Intended for
Dynegy Midwest Generation, LLC
10901 Baldwin Road
Baldwin, IL 62217

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Project No.
1940110241-005

CORRECTIVE ACTION GROUNDWATER MONITORING PLAN

BALDWIN POWER PLANT, FLY ASH POND SYSTEM, IEPA ID NO. W1578510001-01, W1578510001-02, AND W1578510001-03

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ACRONYMS AND ABBREVIATIONS

35 I.A.C.	Title 35 of the Illinois Administrative Code
40 C.F.R.	Title 40 of the Code of Federal Regulations
ASD	Alternative Source Demonstration
BPP	Baldwin Power Plant
CCR	coal combustion residuals
COC	constituent of concern
CSM	conceptual site model
DMG	Dynegy Midwest Generation, LLC
E001	Event 1
FAPS	Fly Ash Pond System
GMP	Groundwater Monitoring Plan
gpm	gallons per minute
GWMS	groundwater management system
GWPS	groundwater protection standard
ID	identification
IEPA	Illinois Environmental Protection Agency
IPCB	Illinois Pollution Control Board
No.	Number
PMP	Potential migration pathway
QA/QC	quality assurance/quality control
Ramboll	Ramboll Americas Engineering Solutions, Inc.
RL	reporting limit
SI	surface impoundment
StAP	Statistical Analysis Plan
UA	uppermost aquifer
UU	Upper unit
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

1.1 Overview

In accordance with requirements of Title 35 of the Illinois Administrative Code (35 I.A.C.) § 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments, Ramboll Americas Engineering Solutions, Inc. (Ramboll) has prepared this Corrective Action Groundwater Monitoring Plan (GMP) on behalf of Baldwin Power Plant (BPP), operated by Dynegy Midwest Generation, LLC. (DMG). This GMP will apply specifically to the coal combustion residuals (CCR) Multi-Unit referred to as the Fly Ash Pond System (FAPS; CCR unit identification [ID] number [No.] 605 and National Inventory of Dams [NID] No. IL50723). The FAPS consists of three CCR SIs including the Old East Fly Ash Pond System (Illinois Environmental Protection Agency [IEPA] ID No. W1578510001-01), the East Fly Ash Pond (IEPA ID No. W1578510001-02), and the West Fly Ash Pond (IEPA ID No. W1578510001-03). The FAPS is a closed, unlined CCR Multi-Unit that was previously used to manage CCR and non-CCR waste streams at the BPP. This Corrective Action GMP includes content requirements specific to 35 I.A.C. § 845.630 (*Groundwater Monitoring System*), 35 I.A.C. § 845.640 (*Groundwater Sampling and Analysis*), 35 I.A.C. § 845.650 (*Groundwater Monitoring Program*), and 35 I.A.C. § 845.680 (*Implementation of the Corrective Action Plan*) for the FAPS at the BPP.

A checklist in **Table 1-1** provides references to sections, tables, and figures within this document that meet the specific requirements of 35 I.A.C. § 845.630, 35 I.A.C. § 845.640, 35 I.A.C. § 845.650, and 35 I.A.C. § 845.680.

This Corrective Action GMP will be included as Appendix B.1 to the Construction Permit Application for the BPP FAPS. DMG completed significant source control efforts in 2020 as part of final closure of the FAPS [1]. The final closure was performed in accordance with the Closure and Post-Closure Care Plan [2] that was developed in accordance with Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257 and submitted to IEPA for review. IEPA found "*…that the plan…represent an appropriate means by which to close the Baldwin Fly Ash Pond System which is comprised of the East Fly Ash Pond, the Old East Fly Ash Pond and the West Fly Ash Pond*" [3].

The Corrective Action Plan proposes source control with a groundwater management system (GMS) as the remedy for the FAPS. As described in the Corrective Action Plan, the proposed remedy meets the performance standards of 35 I.A.C. § 845.670(d) and addresses all current and potential future releases from the FAPS. Likewise, this Corrective Action GMP establishes how data will be collected, documented, and evaluated to assess remedy effectiveness for all currently documented and potential future releases from the FAPS[1] per the process outlined in **Figure 1-1**.

Adaptive site management strategies are an integral part of corrective action groundwater monitoring. The adaptive site management approach consistent with National Research Council, Interstate Technology & Regulatory Council and United States Environmental Protection Agency (USEPA) methodologies will allow timely incorporation of new site information throughout corrective action to ensure the achievement of the groundwater protection standard (GWPS). The adaptive site management approach expedites progress toward meeting the GWPS while acknowledging uncertainties, such as the persistence of current groundwater flow directions and

[1] The presence of exceedances at the waste boundary will continue to be evaluated under the Operating permit GMP previously submitted to IEPA [8].

potential related changes in geochemical conditions. The structured decision-making process proposed in this Corrective Action GMP includes specific metrics used to evaluate remedy progress, criteria which would trigger adaptive management evaluation, and options for those management actions.

1.2 Site Location and Background

The BPP is located in southwest Illinois in Randolph and St. Clair Counties. The Randolph County portion of the BPP is located within Sections 2, 3, 4, 9, 10, 11, 14, 15, and 16 of Township 4 South and Range 7 West. The St. Clair County portion of the property is located within Sections 33, 34, and 35 of Township 3 South and Range 7 West. The FAPS is approximately one-half mile west-northwest of the Village of Baldwin (**Figure 1-2**).

The BPP property is bordered to the west by the Kaskaskia River; to the east by Baldwin Road, farmland, and strip-mining areas; to the southeast by the village of Baldwin; to the south by the Illinois Central Gulf railroad tracks, scattered residences, and State Route 154; and to the north by farmland. The St. Clair/Randolph County Line crosses east-west at approximately the midpoint of Baldwin Lake (*i.e.,* Cooling Pond). **Figure 1-2** shows the location of the BPP; **Figure 1-3** is a site map showing the location of the FAPS (a 35 I.A.C. § 845 regulated CCR Unit and the subject of this GMP), Bottom Ash Pond (BAP), Secondary Pond, Tertiary Pond, and Cooling Pond. Information regarding the BAP, Secondary Pond, Tertiary Pond, and Cooling Pond is solely for background information, as this GMP applies specifically to the FAPS CCR unit, which will hereinafter be referred to as the Site.

1.3 Conceptual Site Model

Significant site investigation has been completed at the BPP to characterize the geology, hydrogeology, and groundwater quality. Based on the extensive investigation and monitoring, the FAPS has been well characterized, as detailed in the Hydrogeologic Site Characterization Report [4] (HCR), Nature and Extent Report [5] and HCR Revision 1 that was provided for the adjacent BAP [6], which were prepared to comply with the requirements specified in 35 I.A.C. § 845.620. These documents expand upon the Hydrogeologic Monitoring Plan [7] and the conceptual site model as presented below.

In addition to CCR, materials at the BPP have been categorized into two hydrostratigraphic units at the FAPS based on stratigraphic relationships, geologic composition, and common hydrogeologic properties. The units, listed from surface downward, are summarized as follows:

- **Upper Unit (UU):** Predominantly clay with some silt and minor sand, silt layers, and occasional sand lenses. Includes the lithologic layers identified as the Cahokia Alluvium, Peoria Loess, Equality Formation, and Vandalia Till Member. This unit is composed of unlithified natural geologic materials and extends from the upper saturated materials to the bedrock. Thin sand seams and the interface (contact) between the UU and bedrock have been identified as potential migration pathways (PMPs). No continuous sand seams were observed within or immediately adjacent to the FAPS; however, the sand seams may act as a PMP due to relatively higher hydraulic conductivities. The acronym UU and the materials it contains is synonymous with Upper Groundwater Unit used in previous documents.
- **Bedrock Unit:** This unit is considered the Uppermost Aquifer (UA) and is composed of interbedded shale and limestone bedrock, which underlies and is continuous across the entire Site.

Groundwater flow in the UA (**Figure 1-4**) is generally to the west and southwest across the Site toward the Kaskaskia River. Groundwater flow in bedrock is toward the northwest in the east and central areas of the BAP, and southwest to northwest on the east area of the FAPS until groundwater reaches the bedrock valley feature underlying the Secondary and Tertiary Ponds west of the BAP and FAPS, at which point the flow direction veers towards this bedrock surface low.

Immediately upgradient and downgradient of the BPP property boundaries, both the shallow glacial deposits and the shallow bedrock have served as a source of water supply. The shallow unlithified deposits off-site have yielded water through intermittent, discontinuous sand lenses and, in the bedrock, through fractured sandstone and limestone. However, within the area of the Site, investigations have indicated only thin and intermittent sand lenses are present within predominantly clay deposits; thus, the unlithified materials do not represent a continuous aquifer unit. Based on these details, the Bedrock Unit was designated as the UA in the *Supplemental Hydrogeologic Site Characterization and Groundwater Monitoring Plan* [8], consistent with the USEPA definition in 40 C.F.R. § 257.53.

The shallow bedrock is the only water-bearing unit that is continuous across the Site. Shallow sandstone and creviced limestone may yield small supplies in some areas, but water quality becomes poorer (*i.e.,* highly mineralized) with increasing depth. The Pennsylvanian and Mississippian rocks generally have low porosities and permeabilities, are not a reliable source of groundwater, and the quality varies considerably [9]. Therefore, the lower limit of the UA is the depth at which either the groundwater is mineralized to a point that it is no longer a useable water source, or the secondary porosities do not yield a sufficient volume of groundwater to produce a useable water supply.

1.4 Groundwater Quality

Groundwater monitoring in accordance with the proposed Operating GMP and sampling methodologies provided in the operating permit application for groundwater compliance at the FAPS began in the second quarter of 2023 [10]. The proposed compliance monitoring wells yield groundwater samples that represent the quality of downgradient groundwater at the CCR boundary (as required in 35 I.A.C. § 845.630(a)(2)).

The Event 1 (E001) quarterly groundwater monitoring event was completed on May 23, 2023. In accordance with 35 I.A.C. § 845.610(b)(3)(C), and the statistical analysis plan submitted with the operating permit application (Appendix A of the Groundwater Monitoring Plan Revision 1) constituent concentrations observed at compliance wells were evaluated for compliance with the GWPSs summarized in 35 I.A.C. § 845.600 to determine exceedances[2] of the GWPS. The following GWPS exceedances were determined at compliance groundwater monitoring wells [11]:

- Boron at wells MW-150 and MW-391
- Sulfate at well MW-150

[2] Throughout this document, "exceedance" or "exceedances" is intended to refer only to potential exceedances of proposed applicable background statistics or Groundwater Protection Standards (GWPSs) as described in the proposed groundwater monitoring program, which was submitted to the IEPA on October 25, 2021, as part of Dynegy Midwest Generation, LLC's operating permit application for the Baldwin Fly Ash Pond System. That operating permit application, including the proposed groundwater monitoring program, remains under review by the IEPA and therefore Dynegy Midwest Generation, LLC has not identified any actual exceedances.

Subsequent compliance sampling events (following E001) were also evaluated for exceedances of the GWPS as described in 35 I.A.C. § 845.600. Additional exceedances identified during the subsequent events [12, 13, 14, 15, 16] consist of the following:

- Boron at well MW-152
- Fluoride at well MW-384
- pH at wells MW-253 and MW-350
- Sulfate at wells MW-252, MW-253R, and MW-366

Pursuant to 35 I.A.C. § 845.650(e), an Alternative Source Demonstration (ASD) was completed for the pH exceedance [17] detected at MW-253 during the Quarter 3, 2023 event and received concurrence in a letter from the IEPA dated March 7, 2024 [18]. The ASD identified contamination of the groundwater by grout used in construction of the monitoring well as the alternative source for the GWPS exceedance. Consequently, a work plan to address this contamination via well abandonment and replacement was submitted to the IEPA on March 14, 2024 [19]. Similar conditions were also observed historically in background well MW-306 and compliance well MW-350 during Quarter 1, 2024, and these wells were also proposed for abandonment in the work plan. The IEPA provided written concurrence with the work plan on April 9, 2024 [20] and the wells were subsequently abandoned and replaced in early May of 2024.

During evaluation of results from groundwater sampling and Alternative Source Demonstrations, inconsistencies in concentrations and water level measurements at background well MW-358 and compliance well MW-391 were identified. Well construction at each location was inspected using a downhole camera and identified that the well casings were compromised. A plan to abandon and replace the wells was submitted to the IEPA [21] and approved in a letter/email dated September 17, 2024. The monitoring wells were replaced in October 2024, and following installation, MW-391R has been dry during monitoring events. This is consistent with the original wells at this location, MW-387 and MW-391, prior to its suspected failure in 2018. This is an indication that the bedrock at this location does not yield recoverable amounts of water and there are no potential exceedances of the GWPS at this location.

In accordance with 35 I.A.C. § 845.660, a Corrective Measures Assessment was developed to address current and potential future GWPS exceedances originating from the FAPS, excluding the pH exceedances at wells MW-253 and MW-350 as addressed in the ASD and associated work plan, and was submitted to IEPA on April 24, 2024 [22]. The selected remedy will meet the performance standards of 35 I.A.C. § 845.670(d) and once implemented and completed, the selected remedy presented in the Corrective Action Plan will attain the GWPSs.

1.5 Supplemental Site Investigation

Additional investigations were conducted in 2024 in accordance with 35 I.A.C. § 845.650 to further assess the nature, degree, and extent of boron groundwater impacts downgradient of the FAPS.

A total of four monitoring wells were installed off-site, south of the FAPS, in two phases to further delineate the extent of boron concentrations above the 35 I.A.C. § 845 GWPS. Soil samples were collected from the unconsolidated material at each location and submitted for full mineral analysis, clay mineral analysis, cation exchange capacity, metals, and loss on ignition. Three wells were

installed across PMPs within the UU in May of 2024 (MW-195, MW-196, and MW-197). After two rounds of sampling, an additional monitoring well was installed in October of 2024 (MW-198).

The Supplemental Site Investigation fully delineated the boron impacts to groundwater downgradient of the FAPS. Boron has migrated laterally to the southwest through PMPs within the UU; however, the lateral migration does not extend greater than 300 feet off-site and is limited by the creek adjacent to the BPP [23].

Sulfate concentrations above the GWPS were first detected at MW253R in July 2024 following installation of the well in May 2024. The monitoring well was installed to replace MW-253 which was impacted by grout contamination. Concentrations measured in groundwater shortly after well installation and development are often not representative of long-term stabilized concentrations, specifically in low permeability units like the UU. Additional samples collected in August and October, 2024 confirmed the elevated concentrations of sulfate and evaluation of the nature and extent of these concentrations is ongoing but is expected to be limited in extent.

2. CORRECTIVE ACTION GROUNDWATER MONITORING PLAN

This Corrective Action GMP is being provided to propose a groundwater monitoring program specific to the FAPS that will comply with 35 I.A.C. § 845.680. The Corrective Action GMP will monitor and evaluate groundwater quality specifically to document the effectiveness of the corrective action remedy. The groundwater monitoring program will include sampling and analysis procedures that are consistent and that provide an accurate representation of groundwater quality.

2.1 Corrective Action Groundwater Monitoring Program and Parameters

2.1.1 35 I.A.C. § 845 Corrective Action Groundwater Monitoring

The proposed 35 I.A.C. § 845 corrective action monitoring well network will consist of 11 wells to document the effectiveness of the corrective action remedy and ultimately demonstrate compliance with GWPSs (**Figure 2-1**). The wells included in the corrective action monitoring well network include select compliance monitoring wells from the Operating GMP network (*e.g.*, those with previously reported exceedances of the GWPS) (**Section 1.4**) and monitoring wells installed during the Supplemental Site Investigation (**Section 1.5**).

As appropriate to meet the corrective action monitoring objectives and evaluate the effectiveness of the corrective action remedy (as described in **Section 3**), the corrective action monitoring program involves assigning each well to a monitoring category or purpose (**Table 2-1**). These monitoring categories include:

- **Inside Plume**– wells located at the CCR boundary with GWPS exceedances.
- **Plume Definition** - wells located along the lateral or vertical boundary of the plume.

A summary of the well locations and associated purpose as it relates to the above categories is presented in **Table 2-1** and **Figure 2-1**. Monitoring well depths and construction details are listed in **Table 2-2** and boring logs and monitoring well construction forms are provided in **Appendix A**. Groundwater samples will be collected and analyzed for the laboratory and field parameters in **Table 2-3**. Laboratory parameters include major ions for evaluating groundwater chemistry and constituents of concern (COCs) (*i.e.*, reported exceedances in accordance with the Operating GMP) the Corrective Action is intended to address. Sampling to evaluate corrective action effectiveness will begin the quarter after the corrective action remedy is implemented and commissioned.

2.2 Sampling Schedule

All wells in the 35 I.A.C. § 845 corrective action GMP network, as presented in **Table 2-1**, will be sampled quarterly to provide a complete picture of corrective action effectiveness. Groundwater elevations will be determined at the time of sample collection from each well. Sampling will end in accordance with 35 I.A.C. § 845.680(c), when compliance with the GWPS has been demonstrated "at all points within the plume of contamination that lies beyond the waste boundary […] for a period of three consecutive years" (details in **Section 3.3**).

Consistent with 35 I.A.C. § 845.650(b)(4), quarterly sampling may be reduced to a semiannual frequency with IEPA approval after completion of five years of monitoring. A request for reduced sampling frequency will include a demonstration that corrective action monitoring effectiveness will not be compromised; sufficient data has been collected to evaluate ongoing remedy effectiveness; and existing data show trends consistent with anticipated remedy performance (details in **Section 3.1**).

2.3 Groundwater Sample Collection

Groundwater samples will be collected and analyzed in accordance with the Multi-Site Sampling and Analysis Plan [24]. Groundwater sampling procedures have been developed and the collection of groundwater samples is being implemented to meet the requirements of 35 I.A.C. § 845.640. In addition to groundwater well samples, quality assurance samples will be collected as described in **Section 2.5** (**Table 2-3**).

2.4 Laboratory Analysis

Laboratory analysis will be performed consistent with the requirements of 35 I.A.C. § 845.640(j) by a state-certified laboratory using methods approved by IEPA and USEPA. Laboratory methods may be modified based on laboratory equipment availability or procedures, but the Reporting Limit (RL) for all parameters analyzed, regardless of method, will be lower than the applicable groundwater quality standard [24]. Concentrations lower than the RL will be reported as less than the RL.

2.5 Quality Assurance Program

Consistent with the requirements of 35 I.A.C. § 845.640(a)(5), the sampling and analysis program includes procedures and techniques for quality assurance/quality control (QA/QC). Additional quality assurance samples to be collected will include the following:

- Field duplicates will be collected at a frequency of one per group of ten or fewer investigative water samples.
- One equipment blank sample will be collected and analyzed for each day of sampling. If dedicated sampling equipment is used, then equipment blank samples will not be collected.
- The duplicate and equipment blank quality assurance samples will be supplemented by the laboratory QA/QC program, which typically includes:
  - Regular generation of instrument calibration curves to assure instrument reliability
  - Laboratory control samples and/or quality control check standards that have been spiked, and analyses to monitor the performance of the analytical method
  - Matrix spike/matrix spike duplicate analyses to determine percent recoveries and relative percent differences for each of the parameters detected
  - Analysis of replicate samples to check the precision of the instrumentation and/or methodology employed for all analytical methods
  - Analysis of method blanks to assure that the system is free of contamination

Water quality meters used to measure pH and turbidity will be calibrated according to manufacturer's specifications. At a minimum, it is recommended that calibration of pH occur daily prior to sampling and checked for accuracy at the end of each day. Unusual or suspect pH

measurements during sampling events will be flagged, evaluated, and additional calibration may be performed throughout the sampling events. Turbidity meters will be checked daily, prior to and following sampling. Unusual measurements or erratic meter performance will be flagged and evaluated for overall effects on the data prior to reporting.

