MWG

Midwest Generation, LLC

Will County Generating Station

2024 Hazard Potential Classification Assessment for South Ash Pond 2 & South Ash Pond 3

Revision 0

October 13, 2024

Issue Purpose: For Use

Project No.: A12661.189

Sargent & Lundy

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EXECUTIVE SUMMARY

This report presents the 2024 hazard potential classification assessment for South Ash Pond 2 and South Ash Pond 3 at Midwest Generation, LLC's (MWG) Will County Generating Station ("Will County" or the "Station"). Pursuant to 35 Ill. Adm. Code 845.440(a)(1), this annual assessment, prepared by Sargent & Lundy (S&L) on behalf of MWG, documents the hazard potential classifications for South Ash Ponds 2 and 3 in accordance with the hazard potential classifications defined in 35 Ill. Adm. Code 845.120.

Per last year's hazard potential classification assessment, South Ash Ponds 2 and 3 were each designated as a Class 2 CCR surface impoundment pursuant to 35 Ill. Adm. Code 845.440(a)(1), which is the equivalent of a significant hazard potential CCR surface impoundment under 40 CFR 257.53, after it was determined that the bases for the initial federal hazard potential classifications assigned to the ponds in 2016 in accordance with 40 CFR 257.73(a)(2) were still valid. Accordingly, to complete this assessment, S&L re-evaluated the bases of the initial federal hazard potential classifications assigned to South Ash Ponds 2 and 3 to determine (1) if any changes have occurred since the initial assessment was completed and (2) whether identified changes warrant adjusting the ponds' 2023 hazard potential classifications. Where no changes were noted for a given input, or where identified changes were determined to have no impact on the results or conclusions of the initial federal hazard potential classification assessment, the previous evaluation of that input was considered to still be valid for this 2024 hazard potential classification assessment.

South Ash Ponds 2 and 3 are currently out of service and are not used to manage any process or wastewater streams at Will County. The only water entering these ponds is direct precipitation (i.e., rain or snow) and run-off from the crests of the ponds' dikes. Moreover, the Station is actively limiting the amount of stormwater that can accumulate in the ponds by periodically pumping water over the overflow weir into the concrete overflow trough at the west end of each pond. Since last year's hazard potential classification assessment, the Station's dewatering efforts have limited the water level in South Ash Pond 3 to at most 2.2 feet; no water has been observed above the CCR remaining in South Ash Pond 2 since last year's assessment. Currently, there is less than a foot of water in each pond. Therefore, the ponds' original design conditions used for the 2016 hypothetical dike breach analyses performed in support of the ponds' initial hazard potential classification assessment is conservative for the ponds' current operating conditions. Otherwise, no other significant changes to South Ash Ponds 2 or 3 or to downstream developments were identified in this 2024 hazard potential classification assessment.

Based on the preceding observations, the bases for the initial federal significant hazard potential classifications assigned to South Ash Ponds 2 and 3 in accordance with 40 CFR 257.73(a)(2) have either not changed or are conservative under current conditions. Per the analyses performed in support of the 2016

federal hazard potential classification assessment, a loss of human life is unlikely to result from a hypothetical failure under the CCR surface impoundments' original design conditions, but potential offsite damage could occur at the Des Plaines River. Because a CCR surface impoundment classified as a significant hazard potential is considered to be an Illinois Class 2 CCR surface impoundment, South Ash Ponds 2 and 3 are classified as Class 2 CCR surface impoundments pursuant to 35 Ill. Adm. Code 845.440(a)(1) under their original design capacities. However, MWG is currently updating the 2016 dike breach analysis to account for the ponds' reduced operating capacities and corresponding reductions in impacts to downstream areas caused by a hypothetical dike breach at each pond. This evaluation will be provided in a subsequent revision to this hazard potential classification assessment.

South Ash Pond 2's and South Ash Pond 3's classifications as Class 2 CCR surface impoundments are not a reflection of the potential for either impoundment to fail. The 2024 annual safety factor assessment conducted pursuant to 35 Ill. Adm. Code 845.460 shows that South Ash Ponds 2 and 3 are stable under design operating conditions.

Table ES-1 presents the 2024 hazard potential classifications assigned to Will County South Ash Ponds 2 and 3 under their original design capacities in accordance with 35 Ill. Adm. Code 845.440(a)(1).

Table ES-1 – 2024 Illinois Hazard Potential Classifications for South Ash Pond 2 & South Ash Pond 3 at the Will County Generating Station

CCR Surface Impoundment	2024 Illinois Hazard Potential Classification
South Ash Pond 2	Class 2
South Ash Pond 3	Class 2

1.0 PURPOSE & SCOPE

1.1 PURPOSE

South Ash Pond 2 and South Ash Pond 3 at Midwest Generation, LLC's (MWG) Will County Generating Station ("Will County" or the "Station") are existing coal combustion residual (CCR) surface impoundments that are regulated by the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments." These regulations are codified in Part 845 to Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code 845, Ref. 1) and are also referred to herein as the "Illinois CCR Rule." Pursuant to 35 Ill. Adm. Code 845.440(a)(1), MWG must conduct and complete an annual hazard potential classification assessment that documents the hazard potential classifications for South Ash Ponds 2 and 3 in accordance with the hazard potential classifications defined in 35 Ill. Adm. Code 845.120.

This report documents the 2024 hazard potential classification assessment conducted and completed in accordance with the Illinois CCR Rule by Sargent & Lundy (S&L) on behalf of MWG for South Ash Ponds 2 and 3 at Will County. This report:

- Lists the inputs and assumptions used in the 2024 hazard potential classification assessment,
- Lists and compares the definitions for the hazard potential classifications for CCR surface impoundments promulgated by the Illinois CCR Rule and by the U.S. Environmental Protection Agency's regulations for CCR surface impoundments,
- Discusses the methodology used to conduct the 2024 hazard potential classification assessment,
- Provides the 2024 hazard potential classifications for South Ash Ponds 2 and 3 in accordance with 35 Ill. Adm. Code 845.440(a)(1).

1.2 SCOPE

In addition to being regulated under the Illinois CCR Rule, South Ash Ponds 2 and 3 at Will County are also regulated by the U.S. Environmental Protection Agency's (EPA) "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," 40 CFR Part 257 Subpart D (Ref. 2), also referred to herein as the "Federal CCR Rule." Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, South Ash Ponds 2 and 3 will continue to be subject to both the Illinois and Federal CCR Rules until the U.S. EPA approves the Illinois EPA's CCR permit program; the Illinois EPA has yet to publish a timeline for submitting its proposed CCR permit program to the U.S. EPA for approval. However, the scope of this 2024 hazard potential classification assessment is strictly limited to demonstrating compliance with the Illinois CCR Rule. Pursuant to 40 CFR 257.73(f)(3), the next hazard potential classification assessment for demonstrating compliance with the Federal CCR Rule will be completed in 2026, five years after the last federal assessment was completed (2021).

2.0 INPUTS

Hazard Potential Classifications

The Illinois CCR Rule (Ref. 1, § 845.120) defines "hazard potential classification" as "the possible adverse incremental consequences that result from the release of water or stored contents due to failure of the diked CCR surface impoundment or mis-operation of the diked CCR surface impoundment or its appurtenances." The Illinois CCR Rule (Ref. 1, § 845.440(a)(1)) requires a CCR surface impoundment be designated as either a Class 1 CCR surface impoundment or a Class 2 CCR surface impoundment. Per 35 Ill. Adm. Code 845.120, the two Illinois hazard potential classifications are defined as follows:

- *Class 1 CCR surface impoundment* means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.
- *Class 2 CCR surface impoundment* means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.

The Federal CCR Rule (Ref. 2, § 257.53), has the same definition for "hazard potential classification" as the Illinois CCR Rule. However, the Federal CCR Rule has three hazard potential classifications instead of the two designations promulgated by the Illinois CCR Rule. Per 40 CFR 257.53, the three federal hazard potential classifications are defined as follows:

- *High hazard potential CCR surface impoundment* means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.
- *Low hazard potential CCR surface impoundment* means a diked surface impoundment where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner's property.
- *Significant hazard potential CCR surface impoundment* means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.

Per the preceding sets of definitions for the federal and Illinois hazard potential classifications, a high hazard potential CCR surface impoundment per the Federal CCR Rule is the same as a Class 1 CCR surface impoundment per the Illinois CCR Rule. Similarly, a CCR surface impoundment that is classified as a low or significant hazard potential per the Federal CCR Rule is considered to be a Class 2 CCR surface impoundment per the Illinois CCR Rule.

