

**2021 USEPA CCR RULE PERIODIC
OPERATING RECORD RUN-ON AND RUN-
OFF CONTROL PLAN REVIEW REPORT**

§257.81

LANDFILL

**Duck Creek Power Plant
Fulton County, Illinois**

Submitted to

Illinois Power Resources Generating, LLC

**17751 North Cilco Road
Canton, Illinois 61520**

Submitted by

Geosyntec 

consultants

engineers | scientists | innovators

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October 11, 2021

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EXECUTIVE SUMMARY

This Periodic Operating Record Run-on and Run-off Control Plan Review Report (Report) for the CCR Landfill (LF) at the Duck Creek Power Plant (DCPP), also known as the Duck Creek Power Station (DUC), has been prepared in accordance with Rule 40, Code of Federal Regulations (CFR) §257 herein referred to as the “CCR Rule” [1]. The CCR Rule requires that initial run-on and run-off control system plans for existing CCR landfills, completed in 2016 [2], be updated on a five-year basis. All reviews are to be posted on the Illinois Power Resources Generating, LLC (IPRG) CCR Website.

The review concluded that no significant updates to the existing run-on and run-off control plan are required. The initial run-on and run-off control system plan developed in 2016 [2] was independently reviewed by Geosyntec. Field observations, interviews with plant staff, and evaluations were performed to evaluate conditions in 2021 relative to the 2016 initial run-on and run-off control plan [2]. The current conditions do not indicate changes are necessary because there are no significant observed changes at the LF since development of the initial plan that would potentially affect the runoff control system plan. **Table 1** provides a summary of the initial 2016 run-on and run-off control plan [2] and conditions observed in 2021.

Table 1 – Periodic Run-on and Run-off Control System Plan Review

CCR Rule Reference	Requirement Summary	2016 Initial Certification		2021 Periodic Certification	
		Requirement Met?	Comments	Requirement Met?	Comments
§257.81 (a)(1)	Prevent flow onto the active portion of the CCR unit during peak discharge from a 24-hr, 25-yr storm.	Yes	The LF is separated from adjacent areas by perimeter berms, which allow flow to be directed around the unit. [2].	Yes	No changes were identified that may affect this requirement.
§257.81 (a)(1)	Collect and control run-off from the active portion of the CCR unit during the 24-hr, 25-yr storm.	Yes	Run-off from the LF flows towards perimeter ditches at the SE corner of the LF to a temporary outfall location. Flow from the temporary outfall location are conveyed by gravity flow through at temporary discharge pipe to Duck Creek Reservoir. All structures were designed for the 25-year, 24-hr rainfall event [2].	Yes	No changes were identified that may affect this requirement.
§257.81(b)	Handle run-off from the active portion of the CCR Unit in accordance with surface water requirements under the Clean Water Act (40 CFR §257.3-3)	Yes	Run-off from the LF is routed to the Duck Creek Reservoir; outflow from the Duck Creek Reservoir is routed to a NPDES-permitted outfall [2].	Yes	No changes were identified that may affect this requirement.

SECTION 1

INTRODUCTION AND BACKGROUND

This Periodic Operating Record Run-on and Run-off Control Plan Review Report (Report) was prepared by Geosyntec Consultants (Geosyntec) for Illinois Power Resources Generating, LLC (IPRG). The review is required by the United States Environmental Protection Agency (USPA) Coal Combustion Residual (CCR) Rule [1] to document compliance with the CCR Rule for the CCR Landfill (LF) at the Duck Creek Power Plant (DCPP), also known as the Duck Creek Power Station (DUC).

DCPP is located at 17751 North Cilco Road, Canton, Illinois 61520. The location of DCPP is illustrated in **Figure 1**, and a site plan showing the location of the LF, among other closed and open CCR and non-CCR surface impoundments, is provided in **Figure 2**.

