litteral, Professional Engineers licensed in the State of Michigan, certify[1] that, NTH and E&E Solutions have reviewed the historical information, conducted the limited field investigation, and prepared the closure plan for the Holland Board of Public Works James DeYoung Power Plant in Holland, Michigan CCR surface impoundments (Ash Ponds 1-3), as presented above. To the best of my knowledge and belief, the closure plan presented in this report for the CCR surface impoundments at the aforementioned facility has been prepared in substantial conformance the requirements established in 40 CFR 257.102 (b).



David R. Lutz, P.E.
State of Michigan Professional Engineer
Registration No. 57487



Blaine A. Litteral, P.E.
State of Michigan Professional Engineer
Registration No. 36551

[1] I am rendering my professional opinion based on the information available to me at the time of this report writing. This certification does not comprise a guarantee or warranty that certain conditions exist, nor does it relieve any other party of their requirements to abide by all applicable local, state, and federal regulations, and to honor all express or customary guarantees and warranties associated with their work.

ATTACHMENTS

- FIGURE 1: SITE LOCATION PLAN
- COVER SHEET - FIGURES 2 THRU 4
- FIGURE 2: EXISTING CONDITIONS
- FIGURE 3: CROSS SECTIONS A-A', B-B' & C-C'
- FIGURE 4: CROSS SECTIONS D-D' & E-E'
- FIGURE 5: PROPOSED GRADING PLAN
- FIGURE 6: PROPOSED GRADING PROFILE

NTH PROJECT No.: 62-160017	CAD FILE NAME: 160017-JDY
DESIGNED BY: SLG	PLOT DATE: 10/4/2016
DRAWN BY: SLG	DRAWING SCALE: 1" = 200'
CHECKED BY: DRL	INCEPTION DATE: 9/7/2016

