HANSON™







Prepared for:

Illinois Department of Natural Resources

# Project Planning & Feasibility Report

# Sears & Steel Dams

## Rock River near Milan, IL

Hanson Professional Services Inc.

*June 30, 2026*

**FINAL**

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Printed by Authority of the State of Illinois, 8/26, DNR-OWR-27012, web

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| Acronym | Definition |
|---|---|
| ACS | American Community Survey |
| AEP | Annual Exceedance Probability |
| AJD | Approved Jurisdictional Determination |
| ASCE | American Society of Civil Engineers |
| ASDSO | Association of State Dam Safety Officials |
| ASTM | ASTM International / formerly American Society for Testing and Materials |
| AUID | Assessment Unit ID |
| BL | Bureau of Land |
| BMPs | Best Management Practices |
| BOW | Bureau of Water |
| BW | Bureau of Water |
| CCDD | Clean Construction and Demolition Debris |
| CERP | Comprehensive Environmental Review Process |
| CFD | Computational Fluid Dynamics |
| cfs | cubic feet per second |
| CWA | Clean Water Act |
| CY | cubic yards |
| DEM | Digital Elevation Model |
| DOR | Depth of Refusal |
| DTW | David T. Williams & Associates |

| | |
|---|---|
| DWRM | Division of Water Resource Management |
| EPA | Environmental Protection Agency |
| ESA | Endangered Species Act |
| FEMA | Federal Emergency Management Agency |
| FERC | Federal Energy Regulatory Commission |
| FHWA | Federal Highway Administration |
| FIS | Flood Insurance Study |
| GIS | Geographic Information System |
| GLO | General Land Office |
| HARGIS | Historic Architectural Resources Geographic Information System |
| HEC-RAS | Hydrologic Engineering Center River Analysis System |
| HEC-SSP | Hydrologic Engineering Center Statistical Software Package |
| HHPD | High Hazard Potential Dam |
| HUC | Hydrologic Unit Code |
| IAC | Illinois Administrative Code |
| IBEW | International Brotherhood of Electrical Workers |
| IDNR | Illinois Department of Natural Resources |
| IDNR-OWR / OWR | Illinois Department of Natural Resources – Office of Water Resources |
| IDOT | Illinois Department of Transportation |
| IEPA | Illinois Environmental Protection Agency |
| ILEPA | Illinois Environmental Protection Agency |
| ILP-25 / PLP-25 | IEPA Assessment Unit ID for the Rock River |
| IPaC | Information for Planning and Consultation |
| ISHPO | Illinois State Historic Preservation Office |
| ISWS | Illinois State Water Survey |
| LiDAR | Light Detection and Ranging |
| LHDI | National Inventory of Low-head Dams |
| MAC | Maximum Allowable Concentration |
| MBTA | Migratory Bird Treaty Act |
| mg/L | milligrams per liter |
| MSA | Metropolitan Statistical Area |
| ND | Not Detected |
| NID | National Inventory of Dams |
| NOAA | National Oceanic and Atmospheric Administration |
| NPDES | National Pollutant Discharge Elimination System |
| NRHP | National Register of Historic Places |
| NS | No Standard is Published |

| | |
|---|---|
| NWI | National Wetlands Inventory |
| NWP | Nationwide Permit |
| OHWM | Ordinary High Water Mark |
| PCBs | Polychlorinated Biphenyls |
| PEC | Probable Effects Concentration |
| RRD | Rock River Dam / Rock River sediment sample identifier |
| S.U. | Standard Units |
| SQRT | Screening Quick Reference Tables |
| SWE-EM | Shallow Water Equation – Eulerian-Lagrangian Method |
| TACO | Tiered Approach to Corrective Action Objectives |
| T&E | Threatened and Endangered |
| TEC | Threshold Effects Concentration |
| TMDL | Total Maximum Daily Load |
| UIUC | University of Illinois at Urbana-Champaign |
| USACE | United States Army Corps of Engineers |
| USCB | United States Census Bureau |
| USEPA | United States Environmental Protection Agency |
| USFO | Uncontaminated Soil Fill Operation |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| USBR | United States Bureau of Reclamation |
| WOTUS | Waters of the United States |
| WQC | Water Quality Certification |
| YR | Year |

## Executive Summary

The Illinois Department of Natural Resources – Office of Water Resources (IDNR–OWR) commissioned this planning-level feasibility study to identify a technically sound, cost-effective, and permittable solution to address public safety hazards associated with the Sears and Steel Dams on the Rock River near Milan, Illinois. Following the decommissioning of the hydropower facility in 2020, the dams no longer serve their original purpose, allowing for a comprehensive evaluation of dam modification or removal alternatives. The study emphasizes improvement of public safety as the primary goal, supported by secondary objectives including reduction of long-term maintenance and cost-effective implementation, ecological enhancement, regulatory compliance, and consideration of recreational uses.

This report evaluates existing conditions, river geomorphology, sediment dynamics, and hydraulic behavior to inform a comparative assessment of six dam alternatives. Analyses were performed using field investigations, geomorphic reconnaissance, sediment sampling, and 1D/2D hydraulic modeling to assess impacts to river processes, infrastructure, ecology, and recreation. All findings are presented at a feasibility level; detailed design, structural assessments, and final permitting are beyond the scope of this study. Evaluation of the Sears powerhouse structure was explicitly excluded.

*Existing Conditions*
The Sears and Steel Dams are low-head, run-of-the-river structures that create dangerous hydraulic rollers capable of trapping swimmers and boaters. At least six fatalities (at Steel Dam) and multiple near-miss incidents (at both Sears and Steel Dams) have occurred in the past 20 years alone. Hydraulic modeling confirms that hazardous conditions exist across nearly all river flow conditions, including common recreational flow conditions. The existing conditions present a persistent public safety risk.

Field investigations and hydraulic modeling determined that the dams impound nearly 20 miles of river. The aging infrastructure no longer supports its original purpose to generate electricity, and the continued operational benefits are impacted by safety risks and maintenance costs.

A reach-based geomorphic assessment indicates the river system is generally stable under current impounded conditions, with banks stabilized by a combination of bedrock, vegetation, and artificial armoring. Approximately 75% of the shoreline remains in natural riparian condition, while developed areas are partially hardened.

From an ecological perspective, the dams block fish migration between the Rock River and Mississippi River. They raise water temperatures and lower dissolved oxygen levels in the river while also decreasing habitat for native species, including state-listed fish and mussels. By impeding river continuity, the dams inhibit biodiversity and alter sediment transport. It has been estimated that approximately 4.3 million cubic yards of sediment are impounded upstream of the structures. The sediment composition is predominantly sand with ~25% fines. Sediment deposition patterns reflect the influence of the dams, with thicker fine-grained deposits near Sears Dam and predominantly sand-dominated material farther upstream. Sediment quality testing indicates generally low contamination levels, supporting the feasibility of passive sediment management but further testing will be required during the permitting process. The geomorphic setting suggests that removal of hydraulic controls

would restore natural processes but initiate a period of channel adjustment, including incision, bar formation, and redistribution of flow between channels.

*Recommended Plan of Action*
Six alternatives were evaluated, ranging from full dam removal to various modification strategies intended to reduce hydraulic hazard while maintaining portions of the impoundment. Alternatives were assessed using a structured evaluation matrix considering public safety, cost, maintenance, ecological benefit, recreation, constructability, and regulatory feasibility. Structural modification alternatives (e.g., stepped spillways, rock ramps, bypass channels) were found to reduce hazardous hydraulic conditions. These options retain long-term maintenance requirements and continue to limit ecological connectivity. Partial removal alternatives provide incremental benefits but maintain elements of the existing hazard and system disruption. The following six alternatives were fully evaluated:

1. Alternative 1 - Remove Both Dams
2. Alternative 2 - Remove Sears, modify Steel Steps
3. Alternative 3 - Remove Sears, modify Steel Rock Ramp
4. Alternative 4 - Remove Sears, modify Steel Steps, add Riffles.
5. Alternative 5 - Remove Sears, modify Steel Steps with Bypass
6. Alternative 6 – No Change to Sears, Modify Steel Steps

Implementation of any alternative will require coordination with IDNR–OWR, Illinois Environmental Protection Agency (IEPA), and the U.S. Army Corps of Engineers (USACE), among others. Key regulatory drivers include compliance with the Clean Water Act (Sections 401 and 404), floodplain management, endangered species consultation, and cultural resource protection. Dam removal alternatives will require mitigation for impacts to wetlands, stream channels, and temporary disruptions to aquatic habitat. While these impacts are more extensive under the full removal scenario, they are balanced by long-term restoration of river processes, reduced cost and provide the strongest alignment with the primary goal for public safety.

The project team in collaboration with IDNR-OWR has determined the recommended plan as Alternative 1 – Removal of Both Dams. Per IDNR-OWR direction, Sears Dam removal was limited to the spillway with the powerhouse remaining in place. Steel Dam is fully removed. This alternative most effectively satisfies the primary project goal by completely eliminating the hydraulic roller hazard and associated public safety risk. It is the only alternative that removes, rather than mitigates, the hazard. Typical river safety hazards will remain; however, but an assessment of such additional safety hazards is outside the scope of this report.

In addition to safety, Alternative 1 provides the strongest overall performance relative to secondary goals. It eliminates long-term maintenance obligations, offers the lowest lifecycle cost, restores approximately 70 miles of river connectivity, and fully reestablishes natural geomorphic and sediment processes. Ecological benefits include improved fish passage, enhanced habitat diversity, and long-term recovery of aquatic systems.

However, the selected alternative does not fully satisfy all project objectives. The transition from an impounded system to a free-flowing river results in the loss of flatwater recreation (e.g., boating and

water skiing) but increases other recreational pursuits such as paddling activities (i.e., canoeing and kayaking). There are also changes to shoreline conditions adjacent to private property. Short-term impacts include sediment release, elevated turbidity, and the potential need for wetland and habitat mitigation. Additionally, changes in water surface elevation and velocity may affect local recreational preferences and require adaptation by river users. There may be significant economic impacts to local river-based businesses and private shoreline residences that warrant consideration. Economic quantification was not considered within the scope of this study.

No single plan can fully achieve all desired goals for this study. The pros and cons of each alternative were evaluated and scored within the alternative evaluation matrix to provide a comprehensive visual comparison. Alternative 1 is recommended as the most balanced solution, providing the greatest overall benefit while directly addressing the primary safety objective. Its advantages in hazard elimination, ecological restoration, and long-term sustainability outweigh the identified tradeoffs. Successful implementation will require careful management of sediment release, coordination with regulatory agencies, and consideration of stakeholder concerns during subsequent design and permitting phases.

# 1. Purpose & Scope

This study was initiated by IDNR-OWR to evaluate potential safety improvements for the Sears and Steel Dams on the Rock River near Milan, Illinois. The existing low-head dams present documented public safety hazards and functional limitations. Following the decommissioning of the Sears Powerhouse in 2020, the structures no longer provide hydroelectric function and are evaluated for modification or removal. The study is guided by the project goals defined in the Executive Summary, emphasizing public safety as the primary objective, with supporting considerations for cost, maintenance, ecological function, recreation, constructability and regulatory feasibility. Feedback from public outreach leans heavily in favor of preserving the existing pool. All of these goals are addressed within this report.

The IDNR-OWR retained Hanson to complete a dam safety feasibility study to evaluate safety improvement modifications for both Sears and Steel dams. Hanson has teamed with Inter-Fluve Inc. (Inter-Fluve), Prairie Engineers (Prairie), and David T. Williams & Associates (DTW) to assist with evaluating dam removal and dam modification feasibility considerations. Hanson's primary role was to develop hydrologic and hydraulic modeling, concept plans and cost estimates. Inter-Fluve performed geomorphic site assessment, evaluated impounded sediment management and assisted in evaluation of the alternatives. Prairie, and their partner EnviroScience, performed environmental and cultural resource investigations, sediment sampling and laboratory analysis and alternative impacts. DTW served in the quality assurance role for all phases of the study. The team also collaborated with IDNR-OWR who led public outreach, performed bathymetric survey for the study reach and traditional surveys of the dams, and depth-of-refusal surveys of the sediment upstream of the structures. This report documents feasibility findings and characterizes existing river conditions, including geomorphology, sediment dynamics, and ecological resources.

The purpose of this study is to evaluate dam safety and river function in the project reach, considering ecological conditions, sediment dynamics, and recreational use. Evaluation of existing hydraulic conditions and the potential impacts of dam modification or removal are central components of the study described in detail in Sections 7 and 8.

The project scope includes the formulation of evaluation criteria to thoughtfully analyze alternatives, development of hydraulic models to assess impacts under varying conditions, and surveying to acquire bathymetric data. Field investigations and data collection support characterization of existing conditions and evaluation of alternative impacts.

This report supports IDNR–OWR in evaluating feasible options to improve public safety and river function through dam modification or removal. The evaluation considers regulatory compliance requirements while assessing implications for public safety and environmental resources.

## *1.1 Hazard Definition*

Run-of-the-river low head dams are known to be a public safety drowning hazard because they often appear harmless while also concealing a strong underlying current that prevents escape. The potential drowning hazard is increased by the ogee spillway shape associated with increased hydraulic efficiency and stronger currents. As water flows over the steep face of the dam, it plunges downward with high velocity, striking the downstream surface and creating intense turbulence (see Figure 1 ). This impact

forms what is known as a hydraulic jump, where fast-moving water meets slower water downstream. At certain downstream levels, the tailwater submerges the hydraulic jump, forming a powerful recirculating current called a roller. This roller pushes water—and anything caught in it—back toward the dam's face, where it gets pulled into the high-velocity jet again. Swimmers, boaters, or even rescuers caught in this cycle can be held underwater or pushed repeatedly into the dam, making escape nearly impossible without specialized equipment or intervention. According to a study on low-head dams by Brigham Young University and the US Department of Homeland Security, across the United States, more than 1,000 deaths have resulted from people unknowingly or accidentally entering the area below the spillway and becoming trapped.

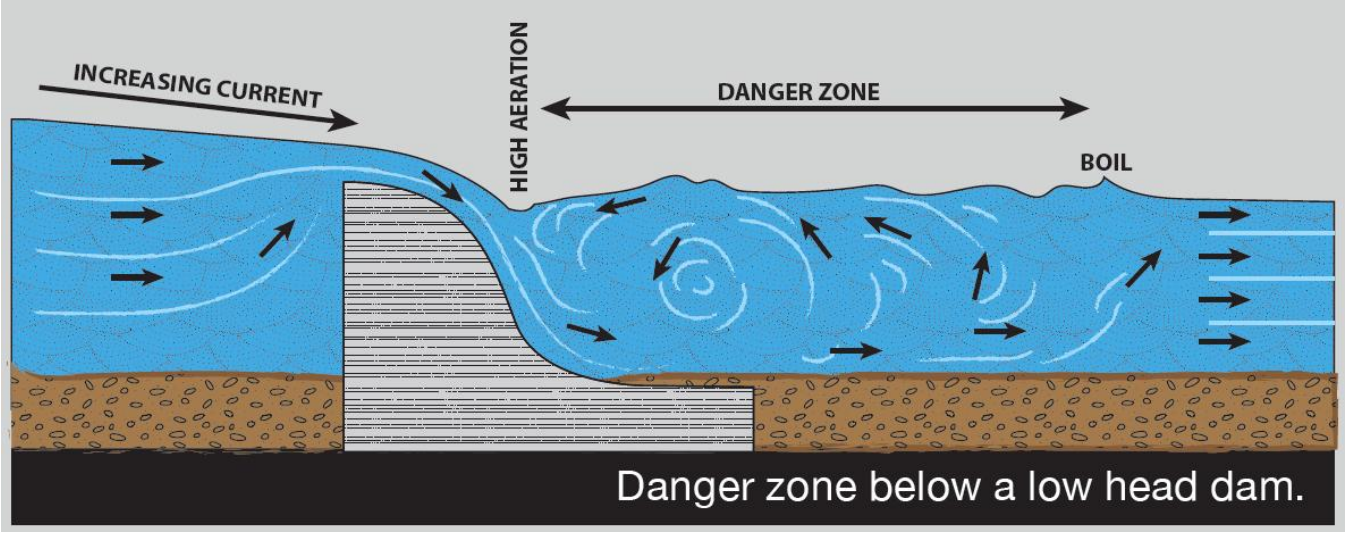



*Figure 1 - Hydraulic Roller (image source: americanrivers.org)*

The nature of low-head dams often leads to their inauspicious hazard. When tailwater elevations rise, the dams become nearly invisible to the upstream boater's perspective with no obvious drop and little to no white water. During low tailwater conditions the low dam height presents a minor vertical drop viewed as inviting to wading anglers or swimmers unaware of the submerged conditions. Under some water discharges no visible hazard may be present leading people to view the area as safe. But when conditions change, like after a rainfall, and the roller forms, what was a safe area becomes deadly. These dams can lull people into a false sense of security. For these reasons posting adequate warning signs is recommended to alert those recreating in the area. With tens of thousands of low-heads across the country, the Association of State Dam Safety Officials (ASDSO) Public Safety Around Dams Committee has formed a Task Force to create a National Inventory of Low-head Dams (LHDI). ASCE estimates that nationwide 50 people drown each year at low-head dams (Landers, 2021).

While warning signs and buoys are installed upstream of the Sears and Steel dams per IDNR policy, accidents have occurred. In 2020, a 21-year-old and 16-year-old were both killed when their boat lost power and went over the Steel Dam. In 2018, a 5-year-old drowned after a boating accident at the dam. In 2013, two jet skiers went over the dam and a 40-year-old died in the incident. Prior deaths were also reported in 2008 (20-year-old) and 2007 (70-year-old). Most recently, in 2023, four boaters (no fatalities) were rescued from a boating incident near Sears Dam.

## 2. Data Collection and Limitation of Study

This section presents the data sources, collection methods, and study limitations that supported the Sears and Steel Dams Feasibility Study. An understanding of existing site conditions was developed through a combination of hydrographic surveys (bathymetric and depth of refusal), limited sediment sampling, Light Detection and Ranging (LiDAR) data, background data, and computational hydraulic modeling. These datasets provided the foundation for evaluating dam safety, sediment dynamics, ecological impacts, and potential alternatives. However, since this is a planning-level study, it was conducted without certain elements typically included in design-phase investigations—such as river borings, dam corings, structural conditions, and finalized design plans. Additionally, response to public outreach and permitting activities were deferred to future phases. The Illinois Environmental Protection Agency (IEPA) and the Illinois Department of Natural Resources – Office of Water Resources (IDNR-OWR) have regulatory authority over dam removal projects in Illinois in cooperation with the United States Army Corps of Engineers (USACE). Permitting and regulatory input were sought with some limited direction documented in this study.

During this study phase, the following limitations were recognized:

- Design and permitting were not performed. The feasibility study was limited to concept level.
- No river borings or dam corings were performed.
- No dam structure condition assessment was performed.
- One chemical background level result was attained – additional samples will likely need to be performed to meet the level required for design and permitting.
- Sediment sampling scope was limited to that of a feasibility assessment. Additional assessment will likely be required for design and permitting.
- No design plans were available for Sears Dam.
- Per IDNR-OWR direction, the powerhouse and all facilities will remain in place with no alterations.

### *2.1 Data Collection*

- Hydrographic surveys were collected by IDNR-OWR in June and August 2024.
- Depth of Refusal (DOR) surveys were collected August 2023, June 2024, and September 2024 by IDNR-OWR.
- 2020 LiDAR data was obtained from the Illinois Geospatial Data Clearing House with a nominal pulse spacing of 0.5-meters. The LiDAR data was post-processed into Digital Elevation Model (DEM) format at a 1-m resolution.
- HEC-RAS 1D hydraulic models were developed for the Rock River by Illinois State Water Survey (ISWS) in 2011 based on surveyed channel cross-sections. The model serves as the regulatory basis for the FEMA floodplain on Rock River. The 1D model was provided by ISWS and amended by Hanson to reflect newly collected LiDAR and bathymetric survey. The model was used for definition of river geometry outside of the newly collected areas associated with this study.
- River supernatant samples were collected by EnviroScience (subcontractor to Prairie) in 2024 for chemical analysis.
- River sediment samples were also collected by EnviroScience for particle size determination and select chemical testing.

- Geomorphic assessment was completed by Inter-Fluve on June 13-14, 2024.
- 2D HEC-RAS hydraulic models were developed by Hanson from bathymetric survey for the area immediately adjacent to the dams, including both channels around Vandruff Island.

### *2.2 IEPA's Illinois Integrated Water Quality Report and Section 303(d) List*

Illinois sets water quality standards against which water bodies are assessed for impairment. State standards for impairment must be as strict, or stricter than the national standards. Water bodies that are rated impaired by pollutants and do not meet the water quality standards for their designated use and are required by the Clean Water Act (CWA) to have Total Maximum Daily Loads (TMDLs) of pollutants that are causing the impairment; the TMDL is the maximum amount of a given pollutant that may be present for the water body to still meet water quality standards. The Environmental Protection Agency (EPA) sets national standards for TMDLs of pollutants in waterbodies. If a water body does not meet the established standards, it is listed on the 303(d) list of impaired waters and the CWA requires the development of a restoration plan (also known as a TMDL).

IEPA develops an Illinois Integrated Water Quality Report every two years to describe the water quality of waterbodies within the State, as required by CWA. IEPA designates water bodies into one of five categories based on waterbody assessments. For this assessment, each waterbody in the State is assigned a use(s) designation. The Illinois use designations including Aesthetic Quality, Aquatic Life, Indigenous Aquatic Life, Primary Contact, Public Food and Processing Water Supply and Fish Consumption. The latest report is the Illinois Integrated Water Quality Report and Section 303(d) List, 2024 Draft (IEPA, 2024). The Rock River segment from the Sears and Steel dams to its confluence with the Mississippi River is within the Lower Rock Watershed (HUC10 070900005) and is identified by IEPA as unit AUID IL_P-25 (this is the assessment unit code given to this water body segment by the IEPA for use in tracking water quality status of waterbodies in the state). This assessment unit is depicted in Figure 2 below in teal.

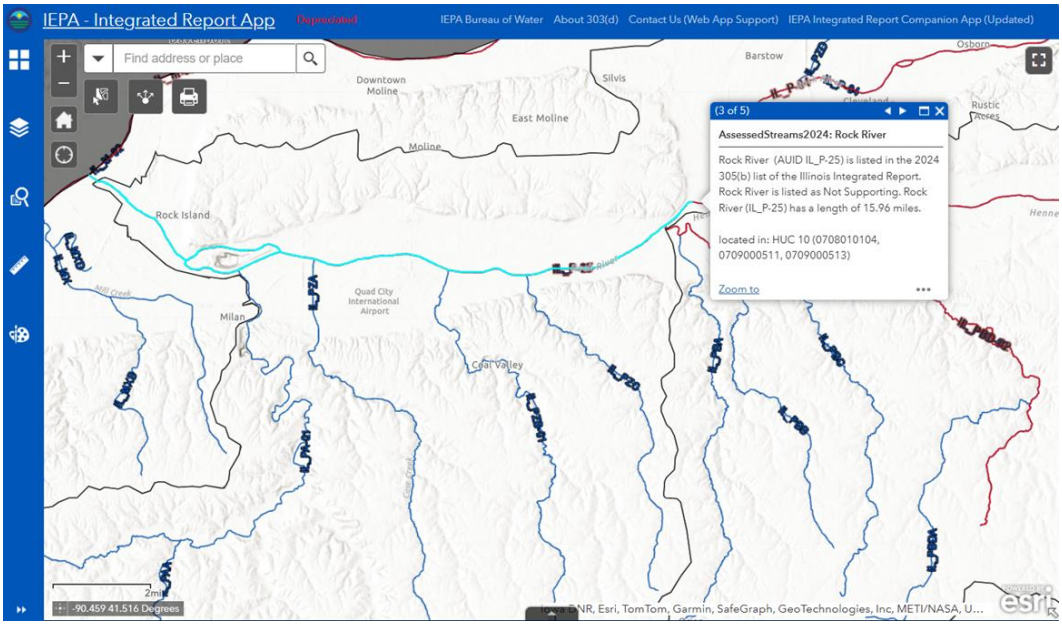



*Figure 2 - IEPA Assessment Unit ID PL_P-25 (source: https://illinois-epa.maps.arcgis.com/apps/webappviewer/index.html?id=773c1711e0e9417ea7cd6cad8afb66ea)*

### *2.2.1 IEPA Water Quality Assessments and TMDLs*

Current water quality conditions in the Rock River were reviewed through IEPA (IEPA, 2025) and U.S. Environmental Protection Agency (USEPA, 2025) resources. According to the IEPA, the Rock River AUID IL_P-25 (see Figure 2 above), as it flows through the Project Area, is impaired for Fish Consumption. Causes of impairment were determined to be from various chemicals including aldrin, dieldrin, endrin, heptachlor, mercury, mirex PCBs and toxaphene. The USEPA further specified that the water quality in this section is impaired for Fish and Shellfish Consumption. Identified issues leading to these impairments include the presence of Mercury, PCBs, and Pesticides.

This section of the Rock River, as it flows through the Project Area (IL_P-25) , while on the 303(d) list as an impaired water, does not yet have a TMDL plan developed for restoration of water quality. In Illinois, the development of TMDLs for waterbodies are prioritized by the watershed within which they are located. There are 52 watersheds and three priority rankings for TMDL development in Illinois. High priority is assigned to waters for which public water supply use is impaired by atrazine, simazine or nitrate. TMDLs for these waters will be developed for the entire watershed. Medium priority is assigned to watersheds with no approved or ongoing TMDL. 'Medium' ranking waters are further categorized in priority based on the number of impairment causes identified for the waterbody. Low priority is assigned to watershed that have an approved or ongoing TMDL, although TMDL implementation is ongoing and unaffected by the prioritization process. The state TMDL development schedule calls for initiation of TMDL development in six TMDL watersheds each year (IEPA, 2024). The Lower Rock Watershed is ranked as a medium priority for TMDL development due to the total number of potential causes of impairment (IEPA, 2024). The current IEPA forecast for watershed TMDL development lists the next six watersheds, higher in priority, for development within the next two years and does not include the Lower Rock Watershed. As a medium priority watershed for TMDL development, it could be sometime before a TMDL is developed for Lower Rock Watershed. Implementing the dam removal option may accelerate the need for TMDL plan development.

## 3. Existing Conditions / Facility (Background)

This section provides a detailed overview of the Sears and Steel Dams, including their physical characteristics, historical significance, and current condition. The information presented here establishes the baseline conditions necessary for evaluating potential modification or removal alternatives in subsequent sections.

### *3.1 Area Overview*

#### *3.1.1 Location*

Sears Dam and Steel Dam are located on the Rock River in Rock Island County, Illinois, near Milan and the City of Rock Island (see Figure 3 ). The Sears Dam spans the North Channel of the Rock River along the north side of Vandruff Island, immediately upstream of the U.S. Highway 67/11th Street bridge. Together with Steel Dam on the South Channel, they impound a portion of the Lower Rock River upstream of Vandruff Island, several miles above the Rock River's confluence with the Mississippi River. The upstream impoundment also includes the City of Moline and Village of Coal Valley. The dams lie within a developed river corridor that includes public transportation infrastructure, former hydroelectric facilities, private riverfront properties, quarry lands, and natural riparian areas.

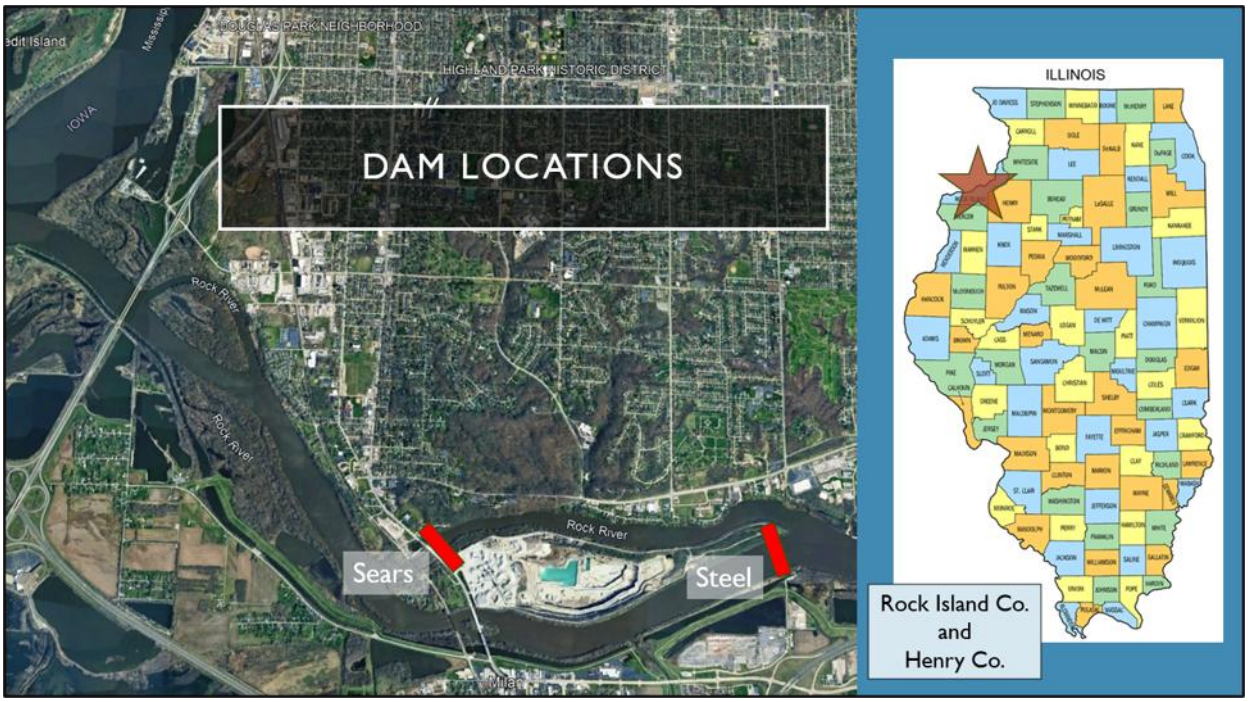



*Figure 3 - Location Map*

These low-head, run-of-the-river dams were originally constructed more than one hundred years ago to support hydroelectric power generation but have since been decommissioned. Currently, the dams impound nearly 20 miles of the Lower Rock River providing a recreational pool but also limiting fish passage from the Mississippi River to the upper Rock River watershed. Run-of -the-river, low-head dams also create a public safety hazard. In recent years there have been multiple drowning deaths associated with the dams. These types of dams have a record of facilitating drowning deaths across the nation and many states have created programs to remove the hazard – often by removing the dams.

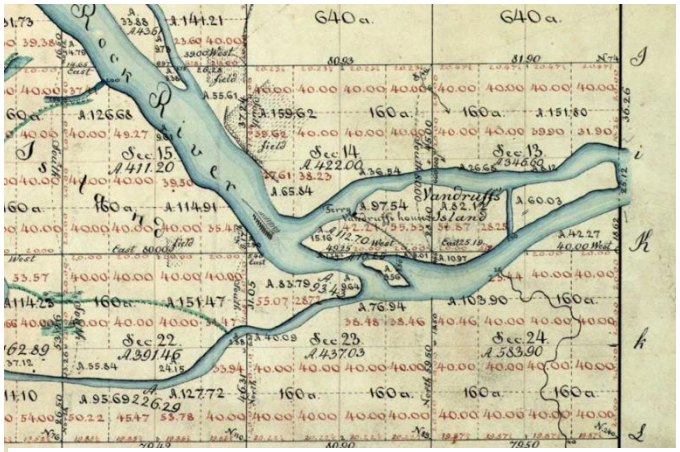


*Figure 4 - General Land Office Map of Survey Plat T17N, R2W, 4th Principal Meridian (GLO 1839)*

### *3.1.2 Geology*

The geology of the Lower Rock River has been described in detail by several researchers (Alden 1918, Anderson 1967, Anderson 2005, Carman 1909, Leverett 1899, and Savage and Udden 1921). The Rock Island-Milan area geology is dominated by Devonian limestone deposits overlain by glacial Mississippi alluvial deposits. See Figure 4 showing rivers as of 1839 prior to dam construction (GLO 1839). The modern river has incised into these deposits, and Vandruff Island is a good example of limestone bedrock exposed through quarrying. The current Vandruff Island was once two islands, Vandruff Island to the west and

Carr Island to the east. Historic maps show that these islands were separated, but the gap was later filled as part of the quarrying and damming operations.

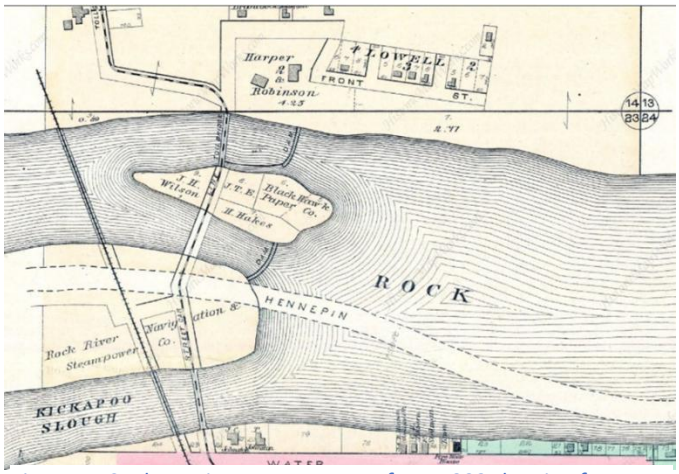



*Figure 5 - Sanborn Fire Insurance Map from 1888 showing former dam location on the south side of Vandruff Island providing power for the Black Hawk Paper Company (Sandborn 1888).*

### *3.1.3 History*

Prior to the current Sears Dam, a previous stone dam was built in the North Channel in 1846 to power the Island Mills operated by D.B. Sears and Sons (see 1888 map in Figure 5 ).
Prior to the Steel Dam being built, a dam once spanned the Rock River across the South Channel near the current County 67 crossing south of Vandruff Island. This dam (the Black Hawk dam) provided power for the Black Hawk Paper Company and diverted water into the Kickapoo Slough (Figure 5 ). The Black Hawk dam is no longer in place. By 1900, the Steel Dam was constructed at the head of Carr Island to control water flow into the Hennepin Canal (Figure 6 ). In the early 20th century, much of the Kickapoo slough and surrounding wetlands were filled.



*Figure 6 -Looking south along the Steel Dam from Vandruff Island, July 26, 1904*

The Hennepin Canal is a concrete and earthen berm canal constructed to facilitate barge traffic from the Illinois River to the Mississippi. Construction of the canal began in 1890, and the boat traffic started in 1907, reducing the distance from Chicago to Rock Island by 419 miles. A portion of this historic channel runs along the left bank (looking downstream) of the Rock River adjacent to the project reach, with a former lock/entrance at the Steel Dam location. Widening of locks on the Illinois and Mississippi Rivers made the Hennepin Canal obsolete shortly after it opened, and by the 1930s, the canal was used primarily for recreational activities. The Hennepin canal was closed to boat traffic in 1951 (Armstrong 1961, Yeater 1979). Portions of Hennepin Canal are listed on the National Register of Historic Places, which may have an impact on site access and permitting requirements for construction at the adjacent Steel Dam.

## 3.2 Dam Details

### 3.2.1 Sears Dam

The current Sears Dam and abutments are owned by the State of Illinois, as well as the adjacent US Highway 67 right-of-way (Figure 7). The surrounding land north of the river is owned by the City of Rock Island (hydroelectric plant), and private parcels including Fraternal Order of Eagles and the Cotton Mill Senior Living Center. The land south of the river is owned by Allied Stone Quarry who maintains active quarry mining operations.



*Figure 7 - Sears Dam Looking Upstream from Highway 67 Bridge (Prairie 2024).*

The National Inventory of Dams (NID) lists the current Sears Dam as having a height of 16-feet (spillway 14-feet and apron 2 feet) and a hydraulic head of roughly 18 feet. While as-built plans are not available, based on available bathymetry, survey and projections, it is estimated that the actual dam height is **13.1 feet**. This height aligns well with a head of impoundment topset delta (depositional area) just downstream of the Hwy 80 crossing (near TPC Deere Run Golf Club). In low gradient alluvial rivers, topset beds are typically composed of coarser grained material, with finer sediment fractions transporting closer to the dams, as is the case with Sears and Steel Dams.

### 3.2.2 Steel Dam



*Figure 8 - Steel Dam Looking North from Southern Bank at Park (Prairie 2024).*

The current Steel Dam and abutments are also owned by the State of Illinois. The surrounding lands north of the river are owned by Allied Stone Quarry and south of the river are publicly owned by State of Illinois and Village of Milan (Figure 8).

The National Inventory of Dams (NID) lists the current Steel Dam as having a height of 11.0 feet. The NID shows the Steel Dam being built in 1912, but photos show the dam in place in summer of 1904, and plat maps from 1905 also show the dam in place. As-built plan drawings are available for the Steel Dam and define a height of **6.0 feet**.

### *3.2.3 Dam Safety Features*

IDNR-OWR installs safety features including buoys and signage at all state-owned dams. Buoys are placed approximately 300' upstream of the dam at 50' intervals across the width of the river. The buoys are marked in accordance with Coast Guard Regulations and say, "DANGER DAM". Buoys are 9" in diameter and a Solar Marine Light is placed on the middle buoy that flashes white at a rate of 60 flashes per minute and is visible for a minimum of 1 nautical mile. At dams that are owned by the State of Illinois, signs are also placed and maintained at the dams. This signage is usually affixed to the dam abutment or placed on property that is owned by the State of Illinois. The Department has no authority to place and maintain signage at locations where it does not own the property.

### *3.3 Cultural Resources*

The information in this summary provides a general review of the potential cultural impacts assessed based on readily available online databases, including an archaeological/historic review of existing Historic and Architectural Resources Geographic Information System (HARGIS, accessed 2025) and Illinois Archaeological Survey / Illinois State Archaeological Survey records (accessed 2025), and a summary of the findings from a Phase I Literature Review. No new Phase I archaeological or onsite investigation was completed as part of this effort.

#### *3.3.1. Previously Recorded Archaeological Sites and Surveys*

A Comprehensive Environmental Review Process (CERP) was approved in July 2024 under CERP code: 2417158. Final reviews will be completed once final plans are developed and submitted.

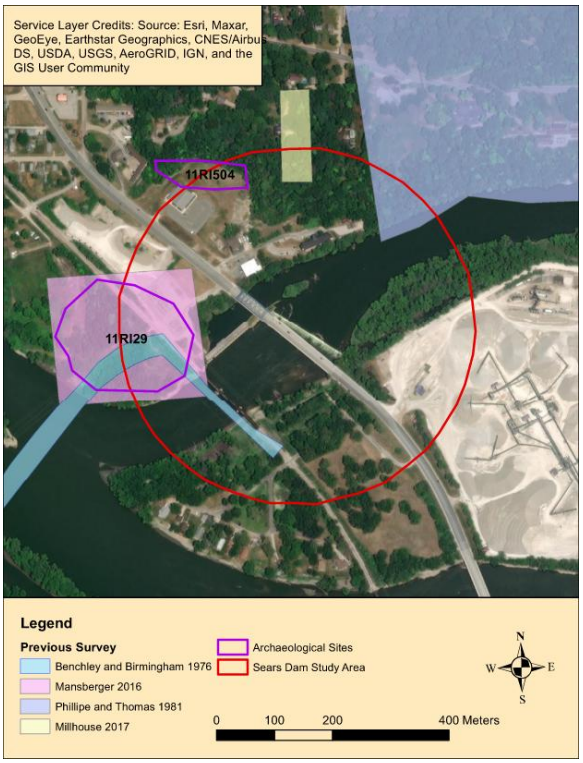



*Figure 9 - Sears Dam Archaeological Sites*

3.3.1.1. Sears Dam

Two archaeological sites and four previous surveys were documented within 1,000-feet (laterally) of the dam (Figure 9 ). For the two archaeological sites, one is the location of the historic Native American Sauk Village of Saukenauk and the other site is known as the Sauk Cemetery. The exact boundaries of either site are not known and neither site has been evaluated for inclusion in the National Register of Historic Places (NRHP). The four previous surveys included portions mapped within 1,000-feet of the dam, which were completed in 1976, 1981, 2016, and 2017. No evidence of these sites was found inside of the search radius of the dam.

3.3.1.2. Steel Dam

Two archaeological sites and one previous survey were documented within 1,000-feet of the dam (Figure 10). For the two archaeological sites, one was a shell midden that had been excavated around 1960. The other

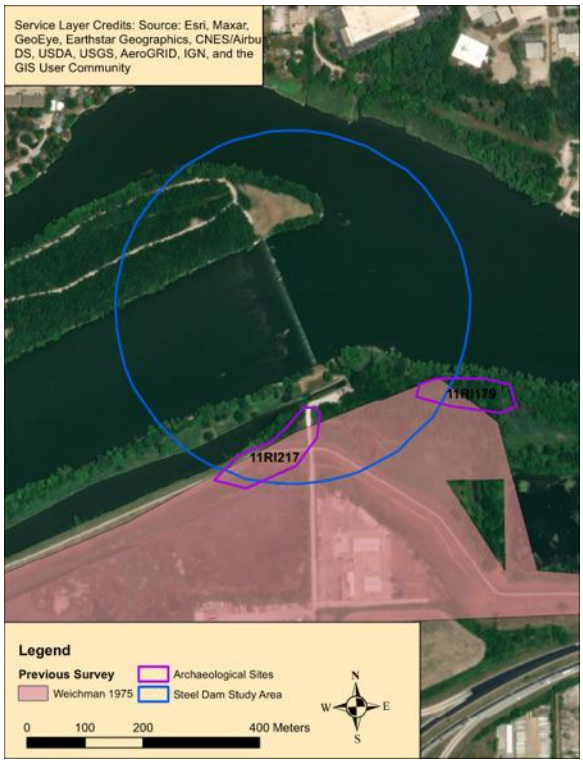



*Figure 10 - Steel Dam Archaeological Sites*

site was a precontact lithic scatter consisting of flakes and projectile points recovered in 1973. The one previous survey conducted in 1975 identified one precontact site recommended for further investigation.

### *3.3.2. Historic Map Data*

The existence on historic maps (Figure 11) of nonextant structures indicates areas of high probability to contain archaeological sites.

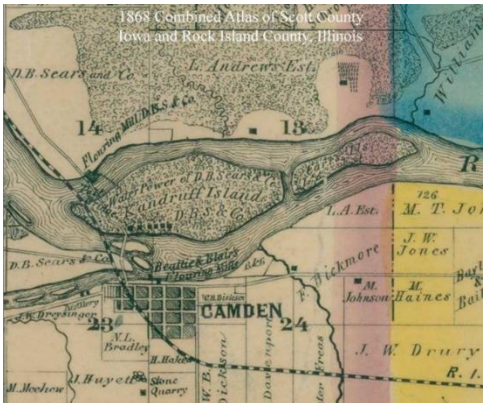



*Figure 11 - Atlas of Rock Island County, Illinois (Thompson and Everts 1868).*

3.3.2.1. Sears Dam

Historic maps from the 1800's and 1900's show nonextant structures within the search radius of the dam including a ferry, Vandruff's House, the D.B Sears and Company flour mill, a historic dam and mill race, a toll bridge, railroad tracks over the river, an additional mill, three small structures, Graham's Cotton Mill, residential structures, and another cotton mill that had occurred prior to the construction of the dam.

3.3.2.2. Steel Dam

Historic maps from the 1800's and 1900's show nonextant structures within the search radius of the dam including a lock for the Hennepin Canal, the Hennepin Canal (now the Illinois and Mississippi Canal) and a single other structure that had occurred prior to the construction of the dam.

### *3.3.3. Historic Architectural Resources and NRHP Properties*

There are no historic architectural resources or recommended eligible or listed NRHP resources in the 1,000-foot study area. Sauk Cemetery and Hennepin Canal are not listed in NRHP and are not in the state's archaeological or architectural databases. These are "potential resources" in the area that would need to be evaluated for the NRHP if they could be impacted by the project.

### *3.3.4. Cemeteries*

The only cemetery within the study area was the previously mentioned Sauk Cemetery (boundary limits unknown).

### *3.3.5. Conclusions*

Given the above findings, there is a high potential for undiscovered archaeological resources on undisturbed grounds within the study area. Design considerations should be given to the four previously recorded archaeological sites with further archaeological investigations to determine NRHP eligibility. It is recommended that a Phase I Archaeological Survey be conducted for areas involving ground disturbance. While most of the disturbed areas will be within the channel, additional disturbance will occur along the abutments, adjacent banks and access points. The Illinois Historic Preservation Agency should be consulted, in accordance with the Illinois State Agency Historic Resources Preservation Act, if state actions are required for the project, including permits, licenses, funding or approvals.

## *3.4 Existing Aquatic and Riparian Wildlife*

Inter-Fluve performed a desktop analysis to review the existing aquatic organisms and obtained local species information during an initial consultation with IDNR-Office of Resource Conservation (ORC). The Rock River aquatic ecosystem in Rock Island County has a rich diversity of fish and native mussel species. This region has been the focus of extensive documentation by IDNR. The river supports a thriving fishery with at least nine sport fish species and over twenty-three extant native mussel species, some of which are state endangered.

Dams have been shown to disrupt the upstream migration of fish and negatively impact fish community composition and genetics in warmwater Midwestern rivers (Kanehl et al. 1997, Smith et al. 2016, Smith et al. 2019). Likewise, many studies have shown that dam removal improves riverine habitat diversity, fish passage, mussel diversity, water quality, geomorphology and sediment and nutrient transport (Baxter 1977, Bednarek 2001, Bushaw-Newton 2002, Cordone and Kelly 1961, Ligon et al. 1995, Petts 1984, Stanley and Doyle 2003, Ward and Stanford 1979).

### *3.4.1 Fish*

The Rock River has a successful and diverse fishery. At least nine species of sport fish can be found in the Rock River: Green Sunfish, Largemouth Bass, Northern Pike, Channel Catfish, Sauger, Smallmouth Bass, Walleye, White Bass, and Flathead Catfish. In efforts to support fishery, each year IDNR stocks over 70,000 walleyes annually (Illinois Department of Natural Resources, n.d.). IDNR has noted that both Lake Sturgeon and Paddlefish were encountered downstream of the dams and have not been recorded upstream of the dams, suggesting that the dams are a barrier to their movement.

The inventory of fish species present in the Lower Rock River have been documented by the IDNR (personal communication with Brian Metzke, IDNR) and are presented in Appendix C. Four state endangered species are included in the Rock River fish inventory: Western Sand Darter (*Ammocrypta clara*), Pallid Shiner (*Hybopsis amnis*), Weed Shiner (*Notropis texanus*), and Lake Sturgeon (*Acipenser fulvescens*). No federally listed fish species or state threatened fish species are known to be present in the project area.

### *3.4.2 Native Mussels*

Forty-five species of mussels have been historically reported in the Rock River basin (Bales et al., 2012). A survey conducted on the Rock River mainstem and tributaries in 2009 found 23 freshwater mussel species to be extant in the mainstem river (Bales et al., 2012) with an additional 10 species encountered and recorded by the Illinois Department of Natural Resources, Division of Natural

Heritage in the lower Rock River of Rock Island County inventory list from 1924 — 2022 (personal communication with Brain Metzke, IDNR). All species documented between these two efforts are summarized in Appendix C. Two of the 33 extant mussel species are state-listed and no species found are federally threatened or endangered.

While no federally endangered species have been recently observed or recorded in the Rock River, the United States Fish and Wildlife Service IPaC (Information for Planning and Consultation; https://ipac.ecosphere.fws.gov/) analysis shows three federally endangered mussel species have known ranges encompassing this project area: Higgins eye (Lampsilis higgensii), Sheepnose (Plethobasus cyphyus), and Spectaclecase (Cumberlandia monodonta). Based on recent surveys, these three species are likely extirpated from the area.

### *3.4.3 Riparian Species of Interest*

During an assessment of threatened and endangered species, Inter-Fluve identified four other listed species have known or expected ranges within the project area. These species, the Indiana bat (*Myotis sodalist*), northern long-eared bat (*Myotis septentrionalis*), and the rusty patched bumble bee (*Bombus affinis*) are federally endangered, and the eastern prairie fringed orchid (*Platanthera leucophaea*) is federally threatened, see Appendix C for more discussion.

Considering the habitat observations from the geomorphic assessment (see Section 5) and the habitat requirements of the species listed above, it is unlikely that these species would be found in the immediate project riparian or wetted areas. However, further investigation may be necessary once any specific activities and areas with potential for habitat disturbance are identified.

### *3.4.4 Summary of Key Wildlife Findings*

- The Rock River supports a successful fish inventory of a recorded ninety-four fish species, including nine sport fish species, as described by IDNR-ORC.
- Four state endangered fish are documented (Western Sand Darter, Pallid Shiner, Weed Shiner, and Lake Sturgeon) and no federally listed fish species are known to occur in the Rock River.
- Twenty-three of the historical forty-five species of native freshwater mussels were encountered in the most recent (2012) extensive survey.
- Three federally endangered native freshwater mussel species are known to have ranges in the Rock River (Higgins eye, Sheepnose, Spectaclecase), however, these species have not been encountered in recent surveys and are likely locally extirpated.
- Four federally listed species of riparian fauna (Indiana bat, northern long eared bat, rusty patched bumble bee, eastern prairie fringed orchid) are known to have ranges in the project area and unlikely to be found in the wetted areas of the river.

## *3.5 Existing Wetlands*

A desktop review of the National Wetlands Inventory (NWI) including a review of wetlands using the NWI, hydric soil mapping and aerial photography was performed within a 1,000-foot radius of each dam in preparation for a field investigation of wetlands (Figure 12). Delineations were performed for three potential wetlands identified from this review (Figure 13). These three wetlands totaled 2.5 acres and included two emergent and one forested wetland. Several other areas were identified that exhibited wetland characteristics but were not delineated as they fell

below the Ordinary High Water Mark (OHWM). Refer to Appendix G for the detailed wetland assessment report.

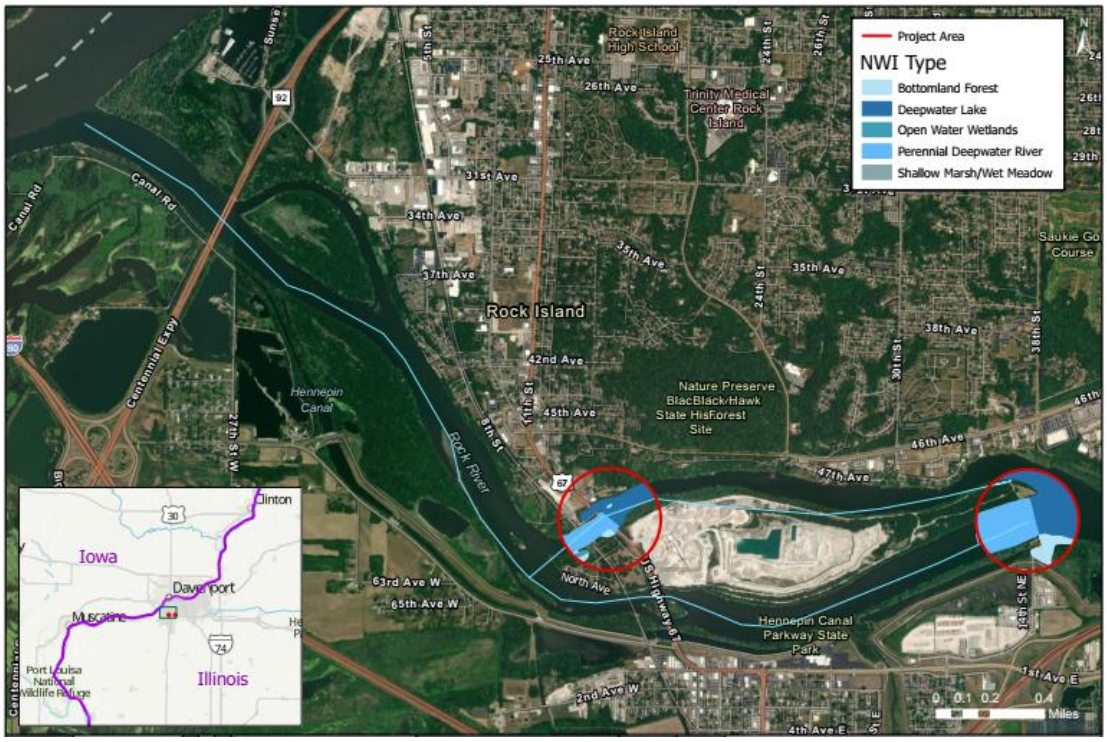



*Figure 12 - National Wetlands Inventory (NWI) Wetlands within a 1,000-foot radius of each dam.*

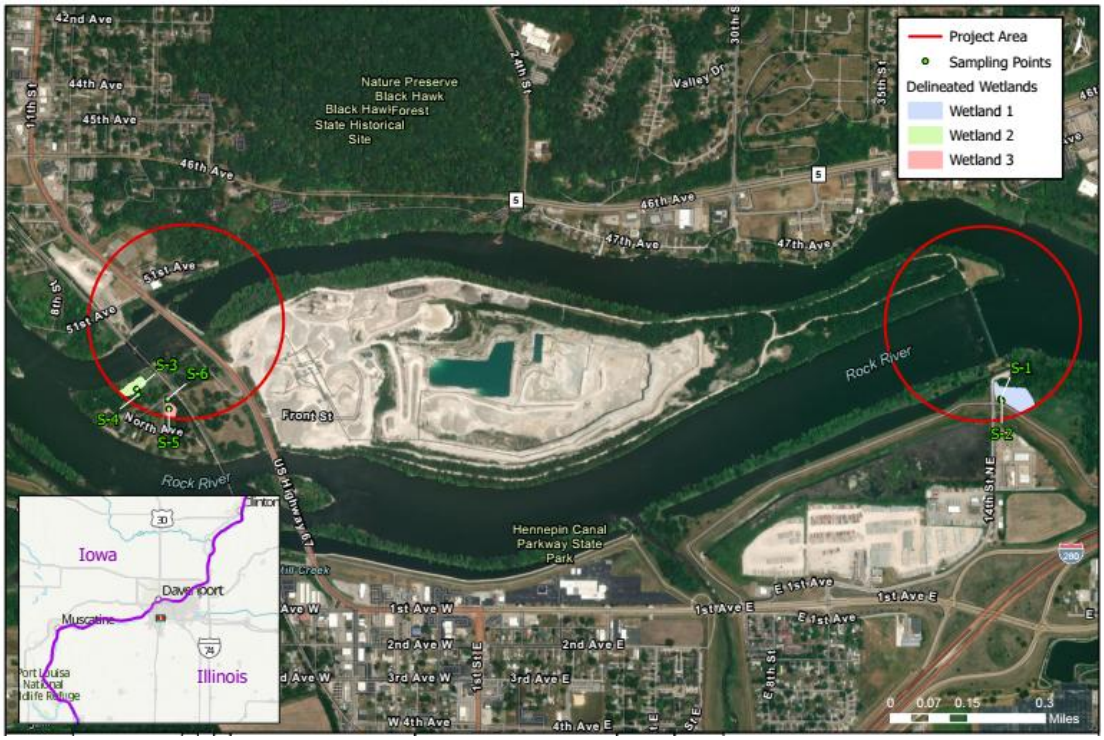



*Figure 13 - Wetlands Delineated within a 1,000-foot radius of each dam.*

The OHWM within 1,000-feet of the dams was also delineated (Figure 14 and Figure 15). The OHWM was typically well defined by changes in bank slope or vegetation, or by lines impressed on concrete structures. Data points were collected using GPS equipment along the OHWM in areas that were accessible. Some areas were inaccessible due to safety and lack of landowner permission. In these areas, the OHWM was estimated via desktop analysis of Light Detection and Ranging (LiDAR) and other publicly available data.

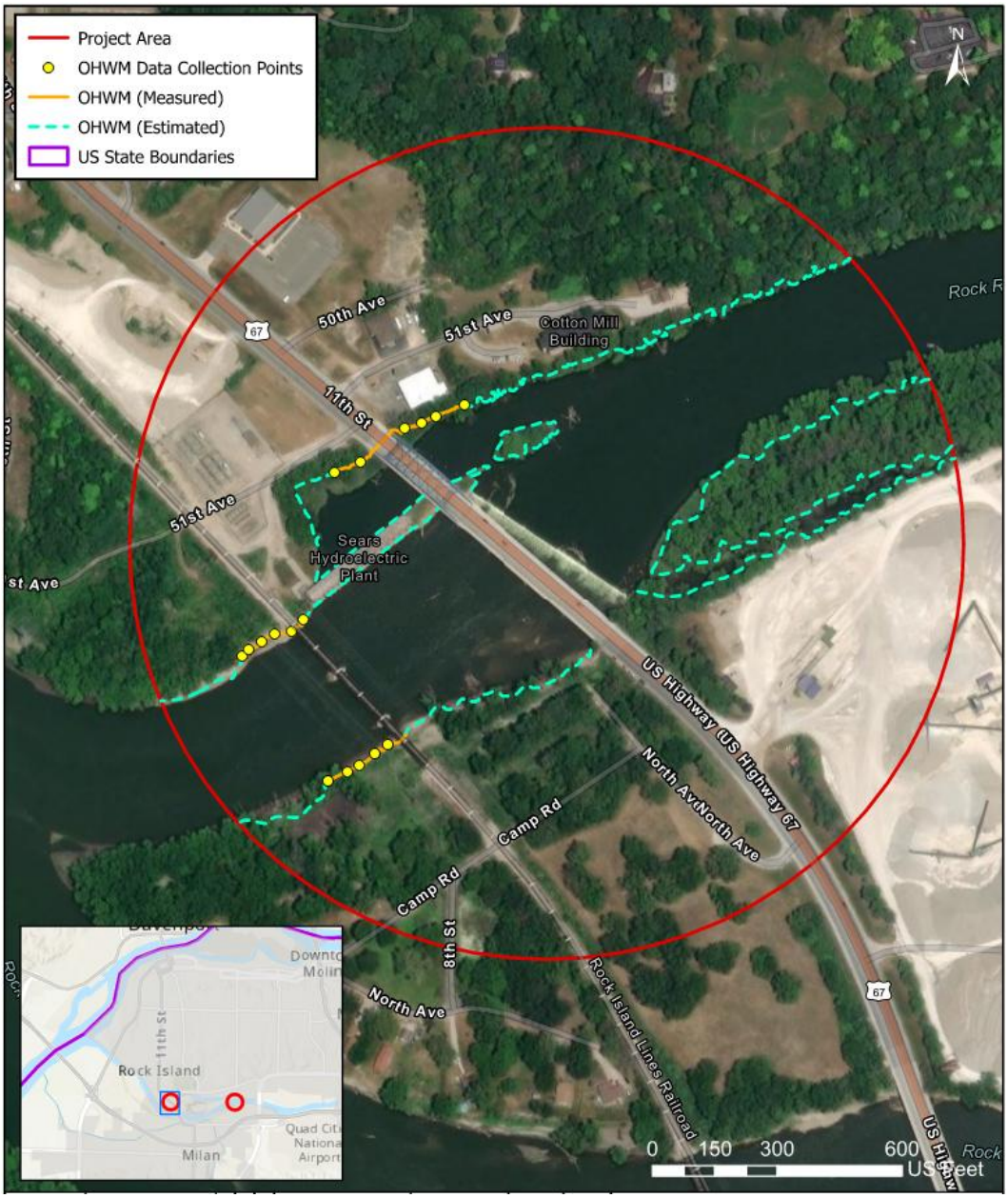



*Figure 14 - Ordinary High Water Mark (OHWM) Delineated within a 1,000-foot radius of the Sears Dam.*

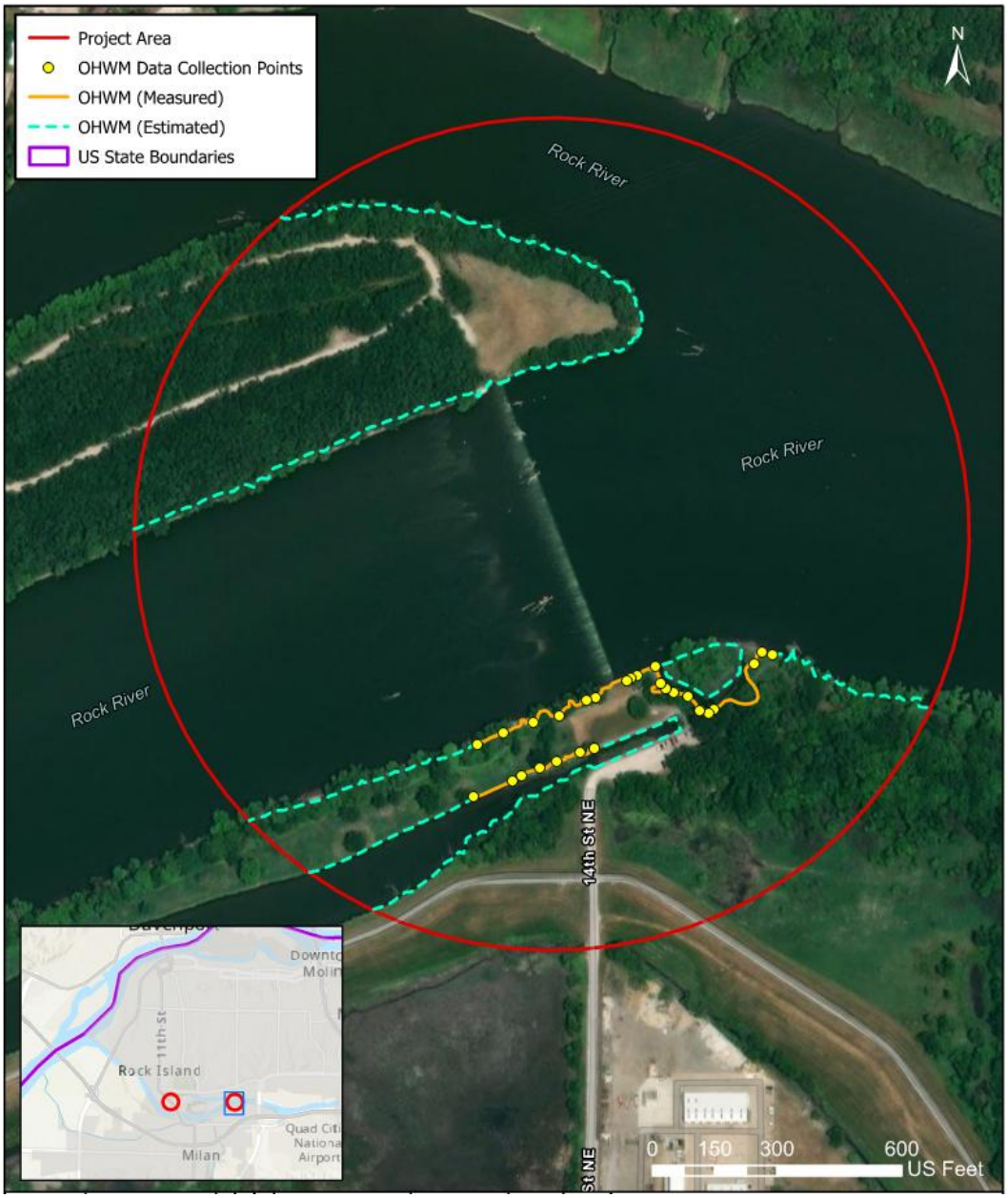



*Figure 15 - Ordinary High Water Mark (OHWM) Delineated within a 1,000-foot radius of the Steel Dam.*

A desktop review was performed for potential wetlands downstream of the dams to the confluence with the Mississippi River and within 1,000-feet of the Rock River (Figure 16). This review of wetlands that could be impacted by removal of the dams identified 706 acres of wetlands and included lake, riverine, bottomland forest, shallow marsh/wet meadow, open water and shrub-scrub wetlands.

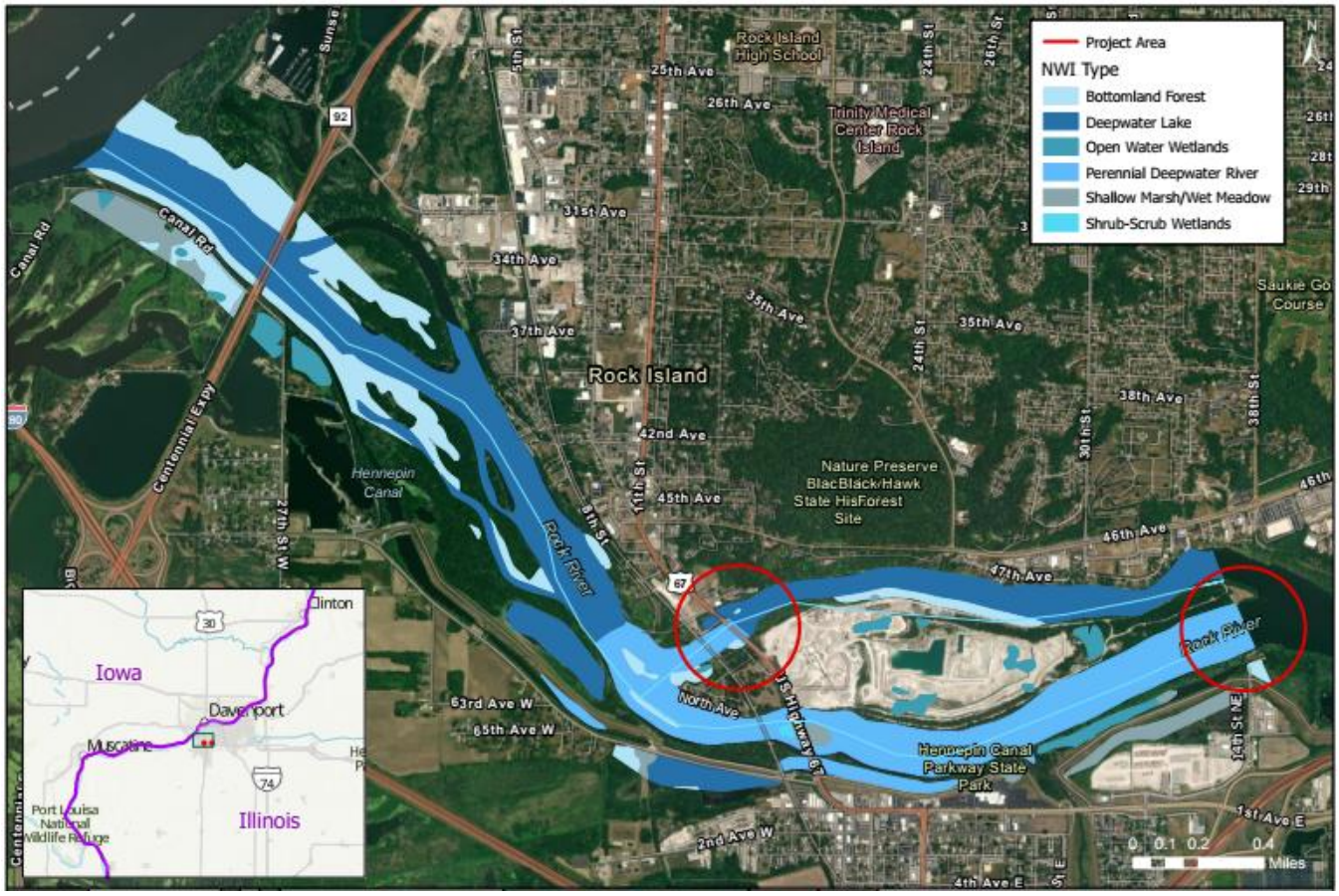



*Figure 16 - National Wetlands Inventory (NWI) Wetlands downstream of each dam and to the confluence with the Mississippi River.*

Many of these wetlands are likely jurisdictional and would require permitting under Section 404 of the Clean Water Act (CWA) if they will be disturbed. The United States Army Corps of Engineers (USACE) and United States Environmental Protection Agency (USEPA) have the final authority to determine which features are jurisdictional and would need to be consulted prior to any disturbance taking place.

## 4. Previous Studies

In 2007, the State of Illinois commissioned a report which evaluated the public safety at 25 run-of-river dams across the state, including several on the Fox River and the Sears and Steel dams. The study identified significant hazards posed by these dams, particularly the dangerous hydraulic conditions downstream that can trap even experienced swimmers. It proposed a range of safety improvements, including enhanced signage, public awareness campaigns, and both temporary (e.g., rock fill) and permanent structural modifications (e.g., dam removal, riffle pools, bypass channels). Dam removal was highlighted as the most effective long-term solution for eliminating safety risks, though it was noted to come with high costs and environmental considerations. The report included cost estimates for each proposed intervention and emphasized the need for site-specific planning and stakeholder engagement.

At Sears Dam, the following recommendations were made:

1. Signage Improvements: Installation of warning and informational signage was proposed to enhance public safety. The estimated cost for signage ranged from $77,000 to $86,000 *[YR 2026: $143k-$163k]*, depending on whether optional signs were included.
2. Temporary Structural Option: Placement of rock fill downstream of the dam was suggested to reduce the formation of dangerous hydraulic conditions (like reverse rollers). This option was estimated to cost $3.79 million *[YR 2026: $7.20m]*.
3. Permanent Structural Option: A stepped face modification of the dam was considered the most viable permanent solution, with an estimated cost of $5.69 million *[YR 2026: $10.8m]*. Other options like full bypass channels or instream bypasses were deemed infeasible due to the presence of hydropower operations and lack of available routes.

Dam removal was not considered for Sears Dam, likely due to its role in hydropower generation at the time. With the decommissioning of the Sears Powerhouse Plant in 2020, the primary function of the dams no longer exists and the opportunity to provide modifications for improved safety are being pursued.

For Steel Dam, the 2007 Illinois Dam Safety Report recommended the following public safety measures:

1. Signage Improvements: The report proposed installing warning and informational signage to alert river users of the dangers near the dam. The estimated cost for signage ranged from $242,000 to $320,000 *[YR 2026: $460k-$608k]*.
2. Temporary Structural Option: Place rock fill downstream of the dam to reduce the formation of dangerous hydraulic rollers. This option was estimated at $1.67 million *[YR 2026: $3.17m]*.
3. Permanent Structural Options:
    a. A minimal canoe chute was considered to allow boaters to bypass both Steel and Sears Dams. A full bypass channel through the adjacent state park canal was deemed infeasible due to hydropower constraints.
    b. A riffle pool rock ramp was estimated to cost $4.77 million *[YR 2026: $9.06m]*.
    c. Instream bypass and dam face modification options were not considered viable, primarily due to their impact on upstream pool levels and hydropower operations at the time.

These recommendations reflect a balance between improving public safety and maintaining existing hydropower functionality. Safety signage is currently present at the dams, but structural modifications were not pursued.

## 5. Geomorphic Assessment

This section presents the results of a semi-quantitative geomorphic reconnaissance assessment conducted by Inter-Fluve to evaluate the physical characteristics and stability of the Rock River channel within the project area surrounding the Sears and Steel Dams. Details are available in Appendix C.

Reconnaissance was completed on foot and via small boat, and included observations of bank stability, channel bed material, depositional and scour features, habitat, and riparian vegetation. The assessment was conducted on June 13-14th, 2024. This assessment divides the Rock River within the project area general limits of impoundment into five sub-reaches (Figure 17):

- Reach 1 extends from the Sears dam to the eastern end of Vandruff Island. This reach is composed of Rock River branch north of Vandruff Island. (Station 24+00N to 115+00N)
- Reach 2 extends from the Highway 67 bridge to the Steel Dam is composed of the Rock River branch on the south side of Vandruff Island. (Station 154+00 to 231+00)
- Reach 3 extends from the upstream end of Vandruff Island to the Milan Beltway bridge. (Station 231+00 to 263+00)
- Reach 4 extends from the Milan Beltway Bridge to the I-74 bridge. (Station 263+00 to 380+00)
- Reach 5 (beyond project area) extends from the I-74 bridge to the I-80 bridge. (Station 380+00 to 909+40)

  Note: Stationing (STA) terminology refers to the distance from the downstream confluence in 100' increments, e.g., 12+00N means 1,200 feet away from the confluence.

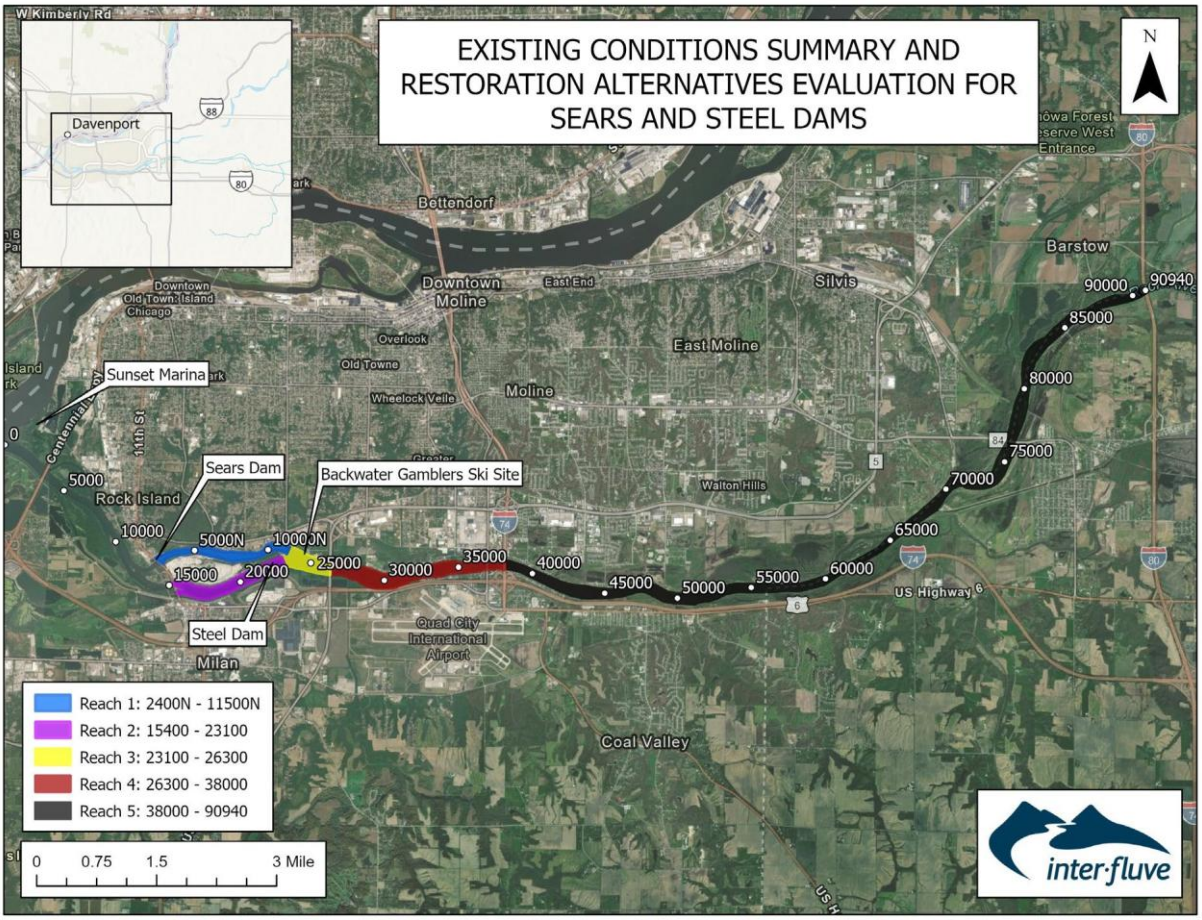



*Figure 17. The five reach sections of the Rock River used for the geomorphic assessment.*

The Inter-Fluve team accessed the Rock River at Ben Williamson Park launch and conducted a boat reconnaissance of the channel from Sears Dam to just upstream of the I-74 Bridge. The area within 1,000-feet of the Steel Dam was not traversed for safety reasons. Flow at the time of survey was approximately 12,300 cubic feet per second (cfs), roughly 1.5-feet above median flow for June 13th (based on the 24-year period of record) and 5-feet higher than on the same date in 2023 (Byron USGS gauge 05440700).

The Sears Dam (Figure 18) was viewed from the Fraternal Order of Eagles parking lot on 51st Avenue, as well as from the Hwy 67 (11th Street) Bridge. The Sears Dam, including the mill building remnant and bridge abutment, spans 934 feet, with the spillway spanning 457 feet. The Steel Dam (Figure 20) was viewed from the left dam abutment. The Steel Dam spillway spans 776 feet. The upstream impoundment is held back by the two dams and Vandruff Island.

Reconnaissance was conducted by car and on foot for areas downstream of the dam spillways to the confluence with the Mississippi. Flow velocities downstream of Steel and Sears Dams were too high to allow for safe access via boat.

Periodic probing of depths and sediment thickness/composition was completed using flexible depth of refusal rod at selected sites. This probing was performed to inform the geomorphic assessment, but full depth of refusal (DOR) measurements were completed by the IDNR-OWR on August 29-30, 2023, and June 11-13, 2024, and September 11, 2024. The IDNR-OWR DOR data was used in the analysis and quantification of moveable bed material. Observations were made regarding stabilized banks (e.g. riprap), bank stability, vegetation, and channel bed features.

### *5.1 Reach 1*

Highway 67 bridge is located immediately downstream of Sears Dam. The dam is located between river left and a multipurpose mill building (circa 1838) parallel to the river right bank. Large wood accumulations were present along the top rim of the dam, and photographs suggest the large wood was present in greater abundance than in past years. The channel on the northern side of Vandruff Island has widths ranging from 600-feet at the dam to 284-feet at bedrock outcrops on river right 2,200-feet upstream of Sears Dam. Water depths range from approximately 5-feet to 12 feet. The dam is situated at the base of a moderately steep riffle section of the North Channel. This riffle had a pre-dam slope of approximately 0.28% with its crest roughly 5,000-feet upstream of the dam, midway along Vandruff Island (Figure 19, FEMA 2010). The upper half of the North Channel flattens out to a plateau-like riffle feature with its crest at roughly the same elevation as the base of the adjacent Steel Dam (553 feet.)



*Figure 18: Sears Dam, looking from river right on Highway 67. June 13, 2024. 41.461637, -90.578965.*

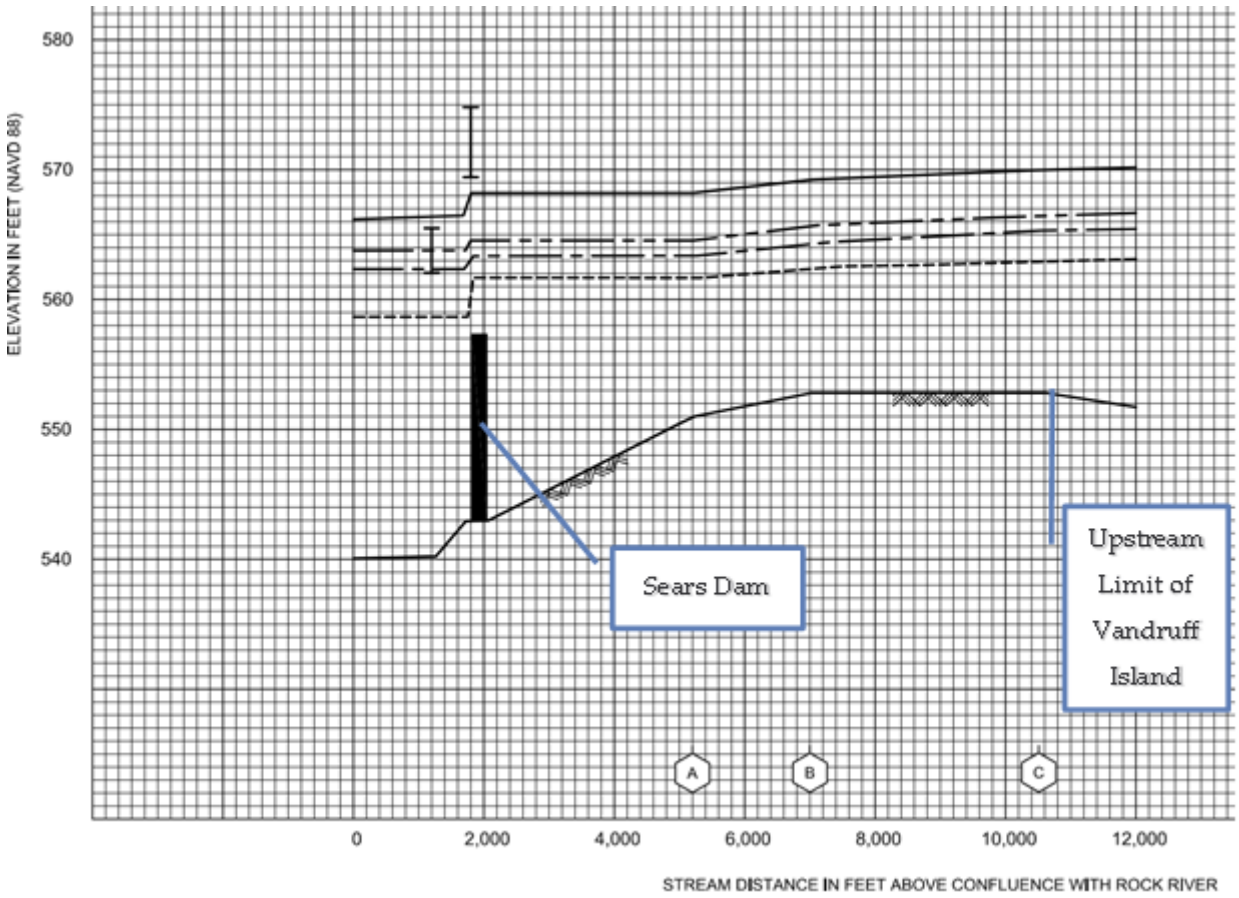



*Figure 19. Flood Insurance Study profile (FEMA 2010) showing the elevation of channel bed features and the Sears Dam in the vicinity of Vandruff Island.*

Fine sediment such as sand and clay travels further in impoundments and is often concentrated closer to the dam spillway. Inter-Fluve probing and IDNR-OWR DOR surveys revealed sediments within 1,000-feet of the Sears Dam are primarily silt from 4- to 8-feet in thickness above a pre-dam gravel bed. Upstream of STA 35+00N to the upstream end of Reach 4, the river bottom is predominantly sand, varying in thickness from 1-3 feet.

Reach 1 sediment deposition varies, with the deepest fine sediment deposits from STA 25+00N to 45+00N (upstream of Sears Dam), and in the backwater channel near the mill building. Sand deposits of 1- to 4-feet in thickness are present along the channel center and right bank from the tributary outlet delta at 60+00N to the upstream head of the island. Sand bars are identifiable from aerial photos by the location of large wood deposits lodged in the sand.

The river right shoreline between the Sears dam and 38th Street (STA 25+00N to 105+00N) is bounded by a 100-foot-tall bluff area sloping steeply toward the south and terminating in the river, sometimes with vertical limestone outcrops. A floodplain bench is present along the base of the bluff, with a small housing development along 47th Avenue east of 24th Street (STA 60+00N). The riparian area is forested between the dam and 24th Street, dominated by large silver maple, red oak, and catalpa overstory trees and an understory of reed canary grass and shrubs.

The Vandruff Island north bank varies from 8- to 15-feet in height. The island riparian area is naturally vegetated but includes invasive shrubs such as bush honeysuckle and buckthorn. The upper canopy is mature with overstory trees similar to the right bank of the channel. Woody debris is present in low density along the island's bank.

Banks are stable throughout the reach. Island side banks have mature trees with thick root systems, whereas the right banks are stabilized with vegetation, bedrock outcrops, and artificial toe stabilization such as riprap and seawalls. Approximately 63% of the Rock River in Reach 1 is developed, primarily with residential housing. A few properties contain no artificial armoring.

### *5.2 Reach 2*

Due to high water, the river channel on the south side of Vandruff Island between the Sears and Steel dams was accessible only by foot along the Hennepin millrace canal. The river left bank is stable and naturally vegetated with cottonwood, black walnut, white oak, and hawthorn as the dominant canopy trees.

Understory vegetation includes dogwood, sumac, and service berry, sedges, poison ivy, milkweed, Canada thistle, goldenrod, and invasive buckthorn. Banks are 7- to 10-feet high, with steep upper banks that taper at the toe. Cottonwood, black willow, and other trees provide stabilizing root systems. The right bank (north) of the channel appears to be stable, but high water prevented inspection of the channel toe.

Mill Creek (STA 217+00) enters this reach from the south, midway between Hwy 67 and the Steel Dam. The historic Hennepin Canal runs along the left floodplain but is interrupted by the Mill Creek crossing and confluence. The Hennepin Canal Trail berm runs south of the canal from the Rock Island-Milan Parkway to 27th Street West. (DOR readings in this Reach were delayed due to the high-water conditions.)  The banks in Reach 2 are undeveloped with natural cover along the quarry bounding to the north and Hennipen Canal to the south.

### *5.3 Reach 3*



*Figure 20. Steel Dam, looking from river left across towards Vandruff Island. June 13, 2024. Location: 41.459772, -90.547531*

The Steel Dam (STA 231+00) is situated on the mainstem of the rock river, just downstream of the head of Vandruff Island at the crest of a riffle (Figure 21, FEMA 2010). At the eastern (upstream) head of Vandruff Island, starting upstream from Steel Dam to the Rock Island-Milan Beltway bridge (STA 234+10), the channel widens to approximately 900- to 1200-feet as this area starts the split flow around Vandruff Island. Bed sediments are approximately 1-3 inches of sand, fines, with mud and gravel mix on top of refusal. Sediment depths increase upstream toward the Milan Beltway

bridge. A relic side channel remains open on river right from Station 255+00 at the Backwater Gamblers Waterski area to 285+00 in Reach 4.