2.6 Groundwater Monitoring Well Maintenance Plan

Consistent with the requirements of 35 I.A.C. § 845.630(e)(2), maintenance will be performed according to the Multi-Site Quality Assurance Project Plan [25] as needed to assure that the monitoring wells provide representative groundwater samples. Monitoring wells will be inspected during each groundwater sampling event; inspections will consist of the following:

- Visual inspection, clearing of vegetation, replacement of markers, and painting of protective casings as needed to assure that monitoring wells are clearly marked and accessible
- Visual inspection and repair or replacement of well aprons as needed to assure that they are intact, drain water away from the well, and have not heaved
- Visual inspection and repair or replacement of protective casings as needed to assure that they are undamaged, and that locks are present and functional
- Checks to assure that well caps are intact and vented, unless in flood-prone areas in which case caps will not be vented
- Routine measurement of monitoring well depths to determine the degree of siltation within the wells. Wells will be redeveloped as needed to remove siltation from the screened interval if it impedes flow of water into the well
- Checks to assure that wells are clear of internal obstructions, and flow freely

If wells are damaged or become otherwise inoperable, they will be replaced by wells screened at the same elevation and as close to the original well as possible (ideally within 10 feet) and notification will be provided to IEPA. If a replacement well cannot be installed within approximately 10 feet of the original well location, notification will be sent to IEPA and a monitoring well will be installed as close as possible to the original monitoring well and given a new well identification number. Any well replacement activities will also be documented in the Annual Groundwater Monitoring and Corrective Action Report.

2.7 Statistical Analysis

A Multi-Site Statistical Analysis Plan (StAP) has been developed to describe the statistical procedures that will be used to evaluate the groundwater results [26].

2.8 Data Reporting

Groundwater monitoring and analysis completed in accordance with 35 I.A.C. § 845 under an approved monitoring program will be reported to IEPA annually by January 31 as required by I.A.C. § 845.550, for data collected the preceding year. The Annual Groundwater Monitoring and Corrective Action Report will include the status of the groundwater monitoring and Corrective Action Plan for the FAPS in addition to other requirements detailed in 35 I.A.C. § 845.610(e).

2.9 Compliance with Applicable Groundwater Protection Standards

As provided in 35 I.A.C. § 845.680(c)(2), corrective action is considered complete when compliance with the GWPS has been achieved by demonstrating that concentration of

constituents listed in 35 I.A.C. § 845.600 have not exceeded the GWPSs for a period of three consecutive years, using the statistical procedures and performance standards in 35 I.A.C. § 845.640(f) and (g).

Attainment of GWPSs and conclusion of corrective action monitoring is discussed below in **Section 3.3**.

If a new exceedance is determined during monitoring under the Operating GMP, the Corrective Action groundwater monitoring program will be evaluated for monitoring of additional locations and/or constituents using the adaptive site management methods presented herein.

3. EFFECTIVENESS OF THE CORRECTIVE ACTION REMEDY

The methods for evaluating the effectiveness of the corrective action remedy described in this section are based on the following guidance documents:

- "Methods for Evaluating the Attainment of Cleanup Standards Volume 2: Ground Water," USEPA, Office of Policy, Planning, and Evaluation, 1992 [27].
- "Groundwater Remedy Completion Strategy: Moving Forward with the End in Mind," Office of Solid Waste and Emergency Response, 2014 [28].
- "Adaptive Site Management – A Framework for Implementing Adaptive Management at Contaminated Sediment Superfund Sites," USEPA, Office of Superfund Remediation and Technology Innovation, 2022 [29].
- "Environmental Cleanup Best Management Practices: Effective Use of the Project Life Cycle Conceptual Site Model," USEPA, Office of Solid Waste and Emergency Response, 2011 [30].

Evaluation of corrective action remedy effectiveness will occur in three phases (**Figure 3-1**): remedy progress evaluation, stability evaluation, and attainment evaluation [31].

1. Remedy progress evaluation occurs after implementation of corrective actions to assesses if the remedy is functioning as anticipated.
2. The stability evaluation, which occurs after groundwater management system has been concluded and a re-equilibration period has elapsed, assesses if a new post-groundwater management system steady state in the groundwater has been reached.
3. Attainment evaluation occurs after a new steady state has been achieved and assesses if COC concentrations are below the GWPS.

COCs are parameters with exceedances of the GWPS to be addressed by the Corrective Action Plan. Corrective action monitoring at BPP FAPS includes the following COC parameters:

- Boron, fluoride, and sulfate

The effectiveness of the remedy at each phase is evaluated using performance metrics designed to assess the goals of that phase. Performance metrics answer questions designed to evaluate multiple aspects of remedy effectiveness with the ultimate goal of holistically guiding management decisions [32]. These metrics may be evaluated using qualitative (subject to expert judgement) or quantitative (numerical outcomes) methods.

This section details the goals and performance metrics of each phase of remedy evaluation. Within each phase, the well groups described in **Section 2.1** have distinct applicable metrics and/or potential management actions consistent with the role of that well group within the corrective action monitoring framework. The remedy evaluation metrics documented here are specific to wells within the Corrective Action monitoring program.

3.1 Remedy Progress Evaluation

The goal of remedy process evaluation is to determine if a groundwater remedy is on track to achieve cleanup standards within the proposed time frame and to inform adaptive management decisions if performance metrics are not achieved. Evaluation of remedy progress includes evaluating the response of COCs in individual monitoring wells and in the plume as a whole.

Remedy progress is evaluated using performance metrics as described below. **Table 3-1** details the questions used to assess remedy progress and metrics which would trigger additional evaluation of adaptive site management options. **Figure 3-2** presents an outline of the decision-making process regarding adaptive management actions (the first step of which is assessing remedy progress per **Table 3-1**).

Documentation of remedy progress metrics will be provided in the Annual Groundwater Monitoring and Corrective Action Report (**Section 2.8**) beginning after the second year of data collection: a minimum of eight data points is required to complete meaningful statistical analysis required for evaluation of the remedy progress metrics, which will be available after two years of quarterly sampling. Per USEPA guidance [32], a thorough review of corrective action progress and remedy effectiveness will be conducted every five years. A Five-Year Annual Groundwater Monitoring and Corrective Action Report will evaluate the comprehensive data set and, if triggered by the results of the remedy progress evaluation metrics (**Table 3-1**), evaluate whether adaptive management actions are needed (**Figure 3-2**). The five-year time frame allows adaptive management decisions to be based on robust data sufficient to complete meaningful statistical analysis while remaining responsive to changing site conditions [32]. The remedy progress evaluation metrics and triggers for additional evaluation are described below.

3.1.1 Comparison to Groundwater Protection Standard

The Inside Plume wells in this monitoring plan were defined based on exceedances of the GWPS. The question posed to evaluate whether exceedances of the GWPS occur, and associated method of evaluation is (**Table 3-1**):

- Are COC concentrations greater than the GWPS? – Compare data points or summary statistics to site-specific GWPS values.

COC concentrations below the GWPS in Inside Plume wells may indicate that remedial actions are approaching completion and that moving to the next phase of remedy effectiveness evaluation may be warranted (see **Section 3.2**). Persistence of COC concentrations above the GWPS in Plume Definition wells may indicate that the plume is no longer properly delineated. Therefore, the trigger criterion for further evaluation is a central tendency measure of the last eight data points exceeding the GWPS.

3.1.2 Agreement with Groundwater Model

A groundwater flow and transport model[3] was used to compare the anticipated time to reach the GWPS for the different corrective actions considered at the FAPS.

The question posed to evaluate agreement of corrective action remedy progress with the groundwater model results is provided in **Table 3-1** and summarized below:

- Are concentrations of COCs at individual wells consistent with modeling expectations? – Evaluate if the observed results track with the predicted results in general direction and magnitude using expert professional judgement.

Only Inside Plume and Plume Definition wells included in the flow and transport model are evaluated according to this metric. Trigger criteria for additional adaptive site management

[3] The Groundwater Modeling Technical Memorandum is included as an attachment to the Corrective Actions Alternative Assessment presented as part of the Corrective Action Plan.

evaluation include monitoring results failing to follow the general magnitude and direction of groundwater model results at one or more locations. It is acceptable to conclude that no further adaptive site management evaluation is triggered if future observations do not precisely match modeled results on an individual well basis if the direction of remedy progress is adequate.

3.1.3 Trend Analysis

Evaluation of COC trends in wells both within and outside of the plume is a major component of remedy progress evaluations [31, 32]. Decreasing COC concentrations within the groundwater plume provides critical support for remedy effectiveness evaluations. Changing concentrations in wells defining the plume may indicate unanticipated plume migration or a need for better plume definition. Both short-term and long-term trends are important to evaluate remedy performance [31]. All trend analyses are performed in accordance with the Corrective Action StAP and the USEPA Unified Guidance for groundwater statistics [33].

The questions posed to evaluate if COC concentrations are decreasing in Inside Plume wells and the associated methods for evaluation are provided in **Table 3-1** and summarized as follows:

- Are average plume COC concentrations decreasing? – Evaluate trend based on quarterly average of COC concentrations of Inside Plume wells, both for the last eight sampling events and since corrective action was initiated.

The questions posed to evaluate if COC concentrations are changing in Inside Plume wells and Plume Definition wells and the associated methods for evaluation are provided in **Table 3-1** and summarized below:

- Are concentrations of COCs at individual wells changing? – Evaluate trend of COC concentrations, both for the last eight sampling events and since corrective action was initiated.

The goal of the corrective action is to reduce COC concentrations in the groundwater. Therefore, trigger criteria have been established for the three types of corrective action monitoring wells as follows:

- Inside Plume well triggers for adaptive site management evaluation are based on no decreasing trend in COC concentrations (short-term or long-term).
- Plume Definition well triggers are based on increasing COC concentrations, which may indicate improper delineation of the plume. Therefore, the trigger criterion for adaptive site management evaluation at Plume Definition wells is increasing short- or long-term trend.

3.1.4 Adaptive Management Actions

The goal of adaptive management actions is to understand why performance metrics are not met and, if the remedy is found to be unsuccessful in meeting remediation goals, drive supplemental corrective actions or, in extreme cases, re-evaluation of remedy selection. This section describes in greater detail the steps in the flow chart presented in **Figure 3-2** (adapted from Figure 2 in [32]).

As the remedy progress evaluation metrics are evaluated annually, failure to meet the metrics (as described in **Table 3-1**) leads to further action. If the data available at the time of the Five-Year Review are anticipated to be inadequate for determining the need for adaptive site

management actions, additional data may be collected before the Five-Year Review including collecting samples from additional wells or measuring additional parameters.

If the remedy progress is not found to be adequate during the Five-Year Review, the most critical question is whether or not the remedy is likely to achieve the GWPS in a reasonable time frame. This may be evaluated using methods such as regression analysis or analysis of groundwater flow with respect to operation of the GWMS. If the remedy progress is not judged to be adequate but the remedy is likely to achieve the GWPS in a reasonable time frame, the CSM or the groundwater model may require updating to reflect evolving field conditions[4]. Additional data collected may also suggest ways to optimize the monitoring network or performance metrics [32].

If the remedy does not appear likely to achieve the GWPS in a reasonable time frame, it may be due to changing hydrogeochemical dynamics within the plume or an additional source of COCs not accounted for in the CSM. If available data suggests either occurrence, the Five-Year Review will describe additional activities planned to investigate if the existing remedy is still a viable option for attaining the GWPS. If the remedy is still viable, an update to the CSM and groundwater model is likely required and will be conducted after additional investigation is completed.

If the remedy does not appear likely to achieve the GWPS in a reasonable time frame, there is no alternative source of COCs not accounted for in the CSM, and the plume is appropriately delineated; or if the investigation into the hydrogeochemical changes or alternative source of COCs determines that the remedial action is no longer solely viable as a corrective action, an evaluation of additional remedial actions will be initiated.

If the remedy progress evaluation metrics indicate that concentrations across the monitoring network are below the GWPS (and the GWMS system has ceased operation; see **Section 3.1.5**), the remedy progress phase may be considered complete, and the monitoring program may move to the Stability Evaluation phase (see **Section 3.2**).

3.1.5 Concluding operation of the GMS

Groundwater modeling used to support design of the GMS (Appendix B of the CAAA-SIR) [34] estimates the selected remedy of source control with the GMS will attain the GWPS in greater than 100 years. The GMS is intended to reduce the accumulation of hydraulic head beneath the FAPS cover system which reduces the potential for liquids from the FAPS to mix with groundwater and migrate past the limits of the FAPS towards the BPP southern property boundary. Source control with GMS was the most effective remedy at reducing predicted concentrations of CCR derived constituents in groundwater and minimizing the footprint of impacted groundwater. The GMS operation will only be ceased when concentrations of COCs at on-site wells adjacent to the system do not exceed the GWPS. Additional considerations such as trends in COC concentrations, analysis of groundwater flow, or seasonal variability may also influence the decision of whether to cease operating the GWMS.

A period of equilibration and rebound is typical when discontinuing groundwater management system operations and caution should be used when interpreting short-term changes in COC

[4] As stated in Section 1.4.1 of the Corrective Action Plan: "Estimated timelines for GWMS and times to reach GWPS will be periodically reviewed and updated based on observed corrective action performance via an adaptive site management strategy."

concentrations [27]. The groundwater flow and transport model may be revised to estimate the potential for rebound to occur. A "slack period" of one year (or more, based on modeling results, if applicable) will be allowed to elapse after conclusion of groundwater management system operations before stability and GWPS attainment are evaluated.

3.2 Stability Evaluation

Evaluation of groundwater stability reflects the idea that implementation of a remedy will, by necessity, cause changes to the physical and chemical environment of the groundwater. In order to evaluate ultimate effectiveness of the remedy, it is critical to evaluate if a new stable equilibrium has been reached after groundwater management system has been discontinued. Stability is achieved when groundwater elevations are stable (accounting for seasonal variability), average COC concentrations are stable across all wells, and COC concentrations are stable at each well. If groundwater management operations have been stopped, a slack period of at least one year is recommended before evaluating stability [31].

Trends in groundwater elevation and COC concentrations at each plume well will be evaluated using the most recent eight data points (*i.e.*, two years of data when sampling quarterly) according to methods presented in the Corrective Action StAP. This metric is met for a plume well when there is no statistically significant trend in groundwater elevation or COC concentrations.

Plume COC concentrations will be evaluated for trend using the most recent eight data points, with the average concentration across plume wells per sampling event considered as one data point, according to methods presented in the Corrective Action StAP. This metric is met when there is no statistically significant trend in average COC concentrations.

3.3 Attainment Evaluation and Conclusion of Corrective Action Monitoring

The ultimate goal of groundwater corrective action is to attain compliance with the GWPS for each COC in Inside Plume wells. After stability has been achieved per the metrics discussed in **Section 3.2**, attainment evaluation will begin. Per 35 I.A.C. § 845.680(c), corrective action is considered complete when compliance with the GWPS has been demonstrated "at all points within the plume of contamination that lies beyond the waste boundary […] for a period of three consecutive years". Attainment of the GWPS will be evaluated in accordance with the StAP. Corrective action monitoring is considered complete for the site when COCs in the corrective action monitoring well network do not exceed the GWPS for three years.

4. REFERENCES

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TABLES

Table 1-1. 35 I.A.C. § 845 Requirements Checklist
Corrective Action Groundwater Monitoring Plan
Baldwin Power Plant
Fly Ash Pond System
Baldwin, IL

35 I.A.C. § 845 Reference	35 I.A.C. § 845 Components	Location of Information in Corrective Action GMP
845.630	**Groundwater Monitoring Systems**	
845.630(a)(2)	Potential contaminant pathways must be monitored.	NA
845.630(a) 845.630(b) 845.630(c)	At least two upgradient wells and four downgradient wells (min. 1 and 3, but requires additional documentation)	Section 2.1 Figure 1-4
845.630(a) 845.630(b) 845.630(c)	Downgradient Well Density	Figure 1-4
845.630(a)(2)	Downgradient wells at waste boundary	Figure 1-4
845.640	**Groundwater Sampling and Analysis Requirements**	
845.640(a)	Consistent sampling and analysis procedures	Section 2 Tables 2-3 and 2-4
845.640(b)	Methods are appropriate	Section 2 Tables 2-3 and 2-4
845.640(c)	Groundwater elevations must be measured in each well prior to purging, each time groundwater is sampled.	Section 2.2
845.640 (d)(e)(f)(g)(h)	Establishment of background and application of statistical methods	Section 2.7 Appendix A
845.640(i)	Analyze total recoverable metals	Table 2-3
845.640(j)	Analyze groundwater samples using a certified laboratory	Section 2.4
845.650	**Groundwater Monitoring Program**	
845.650(a)	Must include monitoring for all constituents with a groundwater protection standard in Section 845.600(a), calcium, and turbidity	Section 2.1 Table 2-3
845.650(b)(c)	Groundwater Monitoring Frequency	Section 2.2
845.650(d)(e)	Exceedances of the groundwater protection standard	Sections 2.9 and 3.1.1
845.650(b)(2) and (3)	Staff gauge/ piezometer to monitor head in impoundment	NA
NA	Staff gauge/ piezometer to monitor head of neighboring surface water body	NA
845.680	**Implementation of the Corrective Action Plan**	
845.680(a)(1)(a)	Establish and implement a corrective action groundwater monitoring program that meets requirements of 845.650	Sections 2.1 and 3 Tables 2-1 and 3-1 Figure 2-1
845.680(a)(1)(b)	Document the effectiveness of the corrective action remedy	Section 3
845.680(a)(1)(c)	Demonstrate compliance with the groundwater protection standard under Subsection [845.680] (c)	Sections 2.9 and 3
845.680(c)(1)	Demonstrate compliance with the groundwater protection standards established by 845.600 has been achieved at all points within the plume of contamination that lies beyond the waste boundary	Section 3.3
845.680(c)(2)	Demonstrate that concentrations of constituents listed in 845.600 have not exceeded the groundwater protection standards for a period of three consecutive years using statistical procedures and performance standards in 845.640(f) and (g)	Sections 3.3 and 3.4

[O: EGP 12/05/24; C: CJC 01/17/25]

Notes:
GMP = Groundwater Monitoring Plan
NA = Not Applicable

Table 2-1. Summary of Monitoring Well Locations and Purpose
Corrective Action Groundwater Monitoring Plan
Baldwin Power Plant
Fly Ash Pond System
Baldwin, IL

Well ID	Monitored Unit	Corrective Action Monitoring Well System	
		Inside Plume	Plume Definition
MW-150	PMP	X	
MW-152	PMP	X	
MW-252	PMP	X	
MW-253R	PMP	X	
MW-350R	UA		X
MW-352	UA		X
MW-366	UA	X	
MW-384	UA	X	
OW-257	PMP		X
PZ-174	PMP	X	
PZ-176	PMP		X

[O: EGP 1/14/25; C: CJC 1/17/25; U: AOC 02/06/25]

Notes:
PMP = Potential Migration Pathway
UA = Uppermost Aquifer

Table 2-2. Monitoring Well Locations and Construction Details
Corrective Action Groundwater Monitoring Plan
Baldwin Power Plant
Fly Ash Pond System
Baldwin, IL

Location	HSU	Date Constructed	Top of PVC Elevation (ft)	Measuring Point Elevation (ft)	Measuring Point Description	Ground Elevation (ft)	Screen Top Depth (ft bgs)	Screen Bottom Depth (ft bgs)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Well Depth (ft bgs)	Bottom of Boring Elevation (ft)	Screen Length (ft)	Screen Diameter (inches)	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
MW-150	PMP	2010-09-01	396.76	396.93	Top of Casing	394.08	15	24.7	379.08	369.38	25.2	368.88	9.6	2	38.189408	-89.878474
MW-152	PMP	2010-09-01	424.94	425.11	Top of Casing	422.12	7.5	16.7	414.62	405.42	17.2	404.92	9.3	2	38.187576	-89.866771
MW-252	PMP	2010-09-01	424.94	425.11	Top of Casing	422.29	44.4	49	377.89	373.29	49.5	372.79	4.6	2	38.18757	-89.866752
MW-253R	PMP	2024-05-01	445.49	445.66	Top of Casing	442.65	29.5	34.5	413.15	408.15	35	407.65	5	2	38.185890	-89.860997
MW-350R	UA	2024-05-03	396.13	396.30	Top of Casing	394.13	42	47	352.13	347.13	47	347.13	5	2	38.189423	-89.878453
MW-352	UA	2010-09-01	424.76	424.93	Top of Casing	422.39	67.9	72.5	354.49	349.89	73	348.59	4.6	2	38.187560	-89.866736
MW-366	UA	2015-12-04	424.91	425.08	Top of Casing	422.51	42	52	380.51	370.51	52	368.21	10	2	38.192192	-89.872345
MW-384	UA	2015-12-18	458.70	458.87	Top of Casing	456.60	60.5	70.5	396.10	386.10	70.5	362.50	10	2	38.191789	-89.860699
OW-257	PMP	2013-08-01	430.94	431.11	Top of Casing	428.30	34	38.5	394.30	389.80	39.1	388.70	4.5	2	38.193873	-89.867461
PZ-174	PMP	2015-08-04	401.30	401.47	Top of Casing	399.07	14.5	24.5	384.57	374.57	24.5	374.37	10	2	38.189689	-89.877215
PZ-176	PMP	2015-08-06	405.72	405.89	Top of Casing	403.61	18.1	28.1	385.51	375.51	28.6	375.01	10	2	38.188573	-89.871629

