TECHNICAL MEMORANDUM

DATE June 5, 2025 **Project No.** 31404789.006

TO Jeff Loewe, Manager, Environmental Remediation
Northern Indiana Public Service Company LLC (NIPSCO)

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FROM Cody Johnson **EMAIL cody.johnson@wsp.com**

RE: NORTHERN INDIANA PUBLIC SERVICE COMPANY LLC
MICHIGAN CITY GENERATING STATION - BOILER SLAG POND
CORRECTIVE MEASURES SELECTION OF REMEDY
SEMI-ANNUAL PROGRESS REPORT #21-10

On behalf of Northern Indiana Public Service Company LLC (NIPSCO) and in conformance with 40 Code of Federal Regulations (CFR) §257.97(a), WSP USA Inc. (WSP) has prepared this semi-annual progress report for the NIPSCO Michigan City Generating Station, 101 Wabash Street, Michigan City, La Porte County, Indiana (MCGS or Site). The purpose of this report is to summarize progress towards selection of a groundwater corrective measure for the Coal Combustion Residuals (CCR) Rule regulated, now closed Boiler Slag Pond (BSP). This semi-annual report covers the six-month period since filing the Corrective Measures Selection of Remedy, Semi-Annual Progress Report #21-09 for the BSP[1] dated December 10, 2024.

Corrective action under the CCR Rule is triggered through a two-phase program of groundwater monitoring: detection and assessment. NIPSCO initiated groundwater monitoring in accordance with the requirements of 40 CFR §257.91, 257.93, and 257.94, beginning with Detection Monitoring in 2016. The first Assessment Monitoring event at the BSP was conducted in October 2018 and verified in February 2019. In May 2019 it was determined that arsenic was detected in groundwater from downgradient well GAMW-10 (now referred to as "PC-GAMW-10") at a statistically significant level (SSL) above its Groundwater Protection Standard (GWPS) based on the Site-specific background concentration at the time of 0.014 mg/L. As a result, NIPSCO initiated an assessment of corrective measures for the BSP in August 2019. The Assessment of Corrective Measures (ACM) Report[2] for the BSP was prepared to address arsenic, which was the only Appendix IV constituent identified at an SSL above its GWPS. Wood Environment & Infrastructure Solutions, Inc. (now WSP) prepared the ACM in conformance with applicable requirements of 40 CFR §257.96, including certification by a qualified Indiana-licensed professional engineer. Subsequently, NIPSCO placed the ACM in the facility operating record, and it was posted to NIPSCO's publicly accessible CCR website. Since that time, the 2019, 2020, 2021, 2022,

[1] WSP 2024. Memo - Northern Indiana Public Service Company LLC, Michigan City Generating Station – Boiler Slag Pond, Corrective Measures Selection of Remedy, Semi-annual Progress Report #21-09. December 10, 2024.

[2] Assessment of Corrective Measures Boiler Slag Pond Michigan City Generating Station Michigan City, Indiana. Wood Environment and Infrastructure Solutions, Inc. January 8, 2020

2023, and 2024 Annual Groundwater Monitoring and Corrective Action Reports[3,4,5,6,7,8] that document the results of groundwater monitoring, and any other corrective measures related activities conducted at the Site in relation to the BSP were placed in the operating record and posted to the NIPSCO CCR website. Arsenic detections at wells located downgradient of the BSP in 2019, 2020, 2021, 2022, 2023, and 2024 were generally consistent with the arsenic concentrations detected through 2018 and were considered in the ACM. However, a new maximum arsenic detection (0.027 mg/L) was reported for groundwater collected from well GAMW-10 during the October 2019 event, above the prior maximum concentration of 0.023 mg/L from GAMW-10 in November 2016. Since the October 2019 event, however, arsenic concentrations in GAMW-10 have been generally consistent with the pre-2019 concentrations.

Notifications for arsenic at SSLs downgradient of the BSP were issued in June 2019, August 2019, and April 2020, for the sampling events of October 2018, April 2019, and October 2019, respectively. A revised arsenic background value of 0.017 mg/L was established in July 2020 based on data through the April 2020 event. There were no arsenic SSL notifications for any well downgradient of the BSP for the April and October 2020 events, the April and October 2021 events, and the March and September 2022 events.

In early 2021 NIPSCO installed and began sampling four new background monitoring wells identified as PC-MW-110, PC-MW-113, PC-MW-114, and PC-MW-115. As of December 2022, eight rounds of background data had been collected from each of the four new wells. Based on the eight rounds of data a new arsenic GWPS of 0.010 mg/L was established and was applied in the evaluation of the tenth Assessment Monitoring event. The four new monitoring wells have now replaced the prior background monitoring wells (GAMW-05, GAMW-12, and GAMW-18) for future monitoring events. An SSL for arsenic was reported for the April 2023 sampling event (the tenth Assessment Monitoring event) based on the new GWPS. No other Appendix IV constituents were detected at SSLs above the GWPS through the twelfth Assessment Monitoring event in April 2024.