NTH Consultants, Ltd.
Infrastructure Engineering and Environmental Services

SITE LOCATION PLAN

JAMES DEYOUNG POWER PLANT
HOLLAND, MI

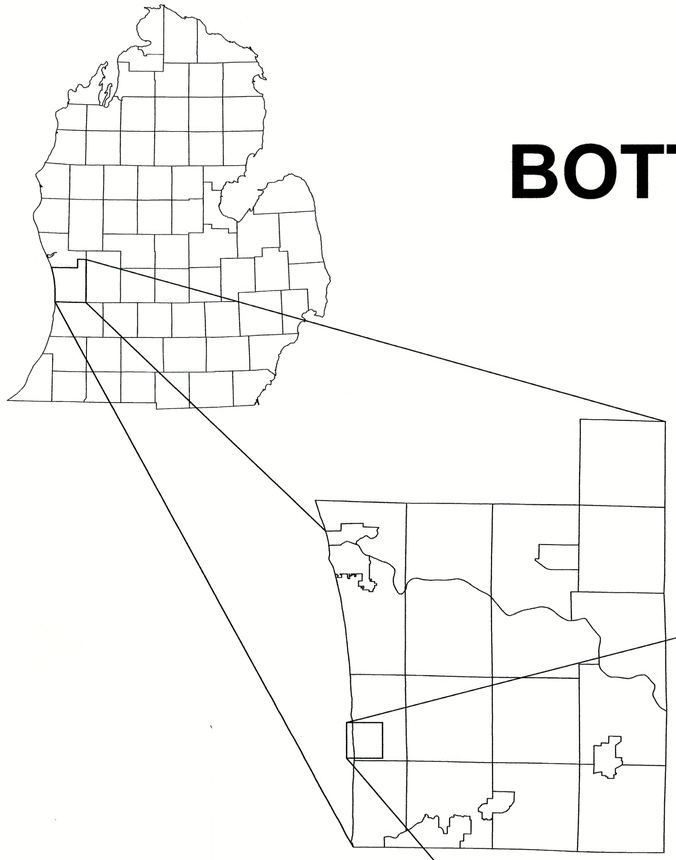
FIGURE: 1

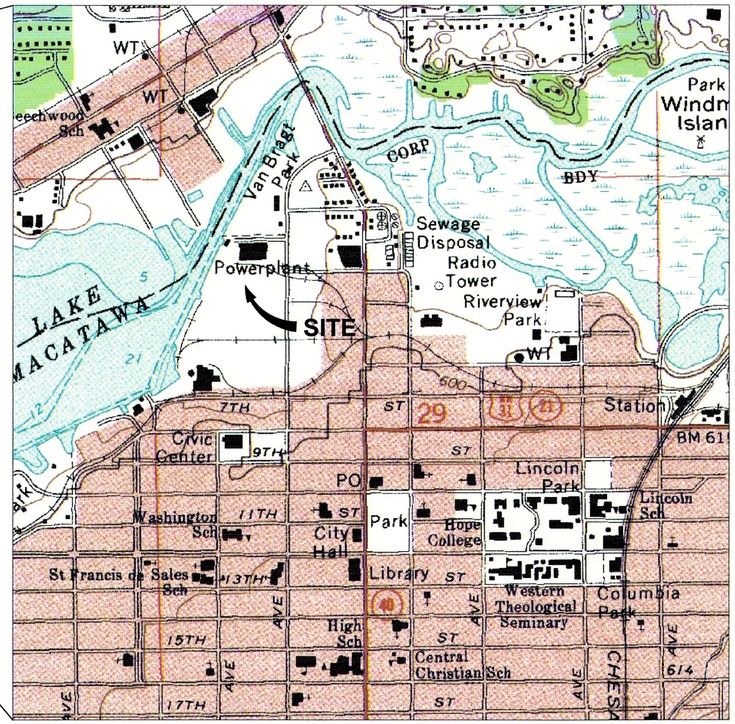
BOTTOM ASH POND INVESTIGATION

HOLLAND BOARD OF PUBLIC WORKS

PREPARED BY:
Engineering & Environmental Solutions, LLC
PROJECT NO: 133-16-001

OCTOBER 2016





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SECTION 30 T. 5 N., R. 15 W.
CITY OF HOLLAND
OTTAWA COUNTY, MICHIGAN

SHEET INDEX

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400 136th Avenue, Building 100, Suite B ■ Holland, Michigan 49424 ■ Phone: (616) 994-6541 ■ Fax: (616) 931-3970 ■ www.goEESolutions.com

BOTTOM ASH POND INVESTIGATION
HOLLAND BOARD OF PUBLIC WORKS

STATE OF MI
BLAIR D. LITTLE
ENGINEER
No. 56531
LICENSED PROFESSIONAL ENGINEER

LEGEND

- MAJOR CONTOUR (5' INTERVAL)
- MINOR CONTOUR (1' INTERVAL)
- FENCE
- LIMITS OF ASH
- LIMITS OF COAL
- STORM SEWER
- CONCRETE
- ASPHALT

SCREEN HOUSE
LOADER GARAGE
TRUCK GARAGE
JAMES DEYOUNG POWER PLANT
SUBSTATION
3RD ST.
PINE AVE.
LIMITS OF COAL
SLAB
APPROXIMATE LOCATION OF 2-10" ROOF DRAINS
APPROXIMATE LOCATION OF CONCRETE PAD
APPROXIMATE LOCATION OF 48" PIPE
6" STEEL PIPE
6".CONCRETE PIPE
6" STEEL INV 586.86
6" CONC INV 585.87
MANHOLE
GAS BUILDING
ACCESS ROAD
CONVEYER
COAL RUNOFF COLLECTION DITCH
POND 1
BOTTOM OF BANK (TYP.)
COAL 584.79
TOP OF BANK
24" CMP CULVERT
24" CMP INV 585.17
24" CMP INV 584.65
SHED
POND 2
24" CMP CULVERT
24" CMP INV 584.22
24" CMP INV 583.47
EDGE OF LANDSCAPING
PERIMETER FENCE
LIMITS OF COAL
APPROXIMATE LOCATION OF STORM WATER PIPE
HOPPER
APPROXIMATE LOCATION OF 48" PIPE
EDGE OF DOCK
LIMITS OF COAL PILE
COAL PILE
CONCRETE RETAINING WALL
POND 3
60" CONC. CULVERT INV = 572.47
APPROXIMATE LOCATION BOTTOM ASH PIPE
EXISTING WEIR SEE SHEET 5
24" PE CULVERT
5000 5001 5074 5071 5072A 5005 5007 5009 5011 5012 5013 5076 5075 5014 5019C 5019B 5019A 5017 5017A 5063 5065 5047 5050 5049 5050A 5043 5041 5036 5033 5029 5020 5026 5060 5061 5059 5058 5057 5056 5055 5053
A A' B B' C C' D D' E E'
0+00 1+00 1+50
0 40 80
SCALE: 1"=40'

