UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

RCRA CORRECTIVE ACTION

FINAL DECISION/RESPONSE TO COMMENTS

July 2012

Northern Indiana Public Service Company (NIPSCO)
Bailly Generating Station
246 Bailly Station Road
Chesterton, Indiana
Areas "A" and "B"
EPA ID#: IND 000 718 114

INTRODUCTION

The U.S. Environmental Protection Agency, Region 5, presents this *Final Decision/Response to Comments (FD/RC)* which identifies the final Corrective Action remedies selected by the EPA for a portion of the Northern Indiana Public Service Company (NIPSCO) Bailly Generating Station (the Bailly facility), located in Chesterton, Indiana, pursuant to Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6928(h). This *FD/RC* identifies the final RCRA Corrective Action remedies to address the operational portions of the Bailly facility, referred to as "Area A" and "Area B". This *FD/RC* does not apply to the remaining portion of the Bailly facility, known as "Area C," or to adjoining off-site areas, which are currently under investigation (See Figure 1).

Included in this FD/RC is a summary of current conditions in Areas A and B at the Bailly facility, the risks posed by those conditions, the Interim Measures previously taken by NIPSCO, and the final corrective action alternatives that were presented by NIPSCO and considered by the EPA. Additional details relating to the facility conditions, the measures taken, and the alternatives considered are available in the Statement of Basis (Enclosure A) issued by the EPA in July 2011. Prior to issuing this *FD/RC*, the EPA presented the Statement of Basis to the public for review and comment, held a public meeting, and received comments from the public. The EPA reviewed all of the comments received prior to selecting the final remedies in this *FD/RC* that the EPA deems necessary to protect human health and the environment. The public comments and the EPA's responses can be found in the Response to Comments section below.

In March 2005, NIPSCO entered into an Administrative Order on Consent with the EPA pursuant to Section 3008(h) of RCRA, which obligated NIPSCO to perform Corrective Action to address the release of hazardous wastes and/or hazardous constituents at the Bailly facility. Under the Consent Order, NIPSCO subsequently: performed a RCRA Facility Investigation (RFI) to determine the nature and extent of contamination at the Bailly facility; undertook Interim Measures to clean up certain areas of the facility; conducted assessments to determine

risks to human health and the environment from conditions at the facility; and submitted a final Corrective Measures Proposal (CMP) for Areas A and B. As noted, this *FD/RC* presents the proposed and final remedies for Areas A and B of the Bailly facility. The EPA will present proposed and final Corrective Action remedies for Area C, which contains historic coal combustion by-product landfills and an adjoining area of the Indiana Dunes National Lakeshore (IDNL), in a separate Statement of Basis and FD/RC in the future.

FACILITY BACKGROUND

Location and History

The Bailly Generating Station occupies approximately 330 acres in an industrial area along the shoreline of Lake Michigan in Chesterton, Indiana. The Site is bordered on the north by Lake Michigan, on the north and east by a portion of the IDNL, on the west and south by the ArcelorMittal Steel Burns Harbor Plant, and partially on the south by U.S. Route 12 and freight and commuter rail lines.

The Bailly facility generates electricity for distribution to industrial, commercial and residential customers throughout Northern Indiana, primarily using two coal-fired, high-pressure steam boilers (Boiler Units Nos. 7 and 8), each connected to a steam turbine generator. Unit 7, a 194 Megawatt (MW) capacity high-pressure boiler and steam turbine, became operational in 1962. Unit 8, a 422 MW capacity high-pressure boiler and steam turbine, became operational in 1968 following a major plant modification and expansion project. A third generator (Unit No. 10), which burns natural gas, is available during peak electrical demand.

The Bailly facility currently consists of about 300,000 square feet of buildings, offices and production areas. The Bailly facility employs 180 people, and operates 24 hours a day. Area A covers the western portion of the Site, containing rail lines, the coal feedstock pile, a coal feedstock pile run-off infiltration basin, debris storage areas, fly ash staging areas, and most of the Site's other Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs). Area B is composed of the Settling Ponds and the Industrial Wastewater Treatment Plant, while Area C consists of the eastern landfill areas and the INDL Study Area. (See Figure 2.)

Hydrogeological Setting

The Bailly facility is located within the Calumet Lacustrine Plain, an area characterized by three post-glacial dune-beach complexes, and bordered on the north by Lake Michigan and on the south by the Valparaiso Morainal Area. The dune-beach complexes parallel the Bailly facility and the current lakeshore boundary. Local geomorphology from the lakeshore to the south consists of the Holocene and Tolleston dune-beach complex, the western portion of the Great Marsh (an interdunal lowland), and the Calumet and Glenwood dune-beach complex. The Bailly facility is situated within the Holocene and Tolleston dune-beach complex; however, the landscape has been modified to support facility activities and consists primarily of fill materials. The land surface elevation ranges from approximately 578 feet (ft) above mean sea level (amsl) along the shore of Lake Michigan, to approximately 620 ft amsl within the Bailly facility, including Areas A and B (See Figure 3).

The surficial aquifer under the Bailly facility consists of glacially derived sediments associated directly or indirectly with the advance and retreat of the Lake Michigan ice lobe during the Wisconsinan glaciation. In the vicinity of Areas A and B, the surficial aquifer consists primarily of unconfined lacustrine sands and ranges in thickness from 20 to 40 ft. In unpaved areas, precipitation directly recharges the shallow unconfined aquifer via infiltration through permeable unsaturated zone soils. Groundwater flow in this aquifer is primarily horizontal and northward toward Lake Michigan.

Ecological Setting

Regionally, the Bailly facility resides within an industrial corridor of Northwest Indiana. The Site shares a border with a portion of the IDNL which lies to the east and north of Areas A and B and is currently still under EPA study as part of Area C (See Figure 1). The IDNL is a globally rare dune and swale ecosystem; the land consists of a series of roughly parallel, sandy ridges and low, wet swales formed from irregular cycles of high and low water levels.[1] The IDNL is composed of over 15,000 acres of dunes, oak savannas, swamps, bogs, marshes, prairies, rivers, and forests. Its landscape represents at least four major successive stages of historic Lake Michigan shorelines, making it one of the most extensive geologic records of one of the world's largest, fresh water bodies. Biological diversity within the IDNL is amongst the highest per unit area of all the national parks, with over 1,100 flowering plant species and more than 350 species of birds.[2]

Areas A and B contain a limited amount of ecological habitat due to the industrialized nature of these portions of the Bailly facility (See Attachment 3). The northern-most portion of Area A includes the Lake Michigan beach area which was evaluated and is addressed in the "Risk Investigations" and "Risk Assessments" sections below.

Although the total area of ecological habitat for Areas A and B is small, the evaluation of potential risk to the piping plover, a federally-endangered shore bird, is of particular importance. By the time the piping plover was listed under the Endangered Species Act in 1985, the Great Lakes population numbered only 17 breeding pairs, and the breeding areas had been reduced from sites in eight states to only northern Michigan.[3] A part of the Lake Michigan shoreline within the IDNL is designated "critical habitat" for the plover. Critical habitat is afforded the same protections as the endangered species for which the habitat is listed. Therefore, because of the proximity of the critical habitat to the Bailly facility, the plover was evaluated as a receptor in an ecological risk assessment regarding Area A. (See Attachment 2 for more information on the IDNL and the piping plover.) However, with the absence of the piping plover and its habitat in close proximity, Area B was not considered to represent an ecologically significant area.

1 The Nature Conservancy, www.nature.org
2 The National Park Service, www.nps.gov
3 US Fish & Wildlife Service, www.fws.gov

INTERIM MEASURES

In 2006, after initial results of the RFI indicated that eight units in Area A of the Bailly facility had releases of hazardous contaminants, NIPSCO implemented Interim Measures to clean up seven of those units: SWMU 10, SWMU 20, SWMU 21, AOC 1, AOC 4, AOC 5 and SWMU 16 (See Attachment 4: Interim Measures Figures). The eighth unit in Area A, SWMU 18, has not yet been addressed. NIPSCO excavated contaminated soil from each of the seven affected units, backfilled the excavated areas with clean soil, and in some cases replaced or repaired equipment associated with the releases. In the CMP, NIPSCO summarized the Interim Measures and concluded that no further cleanup work is required for these seven units. The EPA agrees with that conclusion. A summary of the Interim Measures performed by NIPSCO at each of these units follows. Details are provided in the Statement of Basis.

Area A

SWMU 10

In April 2006, NIPSCO performed soil excavation at SWMU 10 (Coal Handling Maintenance Building, See Attachment 4, Figure 1) after an above-ground storage tank (AST) and associated piping were removed. Excavation continued until all visually-stained soil was removed, soil headspace measurements were at or below background readings, and post-excavation soil sampling and analysis demonstrated that removal of contaminated soil was complete.

In June 2006, NIPSCO collected two groundwater samples at the water table to ensure any impact to the groundwater was appropriately characterized. Analytical results for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals showed no concentrations above the Indiana Department of Environmental Management (IDEM) Risk Integrated System of Closure (RISC) Default Industrial Groundwater Closure Levels. After remediation efforts were completed, NIPSCO installed a new AST with automated overflow protection and secondary containment at the site of the former structure.

SWMU 20

In April 2006, NIPSCO performed soil excavation at SWMU 20 (Former Waste Oil Underground Storage Tank (UST)) (See Attachment 4, Figure 2). Although the tank was removed in 1988 after some 25 years of operation, the surrounding soil was not removed at that time. Soil was excavated from the northern edge of the foundation of Unit #7 approximately 15 feet northward and at a width of approximately 50 feet. The excavation continued until all visually stained soil was removed and soil headspace measurements were at or below background levels, which was achieved at a depth of 3 ft bgs. Post-excavation soil sampling and analysis indicated no constituents above the IDEM RISC industrial soil closure levels.

SWMU 21

In April 2006, NIPSCO performed soil excavation at SWMU 21 (Unit No. 10 UST) (See Attachment 4, Figure 3). Soil excavation efforts continued until all visually stained soil was removed and soil headspace measurements were at or below background. Soil was excavated north of the Unit No. 10 foundation in a footprint of approximately 30 x 40 feet, to a depth of approximately 1.5 ft bgs. Soil immediately around the overflow pipe was excavated to a depth of approximately 3 feet. The UST at SWMU 21 was not removed because the source of oil-stained

soil was the overflow pipe above the ground surface, not loss of product from the tank itself. Post-excavation soil sampling and analysis indicated no constituents above the IDEM RISC industrial soil closure levels. After remediation efforts were completed, NIPSCO installed new automated overflow protection in the Unit No. 10 UST.

AOC 1

In April 2006, NIPSCO performed soil excavation at AOC 1 (Empty Drum Storage) (See Attachment 4, Figure 4). The excavation continued until all visually stained soil was removed and soil headspace measurements were at or below background. The final excavation footprint was approximately 30 x 50 feet and the depth was approximately 5 ft bgs. Post-excavation soil sampling and analysis indicated no constituents above the IDEM RISC industrial soil closure levels. After remediation efforts were completed, NIPSCO constructed a new enclosed containment structure with secondary containment at the site of the former unit.

AOCs 4 and 5

In June 2006, NIPSCO performed soil excavations at AOC 4 and AOC 5 (See Attachment 4, Figure 5). The excavations continued until all visually stained soil was removed and soil headspace measurements were at or below background levels. VOC-contaminated soil was removed from an approximate 60 x 60 foot and 40 x 60 foot footprint, respectively. The average excavation depth was one to two ft bgs. Post-excavation soil sampling and analysis indicated no constituents above the IDEM RISC industrial soil closure levels. NIPSCO replaced the east (AOC 4) and west (AOC 5) Induced Draft fan bearings and associated piping.