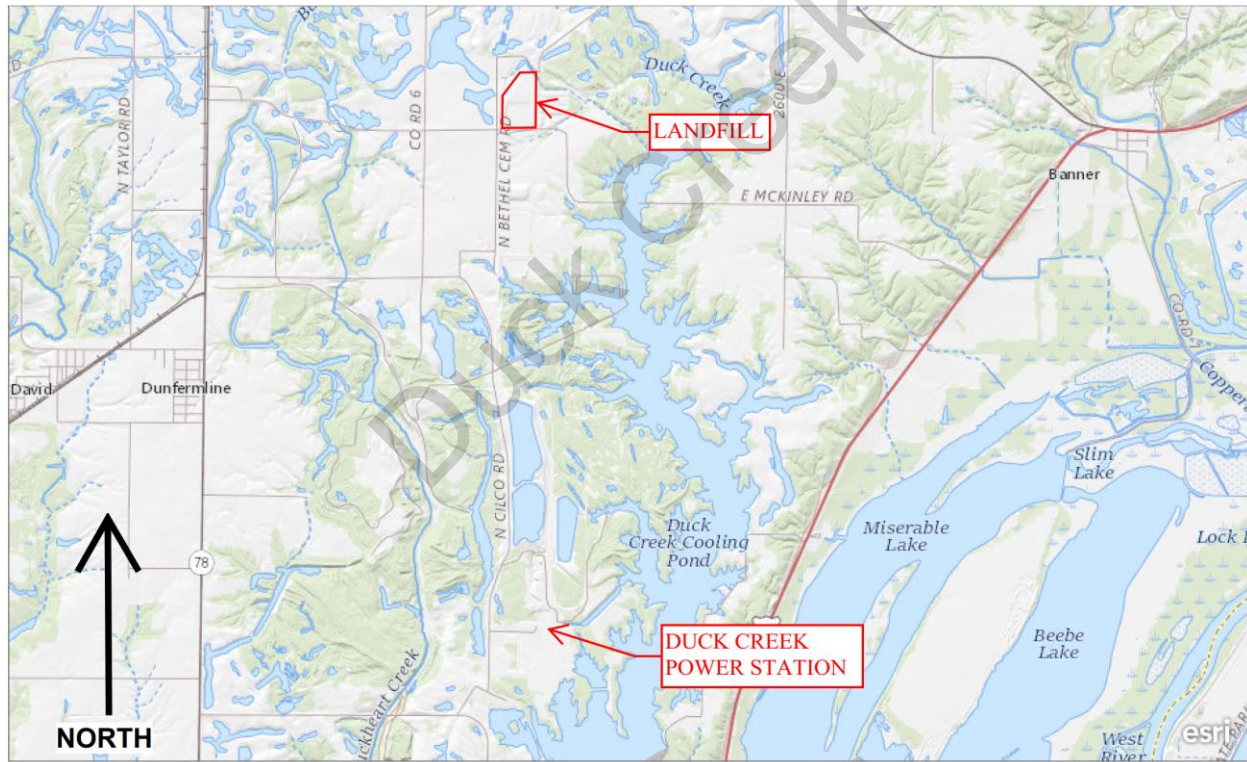


Figure 1 – Site Location Map (from ESRI, 2021)



Figure 2 – Site Plan (modified from Google Earth Pro, 2021)

1.1 Landfill Description

The LF was constructed for the disposal of CCR generated at DCP. The LF has a permitted size of approximately 106 acres, although only the north 22 acres (Cells 1A and 1B) have been constructed to date. The placement of material into the LF ceased when DCP was retired in 2019. The LF is surrounded by earthen perimeter berms that direct stormwater flow away from the LF [2].

The initial run-on and run-off control system plan (§257.81) was completed by Hanson Professional Services, Inc. (Hanson) in 2016 and subsequently posted to IPRG’s CCR Website [2]. Additional documentation for the initial plan, including calculations and other information, was prepared by Hanson [3] but not posted to IPRG’s CCR Website.

1.2 Report Objectives

The objectives of this report are to:

- Compare site conditions from 2015/2016, when the initial run-on and run-off control system plan ([2], [3]) was prepared, to current site conditions in 2020/2021, and evaluate if updates are required to the initial plan based on changes at the site.
- Independently review the initial run-on and run-off control plan ([2], [3]) to determine if updates may be required based on technical considerations.
- Confirm that the LF meets all of the requirements associated with §257.81, or, if the LF does not meet any of the requirements, provide recommendations for compliance with that section of the CCR Rule [1].

SECTION 2

COMPARISON OF INITIAL AND PERIODIC SITE CONDITIONS

2.1 Overview

This section describes the comparison of conditions at the LF between the start of the initial CCR certification program in 2015 and 2016 (initial conditions) and subsequent collection of periodic certification site data in 2020 and 2021 (periodic conditions).

2.2 Review of Annual Inspection Reports

Annual onsite inspections of the LF were performed between 2015 and 2020 ([4], [5], [6], [7], [8], [9]) and were certified by a licensed professional engineer in accordance with §257.84(b). Each inspection report stated that the following information, relative to the previous inspection:

- Cell 1B was constructed in 2015 and was permitted to operate and receive waste in 2016.
- No changes in geometry were present,
- Maintenance operations to correct minor erosion and existing drainage features were ongoing and did not compromise the operation of the LF:
- No appearances of actual or potential structural weakness of the CCR were observed,
- No existing conditions were occurring that were or had the potential to disrupt the operation or safety of the LF,
- No other changes were observed which may have affected the ability or operation of the LF; and
- Approximate CCR volumes in the LF increased from 820,000 CY in 2015 to 1,100,000 CY in 2020.

In summary, the field inspection reports did not indicate any significant changes to the LF between 2015 and 2020, outside of continued CCR placement and the construction of Cell 1B.

2.3 Comparison of Initial and Periodic Surveys

The initial survey of the LF, conducted at the site by Weaver Consultants (Weaver) in 2015 [10], was compared to the periodic survey of the LF, conducted by IngenAE, LLC (IngenAE) in 2020 [11], using AutoCAD Civil3D 2021 software. This comparison was intended to quantify changes in the volume of CCR placed within the LF, evaluate potential changes in surface stormwater drainage around the LF, and evaluate if CCR may have been placed outside of the grades of the

LF used for the existing run-on, run-off control plan ([2], [3]). This comparison is presented in a plan view side-by-side of the surveys in **Drawing 1** and an isopach map denoting changes in ground surface elevation in **Drawing 2**. A summary of the changes in CCR volumes is provided in **Table 1**.

Table 1 – Initial to Periodic Survey Comparison

Total Change in CCR Volume (CY)	+261,576 (Fill)
Were there significant changes in exterior stormwater drainage?	Yes (see below)
Was CCR placed outside of the design grades of the LF?	No

The comparison indicated that approximately 262,000 CY of CCR was placed in the LF between 2015 to 2021. Most of the CCR was placed within Cell 1B, which had not yet received CCR in 2015. Changes in grading and some CCR placement also occurred at the top of Cell 1A. Some minor sedimentation of perimeter ditches was also noted, however periodic sedimentation is being addressed as part of routine maintenance, as indicated in the annual inspections ([4], [5], [6], [7], [8], [9]). The comparison did not indicate that CCR had been placed outside the design grades of the LF.

2.4 Comparison of Initial to Periodic Aerial Photography

Initial aerial photographs of the LF collected by Weaver Consultants in 2015 [10] were compared to periodic aerial photographs collected by IngenAE, LLC in 2020 [11] to visually evaluate if potential site changes (i.e., construction of new ditches, changes in site operations, or changes to other appurtenances) may have occurred between 2015 and 2020. A comparison of these aerial photographs is provided in **Drawing 3**, and the following change was identified:

- Cell 1B was constructed in 2015 but had not yet received CCR. CCR was placed in Cell 1B starting circa 2016, as indicated by the periodic aerial imagery.