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BOTTOM ASH POND INVESTIGATION
HOLLAND BOARD OF PUBLIC WORKS
SECTION 30 T. 5 N., R. 15 W., CITY OF HOLLAND, OTTAWA COUNTY
64 PINE AVE.
HOLLAND, MICHIGAN

MARK	DATE	DESCRIPTION

DESIGNED BY: ---
DRAWN BY: AM
CHECKED BY: BL
PROJECT NO: 133-16-001
SHEET TITLE

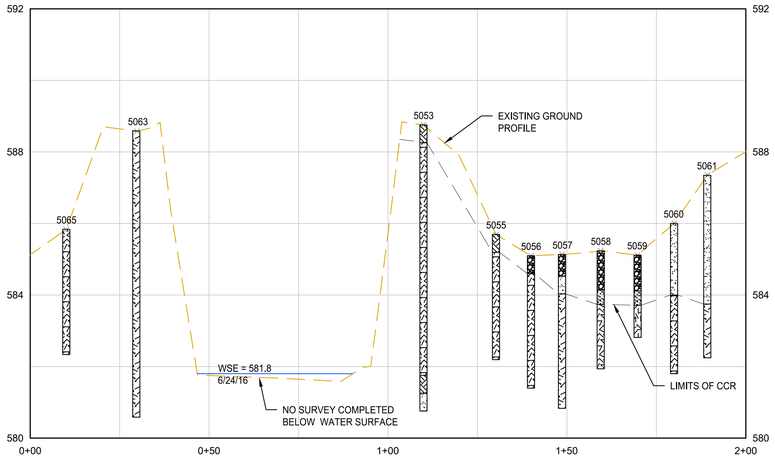
EXSITING CONDITIONS

SHEET 2 OF 5

2

S:\Projects\133 - NTH Consultants\133-16-001 HBPV - Ash Settling Pond and Coal Pile Closure\CAD\Basemap.dwg 10/6/2016 9:59 AM

POND 1 CROSS SECTION A-A'



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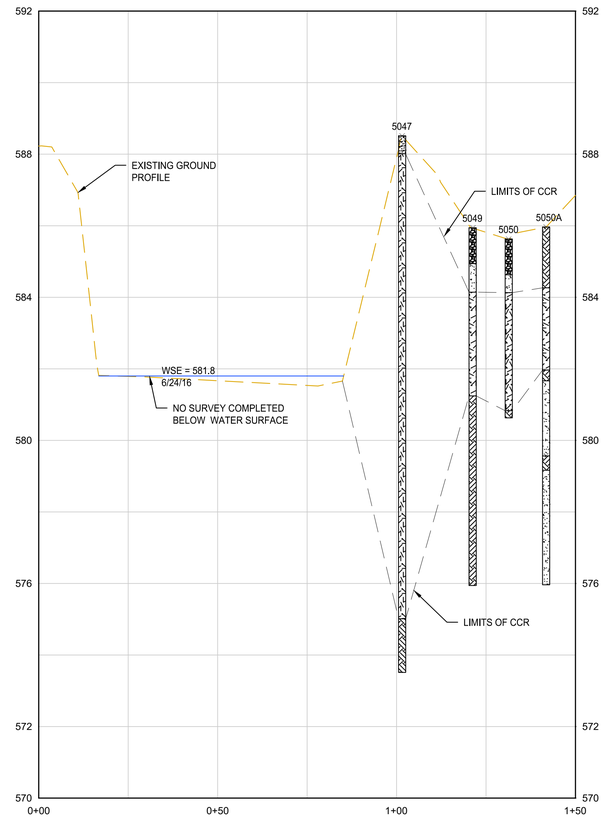