[O: RAB 1/14/25; C: EGP 1/17/25; U: AOC 02/06/25]

Notes:
All elevation data are presented relative to the North American Vertical Datum 1988 (NAVD88), GEOID 12A
bgs = below ground surface
ft = foot or feet
HSU = Hydrostratigraphic Unit
PMP = Potential Migration Pathway
UA = Uppermost Aquifer

Table 2-3. Sampling and Analysis Summary
Corrective Action Groundwater Monitoring Plan
Baldwin Power Plant
Fly Ash Pond System
Baldwin, IL

Parameter	Analytical Method [1]	Number of Samples	Field Duplicates [2]	Field Blanks [3]	Equipment Blanks [3]	MS/MSD [4]	Total	Container Type	Minimum Volume [5]	Preservation (Cool to 4 °C for all samples)	Sample Hold Time from Collection Date
Corrective Action Parameter(s)[6]											
Boron	6020 [7]	11	2	0	0	1	14	plastic	600 mL	HNO_3 to pH<2	6 months
Fluoride	9214 or EPA 300	11	2	0	0	1	14	plastic	300 mL	Cool to 6 °C	28 days
Sulfate	9036 or EPA 300	11	2	0	0	1	14	plastic	50 mL	Cool to 6 °C	28 days
Inorganic Parameters											
Alkalinity, bicarbonate	SM 2320 B	11	2	0	0	1	14	plastic	500 mL	Cool to 6 °C	14 days
Alkalinity, carbonate	SM 2320 B	11	2	0	0	1	14	plastic	500 mL	Cool to 6 °C	14 days
Calcium	6020 [7]	11	2	0	0	1	14	plastic	600 mL	HNO_3 to pH<2	6 months
Chloride	9251 or EPA 300	11	2	0	0	1	14	plastic	100 mL	Cool to 6 °C	28 days
Magnesium	6020 [7]	11	2	0	0	1	14	plastic	600 mL	HNO_3 to pH<2	6 months
Potassium	6020 [7]	11	2	0	0	1	14	plastic	600 mL	HNO_3 to pH<2	6 months
Sodium	6020 [7]	11	2	0	0	1	14	plastic	600 mL	HNO_3 to pH<2	6 months
Total Dissolved Solids	SM2530C	11	2	0	0	1	14	plastic	200 mL	Cool to 6 °C	7 days
Field Parameters											
pH	SM 4500-H+ B	11	NA	NA	NA	NA	11	flow-through cell	NA	none	immediately
Dissolved Oxygen [8]	SM 4500-O/405.1	11	NA	NA	NA	NA	11	flow-through cell	NA	none	immediately
Temperature [8]	SM 2550	11	NA	NA	NA	NA	11	flow-through cell	NA	none	immediately
Oxidation/Reduction Potential [8]	SM 258O B	11	NA	NA	NA	NA	11	flow-through cell	NA	none	immediately
Specific Conductance [8]	SM 2510 B	11	NA	NA	NA	NA	11	flow-through cell	NA	none	immediately
Turbidity [9]	SM 2130 B	11	NA	NA	NA	NA	11	flow-through cell or hand-held turbidity meter	NA	none	immediately

[O: CJC 08/17/21; U: CJC 12/03/24; C: SWL 2/17/25]

Notes:
[1] Analytical method numbers are from SW-846 unless otherwise indicated. Analytical methods may be updated with more recent versions as appropriate.
[2] Field duplicates will be collected at a frequency of one per group of 10 or fewer investigative water samples. Field duplicates will not be collected for radium analysis.
[3] Field blanks will be collected at the discretion of the project manager; Equipment blanks will be collected at a rate of 1 per sampling event if non-dedicated equipment is used.
[4] Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples will be collected at a frequency of one per group of 20 or fewer investigative water samples per CCR unit/multi-unit. Additional volume to be determined by laboratory.
[5] Sample volume is estimated and will be determined by the laboratory.
[6] Determined by reported exceedances under the Operating Groundwater Monitoring Plan
[7] Metals may be analyzed via ICP/ICPMS USEPA methods 6010 or 6020 depending on laboratory instrument availability.
[8] Parameter collected for quality assurance and quality control for field sampling purposes only; not required to be collected or reported under 35 IAC § 845; collection of parameter may be discontinued without notification.
[9] If turbidity exceeds 10 NTUs, a duplicate sample filtered through a 0.45 micron filter may be collected for metals analysis in addition to the unfiltered sample. Both samples would be submitted for analysis.
< = less than
°C = degrees Celsius
HNO_3 = nitric acid
mL = milliliter
NA = not applicable
NTU = nephelometric turbidity unit

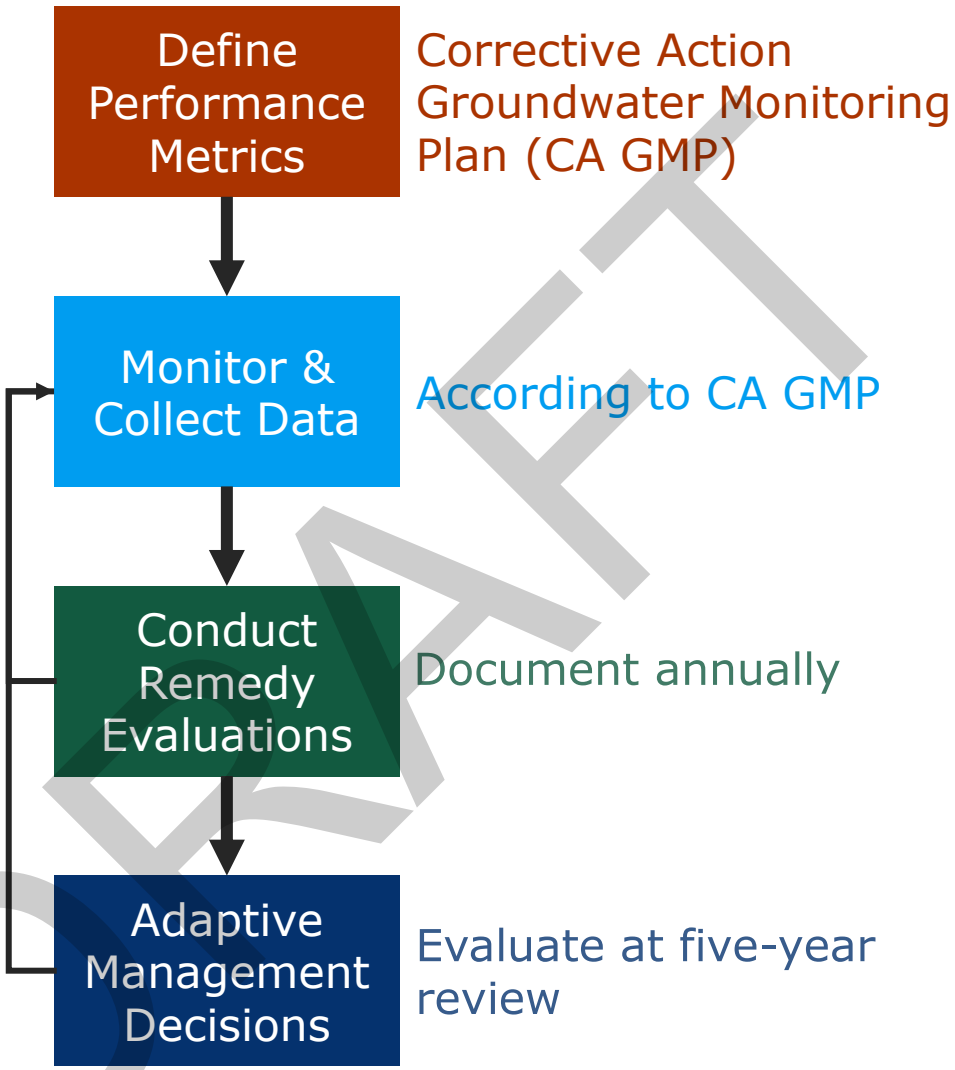
Table 3-1. Adaptive Site Management Metrics and Trigger Criteria
Corrective Action Groundwater Monitoring Plan
Baldwin Power Plant
Fly Ash Pond System
Baldwin, IL

QUESTION	Are COC concentrations greater than the GWPS?		Are concentrations of COCs at individual wells consistent with modeling expectations?[a]		Are the average COC concentrations decreasing?	Are concentrations of COCs at individual wells changing?	Adaptive Site Management Outcome
EVALUATION[b]	Compare data points or summary statistics to site-specific GWPS		Do the observed results track with the predicted results in general direction and magnitude? (Professional judgement)		Evaluate trend on quarterly average of well concentrations, both for last 8 data points and since corrective action initiated or closure completed	Evaluate trend of COCs at each well, both for last 8 data points and since corrective action initiated	
Inside Plume	Central tendency concentration of last eight data points above the GWPS	**AND**	Results inconsistent with model	**AND MORE THAN ONE OF**	Neither trend decreasing	Neither trend decreasing	**Additional Evaluation Triggered (See Figure 3-2)**
Lateral/Vertical Plume Definition	Central tendency concentration of last eight data points above the GWPS		Results inconsistent with model		--	Either trend increasing	

[O: AOC 07/22/24; C: CJC 12/05/24; U: AOC 02/06/25]

NOTES:
a. Only applies to wells included in the flow and transport model
b. To be documented in Annual Monitoring and Corrective Action Reports
-- = No relevant trigger criteria
COC = constituent of concern
CSM = conceptual site model
GWPS = groundwater protection standard

FIGURES



RAMBOLL

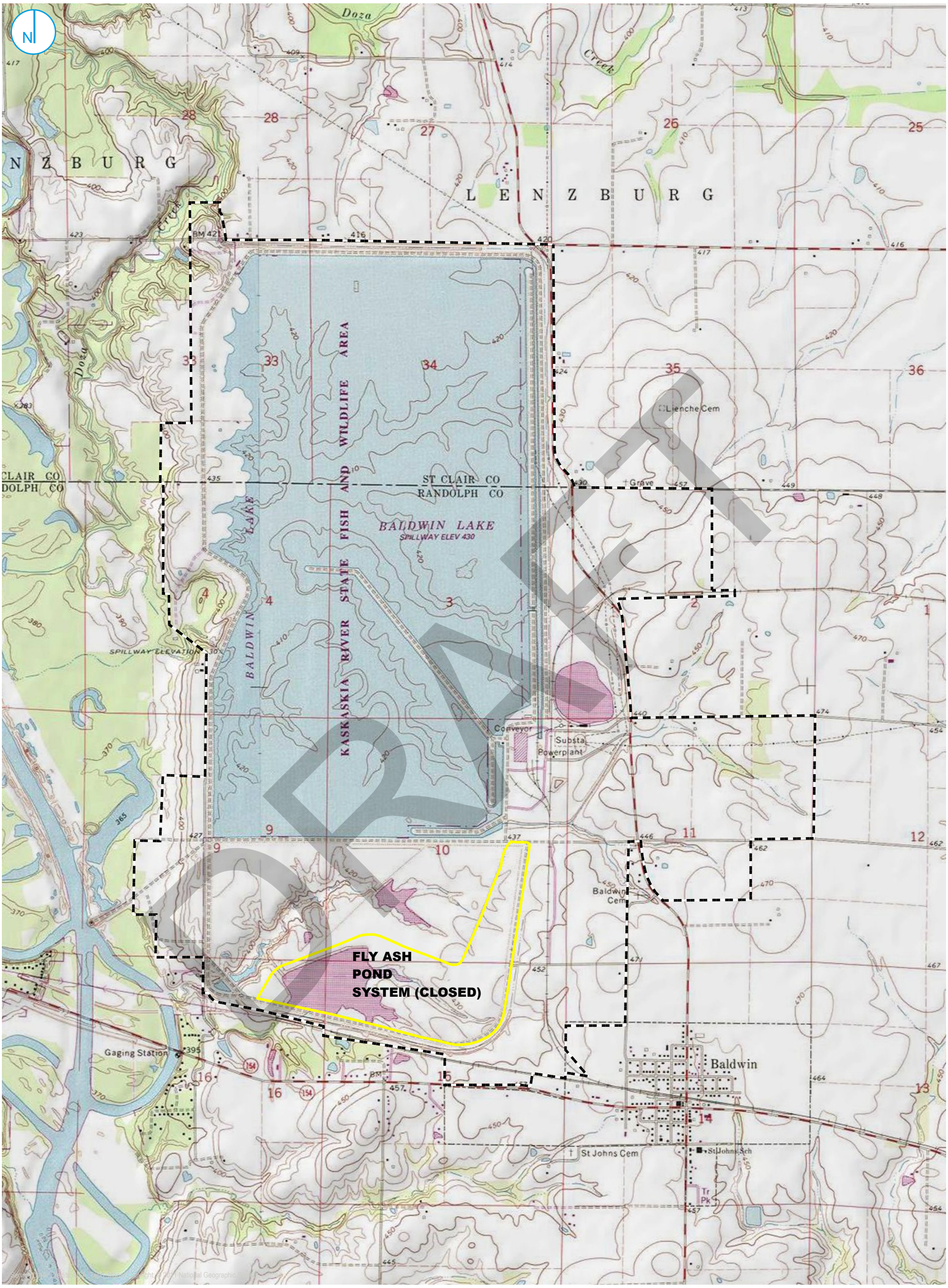
DRAFTED BY: AO

2/3/2025

CORRECTIVE ACTION MONITORING OUTLINE

CORRECTIVE ACTION GROUNDWATER MONITORING PLAN
BALDWIN POWER PLANT
FLY ASH POND SYSTEM
BALDWIN, ILLINOIS

Figure 1-1



REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 1,000 2,000
Feet

SITE LOCATION MAP

CORRECTIVE ACTION GROUNDWATER MONITORING PLAN
FLY ASH POND SYSTEM
BALDWIN POWER PLANT
BALDWIN, ILLINOIS

FIGURE 1-2

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
CAPPED AREA
PROPERTY BOUNDARY

0 400 800 Feet

SITE MAP

CORRECTIVE ACTION GROUNDWATER MONITORING PLAN
FLY ASH POND SYSTEM
BALDWIN POWER PLANT
BALDWIN, ILLINOIS

FIGURE 1-3

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

N

BALDWIN LAKE (COOLING POND)

MW-306

MW-392
428.69

MW-193

MW-394

MW-194

TPZ-160

OW-156

OW-256
(419.50)

MW-356
423.32

MW-192
(428.68)

MW-393

TPZ-159

XPW01
(428.09)

XPW02

MW-369
410.66

XPW06

PZ-169

XPW05
(432.48)

BOTTOM
ASH POND
TPZ-164

MW-154

MW-161

MW-370
402.52

PZ-170
(406.40)

XPW04

MW-383
439.12

MW-258
440.93

MW-358

MW-358R

MW-158R
(446.08)

PZ-171

MW-382
415.19

PZ-182
(414.16)

OW-257
(424.73)

OW-157

MW-155

MW-389

TPZ-165

MW-390
420.10

MW-355

SECONDARY
POND

MW-262

MW-366
410.86

TPZ-166

MW-162

MW-388

MW-384
443.02

OLD EAST FLY
ASH POND

KASKASKIA RIVER

PZ-172

MW-391

MW-391R

FLY ASH
POND SYSTEM
(CLOSED)

MW-373

WEST FLY
ASH POND

EAST
FLY
ASH POND

PZ-173
TERTIARY POND

MW-374

PZ-174

MW-350

MW-350R

MW-450
(377.71)

MW-375

PZ-175

MW-151

PZ-176
(393.68)

MW-377
414.26

PZ-177

MW-152
(418.81)

MW-104SR

MW-104DR

MW-304
445.97

MW-196

MW-197

PZ-178
(421.36)

MW-352

MW-252
(421.58)

MW-195

MW-198

MW-153
(431.68)

MW-253

NOTES:
1. ELEVATIONS IN PARENTHESES WERE NOT USED FOR CONTOURING.
2. ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

Service Layer Credits: World Imagery: Maxar

- COMPLIANCE MONITORING WELL
- BACKGROUND MONITORING WELL
- MONITORING WELL
- PORE WATER WELL
- CLOSED MONITORING WELL
- GROUNDWATER ELEVATION CONTOUR (10-FT CONTOUR INTERVAL, NAVD88)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- REGULATED UNIT (SUBJECT UNIT)
- SITE FEATURE
- CAPPED AREA
- PROPERTY BOUNDARY

0 400 800 Feet

POTENTIOMETRIC SURFACE MAP
NOVEMBER 10, 2024

CORRECTIVE ACTION GROUNDWATER MONITORING PLAN
FLY ASH POND SYSTEM
BALDWIN POWER PLANT
BALDWIN, ILLINOIS

FIGURE 1-4

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

MONITORING WELL
XXX INSIDE PLUME MONITORING WELL
XXX PLUME DEFINITION MONITORING WELL

REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
CAPPED AREA
PROPERTY BOUNDARY

0 400 800 Feet

PROPOSED 35 I.A.C. § 845 CORRECTIVE ACTION MONITORING WELL LOCATION MAP

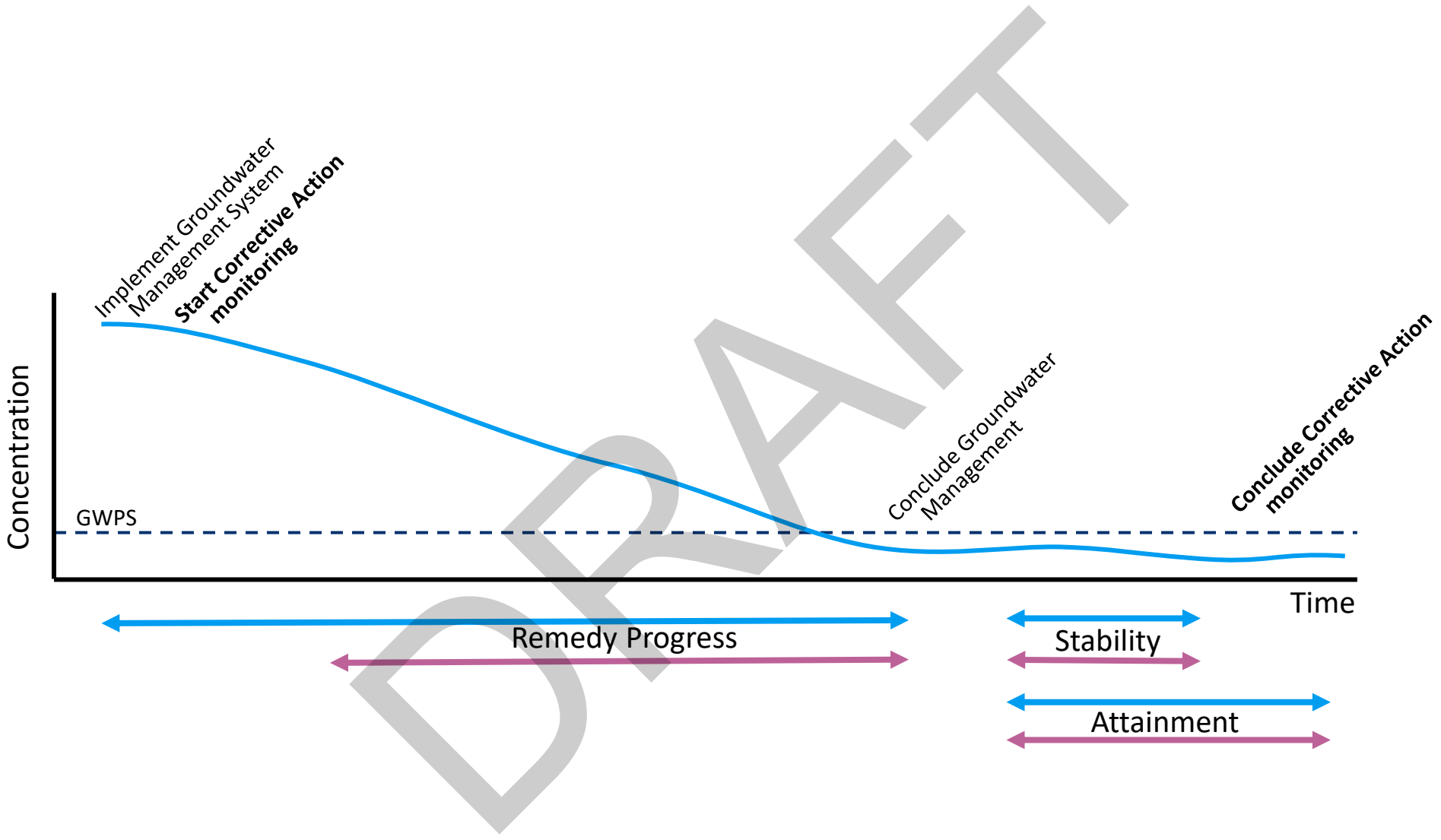
CORRECTIVE ACTION GROUNDWATER MONITORING PLAN
FLY ASH POND SYSTEM
BALDWIN POWER PLANT
BALDWIN, ILLINOIS