A CCR surface impoundment's hazard potential classification is not a reflection of the probability of a hypothetical failure event associated with the surface impoundment. Hazard potential classifications are not contingent upon a CCR surface impoundment's structural stability; they only classify the potential impacts

should a hypothetical failure occur. For example, a well-maintained CCR surface impoundment with appropriate factors of safety may be classified as a Class 1 hazard potential solely because a loss of human life would be probable if a hypothetical failure event did occur. Instead, the structural integrity of a CCR surface impoundment and its potential for failure are evaluated and documented in the structural stability and safety factor assessments prepared pursuant to 35 Ill. Adm. Code 845.450 and 35 Ill. Adm. Code 845.460 (Ref. 3), respectively.

Site Topography

Two topographic datasets for South Ash Pond 2, South Ash Pond 3, and the surrounding areas were obtained: one from the U.S. Geological Survey's (USGS) National Elevation Dataset (NED) (Ref. 5) and one from the U.S. Department of Agriculture's (USDA) National Digital Elevation Program (NDEP) (Ref. 6). The USGS dataset was published in 2011 and was utilized in the initial federal hazard potential classification assessment and the 2016 dike breach analysis. The USGS topography reflects elevation data collected in 2004 at a resolution of approximately 3 meters. Based on a review of the USGS NED, the 2004 USGS elevation dataset is the most recent topographic dataset in the NED at a 3-meter or better resolution for the Station and surrounding areas. Meanwhile, the USDA topography reflects elevation data collected in 2010 at a 1-meter resolution and was utilized in this 2024 assessment to determine whether the site topography referenced in the initial federal hazard potential classification assessment and the 2016 dike breach analysis should be updated.

Impacted Areas

Areas impacted by a hypothetical failure at either South Ash Pond 2 or South Ash Pond 3 were obtained from the ponds' initial federal hazard potential classification assessment (Ref. 4), the dike breach analysis conducted in 2016 for the ponds' eastern dikes (Ref. 7), and the dike breach inundation maps included in the ponds' Emergency Action Plan (Ref. 8). The inputs, assumptions, and methodology utilized to identify areas impacted by failures at each of the ponds' dikes were evaluated to determine whether any updates to these analyses were warranted.

Appendix A provides the initial federal hazard potential classification assessment conducted by Geosyntec Consultants in 2016 for South Ash Ponds 2 and 3.

Aerial Images

Historical and recent aerial images of the Station and surrounding areas were obtained from Google Earth Pro (Ref. 9).

Property Boundaries

Boundaries for the Station's property and adjacent properties were obtained from the geographic information system (GIS) for Will County, Illinois (Ref. 10).

100-Year Floodway & Floodplain

Delineations for the floodway and floodplain for the 1% annual chance flood ("100-year flood") at and downstream from the Will County site were obtained from the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) for the subject area (Ref. 11).

Ash Pond Conditions

The operating and physical conditions for South Ash Ponds 2 and 3 were based on the following inputs:

- Discussions with MWG personnel.
- The 2024 annual inspection report prepared for the CCR surface impoundments in accordance with 35 Ill. Adm. Code 845.540(b) (Ref.12).
- The weekly inspection reports prepared in accordance with 35 Ill. Adm. Code 845.540(a) since the 2023 hazard potential classification assessment was issued (Ref. 17).

3.0 ASSUMPTIONS

There are no assumptions in this document that require verification.

4.0 METHODOLOGY

As documented in last year's hazard potential classification assessment, the 2023 hazard potential classifications assigned to South Ash Ponds 2 and 3 were based on the initial federal hazard potential classifications assigned in 2016 pursuant to the Federal CCR Rule after it was determined that the bases for the initial federal hazard potential classifications were still valid. Accordingly, the bases for South Ash Pond 2's and South Ash Pond 3's initial federal hazard potential classifications as documented within the ponds' initial federal hazard potential classification assessment were re-evaluated to determine if any changes have occurred since the initial assessment was completed. Identified changes were then evaluated to determine if the ponds' 2023 hazard potential classifications warrant adjustments. Where no changes were noted for a given input, or where identified changes were determined to have no impact to the results and conclusions of the initial federal hazard potential classification assessment, the previous evaluation of that input was considered to still be valid for this 2024 assessment.

In instances where changes to one or more factors used as the bases for the 2023 hazard potential classifications that were identified (*e.g.*, downstream development that was not present in 2016), hypothetical

dike breaches were considered at each of the two CCR surface impoundments to evaluate the impacts that a release of CCR and CCR wastewater would have on the identified factor(s). These hypothetical dike breaches were evaluated regardless of potential causes and/or apparent dike stability. When evaluating a hypothetical dike breach at a subject CCR surface impoundment, the solid waste materials in the CCR surface impoundment were conservatively considered as an equivalent volume of liquid, and the CCR surface impoundment was assumed to be entirely filled with liquid.

When evaluating the downstream impacts from a hypothetical dike breach at a CCR surface impoundment, the primary consideration examined was whether a loss of human life is probable under the given hypothetical failure scenario. Loss of human life is the critical aspect of the Class 1 hazard potential classification. If a loss of human life is unlikely to occur, then the CCR surface impoundment was not considered to be a Class 1 hazard potential and was instead classified as a Class 2 hazard potential.

5.0 ASSESSMENT

5.1 SUMMARY OF 2023 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

The previous hazard potential classification assessment for South Ash Ponds 2 and 3 was completed on October 13, 2023. Ultimately, the 2023 hazard potential classifications for South Ash Ponds 2 and 3 were based on the initial federal hazard potential classifications that were assigned to the ponds in 2016 after it was determined that the bases for the initial federal hazard potential classifications were still valid. Per the initial federal hazard potential classification assessment for South Ash Ponds 2 and 3, the ponds were classified as significant hazard potential CCR surface impoundments pursuant to 40 CFR 257.53. Based on the comparison between the Federal and Illinois CCR Rules' definitions for hazard potential classifications in Section 2.0, a significant hazard potential CCR surface impoundment under the Federal CCR Rule is the equivalent of a Class 2 CCR surface impoundment under the Illinois CCR Rule. Therefore, South Ash Ponds 2 and 3 were classified as Class 2 CCR surface impoundments in the 2023 hazard potential classification assessment.

5.2 SUMMARY OF INITIAL FEDERAL HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

The initial federal hazard potential classification assessment for South Ash Ponds 2 and 3 was completed in October 2016 and is included in its entirety in Appendix A. This assessment evaluated the potential consequences of hypothetical dike failures for both ponds. A quantitative dike breach analysis was also conducted for each pond's eastern dike which was determined to pose the most risk to human life due to the eastern dikes' proximities to occupied buildings and the adjacent topography sloping towards occupied

buildings. The 2016 dike breach analysis also assumed that South Ash Pond 2, South Ash Pond 3, and other nearby, non-CCR surface impoundments were at capacity at the time of the hypothetical failure.

Per Figures 2 and 3 in Appendix A, the 2016 dike breach analysis concluded that the flood released through a hypothetical breach in the eastern dike of either South Ash Pond 2 or South Ash Pond 3 could impact several unoccupied buildings and one occupied building. The 2016 dike breach analysis also concluded that the combination of the estimated flood velocity and depth at the occupied building is within the U.S. Department of the Interior, Bureau of Reclamation's (USBR) "Low Danger Zone" (see Figure 4 in Appendix A). In its "Downstream Hazard Classification Guidelines" (Ref. 15), the USBR states that if the depth-velocity combination of a hazard (*e.g.*, flood) for a given area plots within the "Low Danger Zone," "the number of lives-in-jeopardy associated with possible downstream hazards is assumed to be zero." In other words, floods plotting within the USBR's "Low Danger Zone" are unlikely to cause a probable loss of human life. Therefore, the initial federal hazard potential classification assessment concluded that a failure at the eastern dike of either South Ash Pond 2 or South Ash Pond 3 would not result in a probable loss of human life.

Although a hypothetical failure at either South Ash Pond 2 or South Ash Pond 3 was determined to not cause a probable loss of human life, it was also determined that wastewater released from a breach at either pond's western dike would flow directly into the Des Plaines River and cause offsite environmental impacts. Therefore, South Ash Ponds 2 and 3 were both classified as significant hazard potential CCR surface impoundments.