2.5 Comparison of Initial to Periodic Site Visits

An initial site visit to the LF was conducted by AECOM in 2015 and documented in a Site Visit summary and corresponding photographs [12]. A periodic site visit was conducted by Geosyntec on May 27, 2021, with Mr. Lucas P. Carr, P.E. conducting the site visit. The site visit was intended to evaluate potential changes at the site since development of the initial run-on and run-off control plan ([2], [3]) (i.e., modifications to stormwater drainage system(s), modifications to adjacent structures that may route run-on towards the landfill), in addition to performing visual observations of the LF and surrounding area to evaluate if potential maintenance to existing run-on and run-off control systems were required. The site visit is documented in a photographic log provided in **Appendix A**. A summary of significant findings from the site visit is provided below:

- Overall site maintenance appeared to be similar to conditions in 2015, although vegetation was taller in 2021; this is because the 2015 site visit occurred in June, after the site had

been mowed, and the 2021 site visit occurred in May, prior to the spring mowing of the LF.

- The LF was observed to be located in an area with relatively flat surrounding grades, and the LF was surrounded by earthen perimeter berms. Therefore, the LF is located in an area with a low risk of stormwater run-on.
- Cell 1B was under construction at the time of the 2015 site visit. Cell 1B construction was completed prior to the 2021 site visit and CCR had been placed in the LF.
- CCR was no longer being placed in the LF in 2021, as the DCPD was retired in 2019.

2.6 Interview with Power Plant Staff

An interview with Mr. Daryl Johnson and Mr. Brandon Potter of DCPD was conducted by Mr. Lucas P. Carr, P.E. of Geosyntec on May 27, 2021. Mr. Johnson, at the time of the interview, had been employed at DCPD for eight years and was responsible for environmental compliance and completed weekly inspections of the LF on some years and managed vegetation maintenance. Mr. Potter, at the time of the interview, had been employed at DCPD for 10 years and assisted in the inspection and operation of the LF. The interview included a discussion of potential changes that may have occurred at the LF since development of the initial run-on and run-off control plan ([2], [3]). A summary of the interview is provided below.

- Were any construction projects completed for the LF since 2015, and, if so, are design drawings and/or details available?
 - Cell 1B was completed around 2016. The cell design was completed by Hanson with construction support by Feezor Engineering.
- Have there been any changes to operational and/or maintenance programs for the LF since 2015?
 - No changes occurred outside of DCPD retirement and the cessation of CCR placement into the LF in December of 2019.
- Have any other changes and the LF occurred since 2015 that may substantially affect the existing run-on and run-off control plan ([2], [3])?
 - Grading of the LF was completed in November and December of 2020, including regarding the top to be sloped within the permitted waste boundary. The grading was performed per plans developed by Civil & Environmental Consultants (CEC).
- Have there been any instances of uncontrolled stormwater run-on to the LF since 2015?

- No.
- Have there been any instances of uncontrolled stormwater run-off from the LF since 2015?
 - No.

Duck Creek

SECTION 3

RUN-ON AND RUN-OFF CONTROL PLAN - §257.81

3.1 Overview of Initial RRCSP

The Initial Run-on and Run-off Control System Plan (Initial RRCSP) was prepared by Hanson in 2016 ([2], [3]) following the requirements of §257.81. The Initial RRCSP included the following information

- A description of the run-on control features designed for a 25-year, 24-hour storm event;
- A description of the run-off control features designed for a 25-year, 24-hour storm event;
- Detailed discussion of calculations supporting the design of the control features;
- A discussion of the National Pollutant Discharged Elimination System (NPDES) permitting for the DCCP, as it pertained to run-off management; and
- Operations and maintenance procedures to be followed.

The Initial IDF concluded that the LF met the requirements of §257.81, as the run-on control system was designed to prevent flow into the LF, the run-off control system was designed to control and collect water within the LF, and discharge from the LF was routed to a NPDES-permitted outfall during the 25-year, 24-hour design storm event.

3.2 Review of Initial RRCSP

Geosyntec performed a review of the Initial RRCSP ([2], [3]), in terms of technical approach, input parameters, and assessment of the results. The review included the following tasks:

- Reviewing the rainfall depth and distribution for appropriateness;
- Performing a high-level review of the inputs to the hydrologic modeling;
- Performing a high-level review of the design approach to the hydrologic modeling;
- Reviewing the adequacy of stormwater control features versus the applicable requirements of the CCR Rule; and
- Performing a high-level review of the network of stormwater control features.

No significant technical issues were noted within the technical review, although a detailed review (e.g., check) of the calculations was not performed. It should be noted that the RRCSP did not

include run-on calculations and did not provide a reasoning for why they were not included. However, based on Geosyntec’s site visit, the LF is located in a area of relatively flat surrounding topography and is elevated above the surrounding grades with earthen perimeter berms. Therefore, it is Geosyntec’s opinion that run-on calculations are not necessary for the LF.

3.3 Summary of Site Changes Affecting Initial RRCSP

No changes between 2015 and 2021 were identified that would require updates to the Initial RRCSP. Updates to the Initial RRCSP are not recommended at this time.

Duck Creek

SECTION 4

CONCLUSIONS

The LF run-on and run-off controls system plan (§257.81) was evaluated relative to the USEPA CCR Rule periodic assessment requirements. Based on these evaluations, the referenced requirements are satisfied for run-on and run-off control system planning, and updates to the initial run-on and run-off control plan ([2], [3]) are not required at this time.