FIGURE 2-1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

Y:\Mapping\Projects\2292285\MXD\GMP\Baldwin\FAPS_6059845_CorrectiveAction\BAL_605_CA_GMP aprx\Figure 2-1. Proposed 845 CA Monitoring Well Location Map
PROJECT: 1690000XXXX | DATED: 2/7/2025 | DESIGNER: GALARNMC



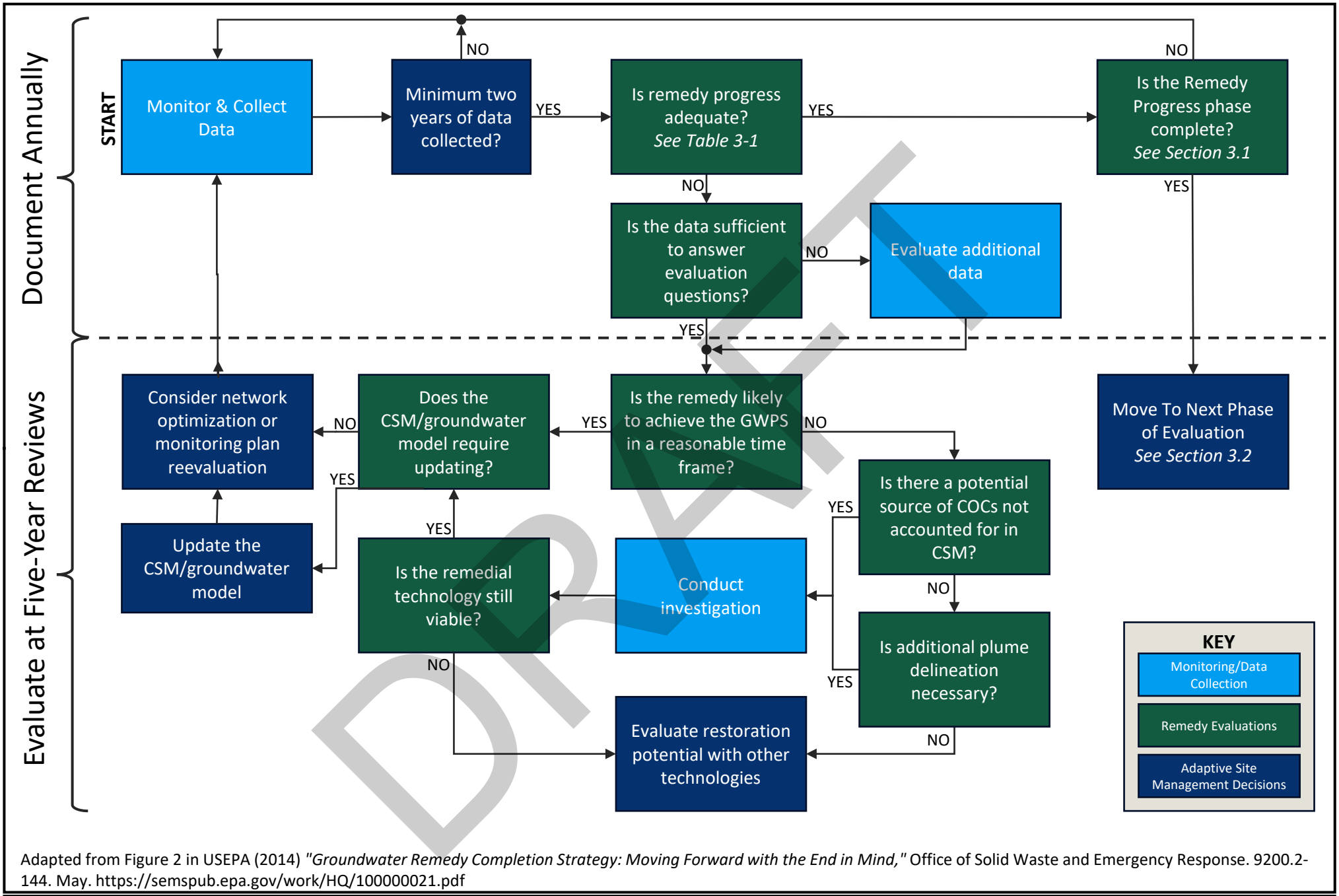
RAMBOLL

DRAFTED BY: AO | 2/3/2025

CORRECTIVE ACTION MONITORING TIMELINE

CORRECTIVE ACTION GROUNDWATER MONITORING PLAN
BALDWIN POWER PLANT
FLY ASH POND SYSTEM
BALDWIN, ILLINOIS

Figure 3-1



Adapted from Figure 2 in USEPA (2014) *"Groundwater Remedy Completion Strategy: Moving Forward with the End in Mind,"* Office of Solid Waste and Emergency Response. 9200.2-144. May. https://semspub.epa.gov/work/HQ/100000021.pdf

RAMBOLL

DRAFTED BY: AO | 10/23/2024

ADAPTIVE SITE MANAGEMENT DECISION-MAKING FLOW CHART

CORRECTIVE ACTION GROUNDWATER MONITORING PLAN
BALDWIN POWER PLANT
FLY ASH POND SYSTEM
BALDWIN, ILLINOIS

Figure 3-2

APPENDICES

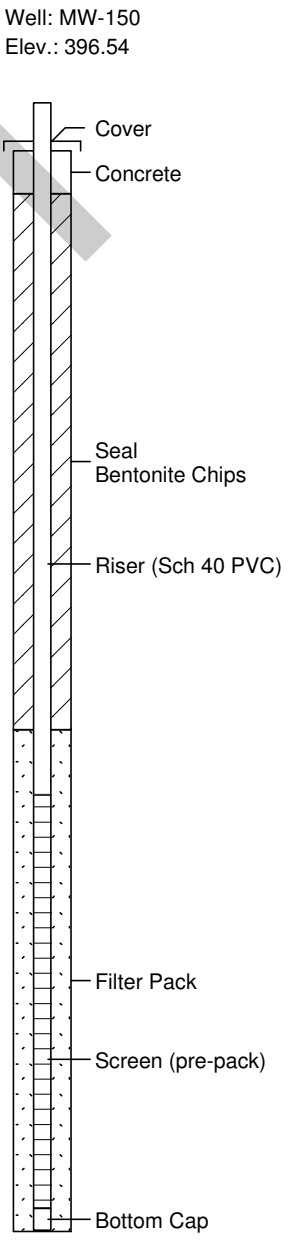
KELRON ENVIRONMENTAL
INCORPORATED

LOG OF BORING MW-150

Ash Pond System Monitoring Well Network
Baldwin Energy Complex
Dynegy Midwest Generation, Inc.
Location: Twp 04S, Rng 07W, 16 SE, NW, NE

Date Completed	: 09/08/2010	Driller	: Matt Cooper
Hole Diameter	: 8 1/2"OD; 4 1/4" ID	Geologist	: Brendon Wilder (PSC)
Drilling Method	: Hollow-Stem (CME-550)	Land Surface Elevation	: 393.84
Sampling Method	: MacroCore (60")	Top of Casing Elevation	396.54
Drilling Company	: Terra Drill, Inc.	X,Y Coordinates	: 2379413, 554563

Depth in Feet	DESCRIPTION	Surf. Elev. 393.84	Samples	Recovery inches	Qp TSF	USCS	GRAPHIC
0	Continous boring - no soil sampling conducted. Refer to boring log for adjacent nested well MW-350 for a description of subsurface materials	393					
5		388					
10		383					
15		378					
20		373					
25	END BOREHOLE AT 25.2 FEET BLS	368					
30							



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KELRON ENVIRONMENTAL
INCORPORATED

LOG OF BORING MW-350

Ash Pond System Monitoring Well Network
Baldwin Energy Complex
Dynegy Midwest Generation, Inc.
Location: Twp 04S, Rng 07W, 16 SE, NW, NE

Date Completed	: 09/07/2010	Driller	: Matt Cooper
Hole Diameter	: 8 1/2"OD / 4 1/4" ID: 3 7/8" rock	Geologist	: Brendon Wilder (PSC)
Drilling Method	: Hollow-Stem/Rotary (CME-550)	Land Surface Elevation	: 394.11
Sampling Method	: MacroCore (60")/NX Core	Top of Casing Elevation	396.80
Drilling Company	: PSC	X,Y Coordinates	: 2379410, 554568

Depth in Feet	DESCRIPTION	Surf. Elev. 394.11	Samples	Recovery inches	Qp TSF	USCS	GRAPHIC
0	CLAY, very stiff to hard, brown, grayish-brown (10YR 5/2) mottled yellowish brown (10YR 5/8), dry	394	1	19/54	4.5		
			2		2.25		
			3				
5	- grain size analysis @ 5 - 6 ft: 2.3% sand, 42.4% silt, 55.3% clay	389	4	47/60	4.5	CH	
			5		3.5		
			6		3.25		
			7		4.0		
10		384	8	60/60	2.75		
	CLAY, brown to olive brown, moist		9		2.75		
	- grain size analysis @ 11 - 12 ft: 8.4% sand, 39.3% silt, 52.3% clay		10		2.75		
			11		1.75	CL/CH	
			12		2.0		
15		379	13	45/60			
	CLAY, soft, high plasticity, dark yellow brown, moist; 1-2" sand seams at 17' and 19'						
	- grain size analysis @ 18 - 20 ft: 1.8% sand, 21.9% silt, 76.3% clay						
	- very stiff to hard, high plasticity						
20		374	14	60/60		CH	
			15	23/23			
25							

Well: MW-350
Elev.: 396.80

Cover
Concrete
Grout
Bentonite Slurry
Riser (Sch 40 PVC)

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KELRON ENVIRONMENTAL
INCORPORATED

LOG OF BORING MW-350

Ash Pond System Monitoring Well Network
Baldwin Energy Complex
Dynegy Midwest Generation, Inc.
Location: Twp 04S, Rng 07W, 16 SE, NW, NE

Date Completed	: 09/07/2010	Driller	: Matt Cooper
Hole Diameter	: 8 1/2"OD / 4 1/4" ID: 3 7/8" rock	Geologist	: Brendon Wilder (PSC)
Drilling Method	: Hollow-Stem/Rotary (CME-550)	Land Surface Elevation	: 394.11
Sampling Method	: MacroCore (60")/NX Core	Top of Casing Elevation	396.80
Drilling Company	: PSC	X,Y Coordinates	: 2379410, 554568

Depth in Feet	DESCRIPTION	Surf. Elev. 394.11
25	- Auger refusal at 26.4 feet bgs	369
	LIMESTONE and SHALE, interbedded, banded, solid, very soft, light to dark gray; slightly weathered	
	LIMESTONE, banded, medium bedded, solid, hard, medium gray; unweathered	
	LIMESTONE and SHALE, interbedded; limestone is banded, medium bedded, hard, medium gray; shale is very soft to medium soft, dark gray	
30		364
	Borehole diameter from 26.4 to 46.7 feet bgs = 3 7/8"	
	RQD for 26.4 - 36.4' = 72% (Fair) Recovery = 116/120"	
35		359
	SHALE, banded, medium bedded, solid, soft to medium soft, dark gray	
40		354
	LIMESTONE, banded, massive, solid, hard to very hard, light to medium gray	
45	RQD for 36.4 - 46.4' = 96% (Excellent) Recovery = 118/120"	349
	END BOREHOLE AT 46.7 FEET BLS	
50		

Samples	Recovery inches	Qp TSF	USCS	GRAPHIC
15	23/23		CL	
			LS/SH	
			LS	
16	116/120		LS/SH	
			SH	
17	118/120		LS	

Well: MW-350
Elev.: 396.80

Grout
Bentonite Slurry
Seal
Bentonite Chips
Riser (Sch 40 PVC)
Filter Pack
Screen (pre-pack)
Bottom Cap

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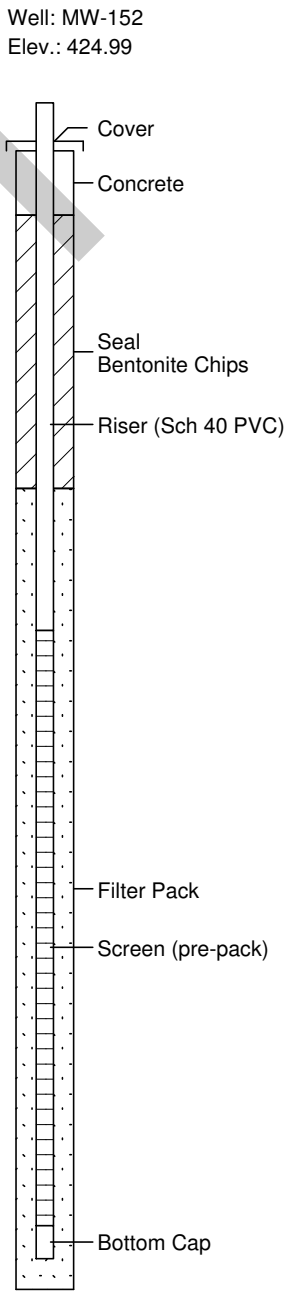
KELRON ENVIRONMENTAL
INCORPORATED

LOG OF BORING MW-152

Ash Pond System Monitoring Well Network
Baldwin Energy Complex
Dynegy Midwest Generation, Inc.
Location: Twp 04S, Rng 07W, 16 SE, NE, NE

Date Completed	: 09/22/10	Driller	: Matt Cooper
Hole Diameter	: 8 1/2"OD / 4 1/4" ID	Geologist	: Brendon Wilder (PSC)
Drilling Method	: Hollow-Stem/Rotary (CME-550)	Land Surface Elevation	: 422.18
Sampling Method	: MacroCore (60")	Top of Casing Elevation	424.99
Drilling Company	: PSC	X,Y Coordinates	: 2382779, 553906

Depth in Feet	DESCRIPTION	Surf. Elev. 422.18	Samples	Recovery inches	Qp TSF	USCS	GRAPHIC
0	Continuous boring - no soil sampling conducted.	422					
	Refer to boring log for adjacent nested well MW-352 for a description of subsurface materials.						
5		417					
10		412					
15		407					
	END BOREHOLE AT 17.7 FEET BLS						
20							



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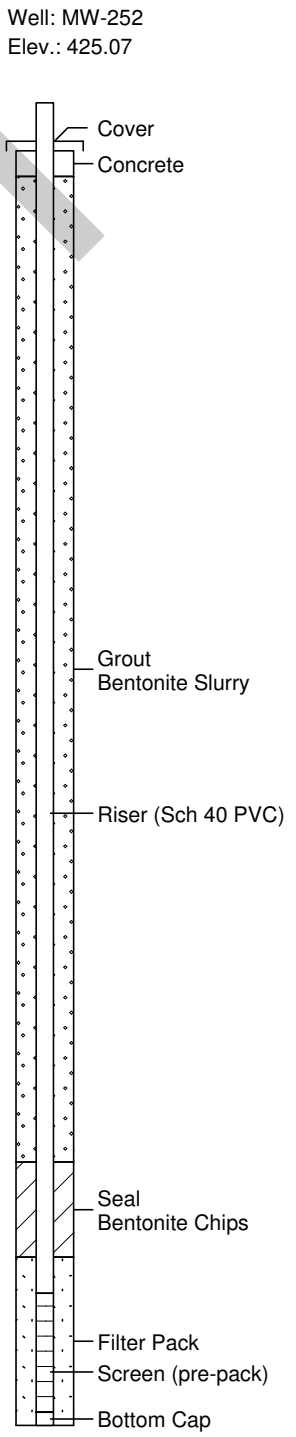
KELRON ENVIRONMENTAL
INCORPORATED

LOG OF BORING MW-252

Ash Pond System Monitoring Well Network
Baldwin Energy Complex
Dynegy Midwest Generation, Inc.
Location: Twp 04S, Rng 07W, 16 SE, NE, NE

Date Completed	: 09/22/10	Driller	: Matt Cooper
Hole Diameter	: 8 1/2"OD / 4 1/4" ID	Geologist	: Brendon Wilder (PSC)
Drilling Method	: Hollow-Stem/Rotary (CME-550)	Land Surface Elevation	: 422.27
Sampling Method	: MacroCore (60")	Top of Casing Elevation	425.07
Drilling Company	: PSC	X,Y Coordinates	: 2382784, 553904

Depth in Feet	DESCRIPTION	Surf. Elev. 422.27	Samples	Recovery inches	Qp TSF	USCS	GRAPHIC
0	Continuous boring - no soil sampling conducted.	422					
	Refer to boring log for adjacent nested well MW-352 for a description of subsurface materials.						
5		417					
10		412					
15		407					
20		402					
25		397					
30		392					
35		387					
40		382					
45		377					
50	END BOREHOLE AT 49.54 FEET BLS						



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KELRON ENVIRONMENTAL
INCORPORATED

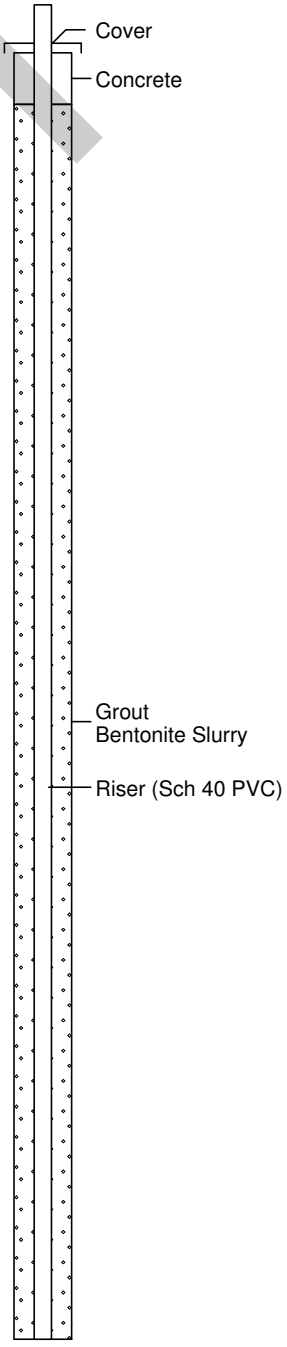
LOG OF BORING MW-352

Ash Pond System Monitoring Well Network
Baldwin Energy Complex
Dynegy Midwest Generation, Inc.
Location: Twp 04S, Rng 07W, 16 SE, NE, NE

Date Completed	: 09/16/2010	Driller	: Matt Cooper
Hole Diameter	: 8 1/2"OD / 4 1/4" ID: 3 7/8" rock	Geologist	: Brendon Wilder (PSC)
Drilling Method	: Hollow-Stem/Rotary (CME-550)	Land Surface Elevation	: 422.36
Sampling Method	: MacroCore (60")/NX Core	Top of Casing Elevation	425.04
Drilling Company	: PSC	X,Y Coordinates	: 2382789, 553901