SWMU 16

NIPSCO performed soil excavation at the former chemical cleaning fractionation tank (SWMU 16) located on the west side of the Unit No. 7 building (See Attachment 4, Figure 6). Validated analytical results on post-excavation soil samples indicated arsenic, benzo(a)pyrene toxic equivalent (BaP-TE), benzo(a)anthracene, benzo(a)pyrene, and benzo(b)flouranthene above the IDEM RISC industrial soil closure levels in soil that remained after the excavation was complete. However, the EPA has concluded that the presence of these compounds in SWMU 16 soil does not pose an unacceptable risk to human health due to the inaccessibility of the unit to the public and the continued industrial use for this area.

SWMU 18

The results of the RFI identified the remaining Area A unit, SWMU 18 (also referred to as the Horseshoe Area) as the source of dissolved metals contaminating groundwater plumes that extend from SWMU 18 northward toward Lake Michigan. Since approximately 1986, NIPSCO temporarily stored coal combustion byproduct, or fly ash, generated intermittently when boilers and ductwork are cleaned, on bare ground in this area, which resulted in infiltration of contaminants through the soil and into the underlying groundwater. NIPSCO delineated the groundwater plume and determined that it is not discharging to Lake Michigan. SWMU 18 was

not addressed as an interim measure because of the size and scope of remediation needed there, but is included in the remedy selected for the site in this Final Decision document.

Area B

The results of the RFI indicated that five units in Area B require no further action. These units included the Bottom Ash Pond (SWMU 2), the Bottom Ash Waste Pile (SWMU 3), the Settling Ponds (SWMU 4), and the Secondary Settling Pond #2 (SWMU 5). In 1980, NIPSCO dredged, reinstalled and lined the central settling ponds, which terminated the historic releases of contaminants from these surface impoundments to the groundwater. Current plumes of boron and selenium in groundwater were identified, delineated to screening level criteria, and shown to be dissipating or stable, confirming the absence of a current source within Area B. The Human Health Risk Assessment for Area B, discussed below, concluded there are no unacceptable risks to human receptors in Area B.

In 1980, prior to the implementation of RCRA Corrective Action, NIPSCO completed rehabilitation of the Bailly facility's previously unlined surface impoundments after the National Park Service complained that contaminated groundwater was infiltrating from the surface impoundments into the IDNL. NIPSCO reconfigured and sealed the impoundments with a foot of natural clay liner, a membrane liner, and sand and buffer materials (See Attachment 5: Historic Site Photos). NIPSCO obtained from IDEM a modified National Pollutant Discharge Elimination System (NPDES) permit that authorized a discharge, currently known as Outfall 001, from the ponds to Lake Michigan. Although the pond sources now appear to be controlled, their legacy includes groundwater plumes with elevated metals concentrations and soils with lowered pH within the IDNL.

RISKS POSED

Risk Investigation Results

The RFI conducted by NIPSCO within Corrective Action Areas A and B included sampling and analysis of groundwater, soil, surface water, and sediment. The results presented below describe the current conditions, after the implementation of Interim Measures.

Groundwater, Surface Water, Soil, and Sediment

Groundwater and surface water screening criteria utilized in the RFI were derived from the Great Lakes Basin Methodologies (Indiana Department of Environmental Management, IDEM, 2002), also known as the Great Lakes Initiative (GLI) values, based upon the Bailly facility's conceptual site model and proximity to Lake Michigan. Some constituents did not have applicable GLI screening criteria and were therefore compared to other values, such as background values, National Recommended Surface Water Quality Criteria, IDEM RISC values, and EPA Regional Screening Levels for tap water (RSLs). Shallow groundwater was also compared to plant toxicity screening values, based upon the site-specific conceptual site model and the presence of shallow groundwater. Soil and sediment constituents were compared to IDEM RISC Industrial Soil Closure Levels or EPA Industrial Soil Regional Screening Levels.

They were also compared to ecological values such as EPA Ecological Soil Screening Levels and EPA Region 5 Ecological Screening Levels.

The results of the RFI indicated that metals were the primary constituents of concern (COCs) associated with the Bailly facility. Volatile and semi-volatile organic compounds (VOCs and SVOCs) were not consistently detected in the groundwater at the Site. The results of sampling of thirteen groundwater-monitoring wells indicated that the groundwater has not been impacted by VOCs or SVOCs. However, because of their presence in on-site soils, certain VOCs and SVOCs were carried through both the human health and ecological risk assessments discussed below.

Groundwater Sampling

In the RFI, NIPSCO compared concentrations of contaminants in the groundwater to surface water quality standards because groundwater at the Site discharges to Lake Michigan. NIPSCO screened the groundwater against IDEM GLI criteria to ensure the Site was not adversely impacting other receptors, particularly those specific to the Great Lakes. A summary of the Lake Michigan beach groundwater sampling from two locations is below. Although only two sample locations are presented below, there were a total of ten sampling locations within this area of the lakeshore (See Figure 4). Some locations consisted of multiple groundwater depth sampling intervals; a total of 21 individual samples were collected at the beach immediately north of the Bailly facility. Sample depth intervals ranged from 0-2 feet deep to 17-19 feet deep, where groundwater aquifers were encountered. Of the 21 individual samples, one location had boron, magnesium and selenium concentrations above background and screening values, and another location had boron only at concentrations above background and the screening value. Those samples are presented in the tables below. (See Administrative Record for other sample results.)

An effort was taken to mitigate the effects of Lake Michigan water on the groundwater aquifer. By utilizing a piper diagram graphically representing the chemistry of a water sample, the EPA determined that, although the groundwater aquifer is heavily influenced by Lake Michigan water, deeper samples were representative of groundwater outside of the groundwater-surface water interface.

Lake Michigan: Groundwater Delineation at the Shore (500' inland)
Sample Location LMB-GW06

Constituent	Background* Concentration (ppm)	GLI** Criteria (ppm)	Sample Concentration (5.7'-7.7') (ppm)	GLI** Criteria (ppm)	Sample Concentration (15.5'-17.5') (ppm)
aluminum	0.14	0.2	0.016	0.2	0.1
arsenic	0.0032	0.15	0.00044	0.15	0.0089
barium	0.019	0.91	0.019	7.24	0.054
boron	0.12	1.6	0.035	1.6	**1.8**
cadmium	0.001	0.0039	0.0004	0.018	0.002
chromium	0.001	0.13	0.00049	0.64	0.0006
copper	0.0023	0.016	0.001	0.085	0.0024
lead	0.0017	0.011	0.0004	0.075	0.002
magnesium	22	82	12	82	**110**

manganese	1	0.97	0.02	5.37	2.4
mercury	0.000115	0.00077	0.00023	0.00077	0.00023
molybdenum	0.01	0.8	0.0048	0.8	0.003
selenium	0.001	0.0046	0.00036	0.0046	**0.0059**
silver	0.001	0.1	0.0004	0.1	0.002

*Background concentrations were calculated according to the "Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance" (USEPA 1989) and the "Addendum to Interim Final Gnidance" (USEPA, 1992).
**GLI criteria for certain constituents are hardness dependent and calculated in accordance with IDEM GLI methodologies using the following equation: GLI = exp{A*[In(hardness)]+B}/1000ug/mg
Concentrations in bold exceed the GLI criteria and the background concentrations.

Sample Location LMB-GW08: (East of GW06)

Constituent	Background Concentration (ppm)	GLI Criteria (ppm)	Sample Concentration (5.7'-7.7') (ppm)	GLI Criteria (ppm)	Sample Concentration (16'-18') (ppm)
aluminum	0.14	0.2	0.0075	0.2	0.1
arsenic	0.0032	0.15	0.00055	0.15	0.015
barium	0.019	1.21	0.029	4.68	0.036
boron	0.12	1.6	0.09	1.6	**2.2**
cadmium	0.001	0.0048	0.0004	0.013	0.002
chromium	0.001	0.16	0.00034	0.46	0.002
copper	0.0023	0.02	0.0011	0.06	0.0019
lead	0.0017	0.014	0.0004	0.051	0.002
magnesium	22	82	17	82	74
manganese	1	1.22	0.027	3.75	1.3
mercury	0.000115	0.00077	0.00023	0.00077	0.00023
molybdenum	0.01	0.8	0.0023	0.8	0.003
selenium	0.001	0.0046	0.0015	0.0046	0.0045
silver	0.001	0.1	0.0004	0.1	0.002

Arsenic was detected above screening values in those lakeshore samples previously described. The GLI screening value for arsenic is higher than the IDEM RISC industrial screening value. The IDEM RISC industrial screening value for arsenic is 0.01 ppm, which is the same as the Safe Drinking Water Act Maximum Contaminant Level (MCL) for that particular constituent. The table below provides the lakeshore arsenic data above the IDEM RISC/MCL screening value.

Lake Michigan: Arsenic Concentrations in Groundwater

Background Concentration (ppm)	GLI Criteria (ppm)	IDEM RISC Industrial/MCL (ppm)	Sample Concentration (ppm)
0.0032	0.15	0.01	**LMB-GW01 0.032**
0.0032	0.15	0.01	**LMB-GW02 0.031**
0.0032	0.15	0.01	**LMB-GW04 0.012**
0.0032	0.15	0.01	**LMB-GW05 0.026**
0.0032	0.15	0.01	**LMB-GW07 0.015**
0.0032	0.15	0.01	**LMB-GW09 0.016**

In addition to the other sampling activities already mentioned, NIPSCO took groundwater samples from the Lake Michigan shoreline in order to evaluate potential risks to the piping

plover. Since the plover is a shore bird that feeds and nests along the beach, its greatest potential risk from the Bailly facility conditions would be the presence of contaminated groundwater, discharging to the Lake or accessible to the bird through feeding on the shoreline, above screening levels calculated specifically for the plover. The groundwater samples for the plover evaluation were collected within 100 feet of the shoreline in the surf zone where shorebirds would be expected to feed (See Figure 4). Although samples were collected at multiple depth intervals, the shallow groundwater samples were used for the purpose of evaluating the plover because deeper groundwater would not be accessible to the bird. In general, groundwater concentrations did not exceed the plover screening criteria; however, the plover was further evaluated within the ecological risk assessment, discussed below.

Piping Plover
Lake Michigan Beach Groundwater (100' Surf Zone)
Highest Concentration found in Five Samples

Constituent	Screening Criterion (ppm*)	Background GW Concentration** (ppm)	Highest Sample Concentration (0-2') (ppm)
aluminum	0.0269	0.14	0.01
arsenic	0.0006072	0.0032	0.00097
barium	0.0103	0.019	0.02
boron	0.2544	0.12	**0.27**
cadmium	0.00001001	0.001	0.0004
chromium	0.0004325	0.001	0.00078
copper	0.009	0.00228	0.0015
lead	0.0025	0.0017	0.0004
magnesium	1.963	22	12
manganese	0.0008149	1	0.0018
mercury	2.349E-09	0.000115	**0.00023**
molybdenum	0.008833	0.01	0.0041
selenium	0.00002163	0.001	0.00056
silver	0.0032	0.001	0.0004

*ppm = parts per million is a measurement equivalent to 1 milligram of the constituent per liter of water (mg/l) or 1 milligram per kilogram soil (mg/kg)

**Background groundwater concentrations are sampled from outside of the influence of the site in order to compare the Bailly facility's impacts to any naturally or regionally occurring concentrations of constituents.