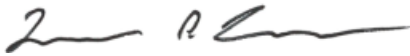
Duck Creek

SECTION 5

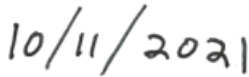
CERTIFICATION STATEMENT

CCR Unit: Illinois Power Resources Generation, LLC; Duck Creek Power Plant, Landfill

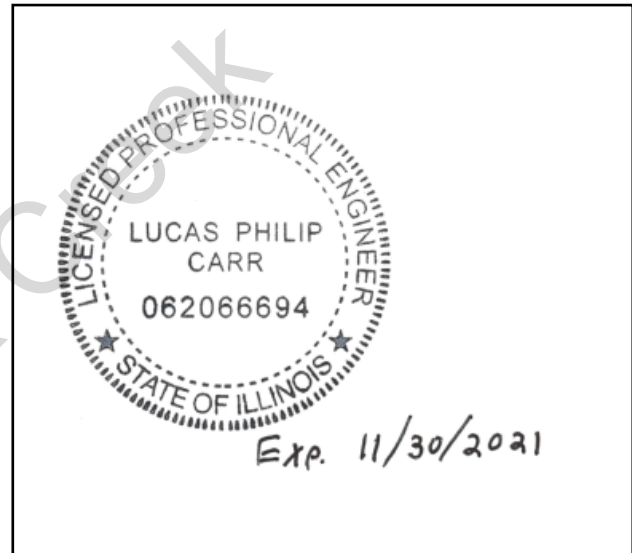
I, Lucas P. Carr, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this 2021 USEPA CCR Rule Periodic Certification Report, has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the periodic assessment of the run-on and run-off control system plan, dated October 2021, was conducted in accordance with the requirements of 40 CFR §257.81.



Lucas P. Carr



Date



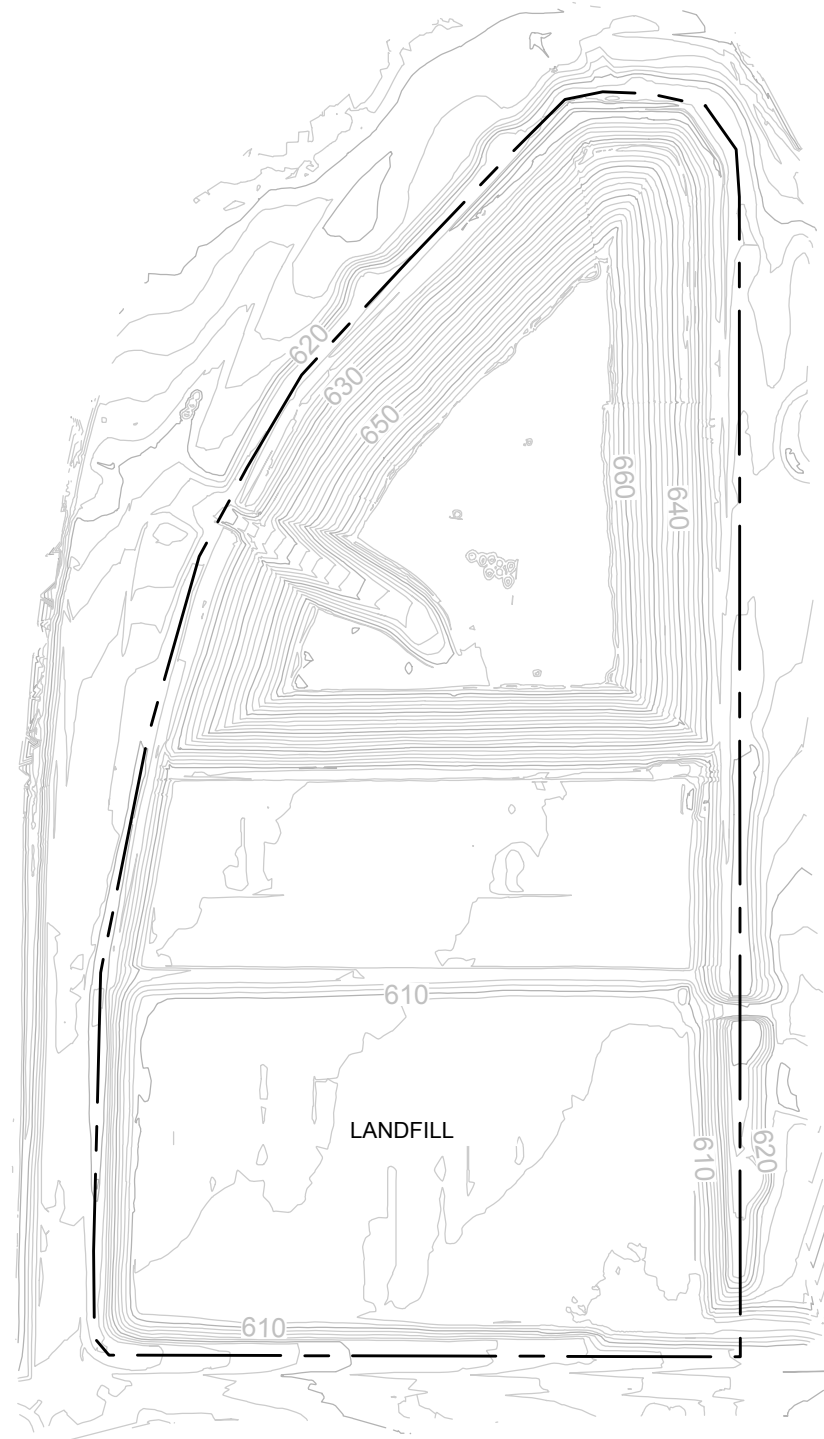
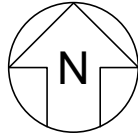
SECTION 6