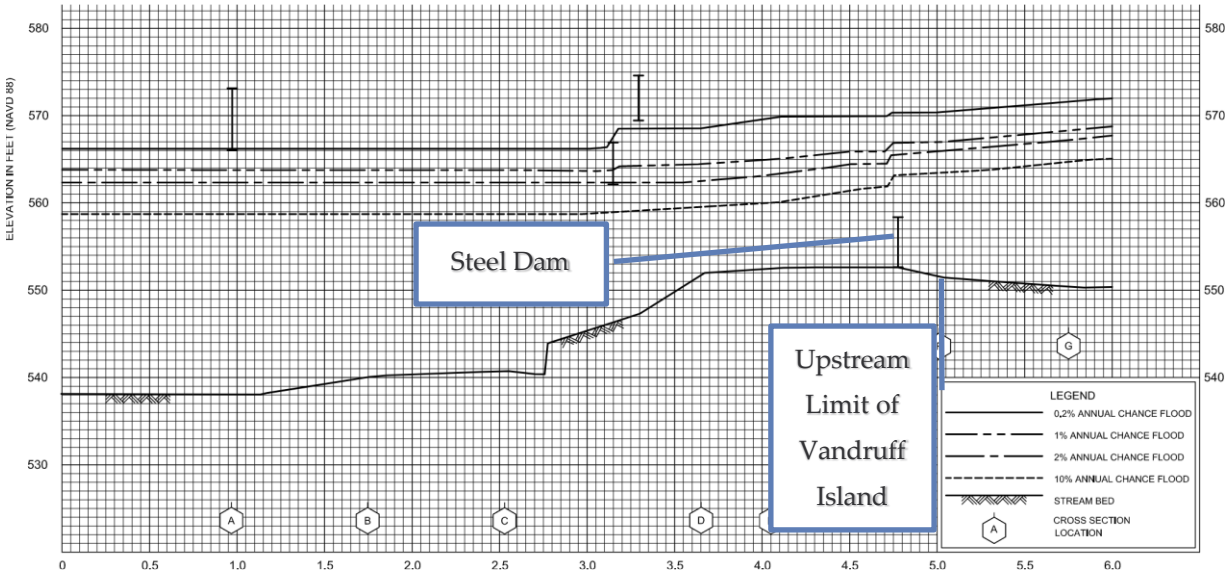



*Figure 21 - FEMA Flood Insurance Study profile showing the elevation of channel bed features and the Steel Dam in the vicinity of Vandruff Island.*

Apart from the waterski facility area, river left (south) and right (north) banks are swamp (forested wetland) dominated, with a silver maple dominated canopy over invasive reed canary grass understory. Ben Williamson Park covers approximately a 900-foot stretch in this reach with heavy foot traffic and a boat launch. The riverbank in the park/waterski area is low and armored by concrete and riprap.

A natural gas pipeline crossing is visible on the right bank shoreline at Station 245+00. Power lines cross the river at Station 112+50N at the head of Vandruff Island – neither are expected to impact construction. Reach 3 is undeveloped along the river outside of Ben Williamson Park.

Probing corroborates OWR depth of refusal data, and Inter-Fluve found a thin veneer of sand between 0-4-feet in thickness. No significant large wood accumulations were noted.

### *5.4 Reach 4*

The reach between Rock Island-Milan Beltway bridge upstream to the I-74 bridge (STA 379+00) becomes narrower than the downstream reaches. Channel width varies from 600 – 1000 feet. River right upstream from the Milan Beltway bridge for approximately 2,000-feet has stable but slightly undercut banks with mature forested wetland dominated by silver maple canopy and an understory monoculture of reed canary grass. Large wood is present along the right bank shoreline.

A relic side channel remains open on river right from Station 255+00 at the Backwater Gamblers Waterski area to 285+00 in Reach 4. This small side channel is part of a larger relic meander still present as wetlands north of North Shore Drive to 16th Street.

Probing corroborates IDNR-OWR depth of refusal data throughout the reach, and Inter-Fluve found a thin veneer of sand between 0- to 2-feet in thickness. Water depths at the time of survey ranged from 6.0 to 8.0 feet.

Approximately 65% of the Rock River in Reach 4 is developed, primarily with residential housing. Banks are riprap or sea walls, most with lawns maintained to the shoreline and few canopy trees. Banks vary up to 12-feet from top of bank to toe of slope, with top of bank typically 4-5 feet above impoundment water level.

### *5.5 Reach 5*

This reach is 7.3 miles long, extending from I-74 to the I-80 bridge (STA 379+00 to 909+40). From I-74 to Green River Park (STA 424+00), the channel is mostly armored with riprap or concrete sea walls to protect homes and roads. Upstream of Green River Park, the channel is bounded by primarily natural, but stable shoreline. The post-glacial valley bottom is over a mile wide and is encroached partially by Highway 5 to the north and I-280 to the south.

Sediment input from upstream and the Green River have created a wide, low floodplain that is frequently inundated. This floodplain area contains relic channel segments, sloughs, and an active side channel. The Green River (STA 666+20) enters the Rock River just downstream of the Illinois & Mississippi/Hennepin Canal terminus, across the Rock River from TPC Deere Run Golf Club. Sediment movement through this reach is likely impacted by the backwater from the Sears and Steel dam complex, which has a normal pool elevation near Elevation 560. This elevation corresponds to the FEMA FIS study channel bottom elevation found in the I-80 area.

Banks are sand and sand loam and stable but vary in width from 580 feet to as wide as 900 feet. Bank morphology, riparian vegetation and channel bed material are consistent with Reach 4, with the bed being predominantly sand with some fines and gravel present. Sediment depths measured by IDNR-OWR (2024) between Bowles Slough and the Green River confluence average 1.5-feet, with a maximum measurement of 4.3-feet. This reflects both a potential topset delta of the dam impoundment as well as deposited sediment from the Green River. The deposited sediment would have a fraction that originates from the upstream Rock River reaches, but clearly the Green River has a strong influence on deposition in this area. If the dam complex was not present, sediment depths would likely be reduced as more Green River sediment would mobilize downstream.

### *5.6 Summary of Key Geomorphic Findings*

Key findings of the geomorphic assessment are summarized as follows:

- Sand bars are present near tributary confluences and on the inside of meander bends. Large wood accumulations are common in these areas, but ephemeral. There is currently more wood in the channel than is visible in aerial photos since 2000.
- Desktop and field geomorphic assessment suggests that the banks are stable, with little or no change observed in the past 30 years. Stability is due to artificial stabilization (riprap and sea walls), bedrock outcrops, and native stabilizing vegetation.
- Residential areas are armored with riprap and sea wall treatments of varying materials and quality. These areas have no riparian habitat value and limited green canopy.

- Reaches 1-4 have a total of 13 miles of shoreline, roughly 3 miles is developed shoreline (25%). The rest is riparian forest varying in width from 20 feet along Hwy 280 to 1800 feet in Ben Williamson Park. Reach 5 has 14.6 miles of shoreline, with roughly 23% developed, including the TPC Deere Run property shoreline (6,000 ft).
- Roughly 75% of the shoreline in the study reach has a natural riparian area, dominated by cottonwood and silver maple overstory, shrub understory and in the case of lowland areas, reed canarygrass marsh/swamp.
- Banks vary in height and morphology, but in natural areas are well vegetated and root stabilized. Some areas had stabilized toes, but high water prevented us from seeing down to the actual river toe.

## 6. Impounded Sediment Assessment

Impounded sediment can be a significant cost and schedule driver for dam removal projects, particularly where fine-grained material is stored behind a structure and permitting requires evaluation of sediment quality and potential downstream effects. This chapter summarizes the estimated quantity, distribution, and quality of sediment impounded upstream of the Sears and Steel Dams, and highlights considerations for sediment management and permitting. Detailed methods, datasets, and laboratory results are provided in Appendix C and the supporting technical documentation referenced therein Appendix D.

### *6.1 Impounded Sediment Quantity*

IDNR-OWR completed DOR probing (2023–2024) and associated bathymetric surveying (June 2024) within the impoundment upstream of the Sears and Steel Dams to the I-80 bridge. DOR measurements estimate sediment thickness by comparing the surveyed channel bed elevation to the elevation of a deeper “refusal” surface (interpreted as a more competent pre-dam substrate such as gravel/cobble/bedrock). These data were used to (1) develop a reach-scale estimate of sediment thickness and volume and (2) inform sediment sampling locations. Detailed methods and assumptions are summarized in the appendices.

Using GIS-based surface comparisons of bathymetry and DOR-derived refusal elevations, the volume of impounded sediment in the surveyed reach (dams to I-80 bridge) is estimated at ~4,300,000 cubic yards. The average fines fraction is 25% establishing ~1,100,000 cubic yards of fine material. This is a planning-level estimate: it reflects interpolation between discrete survey points, excludes potential overbank/vegetated deposits and any material upstream of the survey limits, and is sensitive to areas where refusal could not be reached within the probe length.

DOR and probe results indicate that sediment texture and thickness vary along the impoundment (Figure 22 ). The deepest fine-grained deposits are concentrated nearest the Sears Dam, transitioning upstream to generally thinner, sand-dominated deposits (e.g., a sand “veneer” upstream to approximately Veteran’s Memorial Park). Sand deposits of up to about 8 feet were measured in portions of the reach between Veteran’s Memorial Park and Hwy 84. At a reach scale, the dams create low-flow backwater conditions that can extend several miles upstream, but separating dam-related deposition from naturally depositional river segments is uncertain; historic mapping and geomorphic indicators suggest parts of the reach have long been depositional.

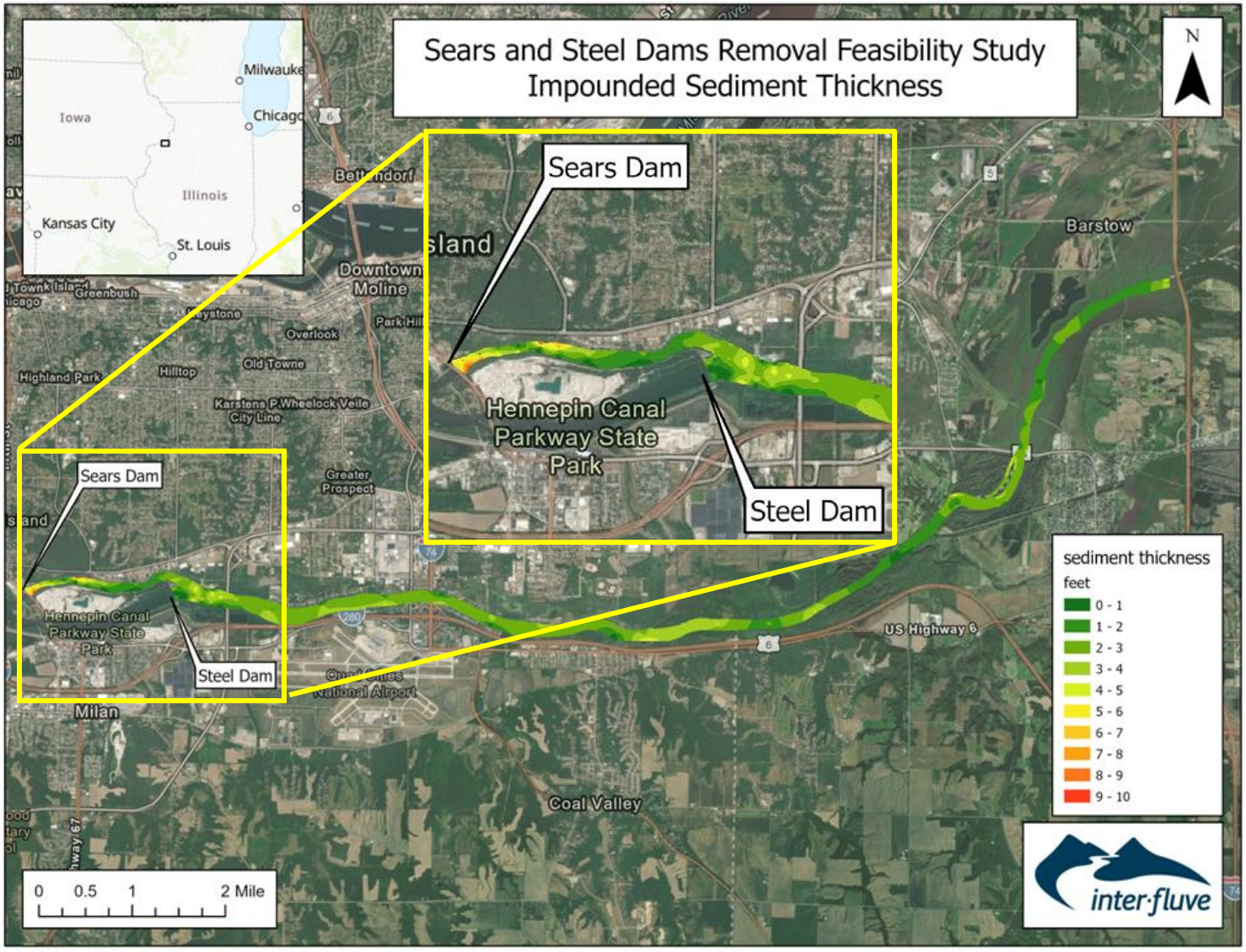



*Figure 22. Sediment Thickness Map for Sears and Steel Dam impoundments to the I-80 bridge.*

Using the bathymetric and DOR survey data, Inter-Fluve created cross-sections and longitudinal profiles of the existing river channel and underlying refusal surfaces. The longitudinal profile is broken into two sections, the North Channel (impoundment upstream of the Sears Dam) and the South Channel profile (upstream and downstream from the Steel Dam). These two longitudinal profiles are shown in Figure 23 and Figure 24.

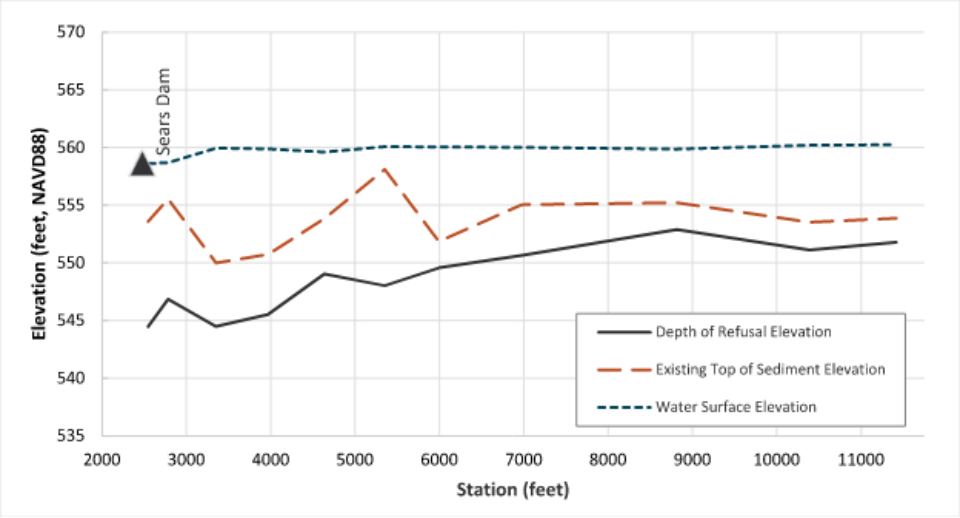



*Figure 23. North Channel Rock River Longitudinal Profile.*

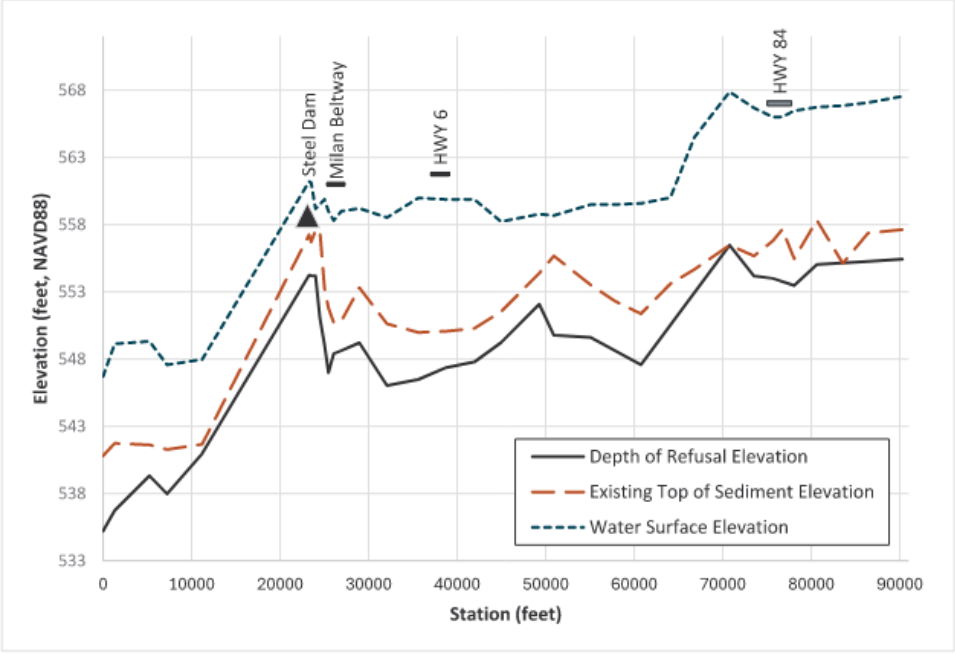



*Figure 24. South Channel Rock River Longitudinal Profile.*

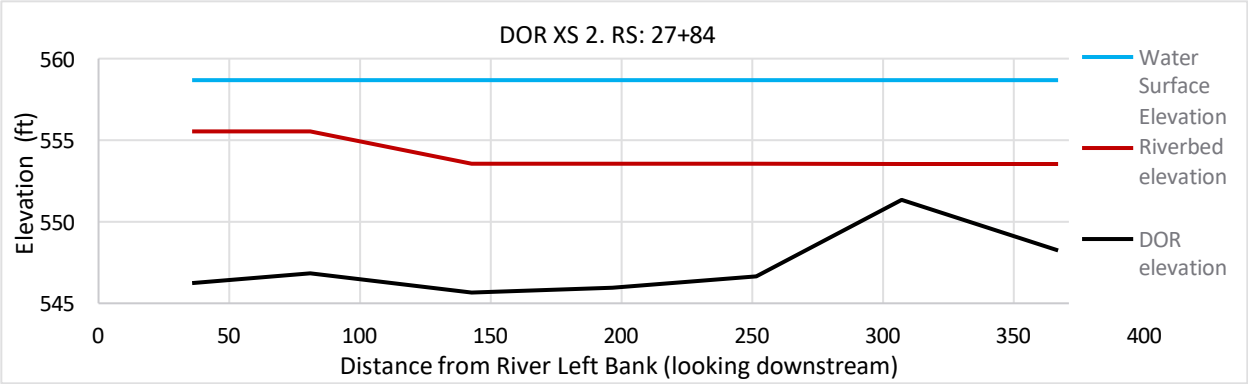
Longitudinal profiles show the thickest accumulation in the North Channel within roughly the first mile upstream of Sears Dam (commonly exceeding 5 feet), with more consistent 2–3 foot thickness farther upstream. Along the main channel, sediment thickness is generally on the order of 2–5 feet through much of the lower impoundment, with more variable and locally thin deposits in the upstream third of

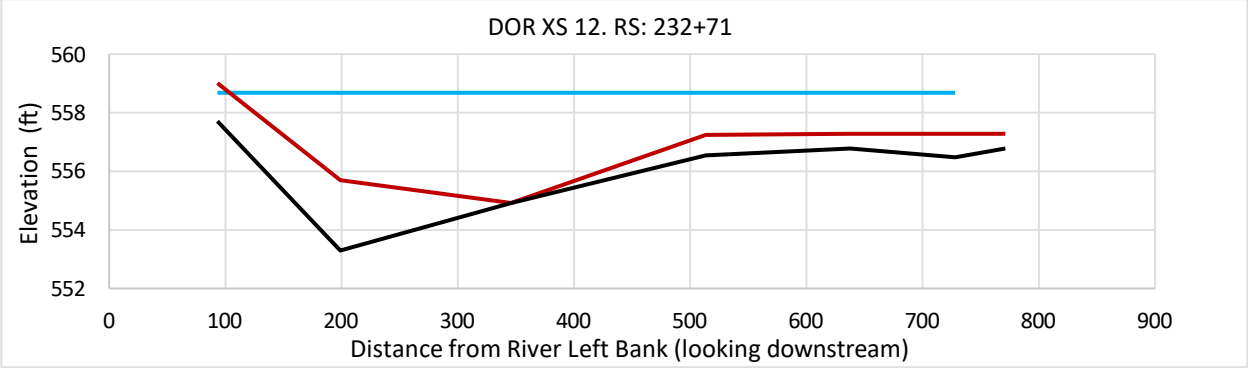
the evaluated reach. Downstream of Steel Dam there is little sediment accumulation due to high velocities resulting in exposed refusal surface.

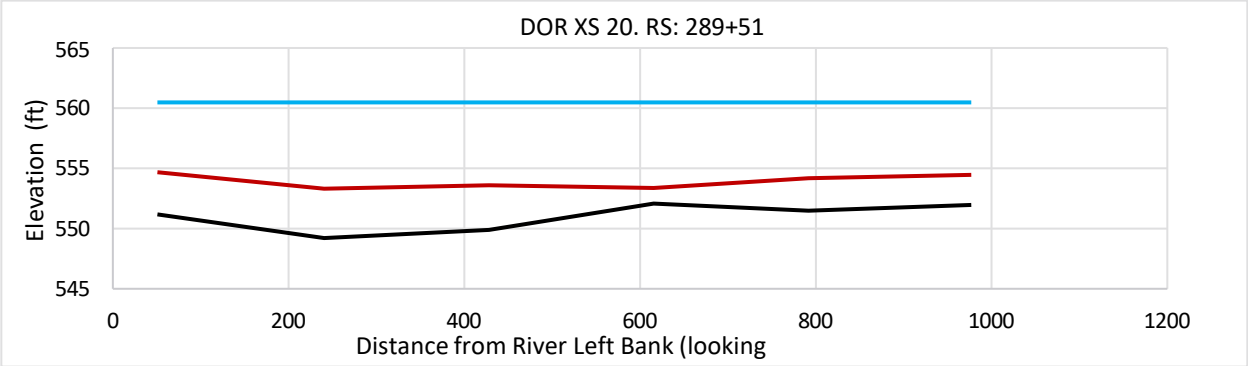
Four representative cross sections are shown in Figure 25 to highlight the range in channel and sediment accumulation characteristics at different sections of the impoundment. Cross sections (XS) indicate that accumulation patterns vary laterally and by reach:

- XS 27+84: the area immediately upstream of Sears Dam represents a higher-accommodation zone for greater sediment storage.
- XS 232+71: the reach near Steel Dam shows localized accumulation in the deeper channel portion with thinner deposits elsewhere.
- XS 289+51: wide portions of the lower impoundment commonly have 2–4 feet of sediment across much of the channel bottom.
- XS 668+00: displays a thin sediment layer representing transitional load in the upper impoundment.

For sediment management, these patterns suggest that (1) fine/thick deposits nearest Sears Dam warrant the greatest attention for turbidity control and potential handling, while (2) much of the remaining reach is dominated by sandier, more evenly distributed material.



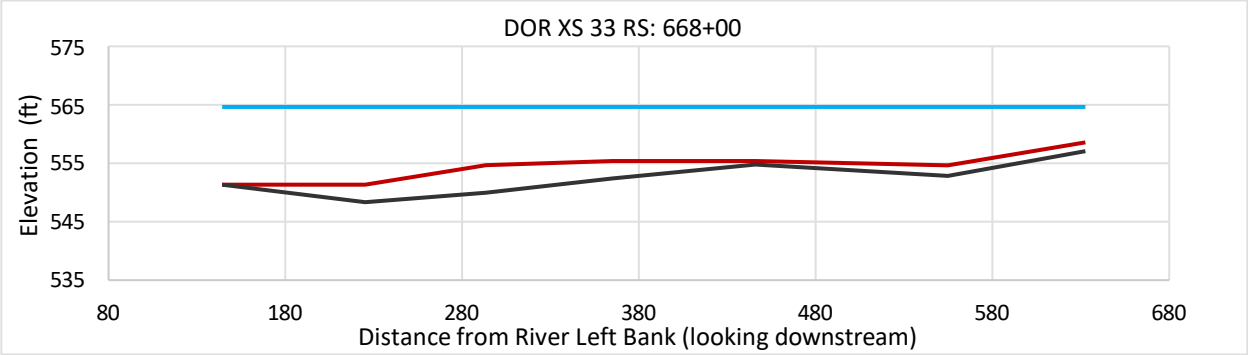




*Figure 25 - Select cross section profiles of the Rock River within the project area showing water surface elevation, riverbed elevation, and DOR elevation.*

## *6.2 Impounded Sediment Quality*

### *6.2.1 Sediment Sampling*

Sediment contaminant sampling was conducted by EnviroScience in spring of 2025, with methods detailed in the Sediment Sampling and Analysis Plan (Enviroscience 2025) and results were summarized in a draft report prepared for IDNR-OWR (Enviroscience 2025, see Appendix D). On March 11-13, 2025, EnviroScience conducted vibracore sediment sampling, supernatant, and water sampling at ten sampling locations on the Rock River (Figure 26). Nine of the ten sample locations were collected upstream of the Sears and Steel dams, with one sample location located directly downstream of the dams. Table 1 shows the results of the testing and comparison to the relevant standard. Refer to Appendix D for details of sediment sampling, laboratory testing and detailed results.

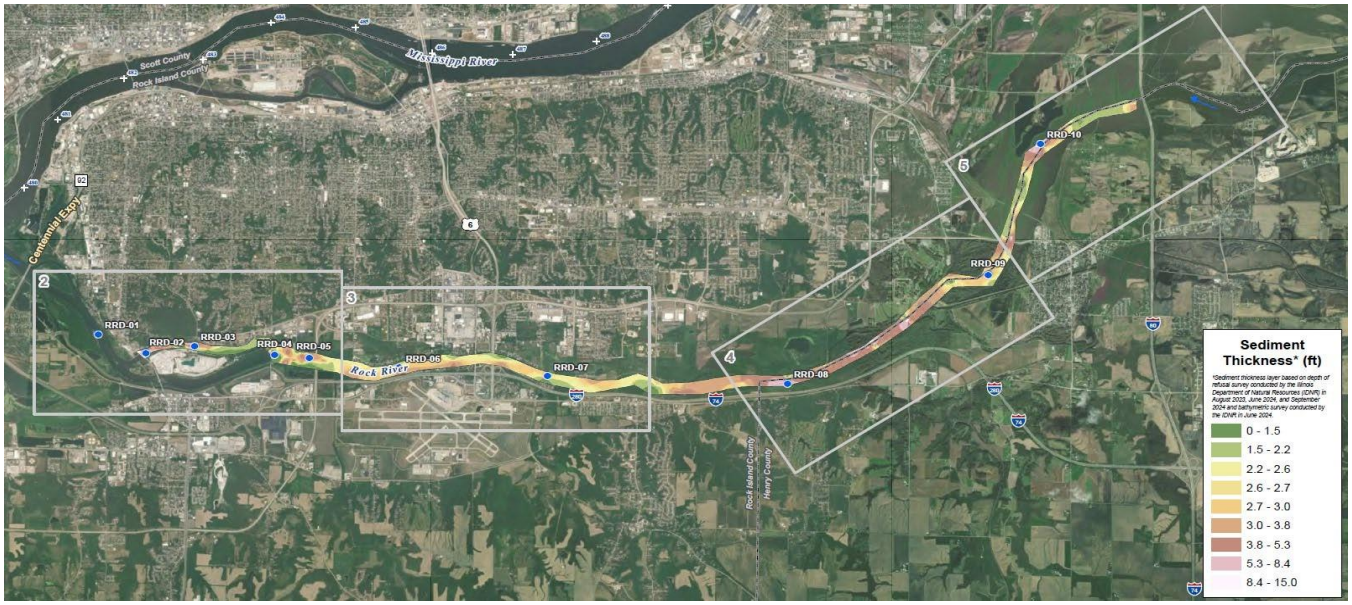



*Figure 26 - Excerpt from Enviroscience (2025) report showing sediment core locations (blue dots) within the project reach. See EnviroScience (2025) for detailed maps.*

- Nine sediment cores, RRD-02 through RRD-10, were retrieved from the Rock River upstream of the Sears and Steel Dams.
- Samples RRD-10, RRD-09, RRD-08, RRD-07, RRD-06, RRD-05, and RRD-03 were collected as supernatant samples with both sediment cores and five gallons of site water being collected from each site location.
- Samples RRD-04 and RRD-02 were collected as sediment samples with no water samples being collected.
- Sample RRD-01 was originally proposed as a supernatant sample with additional receiving water samples. However, no sediment was found at the sample site. Receiving water samples were collected.

### *6.2.2 Analytical Testing*

Sediment samples underwent grain size determination and chemical analysis. Grain size distribution, hydrometer, and Atterberg limits analyses were completed under ASTM D422, C136, and D4318 specifications and characterized by sieve analyses to determine coarse fractions and percent fines. Grain size distribution analyses were performed by Terracon of Parma, Ohio. Sand/fine split analysis were completed under ISW SOP No. Sed. 4 method and were performed by the University of Illinois. Sediment chemical analysis was compared to the Maximum Allowable Concentration (MAC) Standards. This is the maximum concentration of a chemical constituent permitted in soil (or fill material) for it to be considered uncontaminated and eligible for use in regulated fill operations.

Supernatant parameters that were analyzed included those detailed in *Appendix A* of the Illinois Environmental Protection Agency, Bureau of Water Section 401 Water Quality Certification circular entitled *Material Analysis for Dredge and Fill Activities* as well as those added through personal communication with IEPA staff (Gove 2025 pers. comm). Analytes included metals (As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Ni, Se, Ag, Zn), hexavalent chromium, mercury, ammonia, fluoride, oil and grease, phenols, PCBs, Total Volatile Solids, and the 303(d) listed pesticides Aldrin, Dieldrin, Endrin, Heptachlor, Mirex and Toxaphene. Additional parameters for water and supernatant samples included pH, hardness (Ca and Mg calculation), and Total Suspended Solids. Chemical analysis was performed by Eurofins of Pittsburg, Pennsylvania. In addition to comparing to the *Appendix A* thresholds, the supernatant results were also compared to the recommended IEPA 401 Water Quality Certification (WQC) values for aquatic life standards.

### *6.2.3 Analytical Results Summary*

**Sediment Grain Size:**

Grain size distribution analysis performed on the nine sample cores revealed that all samples were predominantly composed of silty sand or clayey sand. The Sand/Fine Split Report from the University of Illinois is included in EnviroScience's 2025 report entitled "Rock River Sediment Analysis" (see Appendix D). Based on the average sand fraction (74%), average fines fraction (25%), and average gravel fraction (1%) from the 9 samples tested for sieve analysis, it could be approximately estimated that of the 4.3 million cubic yards of impounded sediment, approximately 1.1 million cubic yards are fines. However, it should be noted that this estimate is based on a limited number of samples and that results are extrapolated to a much larger volume than sampled.

**Sediment Chemical Analysis:**

The sediment chemical testing results were compared to the Maximum Allowable Concentration (MAC) Standards as directed by IEPA. There was only one chemical MAC exceedance - total Iron in sample RRD-02. Illinois DOT Specifications for Road and Bridge Construction (adopted January 1, 2022) Article 669.05 describes how regulated substances are to be handled for disposal. Hanson believes that there are insufficient sediment samples to make a statistical evaluation of background concentrations to show that the Iron exceedance at RRD-02 falls within the 99% confidence limit to prove its concentration is within the sediment background range of concentrations (Article 669.05(a)(1)). Additional sediment background samples may not indicate Iron contamination.

However, based on the limited data available the Iron concentration does lie above the maximum concentration for location within a Metropolitan Statistical Area (MSA) and for locations outside an

MSA. This means the sediments removed during construction activities could not be used as IDOT right-of-way fill or other backfill or cannot be disposed at a clean construction and demolition debris (CCDD) facility. (Article 669.05(a)(2) and (3)). Without the additional sediment samples to evaluate the background concentration of Iron, the only disposal alternative is to dispose of the sediments as a non-special waste or special waste (depending on its characteristics) at a landfill (Article 669.05(a)(5) or (6)). It is understood that Illinois MAC standards (per Illinois EPA 35 III. Adm. Code 1100 SubpartF) will be used to determine whether any material removed during construction qualifies as CCDD or requires special handling or disposal.

**Supernatant:**
When compared to the water quality thresholds from ILEPA 401 WQC - *Appendix A,* the supernatant exceeded levels for a variety of parameters as follows:

- RRD 03, 05, 06, 07, 08, 09, and 10 for Fluoride, Iron, Manganese and Mercury
- RRD 06, 07, 09, and 10 for Copper
- RRD 03, 05, 06, 07, 08, and 09 for Oil and Grease
- RRD 06, 09, and 10 for Zinc
- Ammonia Nitrogen (as N) for all supernatant samples.

For additional comparison, the Illinois Environmental Protection Agency (EPA) 401 WQC values are the minimum concentration that must be met in testing and the 35 Illinois Administrative Code (IAC) 302 acute and chronic are the general water quality standards for aquatic life. The supernatant results only had three samples, RRD-07, RRD-06, and RRD-03, that exceeded the 35 IAC 302 chronic standard for Ammonia, but did not exceed the maximum allowable Ammonia concentration of 15 mg/L.

**Conclusions:**
This round of testing was performed to better inform what additional testing, if any, is required to satisfy the IEPA 401 water quality certification requirements if this project is pursued. Testing areas will be further refined using a combination of sediment transport modeling, the DOR results, and further grain size testing to better define areas of potential erosion in the riverbed. IEPA is only concerned about the material where particle or grain size analysis shows 20% or greater passage of material through a #230 US sieve (i.e., fines). In future sampling, only those locations where that finer material and erosion occur will require additional chemical analysis.

Key results of the contaminant analysis are summarized as follows from Appendix D:

**Sediment**

- Sediment cores RRD-2 and RRD-4 did not exceed the lowest ILEPA MAC thresholds for any of the analytes tested except for a slight Iron exceedance.

**Supernatant**

- Supernatant water quality thresholds from ILEPA 401 WQC - Appendix A were exceeded in various samples for: Fluoride, Iron, Manganese and Mercury, Copper, Oil and Grease, Zinc and Ammonia Nitrogen (as N).
- The Supernatant water sample concentrations did not exceed any of the available listed EPA SQRT thresholds for Freshwater surface water acute exposure for any of the analytes.
- The EPA SQRT threshold for groundwater was exceeded by iron in Supernatant samples RRD 03, 05, 06, 07, 08, 09, and 10.

- Organochlorine pesticides were not detected in any supernatant samples.
- PCBs **were not detected** in any supernatant samples.

*Table 1. Supernatant and Sediment Sampling and Analytical Plan*

| Media | Supernatant | | | | | | | | | | Sediment | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Applicable Standard | IEPA 401 WQC [1] | 35 IAC 302 (acute) | 35 IAC 302 (chronic) | | | | | | | | TACO Residential [3] | MAC Standards | | |
| unit | mg/L [4] | mg/L | mg/L | RRD-10 | RRD-09 | RRD-08 | RRD-07 | RRD-06 | RRD-05 | RRD-03 | mg/kg | mg/kg | RRD-04 | RRD-02 |
| Arsenic | 0.05 | | 0.05 | 0.0029 | 0.0036 | 0.0015 | 0.0051 | 0.0058 | 0.0034 | 0.0047 | 11.3[5] | 11.3 | 4 | 5.7 |
| Barium | 0.5 | | 1 | 0.19 | 0.24 | 0.16 | 0.23 | 0.21 | 0.22 | 0.23 | 5500 | 1500 | 100 | 120 |
| Cadmium | 0.001 | | 0.01 | 0.00022 | 0.00024 | 0.00025 | 0.00016 | 0.00048 | ND | 0.00015 | 78 | 5.2 | 0.16 | 0.43 |
| Chromium (hexavalent, grab) | 0.01 | | | ND | ND | ND | ND | ND | ND | ND | 230 | NS | ND | ND |
| Chromium (total) | 0.05 | 1.254 | 0.149 | 0.0058 | 0.0053 | 0.0023 | 0.0023 | 0.0013 | 0.003 | 0.0019 | 230 | 21 | 17 | 20 |
| Copper | 0.005 | 0.044 | 0.027 | 0.0059 | 0.0057 | 0.002 | 0.005 | 0.0063 | 0.0038 | 0.0041 | 2900 | 2900 | 8.5 | 12 |
| Cyanide (total) | 0.005 | 22 | 5.2 | | | | | | | | 1600 | 40 | | |
| Fluoride | 0.1 | 17.330 | 8.715 | 0.15 | 0.11 | 0.18 | 0.12 | 0.11 | 0.12 | 0.13 | 4700 | 80 | 1.7 | 2.2 |
| Iron (total) | 0.5 | | | 6.5 | 6.2 | 2.9 | 4.7 | 6.5 | 3.2 | 3.6 | NS | 15000 | 14000 | 16000 |
| Iron (Dissolved) | 0.5 | | 0.3 | | | | | | | | NA | NS | | |
| Lead | 0.05 | 0.013 | 0.013 | 0.0058 | 0.0065 | 0.0018 | 0.005 | 0.0068 | 0.0034 | 0.0049 | 400 | 107 | 8.7 | 12 |
| Manganese | 0.5 | 8.882 | 3.777 | 2.2 | 2.2 | 1.5 | 0.9 | 0.75 | 1.1 | 0.91 | 3700 | 630 | 470 | 610 |
| Mercury | 1.0 ng/L | 2210.0 | 1105.0 | 33 | 42 | 7.3 | 22 | 33 | 18 | 12 | 23 | 0.1 | 0.041 | 0.064 |
| Nickel | 0.005 | 0.193 | 0.012 | 0.0061 | 0.0044 | 0.0024 | 0.0028 | 0.003 | 0.0028 | 0.0035 | 1600 | 100 | 12 | 15 |
| Oil & Grease | 5 | | 0.1 | 4.5 | 6.8 | 7.3 | 7.8 | 7.6 | 8.2 | 7.8 | NS | NS | 170 | 200 |
| Phenols | 0.005 | | 0.1 | | | | | | | | 47000 | 100 | | |
| Selenium | 0.005 | | 1 | 0.00097 | 0.00061 | 0.00073 | 0.00051 | 0.00043 | 0.00051 | 0.00047 | 390 | 1.3 | 0.22 | 0.22 |
| Silver (total) | 0.003 | | 5 | ND | ND | ND | ND | ND | ND | ND | 390 | 4.4 | ND | 0.067 |
| Zinc | 0.025 | | | 0.026 | 0.026 | 0.011 | 0.015 | 0.027 | 0.013 | 0.019 | 23000 | 5100 | 43 | 68 |
| Polychlorinated Biphenyls (PCBs) | 1.0 ng/L | | | ND | ND | ND | ND | ND | ND | ND | 1 | 1 | | |
| Ammonia-Nitrogen (as N) | 0.02 | 15.000 | 6.848 | 1.2 | 5.2 | 0.72 | 11 | 13 | 4.9 | 13 | NA | NS | 120 | 220 |
| Total Suspended Solids (TSS) | 1 | | | 390 | 210 | 77 | 160 | 240 | 120 | 150 | NA | NS | | |
| Total Volatile Solids (TVS) | 1 | | | 650 | 480 | 630 | 410 | 800 | 600 | 390 | NA | NS | 2.8 | 2.5 |
| pH | 0.1 S.U. | | | | | | | | | | NS | NS | | |
| Hardness (as CaCO3) | 1 | | | 320 | 270 | 310 | 260 | 260 | 260 | 240 | NA | NS | ND | ND |
| aldrin | NS | | | ND | ND | ND | ND | ND | ND | ND | 0.04 | 0.94 | ND | ND |
| dieldrin | NS | | | ND | ND | ND | ND | ND | ND | ND | 0.04 | 0.603 | ND | ND |
| endrin | NS | | | ND | ND | ND | ND | ND | ND | ND | 23 | 1 | ND | ND |
| heptachlor | NS | | | ND | ND | ND | ND | ND | ND | ND | 0.1 | 0.871 | ND | ND |
| mirex | NS | | | ND | ND | ND | ND | ND | ND | ND | NS | NS | ND | ND |
| toxaphene | NS | | | ND | ND | ND | ND | ND | ND | ND | 0.6 | 0.6 | ND | ND |

| |
|---|
| 35 IAC 302 chronic aquatic life standard |
| 1000 Maximum Allowable Concentration |
| Water Quality Certification - Appendix A |

**Applicable Standard exceedance**

**Notes:**

1. Standards as indicated in *Appendix A* of the Illinois Environmental Protection Agency, Bureau of Water Section 401 Water Quality Certification circular entitled Material Analysis for Dredge and Fill Activities.
2. Standards as applied to Class I Groundwater from the Illinois Environmental Protection Agency's Tiered Approach to Corrective Action Objectives (TACO), specifically *Appendix B*, Table E: Tier 1 Groundwater Remediation Objectives for the Groundwater Component of the Groundwater Ingestion Route.
3 Standards as applied to the Ingestion Exposure Pathway from the Illinois Environmental Protection Agency's Tiered Approach to Corrective Action Objectives (TACO), specifically *Appendix B*, Table A: Tier 1 Soil Remediation Objectives for Residential Properties.
4. Concentrations in mg/L unless otherwise noted.
5. Lowest Applicable Standard as indicated by Illinois Environmental Protection Agency's Tiered Approach to Corrective Action Objectives (TACO), specifically *Appendix A*, Table G: Concentrations of Inorganic Chemicals in Background Soils.
6. Abbreviations:
   *"NA" - Not Applicable*
   *"ND" - Not Detected*
   *"NS" - No Standard is Published*
   *"mg/L" - milligram per liter*
   *"ng/L" - nanogram per liter*
   *"S.U." - Standard Units*

When interpreting sediment results, it is important to note that supernatant water can be influenced by the water throughflow from upstream and above the sample as well as groundwater from adjacent soils. It is not possible to discern whether or not the materials found in supernatant water come directly from leaching of the soils in the core, or from adjacent sources. Additional background samples are required to fully interpret this data in proper context.

### *6.3 Sediment Management Evaluation*

This section evaluates sediment management strategies for the approximately 4.3 million cubic yards of material impounded upstream of the Sears and Steel Dams. Managed sediment release is a critical component of dam removal planning, influencing project cost, ecological outcomes, and regulatory compliance. Typical sediment management evaluation encompasses a range of approaches—from passive release to active excavation—based on sediment volume, grain size, contamination levels, and transport dynamics. Active excavation and pilot channel considerations were not explored due to favorable chemical results for passive release, concerns for increased costs, and general owner preference to allow the channel to reform in a natural manner. This section also assesses the likely fate of mobilized sediment, potential downstream impacts, and construction-phase considerations. The findings support the selection of a sediment management strategy that balances environmental protection, feasibility, and alignment with IDNR–OWR's project goals.

The degree to which impounded sediments are excavated and managed will have substantial effects on flood hydraulics, habitat suitability, and project cost. Impounded sediment management for dam removals falls somewhere on a spectrum between passive and active management and restoration.

Passive restoration of an impoundment entails removing the major impediment to natural river function (i.e., Sears and/or Steel dams) and allowing the river to evacuate sediments and restore itself over time. The channel within the former impoundment freely adjusts its slope and form via incision, widening, and meandering, and eroded sediment is transported downstream unimpeded. These adjustments continue until the channel develops a form appropriate for its flow and sediment regime. Exposed sediment that is not flushed downstream will develop to form floodplains, and existing seedbanks within those soils may contribute to vegetation that stabilizes surfaces. The advantage of passive restoration approaches is the low cost, as it requires little work in the impoundment to control sediment or create the channel and floodplain characteristics. Low cost comes at the expense of time, as the river will evolve through a process of erosion and migration that may take years or decades following dam removal. It can also have a negative short-term impact on downstream reaches if large volumes of sediment, including any contaminated materials, are delivered to reaches downstream of the dam.

Active sediment management, on the other hand, involves some degree of mechanical excavation of sediment from the impoundment to control and shape channel form and adjustment. When localized sediment contamination is encountered, active management may also include capping or excavation and replacement of sediment along the channel margins that are expected to become future floodplain areas. Active restoration results in reduced sediment loading to downstream reaches, immediately stable channel form, and a higher degree of ecological function in a shorter time. These advantages are realized at a higher project cost. Property rights, access agreements and costs are far more extensive with active sediment management versus passive release.

Sediment management strategies may also include hybrid approaches that combine elements of passive and active strategies. Successful approaches used on dam removals of a similar scale elsewhere include, but are not limited to the following:

- Pilot channels, which partially excavate impounded sediments to reduce the volume mobilized downstream during and immediately after dam demolition.
- Floodplain benching, which constructs a stable channel but does not fully remove sediment from floodplain areas.
- Sediment trapping, which uses constructed and maintained depositional traps to remove mobilized sediment from the river before it is allowed to transport downstream.

### *6.3.1 Sediment Management Recommendations*

Hanson reviewed potential sediment management strategies with IDNR-OWR in the period following DOR surveys and sediment coring/contamination analysis. Given the impounded sediment volume, distribution of sediment, low degree of contamination, and anticipated construction budget, IDNR-OWR prefers a passive approach to sediment management without additional active or hybrid (e.g., pilot channel) management options. The following sections discuss outcomes (evacuation and fate) associated with the recommended passive sediment management approach.

### *6.3.2 Sediment Evacuation and Fate*

#### 6.3.2.1 Grain Size

Grain size analysis was performed on the nine cores collected upstream of the dams by EnviroScience on March 11-13, 2025, and shows that impounded sediments are predominantly composed of silty sand or clayey sand with about 25% average fines fraction (Table 2). Impounded materials in the downstream reach of the project generally have larger fractions of silt and clay compared to reaches further upstream, a finding that is consistent with typical depositional patterns in impounded river reaches.

*Table 2. Grain size analysis for the nine cores collected on March 11-13, 2025.*

| Sample Name | % Cobble | % Gravel | % Sand | % Silt | % Clay | Description |
|---|---|---|---|---|---|---|
| **RRD-02** | 0.0 | 0.0 | 54.1 | 23.7 | 22.1 | Clayey Sand |
| **RRD-03** | 0.0 | 6.3 | 70.7 | 14.4 | 8.6 | Silty Sand |
| **RRD-04** | 0.0 | 0.5 | 68.1 | 13.4 | 17.9 | Clayey Sand |
| **RRD-05** | 0.0 | 0.8 | 83.5 | 7.5 | 8.3 | Silty Sand |
| **RRD-06** | 0.0 | 0.4 | 59.5 | 18.9 | 21.2 | Clayey Sand |
| **RRD-07** | 0.0 | 1.8 | 81.4 | 8.1 | 8.7 | Silty Sand |
| **RRD-08** | 0.0 | 0.0 | 84.8 | 8.3 | 6.9 | Silty Sand |
| **RRD-09** | 0.0 | 0.0 | 90.2 | 5.1 | 4.7 | Poorly Graded Sand with Silt |
| **RRD-10** | 0.0 | 0.1 | 70.0 | 17 | 12.9 | Silty Sand |

#### 6.3.2.2 Sediment Transport Characteristics

Sediment transport estimates within the Rock River are available from Graf (1983) and estimates for the upper Mississippi River are available from Bhowmik et al. (1986). Graf (1983) analyzed bedload data

from the Rock River near Joslin, IL, located approximately 30 miles upstream of the Steel and Sears Dams. Bhowmik et al. (1986) analyzed three gages along the Mississippi River: East Dubuque, IA (100 miles upstream of the Rock River confluence), Burlington, IA (75 miles downstream), and Keokuk, IA (115 miles downstream). Estimates of sediment transport in both studies are based on rating curves developed using stream gaging records, with the Rock River estimates developed over a period of 3.7 years (5/1980-9/1983), and the Mississippi River estimates developed over a 14-year period between 1967 and 1981. Average annual sediment loads shown in Table 3 are based on published data in Bhowmik et al. (1986) and indicate that the Mississippi River carries a larger sediment load 2 to 13 times that of the Rock River, depending on the location. The volume of impounded sediment upstream of Sears and Steel Dams at 4.3 million CY represents a value that is approximately 6.5 times the estimated average annual sediment load of the Rock River and is approximately equal to the annual transport rate of the upper Mississippi River. As such, sediment transport and average sediment deposition associated with dam removal is minimal and not expected to significantly impact the Mississippi River.

*Table 3. Average annual sediment load for the Rock River and the upper Mississippi River as estimated by Graf (1983) and Bhowmik et al. (1986).*

| Gage | Approximate Distance from Steel and Sears Dams (mi) | Average Annual Sediment Load (CY) |
|---|---|---|
| Rock River at Joslin, IL | 30 (upstream) | 656,376 |
| Mississippi River at East Dubuque, IL | 100 (upstream) | 2,390,386 |
| Mississippi River at Burlington, IA | 75 (downstream) | 8,644,169 |
| Mississippi River at Keokuk, IA | 115 (downstream) | 5,080,103 |

6.3.2.3 Sediment Evacuation

Inter-Fluve evaluated expected sediment transport characteristics of the impoundment under dam-removal conditions and downstream reaches of the Rock and Mississippi Rivers to evaluate likely outcomes of the recommended passive sediment management strategy. Following dam removal, the majority of impounded sediments are expected to readily mobilize and transport downstream. The evolution of impoundments under a passive sediment management strategy typically occurs in two phases (Collins et al., 2017). Initially, following the dam removal, sediment is eroded from the channel in a 'process-driven' phase as a result of base level lowering and increase in the energy gradient, incising the channel until a stable channel slope and cross-section are formed (Pearson et al., 2011). During this phase, in the initial months, a large percentage of sediment will be mobilized and transported downstream. Deposition will occur in downstream reaches, and sediment may be stored within depositional areas such as the Rock River with a lower transport capacity, such as point bars, midchannel bars, and pools. Following the 'process-driven' phase, channel evolution enters an 'event-driven' phase in which larger flood events contribute to the majority of sediment transport (Collins et al., 2017).

Predicting precise rates of sediment transport and evacuation during drawdown and post-removal is extremely difficult because driving variables—such as flow magnitude, surface bed sediment composition, water depth, local flow velocity, rate of excavation, and channel size—are subject to

simultaneous change and may not be predictable in advance. Nevertheless, predictions of potential sediment transport characteristics over intermediate time scales are possible based on sediment grain size characteristics and approximate channel hydraulic conditions obtained from 1-D model results of post-removal hydraulics (e.g., Sumaiya et al., 2021).

Model results indicate that following dam removal, materials smaller than fine to medium gravel, which is understood to be the majority of the impoundment, will be readily mobile in reaches upstream of the dams during nearly all flow events. Therefore, it is expected that the process-driven phase of sediment transport will include rapid evacuation of the thick sediment deposits upstream of Sears Dam and a portion of the uniform sand deposits upstream of Vandruff Island. Material finer than medium sand (0.25 mm) is expected to transport as suspended load, while coarser sand will transport as bedload. Suspended load consists of very fine particles such as silt and clay (25% of the sediment composition) that are light enough to be carried within the water column by turbulence. These particles remain in the flow for long distances and are not confined to the riverbed. Bedload, in contrast, consists of coarser particles such as sand and gravel (75% of the sediment) that move along the riverbed. These materials transport depending on local flow velocity and energy conditions, meaning that these sediments tend to deposit relatively quickly when flow velocities decrease, such as in pools, behind bars, or in wider channel sections. Some degree of sediment may be stored within floodplains, bars, and pools within the former impoundment, but over time, over the course of years, a substantial fraction (potentially one third) of the impounded sediment volume is expected to evacuate the impoundment during the process driven phase. Over the event-driven phase, much of the remainder of impounded material would evacuate the impoundment, with deposits remaining as floodplain or bar deposits with the degree of mobility determined by how quickly stabilizing vegetation establishes.

Analysis suggests that under a passive release scenario, the volume of released sediment will be greater than the estimated annual sediment transport capacity, making the Rock River system transport-limited. In transport-limited systems, the ability of the channel to mobilize bed material is the determining factor, as opposed to a supply-limited system where the amount of material is the constraint. Therefore, in the time period immediately following dam demolition, the Rock River will be actively transporting its maximum amount of sediment, and it is during this period that the greatest degree of deposition is anticipated (see Figure 27). As time progresses, river flows will re-mobilize those deposits, transporting those materials further downstream to the Mississippi River.

#### 6.3.2.4 Sediment Fate

A sediment fate analysis was conducted to assess the ability of the Rock River and Mississippi River channels to accommodate the downstream release of impounded sediment following dam removal under a passive sediment management approach. This analysis considered the volume and characteristics of impounded sediment, the sediment transport capacity of the Rock River and the Mississippi River, and identification of potential depositional areas downstream where released impounded sediment may accumulate.

Once within the Mississippi River, mobilized sediments will move downstream and deposit within the pool above Mississippi Lock and Dam number 16 (Lock and Dam no. 16), a 34-foot-tall dam owned and operated by the USACE (U.S. Army Corps of Engineers Rock Island District, 2012). To evaluate impacts to the navigational pool, Inter-Fluve digitized the areal extent of potential deposition (hashed

areas illustrated in Figure 27). The average depth of sediment deposition for fractions of material that may evacuate the Sears and Steel Dam impoundments (Table 4) was estimated considering this area.

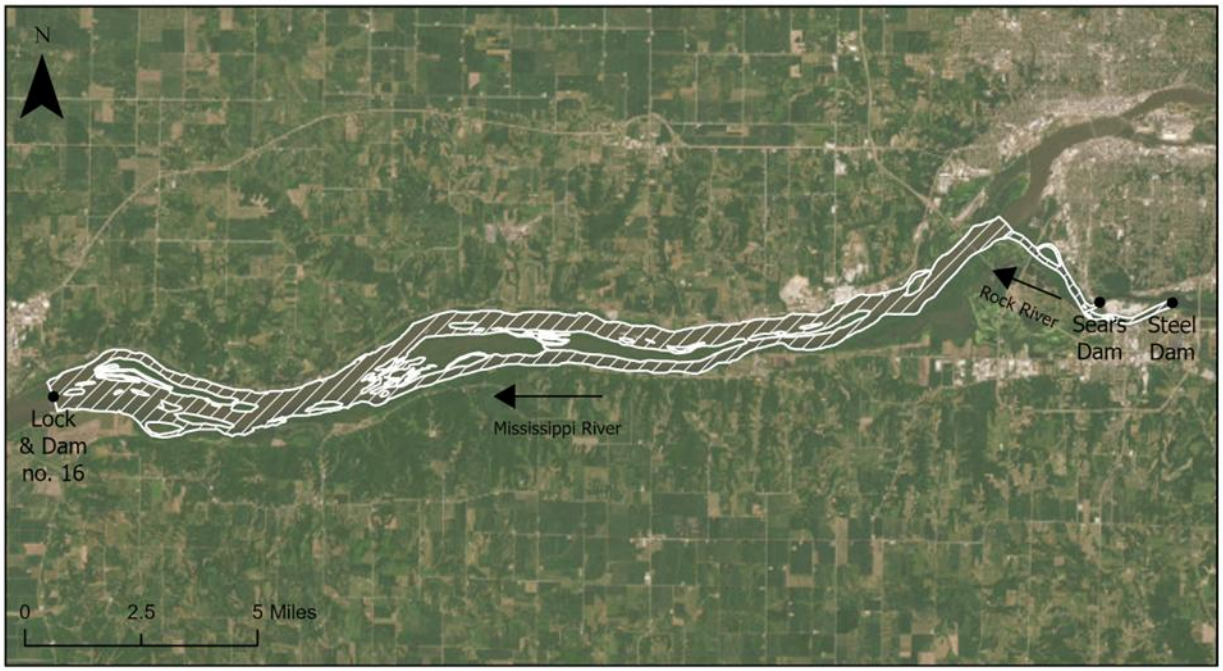



*Figure 27. Potential depositional areas in the navigational pool above Lock and Dam no 16.*

*Table 4. Average depths of potential sediment deposits in reaches of the Rock and Mississippi Rivers downstream of Steel and Sears Dams for given fractions of the total impounded sediment volume.*

| Percentage of Total Impounded Sediment (%) | Volume of Sediment (CY) | Depth of Deposition (inches) |
|---|---|---|
| 100 | 4,300,000 | 3.4 |
| 75 | 3,225,000 | 2.6 |
| 50 | 2,150,000 | 1.7 |
| 25 | 1,075,000 | 0.9 |

The Upper Mississippi River is subject to routine dredging by the USACE to maintain a navigation channel to a depth of 9 feet (USACE, 2024). Annually, the Rock Island District of the Upper Mississippi dredges approximately 500,000 CY over its 314 river miles (USACE, 2024). Given the volume of impounded sediment and the extent of the assumed depositional area, the average anticipated depth of deposition is less than four inches, assuming complete evacuation of the Sears and Steel Dam impoundment. In actuality, the depth of sediment deposition will vary over time and space given flow magnitude, local slope, bedforms, islands, side channels, and other influences on local transport capacity. It should be noted that due to the lower sediment transport capacity of the Rock River (due to

its smaller size) as compared to the Mississippi, it is anticipated that deeper depths of sediment may occur within the Rock River in the years immediately following sediment release.

6.3.2.5 Sediment Management During Construction

Sediment management and erosion control during construction are required to minimize turbidity caused by in-river work and erosion from upland areas of the project site. Given dam conditions and demolition plans, a staged drawdown approach will be adopted. It is anticipated that dam demolition will occur at a maximum rate of up to one foot per day. A staged drawdown results in gradual changes in energy within the impoundment and results in less immediately mobilized sediment compared to a rapid drawdown.

Turbidity may be managed during drawdown, but it is important to note that all dam removal projects result in some degree of turbidity released to downstream waters. Turbidity controls, such as turbidity curtains, cofferdams, or temporary grade control may be adopted to limit turbidity, and thresholds for work stoppage could be adopted if desired. Additionally, construction site erosion and sedimentation control best management practices (BMPs) would be employed to minimize erosion from upland areas. Measures will include sediment control logs or silt fence around the perimeter of spoils piles and along access routes, and stabilized construction entrances.

If IEPA determines there are areas of potential contamination, full mechanical dredging, dewatering, and disposal operation for the 4.3 million cubic yards of impounded sediment—including 1.1 million CY of fine silts—would impose an excessive cost premium estimated over $100 million. However, additional modeling and testing would reduce the quantities requiring potential removal/disposal. In addition, several significantly less expensive alternatives could be pursued to satisfy regulatory objectives. These include engineering solutions such as a targeted "fines-only" extraction coupled with a passive sand bypass (~$30M), in-place geomorphic stabilization to terrace and isolate the sediment within a new floodplain (~$20M), or an incrementally managed high-flow notched drawdown (~$5M) release over multiple years designed to dilute chemicals naturally.

# 7. River Hydraulics

This section provides a comprehensive assessment of the Rock River watershed as it relates to the Sears and Steel Dams project area. Understanding the broader watershed context is essential for evaluating the hydrologic and hydraulic behavior of the river system, sediment transport dynamics, and potential impacts of dam modification or removal. This section outlines key watershed characteristics, including land use, topography, and drainage patterns, and presents hydrologic data to inform modeling scenarios. It also details the development and results of both 1D and 2D hydraulic models used to simulate existing conditions and evaluate the performance of proposed alternatives. This analysis supports informed decision-making by identifying how changes to the dams may influence upstream and downstream flow conditions, infrastructure, and ecological systems.

## *7.1 Watershed Characteristics*

The Rock River drains 10,800 square miles from Wisconsin to Steel Dam just upstream of the confluence with the Mississippi River. The watershed is primarily agricultural with pockets of urban development including cities of Watertown, Jefferson, Fort Atkinson, Janesville, and Beloit in Wisconsin and past Rockford, Dixon, Sterling, Rock Malls, and Moline in Illinois.

The area containing the Sears and Steel Dams lies within the Case Creek – Rock River Watershed (HUC12: 070900051302) within the Mill Creek Watershed (HUC10: 0709000513) within the Lower Rock Watershed (HUC8: 07090005) within the larger Rock River Watershed (HUC6: 070900) in Illinois and Wisconsin. See Figure 28 for a map of these watersheds around the project area.

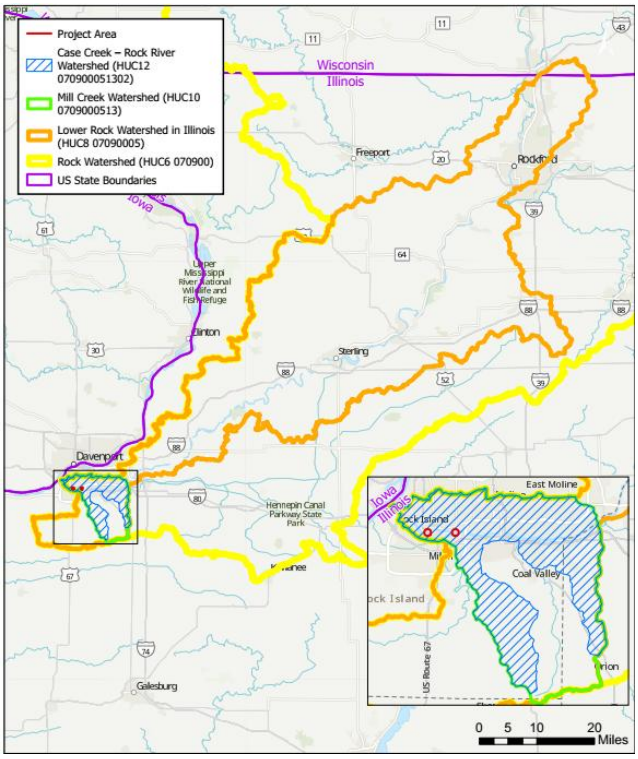



*Figure 28 - Map of Successive Watersheds Including the Project Area (HUC 6 through 12).*

From Rockford, the river flows generally southwest, entering the Mississippi River at Rock Island. The Rock River flows approximately 300 miles from headwaters to its mouth. River elevation declines more than 300 feet over this distance, from an elevation of 857 feet above mean sea level at Horicon Marsh to 553 feet at Steel Dam with an average watershed slope at 0.021%.

### *7.2 Hydrology*

Hanson has reviewed the published FEMA discharges, USGS gage data (05446500 Rock River near Joslin, IL, 05447800 Rock River near Moline, IL), and discharges published by ISWS (Singh et al., 1988) for locations in the study reach to develop a range of design discharges for the hydraulic model. The discharges used to evaluate both existing conditions and proposed alternatives are presented in Table 5 through Table 7.

Annual exceedance flows for the 10%, 4%, 2%, 1% and 0.2% (10-, 25-, 50-, 100-, and 500-year) events were acquired from the US Army Corps of Engineers (USACE) Rock Island District hydraulic model, see Table 5.

*Table 5 – Flood flows*

| AEP (%) | Recurrence Interval (years) | Flow (cfs) |
|---|---|---|
| 10.0 | 10 | 47,400 |
| 4.0 | 25 | 49,800 |
| 2.0 | 50 | 50,900 |
| 1.0 | 100 | 51,900 |
| 0.2 | 500 | 54,900 |

A 7Q10 discharge value, which represents the lowest 7-day average discharge with a recurrence interval of 10-years, was determined *to be 1,520 cfs* using publications provided by ISWS. On the day *t*hat the field survey was completed to capture bathymetry, the flow in the river was 15,500 cfs according to *gage readings*. This flow was used to help calibrate the models to ensure model accuracy. Recreational

and fish passage flows were evaluated by Inter-Fluve as a part of this dam removal study and are provided in this section and Appendix C.

### *7.2.1 Fish Passage Analysis Flows*

Inter-Fluve investigated flow conditions to support hydraulic modeling in design of aquatic organism passage. They researched the local fish species and recreational use of the Lower Rock River and determined suggested flow considerations for hydraulic modeling and alternatives evaluation. The Lower Rock River extent covers the portion of the Rock River within the Lower Rock River watershed (HUC: 07090005) stretching from its confluence with the Mississippi River, continuing upstream to the Illinois-Wisconsin border.

Low head dams, like the Sears and Steel dams, can negatively influence the populations of riverine fish by limiting migration of fish and their food sources, pulsing of nutrients, raising water temperatures, lowering dissolved oxygen, and interrupting normal sediment transport (Bednarek 2010, Cumming, 2004, Porto et al., 1999, J. Tiemann et al. 2004). Understanding dam hydraulics before and after removal, with a special focus on migration periods, is important in determining the conditions for removal and restoration. Hydraulic analysis for fish passage is thus completed during common migration periods for fish in the project reach. Data for fish flow considerations was obtained from the United States Geological Survey (USGS) gage ID 05446500, near Joslin, IL. This is the closest gage to the project site with sufficient available data. Flow exceedances, detailed in Table 6, were determined based on the typical migration periods (April through June) of the migratory fish traveling upstream for spawning habitat.

HEC-SSP (Hydrologic Engineering Center's Statistical Software Package, Version 2.3) was used to perform a flow duration analysis by analyzing streamflow data from USGS gage 05446500 to determine the frequency with which certain flow magnitudes are equaled or exceeded over the period of 1993 to 2023. This process involves sorting the flow data in descending order, ranking each value, and calculating the exceedance probability for each ranked flow. These probabilities are used to create a flow duration curve table, which represents the percentage of time that specific flow rates are met or exceeded. The values of the flow duration curve for April, May, and June of 1993 – 2023 (three total values) were averaged together to obtain the final average flow values, shown in Table 6.

*Table 6 – Fish passage flows (April, May, and June)*

| Percent of Time Exceeded | Average Flow (cfs) |
|---|---|
| 95 | 4,410 |
| 90 | 5,510 |
| 80 | 6,860 |
| 70 | 8,200 |
| 60 | 9,360 |
| 50 | 10,900 |
| 40 | 12,300 |
| 30 | 14,400 |
| 20 | 17,100 |

| | |
|---|---|
| 10 | 21,800 |

### *7.2.2 Recreational Flows*

Inter-Fluve reached out to several local groups to gather information about recreational uses of the Rock River. At that time, no responses were received from the Backwater Gamblers, a water ski group that holds regular shows just upstream of the dams, or Sunset Marina, a large marina (approximately one-hundred slips) located on the Mississippi River near the Rock River confluence. However, Inter-Fluve did receive communication via email with the owner of Quad Cities Kayak River Adventures, a local outfitter that provides kayak guiding, rental, and shuttle services on the Rock River. This individual stated that they paddle the river almost daily during the warmer months and noted that the optimal flow for kayaking is approximately 10,000- to 11,500-cfs, or around a stage of 9 feet at the Moline USGS gage. When the stage drops closer to 6 feet, beaches appear, and other recreational use of the river increases. It was also stated that that common river users include flat-bottom fisherman, pontoon boats, jet skiers, and tubers, with recreational boats and water skiers in the lower reach around Moline. Potential high flows for recreational use were estimated using gage data from the dates when Backwater Gamblers shows were canceled. Using this information, Inter-Fluve determined suggested recreational analysis flows, presented in Table 7.

*Table 7. Suggested recreational passage flow considerations for the Rock River, Rock Island County, Illinois.*

| Flow Description | Flow (cfs) |
|---|---|
| **Low Recreational Flow** (September 90% Exceedance Flow) | 2,700 |
| **Average Recreational Flow** (Average 50% Exceedance Flow for April-October) | 7,900 |
| **High Recreational Flow** (reported high "easy" flow for paddling from Quad Cities Kayak) | 11,500 |
| **Potential Maximum Recreational Flow** (2024 Waterski Show cancellations occurred in July with flows exceeded approximately this value) | 16,000 |

Using these ranges of flows, modeling efforts and comparisons were made using selected flows that best represented the typical or worst case in various situations. For example, when comparing water surface profiles, the periods of most interest by the public would be during the lowest drought case or the average recreational flow so those were used to best illustrate what the river might look like during those river flow ranges. Table 8 provides a summary of which flows were used for each model or comparison.

*Table 8 - Summary of Model Flows*

| Model or Comparison | Flow (cfs) |
|---|---|
| 1D Model (Steady) | 7Q10 (1,520), Fish Passage (Spring 95%=4,409 thru Spring 10%=21,757) |
| 1D Model (Unsteady) | Flood (10yr/10%=47,400 thru 500yr/0.2%=54,900) |
| 2D Model | 7Q10 (1,520), Fish Passage (Spring 95%=4,409 thru 10%=21,757), Calibration (15,500), Flood (10yr/10%=47,400 thru 500yr/0.2%=54,900) |
| CFD Model | Low (2,700) and High Recreation (16,000) |
| River Profile Comparison | 7Q10 (1,520) and Avg. Recreation (7,900) |
| Flow Distribution Comparison | Low (2,700), Avg (7,900), High (11,500), Max (16,000) Recreation and 100yr/1% (51,900) |
| Velocity Comparison | Max Recreation (16,000) |
| Bridge Scour Analysis | 100yr/1% (51,900) |

## *7.3 Hydraulics*

### *7.3.1 Literature Review and Roller Formation*

Low-head ogee-crest run-of-the river dams have a long history of forming dangerous hydraulic rollers at the downstream portion of the spillway. The U.S. Bureau of Reclamation (USBR) developed a spreadsheet tool to define dangerous flow ranges for low-head dams. This tool was used to determine the range of discharges that result in the formation of dangerous rollers under existing site conditions. Flows ranging from the 7Q10 to the 0.2% (500-year) flood were analyzed using the spreadsheet procedure. The tool computes the hydraulic jump formation downstream of the dam and categorizes it into four cases (A, B, C, and D) shown in Figure 29. **Case C** corresponds to dangerous roller conditions, which occur when the tailwater depth downstream of the dam exceeds the conjugate depth of the hydraulic jump, pushing the jump to the face of the dam and forming a roller with recirculating currents. The spreadsheet also establishes "keeper velocities," which are the velocities at the roller surface that push objects back towards the dam face, trapping them in the roller.

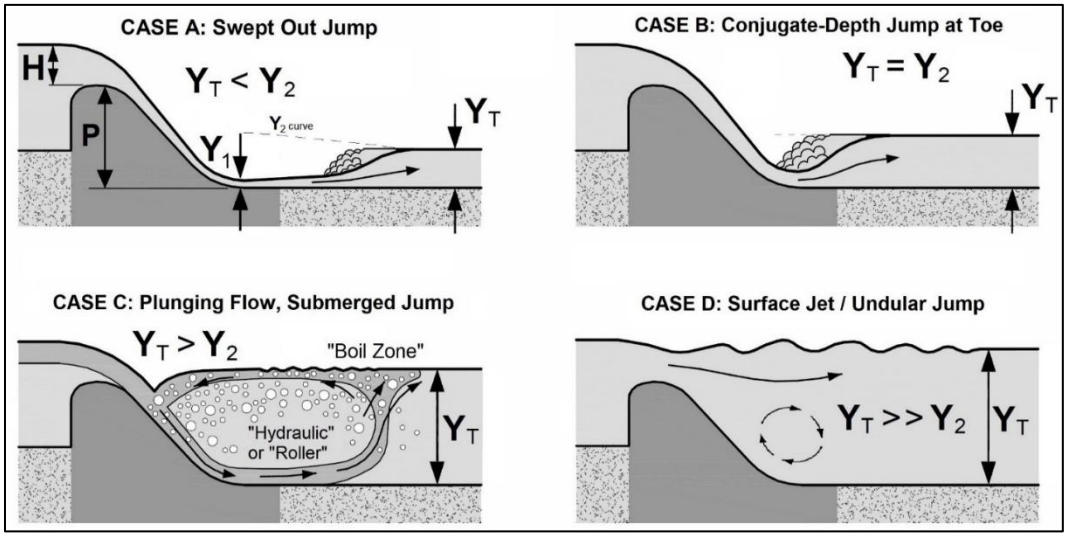



*Figure 29: Hydraulic Jump Case (USBR Wahl, T.L., & Svoboda, C.D. (2023))*

Based on results of spreadsheet calculations, a roller forms at Steel Dam across the full range of low to normal flows (7Q10 through 10% (10-year) annual exceedance fish passage flow) which **encompasses all recreational flows**. The "keeper velocity" ranges from 3.31-ft/s to 4.64-ft/s which exceeds an average person's swimming ability, indicating they cannot swim out of the roller.

A more severe roller forms at Sears Dam for the full range of analyzed flows (7Q10 through 1% (100-year) AEP) which also **encompasses all recreational flows**. The confluence of the North and South Channel is in close proximity to Sears Dam and creates increased tailwater conditions that promote the formation of rollers across the full range of flows. The "keeper velocity" ranges from 4.47-ft/s to 7.15-ft/s. Detailed spreadsheet calculations and documentation can be found in Appendix F.

### *7.3.2 Existing Conditions Model Development*

Sears Dam and Steel Dam are low head run-of-the-river ogee crest dams. Steel Dam has a height of 6.0 feet, measured from the crest of the dam to the toe of the apron, and a weir length of 772.5 feet. Sears Dam has a height of 13.1 feet, measured from the crest of the dam to the toe of the apron, and a weir length of 443 feet. Both structures are classified as low hazard dams; however, this classification system only considers the risk of impacts due to dam failure and does not account for the risk to public safety caused by the formation of adverse hydraulic conditions known to occur at run-of-the-river dams or the risk to watercraft by the dam structure. Both 1D and 2D hydraulic models were developed to establish baseline conditions for evaluating the risk of adverse hydraulic conditions and to assess impacts to the existing upstream pool under proposed alternative conditions.

The HEC-RAS 2D v.6.6 existing conditions model geometry was developed using a combination of LiDAR elevation data collected by the USGS (USGS, 2023), bathymetric data collected by IDNR-OWR in late 2023 and 2024, and cross-section data taken from a 1D unsteady hydraulic model developed by the USACE Rock Island District in 2014 (USACE, 2014). Land cover was defined by visual observation of site orthophoto datasets. Manning's n values in the 2D domain were divided into nine categories. The model domain (Appendix F) used an average grid cell size of 50-feet by 50-feet. Breaklines were used to capture key hydraulic elements such as levees, roadway embankments, bridge piers, and abutments. Breakline spacing varied from 2- to 50-feet to ensure high ground was captured and to maintain cell orientation orthogonal to flow where feasible. The 2D shallow water equation solver (SWE-EM) was used for all model simulations. This method is well suited for simulating 2D free-surface flow allowing the model to represent flow splits, velocity gradients, water-surface variation, and hydraulic conditions near the dams.

The USACE Rock Island District 1D HEC-RAS model was used as a supplement to extend the limits of computed bed shear and velocities upstream of the detailed 2D domain in support of the sediment fate analysis (performed by Inter-Fluve). The geometry of the 1D model developed by USACE was updated using the 2024 IDNR-OWR bathymetric survey from cross-section 0.19 to 17. The 1D model was developed by the USACE Rock Island District on behalf of IDNR-OWR to develop (10, 4, 2, 1, and 0.2 AEP) water-surface elevations for the Lower Rock River (USACE, 2014). Using RAS Mapper, a 1D interpolation surface was created from the survey cross sections. The channel subsections of the model cross sections were updated from the surface.

Results of the 1D model were validated using the flows reported by the USACE gage at Moline, Illinois, on the dates of the observed water surface survey. The profiles were computed with 1D steady HEC-RAS plans. The split flow optimization option for the computation of flow around Vandruff Island was enabled in the HEC-RAS steady flow plan. A comparison of flows over the Sears and Steel Dams for the 1D and 2D plans produced identical flow splits between the two structures. Computed water-surface elevation profiles for the 1D and 2D plans showed reasonable agreement. Documentation of existing conditions boundaries, calibration, and model results are further discussed in the Appendix F Existing Conditions Hydrology and Hydraulics Memo.

### *7.3.3 Computational Fluid Dynamics (CFD)*

A cursory computational fluid dynamics (CFD) analysis was conducted within Flow 3D to verify and provide visualization of roller formation on the downstream crest of the Steel Dam and to demonstrate preliminary viability of two of the six proposed remediation options. Similar CFD models were also developed for the existing Steel Dam, Steel Dam remediated with steps, and Steel Dam with a crest reduction of -2-ft. The models are intended to provide insight into the existing roller formation and determine if potential alternatives such as a spillway steps or reduction in crest height properly mitigate roller formation for all recreation flows (2,700 cfs to 16,000 cfs). These were selected as representing the range most commonly utilized by boaters and typical river users. The CFD model covers a 100-ft section of Steel Dam. The CFD geometry is limited to the Steel Dam structure. Upstream and downstream channel geometry is not incorporated into the model, and the upstream and downstream channel are represented as a wide flat bottom at the approximate thalweg elevation of the Rock River. The model does not incorporate the scour pool formed downstream of Steel Dam. The CFD model has an average vertical and horizontal mesh spacing of 0.125-ft to ensure adequate coverage of the flow field as flow enters the supercritical flow regime over the crest of the dam. The upstream boundary was set as the maximum recreation unit discharge over Steel Dam and a starting water surface elevation informed by the 1D and 2D models. The downstream water surface elevation was informed by the 1D and 2D models. Air entrainment (2 phase flow) was not considered as part of the evaluation to reduce simulation time and file size.

Figure 30 provides results of the CFD modeling for the maximum recreation flow over Steel Dam. As shown in the image with water transparency, the surface turbulence is low and a boater upstream of the dam may not be able to visually identify the hazard. The view with velocity coloration demonstrates the dangerous roller with more prominent visualization. Velocities over the crest of the dam exceed 10-ft/s with “keeper” velocities in the upper water column at the surface exceeding 4-ft/s. A low recreation flow was also analyzed in the CFD to verify the results of the spreadsheet analysis that a roller forms across the full range of recreation flows. Figure 31 depicts the formation of the roller at low recreation flows, validating the results of the USBR spreadsheet (Wahl 2023). “Keeper” velocities in the upper water column exceed 4-ft/s even at the lower discharge.

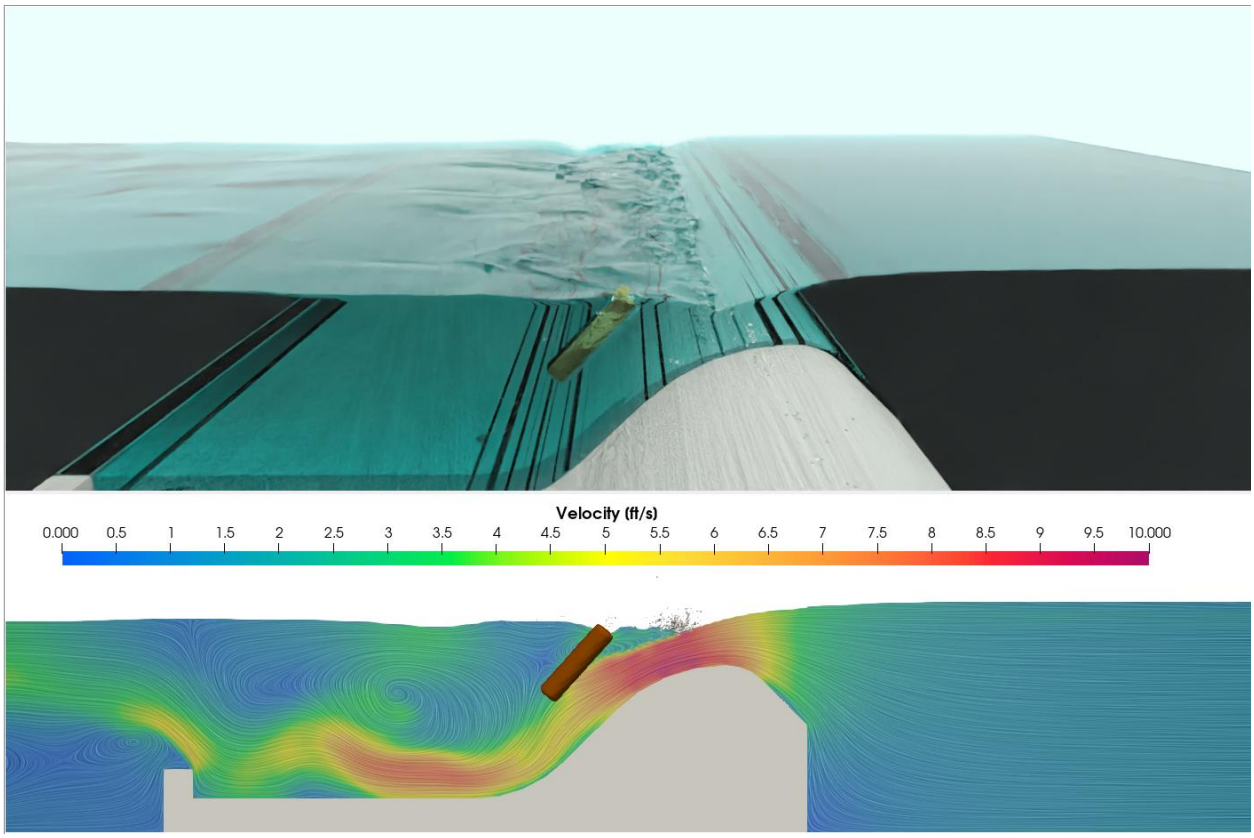



*Figure 30: CFD Roller on Existing Steel Dam at Max Recreation flow.*

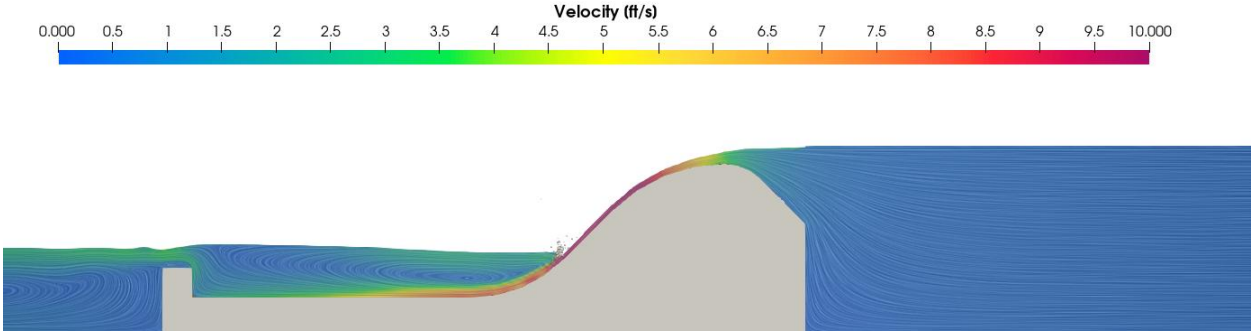



*Figure 31: CFD Roller on Existing Steel Dam at Low Recreation flow.*

## 8. Dam Alternatives

There are a variety of structural alternatives that can be implemented to address the public safety hazards at low-head dams. The alternatives evaluated include full removal, partial removal, and structural modification approaches. Alternatives are evaluated based on their ability to meet project goals, with emphasis on public safety and supporting criteria defined in Section 1. This section summarizes the alternatives considered and provides the basis for comparative evaluation.

Non-structural measures, including signage, public education, and restricted access, can improve awareness but do not eliminate the hydraulic hazard. Alerting the public to the hazard or preventing access to it are common approaches, as well as conducting educational campaigns. On-river safety buoy lines, ropes, ladders and warning systems can also provide safety benefits. These safety features are considered "soft" additions to alert the public to the hazard, but they do not change the safety issues at the dams.

## *8.1 Typical Dam Rehabilitation Options*

IDNR-OWR is exploring options to modify the dams so they do not continue to pose a public safety hazard [REF: Section 1.1 Hazard Definition]. Structural modifications can reduce hazardous hydraulic conditions but do not fully eliminate all risks at dams. The following practices are known options for modification. These common practices were considered during evaluation and selection of alternatives. These structural practices focus on improved hydraulics with roller removal. They do not remove the general hazard of boater or swimmer strikes and general river hazards.

### *8.1.1 Concrete Steps*

Concrete steps are a structural modification to the spillway face that incorporate a series of uniformly spaced vertical drops, typically around one foot vertically and 5 feet horizontally. Concrete steps modify the spillway face to incrementally dissipate energy, reducing hydraulic intensity and improving downstream conditions. Additionally, they offer long-term durability and low maintenance, making them a reliable solution for spillway retrofits.

### *8.1.2 Rock Ramps*

Rock ramps are conducive to nature-based engineering solutions that facilitate gradual water descent over a dam using strategically placed rocks and boulders to simulate a natural streambed. Specific design considerations for nature enhancement should be performed during final design. Rock ramps provide a gradual transition over the structure, reducing energy and supporting fish passage. While rock ramps are considered more cost-effective than structural alternatives, they require a significantly larger footprint due to their extended slope length and could require more long-term costs due to maintenance requirements.

### *8.1.3 Bypass Channels*

Bypass channels are engineered pathways designed to redirect flow around a dam structure, thereby reducing the frequency with which hazardous hydraulic conditions occur at the primary spillway. While they do not completely eliminate the formation of turbulent or high-energy flow zones, they help mitigate these effects by offering an alternative route during dam-flow events. Additionally, nature-like bypass channels can serve as effective fish passage solutions, replicating more natural stream conditions and improving ecological connectivity for aquatic species.

### *8.1.4 Height Reductions*

Height reductions lower the potential energy of the falling water, thereby decreasing the kinetic energy transferred to the river below. A higher vertical drop introduces greater energy into the flow, which intensifies hydraulic forces such as turbulence, scour, and downstream velocities—conditions that can

pose safety risks and structural challenges. By reducing dam height, the energy is reduced, resulting in less aggressive hydraulic behavior and improved safety and stability in the receiving channel.

This concept was tested for Steel Dam in a CFD model simulation. A crest reduction of -2-ft was analyzed to determine if a roller still forms for average recreation flows. As shown in Figure 32 the high velocity jet forms on the ogee crest and remains in place leading to the formation of a roller downstream of the dam. The "keeper" velocities in the roller continue to exceed 4-ft/s. As such, height reductions were not pursued for this study.

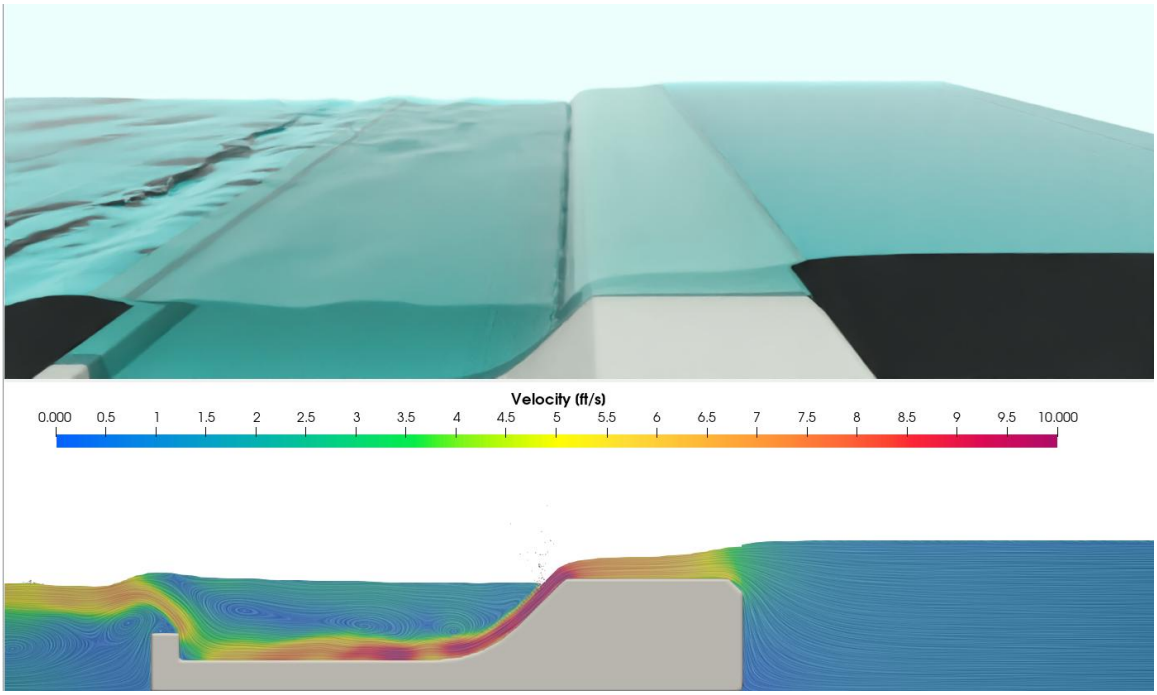



*Figure 32: Steel Dam Crest Reduction of -2-ft at average recreation flows.*

## *8.2 Dam Removal Considerations*

Dam removal eliminates the hydraulic hazard and directly addresses the primary project goal for public safety.