Soil Sampling

The RFI also included several rounds of soil samples collected within Areas A and B between 2005 and 2009 (See Figure 5). The following table presents sampling data that exceeded the screening criteria, IDEM RISC industrial values, or EPA Regional Screening Levels for industrial land use in the absence of IDEM values. Within Area A, 15 total SWMUs and AOCs were sampled, and 7 had constituent concentrations exceeding the screening criteria. Within Area B, 4 SWMUs or AOCs were sampled, and one had a single constituent concentration exceeding the screening criteria. All exceedences were carried through to the risk assessment process, described below. The table presenting the soil samples contains only the highest concentrations of all constituents found above screening values within Areas A and B.

Areas A & B: Soil Samples Exceeding Screening Criteria

Area and Location of Samples[1]	Constituent	Screening Criterion[2,3]	Maximum Concentration Detected[2]	Depth[4]
Area A: SWMU 10	Benzo(A)Anthracene	15 ppm	60 ppm	4.5-5.5'
Area A: SWMU 10	Benzo(A)Pyrene	1.5 ppm	49 ppm	4.5-5.5'
Area A: SWMU 10	Benzo(B)Fluoranthene	15 ppm	70 ppm	4.5-5.5'
Area A: SWMU 10	Dibenzo(A,H)Anthracene	1.5 ppm	13 ppm	4.5-5.5'
Area A: SWMU 10	Indeno(1,2,3-CD)Pyrene	15 ppm	33 ppm	4.5-5.5'
Area A: SWMU 16/18	Arsenic	20 ppm	126J[5]/79 ppm	0-0.5'

[1]Solid Waste Management Unit (SWMU) or Area of Concern (AOC)
[2]Concentrations in parts per million (ppm); one ppm is equivalent to 1 milligram per kilogram soil (mg/kg)
[3]Indiana Department of Environmental Management (IDEM) RISC Industrial soil criteria (http://www.in.gov/idem/files/risctech_appendix1_2006.pdf)
[4]The depth refers to feet below ground surface
[5] "J" refers to this value as being an estimated value, meaning something interfered with the reliability of the data within the laboratory; however, for screening purposes that data can still be used to guide an investigation. The samples nearby this specific sample had mnch lower arsenic values, 1.4-26 ppm, likely more representative of concentrations at that SWMU. The next highest value from SWMU 18 is also reported.

Risk Assessments

The purpose of the risk assessments is to evaluate the potential adverse affects site-related constituents may be having, or may have in the future, on receptors. NIPSCO conducted human health risk assessments for both Areas A and B. NIPSCO conducted an ecological risk assessment for Area A, but not for Area B since no viable ecological habitat exists within Area B. Set out below are summaries of the data evaluated as part of the risk assessments. The tables present the various receptors that were evaluated as part of the risk assessment process after constituents of potential concern were identified in various media.

Areas A & B Human Health Risk Assessments

A human health risk assessment is the process by which scientists evaluate the potential for adverse risks to people in contact with certain medium at a site. Risk assessments characterize potential risks that may be present currently or could exist in the future from site-related contamination.

The risk assessments that NIPSCO performed for Bailly facility Areas A and B evaluated potential risks to the following human health receptor scenarios: current and future Bailly facility workers; current and future trespassers; and future construction workers.

Four constituents of concern were identified within Area A: arsenic; benzo(a)pyrene; benzo(a)pyrene toxic equivalents; and manganese. Two constituents of concern were identified within Area B: arsenic and manganese. Affected media evaluated in both areas included surface soil, subsurface soil, surface water, sediment and groundwater.

Exposure areas within Area A included: the northwest drainage way; SWMU 26; Outfall 001; the northwest area; and the west area. Exposure areas within Area B included: SWMUs 2 and 3; SWMUs 4 and 5; and the future use of the entire Area B.

The final step of the risk assessment process combines toxicity information from the constituents of concern with receptor-specific parameters to provide a quantitative estimate of potential human health risks associated with each combination of constituent, medium, exposure area, and receptor. The EPA has determined that the acceptable cancer risk range is between $1x10^{-4}$ – $1x10^{-6}$, which means that the acceptable range for the chance of developing an additional incident of cancer from the contamination alone is 1-in-10,000 to 1-in-1 million. The non-carcinogenic risk is characterized by the hazard quotient (HQ), a ratio of an exposure level by a contaminant (e.g., maximum concentration) to a screening value selected for the risk assessment for that substance. The HQ is a means to express the relative safety of contaminants that are noncancerous but could cause other health or environmental problems. For contaminants that are cancerous, risks are estimated by the Excess Lifetime Cancer Risk, which is a function of the exposure and the toxicity of the contaminant. If the exposure level is higher than the toxicity value, then there is the potential for risk to the receptor and a risk management decision must be made.

Areas A and B: Human Health Risk

Potential Carcinogenic Risks

Receptor	Exposure Area	COPC	Medium	Maximum Concentration (mg/kg or mg/L)	Exposure Point Concentration (mg/kg or mg/L) (1)	Total Excess Lifetime Cancer Risk
Current Facility Worker	NW Drainageway	BAP-TE	Surface Soil	3.4	3.4	$3x10^{-7}$
	NW Area	Arsenic	Surface Soil	126	29.4	$9x10^{-6}$
Current Trespasser	NW Drainageway	BAP-TE	Surface Soil	3.4	3.4	$1x10^{-7}$
	NW Area	Arsenic	Surface Soil	126	29.4	$2x10^{-7}$
Future Facility Worker	NW Drainageway	BAP-TE	Surface Soil	3.4	3.4	$3x10^{-6}$
	NW Area	Arsenic	Surface Soil	126	29.4	$9x10^{-6}$
Future Construction Worker	NW Drainageway	BAP-TE	Subsurface Soil	3.4	3.4	$2x10^{-7}$
	NW Area	Arsenic	Groundwater	0.018	0.018	$1x10^{-7}$
		BAP-TE	Subsurface Soil	78.6	5.2	$3x10^{-7}$
		Total				$4x10^{-7}$
	SWMU 26	Arsenic	Groundwater	0.018	0.018	$1x10^{-7}$
	Future Area B	Arsenic	Subsurface Soil	30	30	$6x10^{-7}$

Notes:

Exposure Point Concentrations (EPCs) are the lower of the maximum detected concentrations and the 95% upper confidence limit (UCL) on the mean concentration. The 95% UCL, as a means to guide a risk based decision, is more conservative than the arithmetic average of the data. This is because it represents a concentration at which 95% of the time the actual concentration is below. Using the 95% UCL provides a wide margin of safety that takes into consideration the many variables and unknowns associated with environmental sampling and analysis.

Bold indicates the total excess lifetime cancer risk exceeded the target risk of $10x10^{-5}$.

Blank cell indicate constituent was not a COPEC in the given exposure area

COPC – Constituent of potential concern

Mg/kg – milligrams per kilogram

Mg/L – milligrams per liter

Potential Non-Carcinogenic Hazards

Receptor	Exposure Area	COPC	Medium	Maximum Concentration (mg/kg or mg/L)	Exposure Point Concentration (mg/kg or mg/L) (1)	Total Hazard Index
Current Facility Worker	NW Drainage- way	Manganese	Surface Water	2.5	2.5	$2x10^{-4}$
		Benzo(a)pyrene	Surface Soil	2.1	2.1	$5x10^{-6}$
		Total				$2x10^{-4}$
	NW Area	Arsenic	Surface Soil	126	29.4	$5x10^{-2}$
		Total				$5x10^{-2}$
	SWMUs 4 & 5	Manganese	Surface Water	0.95	0.95	$6x10^{-5}$
Current Trespasser	NW Drainage- way	Manganese	Surfaee Water	2.5	2.5	$5x10^{-4}$
		Benzo(a)pyrene	Surface Soil	2.1	2.1	$7x10^{-6}$
		Total				$5x10^{-4}$
	NW Area	Arsenic	Surface Soil	126	29.4	$5x10^{-3}$
	SWMUs 4 & 5	Manganese	Surface Water	0.95	0.95	$2x10^{-4}$
Future Facility Worker	NW Drainage- way	Benzo(a)pyrene	Surface Soil	2.1	2.1	$6x10^{-5}$
	NW Area	Arsenic	Surface Soil	126	29.4	$5x10^{-2}$
Future Construction Worker	NW Drainage- way	Benzo(a)pyrene	Subsurface Soil	2.1	2.1	$6x10^{-5}$
	NW Area	Arsenic	Groundwater	0.018	0.018	$2x10^{-2}$
		Benzo(a)pyrene	Subsurface Soil	49	3.3	$1x10^{-4}$
		Manganese	Groundwater	2.4	2.4	$1x10^{-2}$
		Total				$3x10^{-2}$
	SWMU 26	Arsenic	Groundwater	0.018	0.018	$2x10^{-2}$
	Future Area B	Arsenic	Subsurface Soil	30	30	$9x10^{-2}$

Notes:

Exposure Point Concentrations (EPCs) are the lower of the maximum detected concentrations and the 95% upper confidence limit (UCL) on the mean concentration. The 95% UCL, as a means to guide a risk based decision, is more conservative than the arithmetic average of the data. This is because it represents a concentration at which 95% of the time the actual concentration is below. Using the 95% UCL provides a wide margin of safety that takes into consideration the many variables and unknowns associated with environmental sampling and analysis.

Bold indicates the total hazard quotient (HQ) exceeded the target HQ of of 1.

Blank cell indicate constituent was not a COPEC in the given exposure area

COPC – Constituent of potential concern

/kg – milligrams per kilogram

Mg/L – milligrams per liter

In both Areas A and B, NIPSCO calculated the estimated potential carcinogenic risks associated with potential exposures to all media and exposure areas to be less than the target risk of $1x10^{-5}$ and all non-carcinogenic hazard indices were less than the target hazard index of 1. Based on these findings, NIPSCO determined that there are no unacceptable risks to human receptors in either Areas A or B. The EPA agrees with this determination.

Area A Ecological Risk Assessment

An ecological risk assessment is the process through which scientists evaluate the likelihood that adverse ecological effects might occur, or are occurring, due to exposure to one or more stressors, such as chemical contamination. In the ecological risk assessment for Area A, NIPSCO identified four exposure areas as potential ecological habitat: the northwest swale; SWMU 26; the west area; and the Lake Michigan beach. NIPSCO evaluated eleven potential receptors and respective food-chains within these areas, consisting of four mammals, five birds (including the endangered piping plover), soil invertebrates, and terrestrial plants.

NIPSCO developed assessment endpoints and risk questions for each receptor in each potential habitat to help guide and focus the risk assessment. The endpoints were based on protecting the

reproductive success and population sustainability of the selected non-federally-protected receptors for each habitat, and individual members of the federally-protected species, the piping plover.

The outcome of all measurement endpoint evaluations is a hazard quotient (HQ), which is the ratio of an estimated exposure dose to an established reference value. An HQ greater than 1 means there is potential for harmful effects due to the chemical in question that should be further evaluated through a risk management approach. An HQ equal to 1 means the chemical alone is not likely to cause ecological risk. An HQ of less than 1 means that harmful effects are not likely. However, background concentrations have been established and certain constituents for the highly conservative piping plover screening criteria resulted in background HQ's greater than 1.This means areas outside of the influence of the site have native concentrations of certain constituents above screening criteria. This is not unusual in an industrialized setting. The result of the risk characterization for each habitat is as follows.

