GOLDER
MEMBER OF WSP

REPORT

INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN per CCR Rule 257.82

NIPSCO, R.M. Schahfer Generating Station, Waste Disposal Area, CCR Unit

Submitted to:

Northern Indiana Public Service Company, LLC (NIPSCO)
2723 East 1500 North
Wheatfield, IN 46392

Submitted by:

Golder Associates Inc.
15851 South US 27, Suite 50, Lansing, Michigan, USA 48906

+1 517 482-2262

21455411

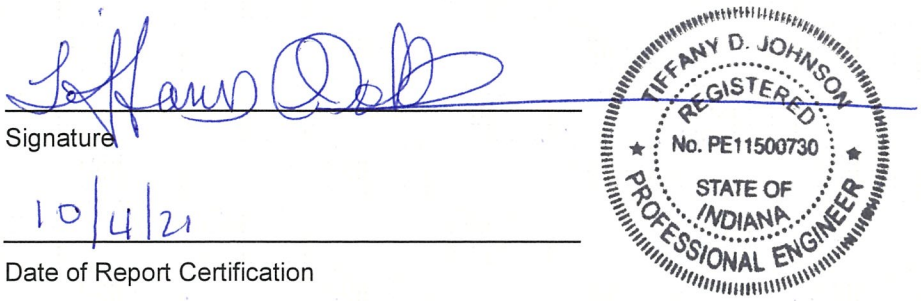
October 4, 2021

Certification

Professional Engineer Certification Statement [40 CFR 257.82(c)(5)]

I hereby certify that, having reviewed the attached documentation and being familiar with the provisions of Title 40 of the Code of Federal Regulations Section 257.82 (40 CFR Part 257.82), I attest that this Inflow Design Flood Control System Plan is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of 40 CFR Part 257.82.

Golder Associates Inc.



Signature

10/4/21

Date of Report Certification

Tiffany D. Johnson, P.E.

Name

PE 11500730

Professional Engineer License Number

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FIGURES

1.0 INTRODUCTION

1.1 Background

Rollin M. Schahfer Generating Station (RMSGS, Site or Facility) is a 1,943 megawatt (MW) capacity coal-fired, steam turbine electric generating plant in Wheatfield, Jasper County, Indiana (see Figure 1). RMSGS began operations in 1976 and occupies an area of approximately four square miles centrally located at 2723 E 1500 N Road in Wheatfield, Jasper County, Indiana. The station includes an electric substation, coal storage and handling operations, bottom ash/boiler slag and fly ash ponds, a landfill, cooling towers, cooling water intake and discharge structures, infrastructure and roadways, train tracks and other support facilities.

1.2 CCR Surface Impoundments

Northern Indiana Public Service Company (NIPSCO) has determined that RMSGS has one CCR surface impoundments that is subject to the requirements of the CCR Final Rule including:

- Waste Disposal Area (WDA) – approximate 83-acre unlined impoundment located in the southwest corner of RMSGS.

The CCR unit location identified above is shown in Figure 2.

1.2.1 Waste Disposal Area (WDA)

The WDA was designed by Sargent & Lundy Engineers of Chicago, Illinois in 1982. The WDA is formed by a ring earth-fill dike with slurry wall core that is approximately 17 feet high and 7,540 feet long (including the common embankment) with a crest elevation of 681 feet above mean sea level (Marbach, 2011). The WDA was constructed for NIPSCO, put in service in 1982, and has been continuously owned and operated by NIPSCO.

The WDA receives primarily bottom ash from the generating station through pipes located at the northern end of the unit. Most of the deposited material is located in the northern half of the WDA. Due to size of the unit and settling/depositional properties of the materials, very little, if any, ash/slag is present in the southern half of the WDA. The east side of the WDA is common with the west side of the adjacent Recycle Settling Basin (RB). Water exits the WDA via an overflow weir (standpipe), to the RB, or through the auxiliary spillway located at the northwest side. The overflow weir is located at the southern end of the east side of the WDA. The WDA and the RB are hydraulically connected and the water level within these impoundments will seek equilibrium when the water level is above the invert elevation of the standpipe connecting the impoundments. A survey of the WDA was performed by Marbach, Brady and Weaver, Inc. in December 2011 (Marbach, 2011), see Figure 3. The auxiliary spillway was modified and construction was completed in November of 2017. The modifications included the removal of the former closed-conduit spillway and the construction of a concrete open-channel spillway with a concrete down-chute and riprap armoring at the toe of the embankment. It is located near the northwest corner of the WDA.