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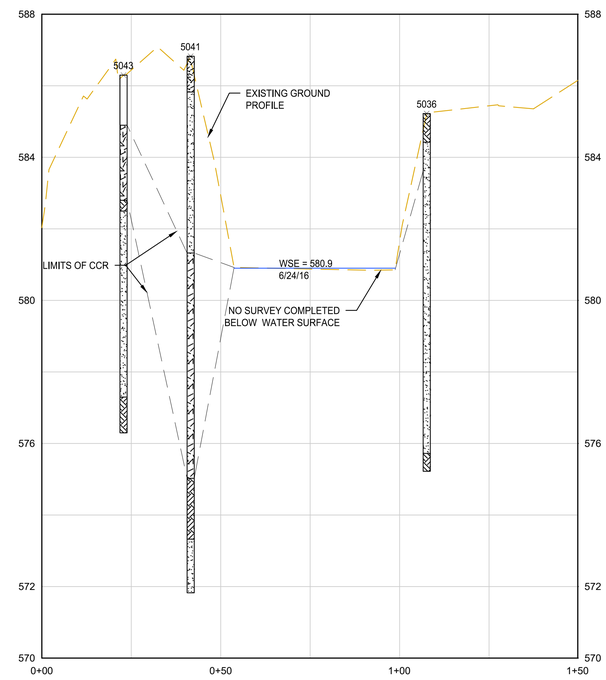

LEGEND

- EXISTING GROUND (JUNE 2016)
- BOTTOM OF CCR SURFACE PROFILE
- GROUNDWATER
- CCR MATERIAL
- COAL
- NATIVE SAND
- NATIVE SILT AND/OR CLAY WITH ORGANICS
- CONCRETE
- GRAVEL

VERTICAL SCALE: 1"=2'

HORIZONTAL SCALE: 1"=20'

Engineering & Environmental Solutions, LLC
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BOTTOM ASH POND INVESTIGATION

HOLLAND BOARD OF PUBLIC WORKS

SECTION 30 T. 5 N., R. 15 W., CITY OF HOLLAND, OTTAWA COUNTY

64 PINE AVE.

HOLLAND, MICHIGAN

MARK	DATE	DESCRIPTION

DESIGNED BY:	---
DRAWN BY:	AM
CHECKED BY:	BL
PROJECT NO:	133-16-001

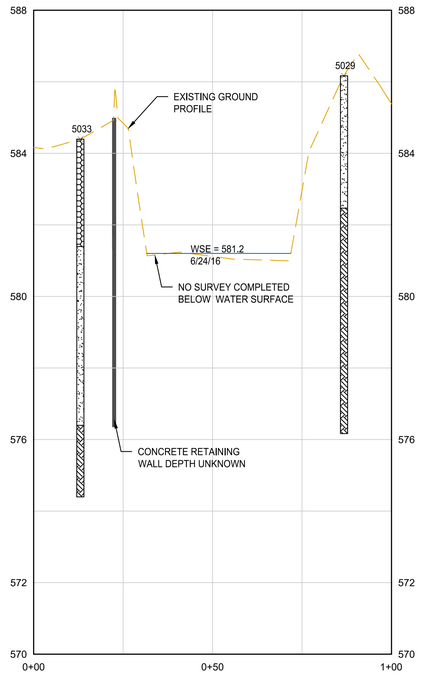
SHEET TITLE

CROSS SECTIONS A-A', B-B' & C-C'

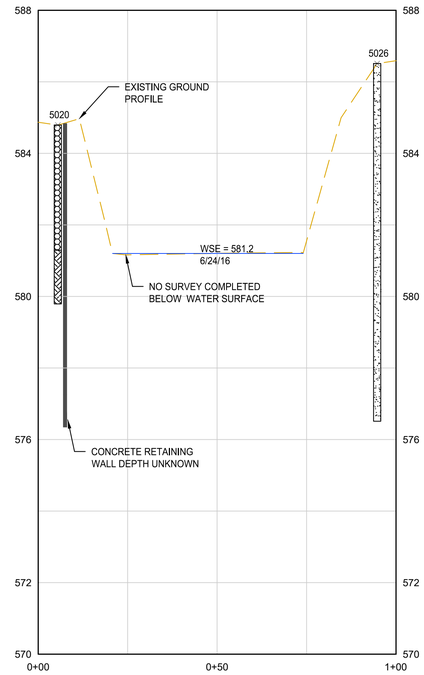
SHEET 3 OF 5

3

POND 3 CROSS SECTION D-D'



POND 3 CROSS SECTION E-E'



LEGEND

EXISTING GROUND (JUNE 2016)
BOTTOM OF CCR SURFACE PROFILE
GROUNDWATER

CCR MATERIAL
COAL
NATIVE SAND
NATIVE SILT AND/OR CLAY WITH ORGANICS
CONCRETE
GRAVEL

VERTICAL SCALE: 1"=2'
HORIZONTAL SCALE: 1"=20'

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Engineering & Environmental Solutions, LLC
400 136th Avenue, Building 100, Suite B, Holland, Michigan 49424
Phone/Fax: (616) 994-4541
www.goEESolutions.com