Area A: Ecological Risk

Exposure Area / Habitat	Receptor (1)	Total Hazard Quotients (2)										
		ALUMINUM	ARSENIC	BARIUM	BORON	CADMIUM	CHROMIUM	COPPER	LEAD	MANGANESE	MOLYBDENUM	SELENIUM
Northwest Area Woodland Swale	Shrew	2E-03			8E-02	6E-01		1E-03	2E-01	1E-01		
	Vole	2E-03			4E-01	2E-01		1E-03	1E-02	4E-01		
	Fox	3E-05			3E-04	8E-04		6E-06	2E-04	2E-04		
	Mink	3E-04			3E-04	3E-02		8E-05	1E-02	4E-03		
	Woodcock	2E-04			1E-02	1E-01		2E-04	3E-01	1E-02		
	C. Goose	5E-07			7E-05	1E-05		5E-07	9E-06	1E-05		
	Robin	1E-03			1E+00	4E-01		1E-03	9E-01	2E-01		
	Hawk	8E-07			3E-05	9E-04		7E-07	2E-03	1E-04		
	Plants-Soil				1E+00	2E-02			3E-01	2E+00		
	Plants-GW				7E-01					1E-01	3E-02	5E-03
	Soil Inv.				6E-01	4E-03			2E-02	1E+00		
SWMU26 Upland Slope Successional Meadow	Shrew				1E-01	6E-01	3E-01		2E-01	2E-01		
	Vole				4E-01	2E-01	4E-02		8E-03	5E-01		
	Fox				2E-03	5E-03	2E-03		1E-03	1E-03		
	Mink				2E-03	2E-01	7E-02		4E-02	3E-02		
	Woodcock				7E-02	5E-01	5E-01		8E-01	7E-02		
	C. Goose				5E-04	7E-05	3E-05		3E-05	9E-05		
	Robin				1E+00	5E-01	4E-01		6E-01	3E-01		
	Hawk				2E-04	5E-03	5E-03		8E-03	1E-03		
	Plants-Soil				1E+00	2E-02	1E+00		2E-01	**3E+00**		
	Plants-GW	2E-01	4E-02		**2E+00**	3E-03	2E-02	5E-02		2E-01	5E-02	2E-02
	Soil Inv.				7E-01	5E-03	5E-01		1E-02	1E+00		
West Area Upland Successional Meadow	Shrew			7E-02	1E-01					7E-02	4E-01	7E-01
	Vole			6E-02	2E-01					4E-02	7E-02	2E-01
	Fox			2E-04	8E-04					3E-04	5E-04	4E-03

	Mink			8E-03	5E-03					1E-02	9E-03	1E-01
	Woodcock			3E-01	2E-01					4E-02	1E-01	4E-01
	C. Goose			6E-05	1E-04					6E-06	5E-06	4E-05
	Robin			6E-01	8E-01					6E-02	1E-01	5E-01
	Hawk			3E-03	4E-04					4E-04	1E-04	4E-03
	Plants-Soil			3E-01	**7E+00**					**2E+00**		**3E+00**
	Soil Inv.			1E+00	**3E+00**					1E+00	2E-02	3E-01
Lake Michigan Beach and Outfall OO1												
LMB-GW01 & Outfall	Piping Plover	2E+00	2E+0	9E+00	9E-01		2E+01	2E+01	9E-01	4E-01	3E-01	2E+01
LMB-GW03 & Outfall		2E+00	2E+0	9E+00	6E-01		2E+01	2E+01	9E-01	4E-01	4E-01	2E+01
LMB-GW05 & Outfall		2E+00	2E+0	9E+00	9E-01		2E+01	2E+01	9E-01	4E-01	3E-01	2E+01
LMB-GW07 & Outfall		2E+00	2E+0	9E+00	**2E+00**		2E+01	3E+01	9E-01	8E-01	7E-01	4E+01
LMB-GW09 & Outfall		2E+00	3E+0	8E+00	7E-01		1E+01	3E+01	9E-01	4E-01	4E-01	2E+01

Notes:

(1) Terrestrial plants were evaluated for potential exposure to soil and groundwater. Receptors defined as "Plants-GW" and 'Plants-Soil" represent these pathways.

(2) Total hazard quotients represent the sum of all applicable hazard quotients for each receptor (For example, the total HQ for the shrew is equal to the sum of HQs calculated from soil, surface water, plants, and invertebrate).

HQ>1.0 There is potential for harmful effects due to the contaminant in question that should be further evaluated through a risk management approach.

HQ=1 Contaminant *alone* is not likely to cause ecological risk

HQ<1.0 Harmful effects are NOT likely

Bold indieates the HQ exceeded both the target HQ of 1, as well as the respective reference area HQ. See the discussion below for further explanation. Blank cells indicate constituent was not a COPEC in the given exposure area

NIPSCO evaluated the northwest swale as potential habitat for wildlife, invertebrates and plants. HQs did not exceed 1 for either site media or reference areas for any receptors. Therefore, this habitat does not pose an unacceptable potential risk to the evaluated receptors.

NIPSCO evaluated SWMU 26 as potential habitat for wildlife, invertebrates and plants. HQs did not exceed 1 for any wildlife or invertebrates, demonstrating that this habitat does not pose an unacceptable potential risk to those receptors. The HQs for plants relating to boron and manganese exposure exceed the threshold criteria of 1(HQs of 2 and 3, respectively). However, this area is within an active operational portion of the Bailly facility, where ecological restoration would not be prudent. The EPA believes that the source control measures detailed below at SWMU 18 will serve to further reduce potential risk at SWMU 26. Nonetheless, the current ecological risk associated with SWMU 26 is acceptable.

NIPSCO evaluated the west area as potential habitat for wildlife, invertebrates and plants. Hazard quotients did not exceed 1 for wildlife; therefore, this area does not pose an unacceptable risk to those receptors. The HQs for plants exposure to boron, manganese and selenium exceed 1 (HQs of 7, 2, and 3, respectively). The HQ for invertebrates exposed to boron exceeds 1 (HQ of 3). This area is also within an active operational portion of the Bailly facility, making ecological restoration difficult. The EPA's remedy decision for Area A (eliminating the source of groundwater contamination at SWMU 18 and employing appropriate institutional controls) may serve to further reduce the already acceptable risk in this nearby area.

NIPSCO evaluated the Lake Michigan beach area as potential habitat for the endangered piping plover. As discussed above, some constituents listed in the table have background HQ's above 1; therefore, only the exceedance that is above background is presented in bold font. The elevated background concentrations are attributed to the industrial setting of the site and the highly conservative assumptions used to derive the screening criteria. All HQs for exposure to contamination in groundwater, surface water and sediment were below 1, or equivalent to background HQs, except for boron at location LMB-GW07. The total HQ for exposure to boron at LMB-GW07 was 2, with approximately 75% of this estimated risk from the groundwater exposure pathway and 25% from the surface water exposure pathway. The total HQ of 2 is essentially equivalent to the background groundwater HQ of 0.7. Based on this analysis, the EPA has concluded that the beach habitat does not pose an unacceptable potential risk to the piping plover from site-related constituents. Again, the source control measure at SWMU 18 will further reduce the already acceptable risk in the Lake Michigan beach area.

SUMMARY OF CORRECTIVE ACTION ALTERNATIVES

Area A

As noted above, NIPSCO implemented soil excavation and off-site disposal as Interim Measures for all SWMUs and AOCs in Area A, except for SWMU 18. The EPA reviewed the effectiveness of these IMs and found that they did reduce the risk to acceptable levels. The EPA reviewed whether soil capping would have been an acceptable alternative; then evaluated the applicability and results of the soil excavation alternative that NIPSCO had implemented; and considered whether any additional final remedies, including institutional controls, would be required, for each of the Area A SWMUs and AOCs, except for SWMU 18. The EPA retroactively ruled out capping as an alternative for each of these areas due to concerns about possible issues with grade changes and because cap maintenance and avoiding traffic over the cap would be problematic in these active production areas of the Bailly facility. Accordingly, the EPA determined that the soil excavation alternative that NIPSCO had implemented was the preferred alternative for these areas, considering the applicable performance criteria, and no further action is necessary. See Statement of Basis.

Area B

The EPA also reviewed the work performed in Area B prior to the onset of Corrective Action and considered whether any additional remedies, including institutional controls, were appropriate for that area. The EPA concluded that NIPSCO's rehabilitation of the Settling Ponds in Area B had stopped previous releases of contaminants to the groundwater, and therefore was an appropriate remedy to address that problem. See Statement of Basis.

SWMU 18

In the CMP, NIPSCO proposed the following three remedial alternatives to address the migration of metals in soils and groundwater at SWMU 18.

No Further Action

For this alternative NIPSCO assumed that the impacts from SWMU 18 are well-understood and are generally minor; natural processes such as sorption, dispersion and dilution would be sufficient to address potential risks to Area A and Lake Michigan habitats; and, therefore, no additional monitoring or remedial efforts would be necessary.

Soil Capping and Groundwater Monitoring

This alternative would involve construction of a cap that would minimize the infiltration of water through SWMU 18 soils, and thereby minimize the further migration of metals from soils to the underlying groundwater. NIPSCO assumed that capping would include: removal of all coal combustion byproduct material on the surface; installation of a 40-mil geomembrane liner over approximately one acre within SWMU 18; and placement of 6 inches of topsoil over the liner, along with seeding, mulching and installation of a perimeter drainage swale. Under this alternative, NIPSCO would record an appropriate institutional control to limit land use to industrial purposes, and include specific operation and maintenance provisions to maintain the integrity of the cap and prevent worker exposure.

Soil Excavation and Off-Site Disposal with Groundwater Monitoring

Under this alternative, source material containing the most concentrated contamination in SWMU 18 would be removed, which would minimize the migration of metals from soils to the underlying groundwater. NIPSCO proposed removal of coal combustion byproduct present at SWMU 18; excavation of impacted soils to target leachate goals[4] developed in the Corrective Measures Proposal for Areas A and B; and transportation of excavated soils to an off-site permitted landfill. The media cleanup standards would be site-specific target leachate goals for the purpose of aquifer restoration and protection. Approximately 780 cubic yards of soil would be removed, but may be increased based upon confirmation sampling. The excavation would be backfilled with a minimum of 6 inches of topsoil or other material capable of supporting vegetation, then seeded and mulched.

NIPSCO proposed post-excavation groundwater monitoring to measure the success of the remedy. Appropriate groundwater points of compliance would be established down-gradient of the excavation area. NIPSCO proposed monitoring these locations for boron and selenium until groundwater concentrations meet the GLI criteria for boron and selenium. Once the criteria were met, the wells would continue to be monitored for a period of at least two years to confirm compliance.

Performance Standards

In the CMP, NIPSCO evaluated each of the proposed alternatives, utilizing a guidance document *Final Remedy Selection for Results-Based RCRA Corrective Action (EPA 2000).* The guidance sets out three performance standards: Protection of the Environment; Achieve Media Cleanup

[4] Target leachate goals were developed consistent with the EPA's Soil Screening Guidance.

Objectives; and Control the Sources of Releases. A fourth performance standard, Comply with Standards for Waste Management, was added by the EPA.

NIPSCO determined that the No Further Action alternative did not meet performance standards regarding Protection of the Environment and Achieve Media Cleanup Objectives because the natural processes that might work to deplete existing sources of soil and groundwater contamination within the SWMU (e.g., infiltration and migration with groundwater) would not be capable of achieving the leachate and groundwater action levels developed to protect Lake Michigan. The Soil Capping and Soil Excavation alternatives appeared to achieve all of the applicable performance standards. See Statement of Basis.

The Soil Capping alternative appeared capable of achieving the Protection of the Environment performance standard because it could create a land surface that could support native vegetation, as well as minimize infiltration through impacted soils and reduce impacts on underlying groundwater, which would reduce potential impacts to ecological receptors in the down-gradient habitats.