5.3 CHANGES IN BASES FOR INITIAL FEDERAL HAZARD POTENTIAL CLASSIFICATIONS

5.3.1 CHANGES IN ASH POND OPERATIONS & EMBANKMENT GEOMETRY

South Ash Ponds 2 and 3 were historically used by the Station to manage ash sluice water, slag tank overflow, stormwater overflow from the South Area Runoff Basin, and recycled sludge from the Station's wastewater treatment clarifiers. In early October 2020, Will County took South Ash Pond 3 out of service for routine cleaning. In April 2021, MWG filed a notice of intent to close South Ash Pond 3 in accordance with the Federal CCR Rule's closure criteria (Ref. 2, § 257.102). After Unit 4 was retired in June 2022, and following subsequent cleaning, isolating, and securing of ash-handling equipment, South Ash Pond 2 was only used to manage stormwater overflow from the South Area Runoff Basin. In December 2022, the Station re-routed South Area Runoff Basin overflow to the North Area Runoff Basin, thereby ceasing all flows to South Ash Pond 2. On January 12, 2023, MWG filed a notice of intent to close South Ash Pond 2. Closure construction activities will commence at both South Ash Ponds 2 and 3 upon receipt of closure construction permits from the Illinois EPA in accordance with Subpart B of the Illinois CCR Rule.

As noted in the latest annual inspection report (Ref. 12), both South Ash Pond 2 and South Ash Pond 3 had less than 1 foot of water when the inspection was performed in September 2024. Moreover, the Station routinely dewaters the ponds to minimize the accumulation of rainwater. To dewater South Ash Ponds 2 and 3, the Station pumps accumulated rainwater over the overflow weir into the concrete overflow trough at the west end of each pond. Per the weekly inspection reports prepared in accordance with 35 Ill. Adm. Code 845.540(a) for South Ash Ponds 2 and 3 since the 2023 hazard potential classification assessment was issued (Ref. 17), the Station's dewatering efforts have limited the water level in South Ash Pond 3 to at most 2.2 feet; no water was observed above the CCR remaining in South Ash Pond 2 since last year's assessment.

As previously mentioned in Section 5.1, the ponds' 2016 federal hazard potential classification assessment examined hypothetical breach scenarios assuming the ponds were at capacity. Currently, the only water entering South Ash Ponds 2 and 3 is direct precipitation (i.e., rain or snow) and run-off from the crests of the ponds' dikes. Moreover, the Station is actively limiting the amount of stormwater that can accumulate in the ponds. Therefore, the assumed operating conditions used for the initial assessment is conservative for the ponds' current operating conditions.

Based on reviews of Google Earth aerial images (Ref. 9) and the 2024 annual inspection report (Ref. 12), there have been no significant physical modifications to South Ash Ponds 2 and 3 (mass excavations, major embankment modifications, *etc*.) since the initial federal hazard potential classification assessment was completed. Therefore, there is no basis to re-evaluate the embankment geometry for this 2024 assessment.

5.3.2 CHANGES IN SITE TOPOGRAPHY

When comparing the 2004 USGS topography (Ref. 5) used in the initial federal hazard potential classification assessment and the 2010 USDA elevation dataset for the area (Ref. 6), no significant differences in the topography adjacent to the ash ponds and within the dike breach impact areas were identified. This observation is further supported by Google Earth aerial images (Ref. 9), which indicate that there have been no significant modifications to the ground surfaces (mass excavations, mass fill placement, *etc*.) adjacent to South Ash Ponds 2 and 3 or within the dike breach impact areas since 2010. Based on these observations, the topographic data used by the initial federal hazard potential classification assessment remains valid for this 2024 assessment.

5.3.3 CHANGES IN DOWNSTREAM PROPERTY DEVELOPMENTS

Based on reviews of Google Earth aerial images (Ref. 9) and the Will County, Illinois GIS (Ref. 10), no new buildings or transport corridors (roads, rail lines, *etc*.) have been constructed in the past eight years within the dike breach impact areas identified in the initial federal hazard potential classification assessment.

However, due to the retirement of Will County Unit 4 in June 2022, the main power building, identified as Building 2 on the updated Site Building Occupancy Map in Appendix B, is now unoccupied. In addition, two structures immediately south of the main power building, identified as Buildings 7 and 9, have been demolished, and a third structure, Building 8, is now unoccupied. Finally, the site's caretakers occupy the Station's wastewater treatment building, identified as Building 11.

Per the updated Site Building Occupancy Map in Appendix B, there are only two occupied buildings on the Will County site. These are the guard shack at the entrance of the site, identified as Building 10, and the aforementioned wastewater treatment building. However, because none of these developments include the addition of occupied buildings within the delineated dike breach areas shown in Appendix A, it is not necessary to reevaluate the potential impacts to the areas downstream of South Ash Ponds 2 and 3 for this 2024 assessment.

5.3.4 CHANGES IN USBR DEPTH-VELOCITY FLOOD DANGER LEVELS

The USBR has not updated the depth-velocity flood danger level relationships presented in its "Downstream Hazard Classification Guidelines" (Ref. 15) since the initial federal hazard potential classification assessment for South Ash Ponds 2 and 3 was completed in 2016. Therefore, there is no basis to re-evaluate the danger levels assigned to the occupied buildings identified within the inundation area downstream of the eastern dikes for South Ash Ponds 2 and 3 following a hypothetical breach at either pond.

5.4 2024 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

Per the preceding evaluation, there have been no significant modifications to the embankments for South Ash Ponds 2 and 3 and no significant modifications to the topography adjacent to and downstream of these CCR surface impoundments since the initial federal hazard potential classification assessment was completed in 2016. Since then, as a result of Unit 4 being retired, two buildings downstream of the CCR surface impoundments have been demolished, and only two buildings at the Station remain occupied. However, no occupied buildings within the delineated dike breach areas for the ponds have been added since the 2016 analysis.

There have also been no changes to the USBR's depth-velocity flood danger level relationships, which were used in the 2016 hazard potential classification assessment. Moreover, the Federal Energy Regulatory Commission's *Engineering Guidelines for the Evaluation of Hydropower Projects*, which references FEMA's *Federal Guidelines for Dam Safety* (Ref.13), states that "the consequences of failure are not expected to cause a probable loss of human life when incremental effects on downstream structures are approximately two feet or less." FEMA's *Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures* (Ref. 14) also states that an incremental rise in flood depth of two feet or less caused

by a dike breach is not considered to be a concern to human life. These two federal guidelines further support the conclusion that the loss of human life at the occupied building is not probable given that the initial dike breach analysis results show the estimated flood depth at this building is less than two feet. In addition, the 2016 dike breach analysis for the ponds' eastern dikes still represents the worst-case failure scenario for each pond since these dikes are the closest to occupied Station buildings. However, the Station has implemented operational changes that reduce the ponds' operating capacities to volumes less than their original design capacities, which reduces the potential impacts to downstream areas during a hypothetical dike breach. Therefore, the results of the 2016 dike breach analysis are conservative for the ponds' current operating conditions.

Based on the preceding observations, the bases for the initial federal significant hazard potential classifications assigned to South Ash Ponds 2 and 3 in accordance with 40 CFR 257.73(a)(2) have either not changed since 2016 or are conservative under current conditions. At their original design capacities, a loss of human life is unlikely to result from a hypothetical failure at these CCR surface impoundments, but potential offsite environmental damage could occur to the Des Plaines River. As discussed in Section 2.0, a CCR surface impoundment classified as a significant hazard potential per the Federal CCR Rule is considered to be an Illinois Class 2 CCR surface impoundment. Therefore, South Ash Ponds 2 and 3 remain classified as Class 2 CCR surface impoundments pursuant to 35 Ill. Adm. Code 845.440(a)(1) under their original design capacities. However, MWG is currently updating the 2016 dike breach analysis to account for the ponds' reduced operating capacities and corresponding reductions in impacts to downstream areas caused by a hypothetical dike breach at each pond. This evaluation will be provided in a subsequent revision to this hazard potential classification assessment.

The classifications of South Ash Ponds 2 and 3 are not a reflection of the potential for the impoundments to fail. The 2024 annual safety factor assessment conducted pursuant to 35 Ill. Adm. Code 845.460 shows that South Ash Ponds 2 and 3 are stable under design operating conditions (Ref. 3).

6.0 CONCLUSIONS

This assessment re-evaluated the factors and design inputs used as the bases for the initial federal hazard potential classification assessment completed in 2016 in accordance with the Federal CCR Rule for Will County's South Ash Ponds 2 and 3. It was determined that no significant physical changes to these CCR surface impoundments and no new downstream developments within the dike breach inundation areas have occurred within the last eight years that would necessitate changing either pond's initial federal hazard potential classification. However, the Station has implemented water level controls that reduce the ponds' operating capacities to volumes less than their original design capacities, which reduces the potential

impacts to downstream areas during a hypothetical dike breach at each pond. MWG is currently updating the 2016 dike breach analysis to account for this reduction in the ponds' operating capacities. This evaluation will be provided in a subsequent revision to this hazard potential classification assessment.