Depth in Feet	DESCRIPTION	Surf. Elev. 422.36	Samples	Recovery inches	Qp TSF	USCS	GRAPHIC
0	SILTY CLAY, very stiff to hard, yellow brown (10YR 5/6), dry	422	1	46/48	4.5+	CL	
			2	60/60	3.5		
5	CLAY, trace sand and fine gravel, very stiff, high plasticity, few black organic material	417	3		4.0		
			4		2.75		
			5		3.0		
10	- medium hard	412	6	60/60	2.75	CL	
	- soft		7		2.0		
			8		1.0		
			9		1.25		
15	- medium hard	407	10	60/60	1.5		
			11		2.5		
	SAND, poorly graded, loose, wet (4-inch thick)		12		2.75	SP	
	SANDY CLAY, trace fine gravel, yellow brown to olive brown (2.5Y 5/3)		13		3.5		
20		402	14	60/60	4.5+	CL	
			15		2.5		
			16		2.5		
			17		2.75		
25			18	48/60	2.5		

Well: MW-352
Elev.: 425.04



KELRON ENVIRONMENTAL
INCORPORATED

LOG OF BORING MW-352

Ash Pond System Monitoring Well Network
Baldwin Energy Complex
Dynegy Midwest Generation, Inc.
Location: Twp 04S, Rng 07W, 16 SE, NE, NE

Date Completed	: 09/16/2010	Driller	: Matt Cooper
Hole Diameter	: 8 1/2"OD / 4 1/4" ID: 3 7/8" rock	Geologist	: Brendon Wilder (PSC)
Drilling Method	: Hollow-Stem/Rotary (CME-550)	Land Surface Elevation	: 422.36
Sampling Method	: MacroCore (60")/NX Core	Top of Casing Elevation	425.04
Drilling Company	: PSC	X,Y Coordinates	: 2382789, 553901

Well: MW-352
Elev.: 425.04

Depth in Feet	DESCRIPTION	Surf. Elev. 422.36	Samples	Recovery inches	Qp TSF	USCS	GRAPHIC
25	- grain size analysis @ 26.5 - 27.5 ft: 33.7% sand, 27.1% silt, 39.2% clay	397	18	48/60	2.5	CL	
	SAND with few gravel, yellow brown					SP	
	CLAY, some sand and fine gravel, hard to very hard, high plasticity, dark yellow brown (10YR 4/6)					CL	
			19	60/60	3.0		
30	CLAY, lean to fat	392	20		3.0		
	- grain size analysis @ 32 - 33 ft: 13.2% sand, 43.9% silt, 42.8% clay		21		3.5		
			22		3.0		
35		387	23	48/60	1.5		
	- medium hard, high plasticity, gray brown to light olive brown (2.5Y 5/2-5/3)		24		1.5		
	- trace silt, dark yellow brown (10YR 4/4)		25		1.75	CL/CH	
			26		1.5		
40		382	27	54/60	1.75		
			28		2.0		
			29		2.5		
			30		2.5		
45		377	31	57/60	2.0		
			32		1.75		
			33		1.75		
	CLAY, medium hard, low plasticity, olive brown (2.5Y 5/4)		34		2.5		
			35		1.75	CL	
50			36	3/3			

Grout
Bentonite Slurry

Riser (Sch 40 PVC)

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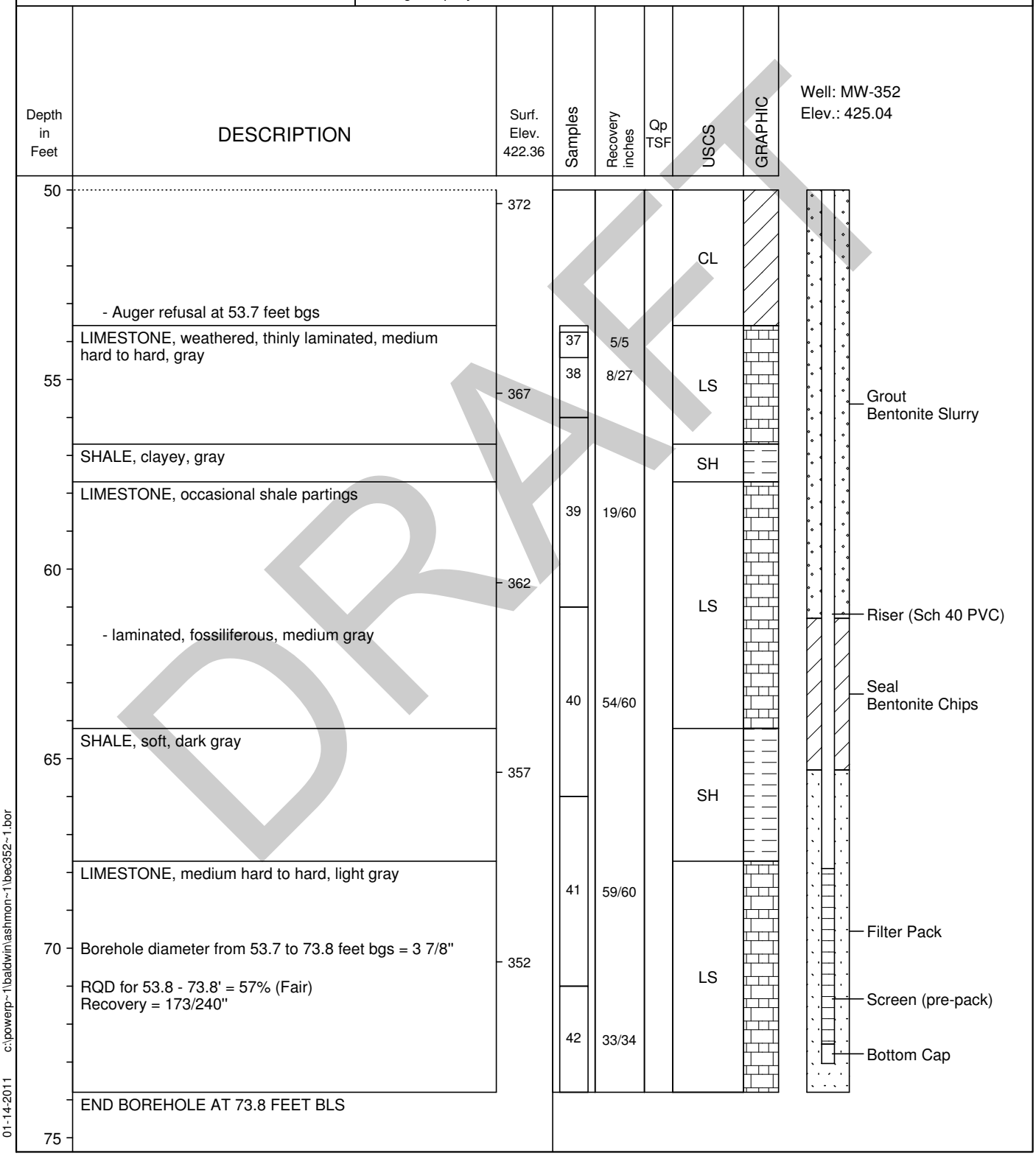
KELRON ENVIRONMENTAL
INCORPORATED

LOG OF BORING MW-352

Ash Pond System Monitoring Well Network
Baldwin Energy Complex
Dynegy Midwest Generation, Inc.
Location: Twp 04S, Rng 07W, 16 SE, NE, NE

Date Completed	: 09/16/2010	Driller	: Matt Cooper
Hole Diameter	: 8 1/2"OD / 4 1/4" ID: 3 7/8" rock	Geologist	: Brendon Wilder (PSC)
Drilling Method	: Hollow-Stem/Rotary (CME-550)	Land Surface Elevation	: 422.36
Sampling Method	: MacroCore (60")/NX Core	Top of Casing Elevation	425.04
Drilling Company	: PSC	X,Y Coordinates	: 2382789, 553901



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KELRON ENVIRONMENTAL
INCORPORATED

LOG OF BORING MW-253

Ash Pond System Monitoring Well Network
Baldwin Energy Complex
Dynegy Midwest Generation, Inc.
Location: Twp 04S, Rng 07W, 15 SW, SW, NE

Date Completed	: 09/20/2010	Driller	: Matt Cooper
Hole Diameter	: 8 1/2"OD / 4 1/4" ID	Geologist	: Brendon Wilder (PSC)
Drilling Method	: Hollow-Stem/Rotary (CME-550)	Land Surface Elevation	: 442.70
Sampling Method	: MacroCore (60")	Top of Casing Elevation	445.84
Drilling Company	: PSC	X,Y Coordinates	: 2384430, 553298

Depth in Feet	DESCRIPTION	Surf. Elev. 442.70	Samples	Recovery inches	Qp TSF	USCS	GRAPHIC
0	SILTY CLAY, trace gravel, hard, light brown, dry	442	1	25/48	4.5+		
			2		4.5+		
5	- hard, medium plasticity, gray (2.5Y 6/1) with yellow-brown mottling (10YR 5/6), moist	437	3	47/60	4.5	CL	
			4		4.5		
			5		4.5		
10		432	6	53/60	4.5		
	CLAY (fat) with SAND, trace gravel, dark yellow brown with light gray mottling, mottling decreases with depth - grain size analysis @ 11 - 12 ft: 0.7% gravel, 16.4% sand, 41.4% silt, 41.4% clay		7		4.0		
			8		4.0		
			9		3.0		
15		427	10	52/60	4.5	CH	
			11		3.5		
			12		3.5		
	- soft		13		2.0		
	CLAY (lean) with SAND, trace gravel, stiff to hard, medium plasticity, dark yellow brown		14	60/60		CL	
20							

Well: MW-253
Elev.: 445.84

Cover
Concrete
Riser (Sch 40 PVC)
Grout
Bentonite Slurry

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KELRON ENVIRONMENTAL
INCORPORATED

LOG OF BORING MW-253

Ash Pond System Monitoring Well Network
Baldwin Energy Complex
Dynegy Midwest Generation, Inc.
Location: Twp 04S, Rng 07W, 15 SW, SW, NE

Date Completed	: 09/20/2010	Driller	: Matt Cooper
Hole Diameter	: 8 1/2"OD / 4 1/4" ID	Geologist	: Brendon Wilder (PSC)
Drilling Method	: Hollow-Stem/Rotary (CME-550)	Land Surface Elevation	: 442.70
Sampling Method	: MacroCore (60")	Top of Casing Elevation	445.84
Drilling Company	: PSC	X,Y Coordinates	: 2384430, 553298

Well: MW-253
Elev.: 445.84

Depth in Feet	DESCRIPTION	Surf. Elev. 442.70	Samples	Recovery inches	Qp TSF	USCS	GRAPHIC
20	- grain size analysis @ 19 - 19.5 ft: 0.7% gravel, 26.9% sand, 38.1% silt, 34.3% clay	422	14	60/60		CL	
25	- small fine sand seams from 25 to 27 feet	417	15	60/60			
	CLAY (fat), shaley, platy/laminated, soft, low plasticity, light yellow brown (10YR 6/4)		16		3.5		
	- stiff to very stiff, light olive brown (2.5Y 5/4) - grain size analysis @ 29 - 30 ft: 6.7% sand, 21.6% silt, 71.7% clay		17		3.0		
30		412	18	60/60	4.5	CH	
			19		3.5		
			20		3.0		
	- Drove split-spoon 2-inches into bedrock: 34.5 to 34.7 feet bls						
	LIMESTONE with SHALE		21	2/2		LS/SH	
35	Auger refusal at 35.0 feet END BOREHOLE AT 35.0 FEET BLS	407					
40							

Grout
Bentonite Slurry
Riser (Sch 40 PVC)
Seal
Bentonite Chips
Filter Pack
Screen (pre-pack)
Bottom Cap

KELRON ENVIRONMENTAL
Incorporated

LOG OF PROBEHOLE OW-257

Phase II Hydrogeologic Investigation
Baldwin Energy Complex
Dynegy Midwest Generation, Inc.

Date Completed	: 08/16/2013	Driller	: John Gates
Hole Diameter	: 8 1/2" OD / 4 1/4" ID	Geologist	: Stuart Cravens (Kelron)
Drilling Method	: HSA (CME-55LC)	Ground Elevation	: 428.17
Sampling Method	: MacroCore (60")	Casing (MP) Elevation	: 431.02
Drilling Company	: Bulldog Drilling, LLC	X,Y Coordinates	: 2382572, 556198

Depth in Feet	DESCRIPTION	Surf. Elev. 428.17	Samples	Recovery inches	Qp TSF	USCS	GRAPHIC
0	Continuous boring to 18.5 feet below ground surface. Refer to boring log for adjacent well OW-157.						
5		425					
		420				CL	
10							
15		415					
		410					
20	Silty CLAY, trace sand and gravel, stiff, high plasticity, gray (10YR 6/1) with 25-50% reddish-brown mottling, moist [TILL]		1 2	56/60	3.0 2.75	CL	

Well: OW-257
Elev.: 431.02

Cover
Concrete
Seal
Bentonite Grout
Riser (Sch 40 PVC)

KELRON ENVIRONMENTAL
Incorporated

LOG OF PROBEHOLE OW-257

Phase II Hydrogeologic Investigation
Baldwin Energy Complex
Dynegy Midwest Generation, Inc.

Date Completed	: 08/16/2013	Driller	: John Gates
Hole Diameter	: 8 1/2" OD / 4 1/4" ID	Geologist	: Stuart Cravens (Kelron)
Drilling Method	: HSA (CME-55LC)	Ground Elevation	: 428.17
Sampling Method	: MacroCore (60")	Casing (MP) Elevation	: 431.02
Drilling Company	: Bulldog Drilling, LLC	X,Y Coordinates	: 2382572, 556198

Well: OW-257
Elev.: 431.02

Depth in Feet	DESCRIPTION	Surf. Elev. 428.17	Samples	Recovery inches	Qp TSF	USCS	GRAPHIC
20	- >50% mottling		2		2.75	CL	
	Sandy CLAY with gravel (fine-coarse, sub-angular; granite piece of 1.5"), brownish yellow (10YR 6/6), wet		3		2.5	CL	
	Silty CLAY, trace sand and gravel, soft, high plasticity, yellowish brown (10YR5/6) with 10-25% light gray mottling	405	4		1.0		
			5		1.5		
	- very soft, brownish yellow with <10% mottling		6	60/60	0.5		
25	- with trace pyrite crystals		7		1.0		
	- medium hardness grading to stiff		8		2.0		
			9		2.0		
		400	10		3.25		
			11	60/60	1.5	CL	
30			12		3.5		
	- stiff, high plasticity, gray with <10% reddish-brown mottling, moist		13		2.75		
			14		2.0		
	- very stiff, dark gray (10YR 4/1)	395	15		3.5		
			16	60/60	2.0		
35			17		2.0		
	- low plasticity, very dark gray (10YR 3/1)		18		4.0		
	SHALE and CLAY (fat), intermittent lamination, hard, very dark gray, moist [note: top of weathered bedrock at 36.3 feet below ground surface]		19		3.0		
		390	20		>4.5	SH/CL	
			21	13/13			
40	END BOREHOLE at 39.6 feet BLS						

Seal
Bentonite Grout

Riser (Sch 40 PVC)

Seal
Bentonite Chips

Filter Pack

Screen (pre-pack)
2"ID/3.5"OD; 4.50'open

Bottom Cap

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Baldwin Energy Complex		MW-366

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Jim Dittmaier Bulldog Drilling	12/3/2015	12/4/2015	4 1/4 HSA and rotary

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
MW-366	Feet (NAVD88)	422.54 Feet (NAVD88)	8.3 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒

State Plane 555,581.80 N, 2,381,171.15 E E/W

1/4 of 1/4 of Section , T N, R

Lat 38° 11' 31.8876"

Long -89° 52' 20.4414"

Local Grid Location ☐N ☐S Feet ☐E ☐W Feet

Facility ID	County	State	Civil Town/City/ or Village
	Randolph	Illinois	Baldwin

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1 2 3 4 5 6 7 8 9 10 11 12	0 - 5.6' **FILL, SILTY CLAY** CL/ML. 5.6 - 33' **SILTY CLAY** CL/ML.	(FILL) CL/ML CL/ML								0-33' Blind Drilled. See logs TPZ-166 and B-13-4 for soil description.

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Brad Rucker

Firm Natural Resource Technology
234 W. Florida St., Fifth Floor, Milwaukee, WI 53204
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Fax: (414) 837-3608

NATURAL RESOURCE TECHNOLOGY

Boring Number MW-366

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)							Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			13	5.6 - 33' **SILTY CLAY** CL/ML. *(continued)*									
			14										
			15										
			16										
			17										
			18										
			19										
			20										
			21										
			22		CL/ML								
			23										
			24										
			25										
			26										
			27										
			28										
			29										
			30										
			31										
			32										

NATURAL RESOURCE TECHNOLOGY

Boring Number MW-366

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			33	5.6 - 33' **SILTY CLAY** CL/ML. *(continued)*	CL/ML								
1 SS	23 18	17 21 20 50	33	33 - 35.6' **LEAN CLAY:** to **SHALE:** CL, gray, residual soil, hard (>4.5 tsf).	CL								
			34										
			35										
1 CORE	60 54		36	35.6 - 39.3' **SHALE:** BDX (SH), gray, highly decomposed, moderately fractured.	BDX (SH)								Core 1, RQD=54%
			37										
			38	38.4' limestone layer (approximately 2.5").									
			39										
			40	39.3 - 42.3' **LIMESTONE:** BDX (LS), cherty, intensely fractured.									
2 CORE	60 47		41		BDX (LS)								Core 2, RQD=32%
			42										
			43	42.3 - 42.9' **SHALE:** BDX (SH), dark gray, intensely fractured.	BDX (SH)								
				42.9 - 43.7' **SHALEY LIMESTONE:** BDX (LS/SH), intensely fractured.	BDX (LS/SH)								
			44	43.7 - 49.8' **SHALE:** BDX (SH), dark gray, moderately fractured.									
			45										
3 CORE	60 63		46										Core 3, RQD=73%
			47		BDX (SH)								
			48										
			49										
			50	49.8 - 54.3' **SHALEY LIMESTONE:** BDX (LS/SH), fossiliferous, slightly fractured.									
4 CORE	60 49		51		BDX (LS/SH)								Core 4, RQD=96%
			52										

NATURAL RESOURCE TECHNOLOGY

Boring Number MW-366

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)							Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			53	49.8 - 54.3' **SHALEY LIMESTONE**: BDX (LS/SH), fossiliferous, slightly fractured. *(continued)* 52.8' - 53.1 shale bed. 53.1' fossiliferous.	BDX (LS/SH)								
			54	54.3' End of Boring.									Bedrock corehole reamed 6" in diameter to 54' for well installation.