There was some uncertainty over there remedial timeline for the Soil Capping alternative regarding: the time to install the cap; the time for native vegetation to become established; and the time frame for groundwater concentrations at the compliance wells to decline below the groundwater action levels, based on aquifer hydrologic properties and the fate and transport characteristics of the metals. Nonetheless, NIPSCO determined that the Soil Capping alternative would likely be capable of preventing the infiltration of leachate and achieving the groundwater action levels developed to protect Lake Michigan, and accordingly, would meet the Achieve Media Cleanup Objectives performance standard.

It appeared that the Soil Capping alternative would meet the Control the Sources of Releases performance standard by controlling the migration of metals from the SWMU by cutting off infiltration of precipitation. Since Soil Capping would not require source removal, the Comply with Standards for Waste Management performance standard was inapplicable.

The Soil Excavation alternative appeared to be capable of achieving the Protection of the Environment performance standard. Excavation and off-site disposal of contaminated soil, followed by backfilling and seeding could create a land surface that could support native vegetation; reduce the impact of contaminated soil pore water and underlying groundwater; and thereby reduce potential impacts to ecological receptors in the down-gradient habitats

There was some uncertainty over the remedial timeline for the Soil Excavation alternative regarding: the time required to remove all coal combustion byproduct, excavate impacted soil and backfill the excavated areas; the time for native vegetation to become established; and the time frame for groundwater concentrations at the compliance wells to decline below the groundwater action levels, based on aquifer hydrologic properties and the fate and transport characteristics of the metals. Nonetheless, NIPSCO determined that the Soil Excavation alternative would likely be capable of preventing the infiltration of leachate and achieving the groundwater action levels developed to protect Lake Michigan, and accordingly, would meet the Achieve Media Cleanup Objectives performance standard.

It appeared that the Soil Excavation alternative would meet the Control the Sources of Releases performance standard by controlling the migration of metals from the SWMU by cutting off infiltration of precipitation. Excavation and off-site disposal is a proven technology and would readily achieve the performance standard Comply with Standards for Waste Management.

Balancing Criteria

NIPSCO further evaluated the Soil Capping alternative and the Soil Excavation alternative regarding the following balancing criteria set out in the *Final Remedy Selection* guidance: Long-Term Effectiveness; Toxicity, Mobility and Volume Reduction; Short-Term Effectiveness; Implementability; Cost; Community Acceptance; and State Acceptance. See Table 1 and Statement of Basis.

Both alternatives appeared to be sufficiently protective of down-gradient habitats and Lake Michigan. Over the long term, the Soil Excavation alternative appeared to be more effective and reliable than the Soil Capping alternative because it reduces or eliminates the source of impacted soil and does not rely on an engineered barrier with a finite lifespan.

Both alternatives would reduce the toxicity, mobility and volume of waste within the SWMU. However, the Soil Excavation alternative would result in the removal of the contaminated source material, which, in combination with alternate fly ash management methods, would provide a permanent remedy.

Both alternatives could be designed and implemented in less than one year, and would effectively minimize migration of metals to groundwater. However, under either alternative, subsequent reductions in groundwater contaminant concentrations at the down-gradient points of compliance could take months or years. According, neither alternative would necessarily be effective in reducing groundwater contamination in the short term.

The technical design and contracting aspects of both alternatives are relatively straight-forward. Either of these alternatives could potentially be successfully implemented in less than one year.

NIPSCO evaluated the costs for both alternatives, based on initial capital costs and subsequent operations and maintenance (O&M) costs, and the net present value of the initial and O&M costs. See Statement of Basis, Table 1. The Soil Capping alternative included a 40-mil geomembrane liner; construction of a drainage swale around the cap to manage storm water; and a cover consisting of a minimum 6 inches of topsoil or other suitable fill material with seeding. O&M costs included 5-year maintenance of the cover and operation of three down-gradient groundwater monitoring wells. The Soil Excavation alternative included the costs for excavation and off-site disposal of the upper 6 inches of coal combustion byproduct; backfilling with 6 inches of topsoil with seeding; and 5 years of O&M consisting of maintenance of the backfill and operation of three down-gradient groundwater monitoring wells. A second cost estimate for a Soil Excavation alternative involving excavation and disposal of 12 inches of coal combustion byproduct was performed. Based on these analyses, the Soil Excavation alternative was the most cost effective, even if additional excavation is required.

Based on the public comments set out below, it appeared that the Soil Excavation alternative was preferred by the community. No comments were received from State agencies.

SELECTED REMEDIES

The EPA is selecting the following Corrective Action remedies to address contaminated soil and groundwater at SWMUs and AOCs at the Bailly facility. The following table is a summary of remedies selected by the EPA. A more detailed explanation of each remedy follows.

Contaminated Media		**Proposed Remedy**
Area A	Soil	1. Excavation and off-site disposal (SWMU 18) 2. Institutional controls to limit future land use and potential exposure risk (Area-Wide)
	Groundwater	1. Monitoring to confirm soil remedy success (SWMU 18) 2. Institutional controls to limit potential future use and risk (Area-Wide)
Area B	Soil	Institutional controls to limit future land use and potential exposure risk
	Groundwater	Institutional controls to limit potential future use and risk

Area A

The EPA's selected remedy for SWMU 10, SWMU 20, SWMU 21, AOC 1, AOC 4, AOC 5, and SWMU 16 is that NIPSCO must maintain institutional controls to make sure that these areas cannot be converted to residential land use in the future, unless additional cleanup is conducted.

SWMU 18

The EPA is selecting the Soil Excavation alternative to address the leaching of metals from SWMU 18 soil to groundwater. Both the Soil Capping alternative and the Soil Excavation alternative would be able to achieve the applicable performance standards. As summarized above, both alternatives have approximately equal potential to be effective in the short-term; both are technically and administratively feasible; and both would be acceptable to the State. However, the Soil Excavation alternative has a greater potential to be effective in the long-term; reduces the volume of impacted soil; would be less expensive; and is more acceptable to the community.

In the CMP, NIPSCO recommended the Soil Excavation alternative and provided: a Pre-Excavation Sampling Plan; a general Implementation Plan for site preparation, soil excavation and disposal, and site restoration; and a Performance Monitoring Plan for short-term soil and

leachate monitoring and long-term groundwater monitoring. The proposals in the CMP for the Soil Excavation alternative are acceptable to the EPA, with the minor modifications noted below.

In the CMP, NIPSCO proposed excavation of soil in SWMU 18 to a minimum depth of 6 inches below the land surface, with a contingency to excavate to a depth of up to 12 inches below grade, with the excavation depths and footprint to be determined by the investigations proposed in its Pre-Excavation Sampling Plan and Performance Monitoring Plan. NIPSCO stated that if contamination existed below 12 inches over a large area of SWMU18, it would discuss with the EPA substitution of the Soil Capping alternative. The EPA is not, at this time, approving implementation of the Soil Capping alternative under the contingency proposed by NIPSCO. If significant contamination is found to exist over large areas of the SWMU area at depths greater than 12 inches below grade, NIPSCO may seek modification of the *FD/RC* to alter the approved alternative.

In the CMP, NIPSCO proposed long-term groundwater monitoring for selenium and boron at the GLI control levels. As noted above, arsenic was found above the IDEM RISC industrial screening value and the MCL in some of the lakeshore groundwater samples. Accordingly, NIPSCO shall include arsenic, along with selenium and boron, in its post-excavation long-term groundwater monitoring plan.

Within 90 days of the date of this *Final Decision and Response to Comments*, NIPSCO must submit to the EPA for review and approval a Corrective Measures Implementation (CMI) work plan based on the provisions of the Proposed Final Corrective Measure of the CMP, as modified herein, including: excavation and off-site disposal of contaminated soils from SWMU 18; backfilling of excavated areas and seeding to establish appropriate vegetative cover; installation and operation of down-gradient groundwater monitoring wells; and an operation and maintenance program for the cover and monitoring wells for at least a 5-year period.

As provided in the CMP, the CMI work plan shall include excavation of contaminated soils in SWMU 18 to the following control levels: soils with SPLP results above the site-specific target leachate goals of 46.1 ug/L for selenium and 16,000 ug/L for boron. The CMI work plan shall also include location and installation of three down-gradient groundwater monitoring wells to be operated for a minimum period of two years after each of the following contaminant control level concentrations are achieved: 0.0046 ppm for selenium;1.6 ppm for boron; and 0.010 ppm for arsenic.

Area B

The EPA has determined that those remedial actions taken in Area B by NIPSCO prior to the Corrective Action have adequately addressed the surface impoundments in that area. However, NIPSCO must file appropriate institutional controls to prevent unacceptable exposures.

Financial Assurance

In the March 2005 Administrative Order on Consent, NIPSCO represented that it had sufficient technical and financial ability to perform Corrective Action at the Bailly Generating Station. As noted herein, NIPSCO has already performed significant Corrective Action under the AOC at the Bailly facility, including the RFI and certain Interim Measures. The AOC includes stipulated penalty provisions for any failure to timely perform the Selected Remedies in this FD/RC.

Also as noted herein, the Soil Excavation and Groundwater Monitoring remedies selected for SWMU 18, the primary remaining Selected Remedies for Corrective Action Areas A and B, are straightforward and relatively inexpensive. Soil excavation and backfilling and installation of the groundwater monitoring wells can be completed in less than a year. The longer-term operation of the groundwater monitoring wells can be accomplished at a modest cost. Given the nature of the remedies required for Areas A and B; the relatively small cost of the remedies; and the expected short duration of implementation of the remedies, the EPA, in its discretion, will not require additional financial assurance for the Areas A and B cleanup beyond NIPSCO's representation in the AOC of its financial ability to carry out Corrective Action at the Bailly Generating Station. Please see the additional discussion on financial assurance in the Response to Comments section.

PUBLIC PARTICIPATION ACTIVITIES

The EPA solicited input from the community on the cleanup methods proposed under each of the previous alternatives, and set a public comment period from July 14 through August 28, 2011, to encourage public participation in the selection process. Previous public participation opportunities regarding the Site included an EPA fact sheet mailed to the community and local environmental groups in February 2010. The EPA hosted a public meeting at the Indiana Dunes National Lakeshore Visitor Center on July 28, 2011, and encouraged all community members to submit comments regarding the proposed remedies. EPA received approximately 20 distinct comments from four different groups; however, many comments were repeated or of similar nature, as described below.

COMMENTS AND THE EPA'S RESPONSES

The public comments provided to the EPA have been divided between the various environmental groups and NIPSCO, with the EPA's responses to the comments in italics. Where possible, similar comments were consolidated; however, for clarity, where different entities asked the same question, the question was repeated with the previous response referenced.

Save the Dunes

Save the Dunes Comment #1: Coal-fired power plants use an outdated technology and regional coal plants are currently being shut down, including one owned by NIPSCO and another owned by Dominion (State Line Power Plant).

On January 13, 2011, the EPA and NIPSCO entered into a Consent Decree to resolve alleged violations of the Clean Air Act at several of NIPSCO's coal-fired electric generating facilities.

The Consent Decree requires permanent retirement of the coal-fired units at the Dean H. Mitchell Station near Wheatfield, Indiana, and upgrades of pollution control equipment at NIPSCO's other power plants located in Chesterton, Michigan City, and Gary, Indiana. The cost of these improvements is estimated to be approximately $600 million. The Consent Decree also requires NIPSCO to spend $9.5 million on environmental mitigation projects and pay a civil penalty of $3.5 million. Compliance with the Consent Decree will reduce emissions of nitrogen oxides and sulfur dioxide from all NIPSCO power plants by 64,000 tons per year from 2008 levels, and will also significantly reduce particulate matter emissions.