Based on the results of this hazard potential classification assessment, the bases for the initial federal significant hazard potential classification assigned to South Ash Ponds 2 and 3 under their original design capacities in accordance with 40 CFR 257.73(a)(2) have either not changed since 2016 or are conservative under current conditions. At their original design capacities, a loss of human life is unlikely to result from a hypothetical failure at either CCR surface impoundment, but potential offsite environmental damage could occur to the Des Plaines River. Therefore, because the 2023 Illinois hazard potential classifications for South Ash Ponds 2 and 3 were based on their respective 2016 federal hazard potential classifications, the 2023 Illinois hazard potential classifications assigned to South Ash Ponds 2 and 3 under their original design capacities, and the bases for these assignments, remain valid for 2024.

Table 6-1 presents the 2024 hazard potential classifications assigned to Will County South Ash Ponds 2 and 3 under their original design capacities in accordance with 35 Ill. Adm. Code 845.440(a)(1).

Table 6-1 – 2024 Illinois Hazard Potential Classifications for South Ash Pond 2 & South Ash Pond 3 at the Will County Generating Station

CCR Surface Impoundment	2024 Illinois Hazard Potential Classification
South Ash Pond 2	Class 2
South Ash Pond 3	Class 2

However, as noted above, the 2024 hazard potential classifications for South Ash Ponds 2 and 3 do not reflect the probability of a hypothetical failure event associated with either pond and are not contingent upon the ponds' structural stabilities. Indeed, the 2024 annual safety factor assessment conducted pursuant to 35 Ill. Adm. Code 845.460 (Ref. 3) shows the South Ash Ponds 2 and 3 are structurally stable under design operating conditions.

7.0 CERTIFICATION

I certify that:

- This hazard potential classification assessment was prepared by me or under my direct supervision.
- The work was conducted in accordance with the requirements of 35 Ill. Adm. Code 845.440.
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas Dehlin Date: October 13, 2024

Seal:

Digitally signed by
Thomas Dehlin
Date: 2024.10.13
11:35:06-05'00'

8.0 REFERENCES

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APPENDIX A: 2016 FED. HAZARD POTENTIAL CLASSIFICATION ASSESSMENT FOR SOUTH ASH PONDS 2 & 3

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HAZARD POTENTIAL CLASSIFICATION ASSESSMENT
SOUTH ASH POND 2S & SOUTH ASH POND 3S
WILL COUNTY STATION
OCTOBER 2016

This initial hazard potential classification assessment (HPCA) addresses the requirements of §257.73(a)(2) of the Coal Combustion Residuals (CCR) regulations, Code of Federal Regulations Title 40, Part 257 for South Ash Pond 2S and South Ash Pond 3S (the Ponds) at the Will County Station (Site) near Romeoville, Illinois. The CCR regulations were published in the Federal Register on 17 April 2015 and became effective as of 19 October 2015. The Site is a coal-fired power station, owned and operated by Midwest Generation, LLC (Midwest Generation).

Ms. Jane Soule, P.E., of Geosyntec, prepared this HPCA in accordance with §257.73(a)(2). Mr. Michael Houlihan, P.E., reviewed this report in accordance with Geosyntec's peer review policy.

Summary

Based on the results of the analyses provided in this report, South Ash Pond 2S and South Ash Pond 3S are classified as significant hazard potential CCR surface impoundments because their failure would not result in probable loss of life, but could result in potential economic and environmental losses.

1. Regulation Requirements - §257.73(a)(2)

According to the Preamble of the CCR regulations (page 21377), "a hazard potential classification provides an indication of the potential for danger to life, development, or the environment in the event of a release of CCR from a surface impoundment." This classification is not an assessment of the likelihood of a release or failure, but rather an evaluation of the potential impacts if one were to occur. Per §257.73(a)(2), "the owner or operator must document the hazard potential of each CCR unit as either a high hazard potential CCR surface impoundment, a significant hazard potential CCR surface impoundment or a low hazard potential surface impoundment." The assessment must include certification from a qualified professional engineer stating that the initial hazard potential classification (and each subsequent periodic classification) was conducted in accordance with these requirements. Section 257.53 provides the following definitions for hazard potential classifications:

- A high hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life;

- A significant hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns; and
- A low hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner's property.

Based on the definitions contained in §257.53, a demonstration that an impoundment does not qualify for either a low or high hazard potential classification results in a hazard classification of significant by default.

2. Site Plan

The Site is bounded by the Des Plaines River on the west and the Chicago Sanitary and Ship Canal on the east. Because of geographic constraints, the watershed area for the Site is limited. A Site Plan identifying the Ponds and key Site elements, including buildings and other surface impoundments, is shown in Figure 1. The Ponds are located along the eastern banks of the Des Plaines River and west of an electrical substation area and main power block structure. Surface water ponds are located south of the Ponds and a lined process pond no longer in service is located north of South Ash Pond 2S.

Based on site observations and a review of available construction documents, the Ponds were constructed with elevated embankments surrounding the Ponds so run-on to the Ponds is limited to the embankment crests. The capacity and embankment height of the Ponds are shown in Table 1 below:

Table 1: Estimated Capacity and Maximum Depth

	South Ash Pond 2S	**South Ash Pond 3S**
Estimated Capacity	13.2 acre-feet	15.1 acre-feet
Estimated Maximum Depth	8 feet	8.5 feet

3. Pond Failure Impact Evaluation

In order to classify the hazard potential of the Ponds, impacts of a potential failure must be evaluated. Due to the proximity of the Ponds to the Des Plaines River, a potential failure of the western embankment(s) of the Ponds could result in environmental losses resulting from

discharge of CCR and CCR-laden water to a water of the United States. This potential impact excludes the Ponds from a low hazard classification.

The next step in classification is to evaluate the potential for failure or mis-operation to cause loss of human life. Figure 1 identifies the location of buildings in the vicinity of the Ponds, including both occupied and unoccupied buildings[1]. Occupied buildings, including the main power block, are located over 700 feet east of the Ponds; no occupied buildings are located north or south of the Ponds. Visual evaluation of the building layout in relation to the Ponds indicates that a potential breach of the eastern embankment of either Pond could result in a potential impact on human life. Detailed modeling, discussed in Section 3.1, was used to assess the impact of a potential breach of the eastern embankments.

3.1 Eastern Embankment Failure Modeling

Impact analysis was performed for a scenario where the Pond(s) are at full capacity prior to embankment failure and downstream depressions or other surface impoundments within the impact area are full and not capable of containing additional flow (flood conditions failure scenario). As discussed in Section 2, run-on to the Ponds is limited and inflow is generally limited to direct precipitation. Therefore, modeling of the Probable Maximum Precipitation (PMP) or other precipitation frequency event was not performed as the inflow of the precipitation event is minimal compared to the capacity of the Ponds.[2]

HEC-HMS Version 4.1 (HEC-HMS, 2013) modeling software was used to estimate the breach hydrographs which are plots of the rate of flow versus time. A two-dimensional model of the Site was then developed using FLO-2D Basic (FLO-2D, 2009) modeling software which incorporates land use (e.g., vegetation or asphalt surfacing) and topographic data. The FLO-2D model estimates flow depth and velocity resulting from the selected hydrograph. The results of the modeling area described below. Details of the modeling are provided in Geosyntec (2016).

Calculated maximum flow depth and maximum velocity from the South Ash Pond 2S breach modeling are shown in Figures 2 and 3, respectively. The results of the FLO-2D model show that flow through the modeled breach travels from South Ash Pond 2S toward the north, south, and east with a majority of the flow heading southeast. Estimated water depths near Building 2 range

[1] Building identification numbers used in this report were generated for reference purposes only and may not correspond to identifications names or numbers utilized at the Site. Buildings are assumed to be occupied if there is at least one human occupant for a minimum of 12 hours per day.

[2] The total volume of direct precipitation from PMP event during the estimated duration of the failure (less than 20 minutes) is minimal compared with the volume that would be released during a failure.

from 0 to 1 foot with velocities less than 1.0 fps. Estimated water depths near Buildings 5, 6, and 7 range from 0 to 1 foot with velocities less than 1.0 fps.

Calculated maximum flow depth and maximum velocity from the South Ash Pond 3S breach modeling are shown in Figures 4 and 5, respectively. The results of the FLO-2D model show that the breach flows from South Ash Pond 3S toward the north, south, and east with a majority of the flow heading south. Estimated water depths near Building 2 range from 0 to 1 foot with velocities less than 1.0 fps. Depths near Buildings 5, 6, and 7 range from 0 to 1 foot with velocities ranging from 1.0 to 2.0 fps.