### *8.2.1 Environmental Restoration*

Nationwide, dam removals are playing a critical role in restoring natural river ecosystems. It allows rivers to reestablish their natural hydrology, which supports the recovery of aquatic and riparian habitats. Natural sediment transport processes resume, contributing to the regeneration of downstream features such as wetlands, floodplains, and estuaries. This enhances habitat complexity and promotes biodiversity. Dam removal restores natural flow, sediment transport, and ecological connectivity [REF: Section 3.4 and Section 5].

### *8.2.2 Sediment Management and Ecosystem Recovery*

Sediment implications of dam removal, including passive release and downstream transport, are described in Section 6.

### *8.2.3 Recreational Activities*

Rivers, dams, and the created pools support a wide range of recreational activities. River-based recreation includes canoeing, kayaking, motorboating, pontoon boating, water skiing, tubing, fishing from boats or shore, swimming, wading, paddleboarding, wildlife viewing, birding, shoreline walking, picnicking, and other informal access activities. Some of these uses benefit from the deeper, slower water created by a dam and its impoundment, while others are limited by the dam as a barrier to navigation and river continuity. Transitioning recreational conditions from impoundment-based uses to riverine conditions represents a tradeoff depending on user type. For that reason, the overall recreational impact of dam removal cannot be characterized as objectively positive or negative.

### *8.2.4 Longterm Costs and Maintenance*

Dam removal eliminates long-term structural maintenance (inspections, debris removal, structural repairs, erosion and scour repairs) and associated liability. Longterm costs and associated dam maintenance are factors in this study and will be part of the evaluation consideration.

### *8.3 Studied Alternatives*

Six studied alternatives were included in the feasibility study. They are listed here and discussed in depth with concept-level drawings later in this section.

1. Alternative 1 - Remove Both Dams
2. Alternative 2 - Remove Sears, modify Steel Steps
   *Alternative 2a - Modify Sears Steps, modify Steel Steps*
3. Alternative 3 - Remove Sears, modify Steel Rock Ramp
4. Alternative 4 - Remove Sears, modify Steel Steps, add Riffles
5. Alternative 5 - Remove Sears, modify Steel Steps with Bypass
6. Alternative 6 – No Change to Sears, modify Steel Steps

Potential remediation alternatives were evaluated through a combination of 1D and 2D hydraulic evaluations. The existing conditions 1D and 2D hydraulic models served as the baseline models for development of the proposed alternatives. The 1D HEC-RAS model was used to identify impacts of the proposed alternatives to the upstream pool and determine how far the water surface impacts propagated upstream. The 2D hydraulic model further evaluated impacts to both bed shear and velocity in the vicinity of the dams. The 2D hydraulic model evaluated impacts with dam removals and the channel degraded to the approximate depth of refusal measured in the upstream pool. The DOR terrain was developed by first creating a DOR channel terrain through interpolation of the DOR survey data using the HEC-RAS RASMapper tool. This interpolated channel terrain was used to generate the final DOR surface which extended to the upstream boundary of the 2D hydraulic model.

Sensitivity testing models were performed in HEC-RAS by modeling and comparing four basic options:

(1) Existing conditions with both dams in place,
(2) Removal of Sears Dam with Steel in place,
(3) Removal of Steel Dam with Sears in place, and
(4) Removal of both dams.

The following profiles summarize river impacts for each condition under average recreational (7,900 cfs) flows (Figure 33, Figure 34) and severe low flow condition represented by 7Q10 (1,520 cfs) flows (Figure 35, Figure 36). The figures demonstrate impacts within the South Channel and the North Channel to understand impacts to all adjacent reaches. The profiles show the change (in feet) in water surface elevations between the existing conditions (green line) and the three removal options. Negative numbers indicate the amount of decrease (in feet) below today's water levels with both dams in place. Detailed discussion and hydraulic analysis of each alternative is available in Appendix F.

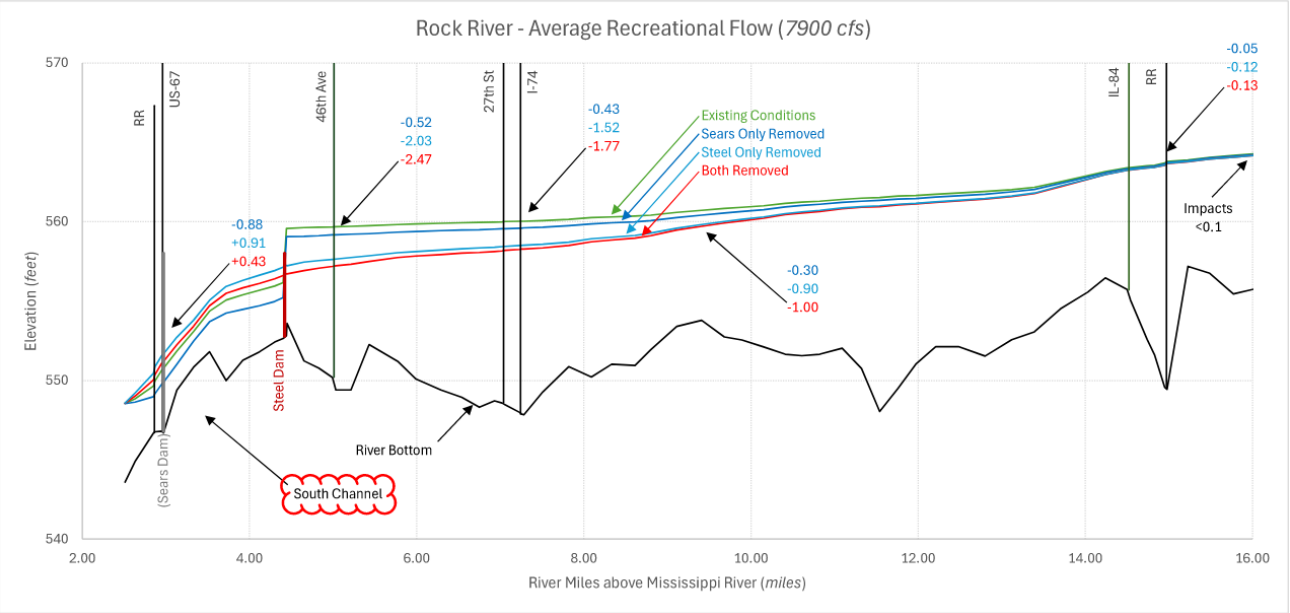



*Figure 33 - River Impacts under Varying Dam Removal Conditions (Rec Flows, South Channel)*

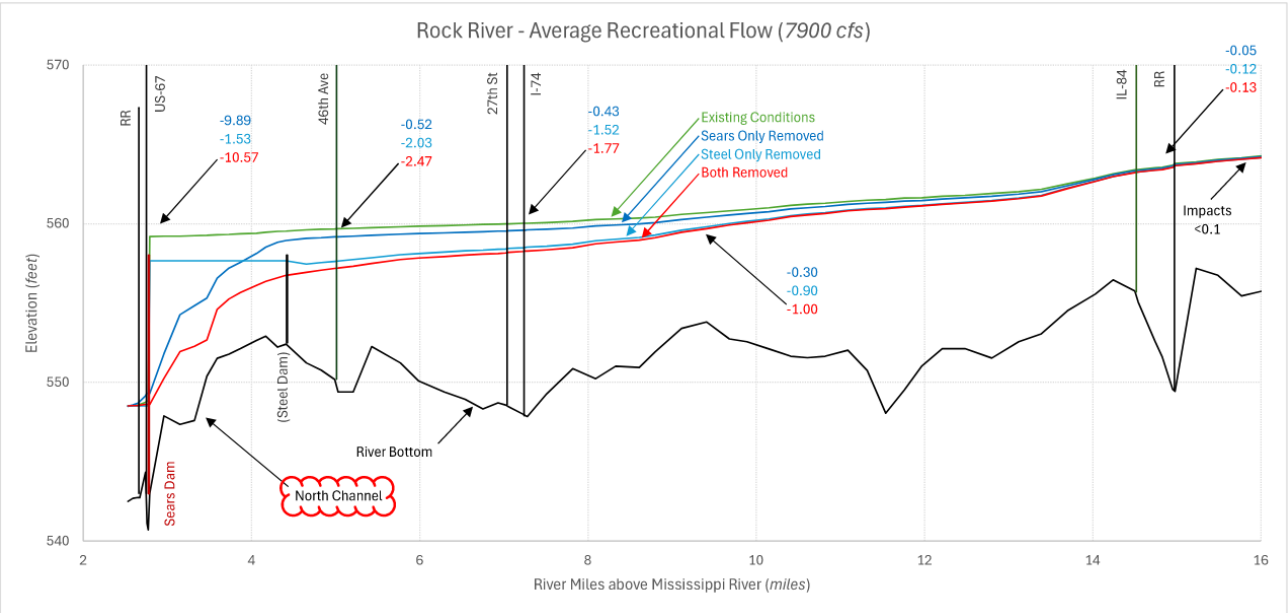



*Figure 34 - River Impacts under Varying Dam Removal Conditions (Rec Flows, North Channel)*

The existing pool is primarily located between Steel Dam and the I-74 bridge. Water level changes are labeled at the major bridge crossings as well as the location where all scenarios are below -1.0-ft of impact. Impacts are most dramatic when flows are low as demonstrated by the low flow profiles in Figure 35 and Figure 36. As flows enter high flow, flood conditions, the impacts become minimal. As expected, the greatest pool impact occurs when both dams are removed. In all cases, the impacts become negligible just upstream of IL-84.

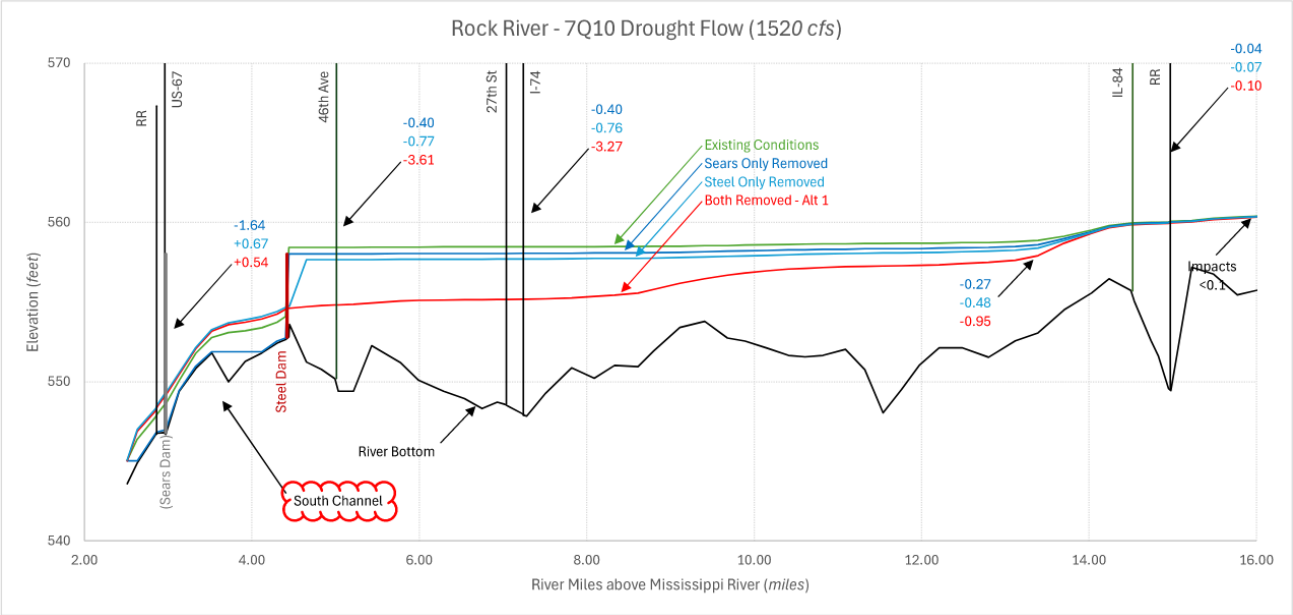



*Figure 35 - River Impacts under Varying Dam Removal Conditions (Low Flows, South Channel)*

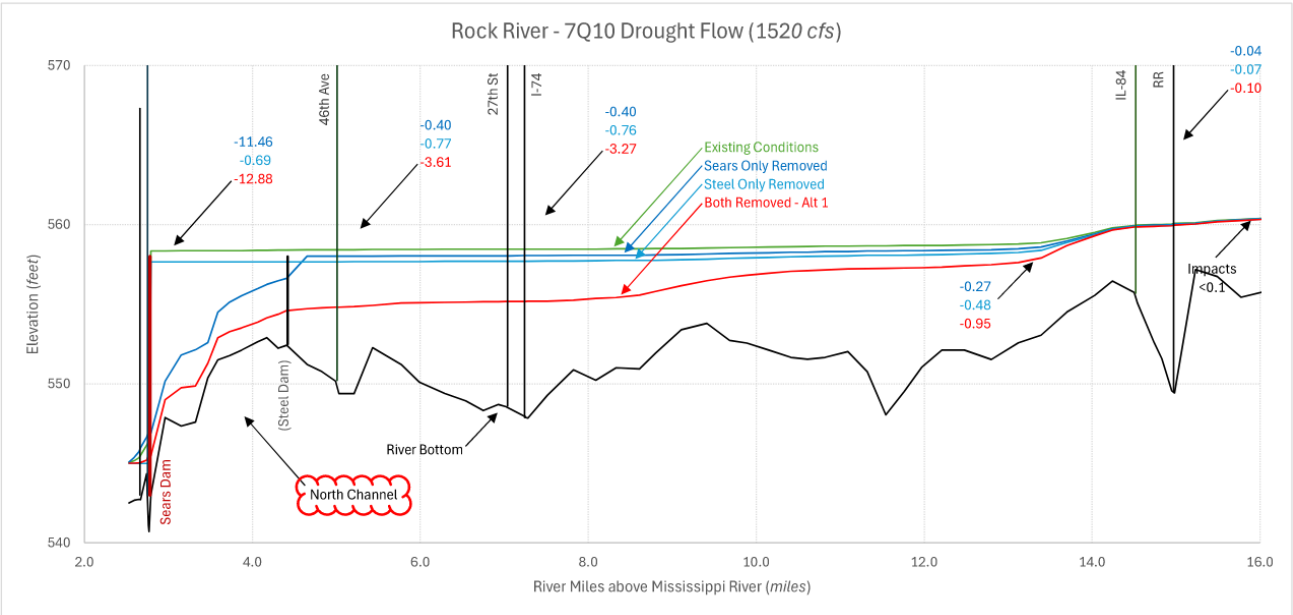



*Figure 36 - River Impacts under Varying Dam Removal Conditions (Low Flows, North Channel)*

Table 9 provides detailed hydraulic model results for multiple recreational flow simulations, as well as the 1% (100-year) flood condition. The change in flow distribution between North and South Channels can be determined from this table as well as corresponding water surface elevation changes. Key findings from the table show that removal of Steel with Sears remaining in place would result in no flow over the Sears Dam for average and low recreational conditions. Under extreme flood conditions (1%/100-year) there is minimal impact to the river flows and elevation with any dam removal scenario. Additionally, the flow distribution between the North Channel and the South Channel for the 1% (100-year) are nearly the same when both dams are removed compared to existing conditions.

*Table 9 - 1D hydraulic model results comparison for Recreation and 1% (100-year) AEP flows*

| | Low Recreation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Alternative | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| Existing | 2,700 | 1,330 | 49 | 1,370 | 51 | 558.57 | 0.00 | 558.7 | 0.00 |
| Both Removed | 2,700 | 374 | 14 | 2,326 | 86 | 546.07 | -12.50 | 555.29 | -3.41 |
| Sears Removed | 2,700 | 2,700 | 100 | - | 0 | 547.7 | -10.87 | 558.02 | -0.68 |
| Steel Removed | 2,700 | - | 0 | 2,700 | 100 | 557.66 | -0.91 | 555.47 | -3.23 |

| | Average Recreation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Alternative | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| Existing | 7,900 | 2,990 | 38 | 4,910 | 62 | 559.19 | 0.00 | 559.62 | 0.00 |
| Both Removed | 7,900 | 1,659 | 21 | 6,241 | 79 | 548.62 | -10.57 | 556.93 | -2.69 |
| Sears Removed | 7,900 | 5,277 | 67 | 2,623 | 33 | 549.3 | -9.89 | 559.08 | -0.54 |
| Steel Removed | 7,900 | - | 0 | 7,900 | 100 | 557.66 | -1.53 | 557.45 | -2.17 |

| | High Recreation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Alternative | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| Existing | 11,500 | 4,051 | 35 | 7,449 | 65 | 559.52 | 0.00 | 560.13 | 0.00 |
| Both Removed | 11,500 | 2,687 | 23 | 8,813 | 77 | 550.01 | -9.51 | 557.73 | -2.40 |
| Sears Removed | 11,500 | 6,460 | 56 | 5,040 | 44 | 550.44 | -9.08 | 559.66 | -0.47 |
| Steel Removed | 11,500 | 525 | 5 | 10,975 | 95 | 558.15 | -1.37 | 558.32 | -1.81 |

| | Maximum Recreation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Alternative | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| Existing | 16,000 | 5,276 | 33 | 10,724 | 67 | 559.84 | 0.00 | 560.69 | 0.00 |
| Both Removed | 16,000 | 4,088 | 26 | 11,912 | 74 | 551.48 | -8.36 | 558.57 | -2.12 |
| Sears Removed | 16,000 | 7,801 | 49 | 8,199 | 51 | 551.76 | -8.08 | 560.27 | -0.42 |
| Steel Removed | 16,000 | 1,841 | 12 | 14,159 | 88 | 558.79 | -1.05 | 559.11 | -1.58 |

| | 1% (100-year) - Unsteady Flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Alternative | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| Existing | 51,900 | 16,058 | 31 | 35,842 | 69 | 561.93 | 0.00 | 564.03 | 0.00 |
| Both Removed | 51,900 | 16,313 | 31 | 35,587 | 69 | 559.77 | -2.16 | 563.32 | -0.71 |
| Sears Removed | 51,900 | 18,180 | 35 | 33,720 | 65 | 559.81 | -2.12 | 563.78 | -0.25 |
| Steel Removed | 51,900 | 14,301 | 28 | 37,599 | 72 | 561.67 | -0.26 | 563.57 | -0.46 |

Note: Negative values indicate that water surface elevations are lower than existing conditions for this and all similar tables.

### *8.3.1 Alt 1 - Remove Both Dams*

#### 8.3.1.1 Alternative Description

Alternative 1 includes removal of both Sears and Steel Dam spillways to restore a free-flowing river system. Removal includes spillways and associated structural elements necessary to reestablish a stable channel.

At the Sears Dam, the abandoned powerhouse structure and its associated approach guide walls and all appurtenances are assumed to remain, in conformance with IDNR-OWR direction. The removal effort is therefore focused on eliminating the hydraulic control structure formed by the spillways while

preserving non-hydraulic historic or structural features that are outside the study scope. Riverbanks at former dam abutments will be reconstructed using a combination of riprap armoring and bioengineering methods, including native vegetation establishment to provide long-term stability.

It is anticipated that sediment management under this alternative is to be controlled through passive release, meaning that sediment accumulated behind both dams will be mobilized and transported downstream through natural hydraulic processes during river drawdown and subsequent flow events. This approach minimizes direct sediment removal but requires careful consideration of downstream impacts and short-term water quality effects.

#### 8.3.1.2 Hydraulics

**1D Hydraulic Modeling**

The removal of both dams results in a significant reduction in upstream water surface elevations, reflecting the elimination of backwater conditions previously maintained by the structures. Modeling results indicate that water surface elevations decrease by approximately 2.12-feet during maximum recreational flows and 3.41-feet during low recreational flow conditions. More substantial localized reductions occur immediately upstream of Sears Dam, where the removal of the spillway eliminates the primary hydraulic control. In these areas, water surface reductions approaching 10.57-feet are observed under average recreational flows, as illustrated in the hydraulic modeling outputs associated with Figure 34. Farther upstream, the magnitude of water surface change gradually diminishes as the influence of the dams decreases. By the upstream boundary of the modeled domain, changes are relatively minor, indicating that the effects of dam removal are most pronounced within the immediate dam reach and below IL-84.

Removal of both dams produces a fundamental shift in hydraulic behavior from a controlled, impounded system to a free-flowing channel. Hydraulic modeling using both 1D and 2D HEC-RAS frameworks indicates a consistent lowering of upstream water surface elevations, increased flow velocities, and redistribution of flow between the North and South Channels around Vandruff Island.

The flow split at Vandruff Island between the North and South Channels is strongly influenced by Steel Dam under existing conditions due to its proximity to North and South Channel flow split and its control of upstream pool elevation. Removal of both dams eliminates this control and allows flow distribution to become a function of channel conveyance capacity. Model results show that at high flow events, including the 10% (10-year) and 1% (100-year) floods, the overall flow split between the North and South Channels remains similar to existing conditions. However, at lower and recreational flows, notable redistribution occurs.

At a maximum recreational flow of approximately 16,000 cfs, the proportion of flow in the North Channel decreases from about 33 percent to 28 percent, with the South Channel conveying a correspondingly greater share. At lower flows, this shift becomes more pronounced, with the South Channel receiving up to 35 percent more discharge relative to existing conditions. This redistribution reflects the removal of the Steel Dam control, which currently elevates water levels upstream and biases flow toward the North Channel.

With removal of both dams, channel velocities increase across much of the study reach due to reduced flow depth and increased hydraulic gradient. The most significant increases occur in areas directly influenced by the former impoundments. 2D hydraulic modeling results, presented in Figure 37 through Figure 39, show localized velocity increases of up to 2-feet per second in the North Channel immediately upstream of the former dam locations. In mid-reach areas, typical increases are on the order of 0.7-ft/s, while upstream boundary conditions show more limited changes, generally around 0.3-ft/s even under larger flow conditions. These velocity increases produce corresponding increases in bed shear stress, enhancing the river's capacity to mobilize and transport sediment (see Appendix F). As a result, sediment that has accumulated under impounded conditions becomes susceptible to erosion and downstream transport.

Below, Table 10 and Table 11 provide the changes in average channel velocities in the North and South Channel for maximum recreational flows (16,000 cfs) with both dams removed. The North Channel experiences the most significant increase in channel velocity with the largest change at the cross-section directly upstream of the dam, which is to be expected.

*Table 10. Removal of Both Dams – North Channel Velocity Change (Max Recreation Flow)*

**North Channel - Velocity Change - Removal of Both Dams**

| | Feet Above Sears Dam | Average Channel Velocity (ft/s) | | Change in Velocity (ft/s) |
|---|---|---|---|---|
| | | Existing | Both Dams Removed | |
| Flow Split | 8606 | 2.01 | 2.55 | 0.54 |
| | 8078 | 1.76 | 2.22 | 0.46 |
| | 7339 | 2.23 | 2.87 | 0.64 |
| | 6758 | 2.63 | 3.56 | 0.93 |
| | 5755 | 1.67 | 2.56 | 0.89 |
| | 5016 | 1.39 | 2.39 | 1.00 |
| | 4277 | 1.84 | 3.96 | 2.12 |
| | 3643 | 1.96 | 5.78 | 3.82 |
| | 2851 | 1.91 | 3.65 | 1.74 |
| | 1954 | 1.97 | 3.86 | 1.89 |
| | 950 | 1.86 | 8.36 | 6.50 |
| | 53 | 1.34 | 1.30 | -0.04 |
| | -53 | 1.45 | 1.13 | -0.32 |
| | -106 | 1.41 | 1.11 | -0.30 |
| | -211 | 1.87 | 1.47 | -0.40 |
| | -581 | 2.37 | 1.85 | -0.52 |
| DS Confluence | -686 | 2.52 | 1.96 | -0.56 |
| | -1003 | 2.16 | 1.68 | -0.48 |
| | -1320 | 1.83 | 1.41 | -0.42 |

*Table 11. Removal of Both Dams – South Channel Velocity Change (Max Recreation Flow)*

**South Channel - Velocity Change - Removal of Both Dams**

| | Feet Above Sears Dam | Average Channel Velocity (ft/s) | | Change in Velocity (ft/s) |
|---|---|---|---|---|
| | | Existing | Both Dams Removed | |
| | 8290 | 2.30 | 2.72 | 0.42 |
| | 7128 | 2.22 | 2.70 | 0.48 |
| | 5333 | 2.19 | 2.82 | 0.63 |
| | 4171 | 2.37 | 3.00 | 0.63 |
| | 3221 | 2.23 | 2.86 | 0.63 |
| | 3010 | 2.15 | 2.81 | 0.66 |
| | 2165 | 2.08 | 2.78 | 0.70 |
| | 1214 | 2.08 | 2.85 | 0.77 |
| Flow Split | 158 | 2.35 | 2.88 | 0.53 |
| | 106 | 2.14 | 2.62 | 0.48 |
| | -106 | 3.13 | 3.26 | 0.13 |
| | -634 | 3.11 | 3.24 | 0.13 |
| | -1584 | 3.02 | 3.16 | 0.14 |
| | -2640 | 3.09 | 3.25 | 0.16 |
| | -3696 | 3.57 | 3.77 | 0.20 |
| | -4752 | 5.07 | 5.29 | 0.22 |
| | -5755 | 4.28 | 4.42 | 0.14 |
| | -6811 | 3.87 | 4.02 | 0.15 |
| | -7656 | 4.98 | 5.28 | 0.30 |
| | -7762 | 4.54 | 4.81 | 0.27 |
| | -8184 | 4.48 | 4.80 | 0.32 |
| | -8290 | 4.64 | 5.02 | 0.38 |
| | -9451 | 2.71 | 2.99 | 0.28 |
| DS Confluence | -10085 | 2.11 | 2.34 | 0.23 |

Note: Positive feet above Sears Dam means distance upstream of the dam and negative values indicate the distance downstream of the dam.

Under Federal Highway Administration (FHWA) recommendations, the 1% (100-yr) design flood is the standard for bridge scour analysis. In the full dam removal scenario, discharge ratios between the North and South Channels remain relatively unchanged for events exceeding the 10-year flood. Therefore, the downstream structures are not expected to experience significant changes in scour parameters.

Changes in velocity and depth resulting from dam removal are expected to influence scour potential at upstream bridges and other infrastructure. At the Milan Beltway crossing, modeling of 1% (100-yr) flows indicates a reduction in flow depth of approximately 0.60-feet with an increase in velocity of 0.29 ft/s, increasing potential for riverbed and bridge pier scour. Further upstream structures such as Old Highway 150 and I-74 are not expected to experience significant immediate hydraulic impacts.

Nevertheless, long-term degradation of sediment within the impounded reach may remove material that historically supported bridge foundations. Removal of material assumed in place during original design could increase the vulnerability of these structures. As such, coordination with bridge owners and evaluation of existing scour countermeasures are recommended as part of final design.

**2D Hydraulic Modeling**

A critical component of Alternative 1 (full removal of both dams) is the release of sediment currently stored upstream of the dams. Hydraulic modeling evaluated both an initial minimum condition (no immediate channel adjustment) and a long-term maximum condition in which the channel degrades to the surveyed depth-of-refusal (DOR) elevations. This captures the full range of potential outcomes and defines the maximum impact.

The 2D hydraulic model was used to provide more refined results for changes in bed shear and velocity due to removal of both the Sears and Steel Dams. Two potential proposed scenarios were analyzed to bracket potential future river conditions due to removal of both dams including: (1) no changes to the channel geometry (anticipated short-term condition) and (2) the upstream channel degraded down to the full depth of refusal measured from field surveys. The terrain for scenario 2 was developed by subtracting the depth of refusal survey information from the existing channel geometry. It should be noted that full depth degradation is not expected but illustrates the worst-case scenario.

Three flow conditions were selected for evaluation in the 2D model to capture a range of scenarios: the 1% (100-year) AEP, the 10% (10-year) AEP, and a 15,500-cfs event (termed Calibration). The 15,500-cfs event was used for model calibration as this was the flow rate during field surveys when water elevations were captured. This flow is approximately equivalent to a maximum recreational flow.

**Scenario 1 – Short-Term**

The flow split fraction between the North and South Channels around Vandruff Island is shown in Table 12. For a flow of 15,500-cfs, the fraction of flow in the North Channel reduces from 33% to 28% from existing to proposed removal. The flow split remains the same between the existing and proposed conditions models for the 10% (10-year) and 1% (100-year) flows. This is in line with results of the 1D hydraulic model which showed more significant changes in the percent of flow to the South Channel for low flows and no change in flow split for the higher flows. This is likely a result of the greater capacity of the South Channel and the proximity of the Steel Dam to the flow split. Under existing conditions, the Steel Dam is directly downstream of the flow split and has a more significant influence on the buildup of the upstream pool that diverts flow through the North Channel. As expected, the influence of the dams diminishes at higher flows.

*Table 12 - Results Comparison - Removal of Both Dams with no Changes to the Channel Geometry*

| Alternative | Calibration Flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| **Existing** | 15,500 | 5,134 | 33 | 10,366 | 67 | 559.91 | 0.00 | 560.64 | 0.00 |
| **Both Removed** | 15,500 | 4,263 | 28 | 11,237 | 72 | 555.43 | -4.48 | 558.60 | -2.04 |

| Alternative | 10-Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| **Existing** | 47,400 | 15,578 | 33 | 31,806 | 67 | 562.30 | 0.00 | 564.42 | 0.00 |
| **Both Removed** | 47,400 | 15,607 | 33 | 31,754 | 67 | 559.35 | -2.95 | 563.44 | -0.98 |

| Alternative | 100-Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| **Existing** | 51,900 | 17,326 | 33 | 34,567 | 67 | 562.65 | 0.00 | 564.96 | 0.00 |
| **Both Removed** | 51,900 | 17,270 | 33 | 34,626 | 67 | 559.90 | -2.75 | 564.03 | -0.93 |

Figure 37 provides the change (delta) in velocity from existing to proposed in the 2D model reach for the 15,500-cfs calibration event. Results of the 2D model show increases of up to 2-ft/s for a large area in the North Channel above Sears Dam and a smaller area directly upstream of Steel Dam. Velocity impacts drop to approximately 0.7-ft/s at the upstream limits of the model domain. There is no significant change in velocity downstream of Steel Dam since the flow split is generally well maintained (a change of 5%) between existing conditions and conditions with both dams removed. Similar impacts were identified at higher flows. Velocities in the North and South Channel have significant scour potential, as shown in Figure 38 for the calibration event and Figure 39 for the 1% (100-year) event. The increase in channel velocities with the proposed dam removal results in commensurate increases in bed shear stress which will influence the transport of impounded bed material downstream. Similar maps depicting the increases in bed shear stress for the proposed dam removal were also developed and available in Appendix F.

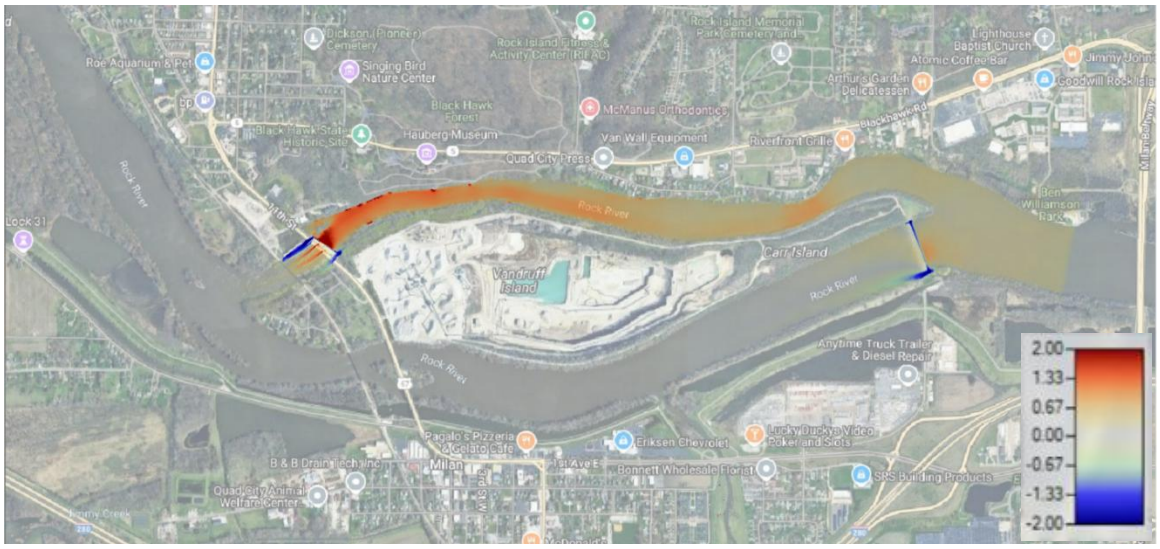



*Figure 37: 15,500-cfs (Calibration/Max Recreation Flow) Change in Velocity-ft/s (Proposed Removal – Existing)*

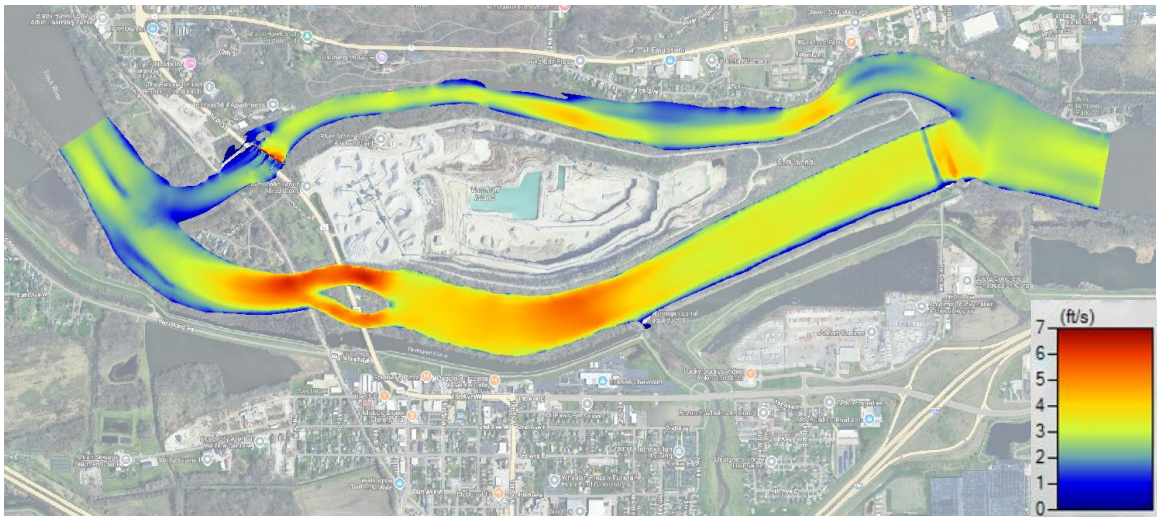



*Figure 38: Proposed Conditions - 15,500-cfs (Calibration/Max Recreation Flow) Velocity-ft/s*

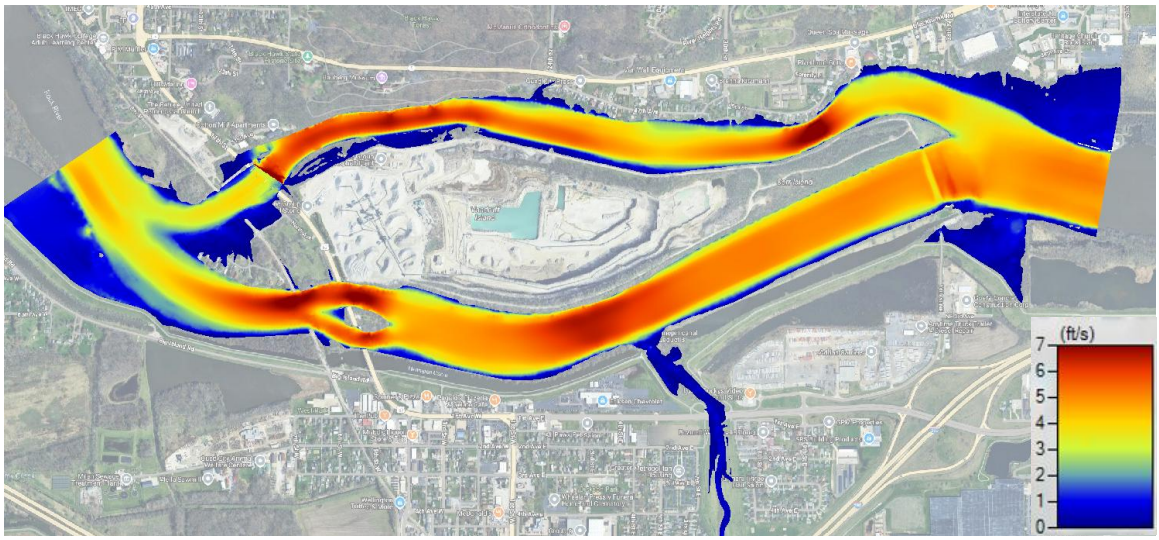



*Figure 39: Proposed Conditions - 100-YR Velocity-ft/s*

**Scenario 2 – Long-Term**

Full removal of the dams with the upstream channel degraded was analyzed to identify potential impacts to the upstream pool elevation and changes in the flow distribution around Vandruff Island under the most extreme degradation condition. Table 13 provides a comparison of discharges and water surface elevations between the existing and proposed conditions with the channel degraded. Results of the model show a significant increase in the percentage of flow through the North Channel compared to existing conditions. The fraction of flow in the North Channel increases from 33% to 40% from existing to proposed removal with the channel degraded for the 15,500-cfs, 10-YR, and 100-YR flows. This increase in flow to the North Channel is due to the greater presence of impounded material in the North Channel upstream of the dam which is prone to movement.

| Alternative | Calibration Flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| **Existing** | 15,500 | 5,134 | 33 | 10,366 | 67 | 559.91 | 0.00 | 560.64 | 0.00 |
| **Both Removed** | 15,500 | 6,275 | 40 | 9,228 | 60 | 551.44 | -8.47 | 557.87 | -2.77 |

| Alternative | 10-Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| **Existing** | 47,400 | 15,578 | 33 | 31,806 | 67 | 562.30 | 0.00 | 564.42 | 0.00 |
| **Both Removed** | 47,400 | 19,129 | 40 | 28,252 | 60 | 559.44 | -2.86 | 562.86 | -1.56 |

| Alternative | 100-Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| **Existing** | 51,900 | 17,326 | 33 | 34,567 | 67 | 562.65 | 0.00 | 564.96 | 0.00 |
| **Both Removed** | 51,900 | 20,954 | 40 | 30,941 | 60 | 559.99 | -2.66 | 563.45 | -1.51 |

*Table 13 - Results Comparison - Removal of Both Dams with Upstream Channel Degraded to the Approximate Depth of Refusal*

Under the degraded conditions, additional lowering of water surface elevations occurs. For example, modeling indicates an additional reduction of approximately 2.77-feet at representative recreational flows, as shown in in Table 13.

Figure 40 shows the depth of refusal depths which correspond to the amount of material removed from the modeled channel terrain. The removal of sediment alters channel hydraulics by increasing conveyance, particularly within the North Channel where significant deposits are present. This may lead to a redistribution of flow over time, with increased discharge routed through the channel that experiences greater degradation. The system is expected to undergo a period of dynamic geomorphic adjustment following removal, including channel incision, bar formation, and realignment of flow paths before stabilizing into a new equilibrium condition.

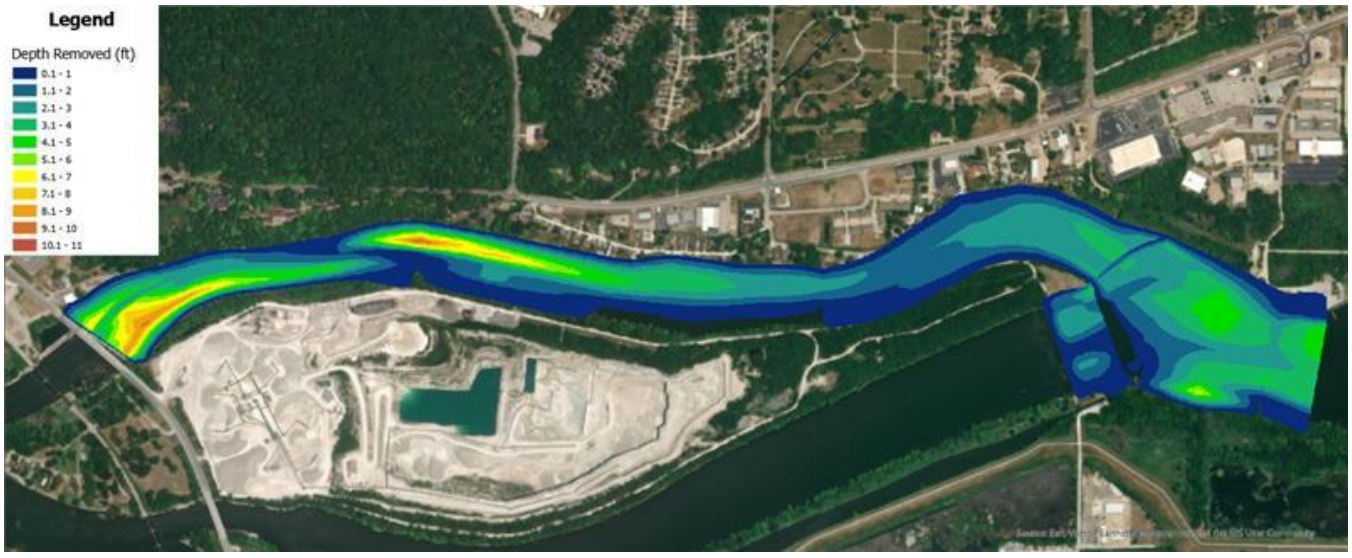



*Figure 40: Depth of Material Removed from Channel Terrain*

### 8.3.1.3 Construction Considerations

Construction of Alternative 1 involves large-scale demolition activities conducted under partially wet conditions. Access to the site is expected to be provided from 14th Street NE, utilizing the existing visitor parking area as a staging location. A temporary bridge spanning the historic lock may be required

to connect staging areas with the upstream causeway and dam site. Additional access points may include the left and right abutments of each dam, as well as public right-of-way along US 67 on the south side of the river, where temporary ramps to the channel may be constructed.

*Drawdown Strategy*
Prior to demolition, the impounded reaches must be dewatered. Two drawdown approaches are considered:

- A **staged drawdown**, which incrementally lowers the water surface and provides greater control over sediment release and bank stability,
- A **rapid drawdown**, which is more efficient but may result in higher turbidity and greater risk of slope instability.

The staged drawdown is recommended for the improved sediment control. Sequencing of drawdown can influence construction efficiency. Lowering the pool at Sears Dam first is expected to improve access to Steel Dam and reduce construction complexity more effectively than reversing the sequence. Concept-level construction drawings are provided in Appendix A with quantities and costs provided in Appendix B.

*Demolition and Material Handling*
Removal of the spillway structures will be conducted using excavators equipped with hydraulic breakers. Concrete debris will be removed from the site, with potential reuse as riprap evaluated where feasible. For purposes of this study, it was assumed that all the concrete will be removed from the site. At the north end of the spillway, contractors will be instructed to use special care to leave the powerhouse approach guide wall undamaged. At the south end of the spillway there are upstream retaining walls that extend downstream and connect to the US 67 bridge approach slope wall. The upstream walls and portions of the downstream walls will be removed to the extent necessary to shape the bank grading back to its natural condition.

*Water Control and Environmental Measures*
Construction will occur under wet conditions potentially requiring localized dewatering and the installation of cofferdams to isolate work areas and prevent backflow from the Mississippi and Rock Rivers. Turbidity increases are expected during both drawdown and demolition. Best management practices, including erosion and sediment control measures and turbidity monitoring, will be implemented to minimize environmental impacts.

*Site Restoration and Additional Considerations*
Following removal, the river channel will naturally adjust to establish a stable grade over time. Banks will be stabilized using riprap and revegetation to prevent bank sloughing.

A unique feature of the Steel dam is a memorial garden dedicated to drowning victims lost at the dam located adjacent to the south abutment. Removal of the abutment and regrading the area will disturb the memorial. We assume the existing memorial will be moved to an appropriate location or that a new memorial will be designed and constructed nearby in cooperation with the families of the victims.

#### 8.3.1.4 River Impacts

The following section summarizes potential impacts and outcomes of the alternative relative to fish passage, river ecology, sediment evacuation and geomorphology, recreational impacts, bank stabilization requirements, and impoundment restoration. This report does not analyze the safety of recreational activities under any alternative due to the inherent risks associated with any river conditions; and it does not include potential economic impacts to local businesses and shoreline residential properties.

The most notable impact of Alternative 1 is the transition from an impounded river system (lentic) to a free-flowing channel (lotic) with reduced pool area. Approximately 2.5-acres of wetlands within 1,000-feet of the dams will be permanently impacted by full dam removal and an additional 22.5-acres potentially impacted upstream. There will be opportunities for wetland creation in final design as well as mitigation bank options. Restoration of the natural sediment transport processes within the Rock River allows impounded sediments to be passively evacuated, with minimal manual excavation required near the structures for demolition. It is estimated that as much as 4.3-million cubic yards of sediment currently stored behind the dams would potentially become mobilized, in time, following dam removal. This volume represents roughly 5- to 10-years of sediment transport capacity for the Rock River but less than one year for the downstream Mississippi River. Hydraulic modeling indicates that the mobilized sediment would be conveyed through both the North and South Channels and would preferentially deposit in low-velocity environments downstream, including side channels, backwaters, floodplains, existing bars, pools, and within the navigational pool upstream of Lock and Dam 16, located approximately 22-river miles downstream of the Rock River confluence. Overall, the anticipated sediment mobilization is substantial but expected to be gradually redistributed downstream in a manner consistent with natural fluvial processes.

Ecologically, removal of both dams would fully reconnect approximately 70-miles of the Rock River, shifting from lentic to lotic fish communities. While short-term sediment release may temporarily elevate turbidity and stress aquatic species, long-term conditions are expected to improve overall river health. Hydraulic modeling indicates that Alternative 1 generally provides conditions favorable for fish passage, with velocities typically below 4.0-ft/s and adequate flow depths, meeting thresholds based on the swimming abilities of key species such as Northern Pike and Lake Sturgeon. Although some localized higher velocities may occur, the presence of low-velocity refuge zones is expected to allow successful passage for most native fish species. This may also facilitate upstream movement of invasive species from the Mississippi River basin into the Rock River system. Movement of species such as Asian carp is not prevented by the dams, but it could expand under fully connected conditions.

With the passive sediment management approach, large pulses of previously impounded sediment may temporarily move through downstream reaches of the Rock and Mississippi Rivers, depositing in main and side channels where they could smother fish eggs, freshwater mussels, and existing habitat features, and increase overbank deposition. Most sediment would move in suspension and ultimately settle in areas already prone to deposition or in downstream impoundments. Mobile species such as fish are expected to be less affected, as they can relocate to newly available upstream habitats, while sessile organisms like mussels may experience short-term burial and turbidity impacts. However, these effects are expected to be temporary, and long-term conditions would improve, with increased mussel abundance and habitat biodiversity following restoration of natural river processes.

Impacts to federally and state-listed threatened and endangered species are expected to be largely beneficial or minimal. Terrestrial species such as Indiana bat and northern long-eared bat are anticipated to experience no impact if tree clearing is timed appropriately. No effects are expected for the eastern prairie fringed orchid due to lack of suitable habitat, though restored hydrology may create future habitat potential. The rusty patched bumblebee may experience minor, temporary disturbance during construction, but impact can be minimized through timing and may ultimately result in net habitat benefits. These findings are preliminary and subject to refinement through permitting and regulatory coordination, with required measures expected to minimize impacts and support long-term ecological gains.

Recreational conditions will shift from flatwater boating to riverine conditions. This will impact adjacent users such as the Backwater Gamblers water ski group with less predictable water-skiing conditions. The Sunset Marina on the Mississippi River will not be impacted. While this eliminates some existing uses, it also enhances opportunities for kayaking and canoeing through a continuous river system. The former impoundment is expected to function as a low-gradient river with generally mild hydraulics, low velocities, and sufficient depths to continue supporting boating, paddling, and angling, with fishing opportunities likely improving due to enhanced fish passage. Land-based recreation would remain supported at existing access points such as Hennepin Canal Parkway Lock #30, Black Hawk State Historic Site, and Ben Williamson Park, with opportunities for enhanced access, trails, and interpretive features. This analysis does not evaluate recreational safety; as with any river system, users assume inherent risks associated with moving water.

Impoundment restoration following dam removal provides an opportunity to stabilize the channel, revegetate newly exposed floodplain areas, and improve degraded habitat. Based on sediment probing, most deposited material upstream of Vandruff Island is less than 4-feet thick, with deeper accumulations in localized depositional areas. Hydraulic modeling indicates the post-removal channel will narrow by approximately 30- to 40-feet, concentrating revegetation efforts along channel margins. It is expected that vegetation will naturally volunteer in these margins. However, select areas slow to revegetate can be assisted with native seeding, woody plantings, or bioengineering methods such as fabric-based stabilization if needed.

Additional habitat enhancements may include installation of large wood, targeted revegetation, invasive species management, gravel augmentation, and selective bank grading. Future stakeholder coordination will need to refine restoration strategies and identify areas for treatment, if needed. Detailed evaluation is also needed to identify locations prone to excessive bank erosion after dam removal. These areas are expected to include reaches where existing bank vegetation is limited, particularly near residential and commercial properties downstream of 27th Street. Tributaries within the impoundment should also be assessed for potential impacts which are expected to be limited to the confluence area. Under typical conditions, water levels in this area are expected to drop by 2- to 4-feet, with modest increases in velocity of about 1 to 2-ft/s. Bioengineering solutions such as a stone toe combined with vegetation or large wood are likely to be effective at stabilizing these banks. The dam removal/modification project is limited to state-owned property and adjacent land required for temporary access and construction activities. Improvements or restoration outside of the immediate project area will need to be coordinated with local stakeholders. Riverbank adjustments are expected to resolve through natural processes.

#### 8.3.1.5 Alt 1 Costs

Because this alternative removes the primary structures requiring ongoing maintenance, long-term maintenance needs are relatively limited. Activities will consist primarily of monitoring channel conditions, bank stability, and vegetation establishment following construction. Construction activities associated with this alternative are expected to be completed within two to three months for each dam removal and restoration.

The planning-level cost estimate for Alternative 1 reflects demolition, site access, restoration, and contingency allowances appropriate for a conceptual design stage is $10.9 M. Detailed cost analysis is provided in Appendix B and a summary of anticipated project costs for all alternatives is included in Table 17.

- Alternate 1: $10.9M

Figure 41 displays the Alternative 1 project concept. For additional details, including construction staging, refer to the full plan set provided in Appendix A.

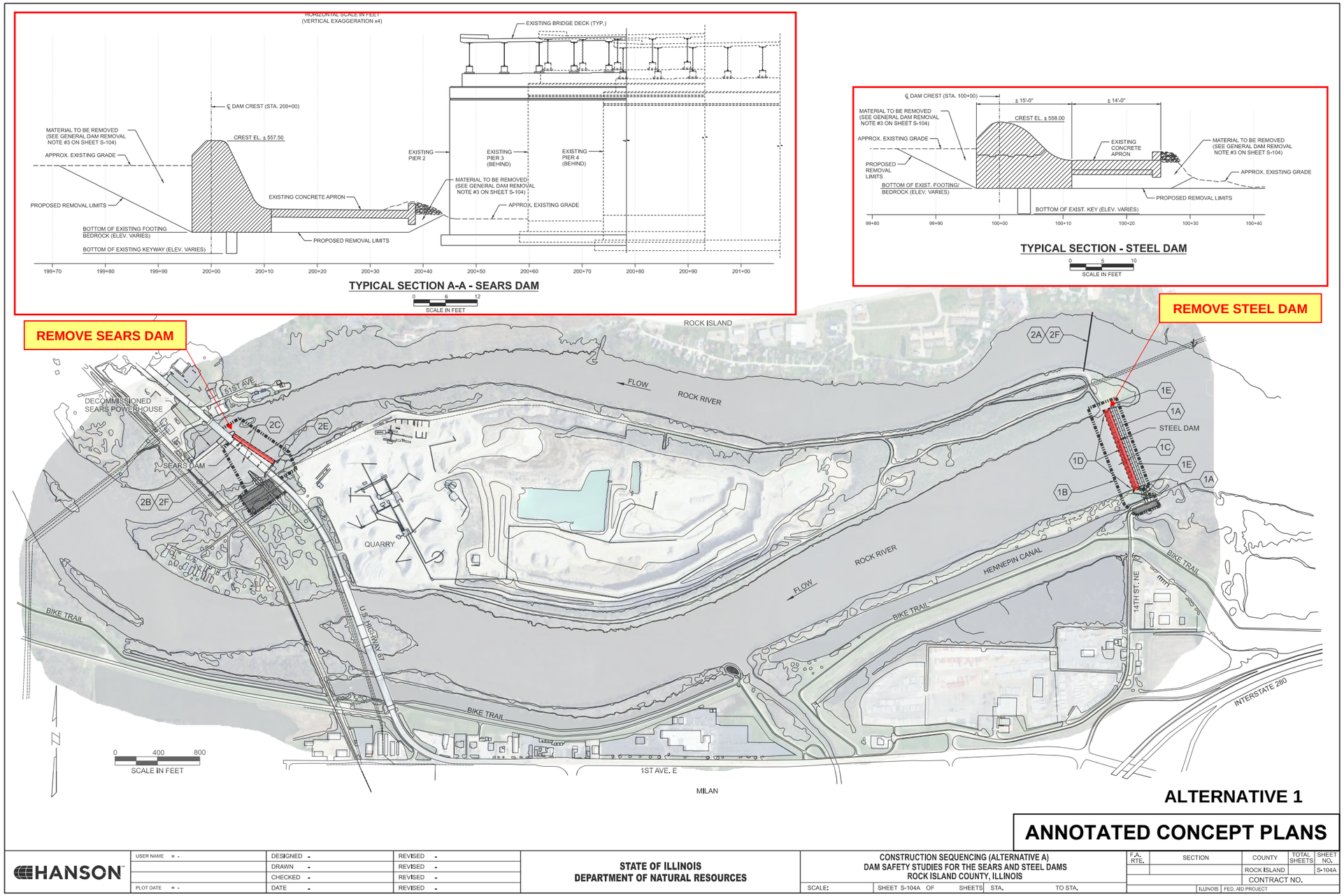



*Figure 41. Alternative 1 Concept Plan*

### *8.3.2 Alt 2 - Remove Sears, modify Steel Steps*

#### 8.3.2.1 Alternative Description

Alternative 2 includes removal of the Sears Dam spillway and modification of Steel Dam using stepped spillway features. Step modifications have been proven to improve safety for run-of-the-river dams. A physical model study was conducted by the University of Illinois at Urbana-Champaign (UIUC) to assess improving spillway safety at Glen D. Palmer Dam at Yorkville, IL on the Fox River (Freeman, 1996). The results of that work were used to modify Glen D. Palmer Dam which was completed by IDNR-OWR in 2010. The UIUC study recommended a stepped slope of 1 to 5 to dissipate the energy on the spillway and eliminate the hydraulic roller on the existing dam. CFD modeling was also used by UIUC to confirm the stepped spillway ratio. Based on this study, the 1 to 5 stepped ratio was used for Steel Dam. The stepped spillway is constructed along the downstream face of the existing Steel Dam, extending from the crest, across the apron, and into the downstream channel. The design involves drilling and grouting reinforcing steel into the existing spillway and apron, with additional anchoring into the underlying bedrock where the stepped structure extends beyond the original foundation. An existing scour hole downstream of the dam is filled and graded with riprap to create a stable transition between the modified structure and the natural riverbed.

The stepped configuration is intended to disrupt the formation of a recirculating hydraulic roller, which is the primary safety concern associated with low-head dams. By breaking the hydraulic drop into a series of smaller steps, energy is dissipated progressively through the water column instead of being concentrated at the base of the dam.

Removal of Sears Dam and retention of Steel Dam results in a system that partially restores river function while maintaining a significant portion of the upstream impoundment. As such, Alternative 2 represents a hybrid condition, balancing safety improvements, ecological benefits, and preservation of existing recreational resources.

#### 8.3.2.2 Hydraulics

**CFD Hydraulic Modeling**

Remediation of Steel Dam with a series of reinforced concrete steps was analyzed in a CFD analysis to evaluate and visualize the breakup of the roller and conditions downstream of the dam. As shown Figure 42, the hydraulic roller does not form downstream of the stepped spillway in the CFD model. High velocities are redirected towards the surface of the water column away from the dam and no longer recirculate back towards the dam. High velocities over the crest of the dam are maintained and there is significant flow turbulence as hydrodynamic flow energy is dissipated closer to the surface of the water, resulting in some residual risk to recreationists.

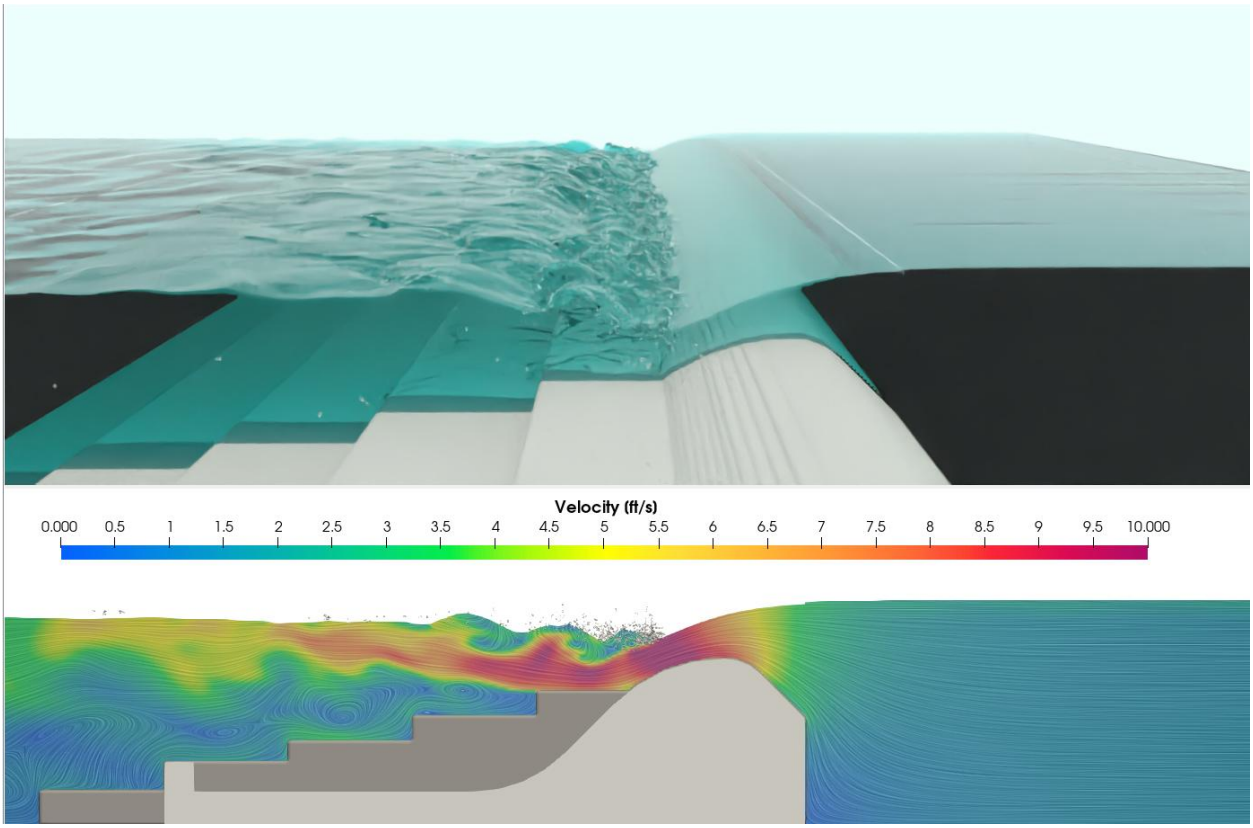



*Figure 42: Steel Dam Remediated with Steps at Max Recreation Flows.*

The CFD analysis for this feasibility report was cursory and provides a proof-of-concept that adding spillway steps for Steel Dam is an effective safety improvement by reducing or eliminating the dangerous hydraulic roller. For future design considerations, a more refined CFD analysis is required to better capture the following:

1. Confirm elimination of roller activity for the full range of flows across the full width of dam.
2. Extend modeling downstream of the remediation to define scour protection needs.
3. Ensure that dangerous conditions are not generated in the existing scour pool downstream of the dam and that the proposed rehabilitation adequately armors/repairs the scour pool.
4. Refine and calibrate the weir discharge coefficient for use in the 1D and 2D hydraulic models. The refined weir discharge coefficient across the full range of flows will improve estimates of changes to the flow split, upstream pool elevations, and changes in bed velocity and shear.
5. Incorporate air entrainment into the CFD analysis for more accurate determinations of flow density, flow bulking, and energy dissipation for the preferred alternative.
6. Optimizing mesh spacing in the model domain to improve computation accuracy and time.
7. Extend the limits of the CFD domain to capture influence of hydraulic features downstream of the dam.
8. Analyze large woody debris impacts to the proposed structure.

### 1D and 2D Hydraulic Modeling

1D and 2D modeling were also performed to understand resultant flow distribution changes between the North and South Channels and to help identify other potential river impacts. At high flood flows (above

10% (10-year) AEP) removing Sears Dam with Steel remaining in place demonstrates an increase of only 4% in the North Channel (without Sears Dam) percentage of total flows. The North Channel experiences more significant increases in the percent of flow for recreational events receiving approximately 16% more at maximum recreation flows, 33% for average recreation flows, and 51% more of the total for low recreation flows. This also results in **no flow** over Steel Dam for low recreation flow and drought flow events, effectively eliminating discharge through the South Channel. The reduction in South Channel flow has implications for both sediment transport and ecological connectivity in that reach.

The river's hydraulic response to Alternative 2 is governed primarily by the continued presence of Steel Dam, which remains the dominant control structure for upstream water surface elevations. Removal of Sears Dam reduces headloss through the North Channel, but the Steel Dam maintains much of the upstream pool. Hydraulic modeling indicates that removal of Sears Dam produces a modest reduction in upstream water surface elevation due to the nearly two miles of channel between the dam and the primary pool location. Pool reduction is approximately 0.42-feet under maximum recreational flow conditions, 0.54-feet under average recreational and 0.68-feet under low flow conditions. This modest reduction contrasts sharply with Alternative 1, where pool reductions exceed 2-feet and extend further upstream.

Within the North Channel, localized increases are more substantial due to concentration of flow in a smaller effective cross-sectional area following the redistribution of discharge. These increased velocities contribute to enhanced sediment transport capacity and potential channel adjustment. In contrast, the South Channel experiences reduced velocities as discharge decreases. At low flows, with low tailwater conditions on the Mississippi River, there is potential for the South Channel to become significantly dewatered.

Table 14 and Table 15 provide the changes in average channel velocities in the North and South Channels for maximum recreational flows with only Sears Dam removed. This promotes an increase in discharge in the North Channel along with a reduction in the flow depth upstream of the demolished dam resulting in increased channel velocities. The existing channel upstream of the North and South Channel flow split sees an increase in velocity of only 0.12-ft/s during maximum recreational flows.

*Table 14. Removal of Sears Dam – North Channel Velocity Change (Max Recreation Flow)*

**North Channel - Velocity Change - Removal of Sears Dam**

| | Feet Above Sears Dam | Average Channel Velocity (ft/s) | | Change in Velocity (ft/s) |
|---|---|---|---|---|
| | | Existing | Sears Dam Removed | |
| Flow Split | 8606 | 2.01 | 3.27 | 1.26 |
| | 8078 | 1.76 | 2.89 | 1.13 |
| | 7339 | 2.23 | 3.82 | 1.59 |
| | 6758 | 2.63 | 4.79 | 2.16 |
| | 5755 | 1.67 | 3.34 | 1.67 |
| | 5016 | 1.39 | 2.99 | 1.60 |
| | 4277 | 1.84 | 4.47 | 2.63 |
| | 3643 | 1.96 | 6.06 | 4.10 |
| | 2851 | 1.91 | 5.08 | 3.17 |
| | 1954 | 1.97 | 5.23 | 3.26 |
| | 950 | 1.86 | 10.08 | 8.22 |
| | 53 | 1.34 | 2.37 | 1.03 |
| | -53 | 1.45 | 2.09 | 0.64 |
| | -106 | 1.41 | 2.04 | 0.63 |
| | -211 | 1.87 | 2.68 | 0.81 |
| | -581 | 2.37 | 3.46 | 1.09 |
| DS Confluence | -686 | 2.52 | 3.71 | 1.19 |
| | -1003 | 2.16 | 3.20 | 1.04 |
| | -1320 | 1.83 | 2.71 | 0.88 |

*Table 15. Removal of Sears Dam – South Channel Velocity Change (Max Recreation Flow)*

**South Channel - Velocity Change - Removal of Sears Dam**

| | Feet Above Sears Dam | Average Channel Velocity (ft/s) | | Change in Velocity (ft/s) |
|---|---|---|---|---|
| | | Existing | Sears Dam Removed | |
| | 8290 | 2.30 | 2.38 | 0.08 |
| | 7128 | 2.22 | 2.31 | 0.09 |
| | 5333 | 2.19 | 2.30 | 0.11 |
| | 4171 | 2.37 | 2.48 | 0.11 |
| | 3221 | 2.23 | 2.34 | 0.11 |
| | 3010 | 2.15 | 2.26 | 0.11 |
| | 2165 | 2.08 | 2.20 | 0.12 |
| | 1214 | 2.08 | 2.20 | 0.12 |
| Flow Split | 158 | 2.35 | 1.92 | -0.43 |
| | 106 | 2.14 | 1.74 | -0.40 |
| | -106 | 3.13 | 2.84 | -0.29 |
| | -634 | 3.11 | 2.81 | -0.30 |
| | -1584 | 3.02 | 2.67 | -0.35 |
| | -2640 | 3.09 | 2.73 | -0.36 |
| | -3696 | 3.57 | 3.10 | -0.47 |
| | -4752 | 5.07 | 4.53 | -0.54 |
| | -5755 | 4.28 | 3.93 | -0.35 |
| | -6811 | 3.87 | 3.49 | -0.38 |
| | -7656 | 4.98 | 4.24 | -0.74 |
| | -7762 | 4.54 | 3.86 | -0.68 |
| | -8184 | 4.48 | 3.67 | -0.81 |
| | -8290 | 4.64 | 3.73 | -0.91 |
| | -9451 | 2.71 | 2.10 | -0.61 |
| DS Confluence | -10085 | 2.11 | 1.61 | -0.50 |

Note: Positive feet above Sears Dam means distance upstream of the dam and negative values indicate the distance downstream of the dam.

Removal of Sears Dam initiates the mobilization of sediment stored within the North Channel. Increased velocities and a steeper hydraulic gradient promote erosion of this material, potentially resulting in channel degradation down to the underlying depth-of-refusal elevation. Hydraulic modeling was extended in the 1D hydraulics model to evaluate long-term degradation effects, with results summarized in Table 16. Under degraded conditions, the conveyance capacity of the North Channel increases significantly, further reducing the amount of flow passing over Steel Dam. At low flow conditions, the 1D hydraulics model predicts no flow over Steel Dam, while at average recreational flows, discharge across the structure is reduced to approximately 6-percent of total flow, compared to approximately 33-percent under non-degraded conditions. This reduction in discharge lowers the upstream pool further. Relative to existing conditions, total pool reductions increase to approximately 1.21-feet at average recreational flows and 1.06-feet at higher recreational flows when full degradation is considered. The influence of degradation extends significantly upstream, with diminishing water surface changes approximately 12 miles upstream of the dam, indicating that long-term geomorphic adjustment has potentially system-wide effects.

*Table 16 - 1D hydraulic model results comparison for Recreation Flows with Sears removed and degradation to DOR*

| Alternative | Low Recreation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| Existing | 2,700 | 1,330 | 49 | 1,370 | 51 | 558.57 | 0.00 | 558.70 | 0.00 |
| Sears Removed | 2,700 | 2,700 | 100 | - | 0 | 547.70 | -10.87 | 558.02 | -0.68 |
| Sears Removed (Degraded to DOR) | 2,700 | 2,700 | 100 | - | 0 | 547.70 | -10.87 | 558.02 | -0.68 |

| Alternative | Average Recreation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| Existing | 7,900 | 2,990 | 38 | 4,910 | 62 | 559.19 | 0.00 | 559.62 | 0.00 |
| Sears Removed | 7,900 | 5,277 | 67 | 2,623 | 33 | 549.30 | -9.89 | 559.08 | -0.54 |
| Sears Removed (Degraded to DOR) | 7,900 | 7,443 | 94 | 457 | 6 | 549.86 | -9.33 | 558.41 | -1.21 |

| Alternative | Higher Recreation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| Existing | 11,500 | 4,051 | 35 | 7,449 | 65 | 559.52 | 0.00 | 560.13 | 0.00 |
| Sears Removed | 11,500 | 6,460 | 56 | 5,040 | 44 | 550.44 | -9.08 | 559.66 | -0.47 |
| Sears Removed (Degraded to DOR) | 11,500 | 9,077 | 79 | 2,423 | 21 | 550.89 | -8.63 | 559.07 | -1.06 |

| Alternative | High Recreation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Flow (cfs) | Sears Flow (cfs) | Sears % of total | Steel Flow (cfs) | Steel % of total | WSEL Upstream of Sears (ft) | WSEL (Upstream of Sears) Reduction Alternative - Existing | WSEL Upstream of Flow Split (ft) | WSEL (Upstream of Flow Split) Reduction Alternative - Existing |
| Existing | 16,000 | 5,276 | 33 | 10,724 | 67 | 559.84 | 0.00 | 560.69 | 0.00 |
| Sears Removed | 16,000 | 7,801 | 49 | 8,199 | 51 | 551.76 | -8.08 | 560.27 | -0.42 |
| Sears Removed (Degraded to DOR) | 16,000 | 10,827 | 68 | 5,173 | 32 | 552.13 | -7.71 | 559.72 | -0.97 |

In addition to these immediate hydraulic changes, long-term degradation may remove sediment that currently contributes to foundation stability. Bridge structures located within the former impounded reach, including crossings at 11th Street, Milan Beltway, 27th Street, Highway 6, and Illinois Route 84, should be evaluated to confirm that existing scour protection measures are adequate under future conditions.

### 8.3.2.3 Construction Considerations

Construction of Alternative 2 involves two primary phases: removal of Sears Dam and modification of Steel Dam. Removal of Sears Dam is generally consistent with the approach described for Alternative 1, including drawdown, demolition using hydraulic equipment, and channel restoration. Modification of Steel Dam requires construction of the stepped spillway, including installation of reinforced concrete elements anchored into the existing structure and bedrock. A causeway is assumed to be constructed upstream of the spillway to facilitate access, with indications that remnants of a previous causeway from dam spillway rehabilitation in the 1980s may be present and can be modified to meet project needs.

Construction is expected to occur largely under wet conditions, though localized dewatering and cofferdams may be required to isolate work areas and ensure quality installation. Sequencing considerations are particularly important, as the Steel Dam continues to control upstream water levels throughout construction.

### 8.3.2.4 River Impacts

Alternative 2 significantly improves river safety by eliminating the hazardous conditions at Sears Dam and significantly reducing the hydraulic hazard at Steel Dam. The potential elimination of the recirculating roller addresses the primary safety concern; however, the structure continues to present residual risks associated with turbulence and high velocities.

With Steel Dam remaining and Sears Dam removed, most flow would shift to the North Channel—reversing current conditions where the South Channel carries the majority of river flows. This shift is

most pronounced at low flows and decreases as flows increase. The South Channel would receive no flow below ~5,500-cfs and exceed 1-foot depth only above ~8,000-cfs. Under median spring flow, the North Channel would have velocities of 3–7 ft/s with depths of 4–6 ft. In contrast, the South Channel would have reduced depths of 1–2 ft, lower velocities (<1 to 2.5 ft/s), and more variable conditions. Compared to Alternative 1, upstream changes would be smaller: water surface elevations would be 0–1.5-ft lower, with velocities of 1.8–3 ft/s, about 0–0.5 ft/s higher than existing.

Ecologically, removal of Sears Dam improves connectivity within the North Channel and enhances fish passage. However, the continued presence of Steel Dam limits full restoration of longitudinal connectivity, particularly in the South Channel, where reduced flows may impede movement under certain conditions. Changes in flow distribution would further limit passage. In the North Channel, typical velocities of 4–7 ft/s exceed the swimming capacity of Northern Pike and Lake Sturgeon, though channel margins may offer limited resting or passage areas.

Following removal of one dam, long-term gains for native freshwater mussels are expected to be limited. While restoring and reconnecting habitat may increase abundance and diversity, the remaining impoundment upstream of Steel Dam will likely continue to provide poor habitat. Because mussels are largely immobile, most individuals are unlikely to colonize newly restored areas. In the short term, they may be affected by burial in depositional zones and increased turbidity from sediment transport. More mobile aquatic macroinvertebrates can already pass low-head dams and likely occur on both sides, so removal may not significantly change community composition, though it could increase habitat diversity.

Sediment transport and impoundment evacuation would generally mirror the volumes, rates, and outcomes within the North Channel as described for Alternative 1. Increased flow energy in the North Channel would also enhance sediment transport within impounded areas along the north side of the river. However, sediments immediately upstream of Steel Dam may persist after modifications, and this reach would likely remain depositional over time. The total volume of sediment transport would be reduced.

Removing Sears Dam would improve connectivity and benefit state-endangered fish by eliminating a passage barrier. For terrestrial species, no effects are expected for Indiana bat, northern long-eared bat (with no tree clearing), or eastern prairie fringed orchid due to lack of suitable habitat. Retaining Steel Dam may limit restoration of natural water fluctuations needed for orchid habitat. The rusty patched bumblebee may experience temporary, localized impacts from bank disturbance, with limited overlap with nesting areas. With construction timing and pollinator-friendly restoration (e.g., native seed mixes, extended bloom, invasive control), impacts are expected to be minor and likely net positive, though smaller in extent than under Alternative 1.

Recreationally, the alternative preserves the majority of the upstream pool, maintaining flatwater boating conditions while allowing improved passage for paddlers through the North Channel. The South Channel would only support use during higher flows with sufficient depth. Increased flow and velocities in the North Channel would favor a shift from flatwater to swift-water activities. Upstream of Vandruff Island, angling opportunities would likely improve due to better fish passage.

Alternative 2 would result in minimal changes to the limits of the upstream impoundment and river hydraulics. In the North Channel, banks susceptible to erosion would need to be stabilized to protect against the increased hydraulic forces and increased water levels that channel would experience relative to the full dam removal option. Because the impoundment upstream of Vandruff Island will experience only minor changes to river widths, opportunities for revegetation or habitat restoration are minimal.

#### 8.3.2.5 Alt 2 Costs

By preserving Steel Dam in Alternative 2, residual annual maintenance costs remain, but at a lower level than existing conditions with two dams. Dam maintenance requires engineering inspections, safety reviews, concrete repairs, removal of woody debris and trash, mowing and controlling trees and invasive species. These residual costs typically range from $10,000 to $100,000 per year depending on conditions. For the purposes of this study, an average annual maintenance cost of $50,000 was applied.

Converting the $50,000 average annual costs to present worth value with a 4% average interest rate and 50-year project life correlates to $1,074,000. The construction cost for Sears Dam removal ($5.6M) and Steel Dam rehabilitation with steps ($10.3M) is $15.9M. Adding the maintenance costs for Steel Dam produces a total cost of:

- Alternate 2: $17.0M

Figure 43 displays the Alternative 2 project concept.

#### 8.3.2.6 Alt 2A

It should be noted that the (Alt 2A) concept of adding steps at Sears Dam to eliminate the roller was also explored but excluded due to high costs. The location of the US-67 bridge immediately adjacent to the dam raises hydraulic and structural concerns with this concept. Extending the spillway via steps would block a significant portion of the bridge opening and could adversely impact the flood conveyance capacity at critical flood events. Extending steps through the bridge also conflicts with the existing piers and structural support of the bridge. Structural remediation would be required for the bridge, or alternatively, the bridge would need to be relocated away from the dam conflict. The minimum added costs for bridge modification are estimated at $1.2 million and full relocation would be at least $14.4 million. These costs are in addition to the dam modification (stepped spillway) costs at Sears of $14.1 million. As such, this concept was deemed cost prohibitive and not explored further. Total Sears Dam costs range from $15,350,000 to $28,550,000, plus $10,280,000 for the stepped spillway at Steel, creates a total alternative project cost of $25.6 to $38.8 million.

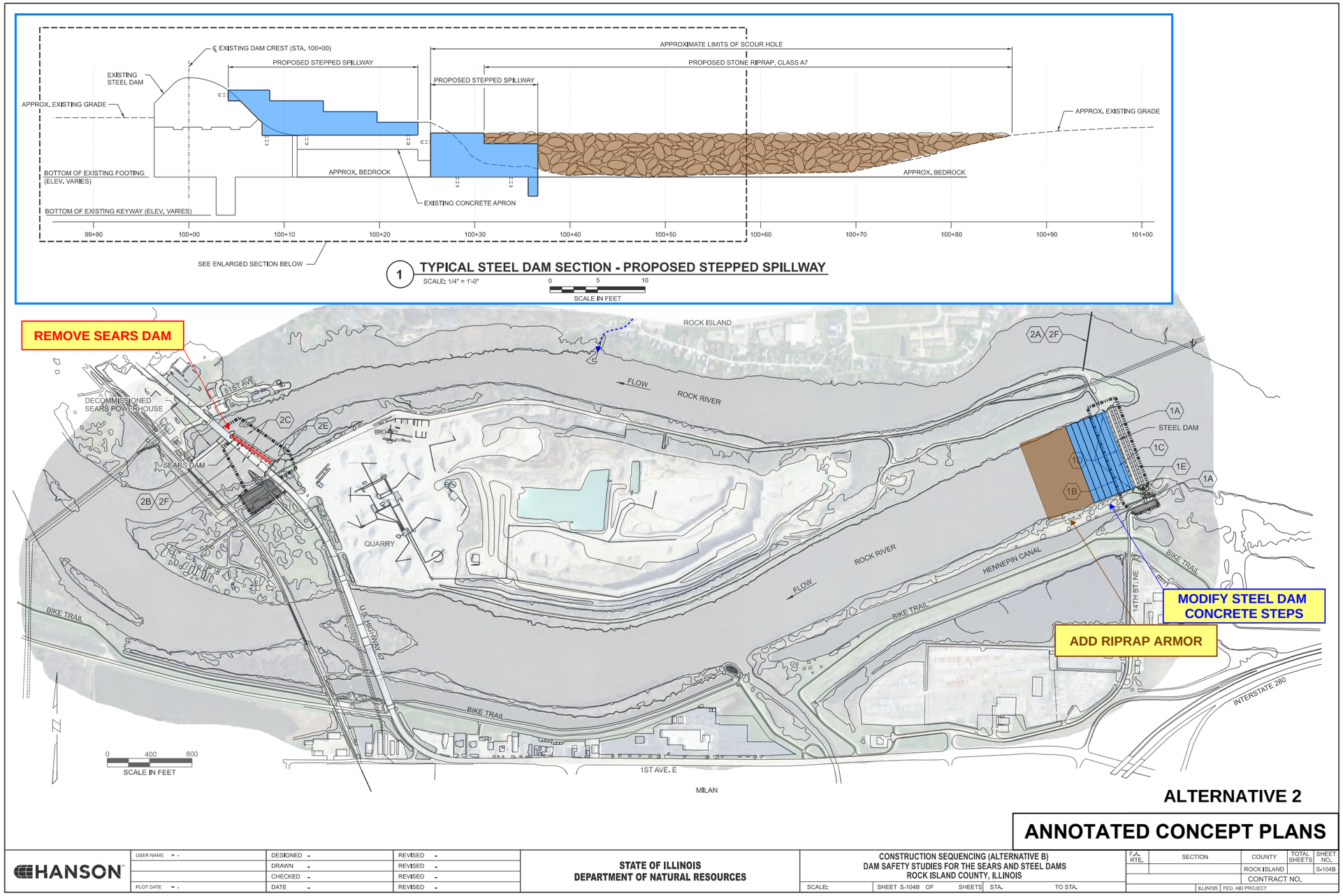



*Figure 43. Alternative 2 Concept Plan*

### *8.3.3 Alt 3 - Remove Sears, modify Steel Rock Ramp*

#### 8.3.3.1 Alternative Description

Alternative 3 consists of the complete removal of Sears Dam coupled with modification of the Steel Dam through construction of a rock ramp spillway extending along the downstream face of the existing structure. The objective of this alternative is to achieve the same fundamental safety improvement as Alternative 2—elimination of the hydraulic roller—while utilizing a more naturalized, geomorphic-based design approach.

The proposed rock ramp is constructed by placing a layer of grouted riprap directly on the existing spillway and apron, anchored to the structure to resist hydraulic forces. Downstream of this grouted section, the ramp transitions into ungrouted riprap placed to fill the existing scour hole and extend into the downstream channel at an approximate slope of 4 percent (1 vertical to 25 horizontal). This creates a continuous transition from the dam crest to the natural riverbed and distributes energy dissipation over a longer distance.

#### 8.3.3.2 Hydraulics

Although Alternatives 2 and 3 achieve the primary objective of eliminating the hydraulic roller, they do so through different mechanisms. The stepped spillway dissipates energy through a series of discrete drops, whereas the rock ramp relies on continuous roughness and slope. These differences do not significantly influence upstream water surface elevations or flow distribution.

The hydraulics essentially mirror those for Alternative 2, see 8.3.2.2 for more information.

#### 8.3.3.3 Construction Considerations

Construction of Alternative 3 includes removal of Sears Dam, followed by installation of the rock ramp at Steel Dam. Removal operations are similar to those described for Alternatives 1 and 2, including drawdown, demolition, and channel restoration. Installation of the rock ramp requires placement of large riprap material over a relatively extensive footprint downstream of the dam. The grouted section near the crest must be carefully constructed to ensure proper anchoring and bonding to the existing structure. Downstream portions involve bulk placement and grading of rock to achieve the specified slope and profile.

Because the ramp extends downstream beyond the existing apron, construction requires additional material quantities and a larger working footprint compared to the stepped spillway option. Access may be provided via temporary causeways, staging areas, or barge operations, depending on site constraints. Construction is expected to occur under partially wet conditions, with localized dewatering or cofferdams used as necessary to facilitate installation of the grouted section.

#### 8.3.3.4 River Impacts

The river impacts associated with Alternative 3 are largely consistent with those of Alternative 2. Removal of Sears Dam improves connectivity within the North Channel and initiates sediment transport processes that move the system toward a more natural state. The rock ramp reduces the immediate hazard associated with the hydraulic roller; however, the presence of a constructed structure and

potential long-term degradation introduces residual safety concerns. The river remains partially controlled, and hydraulic conditions may vary over time depending on the condition of the ramp.

From an ecological perspective, the rock ramp may provide slightly improved habitat complexity relative to a concrete structure due to its rough, irregular surface. However, this benefit is dependent on design and maintenance, and the overall ecological outcome remains constrained by the presence of the Steel Dam.

The long-term performance of the rock ramp is the defining differentiator for Alternative 3 when compared to Alternative 2. Although initial hydraulic performance is comparable, the durability of the rock ramp introduces additional uncertainties. The grouted rock layer near the crest is subjected to continuous high-velocity flow and impact forces from transported debris. Over time, these forces can degrade the grout matrix, loosen rock, and create localized areas of instability. Once degradation begins, the affected areas may experience increased turbulence, which accelerates further erosion and structural breakdown. Debris accumulation presents an additional concern. Large woody debris or manmade materials can become lodged within the rock matrix, creating obstructions that alter local flow patterns and increase turbulence. These localized effects may result in concentrated forces that promote additional degradation.

If the rock ramp deteriorates to the point that underlying portions of the Steel Dam spillway become exposed, the hydraulic behavior of the structure may revert toward a more classical low-head dam profile. In such a scenario, the potential for formation of hazardous recirculating flow would increase, undermining the primary safety objective of the modification. For these reasons, Alternative 3 requires a comprehensive and ongoing maintenance program.

#### 8.3.3.5 Alt 3 Costs

Similar to Alternative 2, residual annual maintenance costs remain, but at a higher level than Alternative 2. As such, the estimated annual maintenance cost is $75,000 in anticipation of more frequent inspections and repairs. Inspections are recommended on at least an annual basis and following significant flow events to assess the condition of the ramp, identify areas of displacement or erosion, and address debris accumulation. Additional maintenance actions may include replacement of rock, re-grouting, and stabilization of affected areas.

Converting the $75,000 average annual costs to a present worth value with a 4% average interest rate and 50-year project life correlates to $1,611,000. The construction cost for Sears Dam removal ($5.6M) and Steel Dam rehabilitation with rock ramp ($5.6M) is $11.2M. Adding the maintenance costs for Steel Dam produces a total cost of:

- Alternate 3: $12.9M

Figure 44 displays the Alternative 3 project concept.