NIPSCO's coal-fired power plants have a combined generating capacity of over 3,300 megawatts (MW), and serve some 457,000 electric customers across the northern third of the State of Indiana. Although NIPSCO is retiring aged units at the Dean H. Mitchell Station, it is unlikely that, in the near term, demand for electricity in Northern Indiana will drop or that the remaining NIPSCO power plants will be closed or replaced with other technology, particularly after NIPSCO makes substantial investments to upgrade those facilities. The Consent Decree specifically requires upgrades to existing flue gas desulfurization systems and selective catalytic reduction systems at the Bailly Generating Station. Accordingly, it is reasonable to assume that the Bailly facility will continue to be operated and that the Bailly property will remain in industrial use into the foreseeable future.

Save the Dunes Comment #2: We believe the future use of the site could one day be non-industrial and frankly, we actively advocate for re-capturing these lands for public use in the long-term. It's our hope that one day the site could be restored and added back into the National Lakeshore, especially given its adjacency to the Lakeshore. This appears consistent with at least two top goals of the Marquette Plan: 1. Plan for public recreational access to the shoreline, and 2. Recapture 75% of the shoreline for free public access.

The Marquette Plan is a comprehensive, two-part regional planning document for Northwest Indiana. It is the result of collaboration between the lakeshore communities of East Chicago, Gary, Hammond, Portage, and Whiting; the Indiana Department of Natural Resources; and the office of Congressman Pete Visclosky. The Plan offers an ambitious and progressive vision of a sustainable future for the area's communities, natural resources, and industry.

Continued operation of the Bailly Generating Station (referred to as the NIPSCO Burns Harbor Plant in the Marquette Plan) is contemplated in the Marquette Plan. For instance, on page 8 of Phase II of the Plan (February 2008) it states, regarding Bailly and the surrounding industries:

> *Evaluate the cluster of industries in and around the Port of Indiana to find potential synergies that could improve the operational effectiveness and vitality of these industries while exploring opportunities for improved environmental quality and public access to the lakeshore.*

In general, the Marquette Plan appears to integrate a balance between the economic viability of regional industries and the need to protect and enhance the area's natural resources. The shoreline footprint of the Bailly Generating Station is relatively limited. In addition, any future public access to this shoreline area may need to be limited in order to manage critical habitat

near the Bailly property. Also, a portion of the Bailly property adjacent to the Indiana Dunes National Lakeshore is already designated as a Greenbelt under a conservation easement signed by NIPSCO and the National Park Service in 1996.

Given the history of the Bailly Generating Station, its current operations, and the upgrades required by the recent Consent Decree, it is reasonable to assume that the Bailly facility will continue to be operated into the foreseeable future. Accordingly, the Corrective Action proposal set out in the Statement of Basis appears warranted and not inconsistent with the Marquette Plan.

Save the Dunes Comment #3: Our understanding is that the National Lakeshore could not acquire the land unless the site is fully remediated. Remediating only to industrial cleanup levels rather than residential levels would serve as a major obstacle for this potential future transaction. As an example, the Dominion plant is being evaluated for future use, with many openly advocating for green space, trails, and public access opportunities. NIPSCO's future use should consider the possibility of a non-industrial scenario.

As outlined above, it is reasonable to expect that land use for the Bailly Generating Station property into the foreseeable future will be primarily industrial. Therefore, on-site soil remediation to industrial standards is appropriate. However, a soil cleanup to industrial standards does not necessarily preclude potential acquisition of the property by the National Park Service sometime in the future. It is likely that remediation beyond that contemplated in the current Corrective Action cleanup would be necessary to convert the industrial site to residential use. However, it is also possible that the property could be suitable for recreational use with soils at non-residential contaminant levels. The specifics of appropriate remediation, land use changes, and other aspects of acquisition by the National Park Service would have to be determined at the time of the transfer of the property. The EPA cannot speculate about specific requirements and detailed needs of any particular land reuse scenario at a time when the current land use will remain consistent into the foreseeable future.

Furthermore, it is not appropriate to require on-site soil remediation to residential standards at an operating industrial facility where migration of pollutants off-site is unlikely and land use is likely to remain industrial into the foreseeable future. "EPA recognizes the complexities associated with developing reasonably anticipated land use assumptions and the need for caution when basing remedial decisions on assumptions of future use; however, the Agency believes that non-residential land use assumptions are appropriate for many corrective action facilities." 61 Fed. Reg. 19452 (May1, 1996).

Bailly Generating Station is an operating industrial facility on private property, and will likely remain so into the foreseeable future. The EPA is requiring Corrective Action cleanup standards applicable at the present time, as well as into the foreseeable future, by regulation and policy to such a facility.

Save the Dunes Comment #4: While Areas A & B are not in the designated "Greenbelt" area, we feel strongly that the provisions for the protection of the Greenbelt should be taken into account for these areas as well. Those provisions state, "NIPSCO shall preserve the Greenbelt in

its natural state. If NIPSCO utilizes the Greenbelt temporarily for a project involving pollution migration or construction on it adjacent facilities, it shall restore the project area to its natural state."

The location of the proposed Corrective Action soil excavation is in the southwest corner of the Bailly Generating Station, adjacent to the nearby steel mill, and well away from the Greenbelt and the Indiana Dunes National Lakeshore. There has been no showing that the contamination that occurred or the cleanup required in Areas A and B will have any adverse impact on the Greenbelt. The preservation and restoration requirements for the Greenbelt are not applicable to the operating areas of the Bailly facility.

Save the Dunes Comment #5: We ask that Areas A, B and C be tested for radiation.

Early in the site investigation, in 2005, the EPA collected samples at the Bailly Generating Station to test for radioactive elements related to coal and coal ash. No evidence of radioactivity was found. However, those samples did not cover the entire Site and were collected several years ago, so the EPA requested that NIPSCO conduct additional sampling and testing at the facility. Samples from each area of the Site (Corrective Action Areas A, B and C) were collected and analyzed for radiation in October 2011. Based upon the results, the groundwater at Areas A and B of the Bailly facility is not adversely impacted by radioactivity. Both the Gross Alpha and Gross Beta sampling results were below the 15 pCi/L MCL and the 50 pCi/L MCL, respectively, for a Community Water System (CWS). Area C was also sampled and is not adversely impacted by radioactivity, but is not being evaluated in this Statement of Basis. The investigation results from Area C will be incorporated into the comprehensive data set and evaluation. Additional information regarding the National Primary Drinking Water Regulations pertaining to radionuclides can be found at the following Federal Register website:
https://www.federalregister.gov/articles/2000/12/07/00-30421/national-primary-drinking-water-regulations-radionuclides-final-rule#

Save the Dunes Comment #6: Cowles Bog, one of IDNL's greatest treasures, is located immediately next to NIPSCO. As a result of the adjacency to the National Park, special care must be given to protection of the natural resource itself, flora and fauna that use and are attracted to the site, and connections to Lake Michigan. We ask that both federal and state species of concern be given consideration and protection due to the unique and sensitive resource that is Cowles Bog.

The EPA is concerned about protecting Cowles Bog and the Indiana Dunes National Lakeshore as a whole. Cowles Bog is a national natural landmark and the IDNL contains globally rare ecosystems. Corrective Action Area C covers property at the Bailly Generation Station immediately adjacent to the IDNL, includes an area of study within the IDNL itself, and is more relevant to Cowles Bog than are Areas A or B. The EPA believes that the ongoing Corrective Action investigation, analysis and remedy determinations in Area C will address concerns about potential impacts to Cowles Bog.

As part of the ecological risk assessment process for Area C, the Indiana Department of Natural Resources, Division of Nature Preserves (IDNR DNP) and the Unites States Fish and Wildlife Service (USFWS) were contacted in writing, requesting information on the potential for

threatened and endangered species to occur in the vicinity of the Bailly Generating Station. The USFWS determined that critical habitat for the endangered piping plover exists directly adjacent to the Bailly facility. Given the proximity of the designated critical habitat to the Site, this species was selected for evaluation in the baseline ecological risk assessment (BERA). The USFWS also identified several protected species that may be in the vicinity of the Bailly facility, including the threatened bald eagle and Pitcher's thistle. The IDNR DNP provided a list of three amphibians, eight birds, one reptile, and 25 vascular plants that represent endangered, threatened and rare species, and high quality natural communities that may be located within one mile of the Bailly facility.

It is practically impossible for the risk assessment to address every possible receptor, primarily because there is insufficient data regarding the potential toxicity of various chemicals on many receptors. Therefore, EPA Guidance and UFWS Guidance suggest the use of representative receptors. Representative ecological receptors are organisms whose function in the ecosystem, taxonomic relatedness, and known or presumed similarities in physiology and life history fairly represent the range of habitats and life histories for those organisms with complete exposure pathways which are found near the Site. Accordingly, several avian receptors, representing various feeding guilds, amphibians, and terrestrial and wetland plants are evaluated in the BERA to account for the potential presence of protected birds, amphibians, and plants.

Save the Dunes Comment #7: We support EPA's decision to excavate and backfill the area with clean soil. We ask the maximum amount of sampling occur before, during and after the work to ensure that further impacts to the IDNL do not occur.

The remedy proposed in the Statement of Basis currently includes extensive sampling, both before and after the excavation, to ensure that contaminated soil is removed and confirm that the soil removal remedy successfully addresses contaminated groundwater. The EPA believes the current level of required sampling is protective and appropriate.

As noted above, the location of the soil excavation is in the interior of the Bailly Generating Station property, well away from the Indiana Dunes National Lakeshore. Implementation of the soil excavation remedy is not expected to have any adverse impact on the IDNL.

Save the Dunes Comment #8: We approve of the proposed groundwater remediation approach, which would allow use of either the Great Lakes Quality Initiative (GLI) criteria or drinking water maximum allowable amount (MCL), whichever is more stringent [as final remedial endpoints]. This is a proactive, responsible approach to protecting an incredible resource.

The EPA believes that the cleanup and monitoring criteria to be applied will assure protection of Lake Michigan.

Save the Dunes Comment #9: We respectfully urge EPA to move swiftly through the Area C corrective action process so that remedial action happens as quickly as possible to minimize the impacts on IDNL.

The EPA shares your desire to see Corrective Action Area C addressed quickly; however, the Agency must conduct a thorough analysis of the problem and a reasoned examination of potential remedies to ensure that valuable resources in the Indiana Dunes National Lakeshore are protected. The EPA will make every effort to proceed as expeditiously as possible; will strive to keep the community up-to-date on progress; and will continue to coordinate closely with the IDNL throughout this process.

Alliance for the Great Lakes

Alliance Comment #1: Fly ash contains highly toxic chemicals that, if allowed to contaminate off-site areas, could have significant detrimental effects on human health and site-adjacent sensitive ecosystems.

The Corrective Action soil excavation remedy proposed for Area A is designed to eliminate the coal-ash contaminated soil from which certain heavy metals have leached into the groundwater under the Bailly Generating Station property. Eliminating the source of these pollutants will allow groundwater restoration through natural attenuation. Post-excavation monitoring will ensure that significantly contaminated groundwater does not leave the site and reach Lake Michigan. As noted above, the location of the soil excavation is in the interior of the Bailly facility, away from the sensitive ecosystems in the Indiana Dunes National Lakeshore. The soil excavation remedy is straightforward; will be performed quickly; and is not expected to result in any off-sight contamination.