BOTTOM ASH POND INVESTIGATION
HOLLAND BOARD OF PUBLIC WORKS
SECTION 30 T. 5 N., R. 15 W., CITY OF HOLLAND, OTTAWA COUNTY
64 PINE AVE.
HOLLAND, MICHIGAN

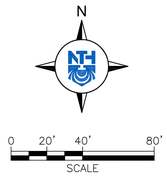
MARK	DATE	DESCRIPTION

DESIGNED BY: --
DRAWN BY: AM
CHECKED BY: BL
PROJECT NO: 133-16-001
SHEET TITLE

CROSS SECTIONS D-D' & E-E'

SHEET 4 OF 5

4

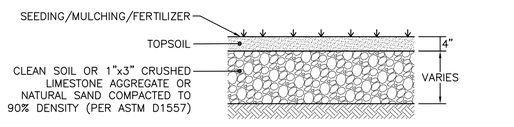


LEGEND

- EXISTING CONTOURS
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING STORM SEWER
- EXISTING STORMWATER JUNCTION STRUCTURE
- EXISTING ASPHALT
- EXISTING CONCRETE
- PROPOSED CONTOURS
- PROPOSED SLOPE
- PROPOSED SPOT ELEVATION

NOTES:

1. EXISTING TOPOGRAPHIC SURVEY COMPLETED BY ENGINEERING & ENVIRONMENTAL SOLUTIONS ON JUNE 23 AND 24, 2016. LOCATION OF PIPING IS APPROXIMATE AND BASED OFF HISTORICAL DRAWINGS PROVIDED BY HBPW.
2. STORMWATER CONTROL DITCHES, CULVERTS, OR OTHER CONTROL FEATURES TO BE DESIGNED AND INSTALLED TO CONTROL THE STORM RUNOFF FROM THE DESIGNED EVENT OF THE CLOSED CCR IMPOUNDMENT AREA. THE RUNOFF WILL OUTFALL AT A DESIGNATED LOCATION UNDER APPROPRIATE AUTHORITY HAVING JURISDICTION PERMIT.



1 CCR IMPOUNDMENT BACKFILL SECTION
NOT TO SCALE

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
For free location of public utility lines.
ALTERNATE NUMBER (810) MISS-DIG
COLOR CODES FOR UTILITY LOCATING:

Yellow	OIL & GAS	Blue	WATER
Orange	PHONE & CATV	Green	STORM DRAIN
Red	ELECTRIC	Brown	SEWER
		Pink	SURVEYING

IF YOU ARE GOING TO WORK NEAR OVERHEAD WIRES ... CALL MISS DIG

NTH Consultants, Ltd.
Infrastructure Engineering and Environmental Services

Northville, MI	248.553.6300
Detroit, MI	313.237.3900
Lansing, MI	517.484.6900
Grand Rapids, MI	616.451.6270
Cleveland, OH	216.334.4040

SUBMITTAL

REV	DESCRIPTION	DATE	BY

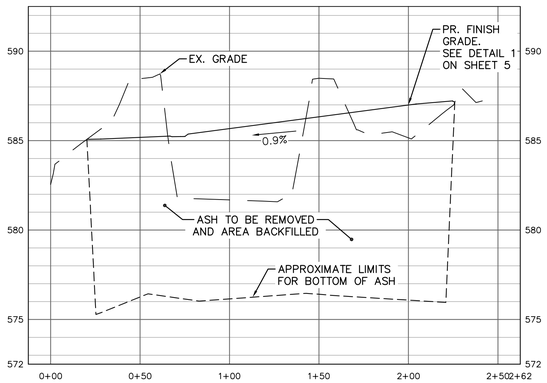
PROJECT NAME:
HOLLAND BPW ASH IMPOUNDMENT CLOSURE

PROJECT LOCATION:
JAMES DEYOUNG POWER PLANT
HOLLAND, MICHIGAN

NTH PROJECT NO.:	CAD FILE NAME:
73-160017	160017-EG-ASH
DESIGNED BY: SLG	INCEP DATE: 10/3/2016
DRAWN BY: SLG	DRAWING SCALE: 1" = 40'
CHECKED BY: DRL	SUBMITTED DATE: 10/17/2016