REFERENCES

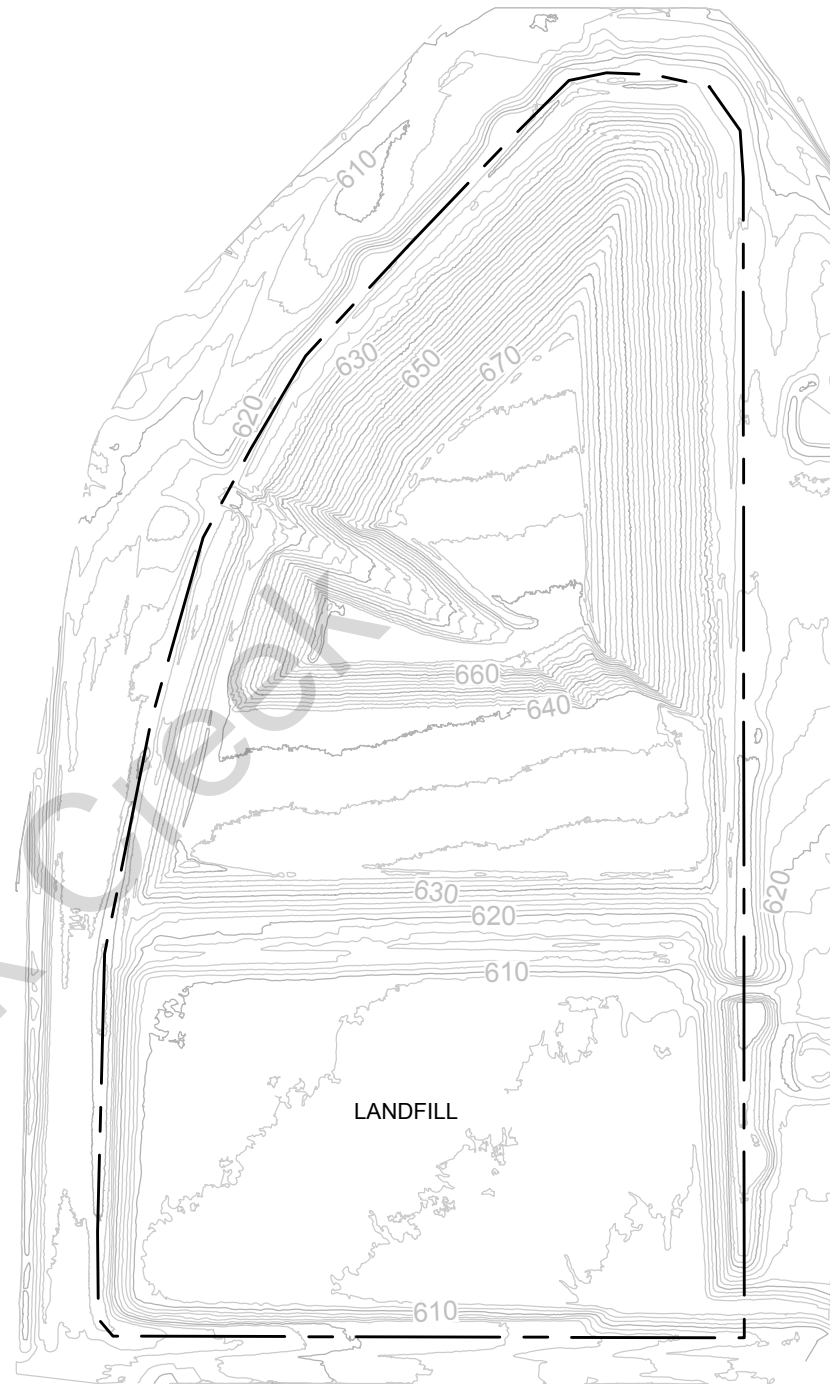
- [1] United States Environmental Protection Agency, 40 CFR Parts 257 and 261; Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, 2015.
- [2] Hanson Professional Services Inc. , "CCR Rule Report: Run-on and Run-off Control System Plan, Duck Creek Power Station, CCR Landfill, Fulton County, Illinois," October 2016.
- [3] Hanson Professional Services, Inc., "Run-on and Run-off Control System Documentation, Duck Creek Power Station, CCR Landfill, Fulton County, Illinois," October 2016.
- [4] D. B. Hoots, "Annual Inspection by a Qualified Professional Engineer, 40 CFR § 257.84(b), Duck Creek Power Station, CCR Landfill," January 14, 2016.
- [5] D. B. Hoots, "Annual Inspection by a Qualified Professional Engineer, 40 CFR §257.84(b), Duck Creek Power Station, CCR Landfill," January 12, 2017.
- [6] D. B. Hoots, "Annual Inspection by a Qualified Professional Engineer, 40 CFR § 257.84(b), Duck Creek Power Station, CCR Landfill," December 14, 2017.
- [7] D. B. Hoots, "Annual Inspection by a Qualified Professional Engineer, 40 CFR § 257.84(b), Duck Creek Power Station, CCR Landfill," December 10, 2018.
- [8] D. B. Hoots, "Annual Inspection by a Qualified Professional Engineer, 40 CFR § 257.84(b), Duck Creek Power Station, CCR Landfill," October 18, 2019.
- [9] D. B. Hoots, "Annual Inspection by a Qualified Professional Engineer, 40 CFR § 257.84(b), Duck Creek Power Station, CCR Landfill," October 18, 2020.
- [10] Weaver Consultants Group, "Dynergy, Collinsville, IL, 2015 - Duck Creek Topography," Collinsville, Illinois, December 2015.
- [11] IngenAE, "Luminant, Illinois Power Recourses [sic] Generating, LLC, Duck Creek Power Station, December 2020, Topography, Canton, Illinois," Earth City, Missouri, February 9, 2021.
- [12] AECOM, "Initial Site Visit CCR Unit Summary, Dynergy CCR Compliance Program - Duck Creek, Duck Creek Landfill," June 26, 2015.