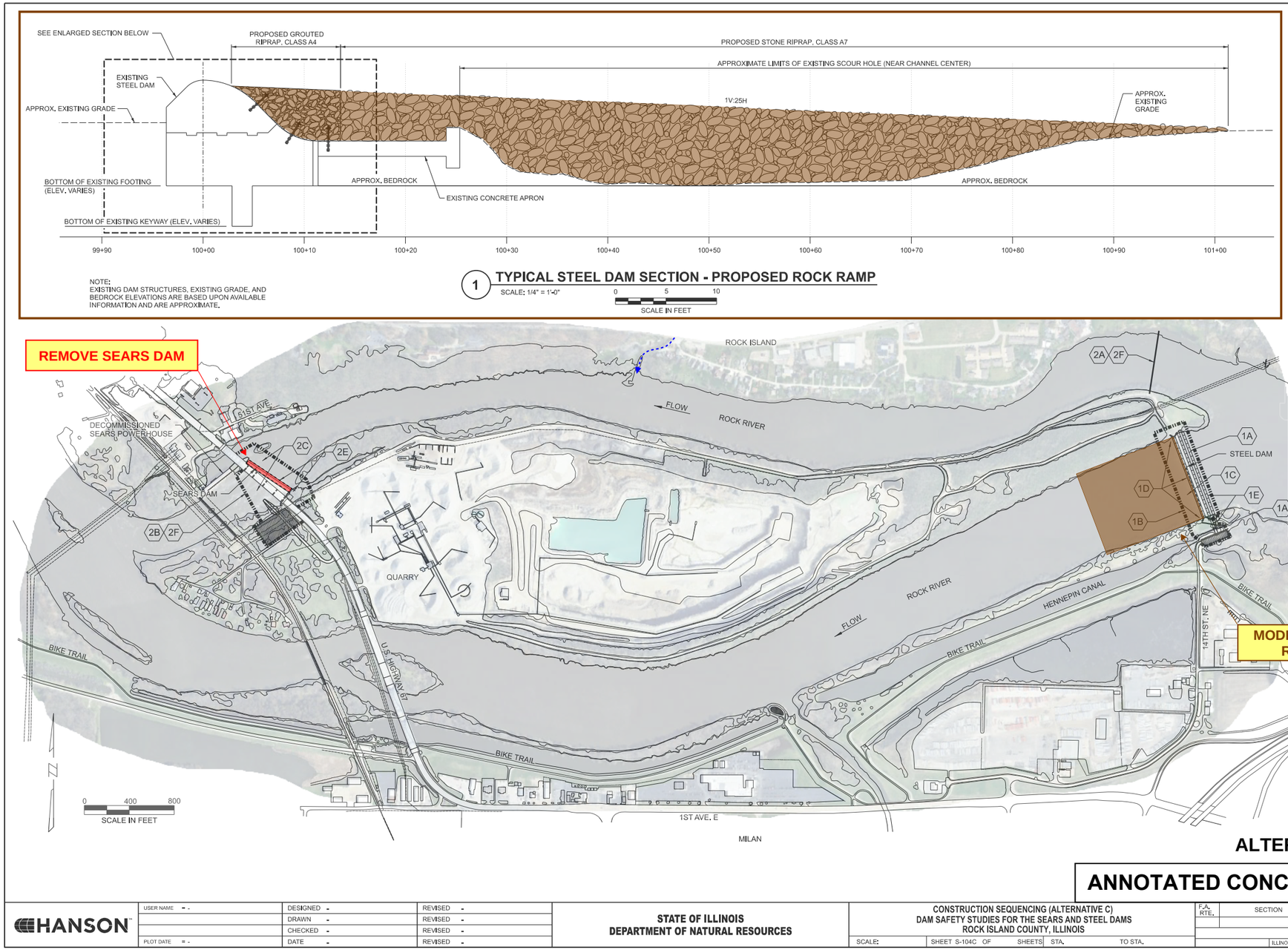



*Figure 44. Alternative 3 Concept Plan*

### *8.3.4 Alt 4 - Remove Sears, modify Steel Steps, add Riffles*

#### 8.3.4.1 Alternative Description

Alternative 4 builds directly on the framework developed for Alternative 2 by combining removal of Sears Dam with modification of Steel Dam using a stepped spillway and further augmenting the system through the addition of a series of rock riffles within the North Channel. The defining objective of this alternative is to preserve the upstream recreational pool while simultaneously addressing public safety concerns and improving ecological function within the river system.

Under this configuration, the Steel Dam remains the primary structural control; however, the introduction of the riffle system fundamentally redistributes hydraulic control within the reach. Instead of relying solely on the downstream structure to maintain pool elevation, Alternative 4 introduces distributed grade control elements in the North Channel that collectively elevate upstream water surface conditions and limit channel incision following removal of Sears Dam.

The riffles are conceptualized as broad, low-gradient structures constructed using large rock material, extending across portions of the North Channel. As reflected in the conceptual design (Figure 46), four riffles are located at approximate HEC-RAS cross sections 4.07, 3.72, 3.35, and 2.99, positioned to maximize backwater influence while also stabilizing sediment and moderating velocities. Each riffle is designed with heights generally between 3 and 4 feet, with lengths ranging from 300 to 500 feet, and slopes on the order of 2 percent, with the exception of the upstream-most riffle, which is approximately 4.3-feet high and functions as the primary control on upstream pool elevation. Riffle locations and configurations can be refined during design if this alternative is selected.

#### 8.3.4.2 Hydraulics

The hydraulic behavior of Alternative 4 differs from the preceding alternatives in that water surface control is distributed spatially rather than concentrated at a single structure. While the Steel Dam continues to influence overall system hydraulics, the riffles establish intermediate control points that collectively define the channel profile and energy gradient. A key insight from the hydraulic analysis is that the upstream riffle can replicate the effect of the removed Sears Dam because it is located at a higher channel bed elevation. There is approximately 10-feet of longitudinal elevation difference between the original Sears Dam location and the upstream riffle site. This allows a relatively modest vertical structure (on the order of 4 feet) to produce a backwater condition comparable to that previously sustained by the dam. If this alternative is selected, the riffle slope should be optimized for fish passage during final design.

Hydraulic modeling indicates that the riffle system is capable of preserving upstream pool elevations under recreational flow conditions. As shown in Figure 45, the water surface profile under the riffle-based alternative closely tracks the existing impounded condition upstream of the riffle system. Without riffles (as in Alternative 2), removal of Sears Dam produces a pool reduction of less than one foot. Under Alternative 4, this loss is effectively offset by the backwater created by the riffles, particularly the upstream structure. As a result, little to no noticeable change in water surface elevation is anticipated upstream of the riffle system during typical recreational flows.

Downstream of the riffles, water surface elevations reflect the stepped condition established by the riffles themselves, resulting in a transition from impounded to more riverine conditions within a controlled reach.

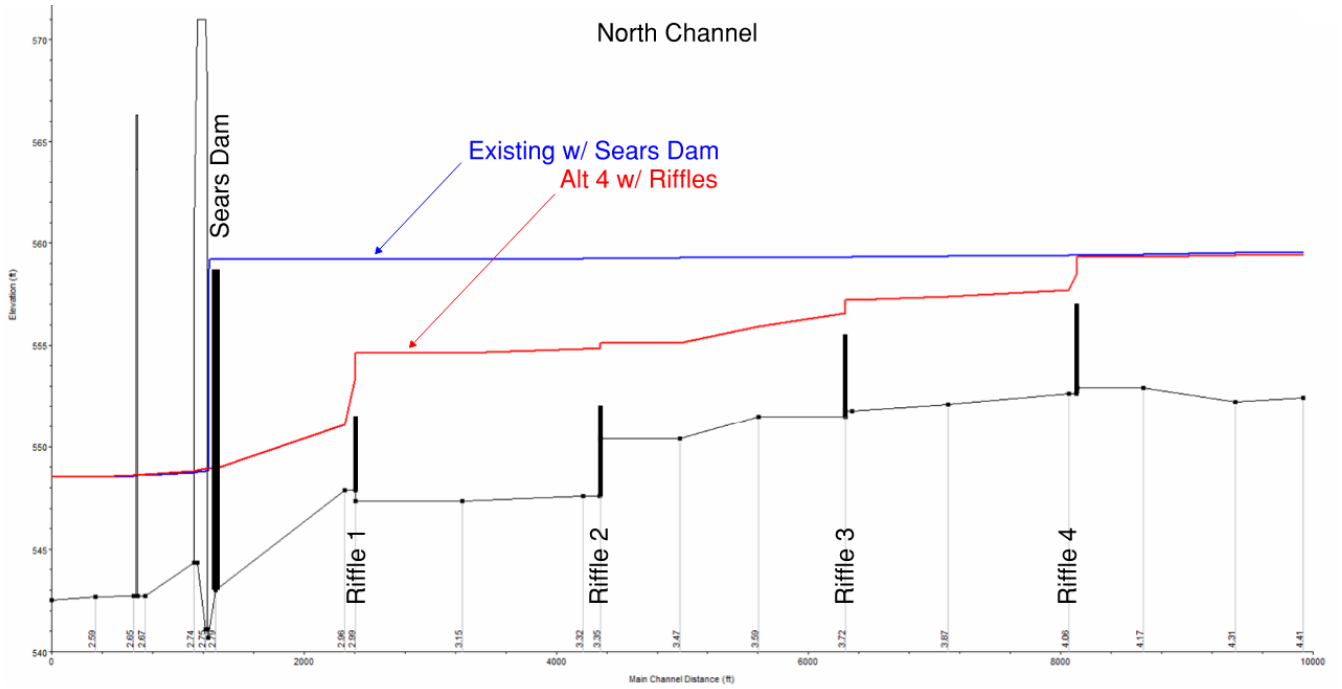



*Figure 45 - Average Recreation Flows – Pool preservation through rock riffles w/ existing (blue) vs proposed riffles (red)*

The introduction of riffles significantly alters velocity patterns in the North Channel. Under Alternatives 2 and 3, increased discharge through the North Channel results in elevated velocities throughout the reach. In Alternative 4, these velocity increases are moderated by the presence of riffles, which increase flow depth locally and create backwater zones upstream of each structure. While localized increases in turbulence and shear occur at riffle crests and downstream transitions, the overall reduction in channel slope and velocity reduces the potential for large-scale scour and bed degradation. Each riffle must be designed with adequate toe protection and embedded depth to resist localized scour and prevent undermining. The distributed nature of the structures reduces the likelihood of catastrophic failure at a single location but introduces multiple points requiring design considerations and future monitoring and maintenance.

Hydraulic modeling indicates that velocities upstream of the riffles are reduced to levels that are less erosive and more favorable for fish passage compared to the higher velocities predicted under Alternatives 2 and 3. Between riffles, localized acceleration occurs, but the spacing and geometry of the structures distribute energy dissipation throughout the reach rather than concentrating it at a single location. This configuration results in a step-pool hydraulic regime, where alternating zones of reduced and increased velocity provide a more heterogeneous flow environment compared to the relatively uniform conditions associated with dam-controlled or fully free-flowing systems.

A key function of the riffle system is sediment stabilization within the North Channel following the removal of Sears Dam. Under Alternatives 2 and 3, increased velocities and channel slope promote

erosion of impounded sediment and long-term degradation toward depth-of-refusal conditions. The riffles act as grade control structures, effectively segmenting the channel profile into shorter reaches with reduced slope. This significantly reduces the erosive capacity of the flow and limits large-scale channel incision. Sediment transport is therefore moderated, with deposition occurring upstream of each riffle where velocities are reduced. The cumulative effect is a more stable channel profile, reducing the extent of downstream sediment transport and associated turbidity impacts. The stabilization also mitigates the long-term lowering of the upstream pool that would otherwise occur as sediment is removed from the system.

By maintaining higher upstream water surface elevations, the riffles influence the overall hydraulic gradient at Vandruff Island. Because pool elevation is preserved and channel stability is improved, the magnitude of flow redistribution will be less sensitive to long-term degradation effects. Also, maintaining upstream pool elevation helps sustain flow over the Steel Dam for a broader range of conditions than in Alternatives 2 and 3, where channel degradation may significantly reduce or eliminate flow across the structure at lower discharges.

#### 8.3.4.3 Construction Considerations

Construction of Alternative 4 is more complex than the previous alternatives due to the addition of multiple in-channel structures. In addition to all construction considerations noted in Alternative 2, this alternative adds construction of four riffle structures within the North Channel. Each riffle requires placement of large rock material across substantial channel widths and lengths. Construction access will likely involve a combination of temporary access roads, staging areas along the riverbanks, and potentially barge-based operations depending on site constraints. Because the riffles extend over hundreds of feet and involve significant material volumes, construction effort and duration will be greater than for Alternatives 1, 2 and 3. Sequencing is particularly important to ensure that pool control is maintained during removal of Sears Dam. In practice, construction of the upstream riffle may need to precede or be coordinated with dam removal to prevent uncontrolled drawdown.

Riffle construction must occur before removal of Sears Dam to prevent significant sediment evacuation within the impoundment. Riffle construction is anticipated to occur within the dry. This requires large cofferdams and dewatering to construct segments of each riffle or the entire reach. Given impounded water conditions, this effort adds significant cost. Impounded sediments within each cofferdam would need to be excavated and potentially disposed of offsite. This has potential to add additional costs to this alternative.

Access to riffle locations would likely require access from existing roads owned by the quarry on Vandruff Island. Impounded sediments located between riffles would quickly mobilize and transport downstream. The quantity of material that would evacuate following construction represents a minor volume compared to the overall volume of impounded sediment at the site. Maintaining the existing impoundment, therefore would not result in substantial evacuation of impounded areas upstream of Vandruff Island.

#### 8.3.4.4 River Impacts

Alternative 4 produces a distinct combination of impacts compared to the other alternatives by simultaneously addressing safety, preserving existing recreation, and improving ecological objectives.

From a public safety perspective, the removal of Sears Dam eliminates the primary dam hazard, and the stepped spillway modification at Steel Dam mitigates the hydraulic roller. Residual risks associated with turbulence remain but are reduced relative to existing conditions. Alternative 4 represents a partially controlled system rather than full river restoration. Sediment transport is moderated rather than fully restored, and the channel remains stabilized through engineered features.

Recreationally, Alternative 4 uniquely preserves the upstream pool to a degree comparable to existing conditions. This allows continued flatwater boating upstream while introducing localized riffle features that may also enhance paddling experiences in certain reaches. Potentially incorporating river access from Black Hawk State Historic Site could provide significant recreational enhancements. Some boaters or paddlers would be able to navigate the series of constructed riffles at certain flow conditions. Angling opportunities within the impoundment would increase given improved fish passage conditions. Recreational activities in the water within the project area will still retain river safety risks as is the case with any river recreation. Adding features that may draw more users could lower the public safety enhancement provided by dam removal. Recreational users must be aware that they are responsible for their own safety and should understand the risks of recreating on or near a moving water system.

Ecologically, the riffle system introduces habitat diversity by creating a sequence of pools and riffles that support varied hydraulic conditions. These features improve fish passage relative to high-velocity conditions in Alternative 2 and provide more naturalized channel characteristics than the constructed solutions alone.

During final design, Alternative 4 would be designed to support native fish passage requirements. Conceptual hydraulic modeling confirmed pool preservation by adding vertical riffle elements to the existing bed. Final design will require additional analysis to ensure passage criteria are met. Riffles are assumed to have a maximum slope of 2%, considered passable for most native species, with intervening resting areas providing low-velocity refuges. Designs would mimic natural riffles using varied rock and boulder roughness to create complex flow patterns. Effectiveness will depend on crest elevation, stone size, flow range, and available low-velocity pathways.

Restoring passage in the North Channel would benefit most species—especially migratory and weak swimmers like Northern Pike and Lake Sturgeon—by improving upstream access. However, upstream passage would still be less effective than under full dam removal. Alternative 4 provides the lowest ecological benefit given that it maintains impounded water conditions. Fish that pass above the dams via the North Channel would experience degraded conditions within the impoundment and would need to swim upstream of the impoundment to find higher-quality spawning and nursery habitat. Bed impacts in the North Channel are greater than the other alternatives and may impact benthic organisms in some areas. Mussels would not benefit from any added habitat area. Threatened and Endangered species outcome characteristics would be similar to those of Alternative 2 and 3.

#### 8.3.4.5 Alt 4 Costs

The distributed nature of the riffle system introduces a broader maintenance footprint compared to other alternatives. While rock riffles are generally durable, they are subject to displacement, settlement, and local erosion over time, particularly during high flow events. Maintenance requirements include periodic inspection of each riffle, replacement of displaced material, and monitoring of channel

conditions between structures. Compared to Alternative 2, where maintenance is concentrated at a single structure, Alternative 4 adds maintenance responsibilities across multiple locations. It is estimated that maintenance costs will average $25,000 for each riffle per year. The total maintenance cost including rock riffles and maintenance of Steel dam is estimated to be $150,000 per year.

Converting the $150,000 average annual costs to a present worth value with a 4% average interest rate and 50-year project life correlates to $3,222,300. The estimated construction cost for Alternative 4 is $24.1 million, reflecting the significant increase in material quantities, construction effort, and complexity associated with installing multiple large-scale in-channel structures. Adding the maintenance costs for the riffle structures and for Steel Dam produces a total cost of:

- Alternate 4: $27.4M

Figure 46 displays the Alternative 4 project concept.

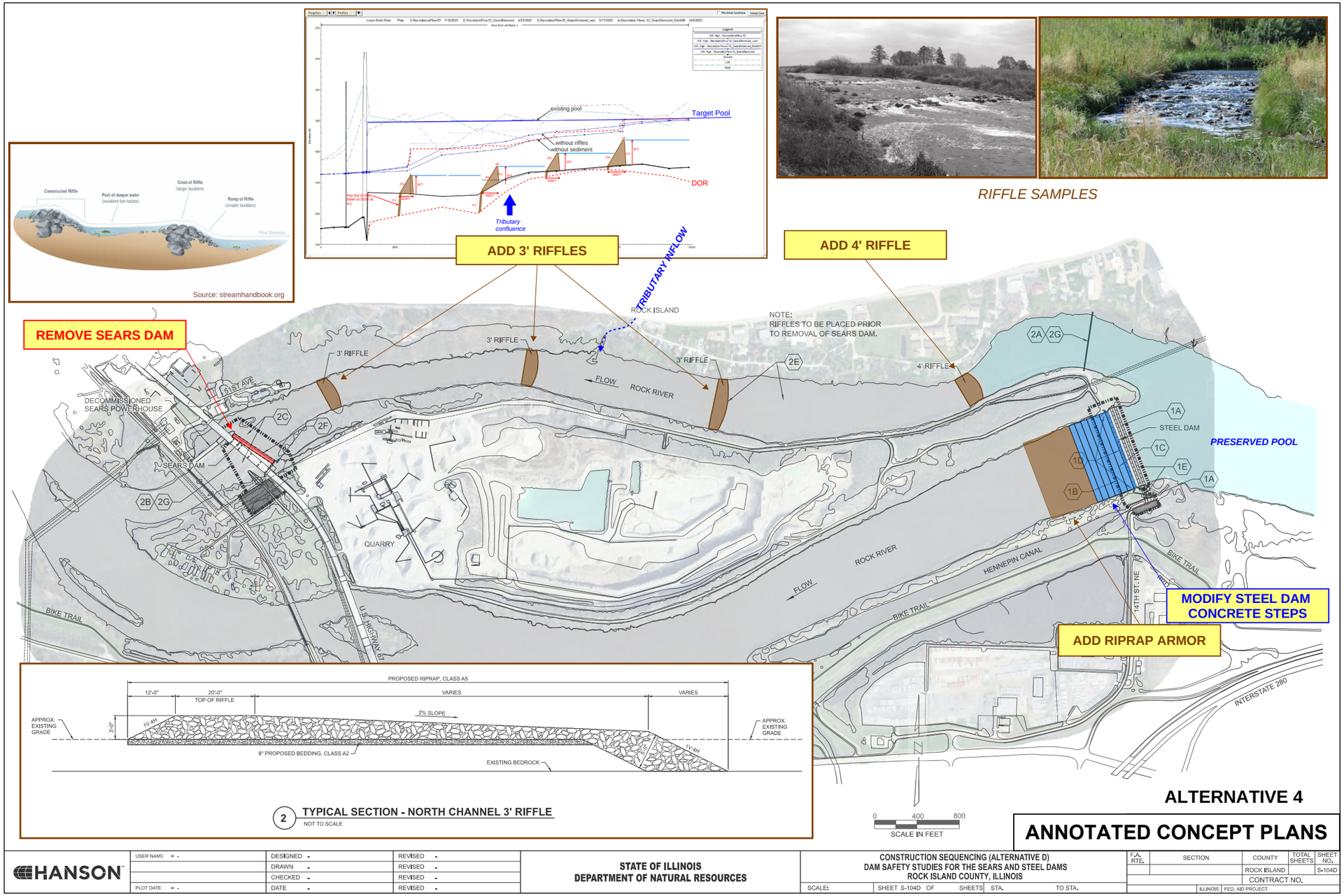



*Figure 46. Alternative 4 Concept Plan*

### *8.3.5 Alt 5 - Remove Sears, modify Steel Steps with Bypass*

#### 8.3.5.1 Alternative Description

Alternative 5 consists of the removal of Sears Dam combined with a multifaceted modification of Steel Dam that integrates three coordinated design elements: a stepped spillway configuration, a notched crest, and a nature-like fish bypass channel (see Figure 47). This alternative is intended to address the key deficiencies identified in Alternatives 2 and 3—specifically the loss of flow in the South Channel and limited fish passage—while maintaining a portion of the upstream recreational pool.

The Steel Dam is partially modified to include a 100-foot-wide and approximately 3-foot-deep notch in the spillway crest. This notch allows controlled discharge through the dam at lower flows while preserving upstream water surface elevation to a degree. The remainder of the spillway is reconstructed with concrete steps, similar to Alternative 2, to dissipate energy and eliminate the recirculating hydraulic roller. In addition to these modifications, a separate fish bypass channel is constructed along the southern side of the spillway. This bypass extends approximately 750-feet downstream at a longitudinal slope of about 1 percent, providing a continuous, low-gradient flow path independent of the main spillway. A separation wall isolates the bypass flow from the stepped spillway to maintain consistent hydraulic conditions suitable for fish passage.

Collectively, these components enable Alternative 5 to function as a hybrid system that improves safety, restores limited hydraulic connectivity, and enhances ecological performance while retaining partial impoundment.

#### 8.3.5.2 Hydraulics

The addition of the notch introduces a controlled reduction in the crest elevation of Steel Dam, allowing a portion of flow to pass through the structure under conditions where Alternatives 2 and 3 would have little to no overtopping flow. As a result, upstream water surface elevations are reduced relative to existing conditions, but not to the extent observed under full dam removal. Hydraulic modeling indicates that under average recreational flows, the upstream water surface elevation is approximately 558.69 feet, representing a reduction of 0.93-feet relative to the existing pool elevation of 559.62 feet.

Despite this reduction, the pool remains substantially elevated compared to Alternative 1 conditions. Under full removal (Alternative 1), the same flow produces an elevation of approximately 556.93 feet, meaning Alternative 5 preserves approximately 1.76-feet of additional pool elevation. This intermediate pool condition reflects the role of the notch as a controlled outlet rather than complete removal of hydraulic control.

One of the most significant hydraulic improvements associated with Alternative 5 is the restoration of flow through the South Channel. Under Alternatives 2 and 3, removal of Sears Dam results in the North Channel capturing the majority of flow at lower discharges, leaving the South Channel effectively dry. The notch in Steel Dam modifies this behavior by providing a lower elevation flow path, allowing water to pass into the South Channel even under low flow conditions. Modeling results indicate that under low recreational flows, discharge through the South Channel increases from 0-cfs under Alternatives 2 and 3 to approximately 869-cfs with the notch in place. This restoration of flow improves hydraulic connectivity across both channels and maintains a more balanced distribution of discharge throughout

the system. It also supports ecological processes that depend on flow in both channels and enhances recreational continuity.

As with Alternatives 2 and 3, long-term geomorphic adjustment in the North Channel plays a significant role in system performance. Modeling was performed to evaluate conditions in which the North Channel degrades to the depth-of-refusal elevation following removal of Sears Dam. Under this scenario, the upstream pool is further reduced to approximately 557.92 feet, representing a total reduction of approximately 1.70-feet from existing conditions. The redistribution of flow under degraded conditions also affects the effectiveness of the notch. With increased conveyance in the North Channel, a greater proportion of flow is diverted away from Steel Dam. As a result, discharge through the notch decreases significantly. Under low flow conditions, South Channel discharge is reduced from 869-cfs to approximately 211.5-cfs. This indicates that while the notch improves hydraulic connectivity initially, its long-term effectiveness is dependent on channel stability upstream and may diminish over time if degradation in the North Channel is not managed.

The fish bypass channel represents a significant advancement in ecological function compared to other alternatives. Unlike the main spillway, which operates under varying flow conditions, the bypass is designed to provide a consistent hydraulic environment suitable for fish passage across a wide range of discharges. The channel's 1 percent slope over 750-feet creates a gradual elevation transition, minimizing velocities and providing sufficient depth for aquatic organisms. Because the bypass is hydraulically separated from the stepped spillway, it avoids the turbulence and flow variability associated with the main structure. The effectiveness of the bypass depends on careful design of entrance and exit conditions, as well as confirmation that velocities and depths fall within acceptable ranges for target species. Further refinement using computational fluid dynamics (CFD) is recommended to accurately model headloss, optimize flow distribution, and ensure functionality under both low and high flow conditions.

Sediment transport dynamics are similar to those observed in Alternatives 2 and 3. Removal of Sears Dam initiates mobilization of sediment within the North Channel, driven by increased velocities and steeper hydraulic gradients. The addition of the notch introduces some redistribution of sediment transport by restoring flow to the South Channel. This allows sediment loads to be shared between both channels rather than being concentrated entirely in the North Channel. However, this redistribution is limited by the amount of flow conveyed through the notch, which decreases under degraded conditions. The fish bypass channel is expected to function independently of sediment transport processes in the main channel and should be designed to avoid excessive sediment deposition that could impair functionality.

The redistribution of flow resulting from the notch has implications for scour potential throughout the system. Increased discharge in the South Channel relative to Alternatives 2 and 3 may result in localized increases in velocity and associated scour potential at structures within that reach. In the North Channel, increased conveyance resulting from Sears removal continues to elevate velocities and requires evaluation of existing bridges and infrastructure, as noted in Alternatives 2 and 3. At Steel Dam, the combination of stepped spillway, notch, and bypass channel introduces complex flow interactions that must be addressed in design. Scour protection is required at the base of the spillway and within the transition zones associated with the notch and bypass channel.

#### 8.3.5.3 Construction Considerations

Alternative 5 presents one of the most complex construction scenarios among the evaluated alternatives due to the integration of multiple structural components. Construction includes removal of Sears Dam, modification of Steel Dam to incorporate both a stepped spillway and a notched crest, and construction of a new bypass channel. The bypass channel requires excavation, grading, and installation of a separation wall to isolate flows from the main spillway.

Sequencing is critical to maintain control of flow during construction. Temporary cofferdams or diversion structures may be required to isolate work areas and ensure safe and effective installation. Construction may occur under partially wet conditions, with localized dewatering as needed. The complexity of the design translates to increased construction duration and coordination requirements compared to other alternatives.

#### 8.3.5.4 River Impacts

Alternative 5 provides a comprehensive set of improvements to river function. Public safety is enhanced through elimination of the hydraulic roller at Steel Dam and removal of Sears Dam. While turbulence remains, the most hazardous recirculating conditions are eliminated.

Ecologically, Alternative 5 offers the most significant improvement short of full dam removal. The combination of restored flow in the South Channel and the addition of a dedicated fish bypass channel significantly enhances connectivity for aquatic species. This represents a substantial improvement over Alternatives 2 and 3, where low flows may isolate portions of the river.

Recreationally, the alternative maintains a portion of the upstream pool while improving navigability and connectivity across both channels. This provides a balance between preservation of existing uses and restoration of riverine conditions. However, as with other partial-removal alternatives, the system remains influenced by structural controls, and long-term channel adjustment processes continue to affect hydraulic performance.

#### 8.3.5.5 Alt 5 Costs

Alternative 5 introduces multiple structural elements that require ongoing maintenance, including the stepped spillway, notch, and fish bypass channel. Regular inspection is required to ensure structural integrity, maintain flow distribution, and prevent obstruction of the bypass channel. As such, the estimated annual maintenance cost is increased from Alternative 2 to $75,000 in anticipation of more frequent inspections and repairs. Inspections are recommended on at least an annual basis and following significant flow events to assess the condition of the ramp, identify areas of displacement or erosion, and address debris accumulation. Additional maintenance actions may include replacement of rock and stabilization of affected areas.

Converting the $75,000 average annual costs to a present worth value with a 4% average interest rate and 50-year project life correlates to $1,611,000. The construction cost for Sears Dam removal ($5.6M) and Steel Dam rehabilitation with steps and fish ramp ($14.1M) is $19.8M. Adding the maintenance costs for Steel Dam produces a total cost of:

- Alternate 5: $21.4M

Figure 47 displays the Alternative 5 project concept.

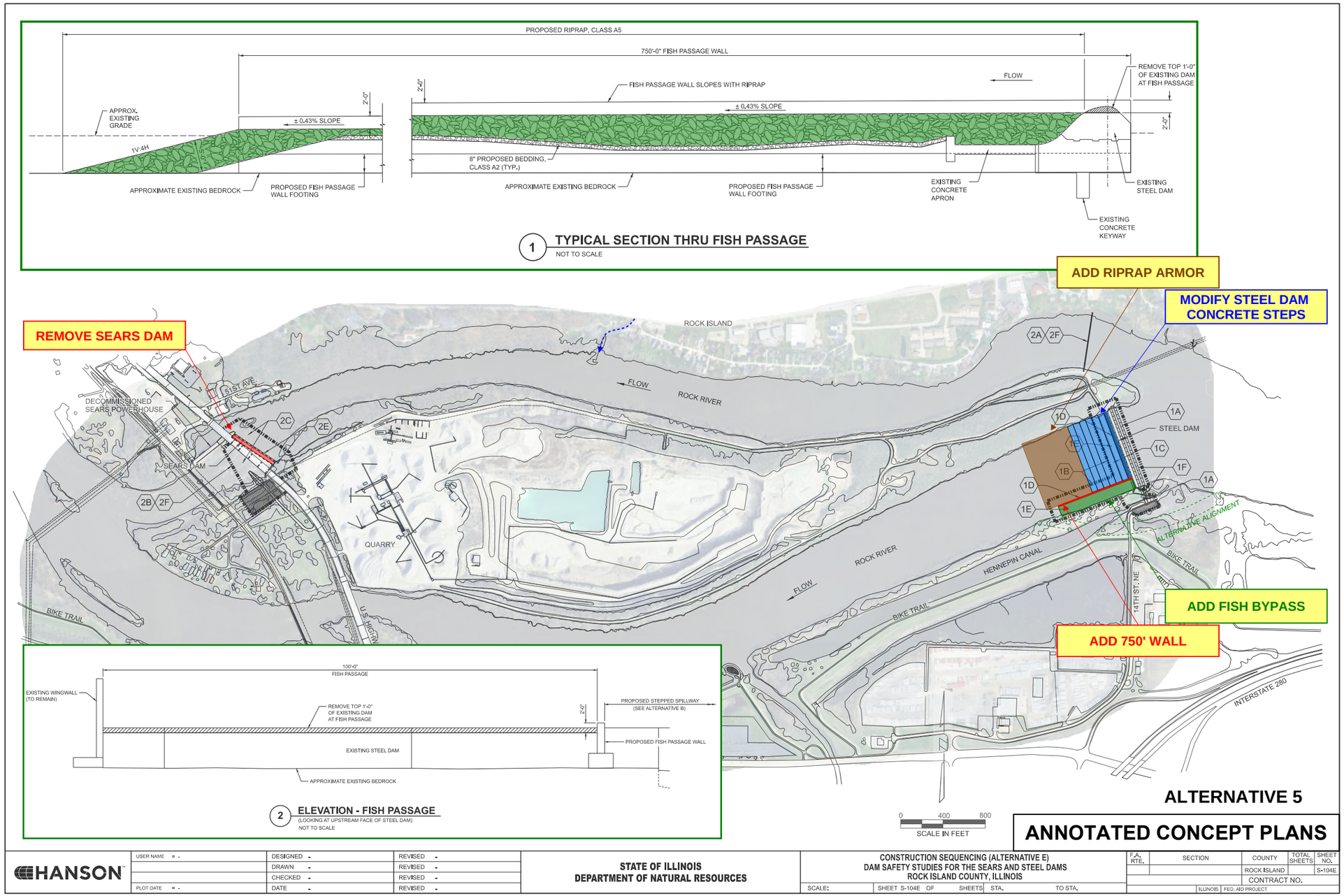



*Figure 47. Alternative 5 Concept Plan*

### *8.3.6 Alt 6 – No Change to Sears, modify Steel Steps*

#### 8.3.6.1 Alternative Description

Following the March 16, 2026, Public Outreach meeting, several comments were received requesting an alternative that does not fully remove Sears Dam. Specifically, stakeholders expressed interest in preserving the existing river pool while improving safety conditions at Steel Dam, which has experienced significantly more safety incidents.

In response, Alternative 6 has been added to emphasize safety enhancements at Steel Dam—where higher hazard events have occurred—by proposing the addition of concrete steps along the spillway. For Sears Dam, where fewer hazard incidents have been documented, safety improvements could include additional signage and/or installation of safety cables or buoys.

This alternative has been incorporated into the report to address public feedback and to allow for future evaluation. The costs associated with Alt 6 were taken from the Steel Dam portion of Alt 2.

#### 8.3.6.2 Hydraulics

This alternative produces no changes to hydraulics from existing conditions.

#### 8.3.6.3 Construction Considerations

Construction includes the same elements for modification of Steel Dam as described in Alt 2.

#### 8.3.6.4 River Impacts

No river impacts are associated with this alternative as it preserves existing river conditions.

#### 8.3.6.5 Alt 6 Costs

Alternative 6 maintains the two dams with structural elements that require ongoing maintenance. Regular inspection is required to ensure structural integrity, maintain flow distribution, and prevent obstructions. The estimated annual maintenance cost is increased to $100,000 to account for two dams. Inspections are recommended on at least an annual basis and following significant flow events to assess the condition of the dams, identify areas of displacement or erosion, and address debris accumulation. Additional maintenance actions may include concrete repair and stabilization of affected areas.

The construction cost for Steel Dam rehabilitation with steps is $10.3M. Adding the maintenance costs for Sears Dam and Steel Dam produces a total cost of:

- Alternate 6: $12.4M

### *8.4 Cost Comparison*

Table 17 provides a planning-level cost comparison for the six studied alternatives, including estimated construction costs and the present-worth value of assumed long-term maintenance obligations where structures remain. These estimates are intended for feasibility-level comparison and should be refined during design as construction sequencing, access requirements, water control, disposal needs, and permitting conditions are better defined.

*Table 17 - Summary of Costs for the Alternatives*

| Alternative | Sears | Steel | Maintenance | Total | Description |
|---|---|---|---|---|---|
| 1 | $5,647,010 | $5,318,880 | $0 | $10,965,890 | Remove Both Dams |
| 2 | $5,647,010 | $10,282,067 | $1,074,109 | $17,003,186 | Remove Sears, modify Steel Steps |
| 3 | $5,647,010 | $5,589,214 | $1,611,164 | $12,847,388 | Remove Sears, modify Steel Rock Ramp |
| 4 | $13,857,431 | $10,282,067 | $3,222,328 | $27,361,826 | Remove Sears, modify Steel Steps, add Riffles |
| 5 | $5,647,010 | $14,163,280 | $1,611,164 | $21,421,454 | Remove Sears, modify Steel Steps with Bypass |
| 6 | $0 | $10,282,067 | $2,148,218 | $12,430,286 | No Change to Sears, modify Steel Steps |

Based on the current estimates, Alternative 1 has the lowest construction cost among the alternatives as it removes both structures and avoids long-term structural maintenance. Alternative 4 has the highest construction cost due to the combined cost of Sears Dam removal, Steel Dam stepped modification, and construction of multiple large rock riffles in the North Channel to preserve the upstream pool. Alternatives 2, 3, and 5 have intermediate construction costs because they remove Sears Dam but retain and modify Steel Dam. Alternative 6 has a lower construction cost than several modification alternatives because it modifies only Steel Dam; however, it does not remove the hazard at Sears Dam and retains maintenance responsibility for both structures.

Long-term maintenance costs are lowest for Alternative 1 because both dam spillways are removed and no modified dam structures remain to inspect, repair, or clear of debris. Alternative 6 has the highest retained dam-maintenance burden because both dams remain in place, with Steel Dam modified and Sears Dam preserved. Alternative 4 also has relatively high maintenance costs because it includes Steel Dam maintenance plus periodic inspection and repair of multiple riffle structures. Alternative 3 has higher maintenance than Alternative 2 because a rock ramp is more susceptible to displacement, grout deterioration, debris accumulation, and post-flood repair needs than a concrete stepped spillway.

Potential cost savings should be reviewed during final design and permitting. Items identified during project coordination include limiting dam removal to the extent necessary for hydraulic hazard elimination rather than removing all concrete to bedrock; avoiding full excavation or filling of downstream scour holes where hydraulic and stability analyses demonstrate that natural adjustment or targeted armoring is acceptable; minimizing or eliminating cofferdams where work can safely be performed under controlled wet conditions; and sequencing drawdown and demolition to reduce temporary access, dewatering, and water-control requirements.

## 9. Environmental Impacts & Permitting Review

This section outlines the anticipated environmental impacts and regulatory considerations associated with the proposed modifications or removal of the Sears and Steel Dams. It provides a comprehensive review of applicable federal and state permitting requirements, including those under the Clean Water Act, Endangered Species Act, and National Pollutant Discharge Elimination System (NPDES), among

others. The section also evaluates potential effects on wetlands, streams, threatened and endangered species, cultural resources, and environmental justice communities. Mitigation strategies and coordination with regulatory agencies such as the U.S. Army Corps of Engineers, Illinois Environmental Protection Agency, and Illinois State Historic Preservation Office are discussed to ensure compliance and minimize adverse impacts. This section serves as a critical foundation for understanding the permitting pathway and environmental responsibilities tied to project implementation.

### *9.1 Regulatory Requirements*

The following permit and compliance requirements will be required for construction of the Project. The Sponsor will need to apply for and secure applicable permits prior to moving forward with the Project.

#### *9.1.1. Clean Water Act (CWA) Sections 404 and 401*

Dam removal activities involving placement or discharge of dredged or fill material into waters of the U.S. (e.g., sediment management, bank stabilization, temporary access fills) require authorization from USACE under Section 404 of the CWA. Any activity requiring a federal Section 404 permit must also receive Section 401 Water Quality Certification (WQC) from the state, issued by the Illinois EPA (IEPA).

#### *9.1.2. Migratory Bird Treaty Act, Endangered Species Act Section 7 and State Sensitive Species*

The Project area is within the range of two federally endangered bat species (Indiana bat, Myotis sodalis and northern long-eared bat, Myotis septentrionalis), one federally endangered insect (rusty patched bumble bee, Bombus affinis) and one federally threatened plant (eastern prairie fringed orchid, Platanthera leucophaea). Two state listed mussel species (Ebonyshell, Reginiaia ebenus and elephantear, Elliptio crassedens) and three state endangered fish (western sand darter, Ammocrypta clara, pallid shiner, Hybopsis amnis, and weed shiner Notropis texanus) also occur within the Project Area. See the following Mitigation section (Section 9.2) for consultation guidance with the U.S. Fish and Wildlife Service (USFWS) and Illinois Department of Natural Resources (IDNR) regarding sensitive species. If Bald Eagle (Haliaeetus leucocephalus) nests are located in the area, a Bald Eagle Nest Removal Permit may be required from the USFWS.

#### *9.1.3. National Pollution Discharge Elimination System*

The National Pollution Discharge Elimination System (NPDES) regulates the discharge of any pollutant from a point source into a water of the United States. The renovation of a dam will discharge sediment and other materials into streams. During the design phase, the sponsor will need to obtain an NPDES Construction General Permit. This permit will outline limits on what pollutants can be discharged, reporting requirements, and other provisions to ensure that the discharge does not adversely affect water quality. This permit may be obtained through the Illinois Environmental Protection Agency (IEPA).

#### *9.1.4. Floodplain Management*

Any development within a regulatory floodplain will require a General Permit from IDNR-OWR Division of Water Resource Management (DWRM). All work must be in accordance with the requirements of Illinois Administrative Code 17 § 1(h), Part 3700 Construction in Floodways of Rivers, Lakes, and Streams as well as all other applicable county/city ordinances, federal programs, and the laws and regulations of the State of Illinois. Additionally, the impacts to the FEMA regulatory flood elevations are not anticipated to require remapping but may be considered in the future.

### *9.1.5. Dam Considerations*

Previously, the dams were regulated by the Federal Energy Regulatory Commission (FERC) as the dams were used for hydropower. With the decommissioning of hydropower, this regulation is no longer active. Steel Dam is a High Hazard Potential Dam (HHPD) and any modification to the dam requires coordination with the Federal Emergency Management Agency (FEMA). Grants to conduct such work on HHPD may be available through FEMA. Concurrently, modifications to the dams will also require a Construction and Maintenance of Dams Permit from the IDNR-OWR DWRM.

### *9.1.6. General Project Implementation*

Prior to project construction, Contractor Registration will be required through both the City of Rock Island and Rock Island County.

## *9.2 Mitigation*

The proposed action may impact wetlands and streams. Any permanent impact on waters of the United States (WOTUS) may require mitigation in the form of restoration (re-establishment or rehabilitation), enhancement, or establishment of aquatic resources. The need for compensatory mitigation would be addressed during the CWA Section 404 permitting process. The Sponsor will request an Approved Jurisdictional Determination (AJD) from the USACE – Rock Island Regulatory District to determine whether the wetlands and streams are subject to jurisdiction under Section 404 of the CWA.

The proposed action may also impact sensitive species and cultural resources. Coordination may also be required with the USFWS, IDNR and the Illinois State Historic Preservation Office (ISHPO) to protect or mitigate impacts to these resources.

### *9.2.1. Wetland Mitigation*

Wetland impacts vary by alternative and may require mitigation as defined during the permitting process. For this study an estimate of potential wetland impacts has been defined. Alternative 1 includes removal of both dams and provides the highest wetland impact potential. Up to 25.0 acres may be impacted consisting of bottomland forest (3.5ac), deepwater lake (21.1ac) and perennial deepwater river (0.4ac). The other alternatives produce lesser impacts up to 10.5 acres consisting of bottomland forest (1.6ac), deepwater lake (1.9ac), perennial deepwater river (6.3ac), shallow marsh (0.6ac) and shrub-scrub (0.2ac). There are also 706 acres of wetlands downstream of the dams to the confluence with Mississippi River and within 1,000-feet of the centerline of the Rock River that could be impacted by construction activities. The AJD will determine if the wetlands are jurisdictional. It would then be necessary to determine the impact and assess whether compensatory mitigation would be required; this would likely include agency coordination to help inform this decision. If needed, the Wetland Monitoring and Assessment Program for the State of Illinois (IEPA 2007), or other assessment methodology would generally be applied to determine appropriate mitigation. There are numerous mitigation banks with a service area that includes the Project Area. If mitigation is necessary, it would also be necessary to address the preference hierarchy and other requirements established in the CWA 2008 Mitigation Rule. Historically, the net positive benefits from dam removal projects negate the need for mitigation. However, dam modifications have less overall benefits so might require mitigation efforts.

### *9.2.2. Stream Mitigation*

Approximately 13,200 linear feet of streams, the Rock River from the dams to the confluence with the Mississippi River, have potential to be impacted by implementation of the preferred alternative. The AJD will determine if the streams are jurisdictional. It would then be necessary to determine the impact and assess whether compensatory mitigation would be required; this would likely include agency coordination to help inform this decision. If needed, the Illinois Stream Mitigation Guidance (USACE 2010), or other assessment methodology would generally be applied to determine appropriate mitigation. There are numerous mitigation banks with a service area that includes the Project Area. If mitigation is necessary, it would also be necessary to address the preference hierarchy and other requirements established in the CWA 2008 Mitigation Rule. Experience with prior dam removal projects in the state indicate that mitigation is likely not required.

### *9.2.3. Migratory Bird Treaty Act and Endangered Species Act Section 7 and State Sensitive Species.*

As the potential for occurrence of both federal and state sensitive species has been identified in the area, an Endangered Species Act (ESA) Section 7 consultation may be required with USFWS, and additional consultation may be necessary with the IDNR. Mitigation measures may include felling potential bat roost trees as needed only during the inactive period of November 16 – March 31 (USFWS 2024) and increasing nectar plants within breeding and migratory areas for insects (USFWS 2021).

### *9.2.4. Cultural Resources.*

Potential impacts to adjacent cultural resources must be assessed and mitigated in cooperation with Illinois State Historic Preservation Office (ISHPO). Several archaeological and historic resources have been identified near the dams, including the Saukenauk Village and Sauk Cemetery. While dam removal may not directly affect these areas, appropriate coordination with the ISHPO and adherence to regulatory requirements will ensure that cultural resources are protected.

## *9.3 Environmental Justice*

The Illinois EPA is committed to protecting the environment and the health of the residents of Illinois, and to promoting environmental equity in the administration of its programs through its Environmental Justice Policy. The demographic and socioeconomic information summarized in this section is provided to support environmental justice review, public involvement planning, and future funding eligibility evaluations. Census-based indicators such as poverty, income, unemployment, minority population, and educational attainment help identify whether the project area includes populations that may warrant additional outreach or consideration during project development and permitting. These data may also be useful when evaluating eligibility for federal or state funding, grants, or loans that consider disadvantaged, underserved, or economically distressed communities. For Illinois funding programs, the data should be compared, where applicable, with 17 Ill. Adm. Code 3025.36, Distressed Communities Definition and Criteria, which identifies economically distressed communities The information in this report addresses review of low-income and minority populations based on census data and site visit observations.

### *9.3.1 Census Data*

Table 18 through Table 23 summarize the region's population, civilian labor force, unemployment, median household income, educational attainment, diversity, and poverty. Population data can be used to assess socioeconomic characteristics. The civilian labor force is the sum of the currently employed

and unemployed and percent unemployed is a comparison of the unemployed people to the total civilian labor force. Median household income is the income level earned by a given household where half of the homes in a demographic area earn more and half earn less. Educational attainment refers to the highest level of education that an individual has completed. Minorites information reveals diversity in an area. People below the poverty threshold indicates the percentage of individuals in poverty status. Monetary income thresholds are used to determine poverty levels. Data is provided by the United States Census Bureau (USCB) American Community Survey (ACS) estimates for years 2000 through 2023.

Based on the USCB data, the Project Area is in a county with average population for the state. County unemployment is similar to the state, while the median household income is lower. The population and civilian labor force in Rock Island Township and Milan Village has decreased somewhat as compared to the county and state, while the change in percent unemployed has decreased markedly as compared to the county and state. The median household income is much lower in Rock Island Township and somewhat lower in Milan village as compared to the county and state. Educational attainment is higher in the county than the state for High School Diplomas but lower for Bachelor's Degrees. Additionally, the county and Milan Village have a much lower minority population than the state while Rock Island Township's minority population is somewhat higher than the state. The county and Milan Village have a similar poverty percentage while Rock Island Township is much higher (USCB 2023a-e).

*Table 18. Population Growth 2000-2023*

**Population Growth 2000-2023**

| Location | 2000 | 2010 | 2023 | Average Annual Change (%) (2000-2023) |
|---|---|---|---|---|
| **State of Illinois** | 12,419,293 | 12,830,632 | 12,549,689 | 0.0 |
| **Rock Island County** | 149,374 | 147,546 | 142,995 | -0.2 |
| **Rock Island Township** | 17,995 | 17,776 | 15,897 | -0.5 |
| **Milan Village** | 5,313 | 5,099 | 5,037 | -0.2 |

*Source: U.S. Census Bureau, 2000 Decennial Census, and 2010 and 2023 American Community Survey 5-Year Estimates.*

*Table 19. Civilian Labor Force 2000-2023*

**Civilian Labor Force 2000-2023**

| Location | 2000 | 2010 | 2023 | Average Annual Change (%) (2000-2023) |
|---|---|---|---|---|
| **State of Illinois** | 6,208,597 | 6,632,592 | 6,638,033 | 0.3 |
| **Rock Island County** | 76,234 | 75,249 | 70,242 | -0.4 |
| **Rock Island Township** | 8,783 | 8,222 | 7,513 | -0.7 |
| Milan Village | 2,697 | 2,367 | 2,622 | -0.1 |

*Source: U.S. Census Bureau, 2000 Decennial Census, and 2010 and 2023 American Community Survey 5-Year Estimates.*

*Table 20. Percent Unemployed 2000-2023*

**Percent Unemployed 2000-2023**

| Location | 2000 | 2010 | 2023 | Average Annual Change (%) (2000-2023) |
|---|---|---|---|---|
| **State of Illinois** | 3.9 | 8.6 | 5.8 | 1.7 |

| | | | | |
|---|---|---|---|---|
| **Rock Island County** | 4.1 | 7.8 | 5.7 | 1.4 |
| **Rock Island Township** | 7.3 | 10.6 | 7.1 | -0.1 |
| **Milan Village** | 3.8 | 15 | 1.2 | -4.9 |

*Source: U.S. Census Bureau, 2000 Decennial Census, and 2010 and 2023 American Community Survey 5-Year Estimates.*

*Table 21. Median Household Income 2000-2023*

**Median Household Income 2000-2023**

| Location | 2000 | 2010 | 2023 | Average Annual Change (%) (2000-2023) |
|---|---|---|---|---|
| **State of Illinois** | $46,590 | $55,735 | $81,702 | 2.5 |
| **Rock Island County** | $38,608 | $46,226 | $66,768 | 2.4 |
| **Rock Island Township** | $27,115 | $30,200 | $40,783 | 1.8 |
| **Milan Village** | $34,556 | $38,674 | $61,188 | 2.5 |

*Source: U.S. Census Bureau, 2000 Decennial Census, and 2010 and 2023 American Community Survey 5-Year Estimates.*

*Table 22. Educational Attainment 2023*

**Educational Attainment 2023**

| Location | High School Diploma or Higher (%) | Bachelor's Degree or Higher (%) |
|---|---|---|
| **State of Illinois** | 26 | 35 |
| **Rock Island County** | 32 | 23 |
| **Rock Island Township** | 38 | 12 |
| **Milan Village** | 32 | 22 |

*Source: U.S. Census Bureau, 2000 Decennial Census, and 2010 and 2023 American Community Survey 5-Year Estimates.*

*Table 23. Summary of Minorities and Poverty 2023*

**Summary of Minorities and Poverty 2023**

| Location | American Indian and Alaska Native (%) | Asian (%) | Black or African American (%) | Hispanic or Latino (%) | Native Hawaiian or Other Pacific Islander (%) | Some Other Race (%) | White (%) | People Below Poverty Threshold (%) |
|---|---|---|---|---|---|---|---|---|
| **State of Illinois** | 0.5 | 5.8 | 13.8 | 18.5 | 0.0 | 7.3 | 58.7 | 11.7 |
| **Rock Island County** | 0.0 | 3.0 | 10.4 | 14.4 | 0.0 | 4.4 | 67.0 | 15.4 |
| **Rock Island Township** | 0.5 | 3.4 | 24.1 | 19.1 | 1.0 | 6.4 | 50.4 | 30.3 |
| **Milan Village** | 0.6 | 0.9 | 2.0 | 9.4 | 0.0 | 2.2 | 84.0 | 15.1 |

*Source: U.S. Census Bureau, 2000 Decennial Census, and 2010 and 2023 American Community Survey 5-Year Estimates*

## *9.4 Permitting Coordination*

This section provides a summary of compliance with various regulatory agencies including IDNR-OWR Part 3700, 3702, and 3704 criteria. Potential permitting concerns for the proposed alternative are being identified through coordination with IDNR-OWR regulatory staff. No permit submittals or applications

are included within this study. Additional permitting requirements for dam removals or modifications are anticipated primarily through the IEPA. The permit submittal process will likely be required via a joint permit with IEPA and USACE for CWA 404/401 permits.

#### *9.4.1. IDNR-OWR Coordination*

IDNR-OWR is responsible for issuing permits for construction, modification, and removal of dams, work in public waters (rivers, lakes, streams), and construction in regulated floodways. Formal dam removal permits will be required along with floodway construction permits. Under Part 3702 OWR will provide regulatory review of the drawdown/dewatering plan, breach design (size, sequencing, stability), hydraulic analysis (100-year flood conveyance, backwater conditions), sediment management plan, erosion and channel stabilization measures, and channel restoration plans.

#### *9.4.2. IDOT Coordination*

Coordination with the Illinois Department of Transportation (IDOT) will be required due to potential adjacent highway bridge impacts, right-of-way, access roads and haul routes. Review of county parcel mapping indicates that part of Sears Dam is located within US-67 right-of-way. Construction activities at Sears Dam will require right-of-way access. IDOT will have project-related interests regarding traffic control measures, bonding, and restoration commitments. IDOT will also review the project for potential impacts to bridge hydraulics, scour, and structural integrity, given the immediate proximity of Sears Dam.

IDOT also provides procedural and contractual guidance for disposal of materials including dredging, regulated substances and contaminated soils.

#### *9.4.3. IEPA Coordination*

Permit authority for CWA 401 waters.

- 06-17-2025 Call – The project team discussed whether the sediment and supernatant sampling completed to date would be sufficient to support future IEPA permitting review. IEPA indicated that the data collected generally addresses the parameters included in the *Appendix A* IEPA Compliance Summary Table. IEPA also noted that if elevated supernatant concentrations are identified, additional supernatant testing should be paired with corresponding particle size analysis to help evaluate the relationship between fine sediment and potential water quality concerns. The current TACO-based sediment evaluation, which included 22 of the 126 chemicals listed in TACO Table A, was considered a useful initial screening tool; however, IEPA clarified that TACO criteria are not the most appropriate basis for evaluating potential aquatic impacts. IEPA also described its typical sediment sampling approach for dam removal projects, which considers both sediment stored behind dams and sediment downstream of the structures, while recognizing project-specific resource constraints. The key takeaway from the call was that the existing dataset provides a reasonable starting point, but additional coordination with IEPA is needed to confirm whether the sampling scope fully satisfies future permitting requirements. Follow-up items included providing IEPA with *Appendix A* for clarification, chemical analysis results, sediment sampling location maps, particle size distribution results, and a Teams meeting invitation for a subsequent coordination meeting.

- 08-19-2025 Call – The project team discussed IEPA Bureau of Land (BL) requirements for sediment sampling and how the existing data may support future permitting needs for dam removal. The key clarification from IEPA was that the project would not be permitted through the Bureau of Land; rather, permitting would proceed through IDNR, with sediment disposal requirements governed by the receiving disposal facility. IEPA indicated that if sediment is removed from the site during construction, it would need to meet the acceptance requirements of the selected disposal facility, which would likely be a Clean Construction and Demolition Debris (CCDD) facility or an Uncontaminated Soil Fill Operation (USFO). These facilities typically rely on Maximum Allowable Concentration criteria derived from TACO standards to determine whether material is acceptable as clean soil or fill. IEPA further clarified that each sediment load transported for disposal would need to be accompanied by an IEPA LPC-663 form, certified by the engineer, documenting that the material is clean. IEPA Bureau of Water (BW) requirements may also apply, including preparation of a stormwater pollution prevention plan and a Section 401 Water Quality Certification permit. The team also learned that any proposal to manage or place material on site, along the banks, or within the river would likely require review by USACE.

- 08-26-2025 Call – The project team discussed IEPA Bureau of Water permitting requirements, IEPA's preliminary review of the sampling results provided in June, and whether the sediment and supernatant data collected to date are sufficient to support future permitting. A key administrative takeaway was that voicemail messages from Hanson had not been reaching IEPA staff, so future coordination should be initiated through formal pre-file meeting requests. IEPA indicated that a follow-up meeting should occur in approximately three to four weeks, during which IEPA would review the information already provided and identify any remaining data gaps. IEPA also indicated that passive sediment release is the preferred sediment management approach, subject to further review of existing data, supernatant testing locations and results, particle size information, and the EnviroScience comparison materials. IEPA noted that additional considerations for permitting will include aquatic resources and threatened and endangered species. The team also confirmed that a joint Clean Water Act Section 404/401 permit application will need to be submitted to the Rock Island District USACE and IEPA as part of the review process. IEPA is expected to provide additional direction in a future meeting regarding construction sequencing and the sediment management approach.

#### *9.4.4. USACE Coordination*

The U.S. Army Corps of Engineers (USACE) serves as the primary federal regulatory authority under Section 404 of the Clean Water Act and, where applicable, Section 10 of the Rivers and Harbors Act. Although dam removal is considered a restoration activity, it involves in-water work which requires authorization. USACE recently issued updated Nationwide Permits for Illinois, effective March 15, 2026, under Section 404 and administered by the Rock Island District. Nationwide Permit (NWP) 53—Removal of Low-Head Dams—would be the appropriate authorization for this project. USACE generally considers low-head dam removal to provide ecological benefits. It is recommended to schedule a pre-application meeting early in the design phase.

#### *9.4.5. Local Coordination*

The dams are owned and operated by the State of Illinois. The primary permitting authorities are at the state and federal levels as noted above. Coordination with local authorities is recommended as any

construction activities will have direct local impacts. The City of Rock Island bounds Sears Dam to the north and the Village of Milan bounds both dams to the south, including Vandruff Island. The dams are also located within Rock Island County with additional regional interests.

## 10. Stakeholder Analysis

Public outreach was carried out at the completion of the draft feasibility study to ensure sufficient material was available for discussion and comment. . State Senator Halpin's (36th District) office hosted and facilitated the event. The public outreach meeting was held on March 16, 2026, at the International Brotherhood of Electrical Workers (IBEW) Hall in Milan, Illinois. IDNR-OWR presented information from the report, and attendees were invited to provide input during the meeting. Written comments were accepted by IDNR-OWR through March 31, 2026. Feedback from local stakeholders is documented in Appendix H.

Public concern noted the lack of alternatives with both dams remaining in place. To address this, text was added to the report to describe one sub-alternative (See Section 8.3.2.6 Alt 2A) that was removed from the report due to excessive costs – spillway modification with concrete steps at both Steel and Sears Dams. A new alternative was also added to the report, Alternative 6, which leaves Sears Dam in place as-is and modifies Steel Dam with concrete steps. These additions are intended to address public concern and convey the full range of potential options.

Additionally, public comments noted that the process seems rushed with inadequate time for local input. This report does not define the "selected" plan. It summarizes possible options, lists pros and cons and offers a recommendation based on the project objectives. Coordination between state and local authorities will be conducted to determine the selected plan. This report serves to provide critical information for the decision-making process.

Several comments were also provided about the potential economic impacts related to river alterations. Pool reduction and lower water elevations may impact local businesses and residential properties. The potential economic impacts of the various alternatives were not addressed in detail in this report and may warrant further consideration during the decision-making process.

## 11. Alternative Evaluation

This section presents a comparative evaluation of the six structural alternatives developed for the Sears and Steel Dams. Each alternative was assessed against a set of project-specific goals established by the project team through coordination with IDNR–OWR, including public safety, cost efficiency, maintenance requirements, ecological benefits, constructability, recreational impacts with pool preservation, and recreational impacts without pool. The evaluation incorporates both qualitative and quantitative criteria, supported by hydraulic modeling, sediment analysis, ecological assessments, and stakeholder considerations. A scoring matrix (Table 24) was developed to rank alternatives based on comparative priorities, providing a transparent framework for identifying the most effective and feasible solution. This section culminates in a recommended alternative that best aligns with IDNR–OWR's objectives for safety, cost consideration, environmental restoration, and long-term sustainability.

### *11.1 Alternative Evaluation Matrix*

The Concept Plans include six proposed structural alternatives for removal or modification to the Sears and Steel Dams on the Rock River in addition to the Do Nothing alternative. Five of the six structural alternatives include full removal of the Sears Dam spillway with the decommissioned powerhouse and approach guide walls to remain intact.

Each project goal was evaluated with a score of 1 to 5, with 5 being the most favorable score (Table 24). The individual alternatives were scored and evaluated against each other alternative and the "do nothing" option to determine feasibility and identify the most favorable alternative.

Alternative 0 – Do nothing

Alternative 1 – Full removal of Sears Dam
Full removal of Steel Dam

Alternative 2 – Full removal of the Sears Dam
Modification of the Steel Dam to include a stepped concrete downstream geometry

Alternative 3 – Full removal of the Sears Dam
Modification of the Steel Dam to include a sloped rock ramp downstream geometry

Alternative 4 – Full removal of the Sears Dam; Addition of Riffles to North Channel to preserve the Recreational Pool
Modification of the Steel Dam to include a stepped concrete downstream geometry

Alternative 5 – Full removal of the Sears Dam
Modification of the Steel Dam to include a stepped concrete downstream geometry with the addition of a nature-like Fish Passage

Alternative 6 – Sears Dam preservation
Steel Dam modification to include a stepped spillway

*Table 24. Alternative Evaluation Matrix*

| | Do Nothing | Sears and Steel - Full Removal of Both Spillways | Sears - Full Removal of Spillway<br>Steel - Modification of Spillway (Stepped Concrete Spillway) | Sears - Full Removal of Spillway<br>Steel - Modification of Spillway (Rock Ramp Spillway) | Sears - Full Removal of Spillway<br>Steel - Modification of Spillway (Stepped Concrete Spillway) North Channel Riffles | Sears - Full Removal of Spillway<br>Steel - Modification of Spillway (Stepped Concrete Spillway) South Channel Fish Passage | Sears - No Change<br><br>Steel - Modification of Spillway (Stepped Concrete Spillway) |
|---|---|---|---|---|---|---|---|
| **Evaluation Criteria** | **Alternative 0** | **Alternative 1** | **Alternative 2** | **Alternative 3** | **Alternative 4** | **Alternative 5** | **Alternative 6** |
| **Cost (OPCC)** | **$0** | **$10.97 M** | **$17.00 M** | **$12.85 M** | **$27.36 M** | **$21.42 M** | **$12.43 M** |
| **Evaluation Criteria: 1 (low/negative) to 5 (high/positive) *** | | | | | | | |
| **Dam Safety** | 1 | 5 | 3 | 3 | 2 | 3 | 2 |
| **Maintenance and Longterm Costs** | 2 | 5 | 4 | 3 | 1 | 3 | 2 |
| **Recreation with Pool Preservation** | 5 | 1 | 3 | 3 | 4 | 2 | 5 |
| **Recreation with Connected River** | 1 | 5 | 3 | 3 | 2 | 4 | 1 |
| **Environmental Considerations** | 1 | 4 | 3 | 3 | 3 | 4 | 1 |
| **Permitting Considerations** | 4 | 3 | 2 | 2 | 2 | 3 | 3 |
| **Initial Construction Cost** | 5 | 4 | 2 | 3 | 1 | 1 | 3 |
| **Rating Total** | **19** | **27** | **20** | **20** | **15** | **20** | **17** |
| ***NOTE: Evaluation Criteria is relative** | | | | | | | |

[1] Rating = scale of 0 to 5 with 5 being the best

### *11.2 DISCUSSION AND RECOMMENDATION*

Based on the evaluations discussed in preceding sections, the recommended alternative is Alternative 1, full removal of both dams with passive sediment management. This alternative has the highest weighted score and meets the project goals relative to removing safety hazards from the river, reducing ongoing maintenance obligations, improving river health and re-establishing fish passage in the Rock River at the lowest overall implementation cost relative to other alternatives evaluated. Passive sediment management is a cost-effective means of sediment management that aligns with OWR's preferences and appears to be an appropriate strategy for this location.

Alternative 1 ranks highest in public safety, highest in long-term cost reduction, highest is connected river recreation, highest in ecological enhancement, and highest in reduced construction cost. This alternative is weakest in pool preservation and associated recreational activities. Alternative 6 ranks highest in recreation with pool preservation.

It is recommended that the following be considered in dam removal design:

- Detailed engineering design development, including dam demolition, staging, sequencing, water control, site and impoundment restoration, and material management plans.
- Evaluation of powerhouse structure that is currently impounding water at Sears Dam and consideration for future stability, use, and management.
- 2D hydraulic modeling of the full impoundment and downstream reaches to evaluate potential depositional areas at various river flows.
- Detailed evaluation of banks and adjacent infrastructure within the impoundment.
- Mussel and substrate surveys of downstream reaches of Rock River and Mississippi River, and if necessary, mussel relocation prior to construction.
- Additional sediment sampling to verify disposal requirements, water quality and permitting.

For non-removal designs, it is recommended that additional CFD and/or physical modeling be conducted to verify safety improvements and to inform future designs. Also, maintenance plans will be needed to address any non-removal consideration.

## 12. Conclusion

The Sears and Steel Dams Feasibility Study, commissioned by the IDNR–OWR, provides an evaluation of the existing conditions, risks, and opportunities associated with the two low-head dams located on the Rock River near Milan, Illinois. The study was initiated in response to the decommissioning of the Sears Powerhouse and the growing public safety concerns, ecological impacts, and sediment management challenges posed by the aging dam infrastructure.

This feasibility study evaluated a range of structural alternatives for addressing public safety hazards associated with the Sears and Steel Dams while also considering ecological restoration, cost, constructability, stakeholder input, and long-term sustainability. Based on comprehensive hydraulic modeling, sediment analysis, environmental review, and alternatives evaluation, Alternative 1 – Full

Removal of Sears and Steel Dams with passive sediment management is recommended as the preferred solution.

### *12.1 Public Safety and Hazard Reduction*

Public safety is the primary driver of this study. Both dams currently generate powerful hydraulic rollers that pose well-documented and persistent drowning hazards across the full range of recreational flows. Historical incidents - including multiple fatalities and near-misses - demonstrate that these hazards cannot be reliably mitigated through signage or partial structural modifications alone.

Alternative 1 provides the only solution that fully eliminates the dam-related hydraulic hazard, thereby achieving the most complete and permanent reduction in public safety risk.

### *12.2 Ecological and Fish Passage Benefits*

The dams currently act as barriers to aquatic organism passage, preventing connectivity between the Mississippi River and upstream reaches of the Rock River. This fragmentation negatively impacts fish migration, mussel populations, and overall riverine ecosystem function. By restoring longitudinal connectivity, Alternative 1 provides the greatest ecological benefit, enabling approximately 70 miles of river to function as a continuous system and supporting recovery of native species and habitat diversity. These benefits are well-supported by regional studies demonstrating improved biological conditions following dam removal.

### *12.3 Sediment Management*

Approximately 4.3 million cubic yards of sediment have accumulated upstream of the dams. Sediment testing indicates generally low contamination levels, supporting the feasibility of passive sediment management. Under Alternative 1, the river is allowed to naturally mobilize and redistribute sediment over time. While short-term turbidity and localized deposition are anticipated, analyses indicate that these impacts are manageable and diminish as the system reaches equilibrium. This approach restores natural sediment transport processes, which are essential to long-term channel stability, habitat formation, and downstream system health. While passive management is expected to be the final approach, additional sediment and background samples and further review may determine otherwise. Requiring active sediment management would be a significant cost burden to the project as discussed in 6.2.3 of this report.

### *12.4 Recreational Impacts*

Recreational opportunities are improved or diminished depending on perspective. While there are those who prefer the opportunities provided by the existing impoundment, there are those who would prefer the opportunities from a natural, connected river. The upstream pool created by the two dams currently offers a large area of calm water, popular for boating and water skiing. Dam removal would lower the pool depth, limiting these activities; however, it would benefit fish habitat, enhance angling opportunities, and open the river to paddlers, creating a continuous boating connection to the Mississippi River.

Implementation of Alternative 1 will transition the river from a pooled, flatwater system to a more natural, free-flowing condition. While this represents a change in use for some stakeholders, it:

- Eliminates dangerous boating hazards at the dams

- Restores continuous navigation along the river corridor
- Enhances opportunities for paddling, fishing, and river-based recreation

### *12.5 Regulatory Considerations*

All potential alternatives require compliance with Clean Water Act Sections 404 and 401, the Endangered Species Act, and floodplain management regulations. IEPA is the primary regulatory agency for dam removal permitting. IDNR-OWR is primary regulatory agency for dam modifications. The USACE regulates waters of the US and will also have regulatory review of proposed river and bank modifications outside of the immediate dam sites.

### *12.6 Cost, Maintenance, and Long-Term Sustainability*

Alternative 1 represents one of the most cost-effective options when both initial construction and long-term considerations are evaluated. While removal requires a significant upfront investment, it:

- Eliminates ongoing maintenance associated with dam structures (e.g., inspections, debris removal, structural repairs, erosion and scour repairs)
- Avoids future rehabilitation costs
- Reduces long-term liability associated with public safety hazards

In contrast, modification alternatives require continued inspection, maintenance, and risk management. Alternative 1 provides the lowest lifecycle cost and the most sustainable long-term solution.

### *12.7 Alternatives Evaluation and Recommendation*

All alternatives were evaluated against project goals including safety, cost, maintenance, ecological benefit, constructability and recreation. While partial-removal and modification alternatives provide incremental improvements, they:

- Retain some level of hydraulic hazard
- Provide reduced ecological benefits
- Require ongoing maintenance and higher long-term costs

Alternative 1 consistently ranked highest across key evaluation criteria, offering the best balance of effectiveness, feasibility, and long-term value. Based on the findings of this study, Alternative 1 – Full Removal of Sears and Steel Dams with passive sediment management is recommended for implementation. This alternative:

- Maximizes public safety by eliminating dam hazards
- Restores ecological connectivity and river function
- Provides a cost-effective and sustainable long-term solution
- Aligns with IDNR-OWR constructability goals and regulatory objectives

While implementation will require careful planning, particularly with respect to sediment release, bank stabilization, and stakeholder coordination, Alternative 1 represents the most effective and defensible path forward for improving safety and restoring the Rock River system.

## References

Alden, W.C. (1918). The quarternary geology of southeastern Wisconsin: Reston Virginia, U.S. Geological Survey, Professional Paper 106, 356p.

Alla, Y. M. K., & Lee Liu, R. (2021). Impacts of Dams on the Environment: A Review. International Journal of Environment Agriculture and Biotechnology, 6(1), 64–74.

Anderson, R.C. (1967). Sand and gravel resources along the Rock River in Illinois: Illinois State Geological Survey circular 414, 17p.

Anderson, R.C. (2005). Geomorphic history of the Rock River, South-Central Wisconsin, Northwestern Illinois. Circular 565, Augustana College. Illinois Dept. Nat. Res./Illinois Geol. Survey, Champaign, IL.

Armstrong, J. E., Crandell, D. R., Easterbrook, D. J., & Noble, J. B. (1965). Late Pleistocene stratigraphy and chronology in southwestern British Columbia and northwestern Washington. Geological Society of America Bulletin, 76(3), 321–330.

Armstrong, R.J. (1961).The Illinois and Mississippi (Hennepin) Canal, unpublished master's thesis, Illinois State University at Normal.

Bales, S. A., Price, A. L., Shasteen, D. K., & Shilts, W. (2012). Freshwater Mussels of the Rock River. Technical Report.

Bauer, G., & Wächtler, K. (2001). Environmental Relationships of Naiads: Threats, Impact on the Ecosystem, Indicator Function. In G. Bauer & K. Wächtler (Eds.), Ecology and Evolution of the Freshwater Mussels Unionoida (pp. 311–315). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-56869-5_16

Baxter, R.M. (1977). Environmental effects of dams and impoundments. Ann. Rev. of Ecol. and Systematics 8:255-283.

Bednarek, A. (2001). Undamming Rivers: A Review of the Ecological Impacts of Dam Removal. Environmental Management 27, 803–814.

Bhowmik, N. G., Rodger, A., Bonini, A. P., Klock, A. M., & Demissie, M. (1986). Sediment Loads of Illinois Streams and Rivers. Report of Investigation, 106.

Buchman, M.F., (1999), NOAA Screening Quick Reference Tables, NOAA HAZMAT report 99-1, Seattle, WA. Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12p

Carman, J.E. (1909). The Mississippi Valley between Savanna and Davenport: Illinois State Geological Survey Bulletin 13, 96p.

Collins. M.J., Snyder, N. P., Boardman, G., Banks, W.S.L., Andrews, M., Baker, M.E., Conlon, M., Gellis, A. McClain, S., Miller, A., and Wilcock, P. (2017). Channel response to sediment release: insights from a paired analysis of dam removal. Earth Surface Processes and Landforms.

Cordone, A.J., and D.W. Kelly. (1961). The influences of inorganic sediment on aquatic life of streams. California Fish and Game 47:189-228.

Cumming, G. (2004). The impact of low-head dams on fish species richness in Wisconsin, USA. Ecological Applications - ECOL APPL, 14, 1495–1506. https://doi.org/10.1890/03-5306

Freeman, J.W., & Garcia, M.H. (1996). *Hydraulic Model Study for the Drown Proofing of Yorkville Dam, Illinois* (Hydraulic Engineering Series No. 50). University of Illinois at Urbana-Champaign.

Enviroscience (2025a). Rock River sampling and analysis plan: Project No. 24-0737. Report to Illinois Dept. of Nat. Res., Stow, OH.

Enviroscience (2025b). Rock River sediment analysis: Project No. 24-0737. Report to the Illinois Dept. of Nat. Res., Stow, OH.

Graf, J. B. (1983). Measurement of Bedload Discharge in Nine Illinois Streams with the Helley-Smith Sampler. Water-Resources Investigations Report, 83–4136.

Hornbach, D. J. (2001). Macrohabitat Factors Influencing the Distribution of Naiads in the St. Croix River, Minnesota and Wisconsin, USA. In K. Bauer Gerhard and Wächtler (Ed.), Ecology and Evolution of the Freshwater Mussels Unionoida (pp. 213–230). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-56869-5_12

Hotchkiss, R.H., Hansen, F.R. (2023). *Low-head Dams: Status and Legal Issues*. The Journal of Dam Safety, Winter, Volume 20, Issue 1.

Hotchkiss, R.H., Schweiger, P., & Kingery, K. (2025, April 8). *Low-head Dams: Mitigating Danger and Liability* [Webinar]. Association of State Dam Safety Officials. Retrieved from https://damsafety.org/training-center/webinar/low-head-dams-mitigating-danger-and-liability

Illinois Department of Natural Resources. (2007). Evaluation of Public Safety at Run-of-River Dams: An Illinois Statewide Program.

Illinois Department of Natural Resources. (n.d.). Stocking information for Rock River. Retrieved August 7, 2024, from https://ifishillinois.org/programs/waterbody_stocking.php?waternum=00534

Illinois Environmental Protection Agency (IEPA). (2007). Wetland Monitoring and Assessment Program for the State of Illinois. IEPA/BOW/07-020. Illinois Environmental Protection Agency – Bureau of Water. September 2007. 128 pp. https://epa.illinois.gov/content/dam/soi/en/web/epa/documents/water/water-quality/report-2007/wetlandfinaloct152007.pdf. Accessed September 2025.

Illinois Environmental Protection Agency (IEPA). (2024). Illinois Integrated Water Quality Report and Section 303(d) List, 2024 Draft. https://epa.illinois.gov/content/dam/soi/en/web/epa/topics/water-quality/watershed-management/tmdls/documents/303d/2024-IR.pdf. Accessed July 2024.

IEPA. (2025). IEPA Integrated Report Companion App. https://experience.arcgis.com/experience/df4e286ea87840cdbd54c8caa08b609a#data_s=id%3A992b4dbfa2754b7597fb7a134ab1cd3c-196d4781b17-layer-14-1%3A805. Accessed July 2025.

IEPA. (2026). Environmental Justice (EJ) Policy. Available at https://epa.illinois.gov/topics/environmental-justice/ej-policy.html. Accessed June 2026.

Inter-Fluve. (2025). Existing Conditions Summary Report for the Dam Safety Feasibility Study for Sears & Steel Dams. Manuscript in preparation.

Kanehl, P.D., J. Lyons, and J.E. Nelson. (1997). Changes in the habitat and fish community of the Milwaukee River, Wisconsin, following removal of the Wollen Mills Dam. N. Am. J. Fish. Mgmt 17:387-400.

Landers, J. (2021). Engineers Work to Reduce Drowning Deaths at Low-Head Dams. Civil Engineering Magazine. American Society of Civil Engineers. https://www.asce.org/publications-and-news/civil-engineering-source/civilengineering-magazine/article/2021/01/engineers-work-to-reduce-drowning-deaths-at-low-head-dams/

Leverett, F. (1899). The Illinois glacial lobe: U.S. Geological Survey Monograph 38, 817p.

Ligon, F.K., Dietrich, W.E., and W.J. Trush. (1995). Downstream ecological effects of dams: a geomorphic perspective. Bioscience 45(3) 183-192.

MacDonald, D.D., C.G. Ingersoll, and T.A. Berger,( 2000). Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems. Archives of Environmental Contamination and Toxicology, 39 20-31.

Ontario (1993) or Persaud, D.R., R. Jaagumagi, and A. Hayton. (1993). Guidelines for the protection and management of aquatic sediments in Ontario. Standards Development Branch. Ontario Ministry of Environment and Energy. Toronto, Canada.

Peake, S.J., Beamish, F.W.H., McKinley, R.S., Scruton, D.A. & Katopodis, C. (1997). Relating swimming performance of lake sturgeon, Acipenser fulvescens, to fishway design. Canadian Journal of Fisheries and Aquatic Sciences, 54, 1361–1366.

Peake, S. (2008). Passage performance of walleye, northern pike, and white sucker in an experimental culvert. North American Journal of Fisheries Management, 28, 321–327.

Pearson, A.J., Snyder, N.P., Collins, M.J. (2011). Rates and process of channel response to dam removal with a sand-filled impoundment. Water Resources Research. v. 47.

Petts, G.E., (1984). Impounded rivers, perspectives for ecological management, John Wiley and Sons, New York, NY, 326p.

Porto, L. M., McLaughlin, R. L., & Noakes, D. L. G. (1999). Low-Head Barrier Dams Restrict the Movements of Fishes in Two Lake Ontario Streams. North American Journal of Fisheries Management, 19(4), 1028–1036. https://doi.org/10.1577/1548-8675(1999)019<1028:LHBDRT>2.0.CO;2

Sanborn (1888). Sanborn Fire Insurance Map, Milan, IL. Sanborn Map and Publishing Company, Pelham, NY.

Savage, T.E. and J. A Udden. (1921). The geology and mineral resources of the Edgington and Milan Quadrangles: Illinois State Geological Survey Bulletin 38B, 68p.

Sethi, S. A., Selle, A. R., Doyle, M. W., Stanley, E. H., & Kitchel, H. E. (2004). Response of Unionid Mussels to Dam Removal in Koshkonong Creek, Wisconsin (USA). Hydrobiologia, 525(1), 157–165. https://doi.org/10.1023/B:HYDR.0000038862.63229.56

Singh, K. P., Stall, J. B., & Quinn, F. H. (1988). Trends in low flows and flow-duration characteristics of Illinois streams. Illinois State Water Survey Report of Investigations No. 140. Champaign, IL: Illinois State Water Survey.

Smith, S., Colombo, R.E., Thomas, T. and D.B. Keeney. (2019). Dissimilar effects of low-head dams on the genetic structure of riverine fishes. Freshwater Science. 2019. 38(1):92–102.

Smith, S., Meiners, S., Hastings, R., Thomas, T., and R. Columbo. (2016). Low-head Dam Impacts on Habitat and the Functional Composition of Fish Communities. River Research and Applications, 33(5), pp 680-689.

Stanley, E.H., and M.W. Doyle. (2003). Trading off: The ecological effects of dam removal. Front. Ecol. Environ. 1(1): 15-22.

Sumaiya, S., Czuba, J. A., Schubert, J. T., David, S. R., Johnston, G. H., & Edmonds, D. A. (2021). Sediment transport potential in a hydraulically connected river and floodplain-channel system. Water Resources Research, 57, e2020WR028852. https://doi.org/10.1029/2020WR028852

Tiemann, J. S., Douglass, S. A., Stodola, A. P., & Cummings, K. S. (2016). Effects of lowhead dams on freshwater mussels in the Vermilion River Basin, Illinois, with comments on a natural dam removal. Transactions of the Illinois State Academy of Science, 109, 1+. https://link.gale.com/apps/doc/A478973831/AONE?u=anon~2c617514&sid=googleScholar&xid=ff5e0e65

Tiemann, J., Gillette, D., Wildhaber, M., & Edds, D. (2004). Effects of Lowhead Dams on Riffle-Dwelling Fishes and Macroinvertebrates in a Midwestern River. Transactions of The American Fisheries Society - TRANS AMER FISH SOC, 133, 705–717. https://doi.org/10.1577/T03-058.1

U.S. Army Corps of Engineers (USACE). (2010). Illinois Stream Mitigation Guidance – Stream Mitigation Method for Processing Section 404 Clean Water Act Permit Applications in the State of Illinois. Version 1.0. March 2010. 19 pp. https://www.mvr.usace.army.mil/Portals/48/docs/regulatory/mitigation/IllinoisMethod.pdf. Accessed September 2025.

U.S. Army Corps of Engineers, Rock Island District. (2014). Rock River Hydraulic Analysis, Whiteside, Henry and Rock Island Counties, Illinois.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. (2024a). Hydraulic Engineering Center River Analysis System (HEC-RAS) 2D User's Manual.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. (2024b). Hydraulic Engineering Center River Analysis System (HEC-RAS) Hydraulic Reference Manual.

United States Census Bureau (USCB). (2023a). ACS Demographics and Housing Estimates. 2019-2023 American Community Survey, Table DP05,2023. Available at https://data.census.gov/table/ACSDP5Y2023.DP05?q=rock+island+county+Illinois+population+2023. Accessed August 2025.

United States Census Bureau (USCB). (2023b). Selected Economic Characteristics. 2019-2023 American Community Survey, Table DP03,2023. Available at https://data.census.gov/table/ACSDP5Y2023.DP03?q=rock+island+county+illinois+employment+2023. Accessed August 2025.

US Environmental Protection Agency (USEPA). (2025). How's My Waterway? Case Creek – Rock River Watershed. https://mywaterway.epa.gov/community/070900051302/overview. Accessed July 2025.

U.S. Fish and Wildlife Service (USFWS). (2021). Recovery Plan for Rusty Patched Bumble Bee (Bombus affinis). July 2021. 16 pp. https://www.fws.gov/sites/default/files/documents/Final%20Recovery%20Plan%20_Rusty%20Patched%20Bumble%20Bee_2021.pdf. Accessed September 2025.

U.S. Fish and Wildlife Service (USFWS). (2024). Range-Wide Indiana Bat and Northern Long-eared Bat Survey Guidelines. March 2024. 97 pp. https://www.fws.gov/sites/default/files/documents/2024-03/usfws_range-wide_ibat-nleb_survey_guidelines_1.pdf. Accessed September 2025.

U.S. Geological Survey. (1837). United States Government Land Office Survey Plat (Township 17 North, Range 2 West, Rock Island County, Illinois). Illinois State Archives, Springfield, Illinois.

U.S. Geological Survey. (2023). 1 meter Digital Elevation Models (DEMs) - USGS National Map 3DEP Downloadable Data Collection: U.S. Geological Survey.

U.S. Geological Survey. (2024). Annual NLCD Collection 1 Science Products: U.S. Geological Survey data release.

Wahl, T.L., & Svoboda, C.D. (2023). A spreadsheet tool for defining dangerous flow ranges of low-head dams. *Water*, 15(6), 1032. https://doi.org/10.3390/w15061032

Watters, G. T. (1996). Small dams as barriers to freshwater mussels (Bivalvia, Unionoida) and their hosts. Biological Conservation, 75(1), 79–85. https://doi.org/https://doi.org/10.1016/0006-3207(95)00034-8

Williams, J. D., Warren Jr., M. L., Cummings, K. S., Harris, J. L., & Neves, R. J. (1993). Conservation Status of Freshwater Mussels of the United States and Canada. Fisheries, 18(9), 6–22. https://doi.org/https://doi.org/10.1577/1548-8446(1993)018<0006:CSOFMO>2.0.CO;2

WQAD, Shellie Nelson (2013). One dead and one rescued after jet skis cross dam on Rock River. https://www.wqad.com/article/news/local/drone/8-in-the-air/one-dead-one-rescued-after-jet-skis-cross-dam-on-rock-river/526-a1085591-d3d4-469f-a422-6ddb35508d21

WQAD, Digital Team (2018). 5-year-old drowning victim found in Mississippi River. https://www.wqad.com/article/news/local/drone/8-in-the-air/emergency-crews-perform-river-rescue-at-steel-dam/526-85323605-8963-4bf0-970a-6637f2c08754

WQAD, Eric Sorensen (2020). Life jackets may decrease your survival odds at a low head dam; new dam design eliminates risk. https://www.wqad.com/article/news/safety-around-low-head-dams/526-16c95c6e-13a8-40ac-9054-2a32ec909485

WQAD, Luke Cleary (2020). Illinois DNR: 2 people died in Rock River boating accident. https://www.wqad.com/article/news/local/river-rescue-crews-pull-four-boaters-from-the-rock-river/526-f94ddcff-9b40-43c9-adb3-ed973c5936ed

WQAD, Harrison Belsanti (2025). Following tragic incidents, Illinois evaluating safety of two Rock River dams. https://www.wqad.com/article/news/local/public-safety/safety-of-two-rock-river-dams-in-rock-island-county-under-review-by-state/526-a25369ce-af77-4169-9fc3-414862788999

Yeater, Mary (1979). The Hennepin Canal: Being a reprint of articles published in American canals, November 1976 through August 1978, Illinois Department of Conservation.