Alliance Comment #2: We are supportive of EPA's decision to excavate and backfill the contaminated soil. We are concerned about the possibility of contamination resulting from the soil disturbance. We recommend extensive sampling prior to, during and after the excavation in order to prevent or quickly locate migration of contaminants on to IDNL or into groundwater.

As noted above, the proposed Corrective Action remedy currently includes extensive sampling to ensure that contaminated soil is removed and confirm that the soil removal remedy successfully addresses contaminated groundwater. The area of soil excavation is not located near the Indiana Dunes National Lakeshore and, therefore, is not expected to have any impacts on the IDNL. Excavation of contaminated soil should stop on-going leaching of heavy metals from the soil into the groundwater and ensure that significantly contaminated groundwater does not reach Lake Michigan. Post-excavation groundwater monitoring will confirm that this goal is achieved.

Alliance Comment #3: We recommend that the excavation process be carried out in the least intrusive manner possible, in order to prevent disturbance to the IDNL wildlife.

As noted above, the location of the proposed Corrective Action soil excavation is in the interior of the Bailly Generating Station, away from the Indiana Dunes National Lakeshore. The remedy will be performed quickly and is not expected to have any significant adverse impact on IDNL wildlife.

Alliance Comment #4: We support EPA's continued investigation of offsite contamination and encourage the process to move forward as quickly as possible. The longer it takes to begin the cleanup; the more damage can be done to this fragile ecosystem.

As noted above, the EPA is conducting a thorough analysis of the problems and potential remedies in Corrective Action Area C; will keep the community informed; and will continue to coordinate with the IDNL.

National Parks Conservation Association

Parks Association Comment #1: Aquatic resources are key components of IDNL. The park includes almost 600 acres of Lake Michigan, 15 miles of coastline, and over 1,200 acres of emergent wetlands, forested wetlands, and bogs. And Lake Michigan serves as the drinking water source for over 10 million people.

The EPA believes that the remedy proposed in the Statement of Basis is protective of the Indiana Dunes National Lakeshore and Lake Michigan.

Parks Association Comment #2: We support EPA's requirement that the cleanup utilize the most stringent groundwater remediation criteria (GLI or MCL). The plan states that "post-excavation groundwater monitoring will occur in order to measure the success of the remedy … [and that] once the criteria are met, the wells will continue to be monitored for a period of at least two years to confirm compliance." We encourage longer-term, more comprehensive post-excavation monitoring because it is likely that we don't know the full extent of the impacts of coal ash on IDNL's water resources and the people and wildlife who utilize them.

As noted above, Corrective Action Areas A and B covered by the Statement of Basis do not include the areas of study inside the Indiana Dunes National Lakeshore. For the areas under current consideration, the EPA is proposing a typical groundwater monitoring schedule that will be evaluated over time in accordance with the data. The EPA expects that the concentrations of contaminants of concern in the groundwater will fall off after the soil excavation remedy is implemented, and that the required minimum two years of groundwater monitoring will confirm that trend. If that is the case, further groundwater monitoring will not be necessary. However, if the data do not show that contaminant concentrations have dropped to acceptable levels, additional monitoring may be required.

Parks Association Comment #3: We encourage the remediation to aim for standards appropriate for any type of land use, not only industrial. These areas are historically the same ecosystem type as the adjacent section of IDNL, and the National Park Service may seek to acquire such lands for inclusion in the park, should they be put up for sale by a willing seller. In such a case, cleanup to industrial standards would be unacceptable, as a much higher standard is warranted for inclusion in the National Park System.

Please see the response to Save the Dunes Comment #3.

Parks Association Comment #4: We ask EPA require soil testing of the clean backfill prior to its placement on-site to ensure it's the right type for that ecosystem and that it does not contain any non-native, invasive plant species.

The EPA shares your concerns regarding the introduction of non-native species into the area surrounding the Indiana Dunes National Lakeshore. Therefore, the following language has been incorporated into the bid specifications for the backfill and topsoil:

> *Satisfactory backfill and topsoil material used at the Site shall be free of debris, organic materials (e.g., roots, stems, and leaves) and any deleterious material such as seeds from invasive and non-native plant species. The material shall come from a source that can be identified by the supplier. The source is defined as the location where the material was removed from the ground (i.e., the borrow area). The stockpile location is defined as the location where the material was stored after being excavated. It is possible that the source and stockpile location are the same place. The source and stockpile locations shall be in the same geographic region as the Bailly Generating Station. There shall be no invasive or non-native species in proximity to either the source or stockpile locations. These requirements are expected to reduce or eliminate the likelihood that non-native or invasive species will be introduced as a result of importing the backfill and topsoil.*

In addition to the language above, the backfill material will be analyzed for pesticides, volatiles, semi-volatiles, metals, and PCBs.

National Park Service, Indiana Dunes National Lakeshore (IDNL)

IDNL Comment #1: We do not agree that the expected future land use at this site would always remain industrial. We encourage EPA to keep all options open, including remediating to the cleanest standards currently available, so that the land adjacent to, and within, the national park is free of any future land-use restrictions due to contamination.

Please see the response to Save the Dunes Comment #3.

IDNL Comment #2: Although the areas within the proposed action area are not within the "Greenbelt", they are adjacent, and from the language in the Indiana Dunes National Lakeshore Act there can be no doubt that Congress intended NIPSCO actions in the Greenbelt and adjacent areas to be taken in such a manner as to protect national park resources.

Please see the response to Save the Dunes Comment #4.

IDNL Comment #3: We believe it's a flawed position to assume the NIPSCO Bailly plant will operate in perpetuity. Coal-fired power plants are dated technology and are being decommissioned throughout the country. We would think that a plant in the midst of a national park would be one of the first to be identified for future decommissioning or retrofitting to cleaner technology.

Please see the response to Save the Dunes Comment #1.

IDNL Comment #4: We support EPA requiring the most stringent groundwater remediation criteria whether it is the GLI or MCL. We feel this aggressive stance in dealing with contaminated lands is prudent given the proximity to the national lakeshore.

Please see the response to Save the Dunes Comment #8.

NIPSCO Bailly Generating Station

NIPSCO Comment #1: NIPSCO respectfully objects to the Proposal's stated intent to apply the more stringent of MCLs or GLI groundwater criteria as remedial closure goals. Specifically, the Final Decision should reflect the usage of the least stringent of Indiana RISC groundwater criteria for industrial properties or GLI groundwater criteria as the remediation's groundwater closure goals. In support of this request, NIPSCO states as follows.

NIPSCO Comment 1a: AOC Section 19(f) was negotiated to state: "In conducting risk assessments, [NIPSCO] will follow the Risk Assessment Guide for Superfund ("RAGS") or other appropriate U.S. EPA Guidance, but may utilize Indiana risk standards for the final corrective action and any interim measures." (Emphasis added). In other words, the AOC allows NIPSCO the option of using Indiana RISC criteria as closure criteria.

The EPA does not agree that the phrase in question in paragraph 19(f) of the Corrective Action Administrative Order on Consent obviates application of longstanding federal and State groundwater remediation standards established by statute, regulation, policy, and guidance. The EPA understood the phrase, "but may utilize Indiana risk standards for the final corrective action and any interim measures... ," inserted in the "Reporting and other requirements" paragraph of the AOC, to merely allow NIPSCO to use State risk assessment standards, in addition to the numerous federal standards cited in the AOC, when evaluating risk-based Corrective Action remedies.

Paragraph 10 of the AOC makes clear that all applicable federal and State policy and guidance is to be utilized for the Corrective Action work at the Bailly Generating Station:

> *Northern Indiana Public Service Company must perform the work undertaken pursuant to this Order in compliance with RCRA and other applicable federal and state laws and their implementing regulations, and consistent with all relevant, current U.S. EPA or Indiana guidance documents, as appropriate to the facility. This guidance includes, but is not limited to, the Documentation of Environmental Indicator Determination Guidance, relevant portions of the Model Scopes of Work for RCRA Corrective Action, U.S. EPA's risk assessment guidance, and Indiana's Risk Integrated System of Closure guidance.*

NIPSCO Comment 1b: In negotiating the Areas A & B Corrective Measures Proposal (the "CMP") with EPA, NIPSCO expressed a willingness to allow the use of GLI-based groundwater closure criteria for certain metals rather than Indiana RISC criteria. That expression was consistent with NIPSCO's rights under the AOC. The Proposal, however, demonstrates that EPA now wishes to disregard both the text of AOC Section 19(f) and its prior approval of the

CMP by arbitrarily imposing MCL-based closure criteria. NIPSCO submits that EPA has acted improperly in doing so.

As noted, the EPA does not agree that paragraph 19(f) of the AOC mandates that the Indiana RISC groundwater standards apply in all circumstances, to the exclusion of other applicable federal and State criteria. Moreover, there is no support for NIPSCO's assertion below for "application of least stringent of GLI or Indiana RISC industrial criteria as closure goals."

The contaminated groundwater beneath Corrective Action Areas A and B at the Bailly Generating Station flows northward toward Lake Michigan which is a source of drinking water for some 10 million people. The groundwater/surface water interface is near a beach that is critical habitat for an endangered species and adjacent to the Indiana Dunes National Lakeshore. The remedy recommended in the Statement of Basis to address soil and groundwater contamination resulting from coal ash deposition at the Bailly facility is excavation of contaminated soil. There is no engineered groundwater remedy. The expectation is that once the contaminated soil, the source of the groundwater contamination, is removed, the groundwater will recover to its pre-contamination condition through monitored natural attenuation, and that significantly contaminated groundwater will not reach the beach or the lake. The groundwater monitoring recommended in the Statement of Basis consists of sampling at sentential wells down-gradient of the excavation area to assure that the soil excavation remedy is successful and the levels of contamination in the groundwater drop to acceptable levels over time.

The EPA believes that the post-excavation groundwater monitoring proposed in the Statement of Basis and clarified below is: 1) appropriate under the circumstances to assure the integrity of the soil excavation remedy; 2) authorized by applicable regulation, policy and guidance, including those cited in the AOC; 3) consistent with NIPSCO's proposals in the CMP and in its Comments on the Statement of Basis; and 4) protective of Lake Michigan and the Indiana Dunes National Lakeshore.

NIPSCO Comment 1c: Even if the AOC did not specifically allow NIPSCO to use Indiana RISC criteria for closure purposes (it does), NIPSCO would nonetheless disagree with the MCL/GLI closure criteria contemplated by the Proposal and submits that the Proposal's proposed criteria are contrary to EPA's *Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action* (the "Groundwater Handbook") which allows use of any groundwater closure criteria which protects Lake Michigan from "unacceptable impacts." More specifically, the Proposal fails to acknowledge that the Groundwater Handbook expressly allows the use of less stringent cleanup levels (e.g. Indiana's RISC criteria) when, for example, the groundwater "is not a current or reasonably expected source of drinking water, and contaminants in groundwater would not result in unacceptable impacts to hydraulically-connected surface water bodies." Groundwater Handbook, pg. 5.3, par. 1(b). EPA's Groundwater Handbook supports, given the circumstances and significant available data, the application of least stringent of GLI or Indiana RISC industrial criteria as closure goals. At the same time, the Groundwater Handbook does not require the application of the lower of MCLs or GLI as closure criteria.

The EPA disagrees with NIPSCO's selective reading and interpretation of the Groundwater Handbook. As reflected throughout the Groundwater Handbook and noted in more detail below,

the primary goal of all of the EPA's groundwater remediation efforts is to restore contaminated groundwater to its maximum beneficial use. The maximum beneficial use of the groundwater in the aquifer beneath the Bailly Generation Station is as a potential source of drinking water. As such, the groundwater cleanup levels generally are the Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act, where MCLs for the contaminants in question exist. See Groundwater Handbook, Pg.5.4 ("What are the groundwater cleanup levels for a current or potential source of drinking water?") and the authorities cited below.