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Baldwin Energy Complex		MW-384

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chad Dutton Bulldog Drilling	12/7/2015	12/16/2015	4 1/4 HSA and rotary

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
MW-384	Feet (NAVD88)	456.70 Feet (NAVD88)	8.3 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒

State Plane 555,446.11 N, 2,384,518.72 E E/Ⓦ

1/4 of 1/4 of Section , T N, R

Lat 38° 11' 30.4398"

Long -89° 51' 38.5158"

Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Randolph	Illinois	Baldwin

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	24 8	2 3 4 6	1	0 - 2.5' **FILL, ASH (Coal):** very soft to moderately stiff (0-0.75 tsf).	(FILL)								
2 SS	24 19	2 4 3 6	2 3	2.5 - 4' **FILL, SILTY CLAY** CL/ML, strong brown (7.5YR 4/6), trace gravel, very soft to very stiff (0-3.5 tsf).	(FILL) CL/ML								
3 SS	24 10	1 2 3 4	4 5	4 - 18' **FILL, ASH (Coal):** yellowish red (5YR 4/6) to reddish black (10R 2.5/1), sand-sized ash and cinders, very soft to stiff (0-1.5 tsf).									
4 SS	24	2 2 2 2	6 7										
5 SS	24	1 2 1 1	8 9		(FILL)								
6 SS	24	1 2 1 1	10 11 12										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

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NATURAL RESOURCE TECHNOLOGY

Boring Number MW-384

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 SS	24	1 5 10 10	13	4 - 18' **FILL, ASH (Coal):** yellowish red (5YR 4/6) to reddish black (10R 2.5/1), sand-sized ash and cinders, very soft to stiff (0-1.5 tsf). *(continued)*									
8 SS	24 14	5 10 11 11	14 15	14' wet.	(FILL)								
9 SS	24 14	5 8 14 15	16 17										
10 SS	24 16	2 2 3 4	18 19	18 - 22' **SILTY CLAY** CL/ML, gray (5Y 6/1), organic odor, stiff to very stiff (1.25-3.75 tsf), wet.									
11 SS	24 18	2 2 6 4	20 21		CL/ML								
12 SS	24 16	4 4 5 4	22 23	22 - 24' **SILT:** ML, very dark gray (10YR 3/1), dark yellowish brown (10YR 3/6) mottling, hard (4.25-4.5 tsf).	ML								
13 SS	24 22	1 2 5 7	24 25	24 - 42.4' **SILTY CLAY** CL/ML, gray (10YR 5/1) with yellowish brown (10YR 5/8), oxidation staining, very soft to hard (<0.25-4.5+ tsf).									Permanent 6" PVC casing set at 25' bgs.
14 SS	24 21	3 4 5 7	26 27	26' yellowish brown (10YR 5/4), trace yellowish brown (10YR 5/8) and very dark gray (10YR 3/1) mottling, 15-30% silt, 5-15% fine sand, trace fine gravel, stiff to very stiff (1.25-2.5 tsf), low to medium plasticity, moist.									
15 SS	24 21	3 4 5 6	28 29	28' color grades to gray (10YR 5/1), 30-50% silt, soft to stiff (0.5-1.25 tsf).	CL/ML								
16 SS	24 17.5	1 5 5 7	30 31	30' yellowish brown (10YR 5/8) mottling (15-30%), trace very dark gray (10YR 3/1) mottling, no gravel, very soft to very stiff (<0.25-2.5 tsf), medium plasticity.									
			32										

NATURAL RESOURCE TECHNOLOGY

Boring Number MW-384

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
17 SS	24 / 20.5	4 4 4 6		24 - 42.4' **SILTY CLAY** CL/ML, gray (10YR 5/1) with yellowish brown (10YR 5/8), oxidation staining, very soft to hard (<0.25-4.5+ tsf). *(continued)*									
			33	32' trace yellowish brown (10YR 5/8) and very dark gray (10YR 3/1) mottling, 15-30% silt, stiff to very stiff (1.75-3.5 tsf).									
18 SS	24 / 22	3 4 5 7	34	34' yellowish brown (10YR 5/8) mottling (15-30%), trace very dark gray (10YR 3/1) mottling, stiff to very stiff (1.5-2.5), dry to moist.									
			35										
				35.3' yellowish brown (10YR 5/8), trace gray (10YR 5/1) and very dark gray (10YR 3/1) mottling.									
19 SS	24 / 21	4 3 3 4	36	36' gray (10YR 5/1) mottling (15-30%), silt content increasing with depth, moderately stiff to stiff (0.75-1.25 tsf), low plasticity, moist.									
			37		CL/ML								
20 SS	24 / 24	2 4 7 14	38	38' grayish brown (10YR 5/2), trace gray (10YR 5/1), trace strong brown (7.5YR 4/6) mottling, 30-50% silt, soft to very stiff (0.5-3.75 tsf).									
			39	38.7' - 40' very dark gray (10YR 3/1) mottling (5-15%), 5-15% fine gravel.									
21 SS	24 / 25	3 11 21 44	40	40' sand (5-15%), trace gravel, very stiff to hard (3.5-4.5+ tsf).									
				40.3' wet.									
			41	40.8' very stiff to hard (3.5-4.5+ tsf), moist.									
			42	41.8' fine sand seam (1/4" thick).									
22 SS	24 / 20	13 11 15 17		42' - 42.4' fine gravel, 30-50% clay, trace sand, wet.									
			43	42.4 - 44.3' **CLAYEY SILT** ML/CL, gray (10YR 5/1) to grayish brown (10YR 5/2), 30-50% clay, 5-15% fine sand, trace subrounded gravel, very stiff to hard (3.5-4.5+), nonplastic to low plasticity, moist.	ML/CL								
23 SS	24 / 17	6 8 10 14	44	43.5' - 44.3' very dark grayish brown (10YR 3/2), brownish yellow trace (10YR 6/6) mottling, trace coal.									
			45	44.3 - 56' **LEAN CLAY:** CL, brownish yellow trace (10YR 6/6), trace light brownish gray (10YR 6/2) mottling, 15-30% silt, 5-15% gravel, trace gravel-sized oxidation-stained nodules, very stiff (2.5-3.0 tsf), low to medium plasticity, moist to dry.									
24 SS	24 / 16	5 10 11 15	46	46' decreasing silt content, trace gravel, clay becoming laminated with depth, very stiff (2.25-3.0 tsf).									
			47										
25 SS	24 / 13.5	6 8 12 22	48	48' silt (5-15%), trace shale gravel, very stiff (3.0 tsf), medium plasticity, dry.	CL								
			49										
				49.2' gravel (2" diameter).									
26 SS	24 / 16	8 9 15 19	50	50' very dark grayish brown (10YR 3/2) to dark grayish brown (10YR 4/2), trace silt, very stiff (3.5 tsf), medium to high plasticity, highly weathered shale (residual soil).									
			51										
			52										

NATURAL RESOURCE TECHNOLOGY

Boring Number MW-384

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
27 SS	24 22	13 14 9 14	53	44.3 - 56' **LEAN CLAY:** CL, brownish yellow trace (10YR 6/6), trace light brownish gray (10YR 6/2) mottling, 15-30% silt, 5-15% gravel, trace gravel-sized oxidation-stained nodules, very stiff (2.5-3.0 tsf), low to medium plasticity, moist to dry. *(continued)*									
28 SS	24 24	12 12 14 22	54 55	52' - 54' clay is fractured, light brownish gray (10YR 6/2) to light yellowish brown (10YR 6/4) in fractures. 54' trace very dark brown (10YR 2/2) laminations, hard (>4.5 tsf).	CL								
29 SS	23 20	11 14 20 50/5"	56	56 - 58.2' **SHALE:** BDX (SH), very dark gray (10YR 3/1), highly weathered, fissile, totally healed fractures, very weak, highly decomposed [light brownish gray (10YR 6/2) in fractures], very intensely fractured (closed to narrow apertures). 57' light yellowish brown (10YR 6/4) to very dark gray (10YR 3/1) layers, thinly bedded, highly decomposed to residual soil.	BDX (SH)								3" steel casing set at 57.7 ft bgs.
1 CORE	24 40		57 58										Core 1, RQD=36%
2 CORE	60 64		59 60	58.2 - 60.8' **LIMESTONE:** BDX (LS), light greenish gray (GLEY 1 7/10Y), microcrystalline, trace fossils, moderately strong to strong, medium bedded, slightly to moderately decomposed, moderately fractured.	BDX (LS)								Core 2, RQD=73%
			61 62	60.8 - 64' **SHALEY LIMESTONE:** BDX (LS/SH), weak, thin to medium bedded, moderately decomposed, slightly to moderately disintegrated.	BDX (LS/SH)								
3 CORE	60 73		63 64 65 66 67	64 - 82.6' **SHALE:** BDX (SH), greenish gray (GLEY 1 5/10Y), very weak, thinly bedded, highly to moderately decomposed, slightly to moderately disintegrated, intensely fractured (very narrow to moderately narrow apertures).									Core 3, RQD= 58%
			68	67.9' - 68.8' shale clasts within decomposed shale matrix.	BDX (SH)								
4 CORE	60 63		69 70	68.8' - 69.2' light yellowish brown (10YR 6/4), trace dark yellowish brown (10YR 3/6) layers. 69.2' - 74' intensely fractured (extremely narrow to narrow aperture).									Core 4, RQD=46%
			71 72										

NATURAL RESOURCE TECHNOLOGY

Boring Number MW-384

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			73	64 - 82.6' **SHALE:** BDX (SH), greenish gray (GLEY 1 5/10Y), very weak, thinly bedded, highly to moderately decomposed, slightly to moderately disintegrated, intensely fractured (very narrow to moderately narrow apertures). *(continued)*									
5 CORE	60 20		74	74' - 79' intensely to very intensely fractured.									Core 5, RQD=0%
			75										
			76										
			77		BDX (SH)								Bedrock corehole reamed 6" in diameter to 77' for well installation.
			78										
6 CORE	60 64		79	79' - 82.6' intensely fractured.									Core 6, RQD=64%
			80										
			81										
			82										
			83	82.6 - 83.9' **SHALEY LIMESTONE:** BDX (LS/SH), light greenish gray (GLEY 1 7/10Y), fossiliferous, intensely fractured (extremely narrow to narrow apertures), slightly decomposed.	BDX (LS/SH)								
7 CORE	60 37		84	83.9 - 85.6' **SHALE:** BDX (SH), greenish gray (GLEY 1 5/10Y), very weak, medium bedded, highly to moderately decomposed, slightly to moderately disintegrated, intensely fractured (extremely narrow to narrow apertures).	BDX (SH)								Core 7, RQD=15%
			85										
			86	85.6 - 88.7' **SHALEY LIMESTONE:** BDX (LS/SH), light greenish gray (GLEY 1 7/10Y), shaley, fossiliferous, intensely fractured (extremely narrow to narrow apertures), slightly decomposed.									
			87	86.4' - 87' SHALE layer, greenish gray (GLEY 1 5/10Y), very weak, medium bedded.	BDX (LS/SH)								
			88										
			89	88.7 - 94.1' **SHALE:** BDX (SH), greenish gray (GLEY 1 5/10Y), very weak, medium bedded, highly to moderately decomposed, slightly to moderately disintegrated, intensely fractured (extremely narrow to narrow apertures).									
8 CORE	60 50		90		BDX (SH)								Core 8, RQD=49%
			91										
			92										

NATURAL RESOURCE TECHNOLOGY

Boring Number MW-384

Sample										Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram		Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			93	88.7 - 94.1' **SHALE:** BDX (SH), greenish gray (GLEY 1 5/10Y), very weak, medium bedded, highly to moderately decomposed, slightly to moderately disintegrated, intensely fractured (extremely narrow to narrow apertures). *(continued)* 92.5' - 93.2' light greenish gray (GLEY 1 7/10Y), shaley, fossiliferous, intensely fractured, slightly decomposed.	BDX (SH)									
			94	94.1' End of Boring.										

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Baldwin Energy Complex		PZ-174

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chad Dutton Bulldog Drilling	8/4/2015	8/4/2015	hollow stem auger

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
PZ-174	Feet (NAVD88)	398.97 Feet (NAVD88)	8.3 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒

State Plane 554,666.23 N, 2,379,774.23 E E/W

1/4 of 1/4 of Section , T N, R

Lat 38° 11' 22.8552"

Long -89° 52' 37.9524"

Local Grid Location

Feet ☐N ☐S Feet ☐E ☐W

Facility ID	County	State	Civil Town/City/ or Village
	Randolph	Illinois	Baldwin

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	24 5	2 3 5 3	1	0 - 2' **TOPSOIL:** ML, brown (10YR 4/3), trace grass and roots, cohesive, nonplastic, dry.	ML								
2 SS	24 0	2 2 2 4	2 3	2 - 4' No Recovery.									
3 SS	24 6	2 2 4 5	4 5	4 - 24.7' **LEAN CLAY:** CL, dark grayish brown (10YR 4/2), dark yellowish brown (10YR 4/4) mottling, silt (10-20%), cohesive, medium plasticity, moist.									
4 SS	24 6	4 4 5 7	6 7										
5 SS	24 23	3 4 5 5	8 9	8' - 9.9' increased yellowish brown (10YR 4/4) mottling, increase in silt content with depth (50%).	CL								
6 SS	24 20	2 4 8 6	10 11 12	10' - 11.7' decrease in silt content with depth (10-20%). 10.6' - 11.2' dark yellowish brown (10YR 4/4) and very dark brown (10YR 2/2) mottling (50%), dry to moist.									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Patrick M Hoffa

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NATURAL RESOURCE TECHNOLOGY

Boring Number PZ-174

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 SS	24 21	2 3 5 7	13	4 - 24.7' **LEAN CLAY:** CL, dark grayish brown (10YR 4/2), dark yellowish brown (10YR 4/4) mottling, silt (10-20%), cohesive, medium plasticity, moist. *(continued)* 12' - 13.8' trace coarse sand, dry.									
8 SS	24 21	2 4 5 8	14 15	14' - 15.8' increased sand content, trace gravel, dry.									
9 SS	24 24	2 4 5 7	16 17	16' - 18' yellowish brown (10YR 5/4), moist.									
10 SS	24 24	3 7 9 12	18 19	18' - 20' coarse sand and gravel (5-15%), moist.	CL								
11 SS	24 24	3 7 9 15	20 21										
12 SS	24 24	4 7 8 10	22 23										
13 SS	8 8	11 50 for 2"	24	24' - 24.7' decreased moisture content with depth.									Hollow Stem Auger Refusal at 24.7 ft bgs on Shale Bedrock.
				24.7' End of Boring.									

SOIL BORING LOG INFORMATION

NATURAL RESOURCE TECHNOLOGY

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Baldwin Energy Complex		PZ-176

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Chad Dutton Bulldog Drilling	8/6/2015	8/6/2015	hollow stem auger

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
PZ-176	Feet (NAVD88)	403.46 Feet (NAVD88)	8.3 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒

State Plane 554,264.76 N, 2,381,381.02 E E/W

1/4 of 1/4 of Section , T N, R

Lat 38° 11' 18.834"

Long -89° 52' 17.8428"

Local Grid Location ☐N ☐S Feet ☐E ☐W Feet

Facility ID	County	State	Civil Town/City/ or Village
	Randolph	Illinois	Baldwin

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	24 15	3 3 4 4	0	0 - 0.5' **TOPSOIL:** ML, dark grayish brown (10YR 4/2), clay (5-15%), trace grass and roots, cohesive, nonplastic, stiff (1.5 tsf), dry.	ML								
			1	0.5 - 2.4' **SILT:** ML, dark grayish brown (10YR 4/2), brownish yellow (10YR 6/6) and dark brown (10YR 3/3) mottling, clay (30-50%), trace roots, cohesive, low plasticity, very stiff (3.0 tsf), dry.	ML								
2 SS	24 16	3 5 5 5	2										
			3	2.4 - 6.3' **LEAN CLAY:** CL, dark yellowish brown (10YR 4/4), dark gray (10YR 4/1) mottling, silt (5-15%), trace roots, cohesive, medium plasticity, moist.	CL								
3 SS	24 9	2 3 4 4	4	4' increase in silt content (40-60%), dry to moist.									
			5										
4 SS	24 21	3 3 3 4	6	6.3 - 12' **SILT:** ML, dark gray (10YR 4/1), cohesive, nonplastic, moist.	ML								
			7										
5 SS	24 12	1 1 1 2	8	8' sand (0-40%), sand content increasing with depth, moist to wet.									
			9										
6 SS	24 13	1 1 1 2	10	10' increase in sand content (40-60%).									
			11										
			12										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Patrick M Hafle

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NATURAL RESOURCE TECHNOLOGY

Boring Number PZ-176

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 SS	24 / 20	1 2 3 5	13	12 - 12.3' **WELL-GRADED SAND:** SW, very dark grayish brown (10YR 3/2), fine gravel (>15%), moist. / 12.3 - 16' **LEAN CLAY:** CL, gray (10YR 5/1), brownish yellow (5-15% 10YR 6/6) and trace very dark brown (10YR 2/2) mottling, silt (5-15%), trace sand seams, cohesive, medium plasticity, stiff to very stiff (1.5-3.0 tsf).	SW								
8 SS	24	2 3 3 5	14 15	14' increase in thickness of sand seams (1"-2" thick, moist, wet).	CL								
9 SS	24 / 17	2 4 7 10	16 17	16 - 28.6' **LEAN CLAY:** CL, dark gray (10YR 4/1), light yellowish brown (10YR 6/4) mottling, cohesive, low plasticity, very stiff to hard (3.5->4.5 tsf) dry.									
10 SS	24 / 18	4 6 8 12	18 19	18' increased mottling, mostly brown (10YR 5/3), brownish yellow (10YR 6/6), dark gray (10YR 4/1), and olive gray (5Y 5/2) mottling.									
11 SS	24 / 17	5 16 22 25	20 21	20' olive gray (5Y 5/2), brownish yellow (10YR 6/6) mottling. 20.3' dark gray (2.5Y 4/1), brownish yellow (10YR 6/6) mottling, clay becoming blocky and laminated.									
12 SS	11 / 7	7 50 for 5"	22 23	22' pale olive (5Y 6/3), dark gray (10YR 4/1) mottling, laminated.	CL								
13 SS	24 / 24	13 21 31 43	24 25	24' brownish yellow (10YR 6/6) mottling.									At 23.6' rock fragment on bottom of split spoon. Refusal of split spoon.
14 SS	24 / 24	14 12 17 19	26 27										
15 SS	8 / 8	9 50 for 2"	28	28' hard (4.5 tsf).									
16 SS	1 / 0	50 for 1"		28.6' End of Boring.									

RAMBOLL

SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Baldwin Power Plant		MW-253R

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Ethan Orange Cascade Drilling LP	5/1/2024	5/1/2024	Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
MW-253R	Feet (NAVD88)	Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E N/C/S
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location
Feet ☐N ☐S Feet ☐E ☐W

Facility ID	County	State	Civil Town/City/ or Village
	Randolph	IL	Baldwin

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	120 120		0	0 - 10.2' **SILTY CLAY:** CL/ML, brown (10YR 5/3), gravel (0-10%), hard, dry.									
			1										
			2	2.2' strong brown (7.5YR 4/6) mottling (20-30%), light gray (2.5Y 7/1) mottling (20-30%), very dark gray (10YR 3/1) mottling (0-10%).									
			3										
			4										
			5		CL/ML								
			6										
			7										
			8										
			9										
			10										
2 CS	120 120		11	10.2 - 15.4' **SILTY CLAY WITH SAND:** (CL/ML)S, brown (10YR 5/3), strong brown (7.5YR 4/6) mottling (20-30%), light gray (2.5Y 7/1) mottling (20-30%), very dark gray (10YR 3/1) mottling (0-10%), gravel (0-10%), medium to high plasticity, moist.	(CL/ML)S			3.5					
			12										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm Ramboll
234 W. Florida St., Fifth Floor, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

Boring Number MW-253R

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			13	10.2 - 15.4' **SILTY CLAY WITH SAND:** (CL/ML)S, brown (10YR 5/3), strong brown (7.5YR 4/6) mottling (20-30%), light gray (2.5Y 7/1) mottling (20-30%), very dark gray (10YR 3/1) mottling (0-10%), gravel (0-10%), medium to high plasticity, moist. *(continued)*	(CL/ML)S			2.5					
			14										
			15					1.5					
			16	15.4 - 18.2' **LEAN CLAY WITH SAND:** (CL)s, yellowish brown (10YR 5/4), gravel (0-10%), medium plasticity, moist.	(CL)s								
			17					1					
			18										
			19	18.2 - 27.2' **SILTY CLAY WITH SAND:** (CL/ML)S, yellowish brown (10YR 5/4), strong brown (7.5YR 4/6) mottling (10-20%), light gray (2.5Y 7/1) mottling (10-20%), very dark gray (10YR 3/1) mottling (0-10%), sand (10-20%), gravel (0-10%), moist.				3					
3 CS	120 120		20	20' gravel (10-20%).									
			21					3.5					
			22	22' - 25' intermittent fine sand seams.									
			23		(CL/ML)S			3.5					
			24										
			25	25' - 27.2' coal (0-5%).				3					
			26										
			27					4.5					
			28	27.2 - 28.3' **LEAN CLAY:** CL, light yellowish brown (10YR 6/4), low plasticity, shaly, laminated, platy.	CL			4.5					
			29	28.3 - 35' **Weathered SHALE Bedrock:** BDX (SH), light olive brown (2.5Y 5/4), weathered shale, laminated.									
4 CS	60 60		30		BDX (SH)								
			31										
			32										

Boring Number MW-253R

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			33	28.3 - 35' **Weathered SHALE Bedrock:** BDX (SH), light olive brown (2.5Y 5/4), weathered shale, laminated. *(continued)*	BDX (SH)								
			34										
			35	35' End of Boring.									