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*Appendix C – Inter-Fluve: "Existing Conditions Summary and Restoration Alternatives Evaluation". 2026.*

*Appendix D – EnviroScience: "Rock River Sediment Analysis". 2025.*

*Appendix E – IDNR-OWR: "Steel Dam on Rock River at Milan, Illinois". 1987.*

*Appendix F – Hanson: "Existing Conditions Hydrology and Hydraulics". 2025.*

*Appendix G - Prairie: "Sears and Steel Dams Wetland Delineation Report". 2025.*

*Appendix H - IDNR-OWR: "Public Outreach Comments". 2026.*

# APPENDIX A - Concept Plan Set

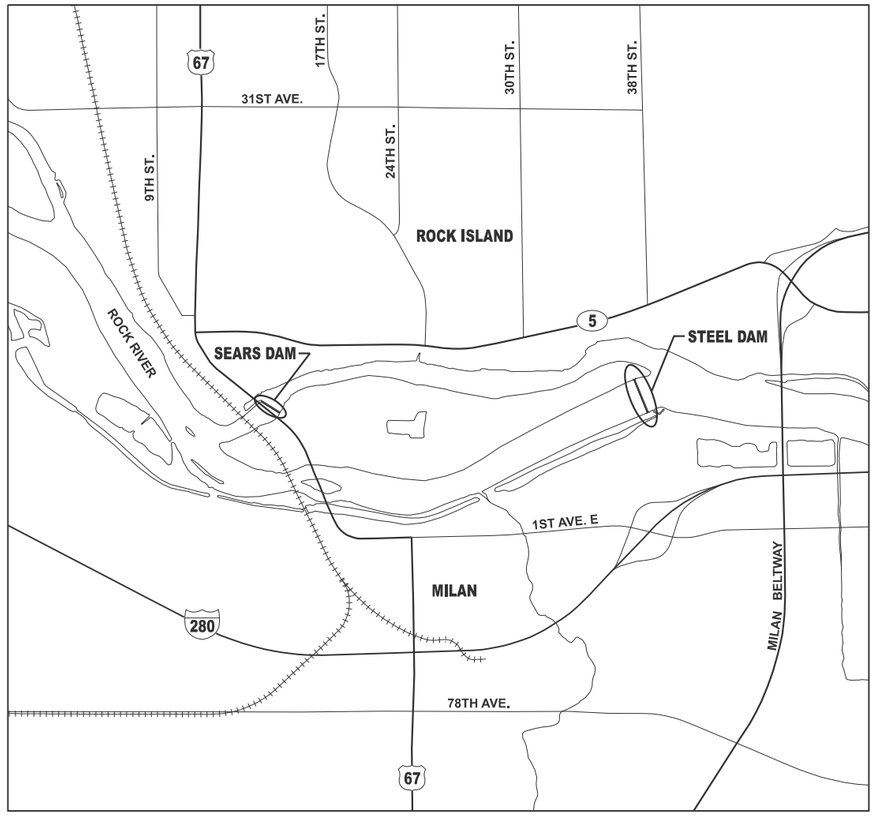
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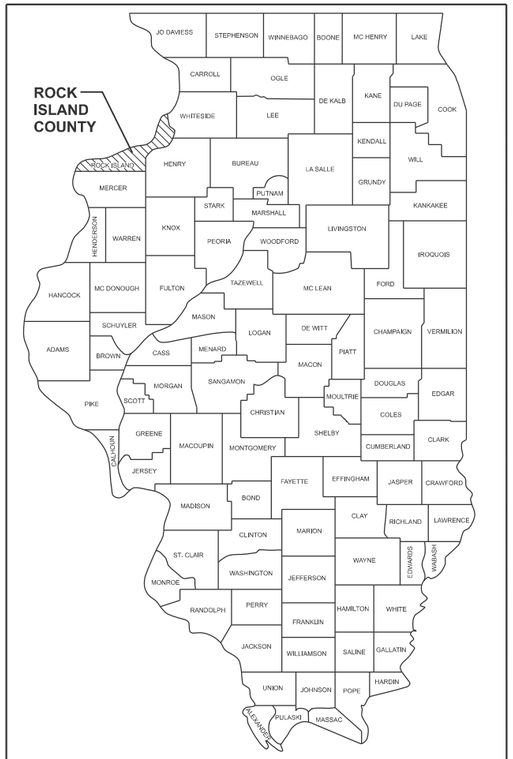
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**IDNR PROJECT NO. 0WR-415**

# CONCEPT PLANS
# DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS (ALTERNATIVES 1 THRU 5)
# ROCK ISLAND COUNTY, ILLINOIS




**LOCATION MAP**



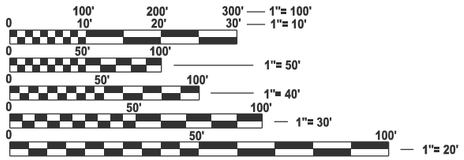

**REGIONAL MAP**

**PREPARED BY:**

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1525 South Sixth Street
Springfield, Illinois 62703-2886
Offices Nationwide


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**FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.**

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**CONCEPT PLANS**

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| S-101 | OVERALL SITE PLAN |
| S-102 | SITE PLAN - SEARS |
| S-103 | SITE PLAN - STEEL |
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| S-108B | STEEL DAM STEPPED SPILLWAY DETAILS (ALTERNATIVE 2) |
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| S-108D | STEEL DAM RIFFLES DETAILS (ALTERNATIVE 4) |
| S-108E | STEEL DAM FISH PASSAGE DETAILS (ALTERNATIVE 5) |

STANDARD ABBREVIATIONS

| | | | |
|---|---|---|---|
| BOT | BOTTOM | NTS | NOT TO SCALE |
| CL | CENTERLINE | O.C. | ON CENTER |
| CJ | CONSTRUCTION JOINT | POB | POINT OF BEGINNING |
| COR | CONTRACTING OFFICER'S REPRESENTATIVE | POE | POINT OF END |
| DIA | DIAMETER | POT | POINT ON TANGENT |
| DNR | DEPARTMENT OF NATURAL RESOURCES | PCF | POUNDS PER CUBIC FOOT |
| EA | EACH | PSF | POUNDS PER SQUARE FOOT |
| EL. | ELEVATION | REQ'D | REQUIRED |
| ELEV | ELEVATION | SHT | SHEET |
| EJ | EXPANSION JOINT | SSP | STEEL SHEET PILE |
| EXIST | EXISTING | STA | STATION |
| HWL | HIGH WATER ELEVATION | T/ | TOP OF |
| H | HORIZONTAL | TYP | TYPICAL |
| K | KIP (1,000 POUNDS) | U.N.O. | UNLESS NOTED OTHERWISE |
| KSI | KIPS PER SQUARE INCH | VIF | VERIFY IN FIELD |
| LWD | LOW WATER DATUM | V | VERTICAL |
| MAX | MAXIMUM | W/ | WITH |
| MIN | MINIMUM | WL | WORK LIMIT |
| N | NORTH | WP | WORK POINT |
| NGVD | NATIONAL GEODETIC VERTICAL DATUM | | |
| NWL | NATURAL WATER LINE | | |
| NAVD | NORTH AMERICAN VERTICAL DATUM | | |

# CONCEPT PLANS

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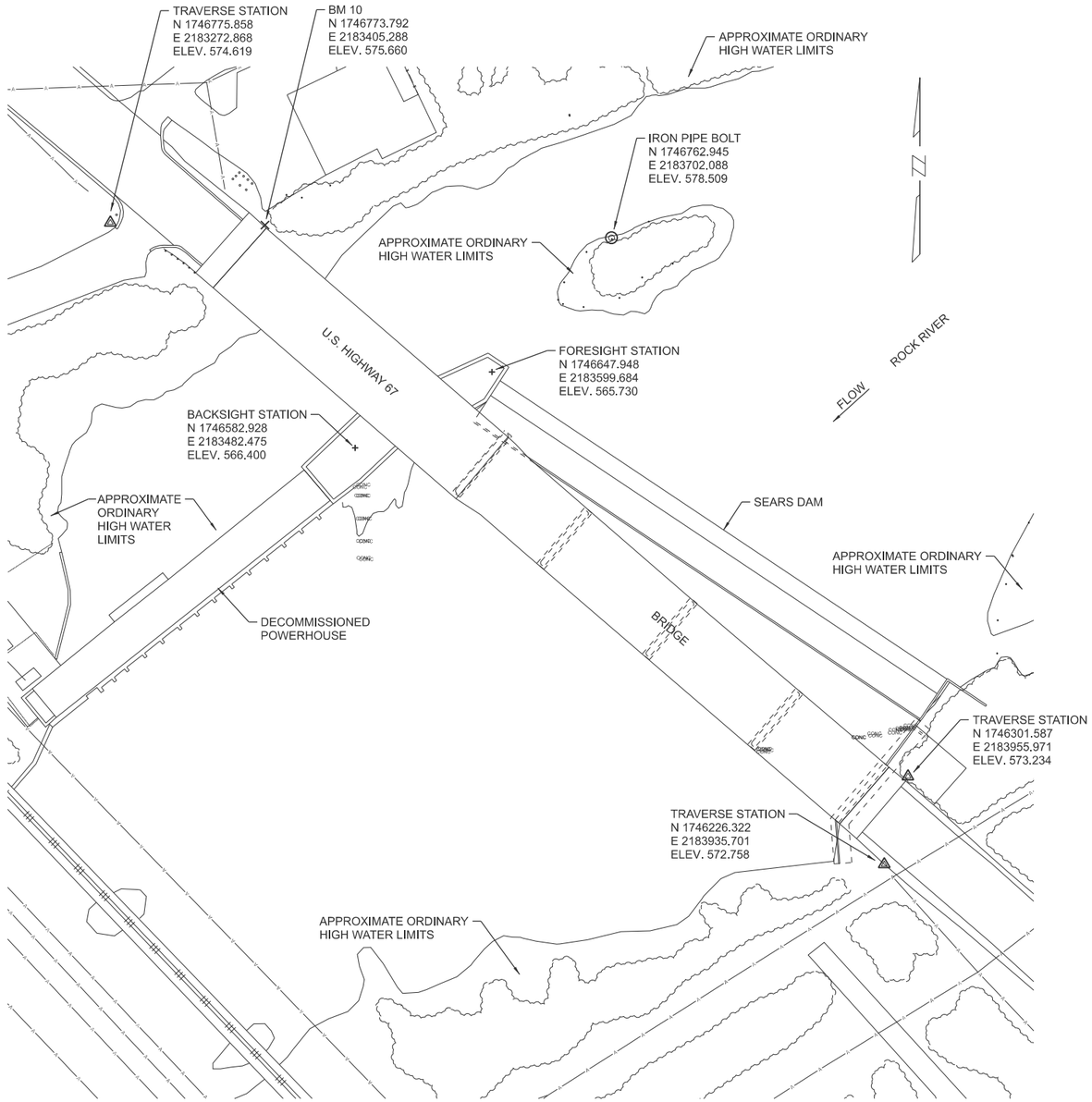
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**SHEET INDEX & ABBREVIATIONS**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

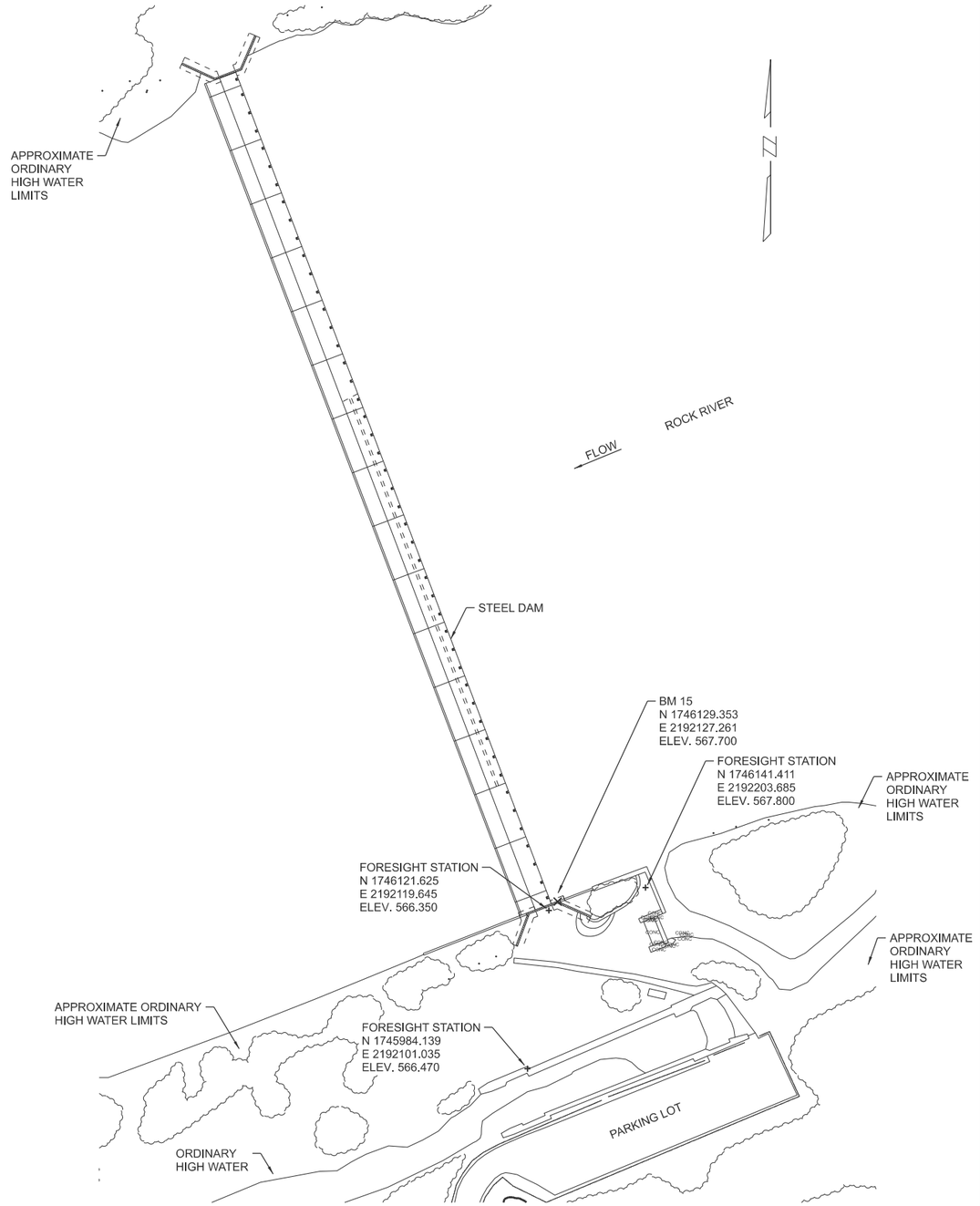
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## EXISTING SURVEY CONTROL - SEARS

0 60 120
SCALE IN FEET




## EXISTING SURVEY CONTROL - STEEL

0 60 120
SCALE IN FEET

# CONCEPT PLANS

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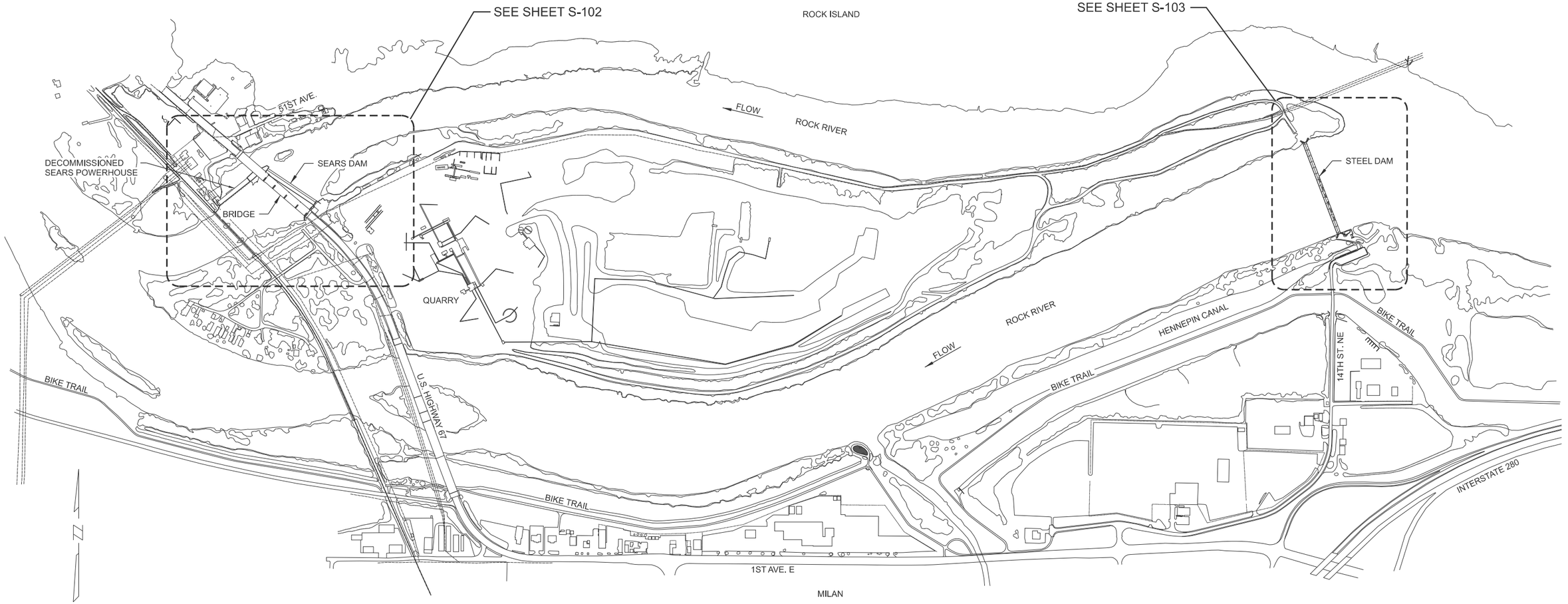
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**DEPARTMENT OF NATURAL RESOURCES**

**EXISTING SURVEY CONTROL**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

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## OVERALL PLAN

0 400 800

SCALE IN FEET

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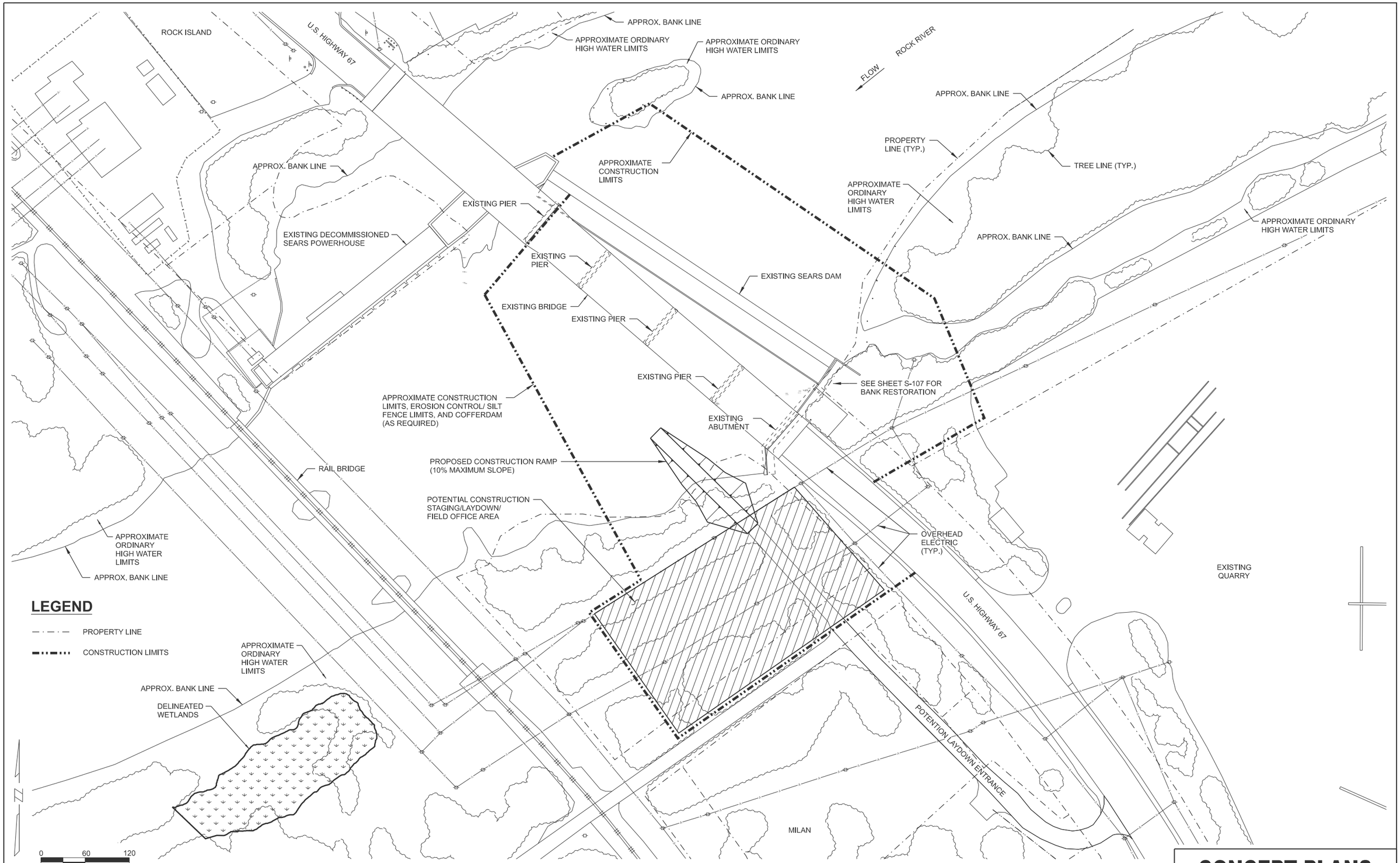
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**OVERALL SITE PLAN**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-101 OF SHEETS | STA. | TO STA.

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## SITE PLAN - SEARS

# CONCEPT PLANS

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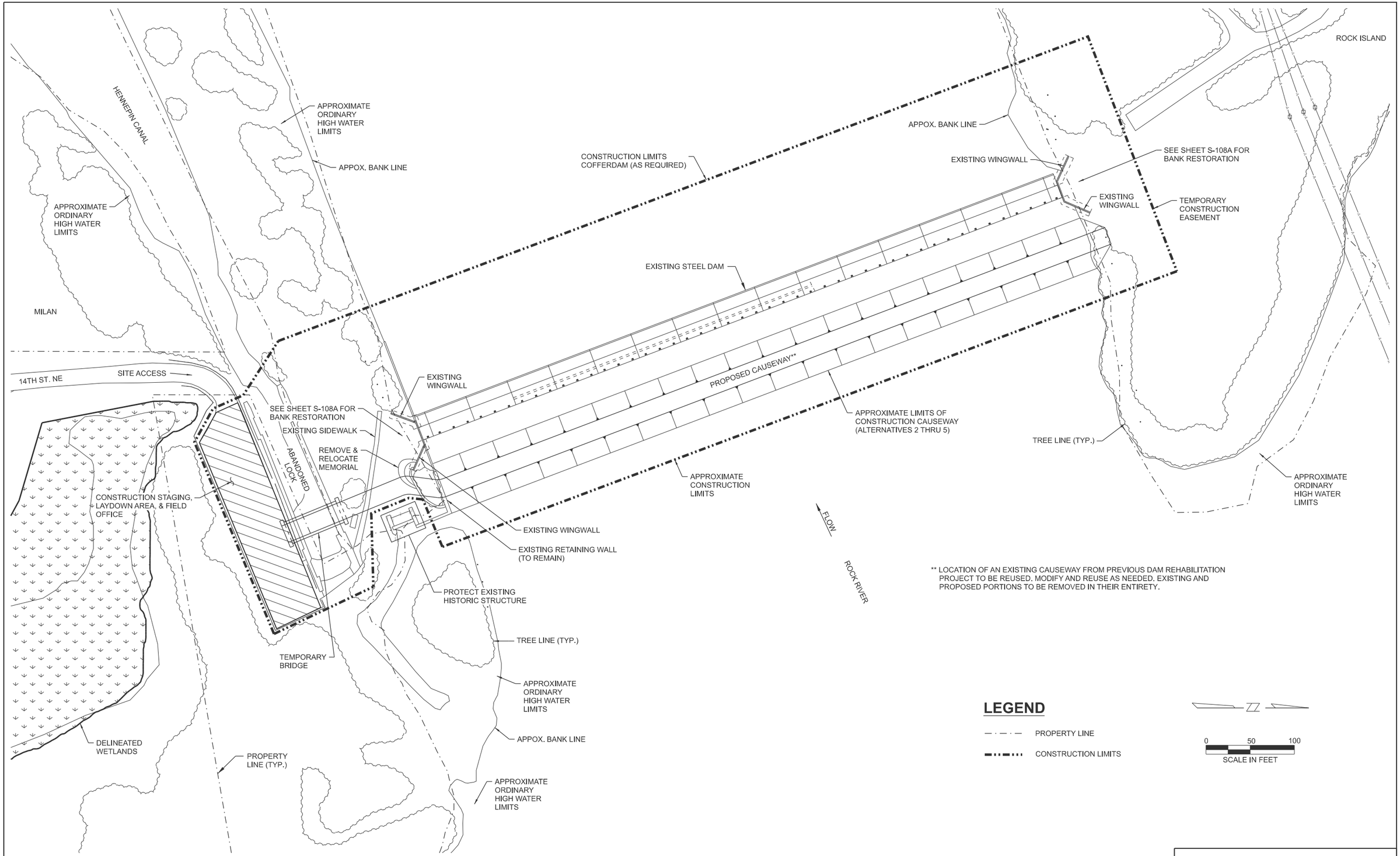
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**SITE PLAN - SEARS**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-102 OF SHEETS | STA. | TO STA.

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| | | ROCK ISLAND | | S-102 |
| | | CONTRACT NO. | | |
| | ILLINOIS | FED. AID PROJECT | | |




** LOCATION OF AN EXISTING CAUSEWAY FROM PREVIOUS DAM REHABILITATION PROJECT TO BE REUSED. MODIFY AND REUSE AS NEEDED. EXISTING AND PROPOSED PORTIONS TO BE REMOVED IN THEIR ENTIRETY.

## SITE PLAN - STEEL

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**DEPARTMENT OF NATURAL RESOURCES**

**SITE PLAN - STEEL**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-103 OF SHEETS | STA. | TO STA.

# CONCEPT PLANS

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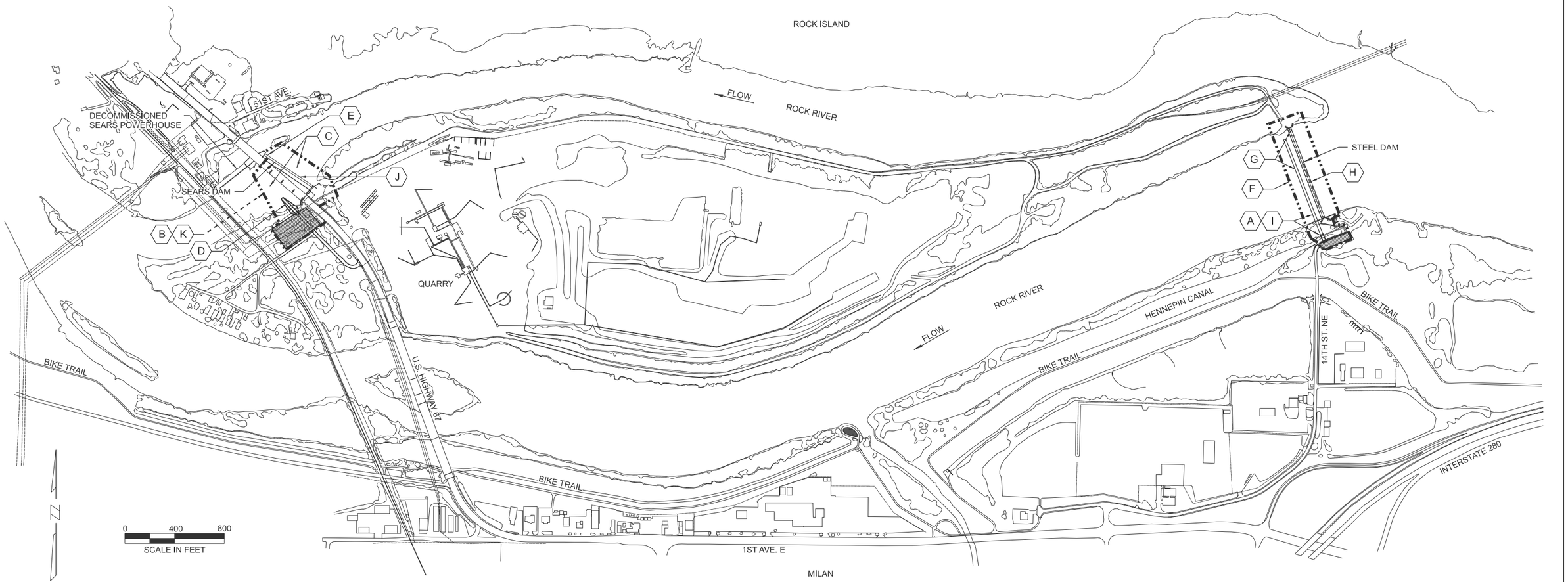
# ALTERNATIVE 1

## ALTERNATIVE 1 SEQUENCING

A. CONSTRUCT TEMPORARY BRIDGE OVER LOCK & HAUL ROAD AT STEEL DAM.
B. CONSTRUCT DOWNSTREAM COFFERDAM AT SEARS.
C. DEWATER DOWNSTREAM CONSTRUCTION LIMITS AT SEARS.
D. PLACE ACCESS RAMP SOUTH OF BRIDGE (MAXIMUM 10% SLOPE) AND CONSTRUCT ACCESS TO THE NORTH END OF SPILLWAY.
E. NOTCH SEARS DAM AT NORTH END TO LOWER UPSTREAM POOL.
F. PLACE TEMPORARY DOWNSTREAM COFFERDAM AT STEEL AS REQUIRED IF TAILWATER POOL DOESN'T RECEDE SUFFICIENTLY.
G. MAKE HAUL ROAD ACCESS DOWNSTREAM OF STEEL DAM AND BEGIN REMOVAL WITH NOTCH AT NORTH END TO LOWER UPSTREAM POOL.
H. REMOVE EXISTING STEEL CONCRETE SPILLWAY IN IT'S ENTIRETY. REMOVE WINGWALLS; RESTORE RIVER BANKS.
I. REMOVE TEMPORARY BRIDGE AND HAUL ROAD; RESTORE SITE.
J. REMOVE EXISTING SEARS CONCRETE SPILLWAY IN IT'S ENTIRETY. REMOVE RETAINING WALL; RESTORE RIVER BANK.
K. REMOVE DOWNSTREAM COFFERDAM; RESTORE SITE.

## GENERAL DAM REMOVAL NOTES

1. A NOTCH CAN BE MADE IN DAM TO LOWER THE UPSTREAM POOL. CONTRACTOR SHALL ENSURE NOTCH MEETS ALL PROJECT HYDRAULIC AND DESIGN CRITERIA AND SUBMIT TO ENGINEER FOR APPROVAL.
2. DAM REMOVAL MATERIAL SHALL BECOME PROPERTY OF CONTRACTOR AND SHALL BE REMOVED FROM SITE. MATERIAL SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL STATE AND FEDERAL GUIDELINES.
3. RIVER BED MATERIAL REMOVED FOR DAM REMOVAL WORK SHALL BE MINIMIZED. THE CONTRACTOR SHALL SUBMIT A SOIL REMOVAL PLAN TO ENGINEER FOR APPROVAL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO TEST SOIL TO BE REMOVED IN ACCORDANCE WITH ARTICLE 669 OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE DESIGN AND ILLINOIS TITLE 35: SUBTITLE J: CHAPTER I: PART 1100 TO DETERMINE IF THE SOILS ARE ELIGIBLE FOR CCDD DISPOSAL. SOIL SHALL BE DISPOSED OF ACCORDINGLY.




## CONSTRUCTION SEQUENCING

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**CONSTRUCTION SEQUENCING (ALTERNATIVE 1)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

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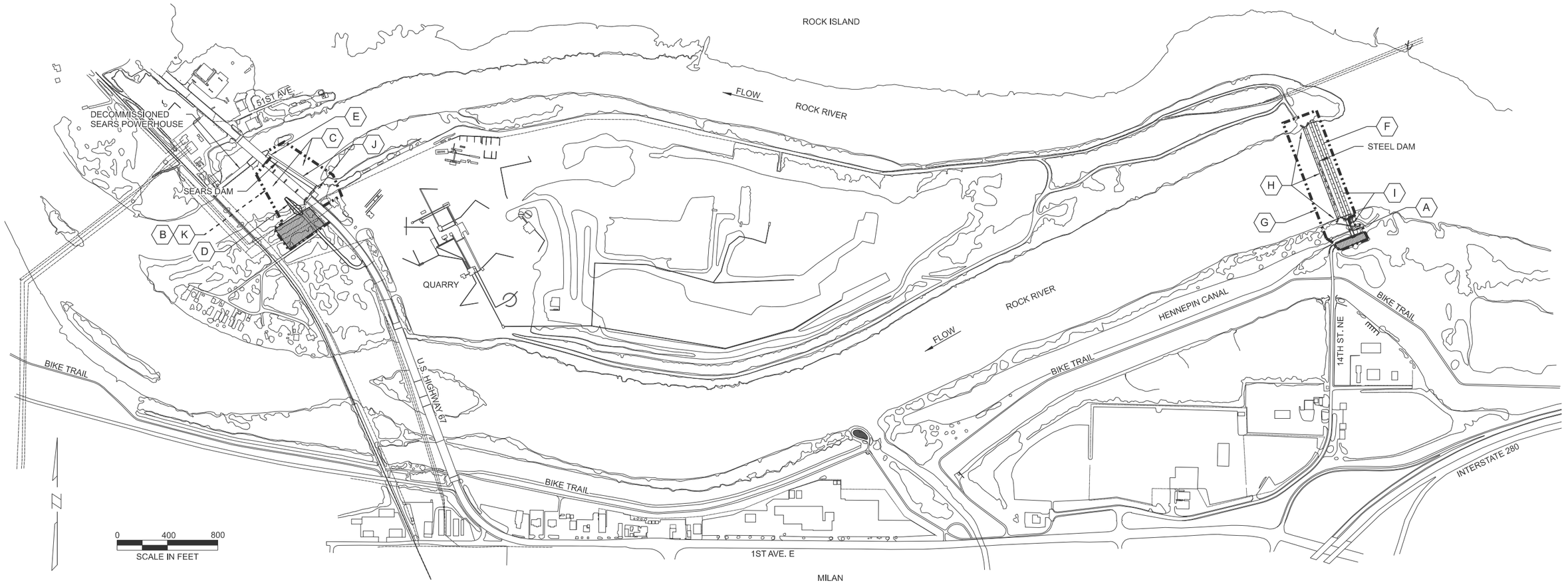
# ALTERNATIVE 2

## ALTERNATIVE 2 SEQUENCING

A. CONSTRUCT TEMPORARY BRIDGE OVER LOCK & HAUL ROAD AT STEEL DAM.
B. CONSTRUCT DOWNSTREAM COFFERDAM AT SEARS.
C. DEWATER DOWNSTREAM CONSTRUCTION LIMITS AT SEARS.
D. PLACE ACCESS RAMP SOUTH OF BRIDGE (MAXIMUM 10% SLOPE) AND CONSTRUCT ACCESS TO THE NORTH END OF SPILLWAY.
E. NOTCH SEARS DAM AT NORTH END TO LOWER UPSTREAM POOL.
F. CONSTRUCT UPSTREAM CAUSEWAY AT STEEL.
G. PLACE TEMPORARY DOWNSTREAM COFFERDAM AT STEEL AS REQUIRED IF TAILWATER POOL DOESN'T RECEDE SUFFICIENTLY AND DEWATER.
H. CONSTRUCT STEPPED SPILLWAY & PLACE DOWNSTREAM RIPRAP.
I. REMOVE TEMPORARY BRIDGE AND HAUL ROAD; RESTORE SITE.
J. REMOVE EXISTING SEARS CONCRETE SPILLWAY IN IT'S ENTIRETY. REMOVE RETAINING WALL; RESTORE RIVER BANK.
K. REMOVE DOWNSTREAM COFFERDAM; RESTORE SITE.

## GENERAL DAM REMOVAL NOTES

1. A NOTCH CAN BE MADE IN DAM TO LOWER THE UPSTREAM POOL. CONTRACTOR SHALL ENSURE NOTCH MEETS ALL PROJECT HYDRAULIC AND DESIGN CRITERIA AND SUBMIT TO ENGINEER FOR APPROVAL.
2. DAM REMOVAL MATERIAL SHALL BECOME PROPERTY OF CONTRACTOR AND SHALL BE REMOVED FROM SITE. MATERIAL SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL STATE AND FEDERAL GUIDELINES.
3. RIVER BED MATERIAL REMOVED FOR DAM REMOVAL WORK SHALL BE MINIMIZED. THE CONTRACTOR SHALL SUBMIT A SOIL REMOVAL PLAN TO ENGINEER FOR APPROVAL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO TEST SOIL TO BE REMOVED IN ACCORDANCE WITH ARTICLE 669 OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE DESIGN AND ILLINOIS TITLE 35: SUBTITLE J: CHAPTER I: PART 1100 TO DETERMINE IF THE SOILS ARE ELIGIBLE FOR CCDD DISPOSAL. SOIL SHALL BE DISPOSED OF ACCORDINGLY.




## CONSTRUCTION SEQUENCING

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**CONSTRUCTION SEQUENCING (ALTERNATIVE 2)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-104B OF SHEETS | STA. | TO STA.

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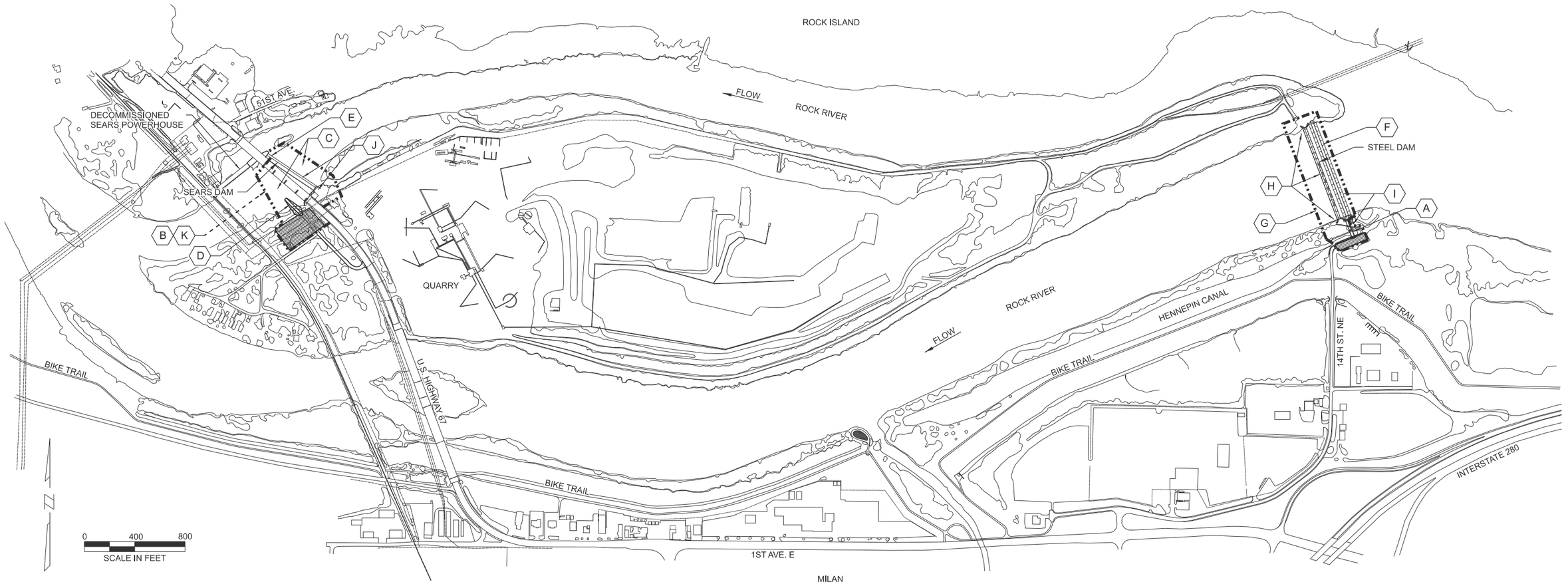
# ALTERNATIVE 3

## ALTERNATIVE 3 SEQUENCING

A. CONSTRUCT TEMPORARY BRIDGE OVER LOCK & HAUL ROAD AT STEEL DAM.
B. CONSTRUCT DOWNSTREAM COFFERDAM AT SEARS.
C. DEWATER DOWNSTREAM CONSTRUCTION LIMITS AT SEARS.
D. PLACE ACCESS RAMP SOUTH OF BRIDGE (MAXIMUM 10% SLOPE) AND CONSTRUCT ACCESS TO THE NORTH END OF SPILLWAY.
E. NOTCH SEARS DAM AT NORTH END TO LOWER UPSTREAM POOL.
F. CONSTRUCT UPSTREAM CAUSEWAY AT STEEL.
G. PLACE TEMPORARY DOWNSTREAM COFFERDAM AT STEEL AS REQUIRED IF TAILWATER POOL DOESN'T RECEDE SUFFICIENTLY AND DEWATER.
H. CONSTRUCT DOWNSTREAM RIPRAP RAMP AT STEEL.
I. REMOVE TEMPORARY BRIDGE AND HAUL ROAD; RESTORE SITE.
J. REMOVE EXISTING SEARS CONCRETE SPILLWAY IN IT'S ENTIRETY. REMOVE RETAINING WALL; RESTORE RIVER BANK.
K. REMOVE DOWNSTREAM COFFERDAM; RESTORE SITE.

## GENERAL DAM REMOVAL NOTES

1. A NOTCH CAN BE MADE IN DAM TO LOWER THE UPSTREAM POOL. CONTRACTOR SHALL ENSURE NOTCH MEETS ALL PROJECT HYDRAULIC AND DESIGN CRITERIA AND SUBMIT TO ENGINEER FOR APPROVAL.
2. DAM REMOVAL MATERIAL SHALL BECOME PROPERTY OF CONTRACTOR AND SHALL BE REMOVED FROM SITE. MATERIAL SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL STATE AND FEDERAL GUIDELINES.
3. RIVER BED MATERIAL REMOVED FOR DAM REMOVAL WORK SHALL BE MINIMIZED. THE CONTRACTOR SHALL SUBMIT A SOIL REMOVAL PLAN TO ENGINEER FOR APPROVAL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO TEST SOIL TO BE REMOVED IN ACCORDANCE WITH ARTICLE 669 OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE DESIGN AND ILLINOIS TITLE 35: SUBTITLE J: CHAPTER I: PART 1100 TO DETERMINE IF THE SOILS ARE ELIGIBLE FOR CCDD DISPOSAL. SOIL SHALL BE DISPOSED OF ACCORDINGLY.




## CONSTRUCTION SEQUENCING

# CONCEPT PLANS

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**DEPARTMENT OF NATURAL RESOURCES**

**CONSTRUCTION SEQUENCING (ALTERNATIVE 3)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-104C OF SHEETS | STA. | TO STA.

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| | | ROCK ISLAND | | S-104C |
| | | CONTRACT NO. | | |
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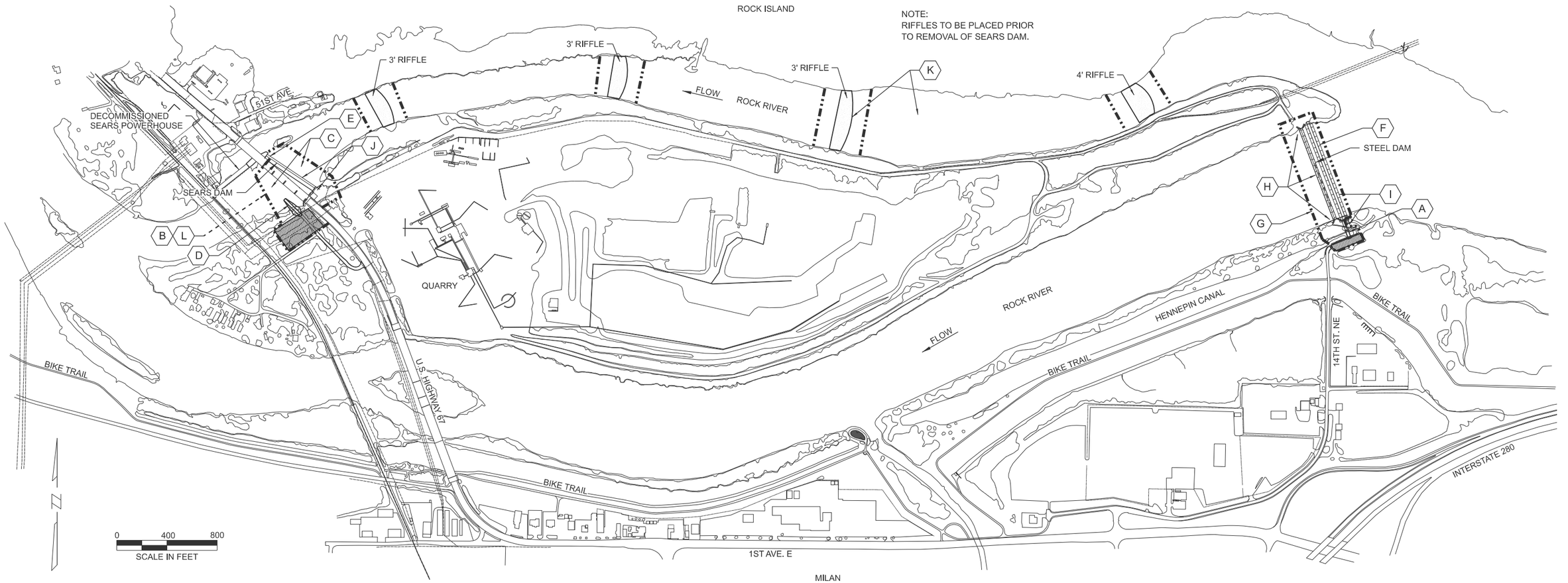
# ALTERNATIVE 4

## ALTERNATIVE 4 SEQUENCING

A. CONSTRUCT TEMPORARY BRIDGE OVER LOCK & HAUL ROAD AT STEEL DAM.
B. CONSTRUCT DOWNSTREAM COFFERDAM AT SEARS.
C. DEWATER DOWNSTREAM CONSTRUCTION LIMITS AT SEARS.
D. PLACE ACCESS RAMP SOUTH OF BRIDGE (MAXIMUM 10% SLOPE) AND CONSTRUCT ACCESS TO THE NORTH END OF SPILLWAY.
E. NOTCH SEARS DAM AT NORTH END TO LOWER UPSTREAM POOL.
F. CONSTRUCT UPSTREAM CAUSEWAY AT STEEL.
G. PLACE TEMPORARY DOWNSTREAM COFFERDAM AT STEEL AS REQUIRED IF TAILWATER POOL DOESN'T RECEDE SUFFICIENTLY AND DEWATER.
H. CONSTRUCT STEPPED SPILLWAY & PLACE DOWNSTREAM RIPRAP.
I. REMOVE TEMPORARY BRIDGE AND HAUL ROAD; RESTORE SITE.
J. REMOVE EXISTING SEARS CONCRETE SPILLWAY IN IT'S ENTIRETY. REMOVE RETAINING WALL; RESTORE RIVER BANK.
K. DEWATER NORTH CHANNEL AND CONSTRUCT RIFFLES.
L. REMOVE DOWNSTREAM COFFERDAM; RESTORE SITE.

## GENERAL DAM REMOVAL NOTES

1. A NOTCH CAN BE MADE IN DAM TO LOWER THE UPSTREAM POOL. CONTRACTOR SHALL ENSURE NOTCH MEETS ALL PROJECT HYDRAULIC AND DESIGN CRITERIA AND SUBMIT TO ENGINEER FOR APPROVAL.
2. DAM REMOVAL MATERIAL SHALL BECOME PROPERTY OF CONTRACTOR AND SHALL BE REMOVED FROM SITE. MATERIAL SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL STATE AND FEDERAL GUIDELINES.
3. RIVER BED MATERIAL REMOVED FOR DAM REMOVAL WORK SHALL BE MINIMIZED. THE CONTRACTOR SHALL SUBMIT A SOIL REMOVAL PLAN TO ENGINEER FOR APPROVAL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO TEST SOIL TO BE REMOVED IN ACCORDANCE WITH ARTICLE 669 OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE DESIGN AND ILLINOIS TITLE 35: SUBTITLE J: CHAPTER I: PART 1100 TO DETERMINE IF THE SOILS ARE ELIGIBLE FOR CCDD DISPOSAL. SOIL SHALL BE DISPOSED OF ACCORDINGLY.




## CONSTRUCTION SEQUENCING

# CONCEPT PLANS

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|---|---|---|---|
| HANSON | USER NAME = - | DESIGNED - | REVISED - |
| | | DRAWN - | REVISED - |
| | | CHECKED - | REVISED - |
| | PLOT DATE = - | DATE - | REVISED - |

**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**CONSTRUCTION SEQUENCING (ALTERNATIVE 4)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-104D OF SHEETS | STA. | TO STA.

| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-104D |
| | | CONTRACT NO. | | |
| | | ILLINOIS | FED. AID PROJECT | |

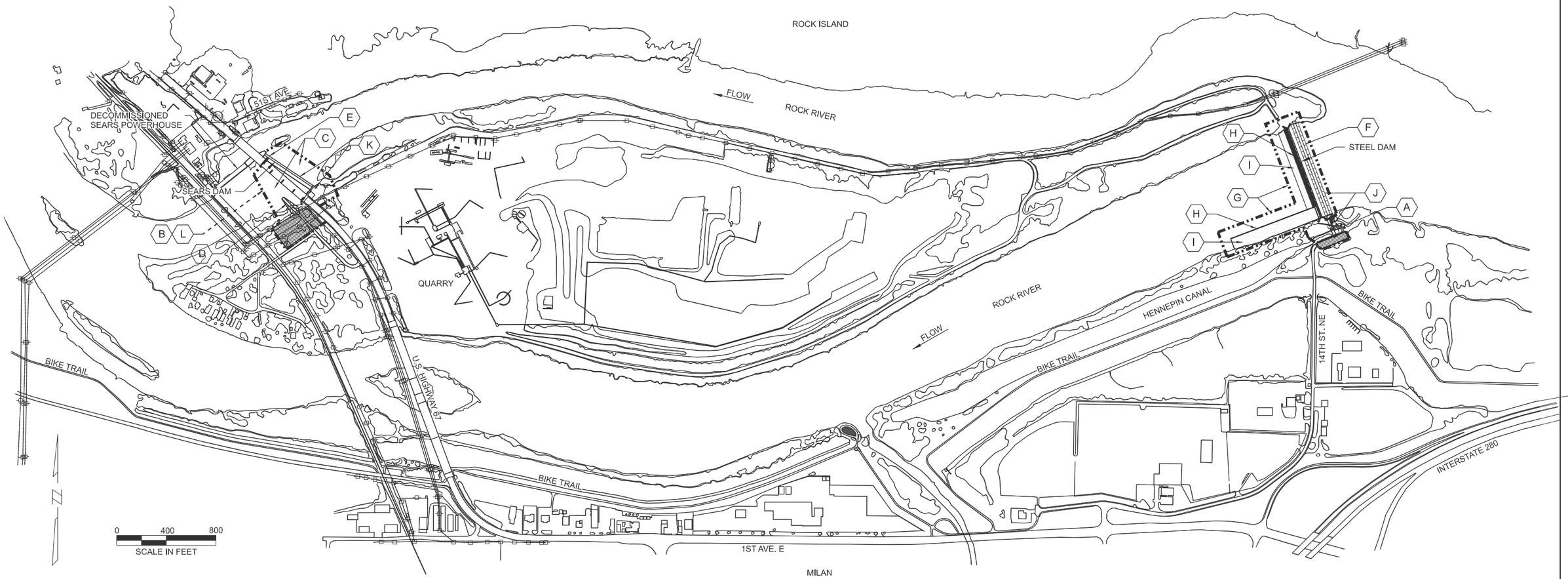
# ALTERNATIVE 5

## ALTERNATIVE 5 SEQUENCING

A. CONSTRUCT TEMPORARY BRIDGE OVER LOCK & HAUL ROAD AT STEEL DAM.
B. CONSTRUCT DOWNSTREAM COFFERDAM AT SEARS.
C. DEWATER DOWNSTREAM CONSTRUCTION LIMITS AT SEARS.
D. PLACE ACCESS RAMP SOUTH OF BRIDGE (MAXIMUM 10% SLOPE) AND CONSTRUCT ACCESS TO THE NORTH END OF SPILLWAY.
E. NOTCH SEARS DAM AT NORTH END TO LOWER UPSTREAM POOL.
F. CONSTRUCT UPSTREAM CAUSEWAY AT STEEL.
G. PLACE TEMPORARY DOWNSTREAM COFFERDAM AT STEEL AS REQUIRED IF TAILWATER POOL DOESN'T RECEDE SUFFICIENTLY AND DEWATER.
H. CONSTRUCT STEPPED SPILLWAY AND FISH PASSAGE WALL.
I. PLACE DOWNSTREAM RIPRAP AND FISH PASSAGE RIPRAP.
J. REMOVE TEMPORARY BRIDGE AND HAUL ROAD; RESTORE SITE.
K. REMOVE EXISTING SEARS CONCRETE SPILLWAY IN IT'S ENTIRETY. REMOVE RETAINING WALL; RESTORE RIVER BANK.
L. REMOVE DOWNSTREAM COFFERDAM; RESTORE SITE.

## GENERAL DAM REMOVAL NOTES

1. A NOTCH CAN BE MADE IN DAM TO LOWER THE UPSTREAM POOL. CONTRACTOR SHALL ENSURE NOTCH MEETS ALL PROJECT HYDRAULIC AND DESIGN CRITERIA AND SUBMIT TO ENGINEER FOR APPROVAL.
2. DAM REMOVAL MATERIAL SHALL BECOME PROPERTY OF CONTRACTOR AND SHALL BE REMOVED FROM SITE. MATERIAL SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL STATE AND FEDERAL GUIDELINES.
3. RIVER BED MATERIAL REMOVED FOR DAM REMOVAL WORK SHALL BE MINIMIZED. THE CONTRACTOR SHALL SUBMIT A SOIL REMOVAL PLAN TO ENGINEER FOR APPROVAL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO TEST SOIL TO BE REMOVED IN ACCORDANCE WITH ARTICLE 669 OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE DESIGN AND ILLINOIS TITLE 35: SUBTITLE J: CHAPTER I: PART 1100 TO DETERMINE IF THE SOILS ARE ELIGIBLE FOR CCDD DISPOSAL. SOIL SHALL BE DISPOSED OF ACCORDINGLY.




## CONSTRUCTION SEQUENCING

# CONCEPT PLANS

HANSON

| | | |
|---|---|---|
| USER NAME = - | DESIGNED - | REVISED - |
| | DRAWN - | REVISED - |
| | CHECKED - | REVISED - |
| PLOT DATE = - | DATE - | REVISED - |

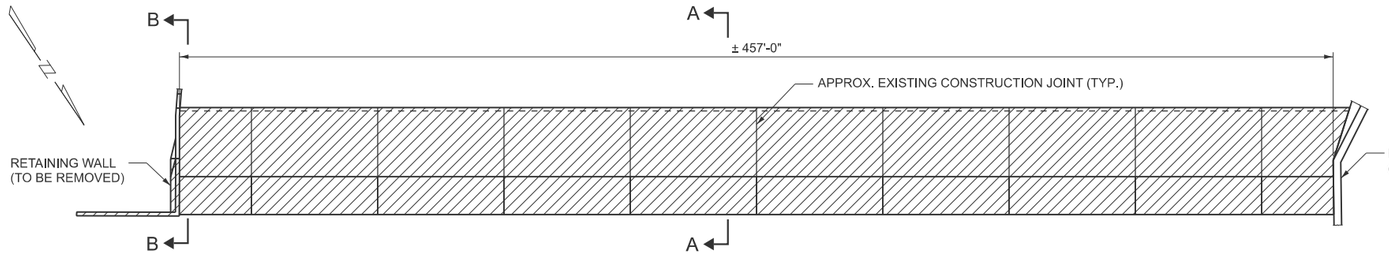
**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**CONSTRUCTION SEQUENCING (ALTERNATIVE 5)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-104E OF SHEETS | STA. | TO STA.

| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-104E |
| | | CONTRACT NO. | | |
| | ILLINOIS | FED. AID PROJECT | | |

# ALTERNATIVES 1 THRU 5

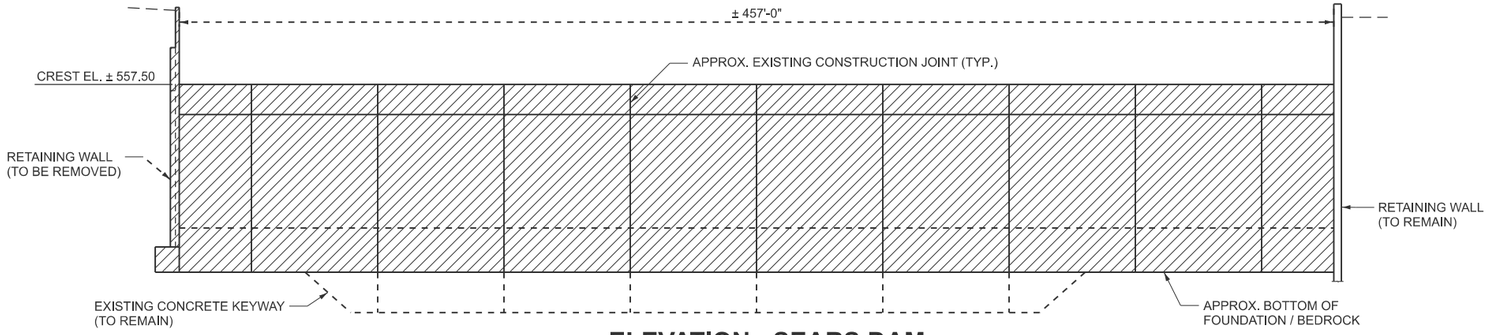



## PLAN - SEARS DAM

0 30 60
SCALE IN FEET

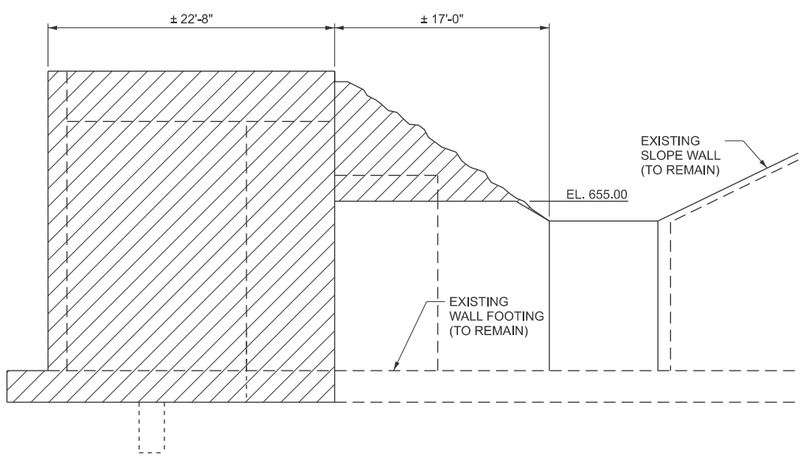
LEGEND

REMOVAL



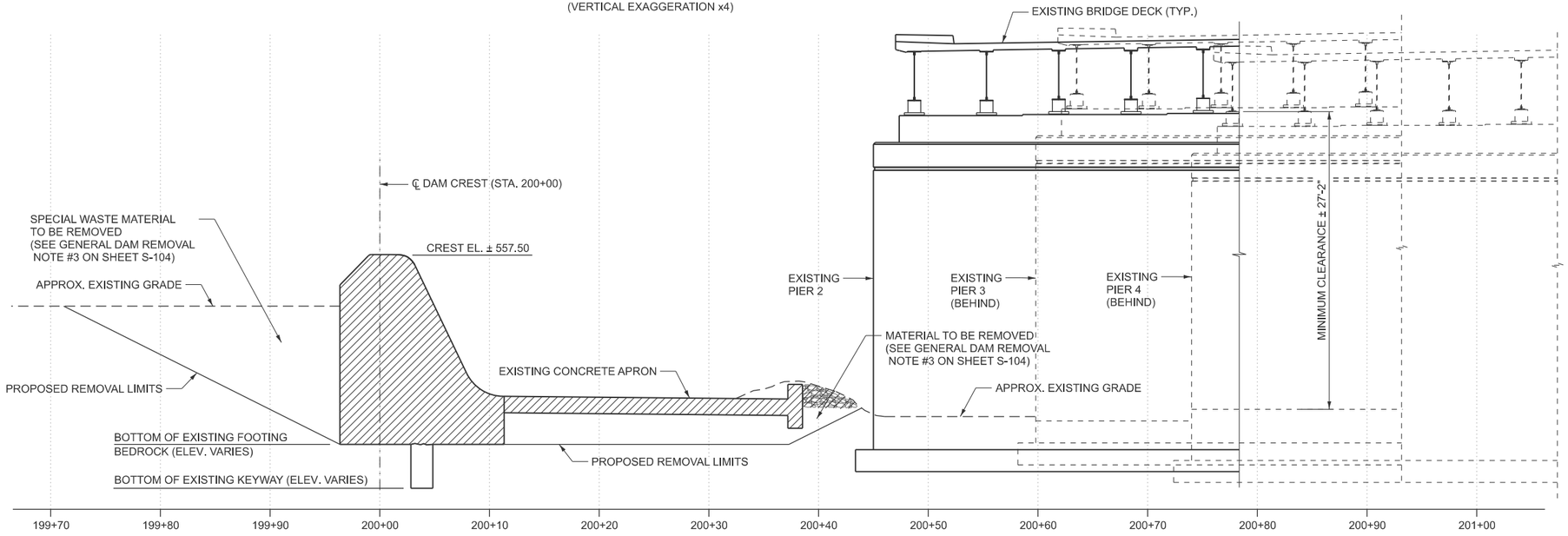

## ELEVATION - SEARS DAM

0 30 60
HORIZONTAL SCALE IN FEET
(VERTICAL EXAGGERATION x4)




## ELEVATION B-B - RETAINING WALL

0 6 12
SCALE IN FEET




## TYPICAL SECTION A-A - SEARS DAM

0 6 12
SCALE IN FEET

# CONCEPT PLANS

HANSON

| | | |
|---|---|---|
| USER NAME = - | DESIGNED - | REVISED - |
| | DRAWN - | REVISED - |
| | CHECKED - | REVISED - |
| PLOT DATE = - | DATE - | REVISED - |

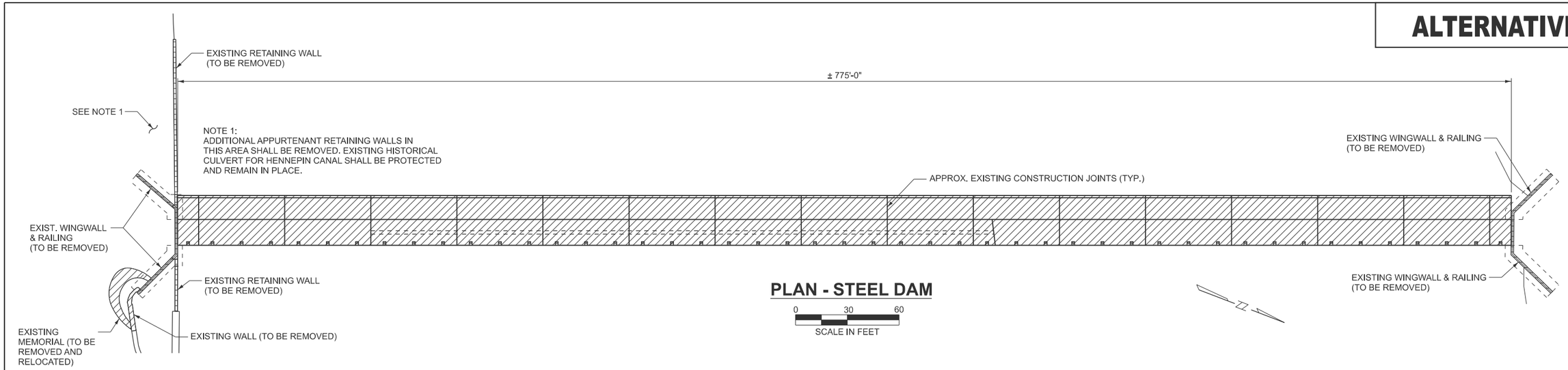
**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**SEARS DAM DEMOLITION**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-105 OF SHEETS | STA. | TO STA.

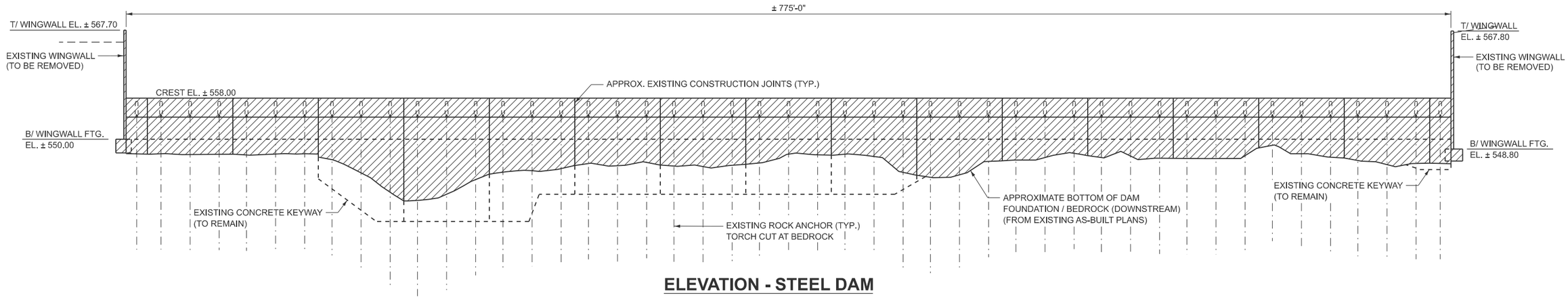
| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-105 |
| | | CONTRACT NO. | | |
| | ILLINOIS | FED. AID PROJECT | | |

# ALTERNATIVE 1



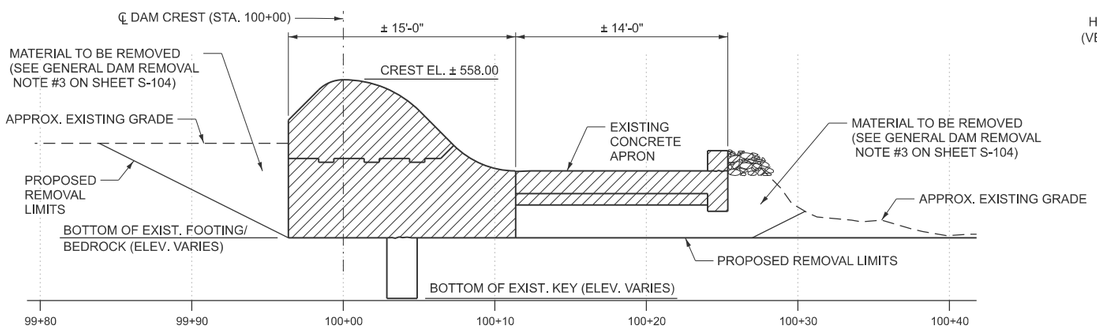

## PLAN - STEEL DAM

0 30 60
SCALE IN FEET




## ELEVATION - STEEL DAM

0 30 60
HORIZONTAL SCALE IN FEET
(VERTICAL EXAGGERATION x4)




## TYPICAL SECTION - STEEL DAM

0 5 10
SCALE IN FEET

LEGEND

REMOVAL

# CONCEPT PLANS

| | | | |
|---|---|---|---|
| HANSON | USER NAME = - | DESIGNED - | REVISED - |
| | | DRAWN - | REVISED - |
| | | CHECKED - | REVISED - |
| | PLOT DATE = - | DATE - | REVISED - |

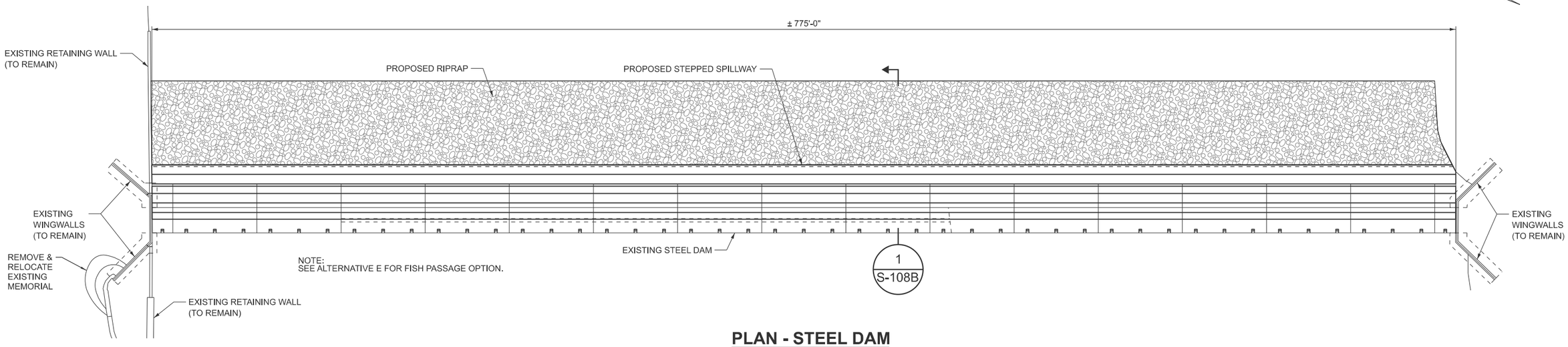
**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**STEEL DAM DEMOLITION (ALTERNATIVE 1)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-106A OF SHEETS | STA. | TO STA.

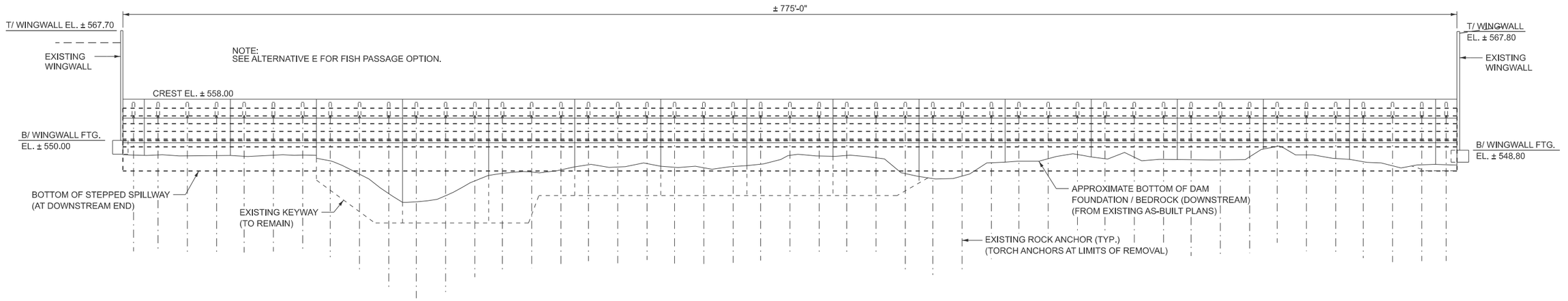
| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-106A |
| | | CONTRACT NO. | | |
| | | ILLINOIS | FED. AID PROJECT | |

# ALTERNATIVES 2, 4, & 5




## PLAN - STEEL DAM

0 30 60
SCALE IN FEET




## ELEVATION - STEEL DAM

0 30 60
HORIZONTAL SCALE IN FEET
(VERTICAL EXAGGERATION x4)

# CONCEPT PLANS

HANSON

| | | |
|---|---|---|
| USER NAME = - | DESIGNED - | REVISED - |
| | DRAWN - | REVISED - |
| | CHECKED - | REVISED - |
| PLOT DATE = - | DATE - | REVISED - |

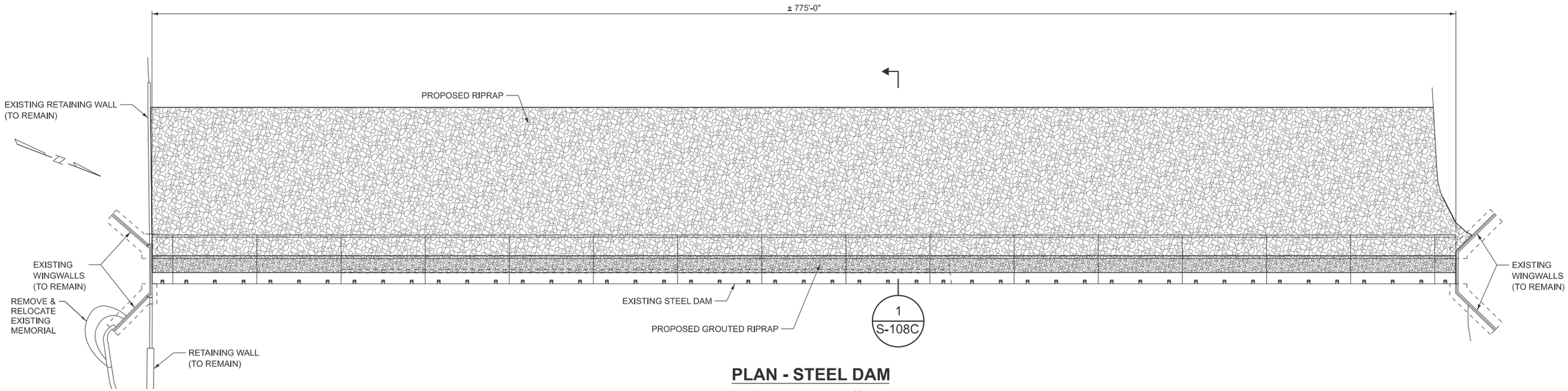
**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**STEEL DAM PLAN AND ELEVATION (ALTERNATIVES 2, 4, & 5)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-106B OF SHEETS | STA. | TO STA.

| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-106B |
| | | CONTRACT NO. | | |
| | ILLINOIS | FED. AID PROJECT | | |

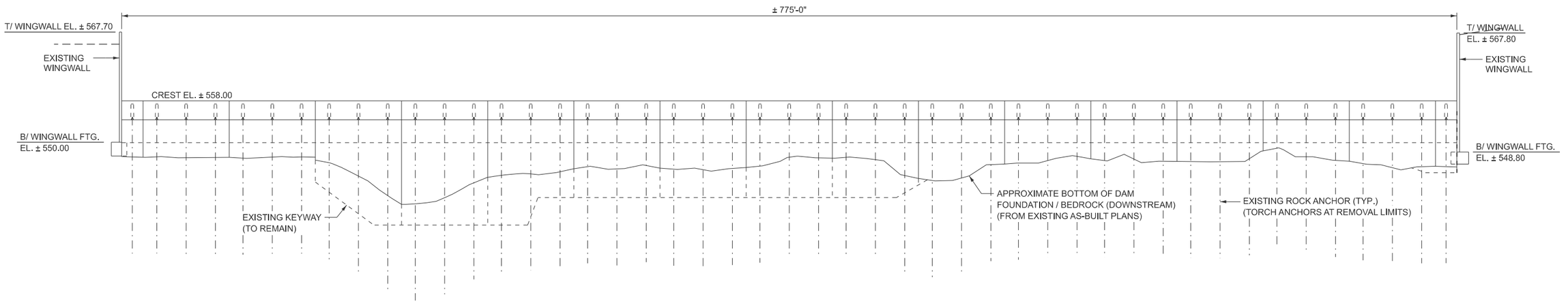
# ALTERNATIVE 3




## PLAN - STEEL DAM

0 30 60

SCALE IN FEET




## ELEVATION - STEEL DAM

0 30 60

HORIZONTAL SCALE IN FEET
(VERTICAL EXAGGERATION x4)

# CONCEPT PLANS

HANSON

| | | |
|---|---|---|
| USER NAME = - | DESIGNED - | REVISED - |
| | DRAWN - | REVISED - |
| | CHECKED - | REVISED - |
| PLOT DATE = - | DATE - | REVISED - |

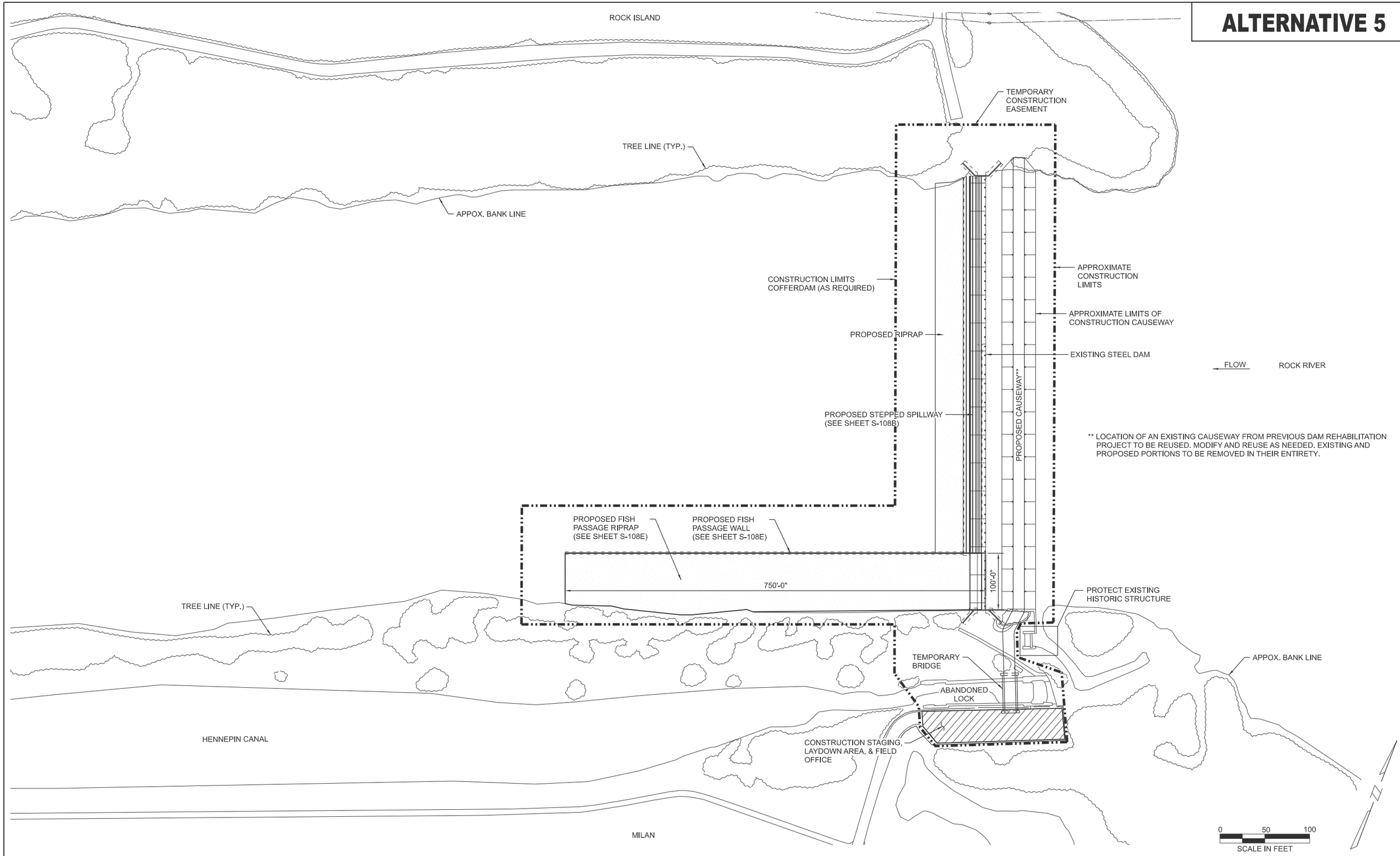
**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**STEEL DAM PLAN AND ELEVATION (ALTERNATIVE 3)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-106C OF SHEETS | STA. | TO STA.

| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-106C |
| | | CONTRACT NO. | | |
| | ILLINOIS | FED. AID PROJECT | | |

# ALTERNATIVE 5




## SITE PLAN - STEEL

# CONCEPT PLANS

| | | | |
|---|---|---|---|
| HANSON | USER NAME = - | DESIGNED - | REVISED - |
| | | DRAWN - | REVISED - |
| | | CHECKED - | REVISED - |
| | PLOT DATE = - | DATE - | REVISED - |

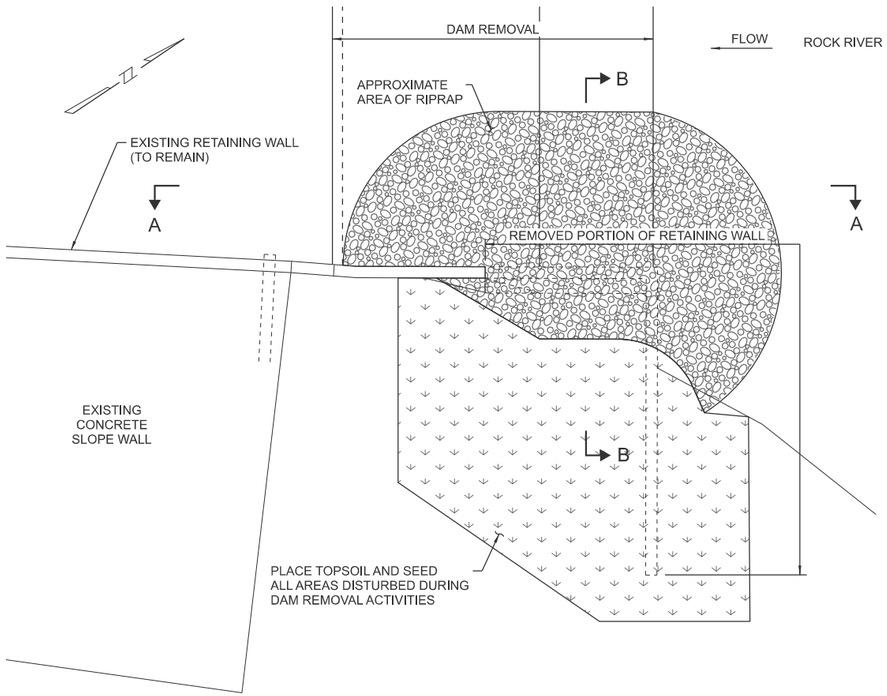
**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**STEEL DAM MODIFICATIONS (ALTERNATIVE 5)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-106E OF SHEETS | STA. | TO STA.

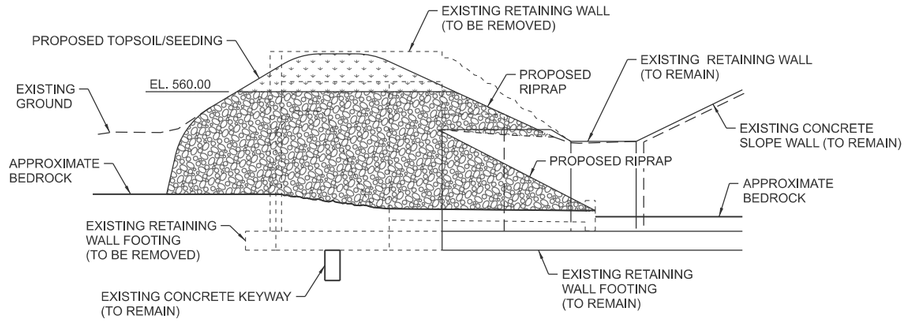
| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-106E |
| | | CONTRACT NO. | | |
| | | ILLINOIS | FED. AID PROJECT | |

# ALTERNATIVES 1 THRU 5



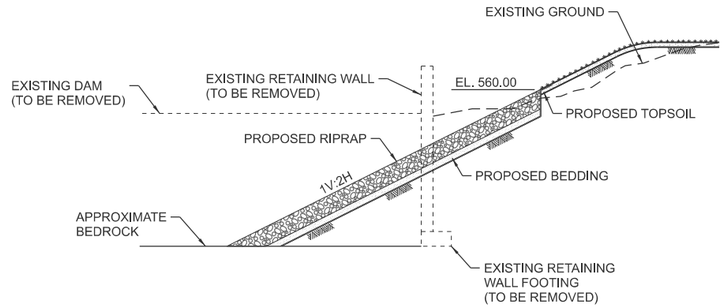

## PLAN - BANK RESTORATION SEARS - SE BANK

0 10 20
SCALE IN FEET




## ELEVATION A-A

0 10 20
SCALE IN FEET




## SECTION B-B

0 8 16
SCALE IN FEET

# CONCEPT PLANS

HANSON

| | | |
|---|---|---|
| USER NAME = - | DESIGNED - | REVISED - |
| | DRAWN - | REVISED - |
| | CHECKED - | REVISED - |
| PLOT DATE = - | DATE - | REVISED - |

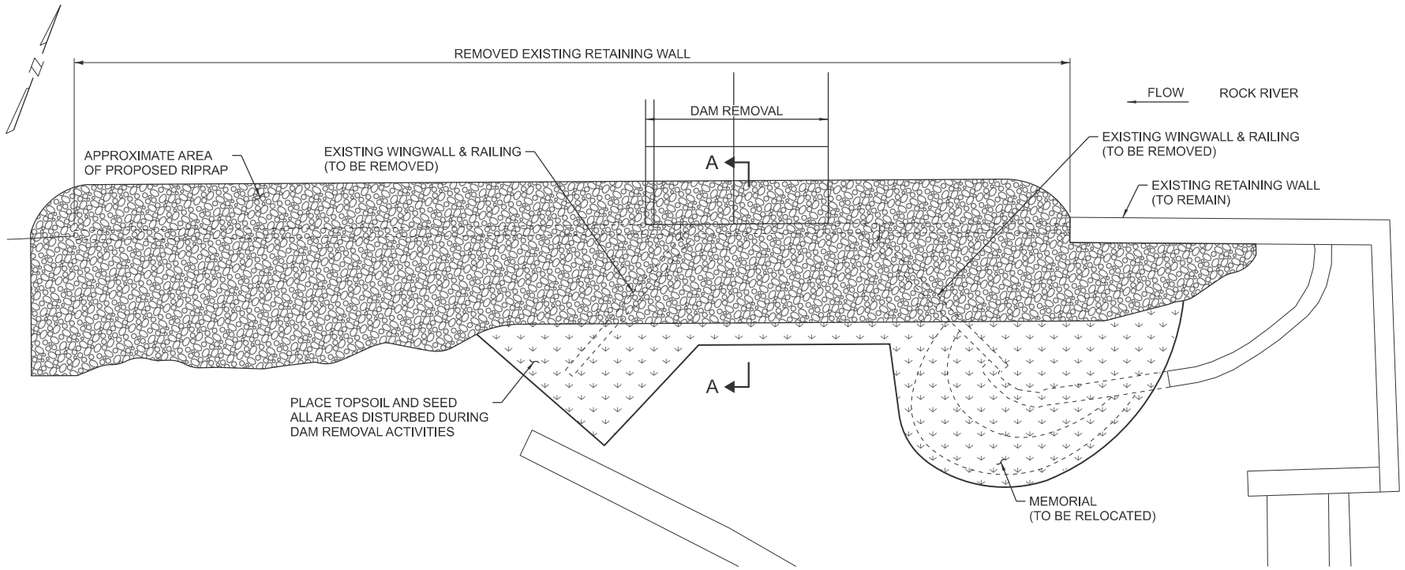
**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**SEARS DAM MODIFICATIONS**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-107 OF SHEETS | STA. | TO STA.