DRAWINGS

Duck Creek



INITIAL SURVEY
12-01-2015 TOPOGRAPHY



PERIODIC SURVEY
02-26-2021 TOPOGRAPHY

PLANT



NOTES:

1. THE INITIAL SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "DYNEGY, COLLINSVILLE, ILLINOIS, 2015 - DUCK CREEK EXISTING TOPOGRAPHY", PREPARED BY WEAVER CONSULTANTS GROUP, DATED DECEMBER 1, 2015.
2. THE PERIODIC SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "LUMINANT, ILLINOIS POWER RESOURCES GENERATING, LLC, DUCK CREEK POWER STATION, DECEMBER 2020 TOPOGRAPHY", PREPARED BY INGENAE, DATED FEBRUARY 9, 2021.
3. ALL SURVEY DATA WAS COLLECTED IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND NORTH AMERICAN DATUM OF 1983 (NAD83) FOR VERTICAL AND HORIZONTAL COORDINATES, RESPECTIVELY.

INITIAL TO PERIODIC SURVEY COMPARISON
LANDFILL
DUCK CREEK POWER PLANT
CANTON, ILLINOIS



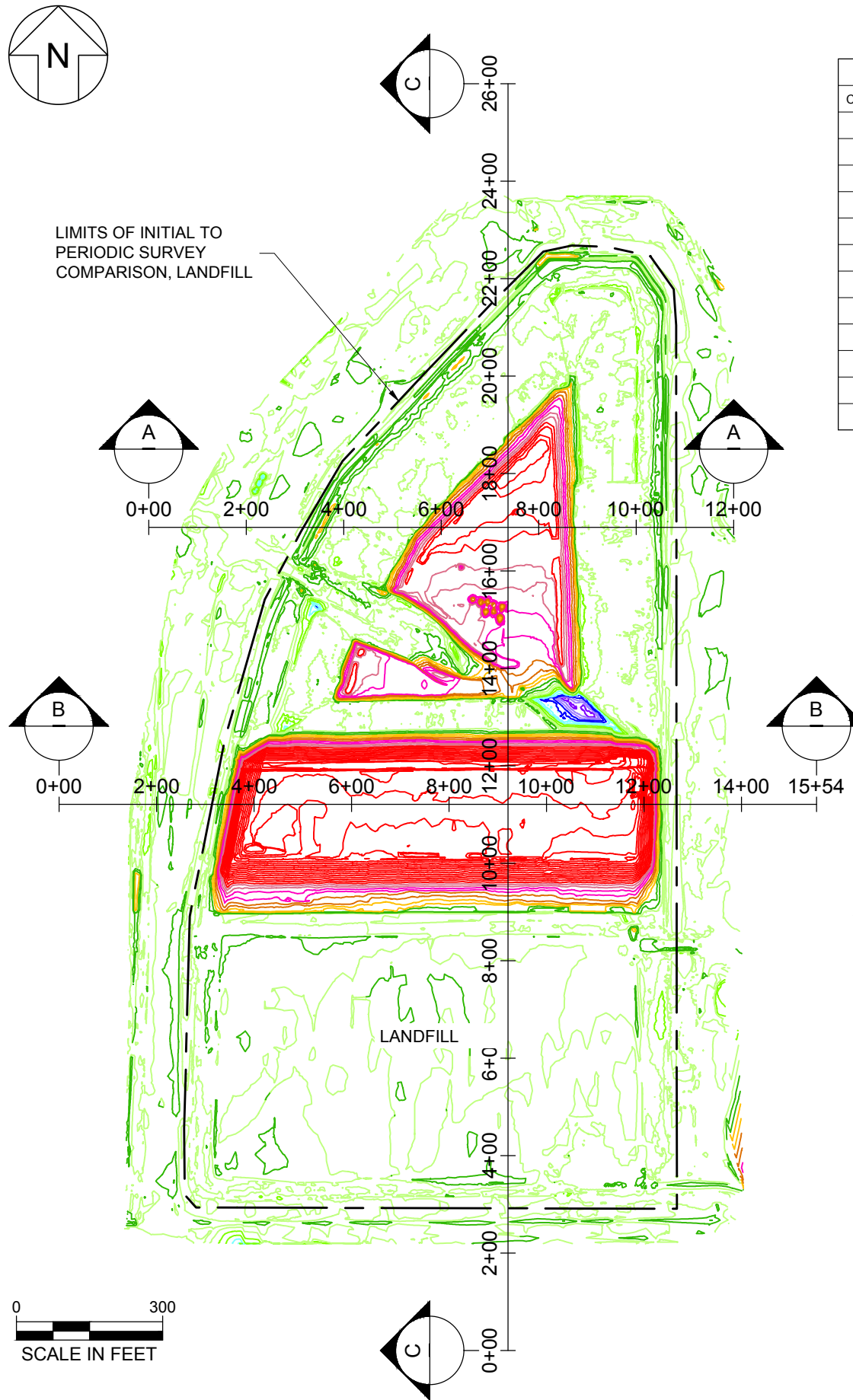
DRAWING

1

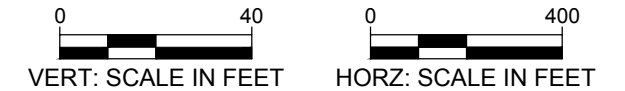
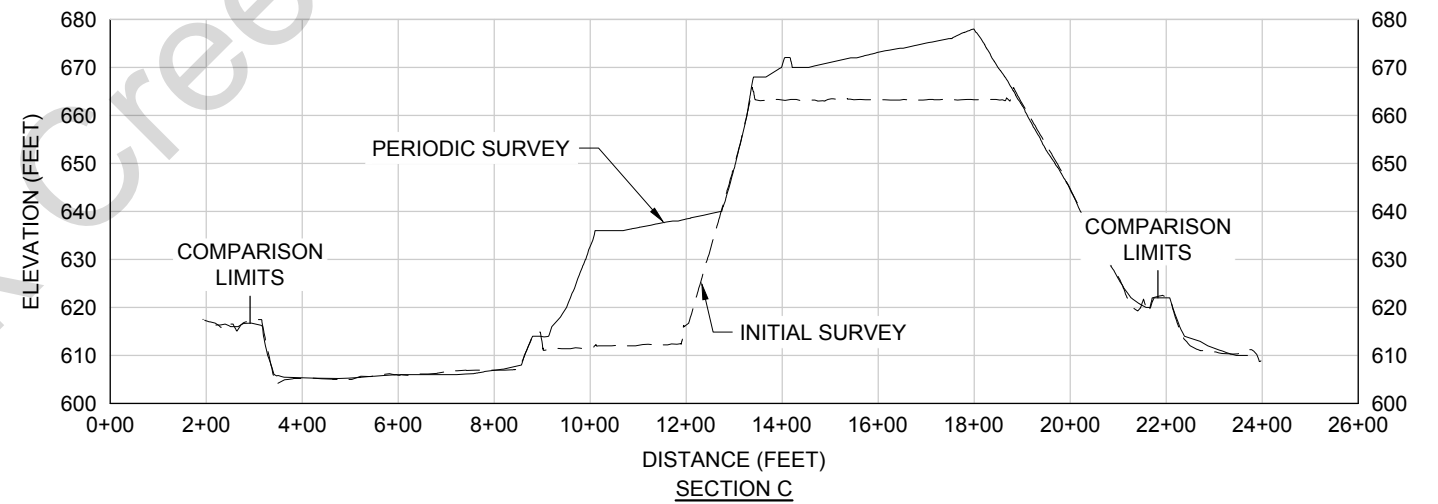
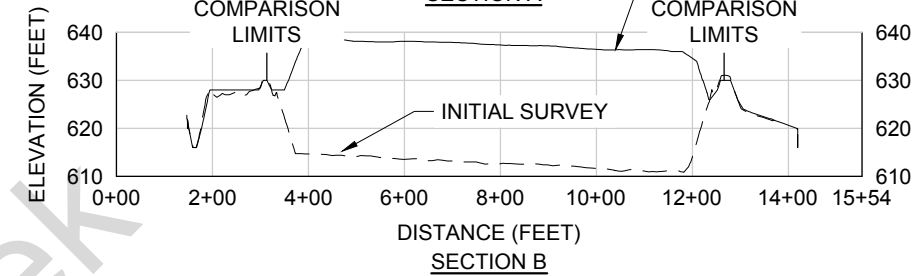
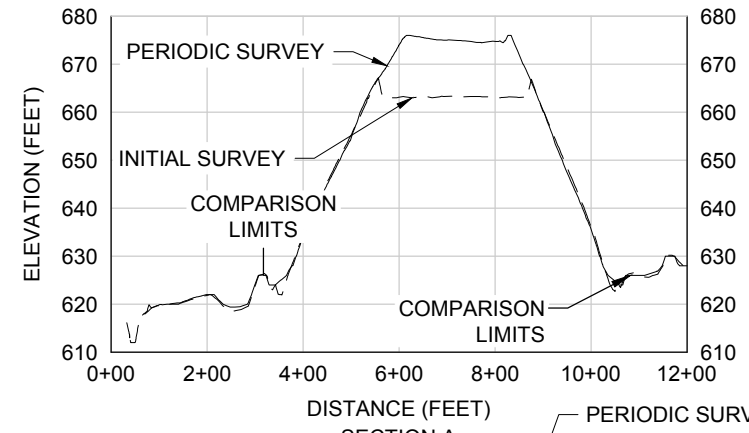
GLP8027.03

MAY 2021