1.3 Purpose

The purpose of the Inflow Design Flood Control System Plan (Plan) is to provide a basis for the certification required by 40 CFR 257.82 Hydrologic and Hydraulic Capacity Requirements for CCR Surface Impoundments. 40 CFR 257.82(a) requires the owner or operator of a CCR surface impoundment to design, construct, operate, and maintain an inflow flood control system as follows:

- Adequately manage the flow into the CCR unit during and following the peak discharge of the inflow design flood as required by the CCR unit hazard potential determined under 40 CFR 257.82(a)(2).
- Adequately manage the flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood as required by the CCR unit hazard potential determined under 40 CFR 257.82(a)(2).
- Handle discharge from the CCR unit in accordance with the surface water requirements under 40 CFR 257.3-3.

1.3.1 Hazard Classification

Golder Associates prepared a Hazard Potential Classification Assessment and Visual Inspection Report for the RMSGS CCR Surface Impoundments pursuant to 40 CFR 257.73 in September 2016 with subsequent annual inspections in 2017 through 2020. An updated Hazard Potential Classification Assessment was completed in June 2021. The assessments performed under 40 CFR 257.73 determined that the WDA is still classified with a **High** Hazard Potential.

As such, for the WDA, a high hazard potential classification triggers the evaluation of the combined capacity of all spillways system during a probable maximum flood (PMF) event under 40 CFR 257.73. Golder completed this hydrologic and hydraulic assessment of the WDA during a PMF event under 40 CFR 257.73 and has submitted a separate Structural Stability and Safety Factor Assessment report detailing the assessment, findings, and recommendations for the WDA in September 2016 and updated in October 2021. The analysis previously performed for the WDA satisfies the requirements of 40 CFR 257.82 and will be discussed briefly in this plan, but the detail of the assessment is submitted under separate cover as part of 40 CFR 257.73.

2.0 FLOOD CONTROL SYSTEM

To satisfy the requirements of 40 CFR 257.82(a), the flood control system must provide flood protection to the CCR unit during the inflow design flood for two cases: 1) floodwater from outside the unit, and 2) controlling internal water levels within the unit. The sections below describe the run-on control systems in place at each CCR, describe the analysis performed to evaluate the adequacy of the existing structure, and list any operational limitations required to maintain adequate flood control measures as required by 40 CFR 257.82(a).

2.1 WDA Analysis

The WDA is classified as a high hazard potential, which requires that the flood control system must provide protection to the CCR unit during a PMF event. As discussed above, Golder completed a hydrologic and hydraulic capacity assessment for the WDA during a PMF event under 40 CFR 257.73 and has submitted a separate Structural Stability and Safety Factor Assessment report detailing the assessment, findings, and recommendations for the WDA in September 2016. A HEC-HMS and wave analysis was performed for the WDA. Since the overflow weir is an interconnecting pipe to the RSB, from which water is pumped as a discharge, the only applicable spillway for the WDA is the auxiliary spillway. Therefore, the analysis was performed using only the auxiliary spillway to manage the PMF event.

2.1.1 WDA Conclusions and Recommendations

Results of the hydrology and hydraulics analysis of the WDA are summarized in Table 1 below:

Table 1: Hydrology and Hydraulics Analysis Results

Criteria	Value
Depth of Precipitation (in) for a PMF Event	31.9
WDA Catchment Area (acres)	83.5
WDA Lowest Crest Elevation (ft MSL, Marbach, 2011)	680
Invert Elevation of Auxiliary Spillway (ft msl)	677.5
Maximum Inflow from Direct Precipitation (cubic feet per second (cfs))	3,692
Maximum Combined Inflow (cfs) [1]	3,732
Maximum WDA Outflow through Spillway (cfs)	335.4
Height of Wave Action (feet)	1.28
Maximum Water Surface Elevation (ft msl) [2]	679.1
Net Freeboard during Design Storm Event (feet) [3, 7]	0.93
Maximum Water Surface Elevation to Prevent Overtopping During PMF (ft msl)	680.1

Notes:
[1] Includes direct precipitation and 40 cfs from overflow weir.
[2] Assumes extra storage capacity is available above embankment crest (e.g. there is no outflow from the impoundment due to overtopping)
[3] Negative freeboard indicates that the embankment will overtop.
[5] All spillway configurations assume 2% longitudinal slope at embankment crest.
[6] All spillway cross-sections are trapezoidal.
[7] Net freeboard = minimum freeboard required for storm event plus the height of wave action.