The Groundwater Handbook does provide that, "Higher cleanup levels ***may be*** *appropriate, for a given facility, for example, when: ... the groundwater designation is not a current or reasonably expected source of drinking water, and contaminants in groundwater would not result in unacceptable impacts to hydraulically-connected surface water bodies." (Emphasis added.) However, groundwater in the aquifer beneath the Bailly facility has not been designated for industrial use or, in fact, for any use other than as a potential source of drinking water. Nor has NIPSCO established that the hazardous contaminants it discharged to the groundwater beneath its facility would not have unacceptable impacts if those contaminants were to reach Lake Michigan at concentration levels above the MCLs. Even if those conditions were met, the EPA is not inclined to use its discretion to allow a higher cleanup level when the groundwater discharge involves a Great Lake, habitat for an endangered species and a national park.*

NIPSCO Comment 1d: MCLs were developed as drinking water standards and are legally enforceable as drinking water standards. More precisely, MCLs are defined to be the "maximum permissible level of a contaminant in water which is delivered to any user of a public water system." (40 CFR 141.2). They are to be applied to users of a "public water system". (40 CFR 141.3). Neither the groundwater beneath the BGS nor the surface waters of Lake Michigan can reasonably be deemed to be a "public water system". Accordingly, MCLs cannot properly be applied to either water body. The Proposal nonetheless (and improperly) advocates for the use of MCLs as groundwater closure criteria whenever MCLs represent the most stringent criteria. EPA is without authority to impose such criteria to the groundwater at issue.

The EPA's groundwater restoration policy is set out in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) at 40 C.F.R. § 300.430(a)(1)(iii)(F):

> *EPA expects to return usable ground waters to their beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site. When restoration of ground water to beneficial uses is not practicable, EPA expects to prevent further migration of the plume, prevent exposure to the contaminated ground water, and evaluate further risk reduction. EPA also expects to control or eliminate surface and subsurface sources of groundwater contamination.*

The groundwater restoration policy is cited in numerous EPA guidance documents, including the 1996 Advanced Notice of Proposed Rulemaking (ANPR) (61 Fed. Reg. 19432,19448) explained below; the 2004 Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action (the "Groundwater Handbook"); and the June 26, 2009, Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration.

Generally, returning usable groundwater to its maximum beneficial use involves attainment of the MCLs (provided reasonable time frames and technical practicability). For example:

> *Such remedial action shall require a level or standard of control which at least attains Maximum Contaminant Level Goals established under the Safe Drinking Water Act ... and water quality criteria established under section 304 or 303 of the Clean Water Act ..., where such goals or criteria are relevant and appropriate under the circumstances of the release or threatened release. Section 121(d)(2)(A) of CERCLA, 42 U.S.C. § 9621(d)(2)(A).*
>
> *Maximum contaminant level goals (MCLGs), established under the Safe Drinking Water Act, that are set at levels above zero, shall be attained by remedial actions for ground or surface waters that are current or potential sources of drinking water... If an MCLG is determined not to be relevant and appropriate, the corresponding maximum contaminant level (MCL) shall be attained where relevant and appropriate to the circumstances of the release. NCP at 40 C.F.R. § 300.430 (3)(B)(C).*
>
> *Consistent with the CERCLA program, in the RCRA corrective action program EPA intends to clean up sites in a manner consistent with available, protective, risk-based media cleanup standards (e.g., MCLs and state cleanup standards) or, when such standards do not exist, to clean up to protective media cleanup standards developed for the site in question (e.g., through a site-specific risk assessment). ANPR, 61 Fed. Reg. at 19449.*

The EPA's policy to remediate groundwater to its maximum beneficial use is clear. It is also clear that where groundwater is a current or potential drinking water source, the Agency generally defines "maximum beneficial use" as attainment of the MCLs. MCLs are relevant and appropriate when it is technically practicable to obtain them in a reasonable time frame. "The maximum beneficial use, determined by EPA or State regulators, is the current or reasonably expected use that warrants the most stringent groundwater cleanup levels." Groundwater Handbook, Pg.5.3.

It does not matter whether the groundwater beneath the Bailly Generating Station or the surface waters of Lake Michigan are "a public water system," or that the groundwater beneath the Bailly facility is not currently being used directly as a source of drinking water. The groundwater beneath the Bailly facility is a potential drinking water source, and is therefore afforded the protection of remediation to its maximum beneficial use which generally is remediation to contaminant levels not exceeding the MCLs.

NIPSCO Comment 1e: The Proposal improperly relies upon and cites to an untitled 1996 ANPR as authority. An ANPR, especially one for which an actual rulemaking did not follow, cannot reasonably be viewed or presented as legal authority for any position. An ANPR is simply an expression of a then current agency intention. It is not legally binding or controlling in any situation.

On May 1, 1996, the EPA published an Advance Notice of Proposed Rulemaking (ANPR) entitled, "Corrective Action for Releases from Solid Waste Management Units at Hazardous Waste Management Facilities" (61 Fed. Reg.19432). The ANPR has long been the cornerstone guidance document for the Corrective Action program and remains an appropriate resource to cite and rely upon for implementation of Corrective Action. See Use of the Corrective Action Advance Notice of Proposed Rulemaking as Guidance (Jan. 17, 1997).

As recently as April 2010, in a comprehensive National Enforcement Strategy for RCRA Corrective Action (NESCA) issued jointly by the Office of Enforcement and Compliance Assurance (OECA) and the Office of Solid Waste and Emergency Response (OSWER), the EPA reiterated the importance and applicability of the 1996 ANPR:

> *On May 1, 1996, EPA published an Advance Notice of Proposed Rulemaking (ANPR). That ANPR provided guidance on areas of the CA [Corrective Action] program that were not addressed by the [earlier]1990 proposal [detailing substantive and procedural requirements to implement the CA program], and replaced the 1990 proposal as the primary guidance for much of the CA program. [Footnote omitted.] For several reasons, EPA later withdrew most provisions of the 1990 proposed rule in an October 7, 1999 Federal Register notice (64 Fed. Reg. 54604). As a result, EPA and States implement the CA program primarily through guidance. The May 1996 ANPR remains the primary guidance document for the CA program. (Transmittal of the National Enforcement Strategy for RCRA Corrective Action, April 27, 2010.)*

The 1996 ANPR was used appropriately as guidance in the Statement of Basis.

NIPSCO Comment 1f: NIPSCO asks that EPA directly ask IDEM's Office of Water Quality if the Proposal's contemplated groundwater closure criteria is consistent with IDEM's interpretation and application of Indiana's water quality regulations.

The groundwater monitoring criteria set out previously in this document as well as in the following response below render moot any response to this Comment.

NIPSCO Comment #2: NIPSCO asks that the Proposal's reference to "up gradient" at the second line of its page 21 be corrected to refer to "down gradient" points of groundwater compliance monitoring. The use of up gradient points would fail to demonstrate the effectiveness of the implemented remedy.

The EPA will correct the error.

NIPSCO Comment #3: NIPSCO asks that the Final Decision reflect, consistent with the CMP, that post-remediation groundwater monitoring will be necessary for only selenium and boron.

The contaminants of concern in the groundwater under Corrective Action Areas A and B are selenium, boron and arsenic, which along with mercury are the primary contaminants of concern typically found in coal ash. In the CMP, NIPSCO agreed that the groundwater action levels were the GLI-derived criteria of 4.61 ug/L for selenium and 1,600 ug/L for boron. These

concentration levels are lower than the MCL for selenium and lower than the health advisory for boron (there is no MCL for boron). Accordingly, the Statement of Basis incorporated these criteria (expressed in the Statement of Basis as 0.0046 ppm for selenium and 1.6 ppm for boron) and proposed post-excavation groundwater monitoring for a period of two years after these levels are achieved. The Final Decision will require submission of a work plan including post-excavation groundwater monitoring for selenium and boron at these GLI-derived levels.

In addition, the Statement of Basis included sampling results from the Lake Michigan shoreline area showing arsenic in the groundwater slightly above the MCL of 0.010 ppm. Sampling results from other locations in this area also showed levels of arsenic in the groundwater above the MCL. NIPSCO has asserted in its Comments on the Statement of Basis that the Indiana RISC industrial groundwater criteria be applied to all contaminants except for selenium and boron, for which it agreed to the GLI criteria. For arsenic, the Indiana RISC industrial groundwater criteria and the MCL are the same, 0.010 ppm. Accordingly the Final Decision will require inclusion in the work plan provisions for post-excavation groundwater monitoring for arsenic at 0.010 ppm.

NIPSCO Comment #4: NIPSCO firmly disagrees that financial assurance can or should be required as a component of the final remedy. The controlling document and starting point for any remedy requirement in this matter is the AOC. It was negotiated to include a representation of NIPSCO's technical and financial ability rather than any other financial assurance requirement. While the Financial Assurance Guidance, in relevant part, clearly presents while that financial assurance is necessary for corrective action done in accordance with TSDF permits, it stops well short of stating a similar requirement for corrective action under Section 3008(h) orders. Moreover, even if EPA has the authority to here require financial assurance (it does not), NIPSCO submits that it would be impractical and unnecessary to impose a financial assurance requirement in this instance given the scope of the remedy and its short implementation period.

The RCRA Corrective Action program requires financial assurance from facilities subject to Corrective Action under Section 3008(h) of RCRA. As provided in the 2003 Interim Guidance on Financial Responsibility for Facilities Subject to RCRA Corrective Action:

> *"EPA is authorized to issue administrative orders or file civil judicial actions that impose corrective action financial responsibility requirements on facilities subject to 3008(h) orders."*

Although the Guidance discusses the advantages of requiring financial assurance at the time of the corrective action order, it also recognizes that financial assurance can be imposed at various times in the corrective action process with certain other advantages.

> *"In determining the timing and the amount of financial assurance at a particular site, there are several approaches for regulators to consider. One approach is to require financial assurance for known releases at the time of final remedy selection, and when the associated cost estimates are known. The advantage of this approach is that the regulator can use this cost to determine the amount of financial assurance to require."*

Further, the 2010 National Enforcement Strategy for RCRA Corrective Action states,

"Financial assurance remains an important component in EPA's corrective action enforcement program for the future, as it is necessary to ensure that funds are available to complete cleanup responsibilities."

However, given the nature of the remedy required for Corrective Action Areas A and B; the relatively small cost of the remedy; and the expected short duration of implementation of the remedy, the EPA, in its discretion, will not require additional financial assurance for the Areas A and B cleanup beyond NIPSCO's representation in the AOC of its financial ability to carry out corrective action at the Bailly Generating Station.

ADMINISTRATIVE RECORD

The administrative record is available at the following locations (please call for hours):

U.S. EPA, Region 5
7th Floor Record Center
77 W. Jackson Blvd.
Chicago, IL 60604
(312) 886-4253

Portage Public Library
2665 Irving Street
Portage, IN 46368
(219) 763-1508

DECLARATION

Based on the information in this Final Decision and Response to Comments and the Administrative Record compiled for this corrective action site, the EPA has determined that the selected remedies at the NIPSCO Bailly Generating Station, Areas A and B, are appropriate and will be protective of human health and the environment.

Date: July 9, 2012

Margaret M. Guerriero, Director
Land and Chemicals Division
United States Environmental Protection Agency,
Region 5