P:\CADD\PROJECTS\VISTRA PONDS\DUCK CREEK\FIGURES\ISOPACH-2 - Last Saved by: K-Hanavec on 5/14/21



ISOPACH CONTOUR KEY		
COLOR	MIN ELEV	MAX ELEV
Dark Purple	-11	-10
Light Purple	-10	-8
Blue	-8	-6
Cyan	-6	-4
Light Green	-4	-2
Green	-2	0
Dark Green	0	2
Yellow	2	4
Orange	4	6
Pink	6	8
Light Red	8	10
Red	10	28



INITIAL TO PERIODIC SURVEY COMPARISON SUMMARY			
CCR UNIT	CUT	FILL	NET (CU. YD.)
LANDFILL	17,452	279,028	261,576 (FILL)

NOTES:

1. THE INITIAL SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "DYNEGY, COLLINSVILLE, ILLINOIS, 2015 - DUCK CREEK EXISTING TOPOGRAPHY", PREPARED BY WEAVER CONSULTANTS GROUP, DATED DECEMBER 1, 2015.
2. THE PERIODIC SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "LUMINANT, ILLINOIS POWER RESOURCES GENERATING, LLC, DUCK CREEK POWER STATION, DECEMBER 2020 TOPOGRAPHY", PREPARED BY INGENAE, DATED FEBRUARY 9, 2021.
3. ALL SURVEY DATA WAS COLLECTED IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND NORTH AMERICAN DATUM OF 1983 (NAD83) FOR VERTICAL AND HORIZONTAL COORDINATES, RESPECTIVELY.