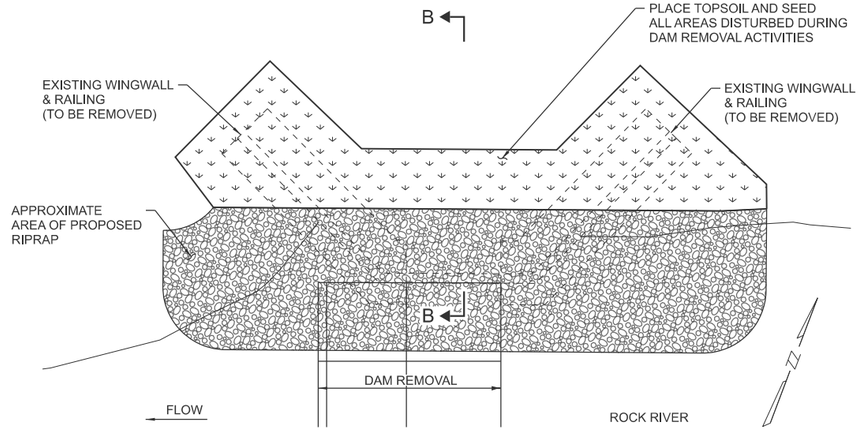
| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-107 |
| | | CONTRACT NO. | | |
| | ILLINOIS | FED. AID PROJECT | | |

# ALTERNATIVE 1



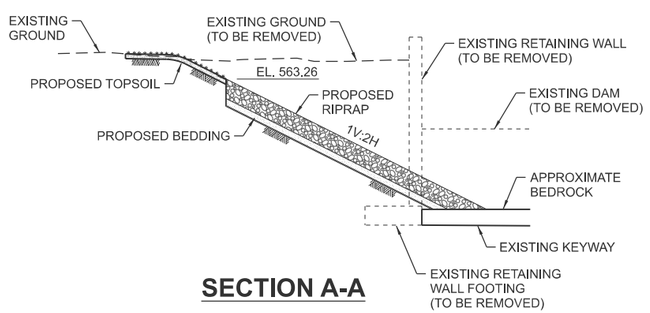

## PLAN - BANK RESTORATION STEEL - SOUTH BANK

0 12 24
SCALE IN FEET



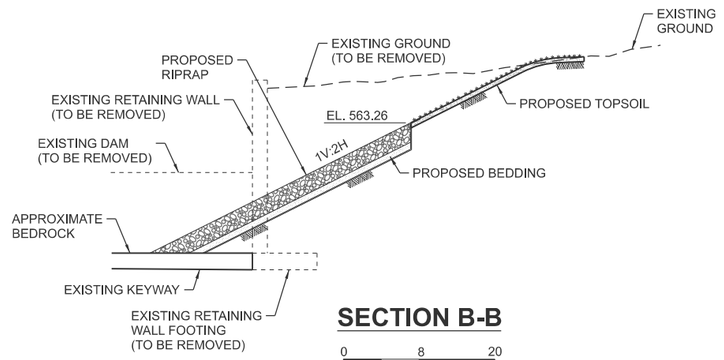

## PLAN - BANK RESTORATION STEEL NORTH

0 12 24
SCALE IN FEET




## SECTION A-A

0 8 20
SCALE IN FEET




## SECTION B-B

0 8 20
SCALE IN FEET

# CONCEPT PLANS

HANSON

| | | |
|---|---|---|
| USER NAME = - | DESIGNED - | REVISED - |
| | DRAWN - | REVISED - |
| | CHECKED - | REVISED - |
| PLOT DATE = - | DATE - | REVISED - |

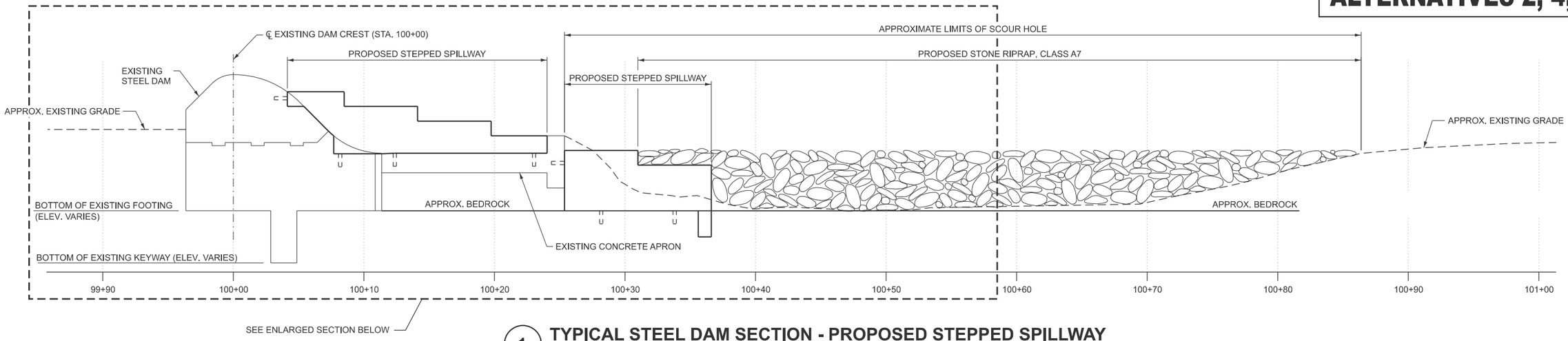
**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**STEEL DAM MODIFICATIONS (ALTERNATIVE 1)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-108A OF SHEETS | STA. | TO STA.

| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-108A |
| | | CONTRACT NO. | | |
| | ILLINOIS | FED. AID PROJECT | | |

# ALTERNATIVES 2, 4, & 5

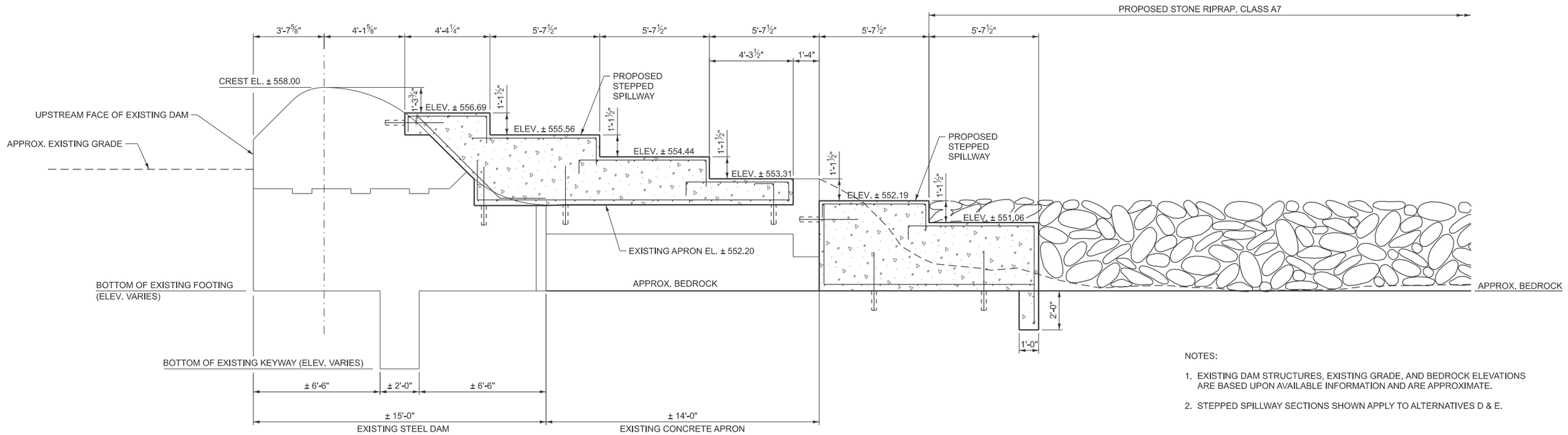



## 1 TYPICAL STEEL DAM SECTION - PROPOSED STEPPED SPILLWAY

SCALE: 1/4" = 1'-0"

0 5 10

SCALE IN FEET




NOTES:

1. EXISTING DAM STRUCTURES, EXISTING GRADE, AND BEDROCK ELEVATIONS ARE BASED UPON AVAILABLE INFORMATION AND ARE APPROXIMATE.
2. STEPPED SPILLWAY SECTIONS SHOWN APPLY TO ALTERNATIVES D & E.

## ENLARGED SECTION THRU STEEL DAM - PROPOSED STEPPED SPILLWAY

SCALE: 3/8" = 1'-0"

0 5 10

SCALE IN FEET

# CONCEPT PLANS

HANSON

| | | |
|---|---|---|
| USER NAME = - | DESIGNED - | REVISED - |
| | DRAWN - | REVISED - |
| | CHECKED - | REVISED - |
| PLOT DATE = - | DATE - | REVISED - |

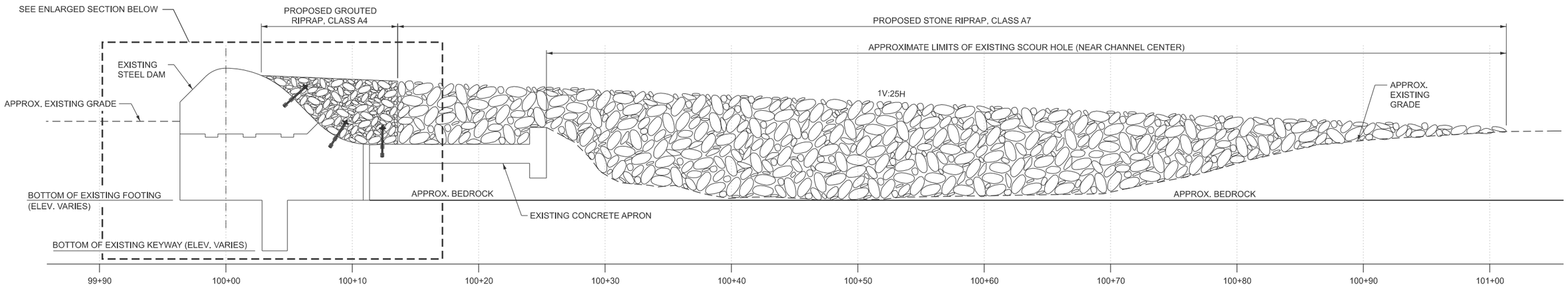
**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**STEEL DAM STEPPED SPILLWAY DETAILS (ALTERNATIVES 2, 4, & 5)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-108B OF SHEETS | STA. | TO STA.

| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-108B |
| | | CONTRACT NO. | | |
| | ILLINOIS | FED. AID PROJECT | | |

# ALTERNATIVE 3



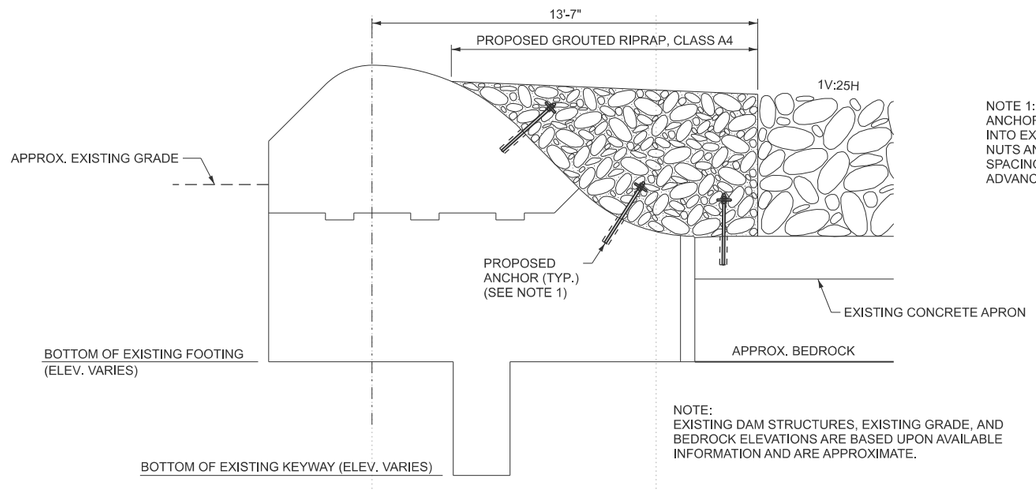

NOTE:
EXISTING DAM STRUCTURES, EXISTING GRADE, AND BEDROCK ELEVATIONS ARE BASED UPON AVAILABLE INFORMATION AND ARE APPROXIMATE.

## 1 TYPICAL STEEL DAM SECTION - PROPOSED ROCK RAMP

SCALE: 1/4" = 1'-0"

0 5 10

SCALE IN FEET




NOTE 1:
ANCHOR CONSISTS OF THREADED ROD EPOXY GROUTED INTO EXISTING STRUCTURES AND SQUARE PLATE SECURED WITH NUTS AND WASHERS (EACH SIDE) IN GROUTED RIPRAP. SIZING AND SPACING WOULD BE DETERMINED IN THE FUTURE IF ALTERNATIVE 3 ADVANCES.

NOTE:
EXISTING DAM STRUCTURES, EXISTING GRADE, AND BEDROCK ELEVATIONS ARE BASED UPON AVAILABLE INFORMATION AND ARE APPROXIMATE.

## ENLARGED SECTION THRU STEEL DAM - PROPOSED ROCK RAMP

SCALE: 3/8" = 1'-0"

0 5 10

SCALE IN FEET

# CONCEPT PLANS

HANSON

| | | |
|---|---|---|
| USER NAME = - | DESIGNED - | REVISED - |
| | DRAWN - | REVISED - |
| | CHECKED - | REVISED - |
| PLOT DATE = - | DATE - | REVISED - |

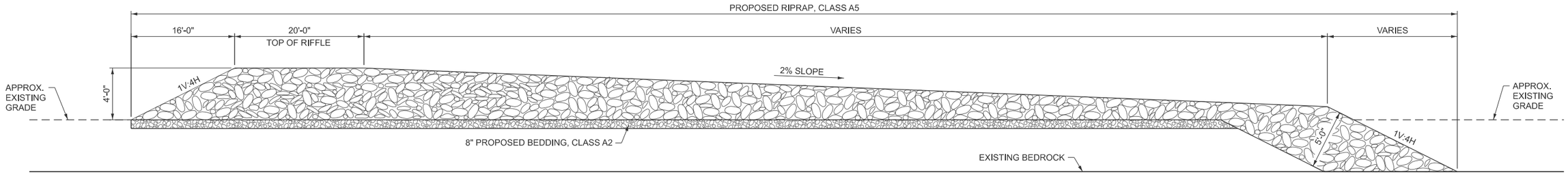
**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**STEEL DAM ROCK RAMP DETAILS (ALTERNATIVE 3)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-108C OF SHEETS | STA. | TO STA.

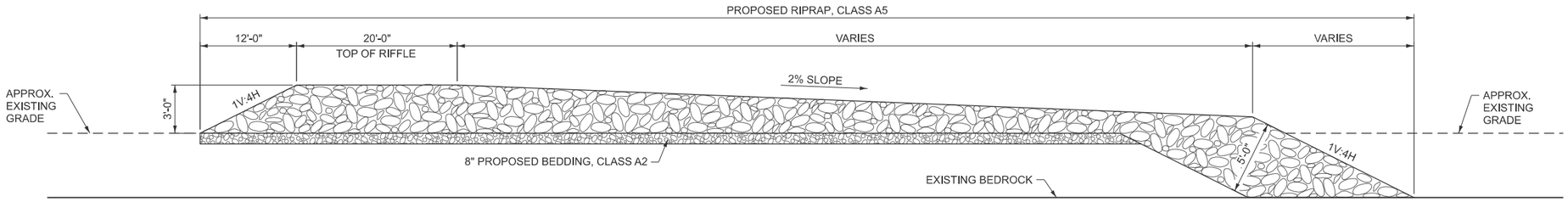
| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-108C |
| | | CONTRACT NO. | | |
| | ILLINOIS | FED. AID PROJECT | | |

# ALTERNATIVE 4




## 1 TYPICAL SECTION - NORTH CHANNEL 4' RIFFLE

NOT TO SCALE




## 2 TYPICAL SECTION - NORTH CHANNEL 3' RIFFLE

NOT TO SCALE

# CONCEPT PLANS

| | | | |
|---|---|---|---|
| HANSON | USER NAME = - | DESIGNED - | REVISED - |
| | | DRAWN - | REVISED - |
| | | CHECKED - | REVISED - |
| | PLOT DATE = - | DATE - | REVISED - |

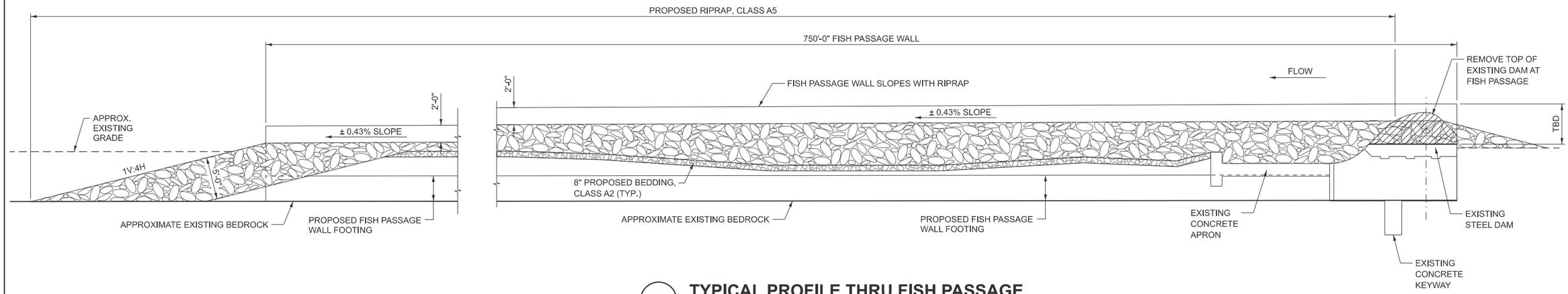
**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**STEEL DAM RIFFLE DETAILS (ALTERNATIVE 4)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-108D OF SHEETS | STA. | TO STA.

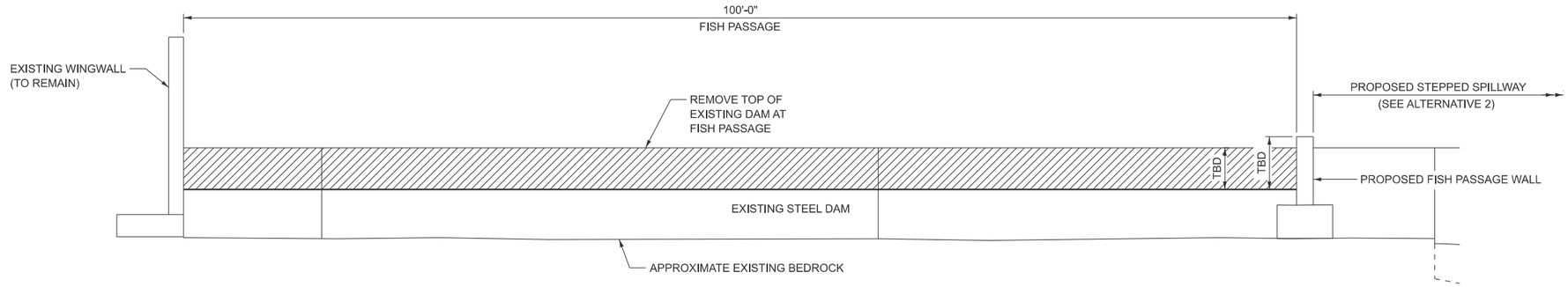
| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-108D |
| | | CONTRACT NO. | | |
| | ILLINOIS | FED. AID PROJECT | | |

# ALTERNATIVE 5




**1 TYPICAL PROFILE THRU FISH PASSAGE**

NOT TO SCALE




**2 ELEVATION - FISH PASSAGE**

(LOOKING AT UPSTREAM FACE OF STEEL DAM)

NOT TO SCALE

NOTES:

1. EXISTING DAM STRUCTURES, EXISTING GRADE, AND BEDROCK ELEVATIONS ARE BASED UPON AVAILABLE INFORMATION AND ARE APPROXIMATE.
2. FISH PASSAGE IS LOCATED ADJACENT TO THE SOUTH BANK OF THE CHANNEL. PASSAGE WIDTH IS 100'. NORTH OF THE FISH PASSAGE THE DAM WILL BE MODIFIED WITH PROPOSED STEPPED SPILLWAY. SEE ALTERNATIVE B FOR STEPPED SPILLWAY INFORMATION.

**CONCEPT PLANS**

HANSON

| | | |
|---|---|---|
| USER NAME = - | DESIGNED - | REVISED - |
| | DRAWN - | REVISED - |
| | CHECKED - | REVISED - |
| PLOT DATE = - | DATE - | REVISED - |

**STATE OF ILLINOIS**
**DEPARTMENT OF NATURAL RESOURCES**

**STEEL DAM FISH PASSAGE DETAILS (ALTERNATIVE 5)**
**DAM SAFETY STUDIES FOR THE SEARS AND STEEL DAMS**
**ROCK ISLAND COUNTY, ILLINOIS**

SCALE: | SHEET S-108E OF SHEETS | STA. | TO STA.

| F.A. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| | | ROCK ISLAND | | S-108E |
| | | CONTRACT NO. | | |
| | ILLINOIS | FED. AID PROJECT | | |

# APPENDIX B - Quantities and Costs

# ALTERNATIVE 1 - Remove Both Dams

| ESTIMATED QUANTITIES - ALTERNATIVE A - REMOVAL SEARS (FULL REMOVAL INCLUDING FOUNDATION) | | | | OPCC | |
|---|---|---|---|---|---|
| PAY ITEM | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| 20100500 | TREE REMOVAL, ACRES | ACRE | 1.13 | $22,900.00 | $25,877.00 |
| 20201450 | CHANNEL EXCAVATION | CU YD | 4174.2 | $40.00 | $166,968.80 |
| 25002024 | SEEDING, CLASS 4B (MODIFIED) | ACRE | 0.14 | $4,000.00 | $560.00 |
| 25100630 | EROSION CONTROL BLANKET | SQ YD | 677.6 | $2.85 | $1,931.16 |
| 28100101 | STONE RIPRAP, CLASS A1 | SQ YD | 170.0 | $35.00 | $5,950.00 |
| 28100109 | STONE RIPRAP, CLASS A5 | SQ YD | 170.0 | $135.00 | $22,950.00 |
| 28100113 | STONE RIPRAP, CLASS A7 | TON | 9635.8 | $110.00 | $1,059,938.00 |
| 28200200 | FILTER FABRIC | SQ YD | 170.0 | $5.25 | $892.50 |
| 40600990 | TEMPORARY RAMP | SQ YD | 950.0 | $20.00 | $19,000.00 |
| 44213200 | SAWCUT | FOOT | 40 | $18.00 | $720.00 |
| 50102400 | CONCRETE REMOVAL | CU YD | 3873.3 | $400.00 | $1,549,328.00 |
| 67100100 | MOBILIZATION | L SUM | 1 | $403,358 | $403,357.85 |
| X0322507 | PREFABRICATED BRIDGE SUPERSTRUCTURE | EACH | 0 | $20,000.00 | $0.00 |
| X0326891 | TEMPORARY ACCESS ROAD (SPECIAL) | SQ YD | 350.0 | $40.00 | $14,000.00 |
| X2800400 | PERIMETER EROSION BARRIER | FOOT | 530 | $8.00 | $4,240.00 |
| X5012508 | CONCRETE WINGWALL REMOVAL | EACH | 0 | $32,000.00 | $0.00 |
| X5021507 | DEWATERING | EACH | 1 | $10,000.00 | $10,000.00 |
| X5021510 | COFFERDAMS (SPECIAL) | EACH | 1 | $1,000,000.00 | $1,000,000.00 |
| X5091600 | STEEL RAILING REMOVAL | FOOT | 0 | $20.00 | $0.00 |
| X6640638 | TEMPORARY CONSTRUCTION FENCE | FOOT | 400 | $7.00 | $2,800.00 |
| Z0013769 | SEDIMENT CONTROL, STABILIZED CONSTRUCTION ENTRANCE | SQ YD | 25 | $35.00 | $875.00 |
| Z0015500 | DEBRIS REMOVAL | L SUM | 1 | $3,500.00 | $3,500.00 |
| Z0075498 | CONCRETE RETAINING WALL REMOVAL | CU YD | 120.1 | $400.00 | $48,048.00 |
| | BANK ENHANCEMENTS TO RETAIN NORMAL POOL | L SUM | 1 | $45,000.00 | $45,000.00 |
| | BANK RESTORATION | L SUM | 1 | $15,000.00 | $15,000.00 |
| | CAUSEWAY CONSTRUCTION AND REMOVAL | L SUM | 0 | $850,000.00 | $0.00 |
| | GENERAL SITE RESTORATION | L SUM | 1 | $25,000.00 | $25,000.00 |
| | GUARDRAIL REMOVAL AND REPLACEMENT | FOOT | 0 | $46.00 | $0.00 |
| | REMOVAL AND RELOCATION OF MEMORIAL | L SUM | 0 | $25,000.00 | $0.00 |
| | RIVER SAFETY MEASURES DURING CONSTRUCTION | L SUM | 1 | $11,000.00 | $11,000.00 |
| | CONTINGENCY | L SUM | 1 | $1,210,074 | $1,210,073.54 |

**Subotal Sears** **$5,647,010**

07-30-25 Estimates for each alternative were generated by JJT using estimated quantities provided by EJM and additional quantities/cost calculated by JJT

08-04-25 Modified estimate to separate Sears & Steel full demo OPCC by EJM/JJT

8-21-25 Modified estimate to separate Sears from Ste alternatives by EJM/JJT

| ESTIMATED QUANTITIES - ALTERNATIVE 1 - REMOVAL STEEL (FULL REMOVAL INCLUDING FOUNDATION) | | | | OPCC | |
|---|---|---|---|---|---|
| PAY ITEM | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| 20100500 | TREE REMOVAL, ACRES | ACRE | 0.13 | $22,900.00 | $2,977.00 |
| 20201450 | CHANNEL EXCAVATION | CU YD | 2741.4 | $40.00 | $109,656.40 |
| 25002024 | SEEDING, CLASS 4B (MODIFIED) | ACRE | 0.13 | $4,000.00 | $520.00 |
| 25100630 | EROSION CONTROL BLANKET | SQ YD | 629.2 | $2.85 | $1,793.22 |
| 28100101 | STONE RIPRAP, CLASS A1 | SQ YD | 730.0 | $35.00 | $25,550.00 |
| 28100109 | STONE RIPRAP, CLASS A5 | SQ YD | 730.0 | $135.00 | $98,550.00 |
| 28100113 | STONE RIPRAP, CLASS A7 | TON | 5779.0 | $110.00 | $635,690.00 |
| 28200200 | FILTER FABRIC | SQ YD | 730.0 | $5.25 | $3,832.50 |
| 40600990 | TEMPORARY RAMP | SQ YD | 0 | $20.00 | $0.00 |
| 44213200 | SAWCUT | FOOT | 0 | $18.00 | $0.00 |
| 50102400 | CONCRETE REMOVAL | CU YD | 4142.8 | $400.00 | $1,657,124.00 |
| 67100100 | MOBILIZATION | L SUM | 1 | $379,920 | $379,920.01 |
| X0322507 | PREFABRICATED BRIDGE SUPERSTRUCTURE | EACH | 1 | $20,000.00 | $20,000.00 |
| X0326891 | TEMPORARY ACCESS ROAD (SPECIAL) | SQ YD | 270.0 | $40.00 | $10,800.00 |
| X2800400 | PERIMETER EROSION BARRIER | FOOT | 430 | $8.00 | $3,440.00 |
| X5012508 | CONCRETE WINGWALL REMOVAL | EACH | 2 | $32,000.00 | $64,000.00 |
| X5021507 | DEWATERING | EACH | 1 | $10,000.00 | $10,000.00 |
| X5021510 | COFFERDAMS (SPECIAL) | EACH | 1 | $1,000,000.00 | $1,000,000.00 |
| X5091600 | STEEL RAILING REMOVAL | FOOT | 176 | $20.00 | $3,520.00 |
| X6640638 | TEMPORARY CONSTRUCTION FENCE | FOOT | 900 | $7.00 | $6,300.00 |
| Z0013769 | SEDIMENT CONTROL, STABILIZED CONSTRUCTION ENTRANCE | SQ YD | 25 | $35.00 | $875.00 |
| Z0015500 | DEBRIS REMOVAL | L SUM | 1 | $3,500.00 | $3,500.00 |
| Z0075498 | CONCRETE RETAINING WALL REMOVAL | CU YD | 45.6 | $400.00 | $18,232.00 |
| | BANK ENHANCEMENTS TO RETAIN NORMAL POOL | L SUM | 1 | $45,000.00 | $45,000.00 |
| | BANK RESTORATION | L SUM | 1 | $15,000.00 | $15,000.00 |
| | CAUSEWAY CONSTRUCTION AND REMOVAL | L SUM | 0 | $850,000.00 | $0.00 |
| | GENERAL SITE RESTORATION | L SUM | 1 | $25,000.00 | $25,000.00 |
| | GUARDRAIL REMOVAL AND REPLACEMENT | FOOT | 40 | $46.00 | $1,840.00 |
| | REMOVAL AND RELOCATION OF MEMORIAL | L SUM | 1 | $25,000.00 | $25,000.00 |
| | RIVER SAFETY MEASURES DURING CONSTRUCTION | L SUM | 1 | $11,000.00 | $11,000.00 |
| | CONTINGENCY | L SUM | 1 | $1,139,760 | $1,139,760.04 |

**Subtotal Steel** **$5,318,880**

# ALTERNATIVE 2 - Remove Sears, modify Steel Steps

| ESTIMATED QUANTITIES - ALTERNATIVE 2 - STEEL STEPPED SPILLWAY | | | | OPCC | |
|---|---|---|---|---|---|
| PAY ITEM | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| 20100500 | TREE REMOVAL, ACRES | ACRE | 0.09 | $22,900.00 | $2,061.00 |
| 25002024 | SEEDING, CLASS 4B (MODIFIED) | ACRE | 0.06 | $4,000.00 | $240.00 |
| 25100630 | EROSION CONTROL BLANKET | SQ YD | 290.4 | $2.85 | $827.64 |
| 28100113 | STONE RIPRAP, CLASS A7 | TON | 5481.3 | $110.00 | $602,943.00 |
| 44213200 | SAWCUT | FOOT | 1590 | $10.00 | $15,900.00 |
| 50102400 | CONCRETE REMOVAL | CU YD | 70.7 | $400.00 | $28,292.00 |
| 50300225 | CONCRETE STRUCTURES | CU YD | 2812.4 | $1,500.00 | $4,218,630.00 |
| 50800205 | REINFORCEMENT BARS, EPOXY COATED | POUND | 130200 | $2.00 | $260,400.00 |
| 67100100 | MOBILIZATION | L SUM | 1 | $734,433.36 | $734,433.36 |
| X0322507 | PREFABRICATED BRIDGE SUPERSTRUCTURE | EACH | 1 | $200,000.00 | $200,000.00 |
| X0326891 | TEMPORARY ACCESS ROAD (SPECIAL) | SQ YD | 270.0 | $40.00 | $10,800.00 |
| X2800400 | PERIMETER EROSION BARRIER | FOOT | 430 | $8.00 | $3,440.00 |
| X5021507 | DEWATERING | EACH | 1 | $10,000.00 | $10,000.00 |
| X5021510 | COFFERDAMS (SPECIAL) | EACH | 1 | $1,000,000.00 | $1,000,000.00 |
| X6640638 | TEMPORARY CONSTRUCTION FENCE | FOOT | 900 | $7.00 | $6,300.00 |
| Z0013769 | SEDIMENT CONTROL, STABILIZED CONSTRUCTION ENTRANCE | SQ YD | 25 | $35.00 | $875.00 |
| Z0015500 | DEBRIS REMOVAL | L SUM | 1 | $3,500.00 | $3,500.00 |
| Z0018900 | DRILL AND GROUT DOWEL BARS | EACH | 1351 | $35.00 | $47,285.00 |
| | BANK ENHANCEMENTS TO RETAIN NORMAL POOL | L SUM | 1 | $45,000.00 | $45,000.00 |
| | CAUSEWAY CONSTRUCTION AND REMOVAL | L SUM | 1 | $850,000.00 | $850,000.00 |
| | GENERAL SITE RESTORATION | L SUM | 1 | $25,000.00 | $25,000.00 |
| | GUARDRAIL REMOVAL AND REPLACEMENT | FOOT | 40 | $46.00 | $1,840.00 |
| | RIVER SAFETY MEASURES DURING CONSTRUCTION | L SUM | 1 | $11,000.00 | $11,000.00 |
| | CONTINGENCY | L SUM | 1 | $2,203,300 | $2,203,300.09 |

**Total** **$10,282,067.10**

# ALTERNATIVE 3 - Remove Sears, modify Steel Rock Ramp

| ESTIMATED QUANTITIES - ALTERNATIVE 3 - STEEL ROCK RAMP | | | | OPCC | |
|---|---|---|---|---|---|
| PAY ITEM | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| 20100500 | TREE REMOVAL, ACRES | ACRE | 0.09 | $22,900.00 | $2,061.00 |
| 25002024 | SEEDING, CLASS 4B (MODIFIED) | ACRE | 0.06 | $4,000.00 | $240.00 |
| 25100630 | EROSION CONTROL BLANKET | SQ YD | 290.4 | $2.85 | $827.64 |
| 28100207 | STONE RIPRAP, CLASS A4 | TON | 1492.5 | $110.00 | $164,175.00 |
| 28100213 | STONE RIPRAP, CLASS A7 | TON | 11629.5 | $110.00 | $1,279,245.00 |
| 67100100 | MOBILIZATION | L SUM | 1 | $399,230 | $399,229.56 |
| X0322507 | PREFABRICATED BRIDGE SUPERSTRUCTURE | EACH | 1 | $200,000.00 | $200,000.00 |
| X0326891 | TEMPORARY ACCESS ROAD (SPECIAL) | SQ YD | 270 | $40.00 | $10,800.00 |
| X2800400 | PERIMETER EROSION BARRIER | FOOT | 430 | $8.00 | $3,440.00 |
| X2810846 | GROUT FOR USE WITH RIPRAP | CU YD | 426.4 | $830.00 | $353,912.00 |
| X5021507 | DEWATERING | EACH | 1 | $10,000.00 | $10,000.00 |
| X5021510 | COFFERDAMS (SPECIAL) | EACH | 1 | $1,000,000.00 | $1,000,000.00 |
| X6640638 | TEMPORARY CONSTRUCTION FENCE | FOOT | 900 | $7.00 | $6,300.00 |
| Z0013769 | SEDIMENT CONTROL, STABILIZED CONSTRUCTION ENTRANCE | SQ YD | 25 | $35.00 | $875.00 |
| Z0015500 | DEBRIS REMOVAL | L SUM | 1 | $3,500.00 | $3,500.00 |
| Z0018900 | DRILL AND GROUT DOWEL BARS | EACH | 288 | $35.00 | $10,080.00 |
| | BANK ENHANCEMENTS TO RETAIN NORMAL POOL | L SUM | 1 | $45,000.00 | $45,000.00 |
| | CAUSEWAY CONSTRUCTION AND REMOVAL | L SUM | 1 | $850,000.00 | $850,000.00 |
| | GENERAL SITE RESTORATION | L SUM | 1 | $25,000.00 | $25,000.00 |
| | GUARDRAIL REMOVAL AND REPLACEMENT | FOOT | 40 | $46.00 | $1,840.00 |
| | RIVER SAFETY MEASURES DURING CONSTRUCTION | L SUM | 1 | $11,000.00 | $11,000.00 |
| | ROCK RAMP ANCHORAGE | L SUM | 1 | $14,000.00 | $14,000.00 |
| | CONTINGENCY | L SUM | 1 | $1,197,689 | $1,197,688.69 |

**Total** **$5,589,213.90**

# ALTERNATIVE 4 - Remove Sears, modify Steel Steps, add Riffles

| ESTIMATED QUANTITIES - ALTERNATIVE 4 - SEARS (FULL REMOVAL & NORTH CHANNEL RIFFLES) | | | | OPCC | |
|---|---|---|---|---|---|
| PAY ITEM | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| 20100500 | TREE REMOVAL, ACRES | ACRE | 1.13 | $22,900.00 | $25,877.00 |
| 20201450 | CHANNEL EXCAVATION | CU YD | 4174.2 | $40.00 | $166,968.80 |
| | CHANNEL EXCAVATION (SPECIAL) | CU YD | 4406.3 | $55.00 | $242,346.50 |
| 25002024 | SEEDING, CLASS 4B (MODIFIED) | ACRE | 0.14 | $4,000.00 | $560.00 |
| 25100630 | EROSION CONTROL BLANKET | SQ YD | 677.6 | $2.85 | $1,931.16 |
| 28100101 | STONE RIPRAP, CLASS A1 | SQ YD | 170.0 | $35.00 | $5,950.00 |
| | STONE RIPRAP, CLASS A2 | TON | 7138.0 | $200.00 | $1,427,600.00 |
| 28100109 | STONE RIPRAP, CLASS A5 | SQ YD | 170.0 | $135.00 | $22,950.00 |
| | STONE RIPRAP, CLASS A5 (SPECIAL) | TON | 34122.0 | $120.00 | $4,094,640.00 |
| 28100113 | STONE RIPRAP, CLASS A7 | TON | 9635.8 | $110.00 | $1,059,938.00 |
| 28200200 | FILTER FABRIC | SQ YD | 170.0 | $5.25 | $892.50 |
| 40600990 | TEMPORARY RAMP | SQ YD | 950.0 | $20.00 | $19,000.00 |
| 44213200 | SAWCUT | FOOT | 40 | $18.00 | $720.00 |
| 50102400 | CONCRETE REMOVAL | CU YD | 3873.3 | $400.00 | $1,549,328.00 |
| 67100100 | MOBILIZATION | L SUM | 1 | $989,816 | $989,816.50 |
| X0322507 | PREFABRICATED BRIDGE SUPERSTRUCTURE | EACH | 0 | $20,000.00 | $0.00 |
| X0326891 | TEMPORARY ACCESS ROAD (SPECIAL) | SQ YD | 350.0 | $40.00 | $14,000.00 |
| X2800400 | PERIMETER EROSION BARRIER | FOOT | 530 | $8.00 | $4,240.00 |
| X5012508 | CONCRETE WINGWALL REMOVAL | EACH | 0 | $32,000.00 | $0.00 |
| X5021507 | DEWATERING | EACH | 1 | $10,000.00 | $10,000.00 |
| X5021510 | COFFERDAMS (SPECIAL) | EACH | 1 | $1,000,000.00 | $1,000,000.00 |
| X5091600 | STEEL RAILING REMOVAL | FOOT | 0 | $20.00 | $0.00 |
| X6640638 | TEMPORARY CONSTRUCTION FENCE | FOOT | 400 | $7.00 | $2,800.00 |
| Z0013769 | SEDIMENT CONTROL, STABILIZED CONSTRUCTION ENTRANCE | SQ YD | 25 | $35.00 | $875.00 |
| Z0015500 | DEBRIS REMOVAL | L SUM | 1 | $3,500.00 | $3,500.00 |
| Z0075498 | CONCRETE RETAINING WALL REMOVAL | CU YD | 120.1 | $400.00 | $48,048.00 |
| | MISCELLANEOUS CONSTRUCTION ACTIVITIES | L SUM | 1.0 | $100,000.00 | $100,000.00 |
| | BANK ENHANCEMENTS TO RETAIN NORMAL POOL | L SUM | 1 | $45,000.00 | $45,000.00 |
| | BANK RESTORATION | L SUM | 1 | $15,000.00 | $15,000.00 |
| | CAUSEWAY CONSTRUCTION AND REMOVAL | L SUM | 0 | $850,000.00 | $0.00 |
| | GENERAL SITE RESTORATION | L SUM | 1 | $25,000.00 | $25,000.00 |
| | GUARDRAIL REMOVAL AND REPLACEMENT | FOOT | 0 | $46.00 | $0.00 |
| | REMOVAL AND RELOCATION OF MEMORIAL | L SUM | 0 | $25,000.00 | $0.00 |
| | RIVER SAFETY MEASURES DURING CONSTRUCTION | L SUM | 1 | $11,000.00 | $11,000.00 |
| | CONTINGENCY | L SUM | 1 | $2,969,449 | $2,969,449.49 |

**Subotal Sears** **$13,857,431**

07-30-25 Estimates for each alternative were generated by JJT using estimated quantities provided by EJM and additional quantities/cost calculated by JJT
08-04-25 Modified estimate to separate Sears & Steel full demo OPCC by EJM/JJT
10/15/2025 Modified estimate to add Alt D (Rock Riffles in North Channel)
10/30/2025 Estimate unit prices for Alt D highlighted items JJT

| ESTIMATED QUANTITIES - ALTERNATIVE 4 - STEEL STEPPED SPILLWAY | | | | OPCC | |
|---|---|---|---|---|---|
| PAY ITEM | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| 20100500 | TREE REMOVAL, ACRES | ACRE | 0.09 | $22,900.00 | $2,061.00 |
| 25002024 | SEEDING, CLASS 4B (MODIFIED) | ACRE | 0.06 | $4,000.00 | $240.00 |
| 25100630 | EROSION CONTROL BLANKET | SQ YD | 290.4 | $2.85 | $827.64 |
| 28100113 | STONE RIPRAP, CLASS A7 | TON | 5481.3 | $110.00 | $602,943.00 |
| 44213200 | SAWCUT | FOOT | 1590 | $10.00 | $15,900.00 |
| 50102400 | CONCRETE REMOVAL | CU YD | 70.7 | $400.00 | $28,292.00 |
| 50300225 | CONCRETE STRUCTURES | CU YD | 2812.4 | $1,500.00 | $4,218,630.00 |
| 50800205 | REINFORCEMENT BARS, EPOXY COATED | POUND | 130200 | $2.00 | $260,400.00 |
| 67100100 | MOBILIZATION | L SUM | 1 | $734,433.36 | $734,433.36 |
| X0322507 | PREFABRICATED BRIDGE SUPERSTRUCTURE | EACH | 1 | $200,000.00 | $200,000.00 |
| X0326891 | TEMPORARY ACCESS ROAD (SPECIAL) | SQ YD | 270.0 | $40.00 | $10,800.00 |
| X2800400 | PERIMETER EROSION BARRIER | FOOT | 430 | $8.00 | $3,440.00 |
| X5021507 | DEWATERING | EACH | 1 | $10,000.00 | $10,000.00 |
| X5021510 | COFFERDAMS (SPECIAL) | EACH | 1 | $1,000,000.00 | $1,000,000.00 |
| X6640638 | TEMPORARY CONSTRUCTION FENCE | FOOT | 900 | $7.00 | $6,300.00 |
| Z0013769 | SEDIMENT CONTROL, STABILIZED CONSTRUCTION ENTRANCE | SQ YD | 25 | $35.00 | $875.00 |
| Z0015500 | DEBRIS REMOVAL | L SUM | 1 | $3,500.00 | $3,500.00 |
| Z0018900 | DRILL AND GROUT DOWEL BARS | EACH | 1351 | $35.00 | $47,285.00 |
| | BANK ENHANCEMENTS TO RETAIN NORMAL POOL | L SUM | 1 | $45,000.00 | $45,000.00 |
| | CAUSEWAY CONSTRUCTION AND REMOVAL | L SUM | 1 | $850,000.00 | $850,000.00 |
| | GENERAL SITE RESTORATION | L SUM | 1 | $25,000.00 | $25,000.00 |
| | GUARDRAIL REMOVAL AND REPLACEMENT | FOOT | 40 | $46.00 | $1,840.00 |
| | RIVER SAFETY MEASURES DURING CONSTRUCTION | L SUM | 1 | $11,000.00 | $11,000.00 |
| | CONTINGENCY | L SUM | 1 | $2,203,300 | $2,203,300.09 |

**Total** **$10,282,067.10**

# ALTERNATIVE 5 - Remove Sears, modify Steel Step with Bypass

| ESTIMATED QUANTITIES - ALTERNATIVE 5 - REMOVAL SEARS (UPPER SPILLWAY REMOVAL) | | | | OPCC | |
|---|---|---|---|---|---|
| PAY ITEM | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| 20100500 | TREE REMOVAL, ACRES | ACRE | 1.13 | $22,900.00 | $25,877.00 |
| 20201450 | CHANNEL EXCAVATION | CU YD | 669.6 | $40.00 | $26,782.40 |
| 25002024 | SEEDING, CLASS 4B (MODIFIED) | ACRE | 0.14 | $4,000.00 | $560.00 |
| 25100630 | EROSION CONTROL BLANKET | SQ YD | 677.6 | $2.85 | $1,931.16 |
| 28100101 | STONE RIPRAP, CLASS A1 | SQ YD | 170.0 | $35.00 | $5,950.00 |
| 28100109 | STONE RIPRAP, CLASS A5 | SQ YD | 170.0 | $135.00 | $22,950.00 |
| 28100113 | STONE RIPRAP, CLASS A7 | TON | 0 | $110.00 | $0.00 |
| 28200200 | FILTER FABRIC | SQ YD | 170.0 | $5.25 | $892.50 |
| 40600990 | TEMPORARY RAMP | SQ YD | 950.0 | $20.00 | $19,000.00 |
| 44213200 | SAWCUT | FOOT | 40 | $18.00 | $720.00 |
| 50102400 | CONCRETE REMOVAL | CU YD | 1808.8 | $400.00 | $723,504.00 |
| 67100100 | MOBILIZATION | L SUM | 1 | $200,763 | $200,763.01 |
| X0322507 | PREFABRICATED BRIDGE SUPERSTRUCTURE | EACH | 0 | $20,000.00 | $0.00 |
| X0326891 | TEMPORARY ACCESS ROAD (SPECIAL) | SQ YD | 350.0 | $40.00 | $14,000.00 |
| X2800400 | PERIMETER EROSION BARRIER | FOOT | 530 | $8.00 | $4,240.00 |
| X5012508 | CONCRETE WINGWALL REMOVAL | EACH | 0 | $32,000.00 | $0.00 |
| X5021507 | DEWATERING | EACH | 1 | $10,000.00 | $10,000.00 |
| X5021510 | COFFERDAMS (SPECIAL) | EACH | 1 | $1,000,000.00 | $1,000,000.00 |
| X5091600 | STEEL RAILING REMOVAL | FOOT | 0 | $20.00 | $0.00 |
| X6640638 | TEMPORARY CONSTRUCTION FENCE | FOOT | 400 | $7.00 | $2,800.00 |
| Z0013769 | SEDIMENT CONTROL, STABILIZED CONSTRUCTION ENTRANCE | SQ YD | 25 | $35.00 | $875.00 |
| Z0015500 | DEBRIS REMOVAL | L SUM | 1 | $3,500.00 | $3,500.00 |
| Z0075498 | CONCRETE RETAINING WALL REMOVAL | CU YD | 120.1 | $400.00 | $48,048.00 |
| | BANK ENHANCEMENTS TO RETAIN NORMAL POOL | L SUM | 1 | $45,000.00 | $45,000.00 |
| | BANK RESTORATION | L SUM | 1 | $15,000.00 | $15,000.00 |
| | CAUSEWAY CONSTRUCTION AND REMOVAL | L SUM | 0 | $850,000.00 | $0.00 |
| | GENERAL SITE RESTORATION | L SUM | 1 | $25,000.00 | $25,000.00 |
| | GUARDRAIL REMOVAL AND REPLACEMENT | FOOT | 0 | $46.00 | $0.00 |
| | REMOVAL AND RELOCATION OF MEMORIAL | L SUM | 0 | $25,000.00 | $0.00 |
| | RIVER SAFETY MEASURES DURING CONSTRUCTION | L SUM | 1 | $11,000.00 | $11,000.00 |
| | CONTINGENCY | L SUM | 1 | $602,289 | $602,289.02 |

**Subotal Sears** **$2,810,682**

07-30-25 Estimates for each alternative were generated by JJT using estimated quantities provided by EJM and additional quantities/cost calculated by JJT
08-04-25 Modified estimate to separate Sears & Steel full demo OPCC by EJM/JJT
10/15/2025 Modified estimate to add Alt E (Fish Passage)

| ESTIMATED QUANTITIES - ALTERNATIVE 5 - STEEL STEPPED SPILLWAY WITH FISH PASSAGE | | | | OPCC | |
|---|---|---|---|---|---|
| PAY ITEM | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| 20100500 | TREE REMOVAL, ACRES | ACRE | 0.09 | $22,900.00 | $2,061.00 |
| 20201450 | CHANNEL EXCAVATION | CU YD | 1742.9 | $55.00 | $95,859.50 |
| 25002024 | SEEDING, CLASS 4B (MODIFIED) | ACRE | 0.06 | $4,000.00 | $240.00 |
| 25100630 | EROSION CONTROL BLANKET | SQ YD | 290.4 | $2.85 | $827.64 |
| | STONE RIPRAP, CLASS A2 | TON | 2823.0 | $200.00 | $564,600.00 |
| 28100109 | STONE RIPRAP, CLASS A5 (SPECIAL) | TON | 11353.0 | $120.00 | $1,362,360.00 |
| 28100113 | STONE RIPRAP, CLASS A7 | TON | 5481.3 | $110.00 | $602,943.00 |
| 44213200 | SAWCUT | FOOT | 1590 | $10.00 | $15,900.00 |
| 50102400 | CONCRETE REMOVAL | CU YD | 75.4 | $400.00 | $30,176.00 |
| 50300225 | CONCRETE STRUCTURES | CU YD | 3140.9 | $1,500.00 | $4,711,365.00 |
| 50800205 | REINFORCEMENT BARS, EPOXY COATED | POUND | 207628 | $2.00 | $415,256.32 |
| 67100100 | MOBILIZATION | L SUM | 1 | $1,011,662.85 | $1,011,662.85 |
| X0322507 | PREFABRICATED BRIDGE SUPERSTRUCTURE | EACH | 1 | $200,000.00 | $200,000.00 |
| X0326891 | TEMPORARY ACCESS ROAD (SPECIAL) | SQ YD | 270.0 | $40.00 | $10,800.00 |
| X2800400 | PERIMETER EROSION BARRIER | FOOT | 430 | $8.00 | $3,440.00 |
| X5021507 | DEWATERING | EACH | 1 | $10,000.00 | $10,000.00 |
| X5021510 | COFFERDAMS (SPECIAL) | EACH | 1 | $1,000,000.00 | $1,000,000.00 |
| X6640638 | TEMPORARY CONSTRUCTION FENCE | FOOT | 900 | $7.00 | $6,300.00 |
| Z0013769 | SEDIMENT CONTROL, STABILIZED CONSTRUCTION ENTRANCE | SQ YD | 25 | $35.00 | $875.00 |
| Z0015500 | DEBRIS REMOVAL | L SUM | 1 | $3,500.00 | $3,500.00 |
| Z0018900 | DRILL AND GROUT DOWEL BARS | EACH | 1351 | $35.00 | $47,285.00 |
| | MISCELLANEOUS CONSTRUCTION ACTIVITIES | L SUM | 1.0 | $100,000.00 | $100,000.00 |
| | BANK ENHANCEMENTS TO RETAIN NORMAL POOL | L SUM | 1 | $45,000.00 | $45,000.00 |
| | CAUSEWAY CONSTRUCTION AND REMOVAL | L SUM | 1 | $850,000.00 | $850,000.00 |
| | GENERAL SITE RESTORATION | L SUM | 1 | $25,000.00 | $25,000.00 |
| | GUARDRAIL REMOVAL AND REPLACEMENT | FOOT | 40 | $46.00 | $1,840.00 |
| | RIVER SAFETY MEASURES DURING CONSTRUCTION | L SUM | 1 | $11,000.00 | $11,000.00 |
| | CONTINGENCY | L SUM | 1 | $3,034,989 | $3,034,988.54 |

**Total** **$14,163,279.84**

# SUMMARY OF ALTERNATIVES

| Alternative | Sears | Steel | Maintenance | Total | Description |
|---|---|---|---|---|---|
| 1 | $5,647,010 | $5,318,880 | $0 | $10,965,890 | Full removal both dams |
| 2 | $5,647,010 | $10,282,067 | $1,074,109 | $17,003,186 | Sears full removal; Steel stepped concrete |
| 3 | $5,647,010 | $5,589,214 | $1,611,164 | $12,847,388 | Sears full removal; Steel rock ramp |
| 4 | $13,857,431 | $10,282,067 | $3,222,328 | $27,361,826 | Sears full removal with riffles; Steel stepped concrete |
| 5 | $5,647,010 | $14,163,280 | $1,611,164 | $21,421,454 | Sears full removal; Steel steps and fish passage |
| 6 | $0 | $10,282,067 | $2,148,218 | $12,430,286 | Sears preservation; Steel stepped concrete |

# APPENDIX C - Existing Conditions Summary and Restoration Alternatives Evaluation



# Existing Conditions Summary and Restoration Alternatives Evaluation

## for the Dam Safety Feasibility Study for Sears & Steel Dams

**SUBMITTED TO**

Hanson Professional Services Inc.

**July 31, 2026**

# Existing Conditions Summary and Restoration Alternatives Evaluation

for the Dam Safety Feasibility Study for Sears & Steel Dams

**SUBMITTED TO**
Hanson Professional Services Inc.
1525 S. 6th Street
Springfield, IL 62703

**PREPARED BY**
Inter-Fluve
1539 Grand Ave.
Saint Paul, MN 55105

**July 31, 2026**

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# 1. Project Background

The Sears and Steel Dams flank Vandruff Island on the Rock River in Milan, Illinois. Together, the dams impound nearly 20 miles of the lower Rock River and limit fish passage from the Mississippi River to the upper Rock River watershed. The Illinois Department of Natural Resources Office of Water Resources (IDNR-OWR) retained Hanson Professional Services, Inc. to complete a dam safety feasibility study to evaluate alternatives for both dams. Inter-Fluve is a subconsultant to Hanson's team and is tasked with supporting evaluation of existing conditions, development of a sediment management plan, and supporting evaluation of the dam safety alternatives. This report documents the findings and analyses for Inter-Fluve's portion of Hanson's team's scope including the summary of existing conditions, sediment management, and dam safety alternative evaluation. It is understood that this report will be an appendix to Hanson's Dam Safety Feasibility report ("Hanson's report").

### PROJECT LOCATION, WATERSHED, AND SITE HISTORY

The Rock River is the major river running generally north to south through south-central Wisconsin and north-central and northwestern Illinois. The river originates in the Horicon Marsh area in east-central Wisconsin. The river then flows generally south and west to Rockford, Illinois, from which flows southwest and enters the Mississippi River at Rock Island. The Rock River flows approximately 300 miles from headwaters to mouth. River elevation declines more than 300 feet over this distance, from an elevation of 857 feet above mean sea level at Horicon Marsh to 545 feet at Rock Island. The geology of the lower Rock River has been described in detail by several researchers (Alden 1918, Anderson 1967, Anderson 2005, Carman 1909, Leverett 1899, and Savage and Udden 1921).

The Rock Island-Milan area geology is dominated by Devonian limestone deposits overlain by glacial Mississippi alluvial deposits. The modern river has incised into these deposits, and Vandruff Island is a good example of limestone bedrock exposed through quarrying. The current Vandruff Island was once two islands, Vandruff Island to the west and Carr Island to the east. Historic maps show that these islands were separated (Figure 1), but the gap was later filled as part of the quarrying and damming operations.




***Figure 1. Government Land Office Map of Vandruff Island from 1839 (GLO 1839). The current locations of the Sears (left) and Steel (right) dams are denoted by the added red lines. No dams were present in 1839, and note the Sears Dam located at the former ferry crossing.***

Prior to the current Sears Dam, a previous stone dam was built in its place in 1846 to power the Island Mills operated by D.B. Sears and Sons. Prior to the Steel Dam being built, a dam once spanned the Rock River at the current County 67 crossing south of Vandruff Island. This dam (the Black Hawk dam) was in place in 1888 and provided power for the Black Hawk Paper Company and also diverted water into the Kickapoo Slough (Figure 2). The Black Hawk dam is no longer in place. By 1900, the Steel Dam was constructed at the head of Carrs Island to control water flow into the Hennepin Canal. In the early 20th century, much of the Kickapoo slough and surrounding wetlands were filled.

The National Inventory of Dams (NID) lists the current Sears Dam as being built in 1912 and having a height of 16 feet (spillway 14 feet and apron 2 feet) and a hydraulic head of roughly 18 feet. According to the Federal Emergency Management Agency Flood Insurance Study (FEMA FIS), the Steel Dam has a height of 14.2 feet (FEMA 2010). Based on available information, the Hanson Team understands the height of the dam to be 13.1 feet. Based on available data, the upstream end of the impoundment is estimated to be roughly 19 miles upriver, just upstream of Highway 80. There is a depositional area just downstream of the Hwy 80 crossing (near TPC Deere Run Golf Club) that may be a topset delta. In low gradient alluvial rivers, topset beds are typically composed of coarser grained material, with finer sediment fractions transporting closer to the dams, as is the case with Sears and Steel Dams.

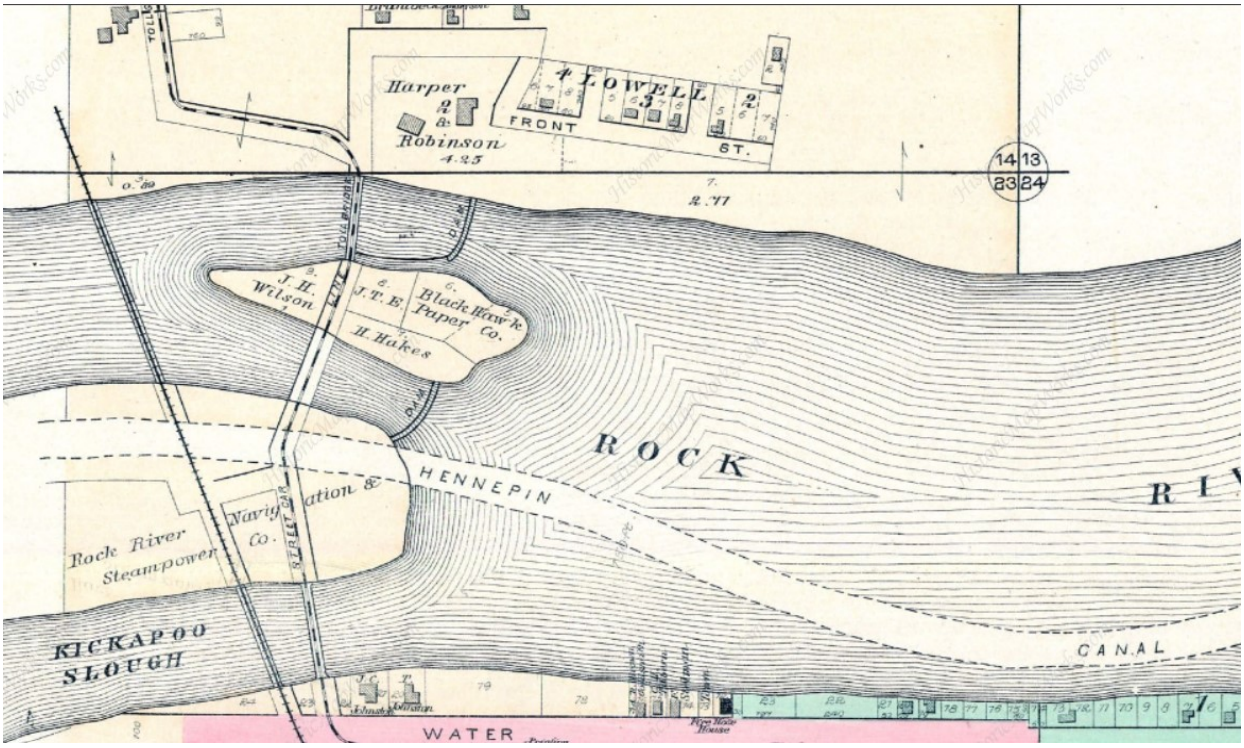



***Figure 2. Sanborn Fire Insurance Map from 1888 showing former dam location on the south side of Vandruff Island providing power for the Black Hawk Paper Company (Sandborn 1888). This dam no longer exists.***



***Figure 3. Looking south along the Steel Dam from Vandruff Island, July 26th, 1904.***

The NID lists the current Steel Dam as having a height of 11 feet. The NID shows the Steel Dam being built in 1912, but photos show the dam in place in summer of 1904 (Figure 3), and plat maps from 1905 also show the dam in place. According to the FEMA FIS, the Steel Dam has a height of 5.5 feet (FEMA 2010). Per as-built records, the Hanson Team understands the height of the dam to be 6.0 feet.

The Hennepin Canal is a concrete and earthen berm canal constructed to facilitate barge traffic from the Illinois River to the Mississippi River. Construction of the canal began in 1890, and the boat traffic started in 1907, reducing the distance from Chicago to Rock Island by 419 miles. A portion of this historic channel runs along the left bank of the Rock River adjacent to the project reach, with a former lock/entrance at the Steel Dam location. Widening of locks on the Illinois and Mississippi Rivers made the Hennepin Canal obsolete shortly after it opened, and by the 1930s, the canal was used primarily for recreational traffic. The Hennepin canal was closed to boat traffic in 1951 (Armstrong 1961, Yeater 1979). The entire Hennepin Canal is listed on the National Register of Historic Places, which may have an impact on site access and permitting requirements for removal of the adjacent Steel Dam.

# 2. Existing Conditions Assessments and Evaluations

The following sections document evaluation and assessment of existing conditions within the Rock River and its watershed to inform the dam safety feasibility study, per Inter-Fluve's scope of work. This includes evaluation of existing aquatic and riparian species within the project area and a site geomorphic assessment.

## 2.1 EXISTING AQUATIC AND RIPARIAN WILDLIFE

Inter-Fluve performed a desktop analysis to review the existing aquatic organisms and obtained local species information during an initial consultation with IDNR-OWR. The Rock River aquatic ecosystem in Rock Island County has a rich diversity of fish and native mussel species. This region has been the focus of extensive documentation by the Illinois Department of Natural Resources (IDNR). The river supports a thriving fishery with at least nine sport fish species and over twenty-three extant native mussel species, some of which are state endangered.

Dams have been shown to disrupt the upstream migration of fish and negatively impact fish community composition and genetics in warmwater Midwestern rivers (Kanehl et al. 1997, Smith et al. 2016, Smith et al. 2019). Conversely, many studies have shown that dam removal improves riverine habitat diversity, fish passage, mussel diversity, water quality, geomorphology and sediment and nutrient transport (Baxter 1977, Bednarek 2001, Bushaw-Newton 2002, Cordone and Kelly 1961, Ligon et al. 1995, Petts 1984, Stanley and Doyle 2003, Ward and Stanford 1979).

### 2.1.1 Fish

The Rock River has a successful and diverse fishery. At least nine species of sport fish can be found in the Rock River: Green Sunfish, Largemouth Bass, Northern Pike, Channel Catfish, Sauger, Smallmouth Bass, Walleye, White Bass, and Flathead Catfish. In efforts to support the fishery, each year the IDNR stocks over 70,000 walleyes annually(Illinois Department of Natural Resources, n.d.). IDNR has noted that both Lake Sturgeon and Paddlefish were encountered downstream of the dams and have not been recorded upstream of the dams, suggesting that the dams are a barrier to their movement.

The inventory of fish species present in the lower Rock River has been documented by the IDNR (personal communication with Brian Metzke, IDNR) and are presented in Table 1. Many, but not all, of these species are also present in the project area, either year-round and at all life-stages as resident populations, or during parts of their migratory life history. Four state endangered species are included in the Rock River fish inventory: Western Sand Darter (*Ammocrypta clara*), Pallid Shiner (*Hybopsis amnis*), Weed Shiner (*Notropis texanus*), and Lake Sturgeon (*Acipenser fulvescens*). No federally listed fish species or state threatened fish species are known to be present in the project area.

***Table 1: Fishes of the Rock River in Rock Island County, Illinois. Recorded by IDNR. (* = State Endangered).***

| Fish Species | | Status |
|---|---|---|
| **Common name** | Scientific name | |
| American eel | *Anguilla rostrata* | Native |
| Bigmouth buffalo | *Ictiobus cyprinellus* | Native |
| Bigmouth shiner | *Notropis dorsalis* | Native |
| Black buffalo | *Ictiobus niger* | Native |
| Black bullhead | *Ictalurus melas* | Native |
| Black crappie | *Pomoxis nigromaculatus* | Native |
| Black redhorse | *Moxostoma duquesnei* | Native |
| Blackstripe topminnow | *Fundulus notatus* | Native |
| Blue sucker | *Cycleptus elongatus* | Native |
| Bluegill | *Lepomis macrochirus* | Native |
| Bluntnose minnow | *Pimephales notatus* | Native |
| Bowfin | *Amia calva* | Native |
| Brook silverside | *Labidesthes sicculus* | Native |
| Bullhead minnow | *Pimephales vigilax* | Native |
| Central mudminnow | *Umbra limi* | Native |
| Channel Catfish | *Ictalurus punctatus* | Native |
| Channel shiner | *Paranotropis wickliffi* | Native |
| Chestnut lamprey | *Ichthyomyzon castaneus* | Native |
| Cichlid | *Cichlasoma sp.* | Non-native |
| Common Carp | *Cyprinus carpio* | Non-native |
| Common shiner | *Luxilus cornutus* | Native |
| Emerald Shiner | *Notropis atherinoides* | Native |
| Fantail darter | *Etheostoma flabellare* | Native |

| Fish Species | | Status |
|---|---|---|
| Fathead minnow | *Pimephales promelas* | Native |
| Flathead Catfish | *Pylodictis olivaris* | Native |
| Freshwater Drum | *Aplodinotus grunniens* | Native |
| Ghost shiner | *Notropis buchanani* | Native |
| Gizzard Shad | *Dorosoma cepedianum* | Native |
| Golden Redhorse | *Moxostoma erythrurum* | Native |
| Golden Shiner | *Notemigonus crysoleucas* | Native |
| Goldeye | *Hiodon alosoides* | Native |
| Goldfish | *Carassius auratus* | Non-native |
| Grass carp | *Ctenopharyngodon idella* | Non-native |
| Grass pickerel | *Esox americanus vermiculatus* | Native |
| Green Sunfish | *Lepomis cyanellus* | Native |
| Highfin Carpsucker | *Carpiodes velifer* | Native |
| Johnny darter | *Etheostoma nigrum* | Native |
| Lake Sturgeon* | *Acipenser fulvescens* | Native |
| Largemouth Bass | *Micropterus salmoides* | Native |
| Logperch | *Percina caprodes* | Native |
| Longear sunfish | *Lepomis megalotis* | Native |
| Longnose Gar | *Lepisosteus osseus* | Native |
| Madtom spp. | *Noturus spp.* | Native |
| Mimic Shiner | *Notropis volucellus* | Native |
| Mississippi silvery minnow | *Hybognathus nuchalis* | Native |
| Mooneye | *Hiodon tergisus* | Native |
| Mosquitofish | *Gambusia affinis* | Native |
| Mud darter | *Etheostoma asprigene* | Native |
| Northern hog sucker | *Hypentelium nigricans* | Native |
| Northern Pike | *Esox lucius* | Native |
| Orangespotted sunfish | *Lepomis humilis* | Native |
| Orangthroat darter | *Etheostoma spectabile* | Native |
| Paddlefish | *Polyodon spathula* | Native |
| *Pallid shiner | *Hybopsis amnis* | Native |
| Pugnose minnow | *Opsopoeodus emiliae* | Native |
| Pumpkinseed | *Lepomis gibbosus* | Native |
| Quillback | *Carpiodes cyprinus* | Native |
| Red Shiner | *Cyprinella lutrensis* | Native |
| Redear sunfish | *Lepomis microlophus* | Non-native |
| Redfin shiner | *Lythrurus umbratilis* | Native |
| Redhorse spp. | *Moxostoma spp.* | Native |
| River carpsucker | *Carpiodes carpio* | Native |
| River darter | *Percina shumardi* | Native |
| River Shiner | *Notropis blennius* | Native |
| Rock bass | *Ambloplites rupestris* | Native |
| Sand Shiner | *Notropis stramineus* | Native |
| Sauger | *Sander canadensis* | Native |
| Shoal chub | *Macrhybopsis hyostoma* | Native |

| Fish Species | | Status |
|---|---|---|
| Shorthead Redhorse | *Moxostoma macrolepidotum* | Native |
| Shortnose Gar | *Lepisosteus platostomus* | Native |
| Silver Chub | *Macrhybopsis storeriana* | Native |
| Silver lamprey | *Ichthyomyzon unicuspis* | Native |
| Silver Redhorse | *Moxostoma anisurum* | Native |
| Silverband shiner | *Notropis shumardi* | Native |
| Skipjack herring | *Alosa chrysochloris* | Native |
| Slenderhead darter | *Percina phoxocephala* | Native |
| Smallmouth Bass | *Micropterus dolomieu* | Native |
| Smallmouth Buffalo | *Ictiobus bubalus* | Native |
| Spotfin Shiner | *Cyprinella spiloptera* | Native |
| Spottail shiner | *Notropis hudsonius* | Native |
| Spotted gar | *Lepisosteus oculatus* | Native |
| Spotted sucker | *Minytrema melanops* | Native |
| Stonecat | *Noturus flavus* | Native |
| Striped shiner | *Luxilus chrysocephalus* | Native |
| Suckermouth minnow | *Phenacobius mirabilis* | Native |
| Walleye | *Sander vitreus* | Native |
| Warmouth | *Lepomis gulosus* | Native |
| *Weed shiner | *Notropis texanus* | Native |
| *Western sand darter | *Ammocrypta clara* | Native |
| Western silvery minnow | *Hybognathus argyritis* | Native |
| White Bass | *Morone chrysops* | Native |
| White Crappie | *Pomoxis annularis* | Native |
| Yellow bass | *Morone mississippiensis* | Native |
| Yellow bullhead | *Ameiurus natalis* | Native |
| Yellow perch | *Perca flavescens* | Native |

### 2.1.2 Native Mussels

Forty-five species of mussels have been historically reported in the Rock River basin (Bales et al., 2012). A survey conducted on the Rock River mainstem and tributaries in 2009 found 23 freshwater mussel species to be extant in the mainstem river (Bales et al., 2012) with an additional 10 species encountered and recorded by the Illinois Department of Natural Resources, Division of Natural Heritage in the lower Rock River of Rock Island county inventory list from 1924 — 2022 (personal communication with Brain Metzke, IDNR). All species documented between these two efforts are summarized in Table 2. Two of the 33 extant mussel species are state listed (denoted in Table 2) and no species found are federally threatened or endangered.

While no federally endangered species have been recently observed or recorded in the Rock River, the United States Fish and Wildlife Service IPaC (Information for Planning and Consultation; https://ipac.ecosphere.fws.gov/) analysis shows three federally endangered mussel species have known ranges encompassing this project area: Higgins eye (Lampsilis higgensii), Sheepnose

(*Plethobasus cyphyus*), and Spectaclecase (*Cumberlandia monodonta*). Based on recent surveys, these three species are likely extirpated from the area.

***Table 2: Extant freshwater mussel species in the mainstem Rock River. (* = State Endangered). Source (Bales et al. 2012).***

| Mussel Species | | Fish Hosts |
|---|---|---|
| **Common name** | **Scientific name** | |
| **Black sandshell** | *Ligumia recta* | Generalist, >20 sp. |
| **Butterfly** | *Ellipsaria lineolata* | Freshwater drum, Green sunfish |
| **Creeper** | *Strophitus undulatus* | Generalist, >40 sp. |
| **Deertoe** | *Truncilla truncata* | Freshwater Drum, Sauger |
| ***Ebonyshell** | *Reginaia ebenus* | Skipjack herring, Largemouth bass, White crappie, Black crappie |
| ***Elephantear** | *Elliptio crassidens* | Skipjack herring |
| **Elktoe** | *Alasmidonta marginata* | White Sucker, Northern Hog Sucker, Shorthead Redhorse, Rock Bass, Warmouth. |
| **Fawnsfoot** | *Truncilla donaciformis* | Freshwater Drum |
| **Flutedshell** | *Lasmigona costata* | Banded darter, Bluegill, Carp, Central stoneroller, Creek chub, Largemouth bass, Longnose dace, Northern hogsucker, Pumpkinseed |
| **Fragile papershell** | *Leptodea fragilis* | Freshwater Drum |
| **Giant floater** | *Pyganodon grandis* | Generalist, >40 sp. |
| **Hickorynut** | *Obovaria olivaria* | Shovelnose Sturgeon, Lake Sturgeon |
| **Lilliput** | *Toxolasma parvum* | Green Sunfish, Warmouth, Orangespotted Sunfish, Bluegill, White Crappie, Johny Darter |
| **Mapleleaf** | *Quadrula quadrula* | Catfish |
| **Monkeyface** | *Theliderma metanevra* | >20 species of minnows |
| **Mucket** | *Actinonaias ligamentina* | Generalist, >10 sp. |
| **Paper pondshell** | *Utterbackia imbecillis* | Generalist, ≥30 sp. |
| **Pimpleback** | *Quadrula pustulosa* | Channel Catfish, Black Bullhead, Brown Bullhead, White Crappie, Flathead Catfish, Shovelnose Sturgeon |
| **Pink heelsplitter** | *Potamilus alatus* | Freshwater Drum |
| **Pink papershell** | *Potamilus ohiensis* | Freshwater Drum, White Crappie |
| **Pistolgrip** | *Tritogonia verrucosa* | Yellow bullhead, Brown bullhead, Flathead catfish |
| **Plain pocketbook** | *Lampsilis cardium* | Banded Killifish, Largemouth Bass, Pumpkinseed, Black Crappie, Largemouth Bass, Perch |
| **Purple wartyback** | *Cyclonaias tuberculata* | Channel catfish, Flathead catfish, Black bullhead, Yellow bullhead |
| **Pyramid pigtoe** | *Pleurobema rubrum* | Spotfin shiner, Streamline chub, Scarlet shiner, Silver shiner |
| **Rock pocketbook** | *Arcidens congragosus* | Rock Bass, American Eel, Freshwater Drum, Gizzard Shad, White Crappie, Channel Catfish |
| **Round pigtoe** | *Pleurobema sintaxia* | Generalist, ≥10 sp. |
| **Threehorn wartyback** | *Obliquaria reflexa* | Goldeye, Silverjaw Minnow, Common Shiner, Longnose Dace |

| Mussel Species | | Fish Hosts |
|---|---|---|
| **Threeridge** | *Amblema plicata* | Freshwater Drum, Bluegill, Mooneye, Emerald Shiner, Steelcolor Shiner, Streamline Chub, Blac, Redhorse, Golden Redhorse, Northern Hogsucker, Channel Catfish, Logperch |
| **Wasbash pigtoe** | *Fusconaia flava* | Silver Shiner, Creek Chub |
| **Wartyback** | *Cyclonaias nodulata* | Channel catfish, Bluegill, Largemouth bass, White crappie, Black crappie, Flathead catfish |
| **Washboard** | *Megalonaias nervosa* | Generalist, ≥30 sp. |
| **White heelsplitter** | *Lasmigona complanata* | Carp, Green Sunfish, Largemouth Bass, White Crappie, Banded Killifish, Orangespotted Sunfish |
| **Yellow sandshell** | *Lampsilis teres* | Shovelnose sturgeon, Longnose gar, Shortnose gar, Largemouth bass, Green sunfish, Orangespotted sunfish, Warmouth, Black crappie, White crappie |

### 2.1.3 Riparian Species of Interest

During an assessment of threatened and endangered species, Inter-Fluve identified four other listed species that have known or expected ranges within the project area. These species, the Indiana bat (*Myotis sodalist*), northern long-eared bat (*Myotis septentrionalis*), and the rusty patched bumble bee (*Bombus affinis*) are federally endangered, and the eastern prairie fringed orchid (*Platanthera leucophaea*) is federally threatened, are detailed below.

- The endangered Indiana bat is a migratory species that nests and forages in forested areas typically in the eastern extent of their range. During the winter, a very small percentage of Indiana bat individuals will hibernate in the mines and caves in Illinois, particularly in a mine in La Salle County and in caves and mines along the Mississippi and Ohio rivers.
- The federally endangered northern long-eared bat is a permanent species found in Illinois. Summer roosting locations include caves, mines, buildings and under tree bark. Like the Indiana bat, hibernation primarily occurs in the mines of La Salle County.
- The rusty patched bumble bee is a federally endangered species and an Illinois permanent resident. This bee species has been found in diverse habitats such as prairies, woodlands, marshes, agricultural areas, and residential parks and gardens frequently visiting sunflowers, asters, goldenrods, and honeysuckles. Their nests are usually located 1 to 4 feet underground in abandoned rodent nests or other mammal burrows.
- Federally threatened eastern prairie fringed orchid, a perennial plant, occurs in a wide variety of habitats, from mesic prairie to wetlands such as sedge meadows, marsh edges, even bogs. It requires full sun for optimum growth and flowering and a grassy habitat with little or no woody encroachment.

Considering the habitat observations from the geomorphic assessment (see Section 2.2) and the habitat requirements of the species listed above, it is unlikely that these species would be found in

the immediate project riparian or wetted areas. However, further investigation may be necessary once any specific activities and areas with potential for habitat disturbance are identified.

### 2.1.4 Summary of Key Wildlife Findings

- The Rock River supports a successful fish inventory of a recorded ninety-four fish species, including nine sport fish species, as described by IDNR.
- Four state endangered fish are documented (Western Sand Darter, Pallid Shiner, Weed Shiner, and Lake Sturgeon) and no federally listed fish species are known to occur in the Rock River.
- Twenty-three of the historical forty-five species of native freshwater mussels were encountered in the most recent (2012) extensive survey.
- Three federally endangered native freshwater mussel species are known to have ranges in the Rock River (Higgins eye, Sheepnose, Spectaclecase), however, these species have not been encountered in recent surveys and are likely locally extirpated.
- Four federally listed species of riparian fauna (Indiana bat, northern long eared bat, rusty patched bumble bee, eastern prairie fringed orchid) are known to have ranges in the project area and unlikely to be found in the wetted areas of the river.

## 2.2 GEOMORPHIC ASSESSMENT

Inter-Fluve completed a semi-quantitative geomorphic reconnaissance assessment of the Sears and Steel Dam impoundments and the Rock River immediately downstream of the dams. Reconnaissance was completed on foot and via small boat, and included observations of bank stability, channel bed material, depositional and scour features, habitat, and riparian vegetation. The assessment was conducted on June 13-14th, 2024. This assessment divides the Rock River within the project area into four sub-reaches (Figure 4), and a fifth reach upstream of the project area:

- Reach 1 extends from Sears Dam to the eastern end of Vandruff Island. This reach is composed of Rock River branch north of Vandruff Island.
- Reach 2 extends from Highway 67 bridge to the Steel Dam is composed of the Rock River branch on the south side of Vandruff Island.
- Reach 3 extends from the upstream end of Vandruff Island to the Milan Beltway bridge.
- Reach 4 extends from the Milan Beltway Bridge to the I-74 bridge.
- Reach 5 (beyond project area) extends from the I-74 bridge to the I-84 bridge.

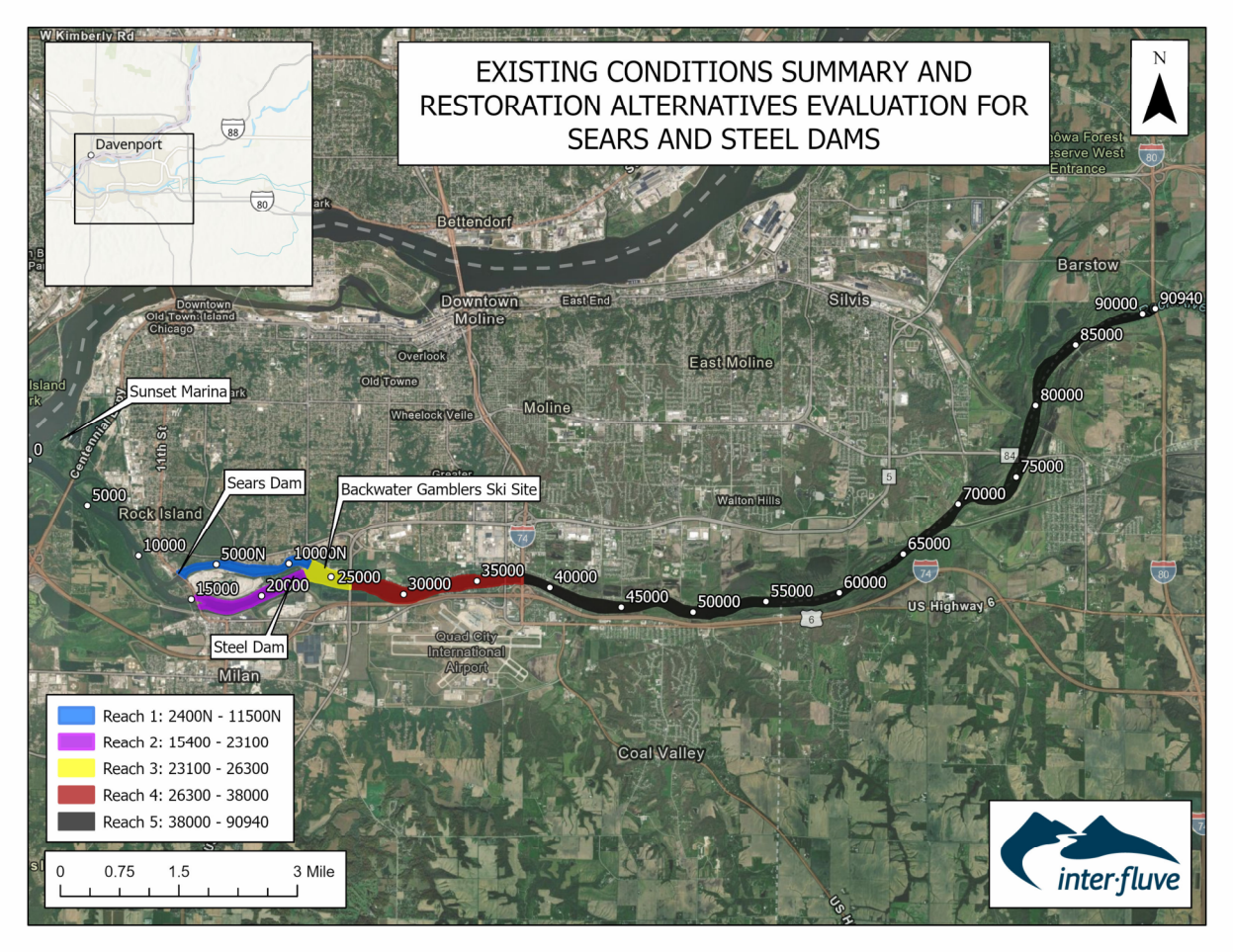



***Figure 4: The four reach sections of the Rock River adopted for the geomorphic assessment.***

The Inter-Fluve team accessed the Rock River at Ben Williamson Park launch and conducted a boat reconnaissance of the channel from Sears Dam to just upstream of the I-74 Bridge. The area within 1,000 feet of the Steel Dam was not traversed for safety reasons. Flow at the time of survey was approximately 12,300 cubic feet per second (cfs), roughly 1.5 feet above median flow for June 13th (based on the 24-year period of record) and 5 feet higher than on the same date in 2023 (Byron USGS gage 05440700). The Sears Dam (Figure 6) was viewed from the Fraternal Order of Eagles parking lot on 51st Avenue, as well as from the Hwy 67 (11th Street) Bridge. The Steel Dam (Figure 5) was viewed from the left dam abutment. The Sears Dam, including the mill building remnant and bridge abutment, spans 934 feet, with the spillway spanning 457 feet. The Steel Dam spillway spans 776 feet. The upstream impoundment is held back by the two dams and Vandruff Island.



*Figure 6. Sears Dam, looking from river right on Highway 67. June 13, 2024.*



*Figure 5. Steel Dam, looking from river left north toward Vandruff Island. June 13, 2024.*

Reconnaissance was conducted by car and on foot for areas downstream of the dam spillways to the confluence with the Mississippi. Flow velocities downstream of Sears and Steel Dams were too high to allow for safe access via boat.

Periodic probing of depths and sediment thickness/composition was completed using flexible depth of refusal rod and selected sites. This probing was performed to inform the geomorphic assessment, but full depth of refusal (DOR) measurements were completed by the Illinois Department of Natural Resources Office of Water Resources (OWR) on August 29-30, 2023, June 11-13, 2024, and September 11, 2024. Observations were made regarding stabilized banks (e.g. riprap), bank stability, vegetation, and channel bed features.

### 2.2.1 Reach 1

The Highway 67 bridge is located immediately downstream of Sears Dam. The dam is located between river left and a multipurpose mill building (circa 1838) parallel to the river right bank. Large wood accumulations were present along the top rim of the dam, and photographs suggest the large wood was present in greater abundance than in past years. The channel on the northern side of Vandruff Island has widths ranging from 600 feet at the dam to 284 feet at bedrock outcrops on river right 2,200 feet upstream of Sears Dam. Water depths range from approximately 5 feet to 12 feet. The dam is situated at the base of a moderately steep riffle section of the North Channel. This riffle had a pre-dam slope of approximately 0.28% with its crest roughly 5,000 feet upstream of the dam,

midway along Vandruff Island (Figure 7, FEMA 2010). The upper half of the North Channel flattens out to a plateau-like riffle feature with its crest at roughly the same elevation as the base of the adjacent Steel Dam (553 feet.)

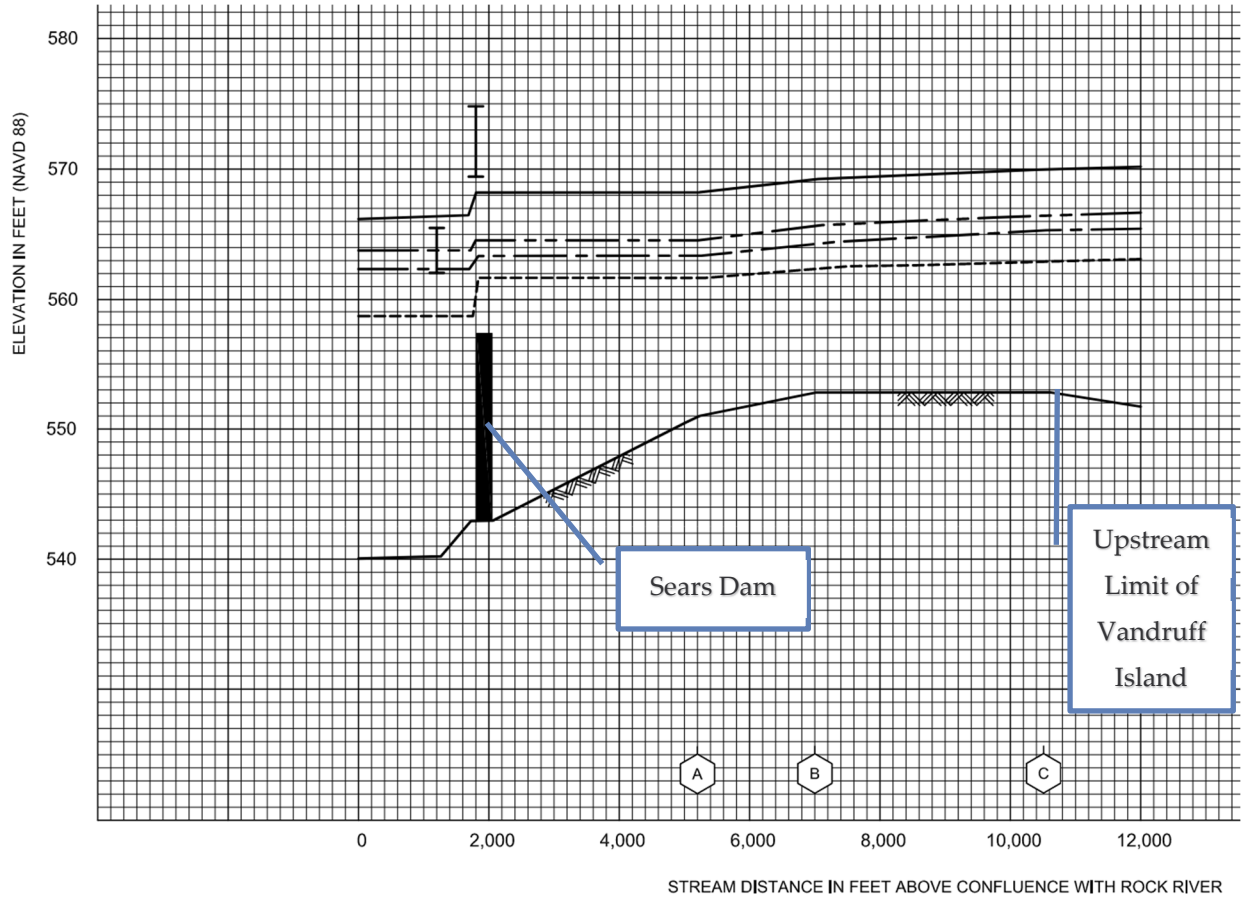



***Figure 7. FEMA Flood Insurance Study profile showing the elevation of channel bed features and the Sears Dam in the vicinity of Vandruff Island.***

Fine sediment such as sand and clay travel further in impoundments and is often concentrated closer to the dam spillway. Inter-Fluve probing revealed sediments within 1,000 feet of the Sears Dam are primarily silt varying from 4-8 feet in thickness above a pre-dam gravel bed. Upstream of Station 35+00N to the upstream end of Reach 4, probing showed the river bottom is predominantly sand, varying in thickness from 1-3 feet.