4. Hazard Classification Assessment

As discussed in Section 1, a CCR surface impoundment is classified as having a high hazard potential if failure or mis-operation will probably cause loss of human life. Guidelines for evaluating potential loss of life during flood conditions are provided in USBR (1988). Figure 6, adapted from USBR (1988), presents a relationship between danger to human life and flood flow depth and velocity for a house-type structure, and depth-velocity combinations that plot within the 'low danger zone' correspond to zero lives seriously in danger from that particular scenario (USBR, 1988). Figure 6 shows a plot of the predicted velocity (~1 fps) and depth of flow (~1 foot) at occupied buildings from a potential failure of South Ash Pond 2S or 3S. This point lies within the 'low danger zone' indicating that a breach of either South Ash Pond 2S or 3S will not result in probable loss of human life.

Based on the results of the analysis, provided in this report, South Ash Pond 2S and South Ash Pond 3S are classified as significant hazard potential CCR surface impoundments because their failure would not result in probable loss of life, but could result in impacts to the Des Plaines River creating potential economic loss and environmental damage.

5. Limitations and Certification

This hazard potential classification assessment report was prepared to comply with §257.73(a)(2) of the Code of Federal Regulations Title 40, Part 257, Subpart D, and was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.

Jane W. Soule, P.E.
Illinois Professional Engineer No. 062-067766
Expiration Date: 11/30/2017

6. References

FLO-2D, 2009. *FLO-2D Basic,* FLO-2D Software, Inc., Arizona 2009.

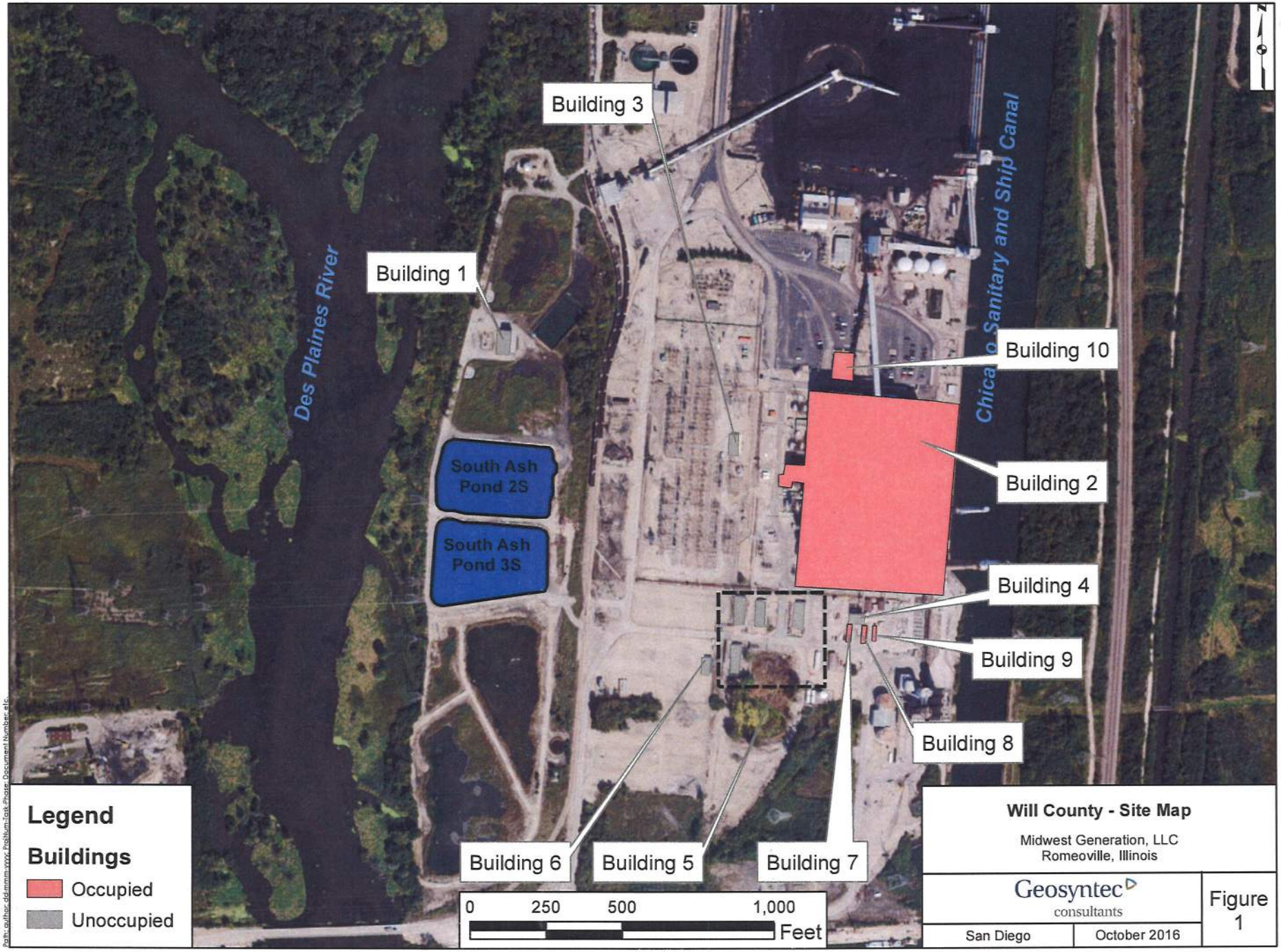
Geosyntec, 2016. Ash Ponds 2S and 3S – Hazard Potential Classification Assessment Embankment Breach Analysis, Will County Station, Romeoville, Illinois, October.

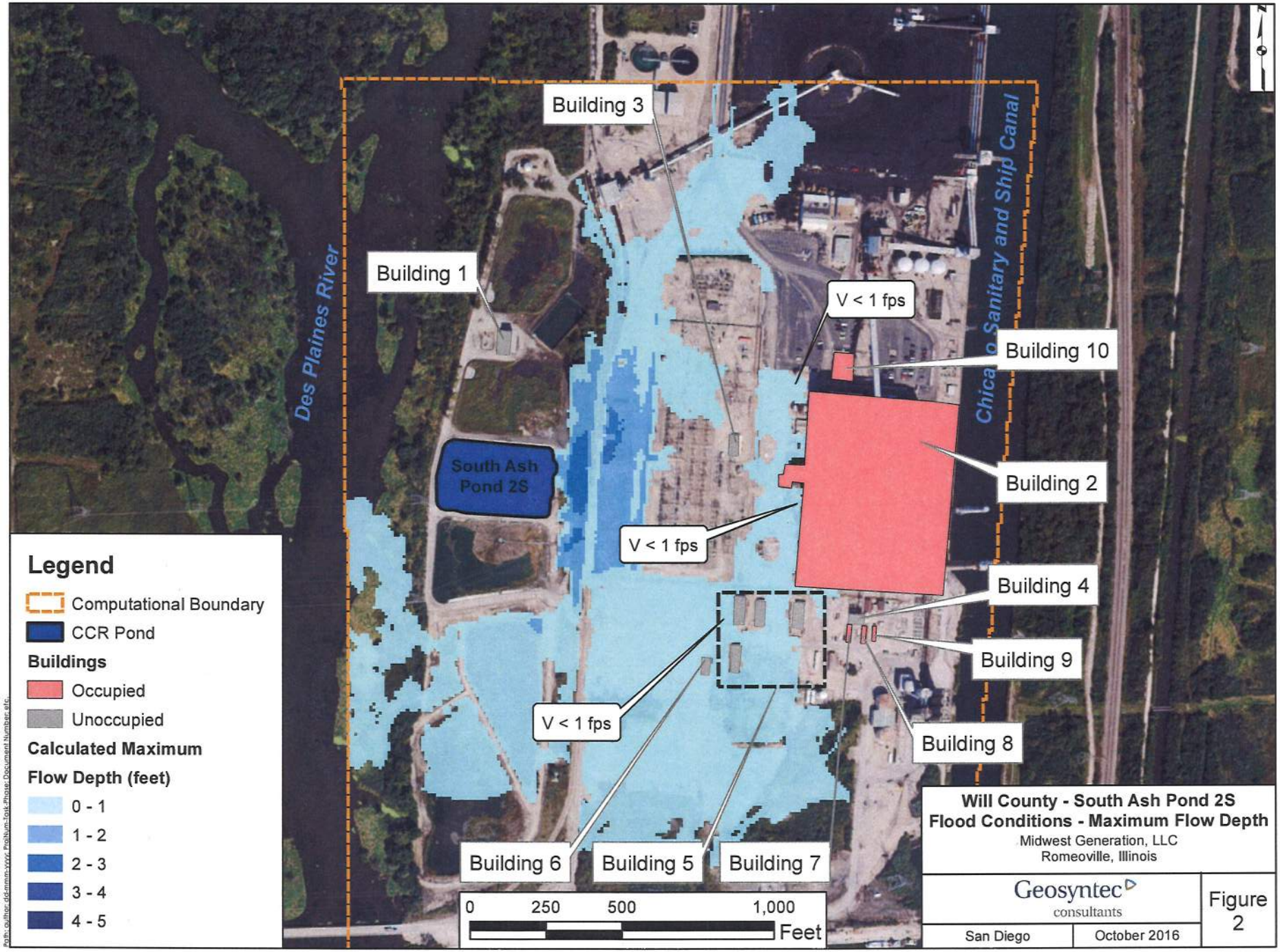
HEC-HMS, 2013. HEC-HMS Hydrologic Modeling System – User's Manual, Version 4.0, U.S. Army Corps of Engineers, Hydrologic Engineering Center (HEC), Davis, California, December 2013.