SURVEY COMPARISON ISOPACH
LANDFILL
DUCK CREEK POWER PLANT
CANTON, ILLINOIS

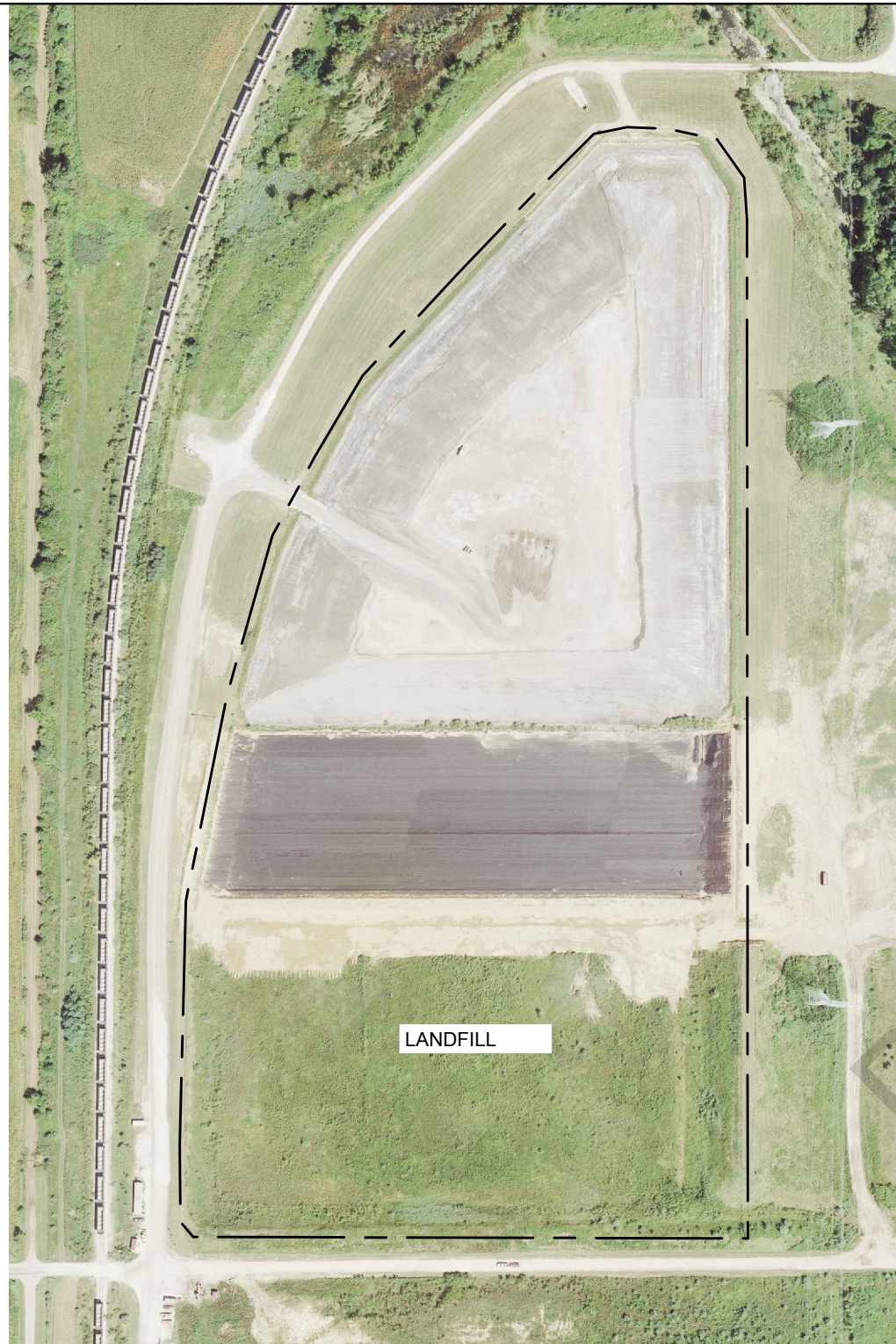
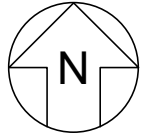


GLP8027.03

MAY 2021

DRAWING

2



INITIAL AERIAL
12-01-2015 IMAGERY



PERIODIC AERIAL
02-09-2021 IMAGERY



NOTES:

1. THE INITIAL IMAGERY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "DYNEGY, COLLINSVILLE, ILLINOIS, 2015 - DUCK CREEK EXISTING TOPOGRAPHY", PREPARED BY WEAVER CONSULTANTS GROUP, DATED DECEMBER 1, 2015.
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INITIAL TO PERIODIC AERIAL IMAGERY
COMPARISON
LANDFILL
DUCK CREEK POWER PLANT
CANTON, ILLINOIS



DRAWING

3

GLP8027.03

MAY 2021

ATTACHMENTS

Duck Creek

Attachment A

LF Site Visit Photolog

Duck Creek

GEOSYNTEC CONSULTANTS
Photographic Record



Site Owner: Illinois Power Resources Generating **Project Number:** GLP8027

CCR Unit: Landfill (LF) **Site:** Duck Creek Power Plant

Photo: 01

Date: 05/27/2021

Direction Facing:
N

Comments:
West LF overview



Photo: 02

Date: 05/27/2021

Direction Facing:
E

Comments:
CCR face on LF.



GEOSYNTEC CONSULTANTS
Photographic Record



Site Owner: Illinois Power Resources Generating **Project Number:** GLP8027

CCR Unit: Landfill (LF) **Site:** Duck Creek Power Plant

Photo: 03

Date: 05/27/2021

Direction Facing:
NE

Comments:
Northwest corner
of landfill



Photo: 04

Date: 05/27/2021

Direction Facing:
SE

Comments:
Northeast side of
landfill



GEOSYNTEC CONSULTANTS
Photographic Record



Site Owner: Illinois Power Resources Generating **Project Number:** GLP8027

CCR Unit: Landfill (LF) **Site:** Duck Creek Power Plant

Photo: 05
Date: 05/27/2021
Direction Facing:
S
Comments:
East side of landfill



Photo: 06
Date: 05/27/2021
Direction Facing:
SW
Comments:
South side of landfill. Diesel pump was operating.