Reach 1 sediment deposition varies, with the deepest fine sediment deposits from Station 25+00N to 45+00N, and in the backwater channel near the mill building. Sand deposits of 1-4 feet in thickness are present along the channel center and right bank from the tributary outlet delta at 60+00N to the upstream head of the island. Sand bars are identifiable from aerial photos by the location of large wood deposits lodged in the sand.

The river right shoreline between the Sears Dam and 38th Street (Station 25+00N to 105+00N) is bounded by a 100-foot-tall bluff area sloping steeply toward the south and terminating in the river, sometimes with vertical limestone outcrops. A floodplain bench is present along the base of the bluff, with a small housing development along 47th Avenue east of 24th Street (60+00N). The riparian area is forested between the dam and 24th Street, dominated by large silver maple, red oak, and catalpa overstory trees and an understory of reed canary grass and shrubs.

The Vandruff Island north bank varies from 8-15 feet in height. The island riparian area is naturally vegetated but includes invasive shrubs such as bush honeysuckle and buckthorn. The upper canopy is mature with overstory trees similar to the right bank of the channel. Large wood is present in low density along the island's bank.

Banks are stable throughout the reach. Island side banks have mature trees with thick root systems, whereas the right banks are stabilized with vegetation, bedrock outcrops, and artificial toe stabilization such as riprap and seawalls. A few properties contain no artificial armoring.

### 2.2.2 Reach 2

Due to high water, the river channel on the south side of Vandruff Island between the Sears and Steel Dams was accessible only by foot along the Hennepin Canal. The river left bank is stable and naturally vegetated with cottonwood, black walnut, white oak, and hawthorn as the dominant canopy trees.

Understory vegetation includes dogwood, sumac, serviceberry, sedges, poison ivy, milkweed, Canada thistle, goldenrod, and invasive buckthorn. Banks are 7-10 feet high, with steep upper banks that taper at the toe. Cottonwood, black willow, and other trees provide stabilizing root systems. The right (north) bank of the channel appears to be stable, but high water prevented inspection of the channel toe.

Mill Creek enters this reach from the south, midway between Hwy 67 and the Steel Dam. The historic Hennepin Canal runs along the left floodplain but is interrupted by the Mill Creek crossing and confluence. The Hennepin Canal Trail berm runs south of the canal from the Rock Island-Milan Parkway to 27th Street West.

DOR readings in Reach 2 were initially delayed due to the high-water conditions but were collected in June of 2024 by IDNR. Probing within Reach 2 revealed no thickness of impoundment sediment or sand. Bedrock was encountered at the bed in four of the five locations investigated, with one location revealing about 0.1 feet of gravel overlaying bedrock.

### 2.2.3 Reach 3

The Steel Dam (Figure 5) is situated on the mainstem of the rock river, just downstream of the head of Vandruff Island at the crest of a riffle (Figure 8, FEMA 2010). At the eastern (upstream) head of Vandruff Island, starting upstream from Steel Dam to the Rock Island-Milan Parkway bridge, the channel widens to approximately 900-1200 feet as this area starts the split flow around Vandruff Island. Bed sediments are approximately 1-3 inches of sand, fines, with mud and gravel mix on top of refusal. Sediment depths increase upstream toward the Milan Beltway bridge. A relic side channel remains open on river right from Station 255+00 at the Backwater Gamblers Waterski area to 285+00 in Reach 4.

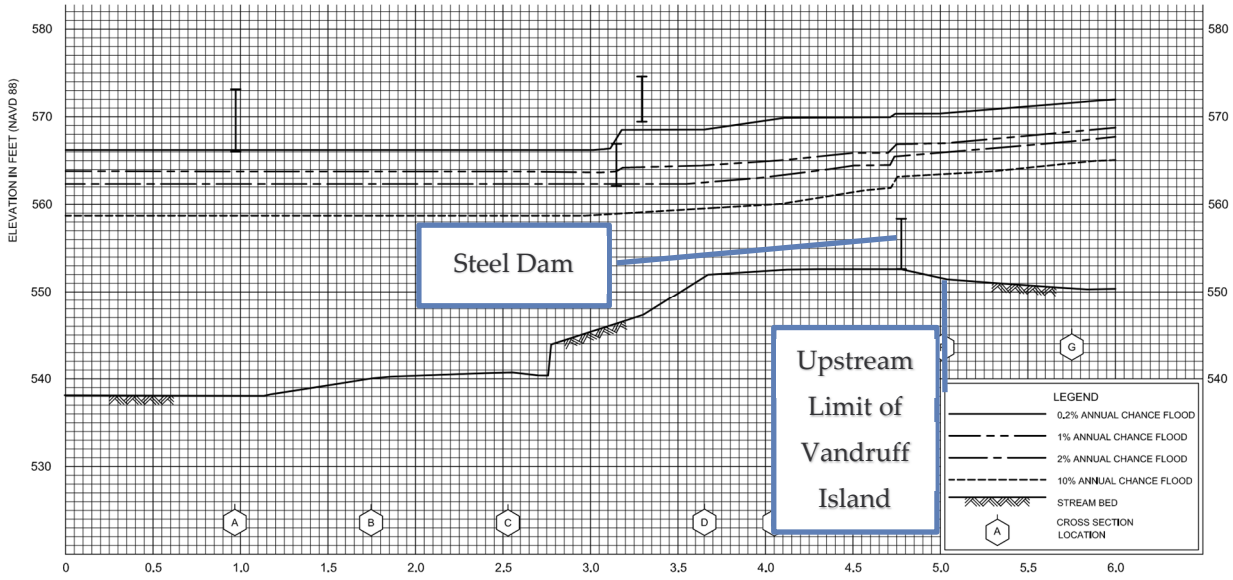



***Figure 8. FEMA Flood Insurance Study profile showing the elevation of channel bed features and the Steel Dam in the vicinity of Vandruff Island.***

Apart from the waterski facility area, river left (south) and right (north) banks are swamp (forested wetland) dominated, with a silver maple dominated canopy over invasive reed canary grass understory. Ben Williamson Park covers approximately a 900-foot stretch in this reach with heavy foot traffic and a boat launch. The riverbank in the park/waterski area is low and armored by concrete and riprap.

A natural gas pipeline crossing is visible on the right bank shoreline at Station 245+00. Power lines cross the river at Station 112+50N at the head of Vandruff Island.

Probing corroborates OWR depth of refusal data, and Inter-Fluve found a thin veneer of sand between 0-4 feet in thickness. No significant large wood accumulations were noted.

### 2.2.4 Reach 4

The reach between Rock Island-Milan Parkway bridge upstream to the I-74 bridge becomes narrower than the downstream reaches. Channel width varies from 600 – 1000 feet. River right upstream from the Milan beltway bridge for approximately 2,000 feet, has stable but slightly undercut banks with mature forested wetland dominated by silver maple canopy and an understory monoculture of reed canary grass. Large wood is present along the right bank shoreline.

A relic side channel remains open on river right from Station 255+00 at the Backwater Gamblers Waterski area to 285+00 in Reach 4. This small side channel is part of a larger relic meander still present as wetlands north of North Shore Drive to 16th Street.

Probing corroborates OWR depth of refusal data throughout the reach, and Inter-Fluve found a thin veneer of sand between 0 – 2 feet in thickness. Water depths at the time of survey ranged from 6.0 to 8.0 feet.

Approximately 65% of the Rock River in Reach 4 is developed, primarily with residential housing. Banks are riprap or sea walls, most with lawns maintained to the shoreline and few canopy trees. Banks vary up to 12 feet from top of bank to toe of slope, with top of bank typically 4-5 feet above impoundment water level.

### 2.2.5 Reach 5

Reach 5 is 7.3 miles long, extending from I-74 to the I-84 bridge. From I-74 to Green River Park, the channel is mostly armored with riprap or concrete sea walls to protect homes and roads. Upstream of Green River Park, the channel is bounded by primarily natural, but stable shoreline. The post-glacial valley bottom is over a mile wide and is encroached partially by Highway 5 to the north and I-280 to the south.

Sediment input from upstream and the Green River have created a wide, low floodplain that is frequently inundated. This floodplain area contains relic channel segments, sloughs, and an active side channel. The Green River enters the Rock River just downstream of the Illinois & Mississippi/Hennepin Canal terminus, across the Rock River from TPC Deere Run Golf Club. Sediment movement through this reach is likely impacted by the backwater from the Sears and Steel Dam complex, which has a normal pool elevation near elevation 560, which corresponds to the FEMA FIS study channel bottom elevation found in the I-84 area.

Banks are composed of sand to sand loam, and are stable, but vary in width from 580 feet to as wide as 900 feet. Bank morphology, riparian vegetation, and channel bed material are consistent with Reach 4, with the bed being predominantly sand with some fines and gravel present. Sediment depths measured by OWR (2024) between Bowles Slough and the Green River confluence reflect both a potential topset delta of the dam impoundment and also deposited sediment from the Green River. The deposited sediment would have a fraction that originates from the upstream Rock River reaches, but clearly the Green River has a strong influence on deposition in this area. If the dam complex was not present, sediment depths would likely be reduced as more Green River sediment would mobilize downstream.

### 2.2.6 Summary of Key Geomorphic Findings

Key findings of the geomorphic assessment are summarized as follows:

- Sand bars are present near tributary confluences and on the inside of meander bends. Large wood accumulations are common in these areas, but ephemeral. There is currently more wood in the channel than is visible in aerial photos since 2000.
- Desktop and field geomorphic assessment suggests that the banks are stable, with little or no change observed in the past 30 years. Stability is due to artificial stabilization (riprap and sea walls), bedrock outcrops, and native stabilizing vegetation.
- Residential areas are armored with riprap and sea wall treatments of varying materials and quality. These areas have no riparian habitat value and limited green canopy.

- Reaches 1-4 have a total of 13 miles of shoreline, roughly 3 miles is developed shoreline (25%). The rest is riparian forest varying in width from 20 feet along Hwy 280 to 1800 feet in Ben Williamson Park. Reach 5 has 14.6 miles of shoreline, with roughly 23% developed, including the TPC Deere Run property shoreline (6,000 ft).
- Roughly 75% of the shoreline in the study reach has a natural riparian area, dominated by cottonwood and silver maple overstory, shrub understory and in the case of lowland areas, reed canary grass marsh/swamp.
- Banks vary in height and morphology, but in natural areas are well vegetated and root stabilized. Some areas had stabilized toes, but high water prevented us from seeing down to the actual river toe.

# 3. Impounded Sediment Assessment

Managing impounded sediment is often one of the most complicated and expensive elements of dam removal projects. In order to develop feasible and effective sediment management alternatives a sediment investigation is necessary to estimate the volume, location, and quality of impounded sediment. This section describes evaluation of existing impounded sediment quantity and quality, implications for sediment management alternatives, and a sediment fate analysis. Discussion is provided regarding recommendations and alternatives based on Inter-Fluve's understanding of OWR preferences for sediment management.

## 3.1 IMPOUNDED SEDIMENT QUANTITY

A DOR survey was completed by the IDNR in August 2023, June 2024, and September 2024 within the impoundment of the Sears and Steel Dams upstream to the I-80 bridge. Associated bathymetric surveys were completed by IDNR in June 2024 over the same reach. DOR surveys consist of pushing a rigid metal rod into the river substrate until the rod cannot be pushed further, referred to as the depth of refusal. In this case the substrate material overlying the depth of refusal is soft impounded sediment that has accumulated due to the limited sediment transport capacity conditions of the river due to the presence of the dams. The refusal layer could be a range of alluvium, gravel, cobble, or bedrock, which is interpreted as the pre-dam channel and/or floodplain surfaces. Forty-one (41) DOR cross sections were surveyed in the extended impoundment upstream of the Sears and Steel Dams to just downstream of the I-80 bridge. DOR measurements were taken in concert with an RTK-GPS bathymetric survey to get precise elevations of the channel bed and underlying refusal layer. The difference in elevation of these two layers provides an estimate of sediment thickness throughout the impoundment, which is used to estimate overall volume of impounded sediment and select sediment sampling locations. Data collection processing, methods and assumptions are discussed at the end of this section.

Sediment thickness was estimated using GIS analysis of depth of refusal surveys conducted by the IDNR. The volume of impounded sediment between the Sears and Steel Dams and the I-80 bridge was estimated by a volume comparison in ArcGIS Pro of the surveyed existing channel surface

(bathymetry) and a surface created using the DOR data. The available data and methods for estimating volume produce a high-level estimate of sediment volume only, as discussed in this section. The estimated volume of impounded sediment is approximately 4,300,000 cubic yards. This total only includes the area surveyed by boat and does not include potentially impounded sediments stabilized by vegetation on the modern floodplain, or sediment upstream of the limits of the survey. The reported impounded sediment volume is an estimate only given that the bathymetric and DOR surfaces are extrapolations that interpolate sediment depth between surveyed point measurements.

Depth of refusal data (OWR, 2024) shows deep deposits of fines near the Sears Dam, and a thin veneer of sand upstream to Veteran's Memorial Park (Station 480+00), consistent with Inter-Fluve's findings during the geomorphic assessment. From Veteran's Park to Hwy 84, sand deposits of up to 8 feet were measured (Figure 9). The FIS study data shows that the Steel Dam crest elevation (558.5 feet) aligns with the Rock River channel bed at roughly Station 1055+00, or 3.0 miles upstream of I-80 near Cleveland, IL. This represents a potential backwater effect at low flow of nearly 16 miles. The sediment deposits downstream of Hwy 84 may be the topset bed or delta that often forms at the upstream end of impoundments, but they could also simply be part of the normal tendency for the river to deposit sand in this location. Government Land Office (GLO) maps from the 1850s show islands present in the area downstream of the Green River, which has a significant watershed and is transporting sand and fines into the Rock River at this location. The wide floodplain and relic meanders here also indicate that this area has historically been depositional. Determining the amount of sediment deposition due to dam presence versus upstream river geomorphology and sediment transport is not possible. Relic meanders are common throughout the floodplain from Erie to Milan and give some idea of the pre-settlement belt width of the Rock River.

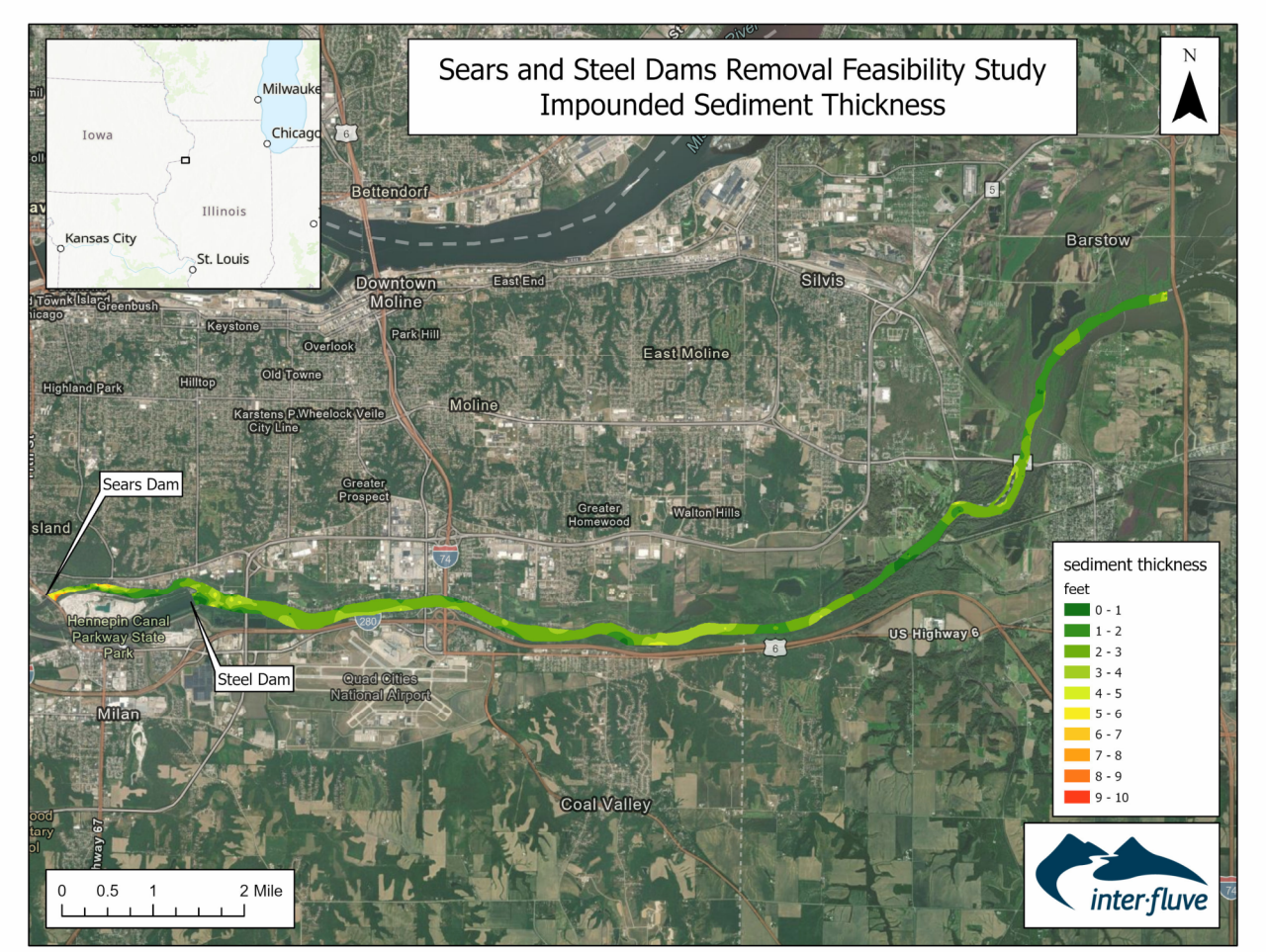



***Figure 9. Sediment thickness map for Sears and Steel Dam impoundments to the I-80 bridge.***

Using the bathymetric and DOR survey data provided by OWR, Inter-Fluve created cross-sections and longitudinal profiles of the existing river channel and underlying refusal surfaces. The longitudinal profile is broken into two sections: the North Channel, including the impoundment upstream of the Sears Dam; and the South Channel, including the river downstream of Steel Dam and the mainstem of the Rock River. These two longitudinal profiles are shown in Figure 10 and Figure 11.

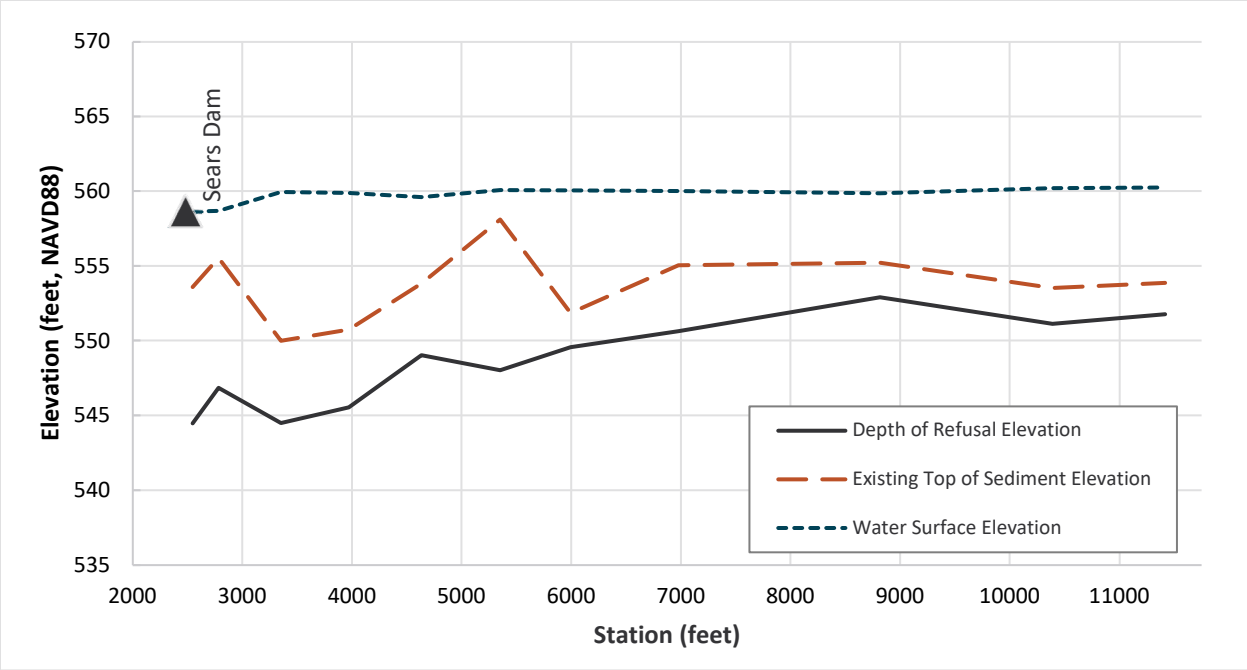



***Figure 10. North Channel of the Rock River longitudinal profile.***

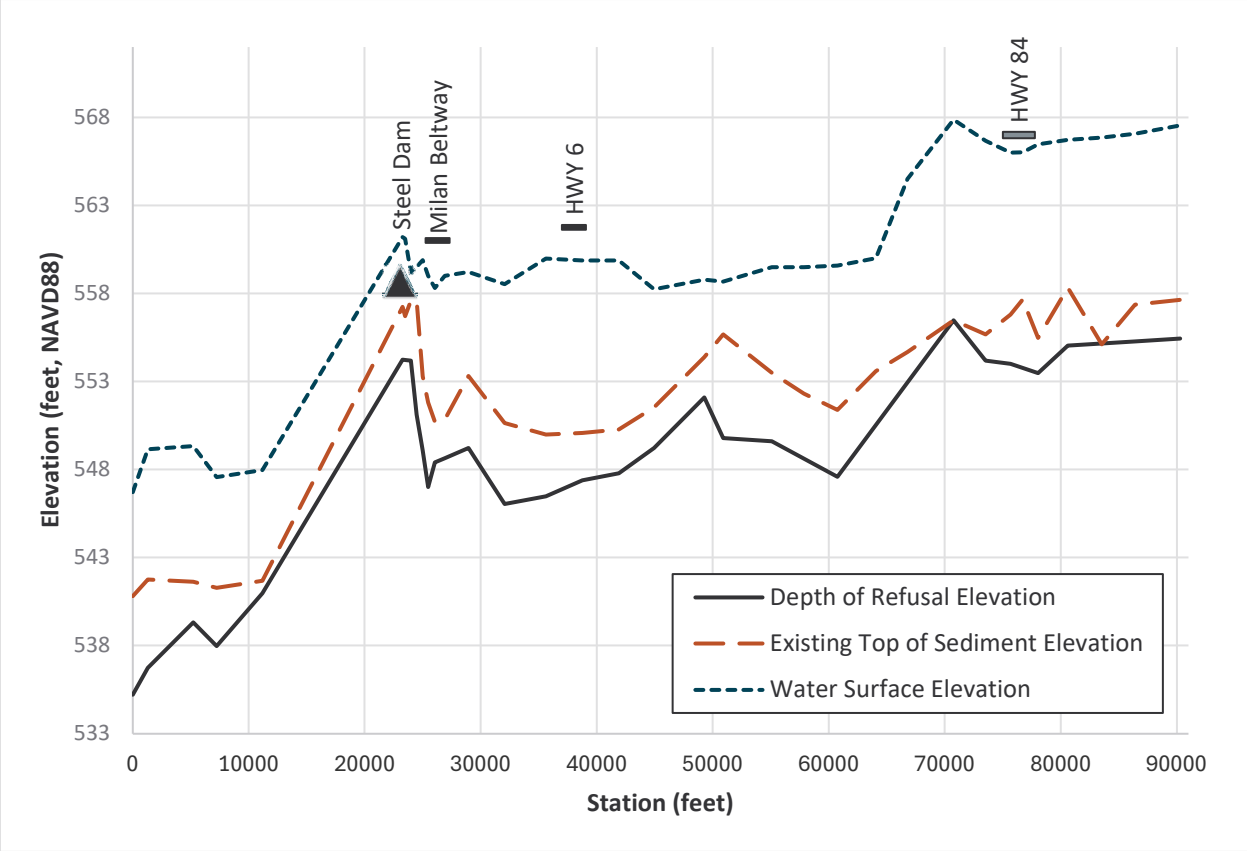



***Figure 11. Longitudinal profile of the South Channel and upstream reaches of the Rock River. Station 0 represents the confluence with the Mississippi River.***

The longitudinal profile of the North Channel (Figure 10) in the Sears Dam impoundment exhibits a thicker accumulation of sediment within the first 5,500 feet upstream of the dam, with sediment thicknesses commonly exceeding 5.0 feet. Continuing upstream, the profile of the current bed and underlying refusal surface are near parallel with consistent sediment thicknesses of 2-3 feet. The longitudinal profile of the main channel (Figure 11) shows relatively consistent sediment thicknesses, where the current channel bed mimics the underlying refusal surface, with 2-5 feet of accumulated sediment, until about 64,000 feet upstream of the dams. The upstream half of this impoundment has less consistent sediment accumulation, typically with depths 1-2 feet of sediment with sections of no accumulated material.

Four representative cross sections are shown in Figure 12 to highlight the range in channel and sediment accumulation characteristics at different sections of the impoundment. The river reach immediately upstream of the Sears Dam displays one of the highest sediment accumulation zones due to the additional accommodation space in a deeper part of the impoundment. Cross section 12, just upstream of the Steel Dam, has an asymmetrical cross section with accumulation of 2-3 feet in the deepest part of the channel 200 feet from the river left bank and minimal (~1 foot) of sediment across the rest of the cross section. Cross section 20, upstream of the Milan beltway bridge is typical of this wide stretch (~900 -foot-wide) of the lower impoundment with 2-4 feet of sediment consistently accumulated across the channel. Cross section 33, due south of the TPC Deere Run golf course, is a representative cross section of the comparatively narrower (~600-foot-wide) upper impoundment with consistent sediment thicknesses of 2-5 feet.

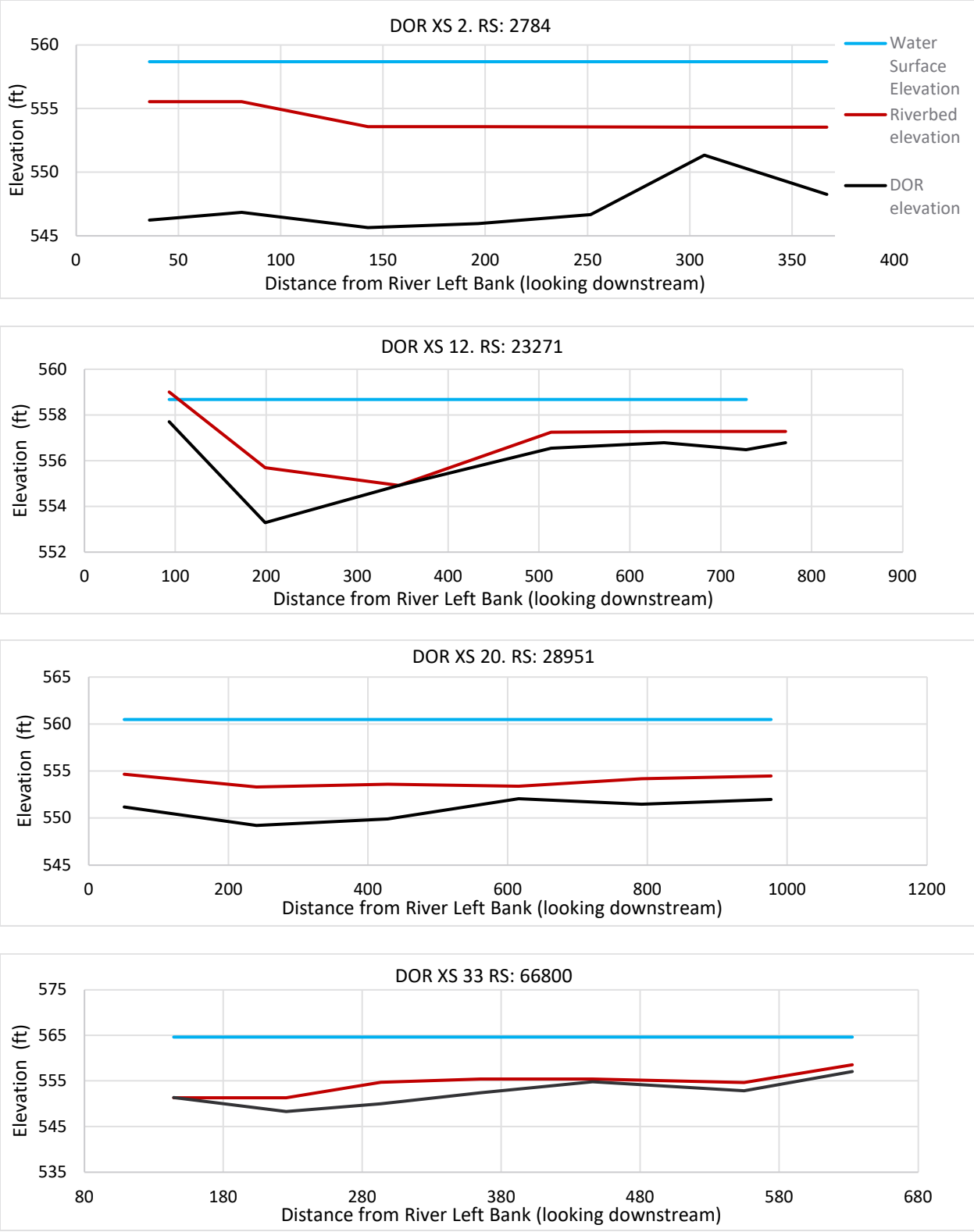



***Figure 12. Select cross section profiles of the Rock River within the project area showing water surface elevation, riverbed elevation, and DOR elevation.***

### 3.1.1 DOR Data Processing, Methods, and Assumptions

- DOR elevations were calculated by subtracting the sediment thickness measurement from the bathymetry elevation using the following methods.
    - During the DOR survey measurements were recorded as distances from the water surface elevation down through the water column and underlying substrate until refusal. This included the depth to the channel bed, depth to refusal, and the sediment thickness (difference between refusal and channel depth).
    - IDNR recorded water surface elevations (WSE) during DOR surveys upstream of the dams for each impoundment, but these elevations were not sufficient to accurately calculate elevations of refusal because of the water surface gradient of the 16-mile project area. To more accurately depict the refusal surface elevations, bathymetry elevations taken in the same locations as the DOR measurements were used.
    - IDNR did not obtain DOR measurements at the same time as the bathymetry, so Inter-Fluve assumed a relatively stable channel bed between data collection dates. Ideally, a water surface elevation measurement and/or a bathymetry measurement at the same location as the DOR probe measurement would be taken to ensure consistency in all surveyed elevations.
- Assumptions
    - IDNR reports that probe lengths between 12-18 feet were used on different days of survey for DOR data collection. No measurements were recorded deeper than 15 feet. In locations where the depth of refusal was greater than the probe length below the water surface at the time of collection, no measurement was recorded.
    - DOR points more than 1,000 ft upstream of each dam that did not have a recorded sediment thickness were not used in the interpolation to calculate the sediment volume estimate.
    - Initially, 15 feet was used as a conservative estimate for missing data points, because it captured the upper bound of all DOR measurements. This was logical for areas immediately upstream of the Sears Dam where there was typically 10+ feet of impounded sediment; however, in the upstream areas (more than 1,000 ft upstream of each dam) the greatest sediment thickness encountered was no more than six feet. It was assumed that these were not outlier areas with substantially thicker sediment deposits but rather were limited by the 15-foot overall probe length in areas with 10+ feet of water. This occurred in nine locations, all of which were omitted from the impounded sediment volume calculation and long profile.

- Calculating the volume of impounded sediment was a multi-step process that resulted in the estimate of impounded sediment in the Rock River.
    - Two surfaces were created from the surveyed point data interpolated with the Topo to Raster tool in ArcGIS Pro. First the bathymetry surface was created using the point data of channel bed elevations at each DOR location, followed by the refusal surface interpolated by the refusal depths at each DOR location.
    - Each surface then had the volume calculated using the Surface Volume tool in ArcGIS Pro above a plane of zero for accurate comparison. The final estimate for the impounded sediment volume was the refusal surface volume subtracted from the bathymetry surface volume.

## 3.2 IMPOUNDED SEDIMENT QUALITY

### 3.2.1 Sediment Sampling

Sediment contaminant sampling was completed by EnviroScience in spring of 2025, with methods detailed in the Sediment Sampling and Analysis Plan (Enviroscience 2025) and results summarized in a draft report prepared for Illinois Office of Water Resources (Eviroscience 2025). On March 11-13, 2025, EnviroScience conducted vibracore sediment sampling, supernatant, and water sampling at ten sampling locations on the Rock River (Figure 13). Nine of the ten sample locations were collected upstream of the Sears and Steel Dams, with one sample location located directly downstream of the dams.

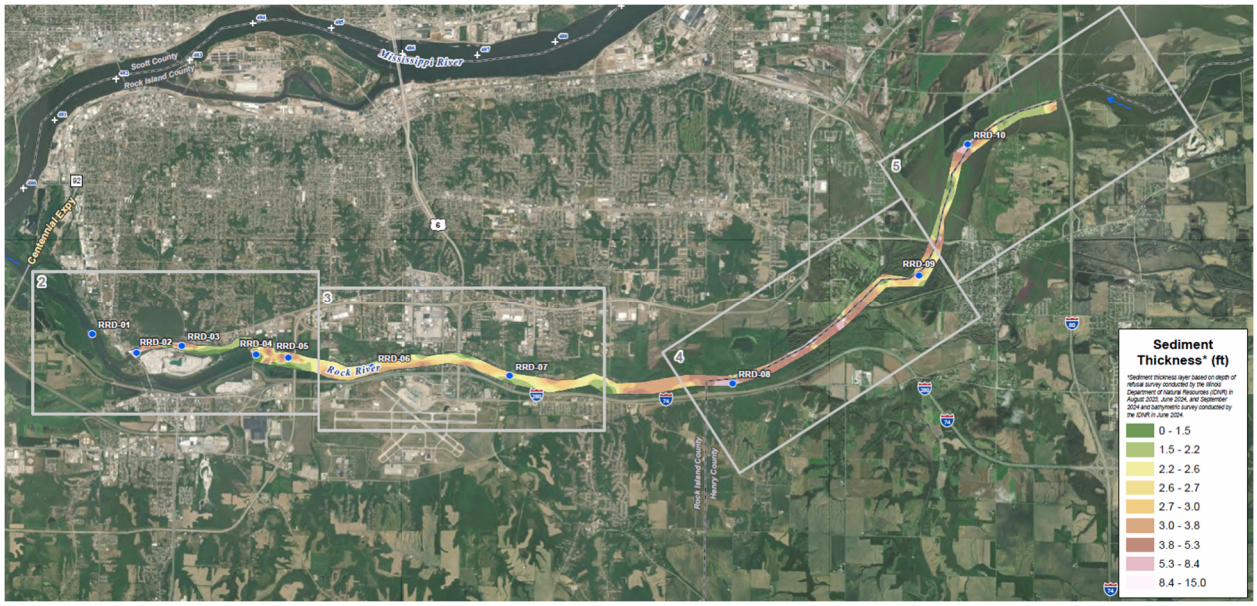



***Figure 13. Excerpt from Enviroscience (2025) report showing sediment core locations (blue dots) within the project reach. See Enviroscience (2025) for detailed maps.***

Sediment core samples were collected and processed for analysis as follows:

- Nine sediment cores, RRD-02 through RRD-10, were retrieved from the Rock River upstream of the Sears and Steel Dams.
- Samples RRD-10, RRD-09, RRD-08, RRD-07, RRD-06, RRD-05, and RRD-03 were collected as supernatant samples with both sediment cores and five gallons of site water being collected from each site location.
- Samples RRD-04 and RRD-02 were collected as sediment samples with no water samples being collected.
- Sample RRD-01 was originally proposed as a supernatant sample with additional receiving water samples. However, no sediment was found at the sample site. Receiving water samples were collected.

Sample analysis parameters and methods were developed based on the following documents:

- Illinois Administrative Code, Title 35, Section 395.205 – Material Testing (IAC 395.205.)
- The Illinois Environmental Protection Agency (IEPA), Bureau of Water Section 401 Water Quality Certification circular entitled Material Analysis for Dredge and Fill Activities (IEPA 401 WQC)
- Analytes identified for Rock River in Appendix A-1 of the IEPAs draft 2024 Illinois Integrated Water Quality Report and Section 303(d) List (IEPA 303(d))

### 3.2.2 Analytical Testing

Sediment parameters that were analyzed included those detailed in Hanson's Table 1 "Supernatant and Sediment Sampling and Analytical Plan" per the Illinois Environmental Protection Agency, Bureau of Water Section 401 Water Quality Certification circular entitled Material Analysis for Dredge and Fill Activities as well as those added through personal communication with IDNR staff (Dove 2025 pers. comm). Analytes included metals (As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Ni, Se, Ag, Zn), hexavalent chromium, mercury, ammonia, fluoride, oil and grease, phenols, PCBs, Total Volatile Solids, and the pesticides Aldrin, Dieldrin, Endrin, Heptachlor, Mirex and Toxaphene. Additional parameters for water and supernatant samples included pH, hardness (Ca and Mg calculation), and Total Suspended Solids. Chemical analysis was performed by Eurofins of Pittsburg, Pennsylvania.

Grain size distribution, hydrometer, and Atterberg limits analyses were completed under ASTM D422, C136, and D4318 specifications and characterized by sieve analyses to determine coarse fractions and percent fines. Grain size distribution analyses were performed by Terracon of Parma, Ohio. Sand/fine split analysis were completed under ISW SOP No. Sed. 4 method and were performed by the University of Illinois.

#### *3.2.2.1 Applicable Standards*

Applicable standards used in sediment result analysis are listed in Hanson's report and Enviroscience (2025), which summarizes the regulatory information used to derive them. Criteria

reviewed are understood to include the following. Hanson coordinated with IDNR-OWR to confirm appropriate and applicable criteria for use in this project.

- Standards as indicated in Appendix A of the Illinois Environmental Protection Agency, Bureau of Water Section 401 Water Quality Certification circular entitled *Material Analysis for Dredge and Fill Activities.*
- Illinois Administrative Code Title 35, Part 302 – Water Quality Standards.
- Action levels for the 303(d) parameters will be defined based on IEPA guidelines.
- Standards as applied to the Ingestion Exposure Pathway from the Illinois Environmental Protection Agency's Tiered Approach to Corrective Action Objectives (TACO), specifically Appendix B, Table A*: Tier 1 Soil Remediation Objectives for Residential Properties.* TACO is a method for developing site specific soil and groundwater remediation objectives that protect human health. Baseline remediation objectives, also called Tier 1 objectives, take into account the intended land use of the property, but do not consider other conditions specific to the site. Because of this, Tier 1 remediation objectives are calculated using the most conservative assumptions exposure pathways.
- Lowest Applicable Standard as indicated by the Illinois Environmental Protection Agency's TACO, specifically Appendix A, Table G: *Concentrations of Inorganic Chemicals in Background Soils.*
- It is understood that the Illinois MAC (Maximum Allowable Concentration) of Chemical Constituents standards (per Illinois EPA 35 III. Adm. Code 1100.SubpartF) will be used to determine whether the material that needs to be removed during construction qualifiesas Clean Construction or Demolition Debris (CCDD) or requires special handling or disposal.
- MacDonald, D.D., Ingersoll, C.G., and Berger, T.A. (2000). Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems. *Archives of Environmental Contamination and Toxicology, 39* 20-31.
- Buchman, M.F. (1999). NOAA Screening Quick Reference Tables, *NOAA HAZMAT report 99-1*, Seattle, WA. Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12p
- Ontario. (1993) or Persaud, D.R., Jaagumagi, R., and Hayton, A. (1993). Guidelines for the protection and management of aquatic sediments in Ontario. Standards Development Branch. *Ontario Ministry of Environment and Energy.* Toronto, Canada.

### 3.2.3 Results Summary

Grain size distribution analysis performed on the nine sample cores revealed that all samples were predominantly composed of silty sand or clayey sand. The *Sand/Fine Split Report* from the University of Illinois is included in Enviroscience's 2025 report entitled "Rock River Sediment Analysis". The IEPA defined sand/fine split test results for the samples average 26.5% fines (passing a 63um/#230 sieve). Using this average, we can estimate that, of the 4.3 million cubic yards of impounded sediment, approximately 1.1 million cubic yards could be considered fines. However, it should be noted that this estimate is based on a limited number of samples and that results are extrapolated to a much larger volume than sampled. Of the samples taken, the average sand fraction was 74%, the average fines fraction was 26%, and the average gravel fraction was under 1%.

Sediment quality sample results are summarized in Hanson's Report and Enviroscience (2025.)

### 3.2.4 Summary of Key Impounded Sediment Findings

Key findings of the impounded sediment evaluation are summarized as follows:

- Preliminary depth of refusal survey estimates approximately 4,300,000 cubic yards of sediment deposits upstream of Sears and Steel Dams.
- Grain size analysis shows that sediment is predominantly sand, but that per the IEPA definition, six out of nine samples taken upstream of the dams qualify as fines.
- Sediment depths probed by Inter-Fluve are consistent with those measured in the 2024 OWR depth of refusal probing effort, with most of the channel in the upstream portion of the impoundment having 1-4 feet of sand overlying the pre-dam alluvial surface.
- Sediment tested from the impoundment did not exceed regulatory thresholds as defined by the ILEPA TACO Tier 1 or EPA SQRT guidelines.
- Supernatant from several samples showed metals, Ammonia-Nitrogen (as N), Total Suspended Solids, Total Volatile Solids, pH, and Hardness in excess of Appendix A – ILEPA Water Quality thresholds, but only Ammonia-Nitrogen (as N) exceeded Illinois Administrative Code Title 35, Part 302 – Water Quality Standards.
- One sediment sample exceeded the MAC Standards for total iron; however, it is understood that MAC standards only apply if trying to qualify the material as CCDD, which would not be the case in a passive release scenario.

When interpreting sediment results, it is important to note that supernatant water can be influenced by the water throughflow from upstream and above the sample as well as groundwater from adjacent soils. It is not possible to discern whether the materials found in supernatant water come directly from leaching of the soils in the core, or from adjacent sources.

These results do not preclude passive release of impounded sediments for this project. However, this assessment is based on a limited number of samples.

# 4. Dam Removal Considerations

Removal of any dam requires a comprehensive understanding of how the movement of water, sediment, and biota will be affected by the proposed actions. Inter-Fluve's scope of work includes evaluation of hydrology, hydraulics, sediment, and fish passage under potential dam removal and safety modification alternatives. The following sections discuss hydrologic analysis, hydraulic modeling, impounded sediment management strategies, sediment evacuation, and sediment fate. These considerations are used to evaluate alternatives in Section 5 of this report.

## 4.1 HYDROLOGY

### 4.1.1 Fish Passage Design Flows

Design flows identified for the project are intended to address project performance criteria relative to flooding, fish passage, and recreational use of the Rock River. Fish passage design flows were identified for the project using a flow duration curve obtained from the United States Geological Survey (USGS) gage number 05446500 located near Joslin, IL, approximately 30 miles upstream of the dams. The flow duration curve adopted for fish passage flows of interest considers the months of April, May, and June over the period from 1993-2023 and is presented in Table 3. For the purposes of evaluating design and sediment transport, the flows in Table 3 are considered a representative distribution of river conditions for considerations of sediment transport, fish passage, and constructability.

***Table 3. Fish passage design flows for the project area.***

| Percent of Time Exceeded | Flow Magnitude (cfs) |
|---|---|
| 95 | 4,409 |
| 90 | 5,514 |
| 80 | 6,858 |
| 70 | 8,196 |
| 60 | 9,361 |
| 50 | 10,867 |
| 40 | 12,320 |
| 30 | 14,380 |
| 20 | 17,133 |
| 10 | 21,757 |

### 4.1.2 Recreational Use Flow Considerations

Inter-Fluve reached out to several local groups to gather information about recreational uses of the Rock River. No responses were received from the Backwater Gamblers (Figure 4), a water ski group that holds regular shows just upstream of the dams, or Sunset Marina (Figure 4), a large marina (approximately one-hundred slips) located on the Mississippi River near the Rock River confluence. However, Inter-Fluve did receive communication via email with the owner of Quad Cities Kayak River Adventures, a local outfitter that provides kayak guiding, rental, and shuttle services on the

Rock River. This individual stated that they paddle the river almost daily during the warmer months and noted that the optimal flow for kayaking is approximately 10,000 to 11,500 cfs, or around a stage of 9 feet at the Moline USGS gage (number 05447800). When the stage drops closer to 6 feet, beaches appear, and other recreational use of the river increases. Quad Cities Kayak observed that common river users include flat-bottom fisherman, pontoon boats, jet skiers, and tubers, with recreational boats and water skiers in the lower reach around Moline. Potential high flows that might limit recreational use were estimated using gage data from the dates when Backwater Gamblers shows were canceled. Using this information, Inter-Fluve determined flow magnitudes pertaining to typical river conditions that facilitate or limit recreational use in the project area (Table 4).

***Table 4. Suggested recreational flow considerations for the Rock River in the vicinity of the project area.***

| Flow Description | Flow Magnitude (cfs) |
|---|---|
| Low Flow Limiting Recreational Use | 2,700 |
| Average Recreational Flow | 7,900 |
| Higher Paddling Flow | 11,500 |
| High Flow Limiting Recreational Use | 16,000 |

### 4.1.3 Peak Flood Flows

Peak flood design flows adopted for the project were identified by Hanson, who reviewed flood discharge estimates from the Federal Emergency Management Agency (FEMA), the Illinois State Water Survey (ISWS), and USGS gaging station data. Flows were routed through a previously developed HEC-RAS models that both considered and neglected floodplain storage along the Rock River to provide recommended estimates of peak flood discharges (Hanson, 2024; Table 5). Hanson also identified the design low-flow (7Q10) discharge of 1,520 cfs (Hanson, 2024).

***Table 5. Recommended flood discharge values for the project. Values reflect HEC-RAS "constricted" plans and are located at IL Rt. 5 bridge.***

| Recurrence Interval (years) | Flow Magnitude (cfs) |
|---|---|
| 10 | 47,400 |
| 25 | 49,800 |
| 50 | 50,900 |
| 100 | 51,900 |
| 500 | 54,900 |

## 4.2 RIVER HYDRAULICS

River hydraulics under existing conditions and considering proposed condition alternatives (see Section 5) were developed by Hanson and provided to Inter-Fluve for review. Models provided by Hanson included both one dimensional (1-D) and two dimensional (2-D) HEC-RAS models that are based on previously completed modeling of the Rock River and its primary tributaries (Hanson, 2024). Model results for design flows were used to analyze Alternatives 1 through 5 relative to fish passage, sediment evacuation, impoundment restoration, and recreational use (see Section 5). Model files reflect proposed conditions that consider both existing bed conditions and conditions that reflect an evolved impoundment in which the measured hard bottom depths comprise the bed. Alternatives 2, 3, and 5, which include safety modifications at Steel Dam, were evaluated using a single proposed condition geometry that preserves the existing Steel Dam and does not model details of concrete and rock-based safety modifications downstream of the dam. Modifications to the North Channel in Alternative 4 were modeled in 1D by Hanson by modifying channel geometry to represent a potential riffle configuration. Model results were not provided or reviewed for Alternative 6.

## 4.3 SEDIMENT MANAGEMENT STRATEGY

The degree to which impounded sediments are excavated and managed will have substantial effects on flood hydraulics, habitat suitability, and project cost. Impounded sediment management for dam removals falls somewhere on a spectrum between passive and active management and restoration.

Passive restoration of an impoundment entails removing the major impediment to natural river function (i.e., Steel and/or Sears Dams) and allowing the river to evacuate sediments and restore itself over time. The channel within the former impoundment freely adjusts its slope and form via incision, widening, and meandering, and eroded sediment is transported downstream unimpeded. These adjustments continue until the channel develops a form appropriate for its flow and sediment regime. Exposed sediment that is not flushed downstream will develop to form floodplains, and existing seedbanks within those soils may contribute vegetation that stabilizes surfaces. The advantage of passive restoration approaches is the low cost, as it requires little work in the impoundment to control sediment or create the channel and floodplain characteristics. Low cost comes at the expense of time, as the river will evolve through a process of erosion and migration that may take years or decades following dam removal. It can also have a negative short-term impact on downstream reaches if large volumes of sediment, including any contaminated materials, are delivered to reaches downstream of the dam.

Active sediment management, on the other hand, involves some degree of mechanical excavation of sediment from the impoundment to control and shape channel form and adjustment. If sediments are highly contaminated, active management may also include capping or excavation and replacement of sediment along the channel margins that are expected to become future floodplain areas. Active restoration results in reduced sediment loading to downstream reaches, immediately stable channel form, and a higher degree of ecological function in a shorter time. These advantages are realized at a higher project cost. Depending on how property boundaries around the

impoundment are platted, active sediment management can also require coordination with property owners along the impoundment.

Sediment management strategies may also include hybrid approaches that combine elements of passive and active strategies. Successful approaches used on dam removals of a similar scale elsewhere include, but are not limited to the following:

- Pilot channels, which partially excavate impounded sediments to reduce the volume mobilized downstream during period during and immediately after dam demolition.
- Floodplain benching, which constructs a stable channel but does not fully remove sediment from floodplain areas.
- Sediment trapping, which uses constructed and maintained depositional traps to remove mobilized sediment from the river before it is allowed to transport downstream.

### 4.3.1 Sediment Management Recommendations

Hanson reviewed potential sediment management strategies with OWR in the period following DOR surveys and sediment coring/contamination analysis. Given the impounded sediment volume, distribution of sediment, low degree of contamination, and anticipated construction budget, OWR is understood to prefer a passive approach to sediment management and does not want to pursue active or hybrid (e.g., pilot channel) management options. The following sections discuss outcomes (evacuation and fate) associated with a passive sediment management approach.

## 4.4 SEDIMENT EVACUATION AND FATE

### 4.4.1 Grain Size

Grain size analysis was performed on the nine cores collected upstream of the dams by EnviroScience on March 11-13, 2025 and shows that impounded sediments are predominantly composed of silty sand or clayey sand (Table 6). Impounded materials in the downstream reach of the project generally have larger fractions of silt and clay compared to reaches further upstream, a finding that is consistent with typical depositional patterns in impounded river reaches. Impounded sediments predominately consist of clayey sand and silty sand.

***Table 6. Grain size analysis for the nine cores collected on March 11-13, 2025.***

| Sample Name | % Cobble | % Gravel | % Sand | % Silt | % Clay | Description |
|---|---|---|---|---|---|---|
| **RRD-02** | 0.0 | 0.0 | 54.1 | 23.7 | 22.1 | Clayey Sand |
| **RRD-03** | 0.0 | 6.3 | 70.7 | 14.4 | 8.6 | Silty Sand |
| **RRD-04** | 0.0 | 0.5 | 68.1 | 13.4 | 17.9 | Clayey Sand |
| **RRD-05** | 0.0 | 0.8 | 83.5 | 7.5 | 8.3 | Silty Sand |
| **RRD-06** | 0.0 | 0.4 | 59.5 | 18.9 | 21.2 | Clayey Sand |
| **RRD-07** | 0.0 | 1.8 | 81.4 | 8.1 | 8.7 | Silty Sand |
| **RRD-08** | 0.0 | 0.0 | 84.8 | 8.3 | 6.9 | Silty Sand |
| **RRD-09** | 0.0 | 0.0 | 90.2 | 5.1 | 4.7 | Poorly Graded Sand with Silt |

| | | | | | | |
|---|---|---|---|---|---|---|
| **RRD-10** | 0.0 | 0.1 | 70.0 | 17 | 12.9 | Silty Sand |

### 4.4.2 Sediment Transport Characteristics

Sediment transport estimates within the Rock River are available from Graf (1983) and estimates for the upper Mississippi River are available from Bhowmik et al. (1986). Graf (1983) analyzed bedload data from the Rock River near Joslin, IL, located approximately 30 miles upstream of the Sears and Steel Dams. Bhowmik et al. (1986) analyzed three gages along the Mississippi River: East Dubuque, IA (100 miles upstream of the Rock River confluence), Burlington, IA (75 miles downstream), and Keokuk, IA (115 miles downstream). Estimates of sediment transport in both studies are based on rating curves developed using stream gaging records, with the Rock River estimates developed over a period of 3.7 years (5/1980-9/1983), and the Mississippi River estimates developed over a 14-year period between 1967 and 1981. Average annual sediment loads shown in Table 7 are based on published data in Bhowmik et al. (1986) and indicate that the Mississippi River carries a larger sediment load 2 to 13 times that of the Rock River, depending on the location. The volume of impounded sediment upstream of Sears and Steel Dams represents a value that is approximately 5-10 times the estimated average annual sediment load of the Rock River and is approximately equal to the annual transport rate of the upper Mississippi River.

***Table 7. Average annual sediment load for the Rock River and the upper Mississippi River as estimated by Graf (1983) and Bhowmik et al. (1986).***

| Gage | Approximate Distance from Sears and Steel Dams (mi) | Average Annual Sediment Load (CY) |
|---|---|---|
| Rock River at Joslin, IL | 30 (upstream) | 656,376 |
| Mississippi River at East Dubuque, IA | 100 (upstream) | 2,390,386 |
| Mississippi River at Burlington, IA | 75 (downstream) | 8,644,169 |
| Mississippi River at Keokuk, IA | 115 (downstream) | 5,080,103 |

### 4.4.3 Sediment Evacuation

Inter-Fluve evaluated expected sediment transport characteristics of the impoundment under dam-removal conditions and downstream reaches of the Rock and Mississippi Rivers to evaluate likely outcomes of a passive sediment management strategy. Following dam removal, the majority of impounded sediments are expected to readily mobilize and transport downstream. The evolution of impoundments under a passive sediment management strategy typically occurs in two phases (Collins et al., 2017). Initially, following the dam removal, sediment is eroded from the channel in a 'process-driven' phase as a result of base level lowering and increase in the energy gradient, incising the channel until a stable channel slope and cross-section are formed (Pearson et al., 2011). During this phase, a large percentage of sediment will be mobilized and transported downstream. Deposition will occur in downstream reaches, and sediment may be stored within depositional areas such as the Rock River with a lower transport capacity, such as point bars, midchannel bars, and pools. Following the 'process-driven' phase, channel evolution enters an 'event-driven' phase in which larger flood events contribute to the majority of sediment transport (Collins et al., 2017).

Predicting precise rates of sediment transport and evacuation during drawdown and post-removal is extremely difficult because driving variables—such as flow magnitude, surface bed sediment composition, water depth, local flow velocity, rate of excavation, and channel size—are subject to simultaneous change and may not be predictable in advance. Nevertheless, predictions of potential sediment transport characteristics over intermediate time scales are possible based on sediment grain size characteristics and approximate channel hydraulic conditions obtained from 1-D model results of post-removal hydraulics (e.g., Sumaiya et al., 2021).

Model results indicate that following dam removal, materials smaller than fine to medium gravel, which is understood to be the majority of the impoundment, will be readily mobile in reaches upstream of the dams during nearly all flow events. Therefore, one may reasonably expect the process-driven phase of sediment transport to include rapid evacuation of the thick sediment deposits upstream of Sears Dam and a portion of the uniform sand deposits upstream of Vandruff Island. Material finer than medium sand (0.25 mm) is expected to transport as suspended load (moving within the water column), while coarser sand will transport as bedload (rolling or bouncing along the channel bed), ultimately driving how and where material is deposited. Some sediment may be stored within floodplains, bars, and pools within the former impoundment, but over time, the majority of the impounded sediment volume is expected to evacuate the impoundment during the process driven phase. Over the event-driven phase, much the remainder of impounded material would evacuate the impoundment, with deposits remaining as floodplain or bar deposits with the degree of mobility determined by how quickly stabilizing vegetation establishes.

Analysis suggests that under a passive release scenario, the volume of released sediment will be greater than the estimated annual sediment transport capacity, making the Rock River system transport-limited. In transport-limited systems, the ability of the channel to mobilize bed material is the determining factor, as opposed to a supply-limited system where the amount of material is the constraint. Therefore, in the time period immediately following dam demolition, the Rock River will be actively transporting its maximum amount of sediment, and it is during this period that the greatest degree of deposition is anticipated. As time progresses, river flows will re-mobilize those deposits, transporting those materials further downstream to the Mississippi River, which has a higher estimated sediment transport capacity and annual sediment load than the Rock River (Table 7).

### 4.4.4 Sediment Fate

A sediment fate analysis was conducted to assess the ability of the Rock River and Mississippi River to accommodate the downstream release of impounded sediment following dam removal under a passive sediment management approach. This analysis considered the volume and characteristics of impounded sediment, the sediment transport capacity of the lower Rock River and the upper Mississippi River, and identification of potential depositional areas downstream where released impounded sediment may accumulate.

Because the timing and magnitude of flows following construction is unknown, and those flows will drive sediment transport, the timing and volume of sediment evacuation from the former impoundment cannot be predicted. Once within the Mississippi River, mobilized sediments will move downstream and deposit within the pool above Mississippi Lock and Dam number 16 (Lock and Dam no. 16), a 34-foot-tall dam owned and operated by the USACE (U.S. Army Corps of Engineers Rock Island District, 2012). To evaluate a range of potential impacts on the navigational pool following a passive release scenario, Inter-Fluve estimated average depth of deposition within the anticipated depositional area (Figure 14) for a range of volumes of impounded sediment that could evacuate (Table 8). This evaluation suggests that if all the sediment evacuated the impoundment at the same time, the average depth of deposition within the potential depositional area would be 3.4 inches.

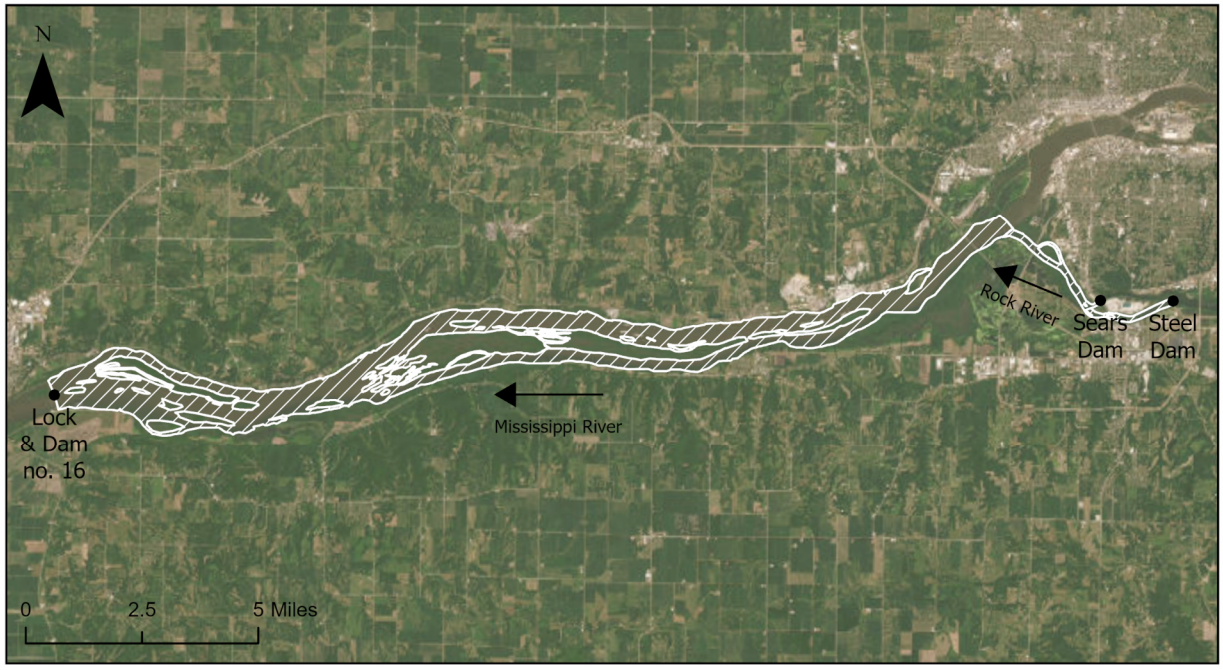



***Figure 14. Potential depositional areas in the navigational pool above Lock and Dam no 16 (shown in white diagonal hatch).***

***Table 8. Average depths of potential sediment deposits in reaches of the Rock and Mississippi Rivers downstream of Sears and Steel Dams for given fractions of the total impounded sediment volume.***

| Percentage of Total Impounded Sediment (%) | Volume of Sediment (CY) | Depth of Deposition (inches) |
|---|---|---|
| 100 | 4,300,000 | 3.4 |
| 75 | 3,225,000 | 2.5 |
| 50 | 2,150,000 | 1.7 |
| 25 | 1,075,000 | 0.8 |

The Upper Mississippi River is subject to routine dredging by the USACE to maintain a navigation channel to a depth of 9 feet (USACE, 2024). Annually, the Rock Island District of the Upper Mississippi dredges approximately 500,000 CY over its 314 river miles (USACE, 2024). Given the volume of impounded sediment and the extent of the assumed depositional area, the average anticipated depth of deposition is less than four inches, assuming complete evacuation of the Sears and Steel Dam impoundment. In actuality, the depth of sediment deposition will vary over time and space given flow magnitude, local slope, bedforms, islands, side channels, and other influences on local transport capacity. It should be noted that due to the lower sediment transport capacity of the Rock River as compared to the Mississippi (Section 4.4.2), it is anticipated that deeper depths of sediment may occur within the Rock River in the years immediately following sediment release.

### 4.4.5 Sediment Management During Construction

Sediment management and erosion control during construction are required to minimize turbidity caused by in-river work and erosion from upland areas of the project site. If feasible given dam conditions and demolition plans, a staged drawdown approach may be adopted. A staged drawdown results in gradual changes in energy within the impoundment and results in less immediately mobilized sediment compared to a rapid drawdown and may be combined with a sediment trapping program above each dam, if desired.

Turbidity may be managed during drawdown, but it is important to note that all dam removal projects result in some degree of turbidity released to downstream waters. Turbidity controls could include use of a sediment trap, staged drawdown timing and flow monitoring, turbidity monitoring with thresholds for work stoppage, among other techniques. Additionally, construction site erosion and sedimentation control best management practices (BMPs) should be employed to minimize erosion from upland areas, including sediment control logs or silt fence around the perimeter of spoils piles and along access routes, and stabilized construction entrances. Turbidity control requirements should be discussed with regulatory agencies during the design and permitting phase of the project.

# 5. Alternatives Evaluation

Hanson has developed six alternatives for Sears and Steel Dams based on consultation with project partners, Inter-Fluve, and proposed project goals and objectives. The alternatives are:

- Alternative 1: remove Sears and Steel Dams
- Alternative 2: remove Sears Dam and construct concrete steps downstream of Steel Dam as a safety modification
- Alternative 3: remove Sears Dam and construct a rock ramp downstream of Steel Dam as a safety modification
- Alternative 4: remove Sears Dam and construct a series of riffles in the North Channel in addition to rock or concrete safety modifications at Steel Dam to "Preserve Recreational Pool"
- Alternative 5: remove Sears Dam and add concrete stepped spillway and bypass channel at Steel Dam
- Alternative 6: maintain Sears Dam and construct concrete steps downstream of Steel Dam as a safety modification

The following sections summarize potential impacts and outcomes of the alternatives relative to fish passage, river ecology, sediment evacuation and geomorphology, recreational impacts, bank stabilization requirements, impoundment restoration.

## 5.1 ALTERNATIVE 1: REMOVE SEARS AND STEEL DAMS

### 5.1.1 Alternative Overview

This alternative consists of removal of the concrete spillways at Sears and Steel Dams down to adjacent hard-bottom (pre-dam) riverbed elevations. At Sears Dam, the abandoned powerhouse building and the constructed land connecting it to the spillway of the dam are proposed to remain in place. Banks at dam abutments would be stabilized with riprap and bioengineering. The alternative includes passive release of impounded sediments, with the exception of any sediment excavation necessary to construct access roads for demolition.

Hydraulic model results indicate that Alternative 1 would result in relatively modest changes to flow distribution around Vandruff Island (Table 9). Model results indicate that during typical and flood flow conditions, the North Channel is expected to receive flow that ranges from nearly equal to approximately 25% greater than the South Channel under existing conditions.

***Table 9. Changes in flow distribution around Vandruff Island for Alternative 1.***

| Flow Description & Magnitude | *Existing Conditions* | | *Proposed Conditions* | |
|---|---|---|---|---|
| | **Flow in North Channel (cfs)** | **Flow in South Channel (cfs)** | **Flow in North Channel (cfs)** | **Flow in South Channel (cfs)** |
| **Average Recreational Flow (7,900 cfs)** | 2,990 | 4,910 | 3,171 | 4,729 |
| **Spring 90% exceeded flow (5,514 cfs)** | 2,273 | 3,241 | 2,259 | 3,255 |
| **Spring 50% exceeded flow (10,867 cfs)** | 3,870 | 6,996 | 4,303 | 6,563 |
| **Spring 10% exceeded flow (21,757 cfs)** | 6,865 | 14,975 | 8,522 | 13,373 |
| **Q10 (47,400 cfs)** | 14,367 | 35,798 | 19,995 | 26,932 |
| **Q100 (54,900 cfs)** | 16,036 | 33,015 | 20,482 | 31,858 |

*Notes:*

1. *Combined North/South Channel flows may differ from overall flow magnitudes due to floodplain storage effects.*
2. *Proposed condition model results reflect an evolved bed condition in which most impounded sediment has evacuated.*

During the median spring flow, the North Channel would have an average gradient of 0.1%, flow velocities of 2-4 feet per second (ft/s) and flow depths of 2-3 feet, on average. Since the majority of the South Channel is located downstream of Steel Dam, changes to river hydraulics would be negligible. Reaches upstream of Vandruff Island would experience changes that diminish with distance upstream, and the reach would generally have a gradient of 0.01% and flow velocities of 1-2.5 ft/s.

### 5.1.2 Sediment Transport, Evacuation, and Fate

Alternative 1 would re-establish natural river sediment transport processes within impounded areas of the Rock River. The alternative includes passive evacuation of impounded sediments with near-negligible amounts of sediment excavation in the immediate vicinity of the dams for demolition and dam removal. Based on sediment analyses completed as a part of this project, it is understood that approximately 4.3 million cubic yards of sediment are impounded by the dams, and the majority of that sediment is sand and silt, with minor amounts of gravel-sized materials. Coarser materials and bedrock were encountered at refusal during probing investigations.

In the case of the Rock River, the total volume of impounded sediment represents approximately 5-10 years' worth of measured transport capacity within the Rock River, and less than one year of sediment transport capacity in receiving reaches of the Mississippi. Based on hydraulic model results, sediment mobilized following dam removal will transport through the North Channel and South Channel reaches and deposit preferentially within low-energy areas of the downstream Rock River and Mississippi River. These areas include side channels, backwaters, floodplains, existing bars, pools, and the navigational pool upstream of Lock and Dam 16.

### 5.1.3 Fish Passage

Removing both dams would fully reconnect approximately 70 miles of the Rock River from the Mississippi River confluence upstream to the Sterling Dam in Rock Falls, Illinois. River reconnection would include restoring fish passage and is expected to improve favorable environmental metrics and river quality, thus increasing the natural habitat and species diversity and distribution. In the years following dam removal, the upstream fish communities are expected to shift from lentic assemblages to lotic specialists, with an overall rise in functional diversity (Jones et al., 2023). Because all non-native species currently present in the Rock River occur both above and below the dams, these species ranges are not expected to change. Short-term sediment releases may elevate turbidity, which has the potential to temporarily stress native adults, larvae, and eggs.

Fish passage evaluation of alternatives was assessed quantitatively by comparing hydraulic model results of flow depth, velocity, and slope against common thresholds for successful passage of native species past barriers. The potential for fish passage is assessed based on the swimming abilities of the weakest-swimming fish expected to benefit, and it is assumed that actions designed to accommodate the weakest swimmer are expected to benefit all native and migratory fish species (Jones et al., 2023; Smith et al., 2017). In the case of Rock River fish assemblages, Northern Pike and Lake Sturgeon were selected to represent the weakest-swimming fish. Adult Northern Pike have been documented to have a sustained swim speed of approximately 3.3 – 3.9 fps (Peake, 2008), and adult Lake Sturgeon can swim against currents of approximately 4.2 fps for intermediate periods of time (Peake et al., 1997). Therefore, a range of 3.0-4.0 fps can be assumed to be passable to most adult native fish, assuming lower-velocity zones and natural river hydraulics are present within a reach. Minimum flow depths of less than approximately 1.0 feet would limit Lake Sturgeon swimming ability and are adopted as a lower bound for passage assessment.

Hydraulic model results demonstrate that Alternative 1 will lead to river conditions that are broadly conducive to native fish passage through the dam sites (Figure 15, Figure 16), with velocities in the North and South Channels generally under 4 fps. Although reaches in the North Channel will feature flow velocities of 4-5 fps during elevated flows, low-velocity zones are expected to provide resting areas along the margins of the channel.

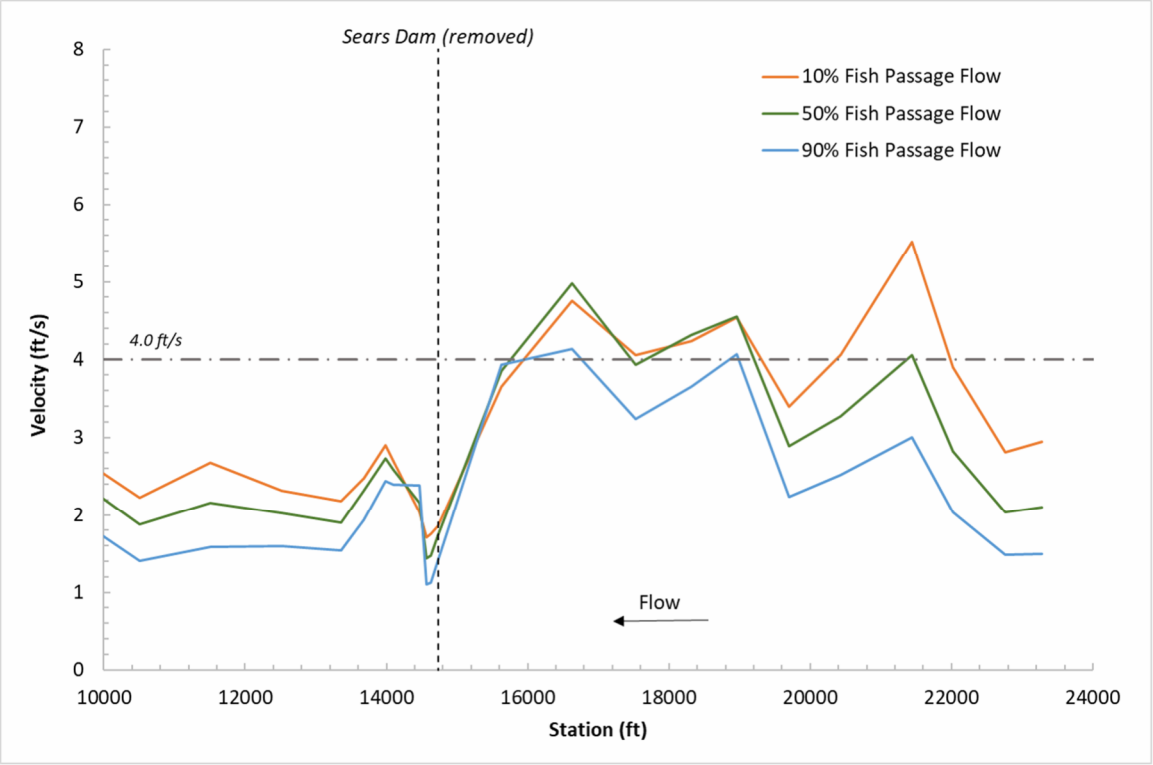



***Figure 15. Velocity profile through the North Channel under the dam-removal alternative.***

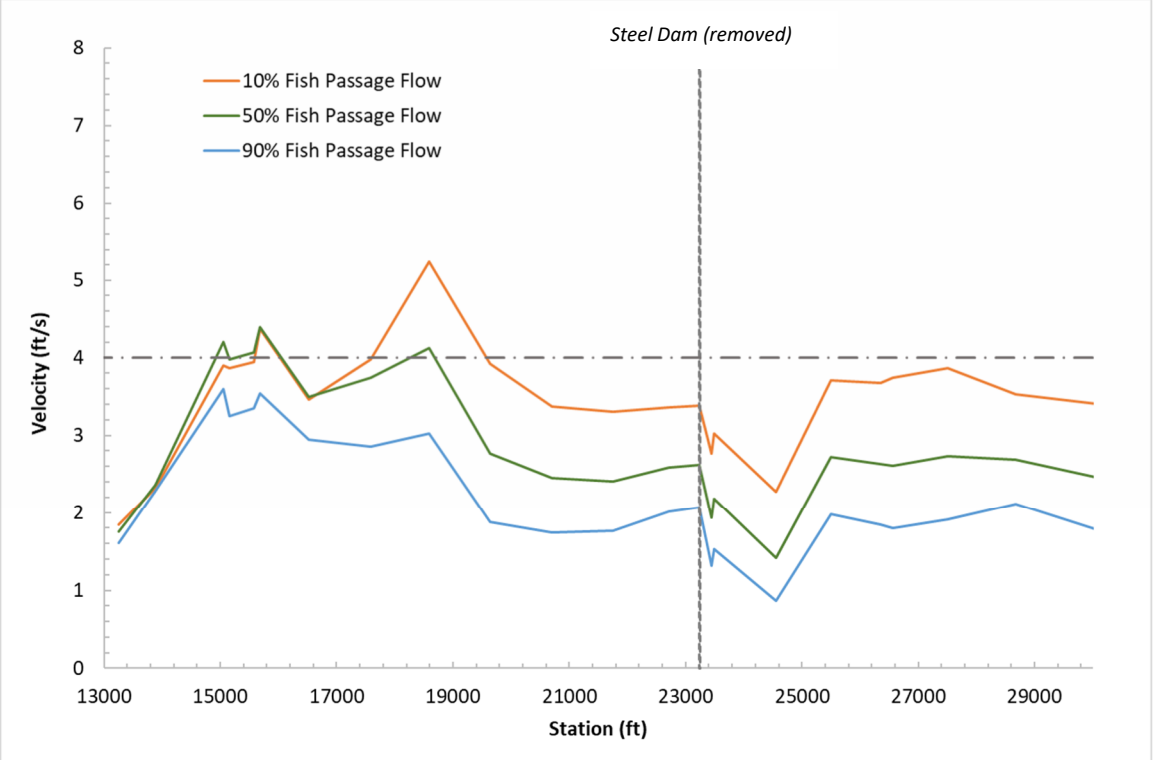



***Figure 16. Velocity profile through the South Channel under the dam-removal alternative.***

### 5.1.4 Recreational Use

Under the dam removal alternative, recreational use of the impoundments will shift from flatwater activities to riverine activities. With the exception of locally higher-gradient reaches within the South Channel, the impoundment following dam removal will revert to a low-gradient river with typically low flow velocities, mild hydraulics, and flow depths adequate for typical boating and paddling activities. Angling, boating, paddling, and other activities will still be possible following dam removal. Angling opportunities within the former impoundment would increase given improved fish passage conditions.

Land-based opportunities for recreation and river access will exist near existing parks and access points including the left abutment of Steel Dam (Hennepin Canal Parkway Lock #30), the Black Hawk State Historic Site, and Ben Williamson Park. Opportunities include park improvements, river access improvements, trails, overlooks, or signage discussing the dams in a park for historic documentation.

This report does not analyze safety of recreational activities under any alternative. Recreational activities in the water within the project area may be hazardous. Recreational users are responsible for their own safety and bear full responsibility for the risks of recreating on or near a moving water system.

### 5.1.5 Impoundment Restoration and Bank Stabilization

Impoundment restoration is a critical part of dam removal projects and provides an opportunity to revegetate newly exposed floodplains, enhance degraded habitat conditions, and stabilize banks that may be susceptible to excessive erosion following dam removal. Based on sediment probing data accumulated sediment thicknesses upstream of Vandruff Island are generally less than 4 feet, with locally thicker deposits in pools and depositional areas. Model results indicate that river widths following dam removal will decrease by 30-40 feet. Therefore, revegetation would be limited to the margins of the channel and could include seeding of rapidly establishing native riparian species, woody plantings, or fabric-based bioengineering.

Habitat enhancement that could be considered includes large wood installation, critical area revegetation, invasive species management, gravel augmentation, or select bank grading/bioengineering. Future detailed design phases will need to develop a strategy for revegetation and impoundment habitat restoration following dam removal.

Future project phases should include detailed evaluation to identify critical areas that may be susceptible to excessive bank erosion and require stabilization following dam removal. Based on model results and current conditions, these areas are expected to include the residential and commercial properties along the north and south banks downstream of 27$^{th}$ Street that currently have limited vegetation along banks. All tributaries within the impoundment would also need to be evaluated for potential impacts and design of restoration strategies to mitigate potential erosion or impacts to upstream properties. During typical flow conditions, these properties will experience water levels 2-4 feet lower than normal with modest increases in flow velocity of generally 1-2 fps.

Bioengineering treatments with a stone toe or integrated large wood could be effective solutions in these areas.

### 5.1.6 Constructability, Access, and Water Control

Alternative 1 involves the removal of two large dams and passive management of impounded sediments. The scope of the dam removal is consistent with other regionally significant dam removals completed in the recent past. Key construction, access, and water control considerations include:

- Construction access can be gained from the left abutment of each dam under the assumption, although construction would be cheaper and easier if access were possible from both abutments at each dam. Barge-based demolition could be used for initial drawdown, alternatively, access roads could be constructed downstream of each dam.
- Drawing down both dams simultaneously would maintain wetted conditions downstream of each dam, reducing ecological impacts. This strategy would also maintain current flow distribution between the north and South Channels. However, drawing down Sears Dam first may benefit construction access and reduce construction cost for the Steel Dam removal.
- Staged or rapid drawdown options could be considered. Since passive evacuation of sediment from the impoundment is the preferred strategy, impacts to downstream reaches are the same for either option. Staged drawdown is more expensive but poses less risk to sensitive slopes or structures, whereas rapid drawdown would be more efficient from a construction operations perspective. A staged drawdown could potentially mitigate the environmental impacts by slightly controlling the rate of release of impounded sediment.
- Following drawdown, access roads could be constructed along each dam face to efficiently demolish and remove debris.
- Work associated with drawdown and demolition would need to occur in the wet. Isolating and dewatering local work areas for bank construction and concrete-based construction is recommended.
- All dam removal projects release some sediment downstream during construction, and spikes in turbidity should be anticipated during drawdown and dewatering. Turbidity limits may be enforced based on monitoring to stop work during periods of high turbidity.
- Construction site erosion and sedimentation control BMPs should be put in place to limit excess turbidity and sedimentation sourced from construction staging areas, access roads, and above-water work areas.
- Access for impoundment restoration and bank stabilization may be achieved either by using barge-based construction, constructed access roads along the river's edge, or via access from

shore. Access from shore would require public land access or construction easements with cooperating landowners abutting the river.

### 5.1.7 Ecological Outcomes

Under a passive sediment management scenario, large pulses of formerly impounded sediments moving through downstream reaches of the Rock River and the Mississippi River could temporarily deposit in the main channel and side channel areas, potentially suffocating fish eggs and native freshwater mussels, burying pool and riffle habitat, and increasing overbank deposition. Most sediment would transport as suspended load, and therefore longer-term deposition would occur in areas that already have depositional tendencies or in areas impounded by downstream dams. Fish are able to quickly move upstream of dam removal sites to occupy newly restored habitats and would therefore be impacted to a lower degree by temporary deposition. Sessile organisms such as native freshwater mussels have been found to have lower species richness and abundance in waters impounded by and immediately below low head dams (Tiemann et al., 2016). Removal of both dams is expected to increase native mussel abundance and richness in the long term by restoring preferred habitat. In the short term, mussels may experience burial in depositional areas and increased turbidity in the water column as impounded sediments are transported downstream, though those impacts would be temporary and relatively short-lived. Other aquatic macroinvertebrates that are more mobile are able to traverse low head dams and likely have similar communities on each side of the dam under existing conditions. Dam removal may not alter the aquatic macroinvertebrate community composition (Hastings et al., 2016) but would provide a more diverse range of habitat and improved habitat conditions in the existing impoundment.

#### *5.1.7.1 T&E Species Impacts*

Under Alternative 1, effects to federally and state listed species are expected to be predominantly beneficial or negligible. For aquatic T&E and state endangered fishes, eliminating the passage barrier will reduce habitat fragmentation, increase longitudinal connectivity, and facilitate upstream recolonization which typically support higher abundance and resilience. For terrestrial species identified in the IPaC review, the project is anticipated to result in no effect on the Indiana bat and northern long-eared bat, assuming tree clearing for construction access occurs when bats are not present in the project area.

No effect on the eastern prairie fringed orchid is anticipated since suitable habitat is absent in the impounded area. Dam removal may restore preferred habitat of the eastern prairie fringed orchid if naturally fluctuating water levels are restored to create wetland and open sedge meadow areas.

The rusty patched bumblebee may be affected, but not likely to be adversely affected, due to temporary, localized bank disturbances in growing season foraging areas. Since their nesting habitat can occur up to 100 feet into the edges of forest and woodlands from upland the nesting habitat in grasslands and shrublands, there may be a potential effect on nesting habitat. However, by timing construction to avoid disturbance during critical seasons and by integrating pollinator-beneficial restoration into design, there is an expected net positive to the rusty patched bumblebee.

These determinations are preliminary and would need to be refined and enforced through permitting and consultation, including ESA Section 7 coordination with USFWS and state authorizations. Complying with the Clean Water Act and state dam removal permits will condition avoidance and minimization disturbance measures (e.g., in-water work windows, turbidity and sediment controls, no-clearing constraints, and post-construction monitoring). Collectively, the design and permit conditions are expected to protect T&E species while delivering long-term ecological gains from restored aquatic organism passage and improved habitat in impounded areas.

## 5.2 ALTERNATIVE 2: REMOVE SEARS DAM AND ADD CONCRETE STEPS AT STEEL DAM

### 5.2.1 Alternative Overview

Alternative 2 consists of removal of the concrete spillways at Sears Dam, as described for Alternative 1, and construction of concrete steps along the downstream face of Steel Dam as a safety modification. Banks at the Sears Dam abutments would be stabilized with riprap and bioengineering, and banks at Steel Dam would be stabilized as needed where disturbed by construction activities. Nature-like fishway options at Steel Dam could be considered to enhance fish passage potential. The alternative includes passive release of impounded sediments, with the exception of any sediment excavation necessary to construct access roads for demolition.

Alternative 2 would result in dramatically changed river conditions compared to existing conditions. Since Steel Dam would be left in place and Sears Dam would be removed, the North Channel would receive a far greater proportion of flow during typical river conditions (

Table 10), a reversal from existing conditions in which the South Channel conveys the majority of river flow. Changes in flow distribution around Vandruff Island are greatest for low-magnitude flows and diminish for increased flows. Model results indicate that the South Channel would receive no flow during flows less than approximately 5,500 cfs (the spring 90% exceedance flow). The South Channel would have flow depths greater than 1 foot only when total river flow is greater than approximately 8,000 cfs, or the flow exceeded 70% of time in the spring.

***Table 10. Modeled flow distribution around Vandruff Island for Alternatives 2 and 3.***

| | *Existing Conditions* | | *Proposed Conditions* | |
|---|---|---|---|---|
| **Flow Description & Magnitude** | **Flow in North Channel (cfs)** | **Flow in South Channel (cfs)** | **Flow in North Channel (cfs)** | **Flow in South Channel (cfs)** |
| **Average Recreational Flow (7,900 cfs)** | 2,990 | 4,910 | 7,443 | 457 |
| **Spring 90% exceeded flow (5,514 cfs)** | 2,259 | 3,241 | 5,514 | 0 |
| **Spring 50% exceeded flow (10,867 cfs)** | 3,870 | 6,996 | 8,882 | 2,044 |
| **Spring 10% exceeded flow (21,757 cfs)** | 6,865 | 14,975 | 12,836 | 9,031 |
| **Q10 (47,400 cfs)** | 14,367 | 35,798 | 20,481 | 26,932 |
| **Q100 (54,900 cfs)** | 16,036 | 33,015 | 22,164 | 29,687 |

*Notes:*

1. *Combined North/South Channel flows may differ from overall flow magnitudes due to floodplain storage effects.*
2. *Proposed condition model results reflect an evolved bed condition in which most impounded sediment has evacuated.*

During the median spring flow under Alternative 2, the North Channel would have an average gradient of 0.1%, flow velocities of 3-7 feet per second (ft/s) and flow depths of 4-6 feet, on average. Due to the substantial change in flow distribution, the South Channel will have reduced flow depths of 1-2 feet, decreased velocities that range from <1 to 2.5 feet, and hydraulic conditions would be more variable as a function of flow compared to existing conditions. Compared to Alternative 1, this alternative would result in lower degrees of change to the upstream reach. During the median spring flow, the upstream reach would feature water surface elevations 0-1.5 feet lower than existing conditions and flow velocities ranging from 1.8-3 ft, or approximately 0 to 0.5 ft/s greater than under existing conditions.