As shown in the table, the current configuration of the WDA's auxiliary spillway is appropriately sized to manage the flow produced by a PMF event and is compliant with 40 CFR 257.73(d)(1)(v). This analysis also satisfies the requirements of 40 CFR 257.82.

3.0 PLAN REVISION AND RECORDKEEPING

Per 40 CFR 257.82(c)(2): "The owner or operator of the CCR unit may amend the inflow design flood control system plan at any time provided the revised plan is placed in the facility's operating record as required by §257.105(g)(3). The owner or operator must amend the written inflow design flood control system plan whenever there is a change in conditions that would substantially affect the written plan in effect."

Per 40 CFR 257.81(c)(4); "The owner or operator must prepare periodic inflow design flood control system plans required by paragraph (c)(1) of this section every five years. The date of completing the initial plan is the basis for establishing the deadline to complete the first subsequent plan. The owner or operator may complete any required plan prior to the required deadline provided the owner or operator places the completed plan into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing a subsequent plan is based on the date of completing the previous plan. For purposes of this paragraph (c)(4), the

owner or operator has completed a periodic inflow design flood control system plan when the plan has been placed in the facility's operating record as required by §257.105(g)(3).”

Per 40 CFR 257.82(d); “The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in §257.105(g), the notification requirements specified in §257.106(g), and the internet requirements specified in §257.107(g).”

4.0 REFERENCES

Golder Associates, NIPSCO RMSGS Hazard Potential Classification Assessment and Visual Inspection Report RCRA CCR Units, Pursuant to 40 CFR 257.73, Waste Disposal Area, Drying Area, Material Storage Runoff Basin, & Metal Cleaning Waste Basin – Surface Impoundments, September 28, 2016 and June 23, 2021.

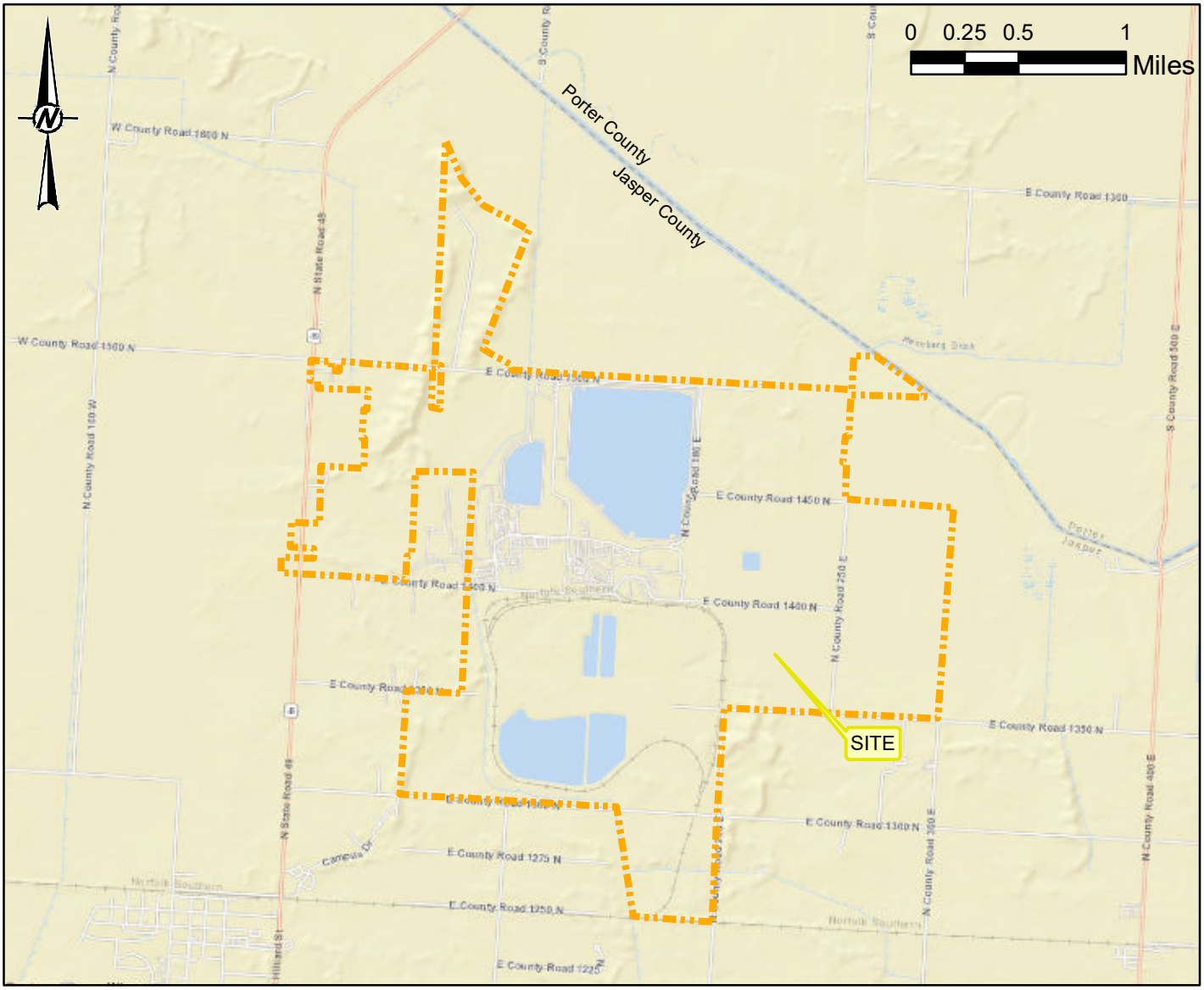
Golder Associates, NIPSCO RMSGS Waste Disposal Area Structural Stability and Safety Factor Assessment, Pursuant to 40 CFR 257.73(d) & 257.73(e), October 5, 2016 and October 2021.