Prior to preparing the ACM for the BSP in January 2020, a Closure Application[9] was filed with the Indiana Department of Environmental Management (IDEM) in 2018 that addressed all five former CCR surface impoundments, including the BSP, through closure by removal. A supplemental addendum to the Closure Application[10] was subsequently filed with IDEM in February 2019. The addendum addressed the post-closure groundwater monitoring network for all five CCR surface impoundments, which includes 24 existing wells and 12 new wells. A virtual public hearing was conducted on April 16, 2020, to present the proposed approach for

[3] Golder, 2020. 2019 Annual Groundwater Monitoring and Corrective Action Report – Boiler Slag Pond, NIPSCO LLC Michigan City Generating Station. Golder Associates, Inc. January 31, 2020.

[4] Golder, 2021. 2020 Annual Groundwater Monitoring and Corrective Action Report – Boiler Slag Pond, NIPSCO LLC Michigan City Generating Station. Golder Associates, Inc. January 31, 2021.

[5] Golder, 2022. 2021 Annual Groundwater Monitoring and Corrective Action Report – Boiler Slag Pond, NIPSCO LLC Michigan City Generating Station. Golder Associates, Inc. January 31, 2022

[6] WSP, 2023. 2022 Annual Groundwater Monitoring and Corrective Action Report – Boiler Slag Pond, January 31, 2023

[7] WSP, 2024. 2023 Annual Groundwater Monitoring and Corrective Action Report – Boiler Slag Pond, January 31, 2024

[8] WSP, 2025. 2024 Annual Groundwater Monitoring and Corrective Action Report – Boiler Slag Pond, January 31, 2025

[9] Wood, 2018. Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, Volume 1 – Closure Plan and Drawings (Appendix A), Michigan City Generating Station, Northern Indiana Public Service Company, Merrillville, Indiana. December 20, 2018.

[10] Wood, 2019. Supplemental Addendum, Monitoring Well Network, Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, Michigan City Generating Station, Northern Indiana Public Service Company, Merrillville, Indiana. February 28, 2019.

CCR unit closure at MCGS, after which NIPSCO received several comments from interested stakeholders. IDEM approved the Closure Application on March 10, 2021.

NIPSCO completed closure of all five impoundments in July 2023 by removing source materials pursuant to 40 CFR §257.102. Closure of the BSP included removal of approximately 47,000 cubic yards of CCR, blast furnace slag, and an additional foot of underlying material which was removed and replaced with native sand backfill. A 24-inch soil cover having a permeability of $1x10^{-5}$ centimeters per second, or less, was placed over the backfilled areas. A non-woven geotextile and 12-inch layer of crushed stone was placed above the cover soil. The cover system was contoured to promote surface drainage to catch basins that discharge to the Final Pond. Professional engineer's certification of impoundment closure was completed on October 16, 2023.

Installation of the post-closure monitoring well network for all five impoundments was completed in two phases in 2023 with the deep wells installed first and the shallow wells installed later to allow the shallow groundwater to recover following dewatering associated with impoundment closure activities. Two of the three BSP downgradient wells are included in the post-closure monitoring well network. The third BSP downgradient well (GAMW-11) was decommissioned during the impoundment closure but was replaced with well pair PC-MW-116A/B in 2023. The deep monitoring wells (PC-MW-116B, PC-MW-117B, PC-MW-118B, and PC-MW-119) were installed in August 2023[11]. Installation of the shallow wells (PC-MW-103A, PC-MW-105A, PC-MW-116A, PC-MW-117A, and PC-MW-118A) was completed in November 2023. During the November mobilization, WSP also decommissioned shallow well PC-GAMW-14 and replaced it in-kind with PC-GAMW-14R.

Removal of source material is the first step in the corrective measure for the BSP. Therefore, the ACM focused on residual concentrations in groundwater upon closure of the BSP and identified five potential groundwater corrective measure alternatives for possible implementation. The five alternatives include monitored natural attenuation (MNA), groundwater extraction for treatment with three options for discharge (surface water, publicly owned treatment works, and groundwater reinjection), and a permeable reactive barrier (PRB). These five alternatives were also considered viable for the other impoundments slated for closure at the MCGS because arsenic is a site-wide contaminant and because of the proximity of impoundments to one another.