RAMBOLL

SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Baldwin Power Plant		MW-350R

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Ethan Orange Cascade Drilling LP	5/3/2024	5/3/2024	Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
MW-350R	Feet (NAVD88)	Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E N/C/S
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location Feet ☐N ☐S Feet ☐E ☐W

Facility ID	County	State	Civil Town/City/ or Village
	Randolph	IL	Baldwin

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	120 120		1	0 - 14.4' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), yellowish brown (10YR 5/8) mottling (30-40%), organics material and roots (0-10%), medium to high toughness, low to medium plasticity, moist.	CL/ML			1.5					
			2										
			3					2					
			4										
			5					2.5					
			6										
			7					3					
			8										
			9					4.5					
			10										
2 CS	120 120		11					3.5					
			12	11.5' sand (0-10%).									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature
Firm Ramboll
234 W. Florida St., Fifth Floor, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

Boring Number MW-350R

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			13	0 - 14.4' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), yellowish brown (10YR 5/8) mottling (30-40%), organics material and roots (0-10%), medium to high toughness, low to medium plasticity, moist. *(continued)*	CL/ML			3.5					
			14										
			15	14.4 - 24.6' **LEAN CLAY:** CL, brown (10YR 5/3), light gray (10YR 7/1) mottling (20-30%), yellowish brown (10YR 5/8) mottling (20-30%), sand (20-30%), silt (20-30%), low to medium plasticity, moist.				1.5					
			16										
			17					1.5					
			18										
			19					1.5					
3 CS	60 60		20	19.7' brown (7.5YR 5/3), sand (0-10%), high plasticity.	CL								
			21					3					
			22	21.7' - 24.6' coarse subangular gravel (10-20%).									
			23					3					
			24					2					
4 CS	120 120		25	24.6 - 26.3' **Weathered SHALE Bedrock:** BDX (SH), olive gray (5Y 5/2), highly weathered, very weak.	BDX (SH)								
			26										
			27	26.3 - 27.1' **LIMESTONE:** BDX (LS), dark gray (10YR 4/1), fresh, competent, fossiliferous, medium bedded, strong.	BDX (LS)								
			28	27.1 - 28.3' **SHALE:** BDX (SH), very dark gray (10YR 3/1), medium bedded, very weak to weak, dry.	BDX (SH)								
			29	28.3 - 28.9' **LIMESTONE:** BDX (LS), dark gray (10YR 4/1), fresh, competent fossiliferous, medium bedded, strong.	BDX (LS)								
			30	28.9 - 32.2' **SHALE:** BDX (SH), very dark gray (10YR 3/1), lightly to moderately weathered, medium bedded.	BDX (SH)								
			31										
			32										

Boring Number MW-350R

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			32	32.2 - 39.5' **SHALEY LIMESTONE:** BDX (LS/SH), reddish gray (2.5YR 5/1), very slightly weathered, strong.									
			33										
			34										
			35	34.5' moderately decomposed, laminated.									
5 CS	60 60		36		BDX (LS/SH)								
			37										
			38										
			39										
			40	39.5 - 41.7' **SHALE:** BDX (SH), gray (10YR 5/1), weathered, laminated, very weak to weak.									
6 CS	48 48		41		BDX (SH)								
			42	41.7 - 47' **LIMESTONE:** BDX (LS), light gray (10YR 7/1), laminated, medium bedded, strong.									
			43										
			44										
7 CS	36 36		45		BDX (LS)								
			46										
			47	47' End of Boring.									

Illinois Environmental Protection Agency

Well Completion Report

Incident No.: None
Site Name: Dynegy-Baldwin Energy Complex
Drilling Contractor: Terra Drill
Driller: Matt Cooper
Drilling Method: Hollow-Stem Auger

Well No.: MW-150
Date Drilled Start: 09/08/10
Date Completed: 09/08/10
Geologist: Brendon Wilder
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite Chips
Type of Bentonite Seal (Granular, Pellet): Bentonite Chips (hydrated)
Type of Sand Pack: Clean Silica Sand

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			
Riser pipe above w.t.		Sch. 40	
Riser Pipe below w.t.		Sch. 40	
Screen		Sch. 40	
Coupling joint screen to riser			
Protective casing			

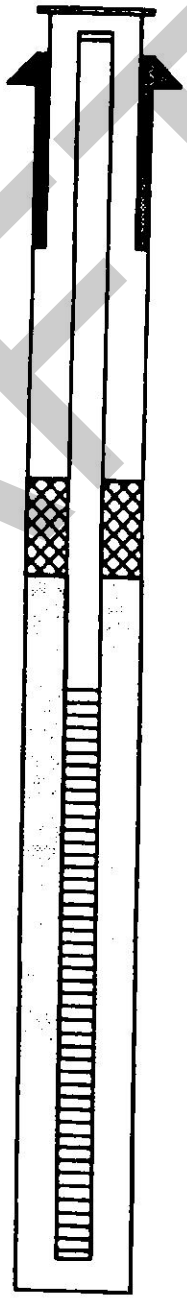
Measurements

to .01 ft (where applicable)

Riser Pipe Length	17.72
Screen Length	9.64
Screen Slot Size	0.01
Protective casing length	
Depth to water	19.58
Elevation of water	376.96
Free Product thickness	
Gallons removed (develop)	4.05
Gallons removed (purge)	
Other	

Completed by: PSC Industrial Outsourcing, LP

Elevations - .01 ft.



____ Top of Protective Casing
396.54 Top of Riser Pipe
393.84 Ground Surface
392.84 Top of Annular sealant
____ Casing Stickup

383.34 Top of Seal
3.00 Total Seal Interval
380.34 Top of Sand

378.82 Top of Screen

9.25 Total Screen Interval

369.18 Bottom of Screen
368.67 Bottom of Borehole

Illinois Environmental Protection Agency

Well Completion Report

Incident No.: None
Site Name: Dynegy-Baldwin Energy Complex
Drilling Contractor: Terra Drill
Driller: Matt Cooper
Drilling Method: Hollow-Stem Auger

Well No.: MW-152
Date Drilled Start: 09/23/10
Date Completed: 09/23/10
Geologist: Brendon Wilder
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite Chips
Type of Bentonite Seal (Granular, Pellet): Bentonite Chips (hydrated)
Type of Sand Pack: Clean Silica Sand

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			
Riser pipe above w.t.		Sch. 40	
Riser Pipe below w.t.		Sch. 40	
Screen		Sch. 40	
Coupling joint screen to riser			
Protective casing			

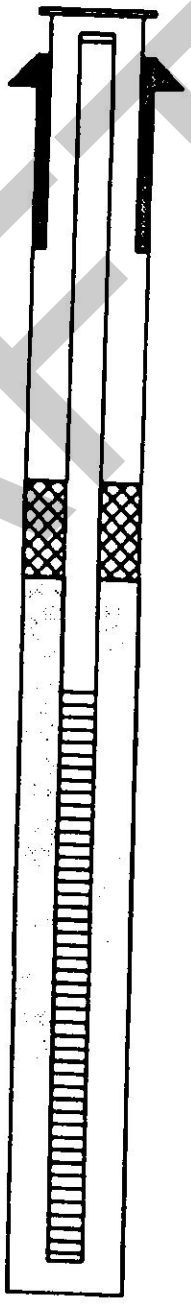
Measurements

to .01 ft (where applicable)

Riser Pipe Length	9.88
Screen Length	9.25
Screen Slot Size	0.01
Protective casing length	
Depth to water	7.35
Elevation of water	417.64
Free Product thickness	
Gallons removed (develop)	6.20
Gallons removed (purge)	
Other	

Completed by: PSC Industrial Outsourcing, LP

Elevations - .01 ft.



____ Top of Protective Casing
424.99 Top of Riser Pipe
422.18 Ground Surface
421.18 Top of Annular sealant
____ Casing Stickup

418.68 Top of Seal
2.00 Total Seal Interval
416.68 Top of Sand

415.11 Top of Screen

9.64 Total Screen Interval

405.47 Bottom of Screen
404.48 Bottom of Borehole

Illinois Environmental Protection Agency

Well Completion Report

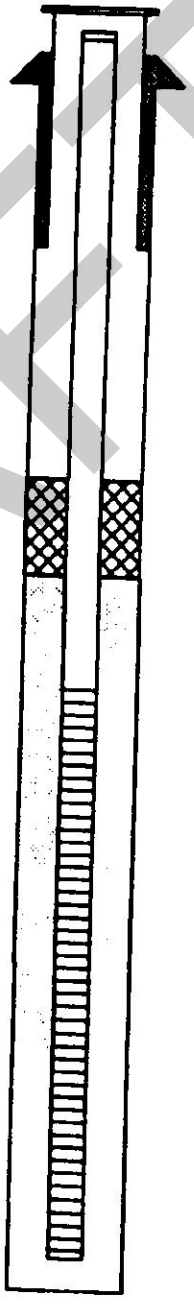
Incident No.: None
Site Name: Dynegy-Baldwin Energy Complex
Drilling Contractor: Terra Drill
Driller: Matt Cooper
Drilling Method: Hollow-Stem Aug.; Mud-Rotary

Well No.: MW-252
Date Drilled Start: 09/21/10
Date Completed: 09/22/10
Geologist: Brendon Wilder
Drilling Fluids (Type): Water w/ Polymer

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement-Bentonite Grout
Type of Bentonite Seal (Granular, Pellet): Bentonite Chips (hydrated)
Type of Sand Pack: Clean Silica Sand

Elevations - .01 ft.



____ Top of Protective Casing
425.07 Top of Riser Pipe
422.27 Ground Surface
421.27 Top of Annular sealant
____ Casing Stickup

382.97 Top of Seal
3.70 Total Seal Interval
379.27 Top of Sand
377.87 Top of Screen
4.63 Total Screen Interval
373.24 Bottom of Screen
372.73 Bottom of Borehole

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			
Riser pipe above w.t.		Sch. 40	
Riser Pipe below w.t.		Sch. 40	
Screen		Sch. 40	
Coupling joint screen to riser			
Protective casing			

Measurements

to .01 ft (where applicable)

Riser Pipe Length	47.21
Screen Length	4.63
Screen Slot Size	0.01
Protective casing length	
Depth to water	0.40
Elevation of water	424.67
Free Product thickness	
Gallons removed (develop)	7.37
Gallons removed (purge)	
Other	

Completed by: PSC Industrial Outsourcing, LP

Illinois Environmental Protection Agency

Well Completion Report

Incident No.: None
Site Name: Dynegy-Baldwin Energy Complex
Drilling Contractor: Terra Drill
Driller: Matt Cooper
Drilling Method: Hollow-Stem Aug.; Mud-Rotary

Well No.: MW-253
Date Drilled Start: 09/20/10
Date Completed: 09/20/10
Geologist: Brendon Wilder
Drilling Fluids (Type): Water w/ Polymer

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement-Bentonite Grout
Type of Bentonite Seal (Granular, Pellet): Bentonite Chips (hydrated)
Type of Sand Pack: Clean Silica Sand

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			
Riser pipe above w.t.		Sch. 40	
Riser Pipe below w.t.		Sch. 40	
Screen		Sch. 40	
Coupling joint screen to riser			
Protective casing			

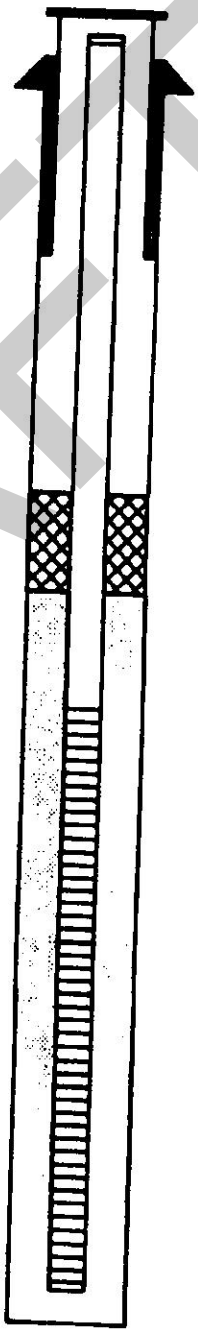
Measurements

to .01 ft (where applicable)

Riser Pipe Length	33.01
Screen Length	4.63
Screen Slot Size	0.01
Protective casing length	
Depth to water	12.71
Elevation of water	433.13
Free Product thickness	
Gallons removed (develop)	7.89
Gallons removed (purge)	
Other	

Completed by: PSC Industrial Outsourcing, LP

Elevations - .01 ft.



_____ Top of Protective Casing
445.84 Top of Riser Pipe
442.70 Ground Surface
441.70 Top of Annular sealant
_____ Casing Stickup

417.00 Top of Seal
2.00 Total Seal Interval
415.00 Top of Sand

412.84 Top of Screen

4.63 Total Screen Interval

408.21 Bottom of Screen
407.70 Bottom of Borehole

Illinois Environmental Protection Agency

Well Completion Report

Incident No.: None
Site Name: Dynegy-Baldwin Energy Complex
Drilling Contractor: Terra Drill
Driller: Matt Cooper
Drilling Method: Hollow-Stem Aug.; Mud-Rotary

Well No.: MW-350
Date Drilled Start: 09/08/10
Date Completed: 09/09/10
Geologist: Brendon Wilder
Drilling Fluids (Type): Water w/ Polymer

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement-Bentonite Grout
Type of Bentonite Seal (Granular, Pellet): _____
Bentonite Chips (hydrated)
Type of Sand Pack: Clean Silica Sand

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			
Riser pipe above w.t.		Sch. 40	
Riser Pipe below w.t.		Sch. 40	
Screen		Sch. 40	
Coupling joint screen to riser			
Protective casing			

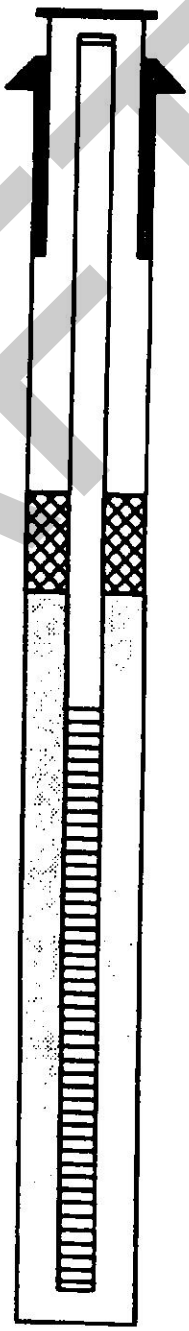
Measurements

to .01 ft (where applicable)

Riser Pipe Length	44.29
Screen Length	4.63
Screen Slot Size	0.01
Protective casing length	
Depth to water	22.52
Elevation of water	374.28
Free Product thickness	
Gallons removed (develop)	10.00
Gallons removed (purge)	
Other	

Completed by: PSC Industrial Outsourcing, LP

Elevations - .01 ft.



_____ Top of Protective Casing
396.80 Top of Riser Pipe
394.11 Ground Surface
393.11 Top of Annular sealant
_____ Casing Stickup

367.71 Top of Seal
10.60 Total Seal Interval
357.11 Top of Sand

352.52 Top of Screen

4.63 Total Screen Interval

347.89 Bottom of Screen
347.38 Bottom of Borehole

Illinois Environmental Protection Agency

Well Completion Report

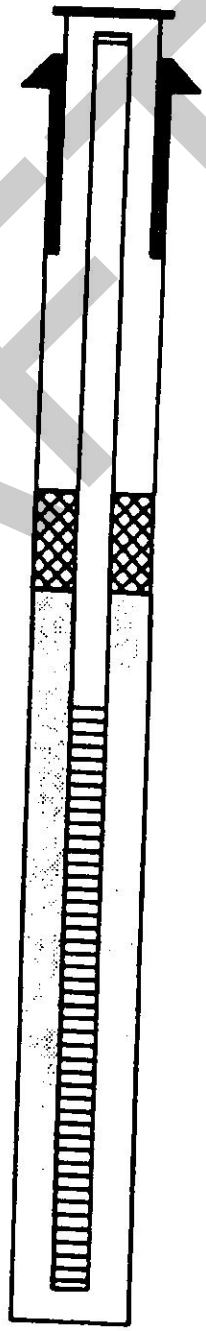
Incident No.: None
Site Name: Dynegy-Baldwin Energy Complex
Drilling Contractor: Terra Drill
Driller: Matt Cooper
Drilling Method: Hollow-Stem Aug.; Mud-Rotary

Well No.: MW-352
Date Drilled Start: 09/15/10
Date Completed: 09/17/10
Geologist: Brendon Wilder
Drilling Fluids (Type): Water w/ Polymer

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement-Bentonite Grout
Type of Bentonite Seal (Granular, Pellet): Bentonite Chips (hydrated)
Type of Sand Pack: Clean Silica Sand

Elevations - .01 ft.



_____ Top of Protective Casing
425.04 Top of Riser Pipe
422.36 Ground Surface
421.36 Top of Annular sealant
_____ Casing Stickup

361.06 Top of Seal
4.00 Total Seal Interval
357.06 Top of Sand

354.46 Top of Screen

4.63 Total Screen Interval

349.83 Bottom of Screen
348.56 Bottom of Borehole

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			
Riser pipe above w.t.		Sch. 40	
Riser Pipe below w.t.		Sch. 40	
Screen		Sch. 40	
Coupling joint screen to riser			
Protective casing			

Measurements

to .01 ft (where applicable)

Riser Pipe Length	70.59
Screen Length	4.63
Screen Slot Size	0.01
Protective casing length	
Depth to water	23.85
Elevation of water	401.19
Free Product thickness	
Gallons removed (develop)	13.70
Gallons removed (purge)	
Other	

Completed by: PSC Industrial Outsourcing, LP

NATURAL RESOURCE TECHNOLOGY

MONITORING WELL CONSTRUCTION

Facility/Project Name: Baldwin Energy Complex	Local Grid Location of Well: ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.	Well Name: MW-366
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 38° 11' 31.888" Long. -89° 52' 20.441" or	
Facility ID	St. Plane 555,581.80 ft. N, 2,381,171.15 ft. E. E/Ⓦ	Date Well Installed: 12/04/2015
Type of Well: mw	Section Location of Waste/Source: ____ 1/4 of ____ 1/4 of Sec. ____, T. ____ N, R. ____ ☐ E ☐ W	Well Installed By: (Person's Name and Firm): Jim Dittmaier; Bulldog Drilling
Distance from Waste/Source: ft. / State: Illinois	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	Gov. Lot Number:

A. Protective pipe, top elevation ____ ft. (NAVD88)

B. Well casing, top elevation 425.08 ft. (NAVD88)

C. Land surface elevation 422.54 ft. (NAVD88)

D. Surface seal, bottom 421.5 ft. (NAVD88) or 1.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ / Hollow Stem Auger ☐ / ____ Other ☐

15. Drilling fluid used: Water ☒ 0 2 / Air ☐ / Drilling Mud ☐ 0 3 / None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required):
Village of Baldwin

E. Bentonite seal, top 387.5 ft. (NAVD88) or 35.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top 382.5 ft. (NAVD88) or 40.0 ft.