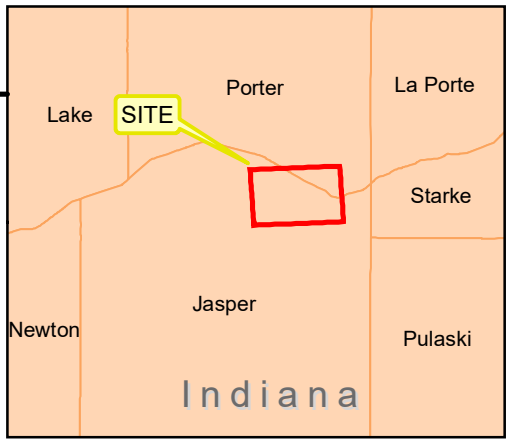
Golder Associates, Hydrologic and Hydraulic Analysis for WDA Impoundment – R.M. Schahfer Generating Station, October 11, 2016.

Golder Associates, Hydrologic and Hydraulic Analysis for CCR Impoundments – R.M. Schahfer Generating Station, October 11, 2016.

USEPA (US Environmental Protection Agency). 2015. Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. 40 CFR Part 257. Effective Date October 19, 2015.

FIGURES





REFERENCE(S)
SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

CLIENT
NORTHERN INDIANA PUBLIC SERVICE COMPANY

PROJECT
CCR SURFACE IMPOUNDMENT
INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN
R.M. SCHAHFER GENERATING STATION, WHEATFIELD, INDIANA

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-07-21
DESIGNED	SF
PREPARED	DJC
REVIEWED	SF
APPROVED	TDJ

TITLE
SITE LOCATION MAP

PROJECT No.	CONTROL	Rev.	FIGURE
21455411	21455411B001-GIS.mxd	0	1

LEGEND

- Approximate Property Line
- CCR Surface Impoundment

500 250 0 500 Feet

NARRATIVE

This figure shows the approximate boundaries of the WDA CCR unit requiring submission of an inflow design control system plan for compliance with the final rule, 40 CFR, Part 257.82.

REFERENCES

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

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PROJECT
CCR SURFACE IMPOUNDMENT
INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN
R.M. SCHAHFER GENERATING STATION, WHEATFIELD, INDIANA

TITLE
EXISTING CONDITIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-07-21
PREPARED	DJC
DESIGN	SF
REVIEW	SF
APPROVED	TDJ