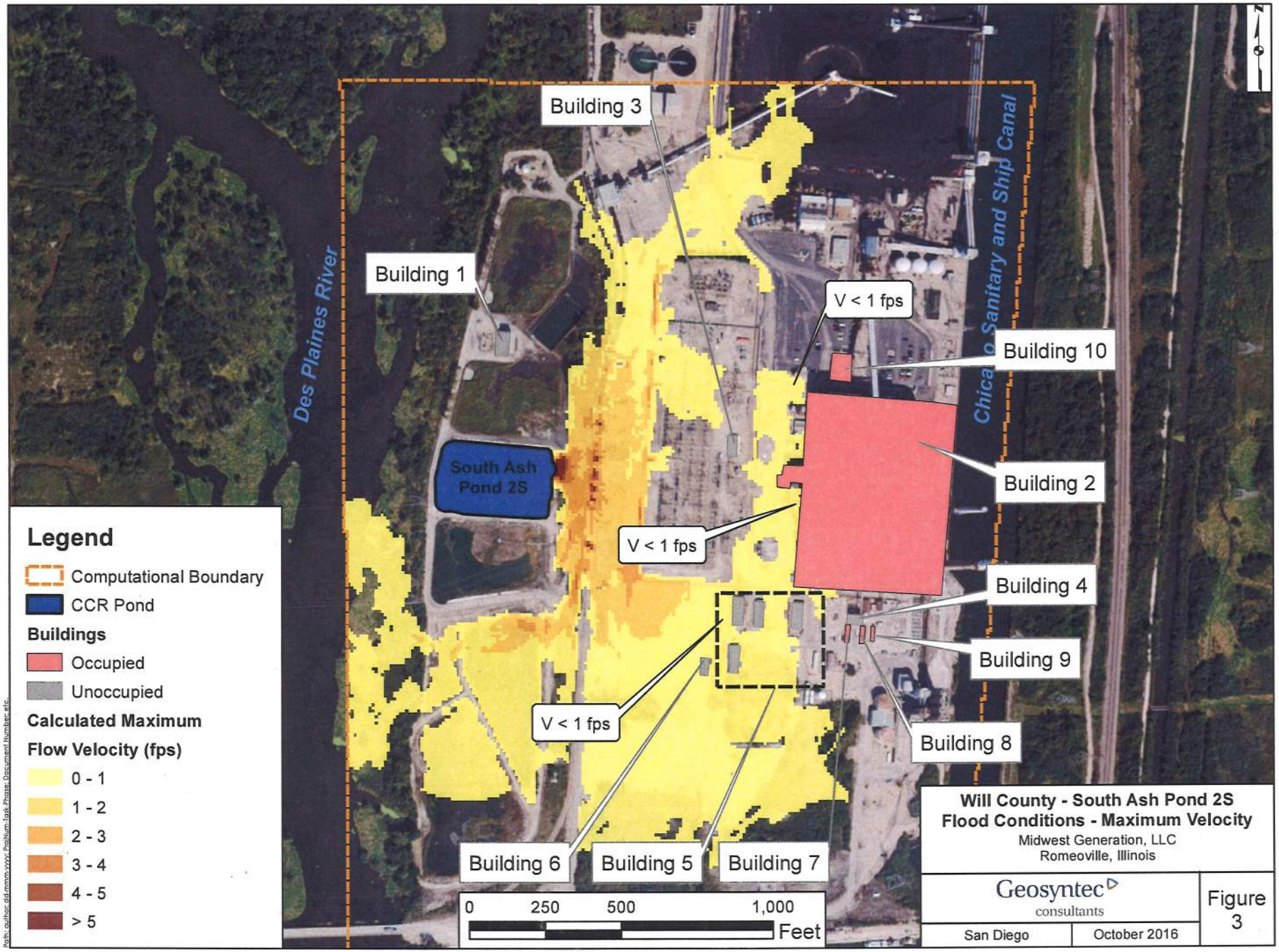
United States Department of the Interior, Bureau of Reclamation (USBR), 1988. Downstream Hazard Classification Guidelines, ACER Technical Memorandum No. 11.