H. Screen joint, top 380.5 ft. (NAVD88) or 42.0 ft.

I. Well bottom 370.5 ft. (NAVD88) or 52.0 ft.

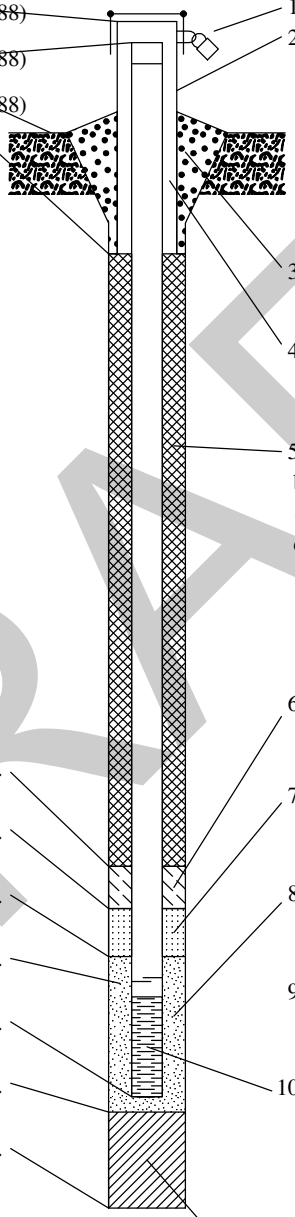
J. Filter pack, bottom 370.0 ft. (NAVD88) or 52.5 ft.

K. Borehole, bottom 368.5 ft. (NAVD88) or 54.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ / ____ Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: Three steel bollards
3. Surface seal: Bentonite ☐ / Concrete ☒ / ____ Other ☐
4. Material between well casing and protective pipe: Bentonite ☒ / Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. ____ Lbs/gal mud weight . . . Bentonite slurry ☐
   d. 30 % Bentonite . . . Bentonite-cement grout ☒
   e. ____ Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ / Tremie pumped ☒ / Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. ____
   b. Volume added ____ ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. Unimin Corporation, FILTERSIL
   b. Volume added ____ ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ / Flush threaded PVC schedule 80 ☐ / ____ Other ☐
10. Screen material: Schedule 40 PVC
    a. Screen Type: Factory cut ☒ / Continuous slot ☐ / ____ Other ☐
    b. Manufacturer ____
    c. Slot size: 0.010 in.
    d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☐ / 1.5' bedrock drill cuttings Other ☒

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 2/4/2016

Signature: Brad Rueber

Firm: Natural Resource Technology
234 W. Florida Street, Floor 5, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

NATURAL RESOURCE TECHNOLOGY

MONITORING WELL CONSTRUCTION

Facility/Project Name: Baldwin Energy Complex	Local Grid Location of Well: ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.	Well Name: MW-384
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 38° 11' 30.440" Long. -89° 51' 38.516" or	
Facility ID	St. Plane 555,446.11 ft. N, 2,384,518.72 ft. E. E/Ⓦ	Date Well Installed: 12/18/2015
Type of Well: mw	Section Location of Waste/Source: ____ 1/4 of ____ 1/4 of Sec. ____, T. ____ N, R. ____ ☐ E ☐ W	Well Installed By: (Person's Name and Firm): Chad Dutton; Bulldog Drilling
Distance from Waste/Source: ft. / State: Illinois	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	Gov. Lot Number:

A. Protective pipe, top elevation ____ ft. (NAVD88)

B. Well casing, top elevation 458.95 ft. (NAVD88)

C. Land surface elevation 456.70 ft. (NAVD88)

D. Surface seal, bottom 455.7 ft. (NAVD88) or 1.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ / Hollow Stem Auger ☐ / ____ Other ☐

15. Drilling fluid used: Water ☒ 0 2 / Air ☐ / Drilling Mud ☐ 0 3 / None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required):
Village of Baldwin

E. Bentonite seal, top 402.7 ft. (NAVD88) or 54.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top 398.2 ft. (NAVD88) or 58.5 ft.

H. Screen joint, top 396.2 ft. (NAVD88) or 60.5 ft.

I. Well bottom 386.2 ft. (NAVD88) or 70.5 ft.

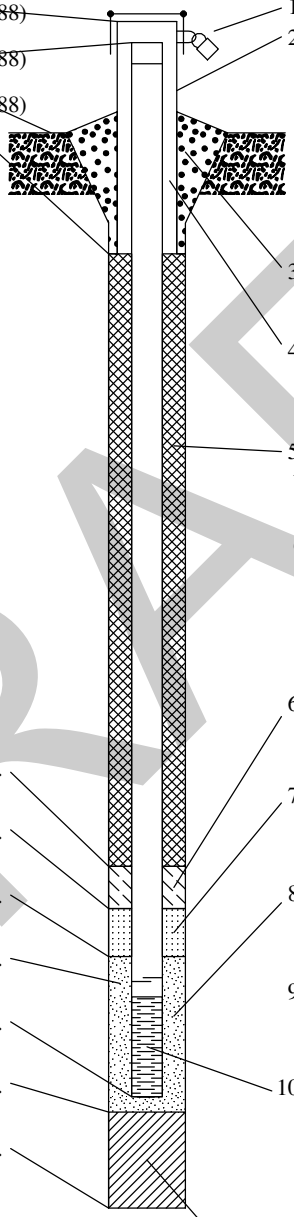
J. Filter pack, bottom 385.2 ft. (NAVD88) or 71.5 ft.

K. Borehole, bottom 379.7 ft. (NAVD88) or 77.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒ / ____ Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Steel bollards (3), 6" PVC casing to 25' bgs

3. Surface seal: Bentonite ☐ / Concrete ☒ / ____ Other ☐

4. Material between well casing and protective pipe:
Bentonite ☒ / Sand Other ☒

5. Annular space seal: a. Granular/Chipped Bentonite ☐
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐
c. ____ Lbs/gal mud weight . . . Bentonite slurry ☐
d. 30 % Bentonite . . . Bentonite-cement grout ☒
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ / Tremie pumped ☒ / Gravity ☐

6. Bentonite seal: a. Bentonite granules ☐
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
c. ____ Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. ____
b. Volume added ____ ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. Unimin Corporation, FILTERSIL
b. Volume added ____ ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ / Flush threaded PVC schedule 80 ☐ / ____ Other ☐

10. Screen material: Schedule 40 PVC
a. Screen Type: Factory cut ☒ / Continuous slot ☐ / ____ Other ☐
b. Manufacturer ____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.

11. Backfill material (below filter pack): None ☐
0.5' of bentonite chips, 5' of bedrock drill cuttings Other ☒

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 2/4/2016

Signature: Brad Rucker

Firm: Natural Resource Technology
234 W. Florida Street, Floor 5, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

NATURAL RESOURCE TECHNOLOGY

MONITORING WELL CONSTRUCTION

Facility/Project Name: Baldwin Energy Complex	Local Grid Location of Well: ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.	Well Name: PZ-174
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 38° 11' 22.855" Long. -89° 52' 37.952" or	
Facility ID	St. Plane 554,666.23 ft. N, 2,379,774.23 ft. E. E/Ⓦ	Date Well Installed: 08/04/2015
Type of Well	Section Location of Waste/Source: ____ 1/4 of ____ 1/4 of Sec. ____, T. ____ N, R. ____ ☐ E ☐ W	Well Installed By: (Person's Name and Firm): Chad Dutton / Bulldog Drilling
Distance from Waste/Source ft. / State: Illinois	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	Gov. Lot Number

A. Protective pipe, top elevation ____ ft. (NAVD88)

B. Well casing, top elevation 401.92 ft. (NAVD88)

C. Land surface elevation 398.97 ft. (NAVD88)

D. Surface seal, bottom 398.0 ft. (NAVD88) or 1.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☒ MH ☐ CL ☒ CH ☐
Bedrock ☐

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ Hollow Stem Auger ☒ Other ☐

15. Drilling fluid used: Water ☒ 0 2 Air ☐ Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required): Village of Baldwin

E. Bentonite seal, top 398.0 ft. (NAVD88) or 1.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top 386.5 ft. (NAVD88) or 12.5 ft.

H. Screen joint, top 384.5 ft. (NAVD88) or 14.5 ft.

I. Well bottom 374.5 ft. (NAVD88) or 24.5 ft.

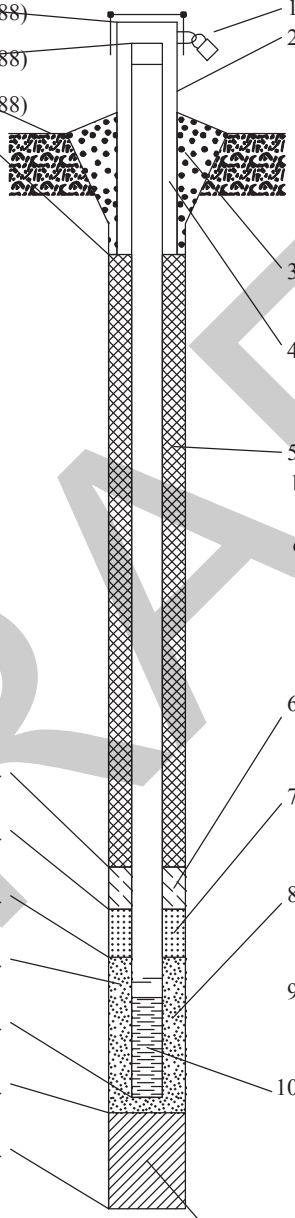
J. Filter pack, bottom 374.5 ft. (NAVD88) or 24.5 ft.

K. Borehole, bottom 374.5 ft. (NAVD88) or 24.5 ft.

L. Borehole, diameter 8.3 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒ Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Three steel bollards

3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐

4. Material between well casing and protective pipe: Bentonite ☒ Sand Other ☒

5. Annular space seal: a. Granular/Chipped Bentonite ☒
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐
c. ____ Lbs/gal mud weight . . . Bentonite slurry ☐
d. ____ % Bentonite . . . Bentonite-cement grout ☐
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☒ Tremie pumped ☐ Gravity ☐

6. Bentonite seal: a. Bentonite granules ☐
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
c. ____ Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. ____
b. Volume added ____ ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. Unimin Corporation, FILTERSIL
b. Volume added ____ ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ Flush threaded PVC schedule 80 ☐ Other ☐

10. Screen material: Schedule 40 PVC
a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
b. Manufacturer ____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.

11. Backfill material (below filter pack): None ☒ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 11/6/2015

Signature: Robin M. Hafle

Firm: Natural Resource Technology
234 W. Florida Street, Floor 5, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

NATURAL RESOURCE TECHNOLOGY

MONITORING WELL CONSTRUCTION

Facility/Project Name: Baldwin Energy Complex	Local Grid Location of Well: ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.	Well Name: PZ-176
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 38° 11' 18.834" Long. -89° 52' 17.843" or	
Facility ID	St. Plane 554,264.76 ft. N, 2,381,381.02 ft. E. E/Ⓦ	Date Well Installed: 08/06/2015
Type of Well	Section Location of Waste/Source: ____ 1/4 of ____ 1/4 of Sec. ____, T. ____ N, R. ____ ☐ E ☐ W	Well Installed By: (Person's Name and Firm): Chad Dutton / Bulldog Drilling
Distance from Waste/Source ft. / State: Illinois	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	Gov. Lot Number

A. Protective pipe, top elevation ____ ft. (NAVD88)

B. Well casing, top elevation 406.44 ft. (NAVD88)

C. Land surface elevation 403.46 ft. (NAVD88)

D. Surface seal, bottom 402.5 ft. (NAVD88) or 1.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☒ CH ☐
Bedrock ☐

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ Hollow Stem Auger ☒ Other ☐ ____

15. Drilling fluid used: Water ☒ 0 2 Air ☐ Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No
Describe ____

17. Source of water (attach analysis, if required):
Village of Baldwin

E. Bentonite seal, top 392.5 ft. (NAVD88) or 11.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top 387.5 ft. (NAVD88) or 16.0 ft.

H. Screen joint, top 385.4 ft. (NAVD88) or 18.1 ft.

I. Well bottom 375.4 ft. (NAVD88) or 28.1 ft.

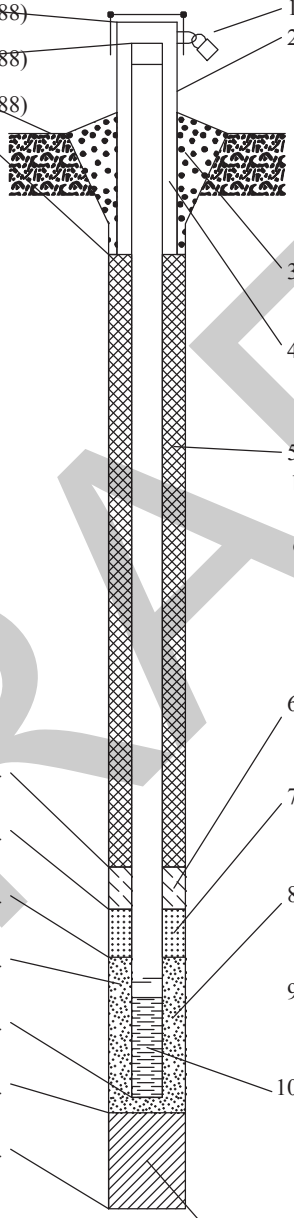
J. Filter pack, bottom 374.9 ft. (NAVD88) or 28.6 ft.

K. Borehole, bottom 374.9 ft. (NAVD88) or 28.6 ft.

L. Borehole, diameter 8.3 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒ Other ☐ ____
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Three steel bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐ ____
4. Material between well casing and protective pipe: Bentonite ☒ Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐
c. ____ Lbs/gal mud weight . . . Bentonite slurry ☐
d. 30 % Bentonite . . . Bentonite-cement grout ☒
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
c. ____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
a. ____
b. Volume added ____ ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. Unimin Corporation, FILTERSIL
b. Volume added ____ ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ Flush threaded PVC schedule 80 ☐ Other ☐ ____
10. Screen material: Schedule 40 PVC
a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐ ____
b. Manufacturer ____
c. Slot size: 0.010 in.
d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☒ Other ☐ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 11/6/2015

Signature Patrick M. Hafle
Firm Natural Resource Technology
234 W. Florida Street, Floor 5, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name: Baldwin Power Plant	Local Grid Location of Well: ____ft. ☐ N. ☐ S. ____ft. ☐ E. ☐ W.	Well Name: MW-253R
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. ° ' " Long. ° ' " or	
Facility ID	St. Plane ____ ft. N, ____ ft. E. E/Ⓦ	Date Well Installed: 05/01/2024
Type of Well: Well Code 12/pz	Section Location of Waste/Source: ____1/4 of ____ 1/4 of Sec. ____, T. ____ N, R. ____ ☐ E ☐ W	Well Installed By: (Person's Name and Firm): Ethan Orange; Cascade Drilling LP
Distance from Waste/Source: ft. / State: IL	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number

A. Protective pipe, top elevation ____ ft. (NAVD88)

B. Well casing, top elevation ____ ft. (NAVD88)

C. Land surface elevation ____ ft. (NAVD88)

D. Surface seal, bottom ____ ft. (NAVD88) or 1.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐ Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☒ Yes ☐ No

Describe N

17. Source of water (attach analysis, if required):
Town of Baldwin

E. Bentonite seal, top ____ ft. (NAVD88) or 23.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top ____ ft. (NAVD88) or 27.0 ft.

H. Screen joint, top ____ ft. (NAVD88) or 29.5 ft.

I. Well bottom ____ ft. (NAVD88) or 34.5 ft.

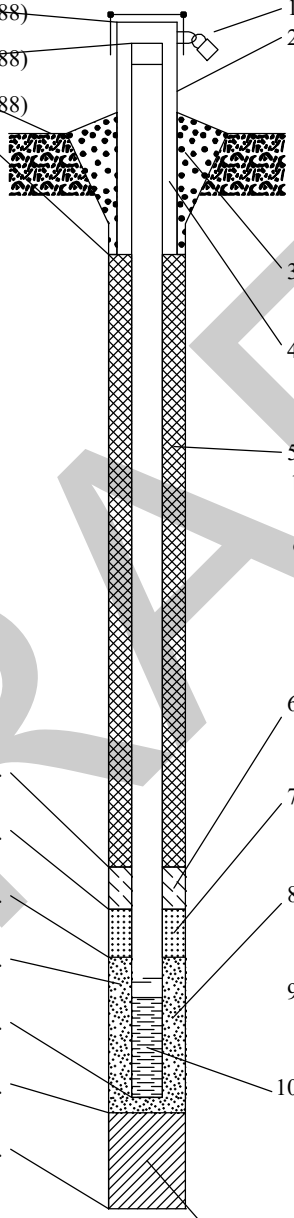
J. Filter pack, bottom ____ ft. (NAVD88) or 35.0 ft.

K. Borehole, bottom ____ ft. (NAVD88) or 35.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒ Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: 4 bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe: Bentonite ☐ Other ☐
5. Annular space seal: a. Granular/Chipped Bentonite ☐
b. ____Lbs/gal mud weight . . . Bentonite-sand slurry ☐
c. ____Lbs/gal mud weight . . . Bentonite slurry ☐
d. 5 % Bentonite . . . Bentonite-cement grout ☒
e. 3.5 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
c. ____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
a. ____
b. Volume added ____ ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. #2 K&E Well Gravel
b. Volume added ____ ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ Flush threaded PVC schedule 80 ☐ Other ☐
10. Screen material: Schedule 40 PVC
a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
b. Manufacturer ____
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☒ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 7/9/2024

Signature [signature] Firm Ramboll
234 W. Florida St., Fifth Floor, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name: Baldwin Power Plant	Local Grid Location of Well: ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.	Well Name: MW-350R
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. ° ' " Long. ° ' " or	
Facility ID	St. Plane ____ ft. N, ____ ft. E. E/Ⓦ	Date Well Installed: 05/03/2024
Type of Well: Well Code 12/pz	Section Location of Waste/Source: ____ 1/4 of ____ 1/4 of Sec. ____, T. ____ N, R. ____ ☐ E ☐ W	Well Installed By: (Person's Name and Firm): Ethan Orange; Cascade Drilling LP
Distance from Waste/Source: ft. / State: IL	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number

A. Protective pipe, top elevation ____ ft. (NAVD88)

B. Well casing, top elevation ____ ft. (NAVD88)

C. Land surface elevation ____ ft. (NAVD88)

D. Surface seal, bottom ____ ft. (NAVD88) or 1.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐ Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☒ Yes ☐ No

Describe N

17. Source of water (attach analysis, if required):
Town of Baldwin

E. Bentonite seal, top ____ ft. (NAVD88) or 27.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top ____ ft. (NAVD88) or 37.0 ft.

H. Screen joint, top ____ ft. (NAVD88) or 42.0 ft.

I. Well bottom ____ ft. (NAVD88) or 47.0 ft.

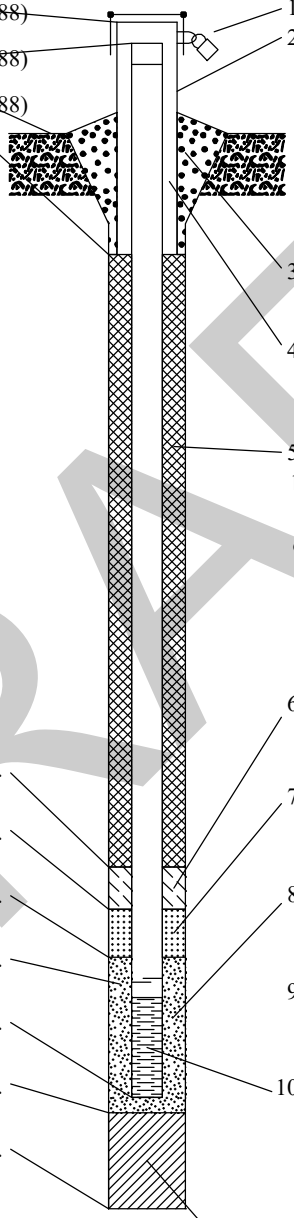
J. Filter pack, bottom ____ ft. (NAVD88) or 47.0 ft.

K. Borehole, bottom ____ ft. (NAVD88) or 47.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒ Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: 4 bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe: Bentonite ☐ Other ☐
5. Annular space seal: a. Granular/Chipped Bentonite ☐
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐
c. ____ Lbs/gal mud weight . . . Bentonite slurry ☐
d. 5 % Bentonite . . . Bentonite-cement grout ☒
e. 4 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
c. ____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
a. ____
b. Volume added ____ ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. #2 K&E Well Gravel
b. Volume added ____ ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ Flush threaded PVC schedule 80 ☐ Other ☐
10. Screen material: Schedule 40 PVC
a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
b. Manufacturer ____
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☒ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 7/9/2024

Signature: [signature] Firm: Ramboll, 234 W. Florida St., Fifth Floor, Milwaukee, WI 53204 Tel: (414) 837-3607 Fax: (414) 837-3608