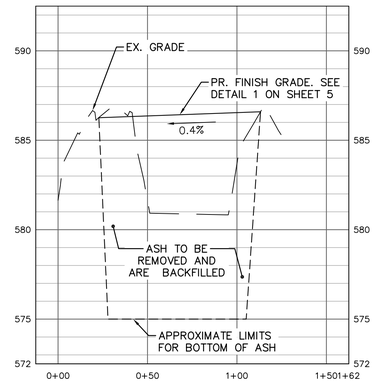
SHEET TITLE:
ASH IMPOUNDMENT CLOSURE PROPOSED GRADING PLAN

SHEET REFERENCE NUMBER:
5



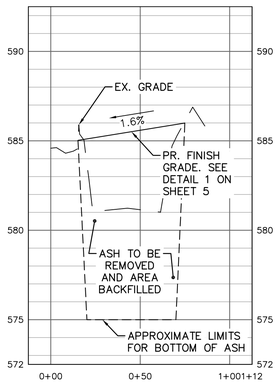
SECTION A-A

HORIZ SCALE: 1" = 40'
VERT SCALE: 1" = 4'



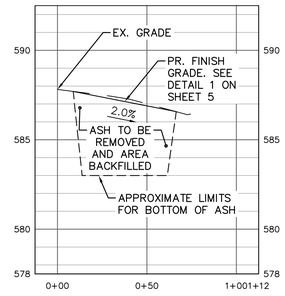
SECTION B-B

HORIZ SCALE: 1" = 40'
VERT SCALE: 1" = 4'



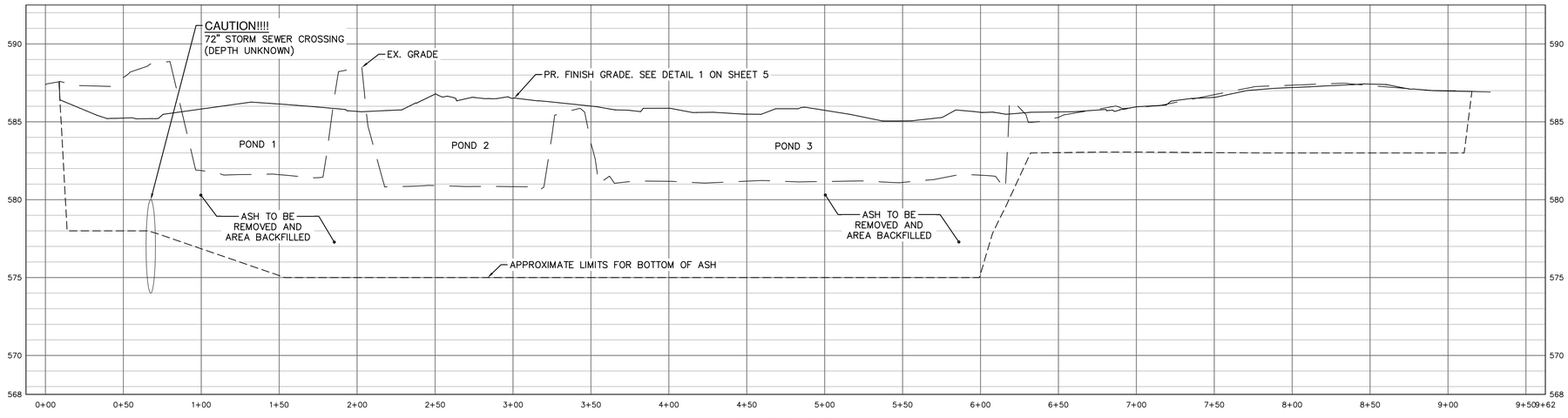
SECTION C-C

HORIZ SCALE: 1" = 40'
VERT SCALE: 1" = 4'



SECTION D-D

HORIZ SCALE: 1" = 40'
VERT SCALE: 1" = 4'



SECTION E-E

HORIZ SCALE: 1" = 40'
VERT SCALE: 1" = 4'

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SUBMITTAL

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DRAWN BY: SLG	DRAWING SCALE: 1" = 40'
CHECKED BY: DRL	SUBMITTED DATE: 10/13/2016

SHEET TITLE:

ASH IMPOUNDMENT CLOSURE
PROPOSED GRADING PROFILES

SHEET REFERENCE NUMBER:

6

J:\2016\73\160017\source drawings\surfaces\160017-eg-ash.dwg Plotted: 10/13/2016 11:55 AM by sgrant