In May 2023, WSP engineers visited the Site to initiate a constructability evaluation of the potential remedies, focusing on space limitations between the closed impoundments and nearby features (e.g., the Final Pond, sheet pile along Lake Michigan), the potential influence of sheet pile around Secondary 1 and 2, limitations on construction equipment due to overhead transmission lines, the presence of underground utilities (e.g., recirculation lines to the cooling tower that pass beneath the central portion of the BSP and south along Primary 2), and limitations/requirements to protect transmission tower foundations. The findings of this assessment will be used in conjunction with future studies as a component of the evaluation of potential corrective measures in the Selection of Remedy (SOR) report for the BSP and Primary 2.

[11] WSP, 2023. Post-Closure Monitoring Well Completion Report – Phase I Deep Wells Installation, NIPSCO LLC, Michigan City Generating Station, Michigan City, IN. October 31, 2023

A three-dimensional numerical groundwater flow model for the MCGS has also been developed using the USGS finite-difference code MODFLOW-NWT[12]. The flow model will be used to simulate the groundwater flow system at MCGS in preparation for subsequent transport simulations using the code MT3D[13]. Additional modeling will be performed as a component of the SOR to evaluate the effectiveness of the pump-and-treat alternatives proposed in the ACM for the BSP, and to assess the estimated times to achieve closure for groundwater.

NIPSCO is also performing additional studies of soil and groundwater that are considered imperative to assessing the groundwater following removal of the source of CCR constituents so that the most appropriate corrective measure technology can be selected based on current post-closure conditions. In November 2023 and January 2024 WSP collected soil and groundwater samples for use in a fate-and-transport study focused on arsenic, selenium, and thallium. Specifically, the study is intended to further understanding of the relationship between inorganics adsorbed onto the aquifer solids and those in the dissolved-phase plume, which will allow for refined estimates on the time required to achieve the clean-up criteria, allow more efficient placement of potential selected remedy components (i.e. recovery wells and/or PRB(s)), and will provide data necessary to understand how the aquifer geochemistry affects plume behavior and potential ways to manipulate the geochemical environment if feasible to accelerate remediation. NIPSCO completed the study in February 2025. The results will be incorporated into the SOR evaluation of corrective measures and the study report will be included as an appendix to the SOR report.

NIPSCO has also completed a treatability study to evaluate potential treatment media for use in a PRB remedy and/or an ex-situ treatment system associated with a groundwater extraction and treatment remedy. Collection of soil and groundwater for use in the treatability study was conducted in August 2024. The study was completed in March 2025 and indicated that two of the selected media were capable of reducing arsenic concentrations in the test water collected from the Site to below the GWPS. The results of this study have helped to refine understanding of the potential performance and reliability of proposed remedies and may speed implementation once a remedy has been selected

The analytical results of groundwater samples collected during the 2023 and 2024 semi-annual monitoring events have indicated a rising trend in molybdenum concentrations in some wells downgradient to the north of the BSP (PC-GMMW-2 and PC-GAMW-10). The detected molybdenum concentrations exceeded the GWPS of 0.10 mg/L in October 2023 (PC-GAMW-10) and October 2024 (PC-GMMW-2 and PC-GAMW-10). However, these detections did not constitute SSLs because there were an insufficient number of GWPS exceedances for each well to perform the required statistical analysis. The cause of these recently rising concentrations is unknown, but based on the timing appear to be associated with closure-related effects on the aquifer. The molybdenum concentrations are expected to decrease as the aquifer recovers from closure of the BSP. However, if the elevated concentrations persist and SSLs of molybdenum are confirmed, it will affect development of corrective measures under the SOR process. Therefore, NIPSCO is continuing to assess the

[12] Niswonger, R.G., Panday, Sorab, and Ibaraki, Motomu, 2011, MODFLOW-NWT, A Newton formulation for MODFLOW-2005: U.S. Geological Survey Techniques and Methods 6-A37, 44 p.

[13] Zheng, Chunmiao, and P. Patrick Wang, 1999, MT3DMS, A modular three-dimensional multi-species transport model for simulation of advection, dispersion and chemical reactions of contaminants in groundwater systems; documentation and users guide, U.S. Army Engineer Research and Development Center Contract Report SERDP-99-1, Vicksburg, MS, 202 p.

situation. Molybdenum was not detected above the GWPS in either of these wells during the April 2025 monitoring event and has not been identified as an SSL for the Site.

An updated progress report will be prepared semi-annually, in conformance with applicable requirements of 40 CFR §257.97(a), that summarizes NIPSCO's progress towards selection of a remedy for groundwater Corrective Measures at the BSP.