PROJECT No.	CONTROL	Rev.	FIGURE
21455411	21455411B002-GIS.mxd	0	2

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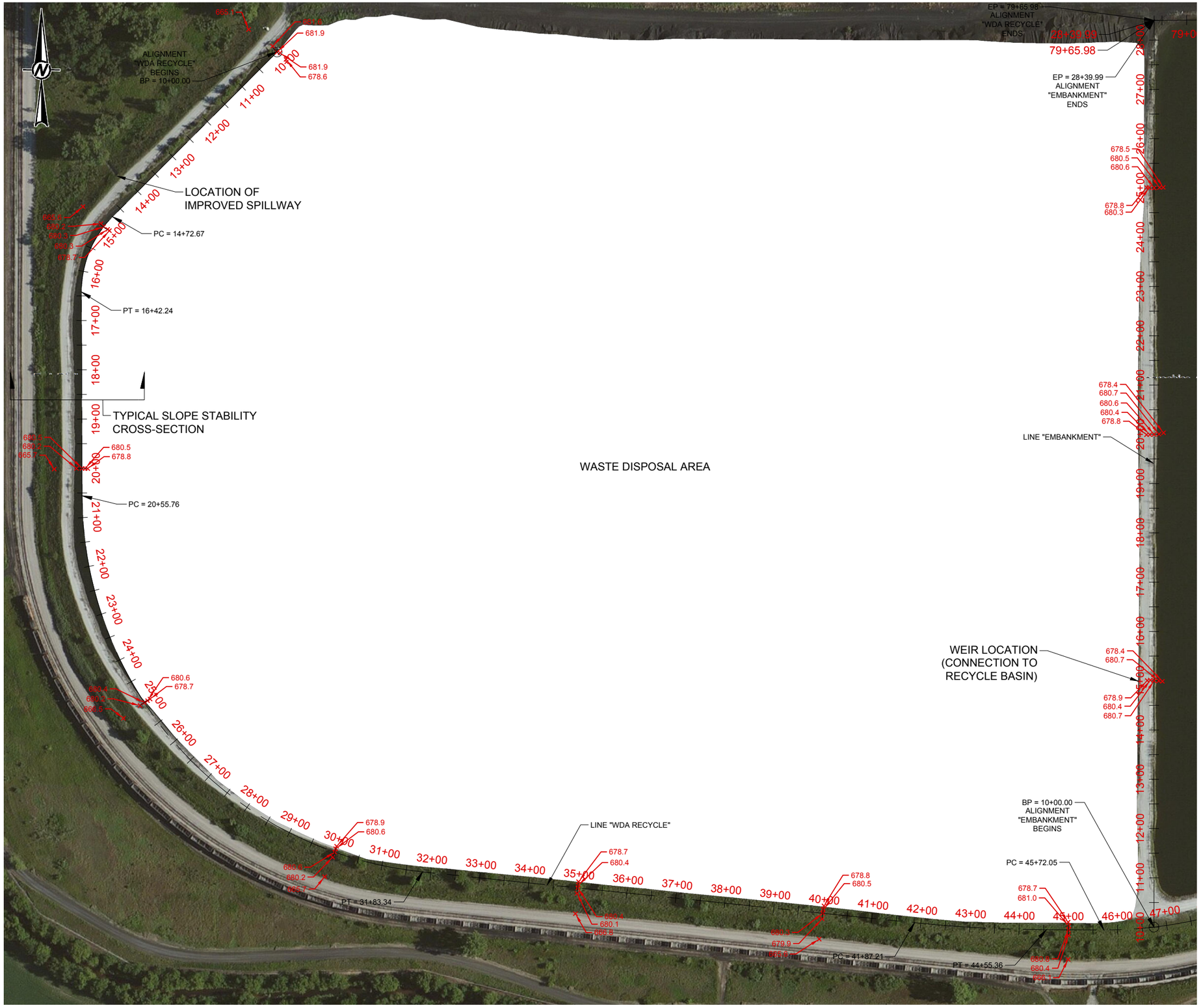

REFERENCE(S)

BASE MAP TAKEN FROM MARBACH, BRADY & WEAVER ENGINEERING & SURVEYING; EMBANKMENT ELEVATION SURVEY; DRAWING NO. A-31565; FILE NO. 0221-2011.DWG; DATED 2011-12-30; DELIVERED IN .DWG FORMAT

0 100 200
1" = 200' FEET

CLIENT
NIPSCO
SCHAHFER GENERATING STATION
WHEATFIELD, INDIANA

PROJECT
INFLOW FLOOD CONTROL FOR THE WASTE DISPOSAL AREA

TITLE
WASTE DISPOSAL AREA SURVEY

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-07-21
DESIGNED	SF
PREPARED	DJC
REVIEWED	SF
APPROVED	TDJ

PROJECT NO.	CONTROL	REV.	FIGURE
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