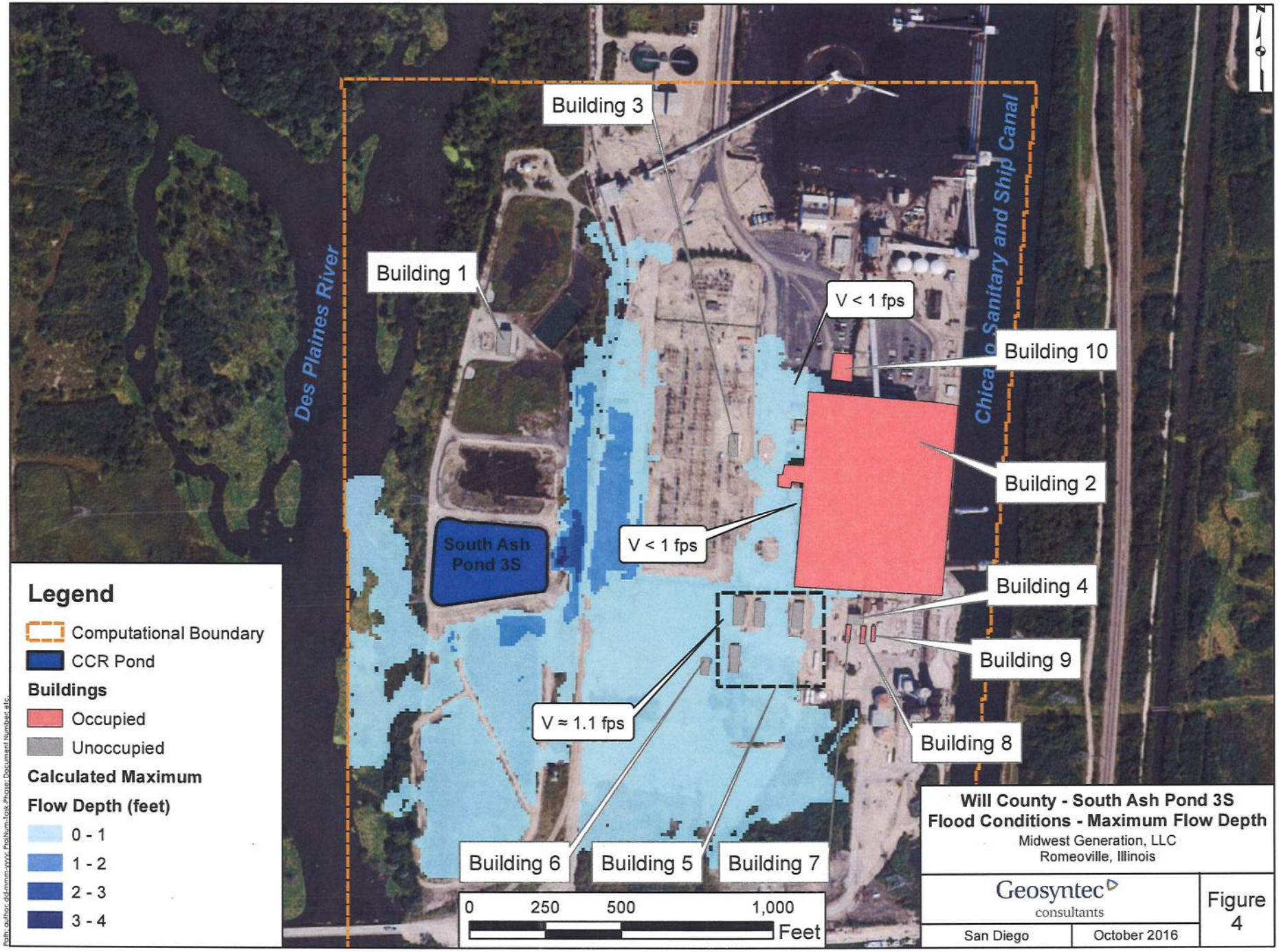
Attachments

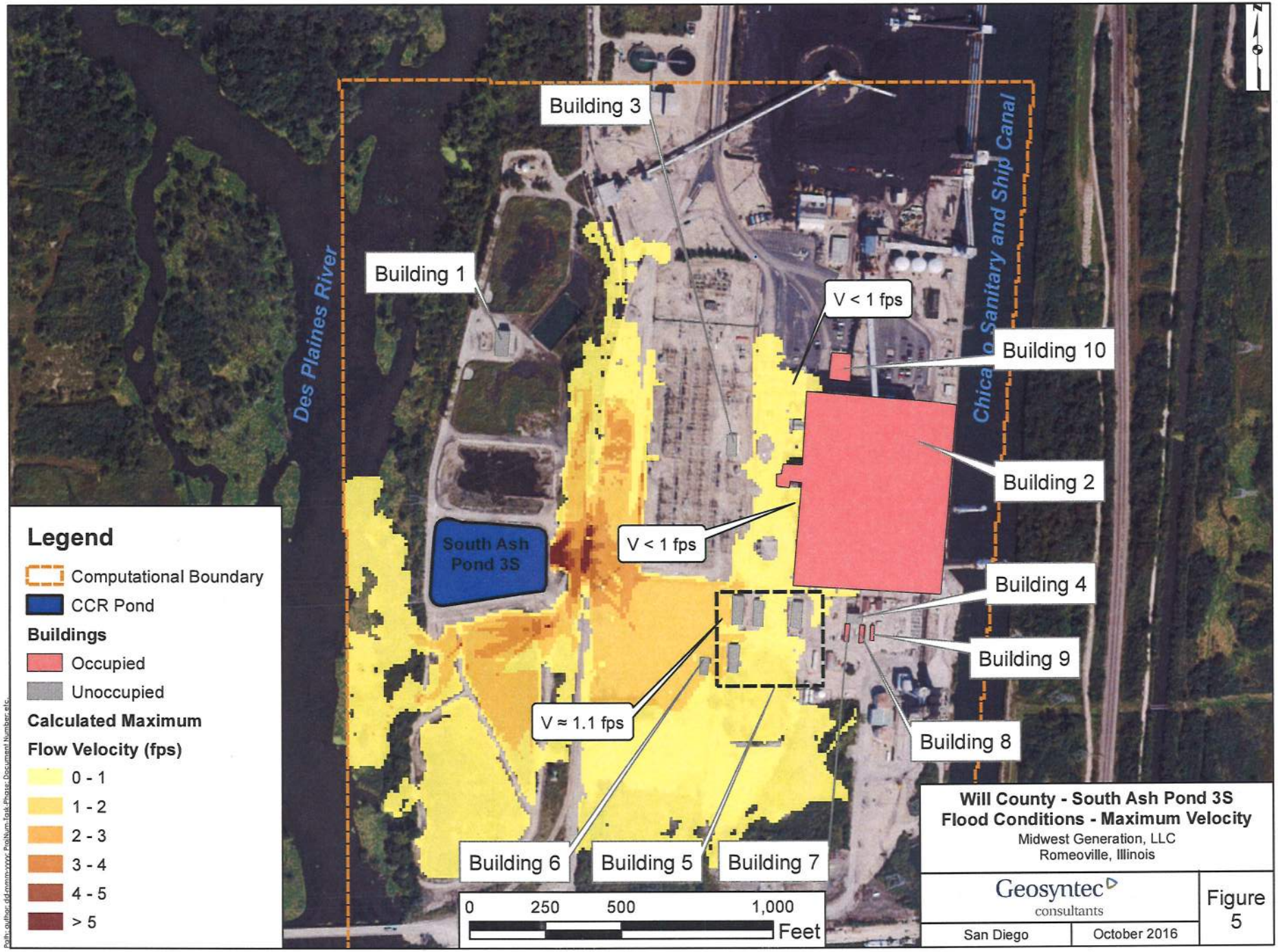
Figure 1 – Site Map
Figure 2 – South Ash Pond 2S Flood Conditions – Maximum Flow Depth
Figure 3 – South Ash Pond 2S Flood Conditions – Maximum Velocity
Figure 4 – South Ash Pond 3S Flood Conditions – Maximum Flow Depth
Figure 5 – South Ash Pond 3S Flood Conditions – Maximum Velocity
Figure 6 – Estimated Flood Danger Levels


Building 3
Building 1
Des Plaines River
Chicago Sanitary and Ship Canal
Building 10
Building 2
South Ash Pond 2S
South Ash Pond 3S
Building 4
Building 9
Building 8
Building 6
Building 5
Building 7
0
250
500
1,000
Feet
Legend
Buildings
Occupied
Unoccupied
Will County - Site Map
Midwest Generation, LLC
Romeoville, Illinois
Geosyntec consultants
San Diego
October 2016
Figure 1


Building 3
Building 1
Des Plaines River
Chicago Sanitary and Ship Canal
V < 1 fps
Building 10
South Ash Pond 2S
Building 2
V < 1 fps
Building 4
Building 9
V < 1 fps
Building 8
Building 6
Building 5
Building 7
Legend
Computational Boundary
CCR Pond
Buildings
Occupied
Unoccupied
Calculated Maximum Flow Depth (feet)
0 - 1
1 - 2
2 - 3
3 - 4
4 - 5
0
250
500
1,000
Feet
Will County - South Ash Pond 2S
Flood Conditions - Maximum Flow Depth
Midwest Generation, LLC
Romeoville, Illinois
Geosyntec consultants
San Diego
October 2016
Figure 2


Building 3
Building 1
Des Plaines River
Chicago Sanitary and Ship Canal
V < 1 fps
Building 10
South Ash Pond 2S
Building 2
V < 1 fps
Building 4
Building 9
V < 1 fps
Building 8
Building 6
Building 5
Building 7
0
250
500
1,000
Feet
Legend
Computational Boundary
CCR Pond
Buildings
Occupied
Unoccupied
Calculated Maximum Flow Velocity (fps)
0 - 1
1 - 2
2 - 3
3 - 4
4 - 5
> 5
Will County - South Ash Pond 2S
Flood Conditions - Maximum Velocity
Midwest Generation, LLC
Romeoville, Illinois
Geosyntec consultants
San Diego
October 2016
Figure 3

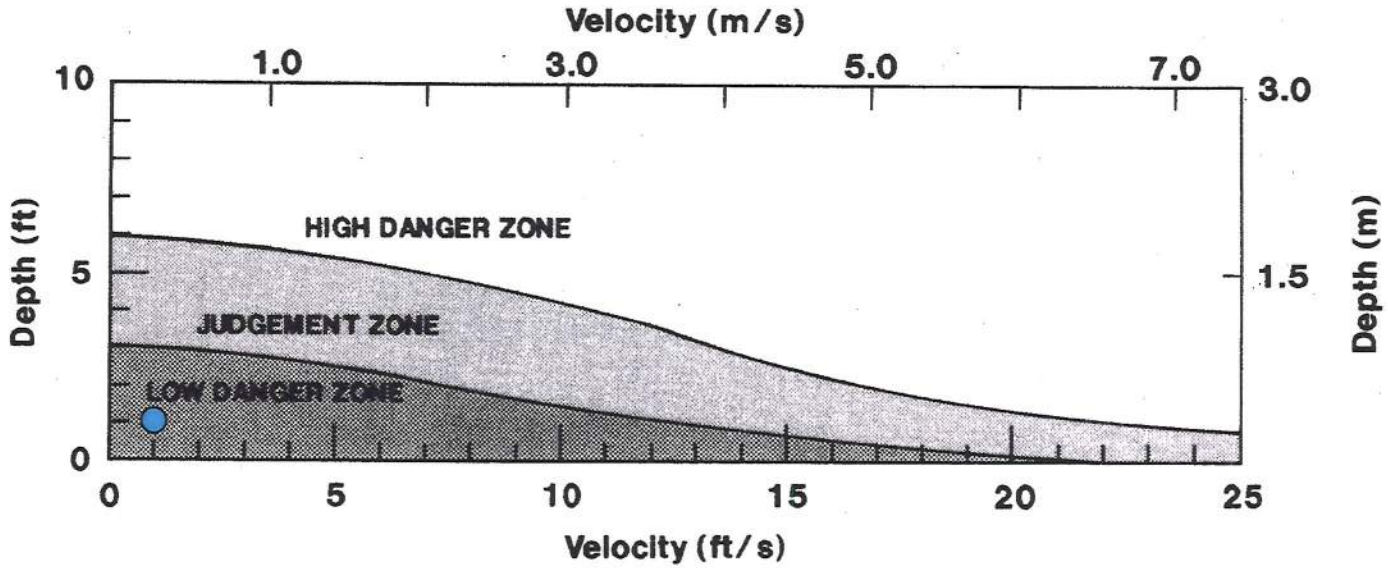

Building 3
Building 1
Building 10
Building 2
Building 4
Building 9
Building 8
Building 6
Building 5
Building 7
Des Plaines River
Chicago Sanitary and Ship Canal
South Ash Pond 3S
V < 1 fps
V < 1 fps
V ≈ 1.1 fps
Legend
Computational Boundary
CCR Pond
Buildings
Occupied
Unoccupied
Calculated Maximum Flow Depth (feet)
0 - 1
1 - 2
2 - 3
3 - 4
0
250
500
1,000
Feet
Will County - South Ash Pond 3S
Flood Conditions - Maximum Flow Depth
Midwest Generation, LLC
Romeoville, Illinois
Geosyntec consultants
San Diego
October 2016
Figure 4


Building 3
Building 1
Des Plaines River
Chicago Sanitary and Ship Canal
V < 1 fps
Building 10
Building 2
South Ash Pond 3S
V < 1 fps
Building 4
Building 9
V ≈ 1.1 fps
Building 8
Building 6
Building 5
Building 7
0
250
500
1,000
Feet
Legend
Computational Boundary
CCR Pond
Buildings
Occupied
Unoccupied
Calculated Maximum Flow Velocity (fps)
0 - 1
1 - 2
2 - 3
3 - 4
4 - 5
> 5
Will County - South Ash Pond 3S
Flood Conditions - Maximum Velocity
Midwest Generation, LLC
Romeoville, Illinois
Geosyntec consultants
San Diego
October 2016
Figure 5

HIGH DANGER ZONE - Occupants of most houses are in danger from floodwater.

JUDGEMENT ZONE - Danger level is based upon engineering judgement.

LOW DANGER ZONE - Occupants of most houses are not seriously in danger from flood water.



● = Predicted maximum velocity and depth of water at occupied buildings resulting from potential failure of Ash Pond 2S or 3S.

Adapted from Figure 2, USBR (1988), for houses/buildings built on foundations.

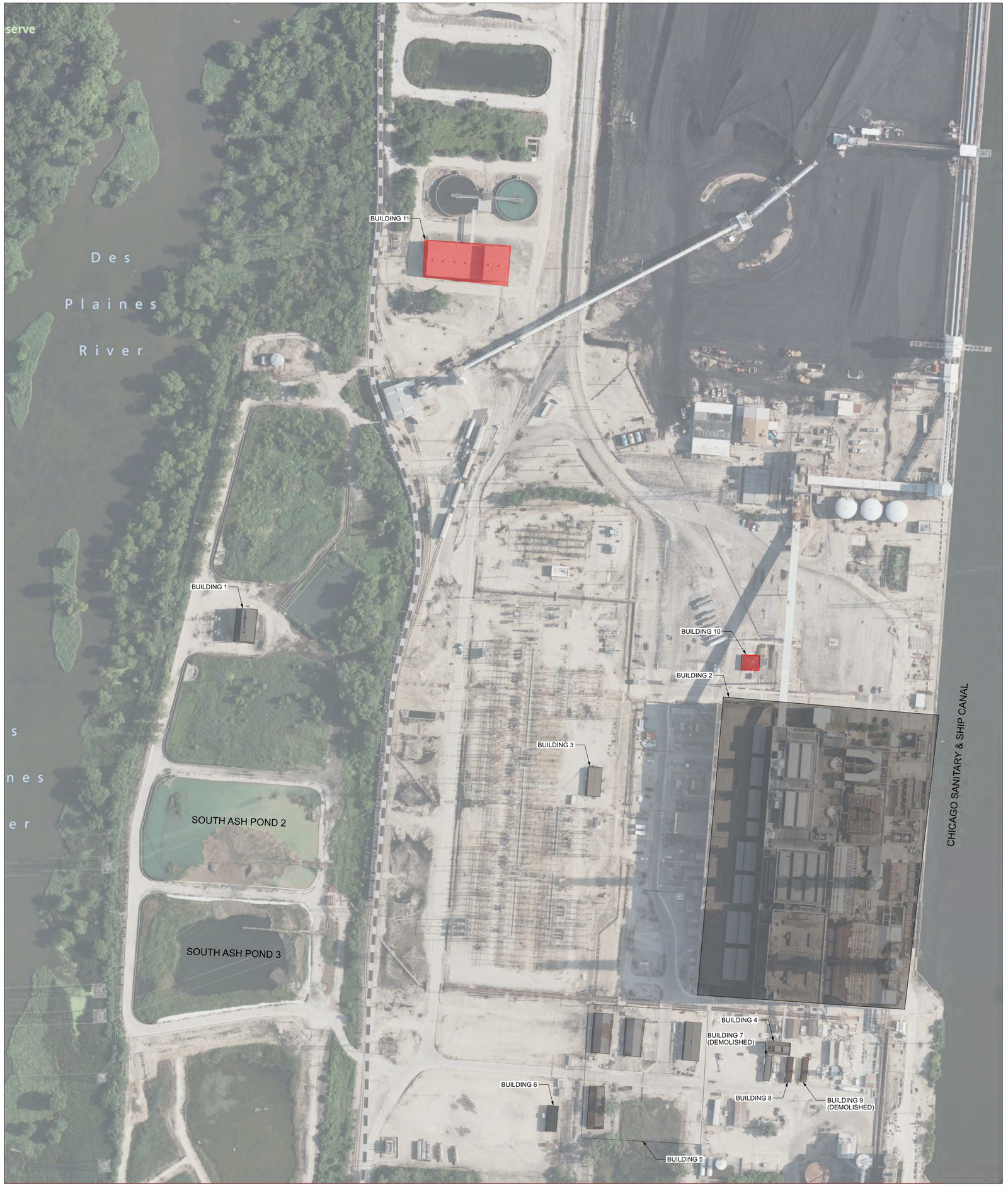
Estimated Flood Danger Levels
South Ash Pond 2S and 3S - Will County Station
Midwest Generation, LLC
Romeoville, Illinois

Geosyntec consultants

San Diego | October 2016

Figure 6

APPENDIX B: 2024 SITE BUILDING OCCUPANCY MAP



PRELIMINARY
NOT FOR CONSTRUCTION

NORTH

80' 0' 80' 160'
GRAPHIC SCALE

LEGEND

- OCCUPIED BUILDING
- UNOCCUPIED BUILDING

NOTES

1. AERIAL IMAGE IS FROM GOOGLE EARTH PRO V7.3 AND MAY NOT BE REPRESENTATIVE OF CURRENT SITE CONDITIONS.
2. BUILDING NUMBERS ARE FOR REFERENCE PURPOSES ONLY AND MAY NOT CORRESPOND TO THE BUILDING NAMES OR NUMBERS ASSIGNED BY / USED AT THE STATION.
3. BUILDINGS ARE CONSIDERED TO BE OCCUPIED IF AT LEAST ONE HUMAN OCCUPANT IS PRESENT IN THE BUILDING FOR AT LEAST 12 HOURS PER DAY.

REFERENCE DRAWINGS

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

UNDERGROUND OR EMBEDDED UTILITIES MAY BE LOCATED WITHIN OR ADJACENT TO THE AREA IN WHICH EXCAVATION, DEMOLITION, FOUNDATION, OR MODIFICATION WORK IS TO BE PERFORMED.

REFERENCES RELATING TO THE UNDERGROUND OR EMBEDDED UTILITIES ARE PROVIDED TO ASSIST THE CONTRACTOR/INSTALLER IN THE FIELD LOCATING THOSE UTILITIES AND OTHER POSSIBLE UNDERGROUND OR EMBEDDED INTERFERENCES WITH THE WORK.

THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

HOLD INFORMATION

NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	10-10-2024	FOR USE

ISSUE PURPOSE:	USE
SPECIFICATION:	N/A
PROJECT NO.:	12661-189
CAD FILE NAME:	WC-EXHIBIT-CSK-002.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	---

ANY MODIFICATION OR ADDITION TO THIS DRAWING BY AN ORGANIZATION OTHER THAN SARGENT & LUNDY, IS NOT THE RESPONSIBILITY OF SARGENT & LUNDY.

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SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

WILL COUNTY
GENERATING STATION
2024 HAZARD POTENTIAL
CLASSIFICATION ASSESSMENT

DRAWING TITLE

SITE BUILDING
OCCUPANCY MAP

DRAWING NUMBER	REVISION
12661-189-WC-CSK-001	0

SHEET 1 OF 1

PL:12804/0R9007/E:\Shared\INFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DESIGN\2-Will County - CCR\Will County Ash Pond Closure 1N, 1S, 2S & 3S Drawings\WC-EXHIBIT-CSK-002.dgn
Form GDG-0401-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010
10/11/2024 4:14:01 PM
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