### 5.2.2 Sediment Transport, Evacuation, and Fate

Sediment transport characteristics and impoundment evacuation under Alternative 2 would broadly reflect the volumes, transport rates, and eventual fate of impounded sediment discussed for Alternative 1. Increased flow energy in the North Channel would result in increased sediment transport rates within impounded areas. Impounded sediments located immediately upstream of Steel Dam may remain following dam removal and safety modifications, and that area of the channel would likely remain depositional over time.

### 5.2.3 Fish Passage

Alternative 2 would remove Sears Dam, which is currently an impediment to aquatic organism passage. Steel Dam would remain in place, and concrete steps proposed below Steel Dam would not support fish passage. Alternations to flow distribution shown in

Table 10 would restrict the potential for fish passage further. Within the North Channel, flow velocities under typical flow conditions are expected to range from 4-7 fps, which exceed the swimming capabilities of Northern Pike and Lake Sturgeon (Figure 17). Areas along the margins of the channel may provide resting areas or zones for upstream passage. An option to increase opportunity for fish passage at Steel Dam under Alternative 2 is included as Alternative 5.

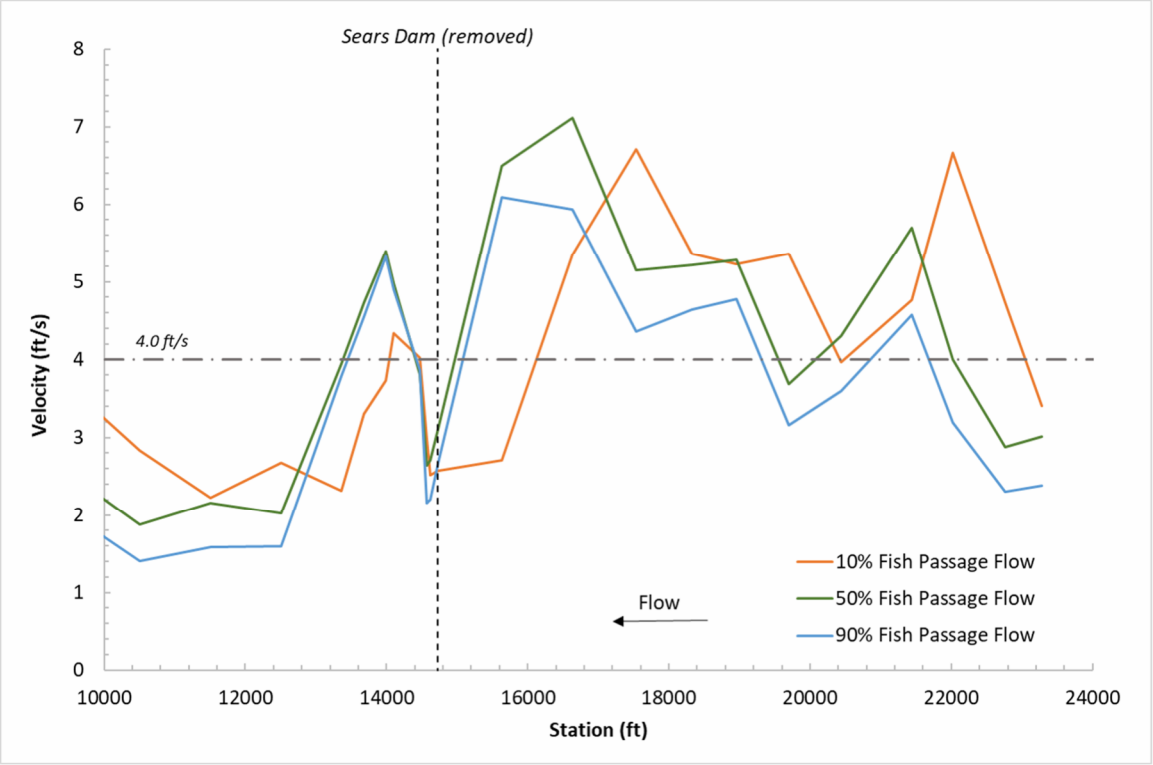



***Figure 17. Velocity profile through the North Channel under Alternatives 2 and 3.***

### 5.2.4 Recreational Use

Under Alternative 2, recreational use of the river would likely shift compared to current conditions. In the South Channel, recreational use would be limited to periods of elevated flow in which appreciable water depths are present. Increased flow in the North Channel and increased velocities would affect the types of boating that river users could engage in in that area, shifting from flatwater activities to swift water activities. Changes to river use in reaches upstream of Vandruff Island would generally shift from flatwater to moving-water activities similar to those described for Alternative 1. Angling opportunities within the impoundment would increase given improved fish passage conditions.

### 5.2.5 Impoundment Restoration and Bank Stabilization

Alternative 2 would result in minimal changes to the limits of the impoundment and river hydraulics in the South Channel. In the North Channel, banks susceptible to erosion would need to be stabilized to protect against the increased hydraulic forces and increased water levels that channel would experience relative to the full dam removal option. Because the impoundment upstream of Vandruff Island will experience only minor changes to river widths, opportunities for revegetation or habitat restoration are limited.

### 5.2.6 Constructability, Access, and Water Control

Alternative 2 involves the removal of Sears Dam, passive management of impounded sediments, and construction of concrete-based safety improvements at Steel Dam. Key construction, access, and water control considerations include:

- Drawdown and demolition of Sears Dam would consider the items discussed for Alternative 1.
- Work at Sears Dam would need to occur in the wet. Given that drawdown will substantially increase the amount of flow moving through the North Channel, gaining additional conveyance capacity around the dam should be explored in future design phases. This might include routing flow through the abandoned powerhouse building gates, demolishing the powerhouse building and building a stable bypass channel, or temporarily siphoning a portion of the river flow over the Steel Dam spillway.
- Drawdown and demolition at Sears Dam should occur before work at Steel Dam to efficiently create dewatered conditions (at low flows) downstream of Steel.
- Construction access for work at Steel Dam can be gained from the river-left abutment, however, access from both banks would be optimal and should be explored in future design phases.
- All dam removal projects release some sediment downstream during construction, and spikes in turbidity should be anticipated during drawdown and dewatering. Turbidity limits may be enforced based on monitoring to stop work during periods of high turbidity.
- Construction site erosion and sedimentation control BMPs should be put in place to limit excess turbidity and sedimentation sourced from construction staging areas, access roads, and above-water work areas.
- Access for impoundment restoration and bank stabilization may be achieved either by using barge-based construction, constructed access roads along the river's edge, or via access from shore. Access from shore would require public land access or construction easements with cooperating landowners abutting the river.

### 5.2.7 Ecological Outcomes

Following the removal of one dam, native freshwater mussels are anticipated to experience relatively limited long-term gains. Removing an area of impounded water is expected to increase native mussel abundance and richness in the long term by restoring and reconnecting preferred habitat (Tiemann et al., 2016). The impounded area upstream of Steel Dam is expected to remain as unfavorable habitat for most species and freshwater mussels are largely immobile such that most individuals will unlikely seek out the newly established habitat from Sears Dam removal. In the short term, mussels may experience burial in depositional areas and increased turbidity in the water column as impounded sediments are transported downstream. Other aquatic macroinvertebrates that are more mobile are able to traverse low head dams and likely have similar communities on each side of the dam. Dam removal may not alter the aquatic macroinvertebrate community composition (Hastings et al., 2016) but may provide a more diverse range of habitat.

#### *5.2.7.1 T&E Species Impacts*

Under Alternative 2, removing Sears Dam would benefit the state endangered fishes by eliminating a passage barrier and improving longitudinal connectivity of aquatic habitats. The proposed modifications at Steel Dam would continue to impede passage of native fish species given their limited leaping and sustained swim capacity unless a nature-like fishway option is included.

For terrestrial species identified in the IPaC review, Alternative 2 is anticipated to result in no effect on Indiana bat and northern long-eared bat where no tree clearing occurs, and no effect to eastern prairie fringed orchid within the impounded area because suitable habitat is absent. Leaving Steel Dam in place may reduce the opportunity to restore natural water level fluctuations that could create wetlands and open sedge meadow conditions for eastern prairie fringe habitat. The rusty patched bumblebee may be temporarily affected, and not likely adversely affected, due to temporary and localized bank disturbances in growing season foraging areas. Affects have a limited potential to intersect nesting habitat that can occur up to about 100 feet (30 meters) into forest and woodland edges adjacent to upland grasslands and shrublands.

Timing construction disturbance and integrating pollinator-beneficial restoration (native seed mixes, extended bloom periods, invasive control) into design is expected to provide a net positive outcome, however relatively limited as the restoration footprint would be smaller than that of Alternative 1.

## 5.3 ALTERNATIVE 3: REMOVE SEARS DAM AND ADD ROCK RAMP AT STEEL DAM

### 5.3.1 Alternative Overview

Alternative 3 consists of removal of the concrete spillways at Sears Dam as described for Alternative 1 and construction of a rock ramp along the downstream face of Steel Dam. Banks treatments and sediment management would be largely similar to those of Alternative 2 and would include passive release of impounded sediments, with the exception of any sediment excavation necessary to construct access roads for demolition. Nature-like fishway options at Steel Dam could be considered to enhance fish passage potential.

Alternative 3 would result in nearly identical post-project conditions as Alternative 2 and would result in the same flow distribution around Vandruff Island in which flows in the North Channel are substantially increased compared to existing conditions (

Table 10).

### 5.3.2 Sediment Transport, Evacuation, and Fate

Alternative 3 would have nearly identical sediment transport, evacuation, and fate characteristics as Alternative 2.

### 5.3.3 Fish Passage

Fish passage characteristics under Alternative 3 would be similar to Alternative 2, though there may be increased opportunity for aquatic organism passage over Steel Dam. Riprap placed as a rock ramp downstream of the spillway would need to feature large resting pools and be constructed with a slope of <2% in order to provide safe, timely, and effective fish passage for native fish species during periods of the year when flow is carried through the South Channel. In order to minimize water losses through placed stone material, this option may need to include raising of the channel bed with a matrix of finer material under an armor layer of immobile stone. Some water losses to throughflow would be inevitable with this alternative.

Alternatively, riprap could be placed at a steeper slope and fish passage could be improved by constructing one of the nature-like fishway options discussed for Alternative 2 (see Section 5.2.3).

### 5.3.4 Recreational Use

Recreational use characteristics for Alternative 3 would be nearly identical to those discussed for Alternative 2.

### 5.3.5 Impoundment Restoration and Bank Stabilization

Impoundment restoration and bank stabilization considerations for Alternative 3 would be nearly identical to those discussed for Alternative 2.

### 5.3.6 Constructability, Access, and Water Control

Construction access and water control for Alternative 3 would be similar to those discussed for Alternative 2. Construction of safety modifications at Steel Dam would require a significant amount of material placement and significant expense, with minimal benefit over Alternative 2.

### 5.3.7 Ecological Outcomes

Ecological outcomes would be similar to those discussed for Alternative 2.

#### *5.3.7.1 T&E Species Impacts*

Threatened and Endangered species outcome characteristics would be similar to those discussed for Alternative 2.

## 5.4 ALTERNATIVE 4: REMOVE SEARS DAM, CONSTRUCTED RIFFLES IN NORTH CHANNEL, AND SAFETY MODIFICATIONS AT STEEL DAM

### 5.4.1 Alternative Overview

Alternative 4 is intended to preserve the existing impoundment while addressing safety concerns at both dams. Under this alternative, Sears Dam would be removed and replaced with a series of constructed riffles that extend to approximately 24th Avenue extended, where a tributary enters the Rock River. These riffles would be constructed of naturally rounded alluvial material (boulders, cobble, and gravel) with a gradient of approximately 0.5-2% and a head loss per riffle of 2-4 feet. At Steel Dam, safety modifications would consist of those described in either Alternatives 2 or 3, and nature-like fishway options are possible at the dam.

Because Alternative 4 would preserve the existing impoundment, sediment management in the impoundment would not be required as a part of the project.

### 5.4.2 Sediment Transport, Evacuation, and Fate

Alternative 4 would maintain the existing impoundment, and therefore would not result in substantial evacuation of impounded areas upstream of Vandruff Island. To construct riffles in the North Channel, impounded sediments would need to be excavated from work areas and may need to be disposed of off-site. Impounded sediments located between riffles would quickly mobilize and transport downstream. The quantity of material that would evacuate following construction represents a minor volume compared to the overall volume of impounded sediment at the site.

### 5.4.3 Fish Passage

The riffles constructed for Alternative 4 would be designed to provide opportunities for native fish passage. Although hydraulic modeling has not been completed for this alternative, the riffles would be designed with a maximum slope of 2%, which is understood to be passable for most native fish species. Resting areas between the riffles would provide low-velocity zones between higher-velocity areas along riffles. Riffles would be designed to mimic the complex flow fields found in steep naturally occurring riffles, and would contain natural roughness elements. Effectiveness will depend on riffle crest elevation, stone sizing, expected flow ranges, and provision of low-velocity microhabitats. Because non-native species already occur above and below the dams, range shifts are not anticipated.

Restoring passage via the river-right (northern) channel would benefit most species, especially migratory and weak swimmers such as Northern Pike and Lake Sturgeon, by increasing upstream passage opportunities. However, relative to full dam removal this alternative would have a lower upstream passage potential.

### 5.4.4 Recreational Use

Recreational use of the site under Alternative 4 would be similar to existing conditions, with the exception that some boaters or paddlers would be able to navigate the series of constructed riffles at

certain flow conditions. Angling opportunities within the impoundment would increase given improved fish passage conditions.

### 5.4.5 Impoundment Restoration and Bank Stabilization

Alternative 4 would require limited impoundment restoration or bank stabilization. Banks would need to be constructed along riffles in the North Channel, and habitat enhancement could be considered within the constructed reach. Upstream of the riffles, impounded conditions would persist and restoration or stabilization work would not be required.

### 5.4.6 Constructability, Access, and Water Control

Alternative 4 represents a costly and ambitious project to remove an impediment to flow while preserving the upstream impoundment for recreation. Key construction, access, and water control considerations include:

- Riffle construction must occur before removal of Sears Dam to prevent significant sediment evacuation within the impoundment.
- Riffle construction must occur within the dry. Therefore, large cofferdams would need to be constructed and dewatered to construct segments of each riffle or the entire reach. Given impounded water conditions, this effort would be extremely time consuming and expensive. Impounded sediments within each cofferdam would need to be excavated and potentially disposed of offsite and would represent a major logistical hurdle and cost item.
- Existing impoundment sediment in the Sears impoundment would need to be removed throughout the entire North Channel prior to riffle construction.
- Access to riffle locations would likely require access from existing roads owned by the quarry on Vandruff Island.
- Steel Dam safety modifications would have access and construction considerations as described for Alternatives 2 and/or 3.
- Typical construction site BMPs to reduce erosion and sedimentation would be required.
- Spikes in turbidity should be anticipated during riffle construction, drawdown and dewatering. Turbidity limits may be enforced based on monitoring to stop work during periods of high turbidity.
- Construction site erosion and sedimentation control BMPs should be put in place to limit excess turbidity and sedimentation sourced from construction staging area, access roads, and above-water work areas.

### 5.4.7 Ecological Outcomes

Alternative 4 provides the lowest ecological benefit given that it maintains impounded water conditions. Fish that pass above the dams via the North Channel would experience degraded conditions within the impoundment and would need to swim upstream of the impoundment to find higher-quality spawning and nursery habitat. Bed impacts in the North Channel are greater than the other alternatives and may impact benthic organisms in some areas. Mussels would not benefit from any added habitat area.

#### *5.4.7.1 T&E Species Impacts*

Threatened and Endangered species outcome characteristics would be similar to those of Alternative 2 and 3.

## 5.5 ALTERNATIVE 5: REMOVE SEARS DAM AND ADD CONCRETE STEPPED SPILLWAY AND BYPASS CHANNEL AT STEEL DAM

### 5.5.1 Alternative Overview

Alternative 5 incorporates the removal of the concrete spillways at Sears and construction of concrete steps along the downstream face of Steel Dam as a safety modification described in Alternative 2. This allows for the improvement of the river habitat in the North Channel and the public safety modifications in the South Channel provided by Alternative 2. Additionally, Alternative 5 improves fish passage in the South Channel with a nature-like fish bypass channel incorporated into the spillway modification design at Steel Dam. This alternative would have 600-feet of the Steel Dam spillway modified with concrete steps, while the remaining southmost 100-feet of spillway would be converted into a walled off 750-foot-long fish bypass channel with a 1% longitudinal slope. The fish passage would need to be evaluated and designed in detail in future project phases.

Bank treatments and sediment management would be largely similar to those of Alternative 2 and would include passive release of impounded sediments, with the exception of any sediment excavation necessary to construct access roads for demolition.

Alternative 5 would result in nearly identical post-project conditions as Alternative 2 and would result in similar flow distribution around Vandruff Island in which flows in the North Channel are substantially increased compared to existing conditions (

Table 10).

### 5.5.2 Sediment Transport, Evacuation, and Fate

Alternative 5 would have nearly identical sediment transport, evacuation, and fate characteristics as Alternative 2.

### 5.5.3 Fish Passage

Fish passage characteristics under Alternative 5 would be similar to Alternative 2 with increased opportunity for aquatic organism passage around Steel Dam. The bypass channel would require a constructed boulder-cobble bed with riffle-pool morphology and require constructed inlet and outlet conditions to optimize passage hydraulics. It would also likely require a bridge for pedestrians or maintenance equipment. Fish passage would be limited to periods of time with total river flow greater than approximately 8,000 cfs, as flows less than this value would not result in adequate flow depth in the South Channel.

### 5.5.4 Recreational Use

Recreational use characteristics for Alternative 5 would be nearly identical to those discussed for Alternative 2.

### 5.5.5 Impoundment Restoration and Bank Stabilization

Impoundment restoration and bank stabilization considerations for Alternative 5 would be nearly identical to those discussed for Alternative 2.

### 5.5.6 Constructability, Access, and Water Control

Construction access and water control for Alternative 5 would be similar to those discussed for Alternative 2.

### 5.5.7 Ecological Outcomes

Ecological outcomes would be similar to those discussed for Alternative 2.

#### *5.5.7.1 T&E Species Impacts*

Threatened and Endangered species outcome characteristics would be similar to those discussed for Alternative 2 for the North Channel and terrestrial species. However, with the improvements to fish passage at the Steel Dam, the longitudinal connectivity of aquatic habitats would improve for fish species in the South Channel.

## 5.6 ALTERNATIVE 6: MAINTAIN SEARS DAM AND ADD CONCRETE STEPS AT STEEL DAM

### 5.6.1 Alternative Overview

Alternative 6 was added following a request made through public comment in 2026 to include an alternative that keeps Sears Dam. Under this alternative, Sears Dam would be maintained with no safety improvements, thus not meeting project goals. See Hanson report for discussion of risks, maintenance requirements, and costs associated with keeping the Sears Dam. At Steel Dam, safety modifications would consist of those described in Alternative 2.

Because Alternative 6 would preserve the existing impoundment, sediment management in the impoundment would not be required as a part of the project.

### 5.6.2 Sediment Transport, Evacuation, and Fate

Alternative 6 would maintain the existing impoundment and therefore would not result in sediment evacuation within the impounded areas.

### 5.6.3 Fish Passage

Alternative 6 would not provide any fish passage.

### 5.6.4 Recreational Use

Recreational use of the site under Alternative 6 would be similar to existing conditions.

### 5.6.5 Impoundment Restoration and Bank Stabilization

Alternative 6 would not result in impoundment restoration or habitat enhancement. Impounded conditions would persist.

### 5.6.6 Constructability, Access, and Water Control

Alternative 6 represents an alternative that does not provide a safety improvement to Sears Dam while preserving the upstream impoundment for recreation. Key construction, access, and water control considerations include:

- Steel Dam safety modifications would have access and construction considerations as described for Alternative 2.

### 5.6.7 Ecological Outcomes

Alternative 6 provides the lowest ecological benefit given that it maintains impounded water conditions. Fish that pass above the dams via the North Channel would experience degraded conditions within the impoundment and would need to swim upstream of the impoundment to find higher-quality spawning and nursery habitat. Mussels would not benefit from any added habitat area.

#### *5.6.7.1 T&E Species Impacts*

Threatened and Endangered species outcome characteristics would be similar to those of Alternative 2, 3, and 4.

## 5.7 DISCUSSION AND RECOMMENDATION

Based on the evaluations discussed in preceding sections, Inter-Fluve recommends moving forward with Alternative 1, full removal of both dams with passive sediment management. This alternative meets the project goals relative to removing safety hazards from the river, reducing ongoing maintenance obligations, and re-establishing fish passage in the Rock River at the lowest overall implementation cost relative to other alternatives evaluated that meet the project goals. Passive sediment management is a cost-effective means of sediment management that aligns with OWR's

preferences and, based on Inter-Fluve's review of available data, appears to be an appropriate strategy. It is recommended that the following be considered in dam removal design:

- Detailed engineering design development, including dam demolition, staging, sequencing, water control, site and impoundment restoration, and material management plans
- Evaluation of powerhouse structure that is currently impounding water at Sears Dam and consideration for future stability, use, and management.
- 2D hydraulic modeling of the full impoundment and downstream reaches to evaluate potential depositional areas at various river flows.
- Detailed evaluation of banks and adjacent infrastructure within the impoundment.
- Mussel and substrate surveys of downstream reaches of Rock River and Mississippi River, and if necessary, mussel relocation prior to construction.
- Regulatory coordination.

# 6. References


Alden, W.C. (1918). The quaternary geology of southeastern Wisconsin: *Reston Virginia, U.S. Geological Survey, Professional Paper 106*, 356p.

Alla, Y. M. K., & Lee Liu, R. (2021). Impacts of Dams on the Environment: A Review. International Journal of Environment Agriculture and Biotechnology, 6(1), 64–74.

Anderson, R.C. (1967). Sand and gravel resources along the Rock River in Illinois: *Illinois State Geological Survey circular 414,* 17p.

Anderson, R.C. (2005). Geomorphic history of the Rock River, South-Central Wisconsin, Northwestern Illinois. *Circular 565,* Augustana College. Illinois Dept. Nat. Res./Illinois Geol. Survey, Champaign, IL.

Armstrong, J. E., Crandell, D. R., Easterbrook, D. J., & Noble, J. B. (1965). Late Pleistocene stratigraphy and chronology in southwestern British Columbia and northwestern Washington. *Geological Society of America Bulletin, 76(3),* 321–330.

Armstrong, R.J., (1961). The Illinois and Mississippi (Hennepin) Canal, unpublished master's thesis, *Illinois State University at Normal.*

Bales, S. A., Price, A. L., Shasteen, D. K., & Shilts, W. (2012). Freshwater Mussels of the Rock River.

Bauer, G., & Wächtler, K. (2001). Environmental Relationships of Naiads: Threats, Impact on the Ecosystem, Indicator Function. In G. Bauer & K. Wächtler (Eds.), *Ecology and Evolution of the Freshwater Mussels Unionoida*, pp. 311–315. Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-56869-5_16.

Baxter, R.M. 1977. Environmental effects of dams and impoundments. *Ann. Rev. of Ecol. and Systematics* 8:255-283.

Bednarek, A. 2001. Undamming rivers: A review of the ecological impacts of dam removal. *Envir. Mgmt. 27(6).* 803-814.

Bednarek, A. (2001). Undamming Rivers: A Review of the Ecological Impacts of Dam Removal. *Environmental Management 27,* 803–814.

Bhowmik, N. G., Rodger, A., Bonini, A. P., Klock, A. M., & Demissie, M. (1986). Sediment Loads of Illinois Streams and Rivers. *Report of Investigation*, 106.

Buchman, M.F. (1999). NOAA Screening Quick Reference Tables, NOAA HAZMAT report 99-1, Seattle, WA. *Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration,* 12p.

Bushaw-Newton, K. L., Hart, D. D., Pizzuto, J. E., Thomson, J. R., Egan, J., Ashley, J. T., ... & Velinsky, D. J. (2002). An integrative approach towards understanding ecological responses to dam removal: the Manatawny Creek Study 1. *JAWRA Journal of the American Water Resources Association, 38(6),* 1581-1599.

Carman, J.E. (1909). The Mississippi Valley between Savanna and Davenport: Illinois State Geological Survey Bulletin 13, 96p.

Collins. M.J., Snyder, N. P., Boardman, G., Banks, W.S.L., Andrews, M., Baker, M.E., Conlon, M., Gellis, A. McClain, S., Miller, A., and Wilcock, P. (2017). Channel response to sediment release: insights from a paired analysis of dam removal. *Earth Surface Processes and Landforms.*

Cordone, A.J., and D.W. Kelly. (1961). The influences of inorganic sediment on aquatic life of streams. *California Fish and Game* 47:189-228.

Cumming, G. (2004). The impact of low-head dams on fish species richness in Wisconsin, USA. *Ecological Applications - ECOL APPL, 14,* 1495–1506.

Enviroscience. (2025). Rock River sampling and analysis plan: Project No. 24-0737. *Report to Ill. Dept. of Nat. Res.,* Stow, OH.

Federal Emergency Management Agency. (2010). Flood Insurance Study, Rock Island County, Illinois and Incorporated Areas. Washington, D.C. April 5.

Graf, J. B. (1983). Measurement of Bedload Discharge in Nine Illinois Streams with the Helley-Smith Sampler. *Water-Resources Investigations Report, 83*–4136.

Hanson. (2024). 2D Existing Conditions Model Development Report, 1-25.

Hastings, R. P., Meiners, S. J., Colombo, R. E., & Thomas, T. E. (2016). Contrasting impacts of dams on the metacommunity structure of fish and macroinvertebrate assemblages. *North American Journal of Fisheries Management, 36(6),* 1358-1367.

Hornbach, D. J. (2001). Macrohabitat Factors Influencing the Distribution of Naiads in the St. Croix River, Minnesota and Wisconsin, USA. In K. Bauer Gerhard and Wächtler (Ed.), Ecology and Evolution of the Freshwater Mussels Unionoida (pp. 213–230). *Springer Berlin Heidelberg.* https://doi.org/10.1007/978-3-642-56869-5_12

Illinois Department of Natural Resources. (n.d.). Stocking information for Rock River. Retrieved 8/7/2024 from https://ifishillinois.org/programs/waterbody_stocking.php?waternum=00534.

Jones, A. C., Meiners, S. J., Effert-Fanta, E., Thomas, T., Smith, S. C., & Colombo, R. E. (2023). Low-head dam removal increases functional diversity of stream fish assemblages. *River Research and Applications, 39(1),* 3-20.

Kanehl, P.D., J. Lyons, and J.E. Nelson. (1997). Changes in the habitat and fish community of the Milwaukee River, Wisconsin, following removal of the Wollen Mills Dam. *N. Am. J. Fish. Mgmt 17:387-*400.

Leverett, F. (1899). The Illinois glacial lobe: *U.S. Geological Survey Monograph 38,* 817p.

Ligon, F.K., Dietrich, W.E., and W.J. Trush. (1995). Downstream ecological effects of dams: a geomorphic perspective. *Bioscience 45(3) 183-*192.

MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. (2000). Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems. *Archives of*

*Environmental Contamination and Toxicology, 39* 20-31.

Ontario. (1993) or Persaud, D.R., R. Jaagumagi, and A. Hayton. (1993). Guidelines for the protection and management of aquatic sediments in Ontario. Standards Development Branch. *Ontario Ministry of Environment and Energy*. Toronto, Canada.

Peake, S.J., Beamish, F.W.H., McKinley, R.S., Scruton, D.A. & Katopodis, C. (1997). Relating swimming performance of lake sturgeon, Acipenser fulvescens, to fishway design. *Canadian Journal of Fisheries and Aquatic Sciences, 54,* 1361–1366.

Peake, S. (2008). Passage performance of walleye, northern pike, and white sucker in an experimental culvert. *North American Journal of Fisheries Management, 28,* 321–327.

Pearson, A.J., Snyder, N.P., Collins, M.J. (2011). Rates and process of channel response to dam removal with a sand-filled impoundment. *Water Resources Research. v*. 47.

Petts, G.E. (1984). Impounded rivers, perspectives for ecological management, John Wiley and Sons, New York, NY, 326p.

Porto, L. M., McLaughlin, R. L., & Noakes, D. L. G. (1999). Low-Head Barrier Dams Restrict the Movements of Fishes in Two Lake Ontario Streams. *North American Journal of Fisheries Management, 19(4),* 1028–1036.

Sanborn. (1888). Sanborn Fire Insurance Map, Milan, IL. Sanborn Map and Publishing Company, Pelham, NY.

Savage, T.E. and J. A Udden. (1921). The geology and mineral resources of the Edgington and Milan Quadrangles. *Illinois State Geological Survey Bulletin 38B,* 68p.

Sethi, S. A., Selle, A. R., Doyle, M. W., Stanley, E. H., & Kitchel, H. E. (2004). Response of Unionid Mussels to Dam Removal in Koshkonong Creek, Wisconsin (USA). *Hydrobiologia, 525(1).* 157–165.

Smith, S., Colombo, R.E., Thomas, T. and D.B. Keeney. (2019). Dissimilar effects of low-head dams on the genetic structure of riverine fishes. *Freshwater Science. 2019. 38(1):*92–102.

Smith, S., Meiners, S., Hastings, R., Thomas, T., and R. Columbo. (2017). Low-head Dam Impacts on Habitat and the Functional Composition of Fish Communities. *River Research and Applications. 33(5).* pp 680-689.

Stanford, J. A., & Ward, J. V. (1979). Stream Regulation in North America. In *The ecology of regulated streams* (pp. 215-236). Boston, MA: Springer US.

Stanley, E.H., and M.W. Doyle. (2003). Trading off: The ecological effects of dam removal. Front. *Ecol. Environ*. 1(1): 15-22.

Sumaiya, S., Czuba, J. A., Schubert, J. T., David, S. R., Johnston, G. H., & Edmonds, D. A. (2021). Sediment transport potential in a hydraulically connected river and floodplain-channel system. *Water Resources Research, 57,* e2020WR028852. https://doi.org/10.1029/2020WR028852

Tiemann, J. S., Douglass, S. A., Stodola, A. P., & Cummings, K. S. (2016). Effects of lowhead dams on freshwater mussels in the Vermilion River Basin, Illinois, with comments on a natural dam removal. *Transactions of the Illinois State Academy of Science.* 109.

Tiemann, J., Gillette, D., Wildhaber, M., & Edds, D. (2004). Effects of Lowhead Dams on Riffle-Dwelling Fishes and Macroinvertebrates in a Midwestern River. *Transactions of The American Fisheries Society, 133,* 705–717. https://doi.org/10.1577/T03-058.1

U.S. Army Corps of Engineers Rock Island District. (2012). Lock & Dam 16. http://www.mvr.usace.army.mil/Portals/48/docs/CC/FactSheets/Miss/LockandDam16.pdf

U.S. Army Corps of Engineers Rock Island District. (2024, August 30). Mississippi River Maintenance Dredging (Operations & Maintenance). https://www.mvr.usace.army.mil/about/offices/programs-and-project-management/district-projects/projects/article/1168726/mississippi-river-maintenance-dredging-operations-maintenance/

U.S. Geological Survey. (1837). United States Government Land Office Survey Plat (Township 17 North, Range 2 West, Rock Island County, Illinois). Illinois State Archives, Springfield, Illinois. Ward, J.V., and J.A. Stanford. 1979. Ecological factors controlling stream zoobenthos with emphasis on thermal modifications of regulated streams. Pages 35-55 in J.V. Ward and J. A. Stanford (eds). *The Ecology of Regulated Streams.* Plenum Press. New York.

Watters, G. T. (1996). Small dams as barriers to freshwater mussels (Bivalvia, Unionoida) and their hosts. *Biological Conservation, 75(1).* 79–85. https://doi.org/https://doi.org/10.1016/0006-3207(95)00034-8.

Williams, J. D., Warren Jr., M. L., Cummings, K. S., Harris, J. L., & Neves, R. J. (1993). Conservation Status of Freshwater Mussels of the United States and Canada. *Fisheries. 18(9),* 6–22.

Yeater, Mary. (1979). The Hennepin Canal: Being a reprint of articles published in American canals, November 1976 through August 1978. *Illinois Department of Conservation.*

# APPENDIX D - Rock River Sediment Analysis

HANSON™

# ROCK RIVER SEDIMENT ANALYSIS

Prepared for: Illinois Department of Natural Resources
Office of Water Resources

**Project No.:** 24-0737
**Date:** 10/07/2025

Prepared by:

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Rock River Sediment Analysis

Document Date: 10/07/2025

Project No.: 24-0737

Prepared for:
Illinois Department of Natural Resources Office of Water Resources

## Authorization for Release

*The analyses, opinions, and conclusions in this document are based entirely on EnviroScience's unbiased, professional judgment. EnviroScience's compensation is not in any way contingent on any action or event resulting from this study.*

*To the best of their knowledge, the undersigned attest that this document, and the information contained herein, is accurate and conforms to EnviroScience's internal Quality Assurance standards.*

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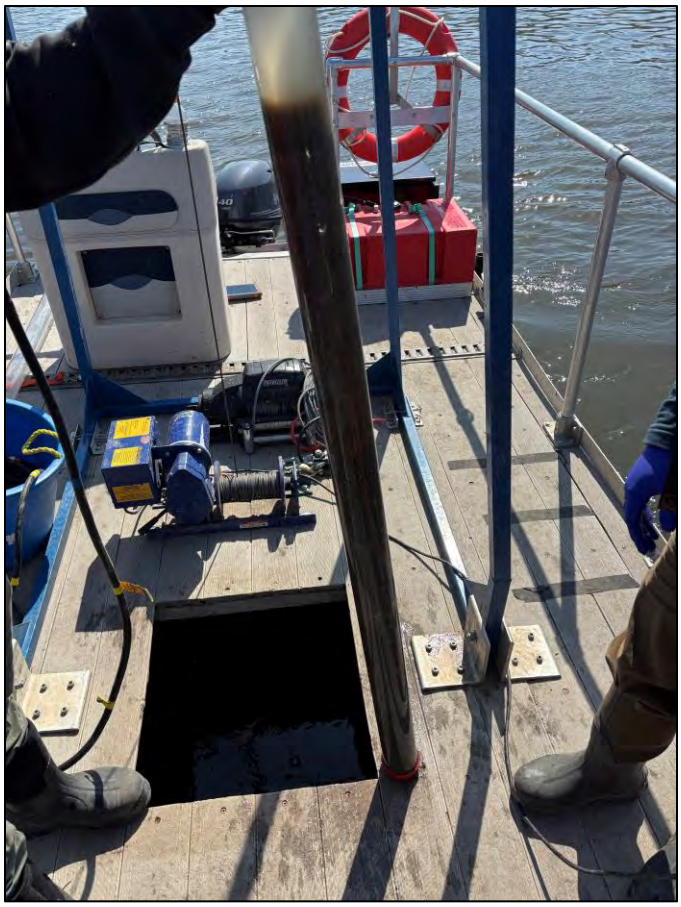
# 1.0 INTRODUCTION

This Analytical Report presents the results of the sediment sampling conducted as part of the Rock River Sediment Survey in Rock Island County, Illinois. On March 11-13, 2025, EnviroScience, Inc., conducted vibracore sediment sampling, supernatant, and water sampling along ten different sampling locations along Rock River. Nine of the ten sample locations were collected upstream of the Sears and Steel dams, with one sample location located directly downstream of the dams.

# 2.0 SAMPLING

Sampling activities were conducted based on the approved Sampling and Analysis Plan (SAP) dated March 4, 2025, which is included as **Appendix A**. Sediment core sampling locations as installed in the field are shown in **Appendix B**.

## 2.1 SAMPLING



EnviroScience scientists successfully collected nine proposed sediment cores, as well as supernatant and receiving water samples from all ten locations:

- Nine sediment cores, RRD-02 through RRD-10, were retrieved from Rock River upstream/west-northwest of the Sears and Steel dams.
- Samples RRD-10, RRD-09, RRD-08, RRD-07, RRD-06, RRD-05, and RRD-03 were collected as supernatant samples with both sediment cores and five gallons of site water being collected from each site location.
- Samples RRD-04 and RRD-02 were collected as sediment samples with no water samples being collected.
- Sample RRD-01 was originally proposed as a supernatant sample with additional receiving water samples. However, sediment recovery was unable to be collected from this sample point due to the lack of sediment east/downstream of the Sears and Steel dams. Receiving water samples were collected successfully.

Recovery was measured in the polycarbonate core tube prior to extrusion of the contents into polyethylene sleeves.

The core tube was advanced to refusal at all locations. Sediment thickness encountered at the sites varied from those anticipated in the SAP. The sample site designated as RRD-01 did not yield a viable core due to insufficient recovery and penetration. Multiple attempts were made in the vicinity of RRD-01, but all resulted in the same outcome: refusal with no recovery. It is presumed that the area has little to no sediment viable for coring, with the bottom consisting primarily of rock.

**Table 1** summarizes variation between the sample intervals proposed in the SAP and those designated based on field conditions encountered during core sampling activities.

**Table 1: Sample Interval Comparison**

| Sample ID | Proposed Depth in SAP (ft.) | Actual Depth Recovery (ft.) | Sample Nomenclature |
|---|---|---|---|
| RRD-01 | Not Surveyed | No Recovery | Receiving water |
| RRD-02 | 7.4 | 5.2 | Sediment |
| RRD-03 | 4.5 | 3.2 | Supernatant |
| RRD-04 | 0.15 | 2.8 | Sediment |
| RRD-05 | 4.1 | 4.3 | Supernatant |
| RRD-06 | 3.6 | 4.0 | Supernatant |
| RRD-07 | 3.6 | 3.8 | Supernatant |
| RRD-08 | 7.7 | 4.2 | Supernatant |
| RRD-09 | 4.1 | 6.0 | Supernatant |
| RRD-10 | 11.6 | 5.0 | Supernatant |

## 2.2 LABORATORY ANALYSES REQUESTED

Sample analysis parameters and methods were developed based on the following documents:

- Illinois Administrative Code, Title 35, Section 395.205 – Material Testing (IAC 395.205.)
- The Illinois Environmental Protection Agency (IEPA), Bureau of Water Section 401 Water Quality Certification circular entitled Material Analysis for Dredge and Fill Activities (IEPA 401 WQC)
- Analytes identified for Rock River in Appendix A-1 of the IEPAs draft 2024 *Illinois Integrated Water Quality Report and Section 303(d) List* (IEPA 303(d))

Sediment parameters that were analyzed include: metals (As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Ni, Se, Ag, Zn), Hexavalent chromium, Low-level mercury, ammonia, fluoride, oil and grease, phenols, PCBs, Total Volatile Solids, and project pesticides. Additional parameters for water and supernatant samples included: pH, hardness (Ca and Mg calculation), and Total Suspended Solids. Chemical analyses were performed by Eurofins of Pittsburg, Pennsylvania.

Grain size distribution, hydrometer, and Atterberg limits analyses were completed under ASTM D422, C136, and D4318 specifications and characterized by sieve analyses to determine coarse

fractions and percent fines. Grain Size Distribution analyses were performed by Terracon of Parma, Ohio.

Sand/fine split analysis were completed under ISW SOP No. Sed. 4 method and were performed by the University of Illinois.

## 2.3 SEDIMENT CHARACTERIZATION RESULTS

### 2.3.1 Eurofins Chemical Analyses

**Tables 2-4** summarize the results of the Eurofins Chemical analyses. The full analysis results can be found in the Eurofins report located in **Appendix C**.

### 2.3.2 Grain Size Distribution

The Grain Size Distribution Report from Terracon is included in **Appendix D.**

Grain size distribution analysis was performed on nine of the sample locations. The results revealed that all samples were predominantly composed of silty sand or clayey sand.

### 2.3.3 Sand/Fine Split Analysis

The Sand/Fine Split Report from the University of Illinois is included in **Appendix E.**

Sand/fine split analysis was performed on nine of the sample locations. EnviroScience is still awaiting on results for Sand/Fine Split from the University of Illinois. Once results have been provided this section and **Appendix E** will be updated accordingly.

**Table 2: Supernatant Sample Analytical Table**

| Analyte | Units | RRD-10 | RRD-09 | RRD-08 | RRD-07 | RRD-06 | RRD-05 | RRD-03 |
|---|---|---|---|---|---|---|---|---|
| Mercury | ng/L | 33 | 42 | 7.3 | 22 | 33 | 18 | 12 |
| Total Solids | mg/L | 1000 | 690 | 660 | 600 | 820 | 690 | 540 |
| Total Suspended Solids | mg/L | 390 | 210 | 77 | 160 | 240 | 120 | 150 |
| Total Volatile Solids | mg/L | 650 | 480 | 630 | 410 | 800 | 600 | 390 |
| Fixed Solids | mg/L | 390 | 220 | ND | 190 | ND | 92 | 150 |
| Arsenic | mg/L | 0.0029 | 0.0036 | 0.0015 | 0.0051 | 0.0058 | 0.0034 | 0.0047 |
| Barium | mg/L | 0.19 | 0.24 | 0.16 | 0.23 | 0.21 | 0.22 | 0.23 |
| Cadmium | mg/L | 0.00022 | 0.00024 | 0.00025 | 0.00016 | 0.00048 | ND | 0.00015 |
| Calcium | mg/L | 77 | 58 | 73 | 52 | 52 | 54 | 46 |
| Chromium | mg/L | 0.0058 | 0.0053 | 0.0023 | 0.0023 | 0.0013 | 0.0030 | 0.0019 |
| Copper | mg/L | 0.0059 | 0.0057 | 0.0020 | 0.0050 | 0.0063 | 0.0038 | 0.0041 |
| Iron | mg/L | 6.5 | 6.2 | 2.9 | 4.7 | 6.5 | 3.2 | 3.6 |
| Lead | mg/L | 0.0058 | 0.0065 | 0.0018 | 0.0050 | 0.0068 | 0.0034 | 0.0049 |
| Magnesium | mg/L | 30 | 30 | 30 | 31 | 32 | 31 | 31 |
| Manganese | mg/L | 2.2 | 2.2 | 1.5 | 0.90 | 0.75 | 1.1 | 0.91 |
| Nickel | mg/L | 0.0061 | 0.0044 | 0.0024 | 0.0028 | 0.0030 | 0.0028 | 0.0035 |
| Selenium | mg/L | 0.00097 | 0.00061 | 0.00073 | 0.00051 | 0.00043 | 0.00051 | 0.00047 |
| Silver | mg/L | ND | ND | ND | ND | ND | ND | ND |
| Zinc | mg/L | 0.026 | 0.026 | 0.011 | 0.015 | 0.027 | 0.013 | 0.019 |
| Oil & Grease (HEM) | mg/L | 4.5 | 6.8 | 7.3 | 7.8 | 7.6 | 8.2 | 7.8 |
| Ammonia | mg/L | 1.2 | 5.2 | 0.72 | 11 | 13 | 4.9 | 13 |
| Total PCBs | µg/L | ND | ND | ND | ND | ND | ND | ND |
| 2,3,4,6-Tetrachlorophenol | mg/L | ND | ND | ND | ND | ND | ND | ND |
| 2,4,5-Trichlorophenol | mg/L | ND | ND | ND | ND | ND | ND | ND |

| Analyte | Units | RRD-10 | RRD-09 | RRD-08 | RRD-07 | RRD-06 | RRD-05 | RRD-03 |
|---|---|---|---|---|---|---|---|---|
| 2,4,6-Trichlorophenol | mg/L | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dichlorophenol | mg/L | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | mg/L | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dinitrophenol | mg/L | ND | ND | ND | ND | ND | ND | ND |
| 2,6-Dichlorophenol | mg/L | ND | ND | ND | ND | ND | ND | ND |
| 2-Chlorophenol | mg/L | ND | ND | ND | ND | ND | ND | ND |
| 2-Methylphenol | mg/L | ND | 0.0033 | ND | ND | ND | ND | ND |
| 2-Nitrophenol | mg/L | ND | ND | ND | ND | ND | ND | ND |
| 4,6-Dinitro-2-methylphenol | mg/L | ND | ND | ND | ND | ND | ND | ND |
| 4-Chloro-3-methylphenol | mg/L | ND | ND | ND | ND | ND | ND | ND |
| Methylphenol, 3 & 4 | mg/L | ND | ND | ND | ND | ND | ND | ND |
| 4-Nitrophenol | mg/L | ND | ND | ND | ND | ND | ND | ND |
| Pentachlorophenol | mg/L | ND | ND | ND | ND | ND | ND | ND |
| Aldrin | µg/L | ND | ND | ND | ND | ND | ND | ND |
| Dieldrin | µg/L | ND | ND | ND | ND | ND | ND | ND |
| Endrin | µg/L | ND | ND | ND | ND | ND | ND | ND |
| Heptachlor | µg/L | ND | ND | ND | ND | ND | ND | ND |
| Mirex | µg/L | ND | ND | ND | ND | ND | ND | ND |
| Toxaphene | µg/L | ND | ND | ND | ND | ND | ND | ND |
| Fluoride | mg/L | 0.15 | 0.11 | 0.18 | 0.12 | 0.11 | 0.12 | 0.13 |
| Hardness as calcium carbonate | mg/L | 320 | 270 | 310 | 260 | 260 | 260 | 240 |
| Hexavalent Chromium | mg/L | ND | ND | ND | ND | ND | ND | ND |

**Table 3: Sediment Sample Analytical Table**

| Analyte | Units | RRD-4 | RRD-2 |
|---|---|---|---|
| Mercury | µg/Kg | 41 | 64 |
| Arsenic | mg/Kg | 4.0 | 5.7 |
| Barium | mg/Kg | 100 | 120 |
| Cadmium | mg/Kg | 0.16 | 0.43 |
| Chromium | mg/Kg | 17 | 20 |
| Copper | mg/Kg | 8.5 | 12 |
| Iron | mg/Kg | 14000 | 16000 |
| Lead | mg/Kg | 8.7 | 12 |
| Manganese | mg/Kg | 470 | 610 |
| Nickel | mg/Kg | 12 | 15 |
| Selenium | mg/Kg | 0.22 | 0.22 |
| Silver | mg/Kg | ND | 0.067 |
| Zinc | mg/Kg | 43 | 68 |
| Ammonia | mg/Kg | 120 | 220 |
| Fluoride | mg/Kg | 1.7 | 2.2 |
| Oil & Grease (HEM) | mg/Kg | 170 | 200 |
| 2,3,4,6-Tetrachlorophenol | µg/Kg | ND | ND |
| 2,4,5-Trichlorophenol | µg/Kg | ND | ND |
| 2,4,6-Trichlorophenol | µg/Kg | ND | ND |
| 2,4-Dichlorophenol | µg/Kg | ND | ND |
| 2,4-Dimethylphenol | µg/Kg | ND | ND |
| 2,4-Dinitrophenol | µg/Kg | ND | ND |
| 2,6-Dichlorophenol | µg/Kg | ND | ND |
| 2-Chlorophenol | µg/Kg | ND | ND |
| 2-Methylphenol | µg/Kg | ND | ND |
| 2-Nitrophenol | µg/Kg | ND | ND |

| Analyte | Units | RRD-4 | RRD-2 |
|---|---|---|---|
| 4,6-Dinitro-2-methylphenol | µg/Kg | ND | ND |
| 4-Chloro-3-methylphenol | µg/Kg | ND | ND |
| Methylphenol, 3 & 4 | µg/Kg | ND | ND |
| 4-Nitrophenol | µg/Kg | ND | ND |
| Pentachlorophenol | µg/Kg | ND | ND |
| Aldrin | µg/Kg | ND | ND |
| Dieldrin | µg/Kg | ND | ND |
| Endrin | µg/Kg | ND | ND |
| Heptachlor | µg/Kg | ND | ND |
| Mirex | µg/Kg | ND | ND |
| Toxaphene | µg/Kg | ND | ND |
| Total Volatile Solids | % | 2.8 | 2.5 |
| Hexavalent Chromium | % | ND | ND |

**Table 4: Receiving Water Sample Analytical Table**

| Analyte | Units | RRD-1 |
|---|---|---|
| Mercury | ng/L | 1.3 |
| Total Solids | mg/L | 530 |
| Total Suspended Solids | mg/L | 16 |
| Total Volatile Solids | mg/L | 290 |
| Arsenic | mg/L | 0.00077 |
| Barium | mg/L | 0.055 |
| Cadmium | mg/L | ND |
| Calcium | mg/L | 62 |
| Chromium | mg/L | ND |
| Copper | mg/L | 0.0011 |
| Iron | mg/L | 0.25 |
| Dissolved Iron | µg/L | 290 |
| Lead | mg/L | 0.00033 |
| Magnesium | mg/L | 35 |
| Manganese | mg/L | 0.042 |
| Nickel | mg/L | 0.00081 |
| Selenium | mg/L | 0.00048 |
| Silver | mg/L | ND |
| Zinc | mg/L | ND |
| Oil and Grease | mg/L | 4.8 |
| Fluoride | mg/L | 0.099 |
| 2,3,4,6-Tetrachlorophenol | mg/L | ND |
| 2,4,5-Trichlorophenol | mg/L | ND |
| 2,4,6-Trichlorophenol | mg/L | ND |
| 2,4-Dichlorophenol | mg/L | ND |
| 2,4-Dimethylphenol | mg/L | ND |

| Analyte | Units | RRD-1 |
|---|---|---|
| 2,4-Dinitrophenol | mg/L | ND |
| 2,6-Dichlorophenol | mg/L | ND |
| 2-Chlorophenol | mg/L | ND |
| 2-Methylphenol | mg/L | ND |
| 2-Nitrophenol | mg/L | ND |
| 4,6-Dinitro-2-methylphenol | mg/L | ND |
| 4-Chloro-3-methylphenol | mg/L | ND |
| Methylphenol, 3 & 4 | mg/L | ND |
| 4-Nitrophenol | mg/L | ND |
| Pentachlorophenol | mg/L | ND |
| Aldrin | µg/L | ND |
| Dieldrin | µg/L | ND |
| Endrin | µg/L | ND |
| Heptachlor | µg/L | ND |
| Mirex | µg/L | ND |
| Toxaphene | µg/L | ND |
| Total PCBs | µg/L | ND |
| PCB-1016 | µg/L | ND |
| PCB-1221 | µg/L | ND |
| PCB-1232 | µg/L | ND |
| PCB-1242 | µg/L | ND |
| PCB-1248 | µg/L | ND |
| PCB-1254 | µg/L | ND |
| PCB-1260 | µg/L | ND |

# Appendix A

## Sediment Analysis Plan

# SEARS AND STEEL DAMS
# SAMPLING AND ANALYSIS PLAN

Prepared for: Illinois Department of Natural Resources-Office of Water Resources

**Project No.:** 24-0510
**Date:** 03/04/2025

Prepared by:

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# 1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) summarizes the sample collection and analytical program related to the characterization of sediments in the Rock River upstream of the Sears and Steel dams near Milan in Rock County, Illinois. This work supports a Feasibility Study.

## 1.1 BACKGROUND

Part of the Feasibility Study includes a sediment fate analysis which is critical to evaluation of dam removal/modification alternatives, as well as defining estimated costs for each viable alternative. The number and extent of samples is limited based on the nature of a feasibility study. Additional samples may be required during permitting or design. The study team, in coordination with OWR, has identified ten sample locations extending to I-80. One background sample is located downstream of the dam. Two samples are located close to the dams (one each) to identify the material that may be mechanically removed to accommodate construction activities. The remaining samples are primarily based on known sediment depths to best identify characteristics of the material, most likely to move downstream after dam removal.




**Rock River Dams Vicinity**

# 2.0 SAMPLE COLLECTION

The sampling for the Rock River Dams will consist of the collection of sediment cores, site water, and supernatant samples. Sediment samples collected from within the project area will be obtained using vibratory coring methods. Supernatant samples will be composited in the laboratory using site water and sediment collected in specifically proportioned volumes (1:4 ratio of sediment to site water).

Sampling locations in this SAP were selected based on initial characterization data quality objectives to assess the impact of dam removals on components of the Rock River including resultant sediment quality and load. Figure 1 depicts the limits of the study area considered in this SAP.

A total of 2 sediment samples will be analyzed for bulk chemistry parameters. A total of 8 supernatant samples will be analyzed for wet chemistry parameters. A total of 10 samples will be analyzed for sand/fine split and grain size distribution. Specific analytical methods and analytes are discussed further in **Section 3.1**.

## 2.1 SEDIMENT CORE LOCATIONS

Sediment and supernatant samples will be obtained from specific core locations indicated on **Table 2.1. Figures 1 through 5** depict the proposed locations along an approximately 15-mile stretch of the Rock River. There are 10 sampling locations designated RRD-01 through RRD-10. One location, RRD-01 is located downstream of the dams, while all other sampling points are upstream of the dams.

**Table 2.1 Sediment Core Sample Locations**

| Sediment Core Location ID | Latitude | Longitude | Anticipated Sediment Thickness* | Characterization Scenario |
|---|---|---|---|---|
| RRD-01 | 41.46542 | -90.588902 | Not Surveyed | Receiving Water |
| RRD-02 | 41.46185 | -90.577586 | 7.4 | Mechanical Dredge |
| RRD-03 | 41.46323 | -90.566082 | 4.5 | Hydraulic Dredge |
| RRD-04 | 41.46154 | -90.547074 | 0.15 | Mechanical Dredge |
| RRD-05 | 41.46103 | -90.538818 | 4.1 | Hydraulic Dredge |
| RRD-06 | 41.45927 | -90.517434 | 3.6 | Hydraulic Dredge |
| RRD-07 | 41.45769 | -90.482282 | 3.6 | Hydraulic Dredge |
| RRD-08 | 41.45646 | -90.425322 | 7.7 | Hydraulic Dredge |
| RRD-09 | 41.47738 | -90.377752 | 4.1 | Hydraulic Dredge |
| RRD-10 | 41.50254 | -90.365419 | 11.6 | Hydraulic Dredge |

* Sediment thickness estimated based on GIS analysis of depth of refusal surveys conducted by the Illinois Department of Natural Resources (IDNR) in August 2023, June 2024, and September 2024 and bathymetric survey conducted by the IDNR in June 2024.

Sediment core locations may be altered in the field based on safety considerations, flow conditions and sediment thicknesses observed during sampling.

## 2.2 SEDIMENT SAMPLES

Sediment samples will be taken from each sediment core location, as indicated in **Table 2.1**. The sample interval at each location will consist of the entire recovery of the sediment column which will be homogenized for analysis. A Specialty Devices, Inc. (SDI) VibeCore-D vibratory core sampler (vibracore) will be used to advance and collect core samples. EnviroScience's VibeCore-D-based sampling system can push cores up to 12 feet in length and 3 inches in diameter.

Sediment coring is anticipated to occur at water depths of approximately 20 feet or less, with anticipated sediment penetration depths of up to 12 feet. At every designated location, the sediment coring will continue until either refusal or maximum core length of 12 feet is reached

Recovered sediments will be extruded into a polyethylene sleeve and logged for sample collection by EnviroScience.

The general procedure related to each sediment core location is described below:

1. A derrick-outfitted pontoon sampling vessel will be navigated to an established sampling location within work area using an onboard global positioning system (GPS) device.
2. Once at the location, samplers will don clean nitrile gloves and gather laboratory-supplied sample containers. Gloves will be discarded after use at each site.
3. The appropriate length core tube will be selected based on target core depth (as assessed in **Table 2.1**). Available core tube lengths are 3, 6, 9 and 12 feet. The maximum length of core tube is 12 feet.
4. The vibrating core sampler will be deployed and allowed to penetrate to refusal.
5. After the core tube has reached the target depth, the vibrating unit will be turned off, containing cored sediments within the core tube.
6. The tube containing the core sample will be retrieved back to the sampling vessel. If core recovery is less than 75% of the penetration depth, up to three additional attempts will be made. If necessary, aluminum "core keeper" baskets will be utilized.
7. Samples will be de-watered by carefully decanting overlying water, avoiding the loss of fine surficial sediments.
8. All contained sediment will be extruded into a polyethylene sampling sleeve.
9. Recovered sediments will either be processed on shore in a designated area or on a supporting vessel.
10. Sediment from each core will be homogenized by thorough mixing in a precleaned bucket or dedicated sampling sleeve.
11. Once homogenized, the sediment will be placed into appropriate laboratory containers.
12. Samplers will wipe the threads on the top of the sample container if they are appreciably fouled with sediment to ensure a good seal with the lid and prevent leakage.
13. All containers will be labeled with appropriate information and immediately placed in a cooler with wet ice and chilled to 4°C.
14. Sample coolers will be shipped via FedEx or delivered to the laboratory. All samples requiring chemistry analysis according to the parameters indicated will be delivered to Eurofins' specialty sediment testing lab in Pittsburgh, Pennsylvania. Samples for grain size distribution determination will be shipped to Terracon in Parma, Ohio. All samples will be delivered following chain-of-custody protocols.
15. Sediments that remain following the sampling and packaging activities will be returned to the general location where they were collected.

Sampling locations may be adjusted in the field due to flow conditions, sediment thickness encountered, or other factors.

## 2.3 SAMPLE HANDLING AND DELIVERY PROCEDURES

EnviroScience will place the samples in appropriate containers and fill out the container labels with the sample date, location, sampler name, unique sample number, and any other required information. Supernatant samples representing sediment core locations upstream of the dams will be composited as indicated on Table 2.3, which also designates sample labeling nomenclature.

**Table 2.3 Sample Nomenclature**

| Sediment Core Location | Supernatant Sample ID | Sediment Sample ID | Grain Size Sample ID |
|---|---|---|---|
| RRD-01 | RRD01-SU | | RRD01-GSD |
| RRD-02 | | RRD02-SE | RRD02-GSD |
| RRD-03 | RRD01-SU | | RRD04-GSD |
| RRD-04 | | RRD04-SE | RRD03-GSD |
| RRD-05 | RRD05-SU | | RRD05-GSD |
| RRD-06 | RRD06-SU | | RRD06-GSD |
| RRD-07 | RRD07-SU | | RRD07-GSD |
| RRD-08 | RRD08-SU | | RRD08-GSD |
| RRD-09 | RRD09-SU | | RRD09-GSD |
| RRD-10 | RRD10-SU | | RRD10-GSD |

Concurrently with sample collection, EnviroScience personnel will record the sample identification number (Sample ID), location, sediment characteristics, and other relevant field data in a field notebook. Sample containers will be provided by Eurofins and all samples will be labeled with a unique Sample ID, date and time of sample collection, and the initials or name of the person collecting the sample. Samples will immediately be placed on ice in a cooler. Individual sample containers must be packed into sealable plastic bags to prevent direct contact with ice melt. EnviroScience will pack the containers in insulated shipping boxes or coolers with ice sufficient to maintain the samples at 4 degrees Celsius (°C) for 24 hours. Ice must be placed inside sealable bags before being placed inside the shipping containers or coolers.

All samples for chemistry analysis will be shipped to Eurofins along with a completed laboratory-provided chain-of-custody (COC) form verifying the matrix, date and time of collection, and sampling personnel. Samples requiring grain size distribution determination will be hand delivered to Terracon in Parma, Ohio. COC procedures will be maintained from the time of sample collection until arrival at the laboratory to protect sample integrity. The transport of samples to the laboratory will be done within a timeframe that ensures hold times are met. One copy of the COC record will be maintained by field personnel.

## 3.0 ANALYSIS

Sample analysis parameters and methods were developed based on the following documents:

- Illinois Administrative Code, Title 35, Section 395.205 – *Material Testing* (IAC 395.205);
- The Illinois Environmental Protection Agency (IEPA), Bureau of Water Section 401 Water Quality Certification circular entitled *Material Analysis for Dredge and Fill Activities* (IEPA 401 WQC); and
- Analytes identified in for Rock River in Appendix A-1 of the IEPAs draft 2024 *Illinois Integrated Water Quality Report and Section 303(d) List* (IEPA 303(d)).

Supernatant samples will be prepared in accordance with Section 10.1.2.1 of the United States Environmental Protection Agency and US Army Corps of Engineers February 1998 Inland Testing Manual.

## 3.1 ANALYTICAL PROGRAM

The analytical program selected for Supernatant and Sediment samples is summarized in the table below.

**Table 3.1: List of Analytical Parameters**

| Parameter | Supernatant (Method) | Sediment (Method) | Applicable Regulatory Source |
|---|---|---|---|
| Metals (As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Ni, Se, Ag, Zn) | 6020B | 6020B | IEPA 401 WQC |
| Chromium (hexavalent) | 7196A | 7196A | IEPA 401 WQC |
| Mercury | 1631E | 1631E | IEPA 401 WQC/IEPA 303(d) |
| Ammonia Nitrogen | 350.1 | 350.1 | IEPA 401 WQC/IAC 395.205 |
| Fluoride | 9056A | 9056A | IEPA 401 WQC/IAC 395.205 |
| Oil and Grease | 1664B | 9071B | IEPA 401 WQC |
| Phenols | 8270E LL | 8270E LL | IEPA 401 WQC |
| PCBs | 8082A | 8082A | IEPA 401 WQC/IEPA 303(d) |
| pH | 9045 | - | IEPA 401 WQC |
| Hardness | 2340B | - | IEPA 401 WQC |
| Total Volatile Solids | 2540B | 2540G | IEPA 401 WQC/IAC 395.205 |
| Total Suspended Solids | 2540B | - | IEPA 401 WQC/IAC 395.205 |
| Project Pesticides (aldrin, dieldrin, endrin, heptachlor, mirex, toxaphene) | 8081B LL | 8081B LL | IEPA 303d |
| Sand/Fine Split | - | ISWS SOP No. Sed. 4 | IEPA 401 WQC |
| Grain Size Distribution (GSD), Hydrometer, and Atterberg Limits | - | ASTM D2487, D6913, D7928 | Supplemental Elective Analyses |

# 4.0 QUALITY ASSURANCE / QUALITY CONTROL

The goal of QA/QC is to ensure samples are collected without the effects of accidental cross-contamination or systemic contamination and refers to the sampling and analysis procedures for generating defensible data. The following IEPAs describe the procedures that will be performed to generate defensible data.

## 4.1 QA/QC SAMPLING

The sampling and analyses activities described in this document represent an initial characterization of the conditions in the Rock River related to the potential removal of the Sears and Steel dams and the resultant impact to the water conditions nearby. For the purposes of initial data collection, budget was not allocated for QA/QC sampling. Should further delineation and assessment activities be undertaken related to the permitting or design of dam removal activities, additional sampling, including QA/QC samples would likely be necessary.

## 4.2 DECONTAMINATION

Since the samples collected are intended for environmental analysis, decontamination of any sampling or processing equipment that will come into direct contact with the sediment or water samples is required. EnviroScience will perform decontamination prior to collection of the first sample (either in the field or before arriving at the site). Decontamination will not be required between successive sediment core samples collected at the same sampling location.

Decontamination procedures refer to the steps taken to minimize the potential for cross-contamination between sampling locations. All equipment and instruments used that are in direct contact with the sediment collected for analysis will be decontaminated between sample locations using the following procedure:

1. Don a clean pair of nitrile gloves.
2. Remove excess sediment from the equipment using a brush or similar tool.
3. Rinse with raw water to remove any material.
4. Brush clean the outside and inside of the core barrel using a phosphate-free soap and brush (e.g., Liquinox® or Alconox®).
5. Raw water wash.

### 4.3 INVESTIGATION DERIVED WASTE (IDW)

EnviroScience will collect all refuse waste generated from the execution of the field sampling activity, such as used personal protective equipment (gloves, Tyvek suits, etc.), and place waste into large high-density polyethylene bags. The bags will be stored with the support vessel and equipment until they can be disposed of appropriately. The IDW generated in this sampling event is not hazardous and will be disposed of in conventional waste containers.

Recovered sediment in excess of the amount required for sample analyses will be returned to the general location in Rock River from where they were taken.

## 5.0 FIELD VARIANCES

Every effort will be made to follow the Sampling and Analysis Plan as presented. However, as conditions in the field may change, it may become necessary to implement minor modifications to sampling as presented in this plan. If deviations are deemed appropriate and necessary by field personnel, the project manager will be notified, and verbal approval will be obtained before implementing any necessary changes. Any modifications to the approved Sampling and Analysis Plan will be documented.

## 6.0 HEALTH AND SAFETY

### 6.1 HEALTH AND SAFETY PLAN

EnviroScience is committed to the health and safety of its employees and has developed the *Health Safety and Environment Plan, Hazards and Risk Minimization Policies* (HASP) to ensure employees will be provided with a safe work environment. Policies set out in the HASP will be followed for this sampling effort and are applicable to all EnviroScience personnel.

The HASP provides EnviroScience personnel with safety guidelines, risk minimization and guidance if an accident does occur while working.

In addition to guidelines covered in the HASP, all personnel must adhere to all federal, state and local safety laws and regulations. EnviroScience personnel are also required to follow any HASP or other safety requirements developed by the State of Illinois.

### 6.2 DAILY SAFETY BRIEFING

Anticipated Hazard Assessment (AHA), also known as Hazard Identification or Job Safety Analysis, is the term given to identifying risks to health and safety during field work and documenting the control measures taken to manage those risks. AHA forms are to be completed prior to field work and discussed during each

daily safety briefing. Once safety briefings are concluded, all members of the team are required to sign the daily AHA. At any time, if conditions change, all work must stop and the AHA must be amended and reviewed to address the change.

This task should be shared among the entire field crew, giving all members of the team the opportunity to address specific safety issues, cover topics of concern, and maintain a more dynamically safe work environment. All employees are given the responsibility and authority to stop work when employees believe that a situation exists that places them, their coworker(s), contracted personnel, or the public at risk or in danger. The project manager is responsible for keeping records of all safety briefings held.

## 6.3 SEDIMENT SAMPLING REPORT

EnviroScience will submit a letter reporting the data to the Rock River Dam Removal Study Partners. The Sediment Sampling Letter Report will include:

- Brief narrative report on the project, including:
  - Narrative project description and summary of sample collection activities
  - Map of actual sampling locations, with table of sampling locations including GPS coordinates, water depth, sediment depth
  - Water depths at each sampling location
  - COC sheets
  - Other pertinent information
- Laboratory Analytical results, including QA/QC documentation.
- Analytical results compared to applicable standards in a format compatible with Microsoft Excel.

## 6.4 APPLICABLE STANDARDS

Applicable standards are summarized in **Table 6.4,** which summarizes the regulatory information used to derive them as indicated in the notes below:

1. Standards as indicated in Appendix A of the Illinois Environmental Protection Agency, Bureau of Water Section 401 Water Quality Certification circular entitled *Material Analysis for Dredge and Fill Activities.*

2. Action levels for the 303(d) parameters will be defined based on Illinois Environmental Protection Agency (IEPA) guidelines.

3. Standards as applied to the Ingestion Exposure Pathway from the Illinois Environmental Protection Agency's Tiered Approach to Corrective Action Objectives (TACO), specifically Appendix B, Table A*: Tier 1 Soil Remediation Objectives for Residential Properties.*

4. Concentrations in mg/L unless otherwise noted.

5. Lowest Applicable Standard as indicated by the Illinois Environmental Protection Agency's Tiered Approach to Corrective Action Objectives (TACO), specifically Appendix A, Table G: *Concentrations of Inorganic Chemicals in Background Soils.*

6. Abbreviations:

"NA" - Not Applicable
"NS" - No Standard is Published

**Table 6.4 Applicable Standards**

| *Media* | **Supernatant** | **Sediment** |
|---|---|---|
| *Applicable Standard* [2] | **IEPA 401 WQC** [1] | **TACO Residential** [3] |
| *unit* | *mg/L*[4] | *mg/kg* |
| Arsenic | 0.05 | 11.3[5] |
| Barium | 0.5 | 5500 |
| Cadmium | 0.001 | 78 |
| Chromium (hexavalent, grab) | 0.01 | 230 |
| Chromium (total) | 0.05 | 230 |
| Copper | 0.005 | 2900 |
| Cyanide (total) | 5 ug/l | 1600 |
| Fluoride | 0.1 | 4700 |
| Iron (total) | 0.5 | NS |
| Iron (Dissolved) | 0.5 | NA |
| Lead | 0.05 | 400 |
| Manganese | 0.5 | 3700 |
| Mercury | 1.0 ng/L | 23 |
| Nickel | 0.005 | 1600 |
| Oil & Grease | 5 | NS |
| Phenols | 0.005 | 47000 |
| Selenium | 0.005 | 390 |
| Silver (total) | 0.003 | 390 |
| Zinc | 0.025 | 23000 |
| Polychlorinated Biphenyls (PCBs) | 0.001 µg/L | 1 |
| Ammonia-Nitrogen (as N) | 0.02 | NA |
| Total Suspended Solids (TSS) | 1 | NA |
| Total Volatile Solids (TVS) | 1 | NA |
| pH | 0.1 S.U. | NS |
| Hardness (as CaCO3) | 1 | NA |
| aldrin | NS | 0.04 |
| dieldrin | NS | 0.04 |
| endrin | NS | 23 |
| heptachlor | NS | 0.1 |
| mirex | NS | NS |
| toxaphene | NS | 0.6 |

# Figures

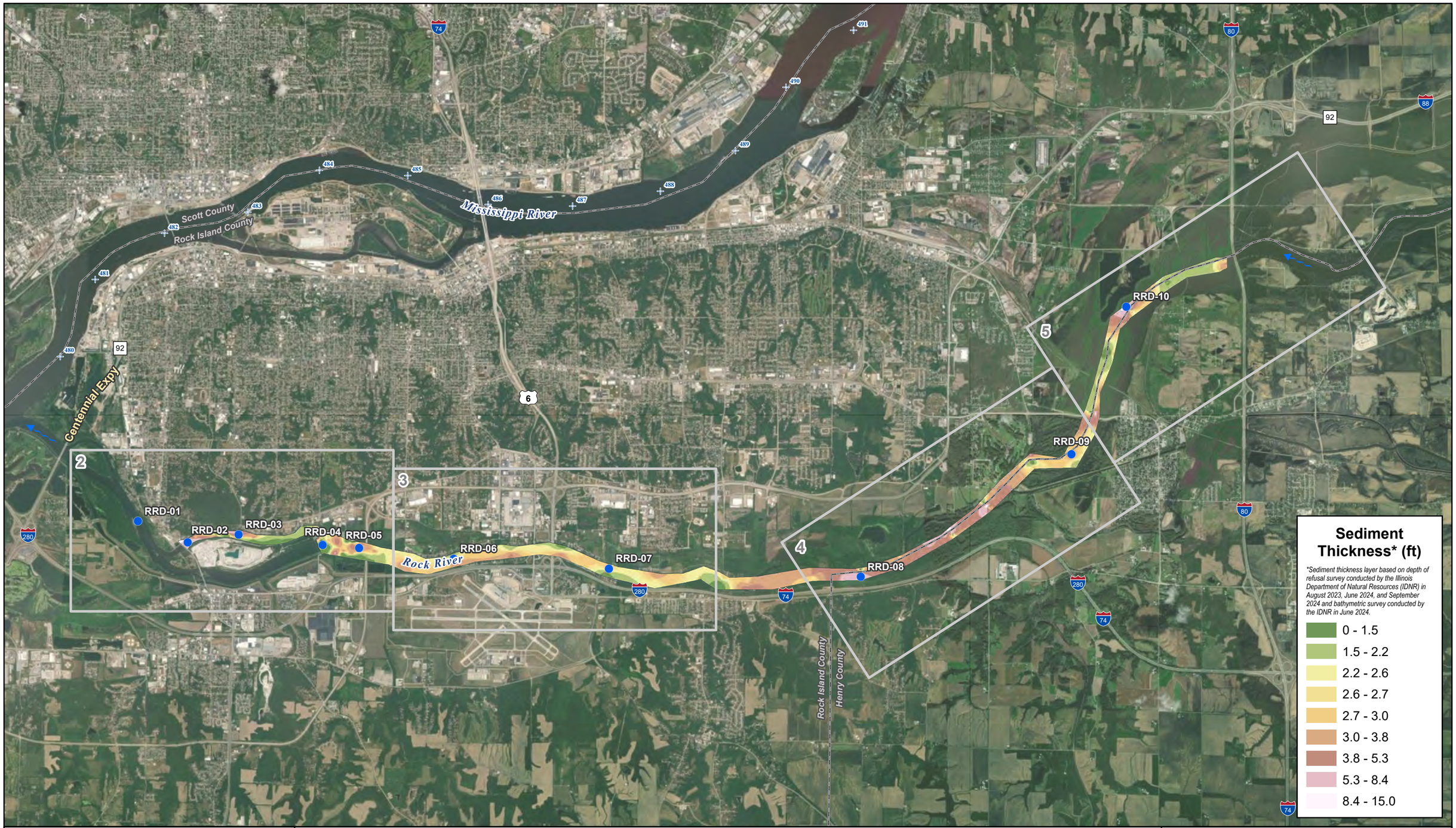



Figure 1.
Proposed Vibracore
Sediment Sampling Locations.
Rock Island County, Illinois.

Proposed Sample Location
USACE River Mile Marker

0 0.5 1 2 Miles
0 1 2 4 Kilometers

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Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

Date: 11/21/2024 Path: C:\Users\APIAZZA\OneDrive - ACRT\Desktop\24-0510_Rock_River_Survey\24-0510_Rock_River_Survey.aprx

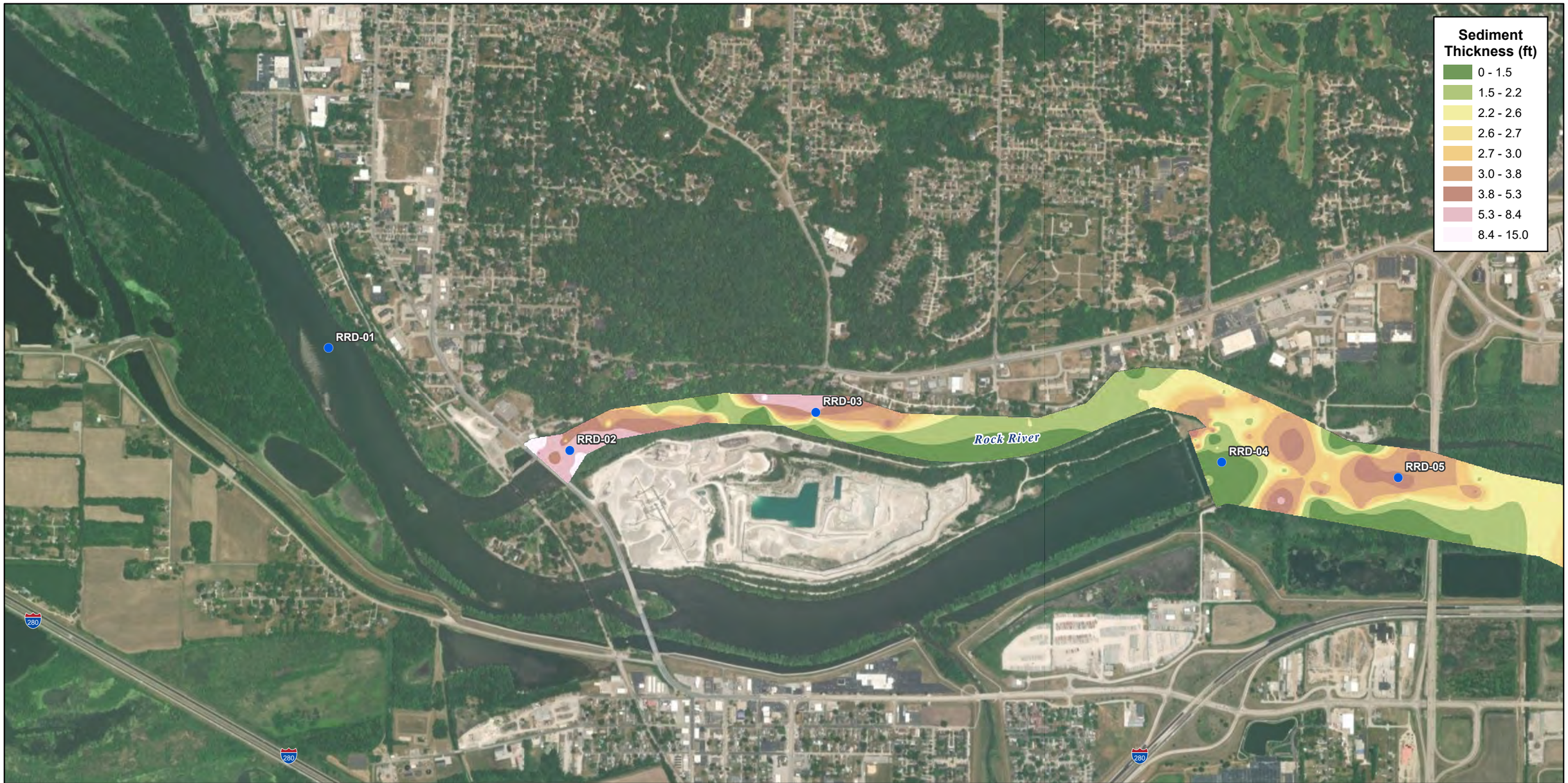





Figure 2. Field Location Plan – RRD-01 through RRD-05.
Rock Island County, Illinois.

● Proposed Sample Location

1:15,000

0 1,000 2,000 4,000 Feet

0 345 690 1,380 Meters

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NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

Date: 11/21/2024 Path: C:\Users\APIAZZA\OneDrive - ACRT\Desktop\24-0510_Rock_River_Survey\24-0510_Rock_River_Survey.aprx

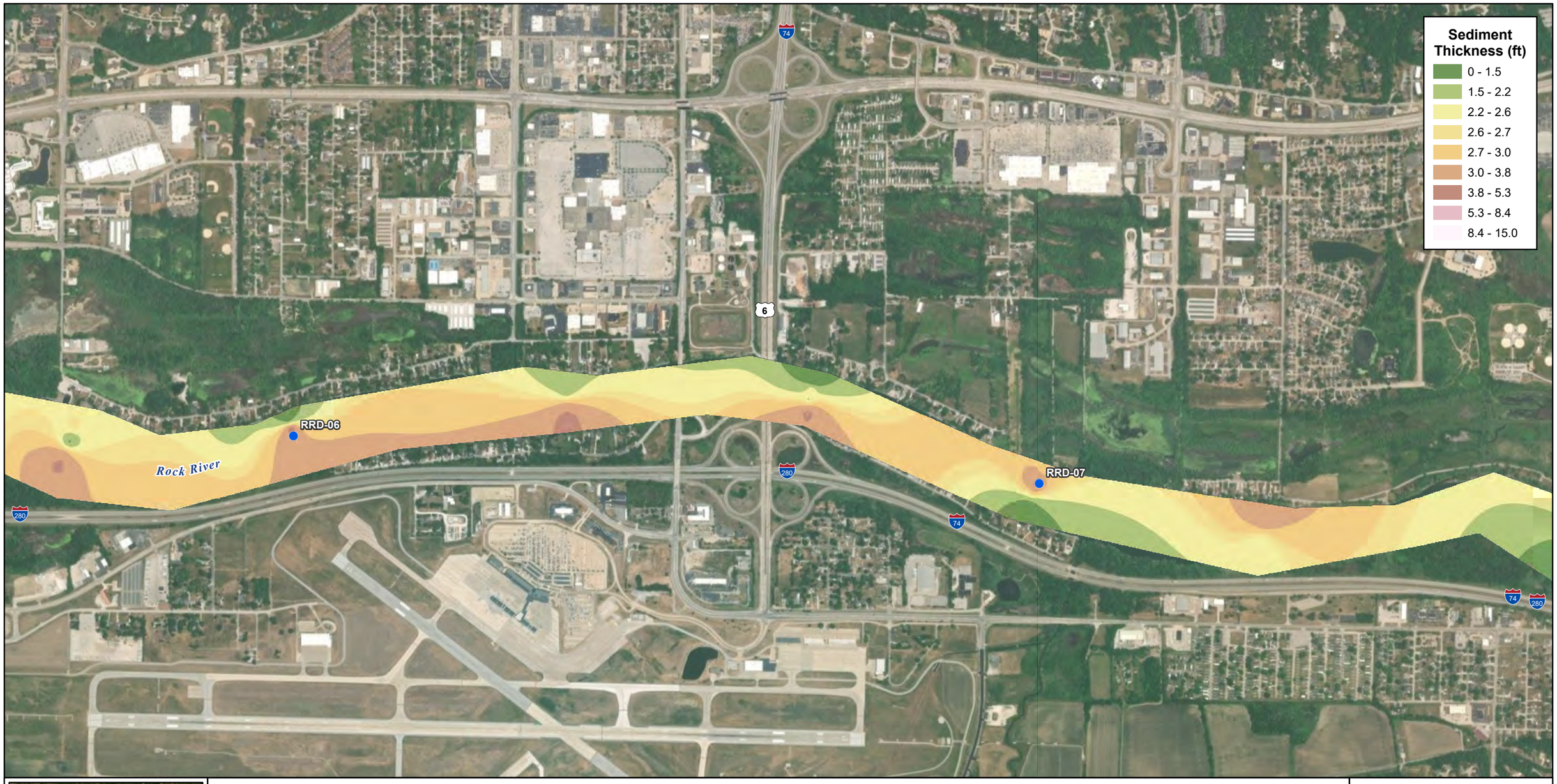





Figure 3. Field Location Plan – RRD-06 and RRD-07.
Rock Island County, Illinois.

● Proposed Sample Location

1:15,000

0 1,000 2,000 4,000 Feet

0 345 690 1,380 Meters

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Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

Date: 11/21/2024 Path: C:\Users\APIAZZA\OneDrive - ACRT\Desktop\24-0510_Rock_River_Survey\24-0510_Rock_River_Survey.aprx






Figure 4. Field Location Plan – RRD-08 and RRD-09.
Rock Island County, Illinois.

● Proposed Sample Location

1:15,000

0 1,000 2,000 4,000 Feet

0 345 690 1,380 Meters

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Date: 11/21/2024 Path: C:\Users\APIAZZA\OneDrive - ACRT\Desktop\24-0510_Rock_River_Survey\24-0510_Rock_River_Survey.aprx

Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

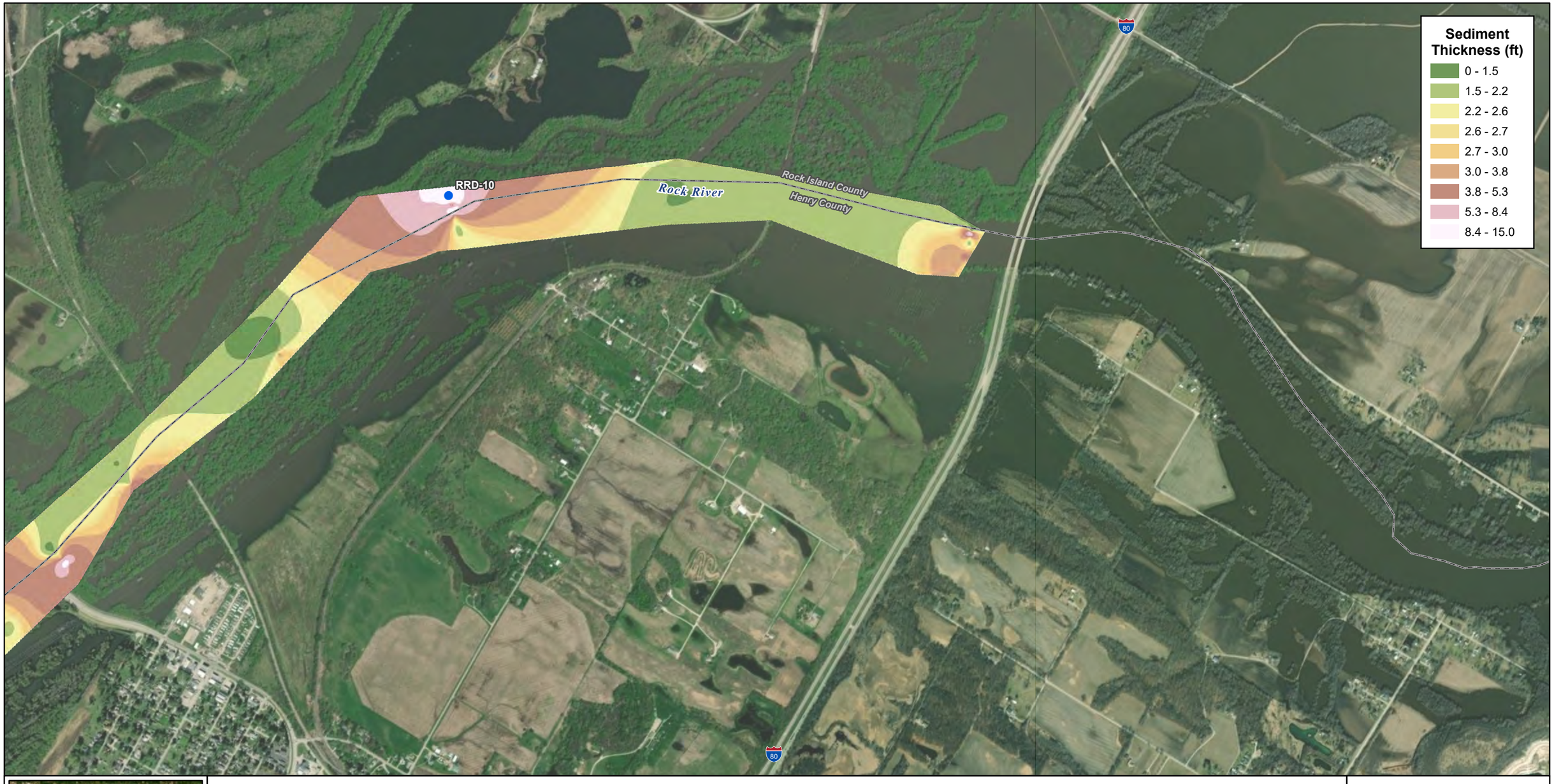





Figure 5. Field Location Plan – RRD-10.
Rock Island County, Illinois.

Proposed Sample Location

1:15,000

0 1,000 2,000 4,000 Feet

0 345 690 1,380 Meters

EnviroScience™
Excellence In Any Environment

Date: 11/21/2024 Path: C:\Users\APIAZZA\OneDrive - ACRT\Desktop\24-0510_Rock_River_Survey\24-0510_Rock_River_Survey.aprx

Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

# Appendix B

## Sediment Sample Location Map




Figure 1.
Installed Vibracore
Sediment Sampling Locations.
Rock Island County, Illinois.

Sample Location

USACE River Mile Marker

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Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

Date: 3/26/2025 Path: P:\10_Projects\P\Prairie_Engineers\24-0510_Rock_River_Survey\GIS\24-0510_Rock_River_Survey.aprx






Figure 2. Field Location Plan – RRD-01 through RRD-05.
Rock Island County, Illinois.

Sample Location

0 1,000 2,000 4,000 Feet

0 250 500 1,000 Meters

1:15,000

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Date: 3/26/2025 Path: P:\10_Projects\P\Prairie_Engineers\24-0510_Rock_River_Survey\GIS\24-0510_Rock_River_Survey.aprx

Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

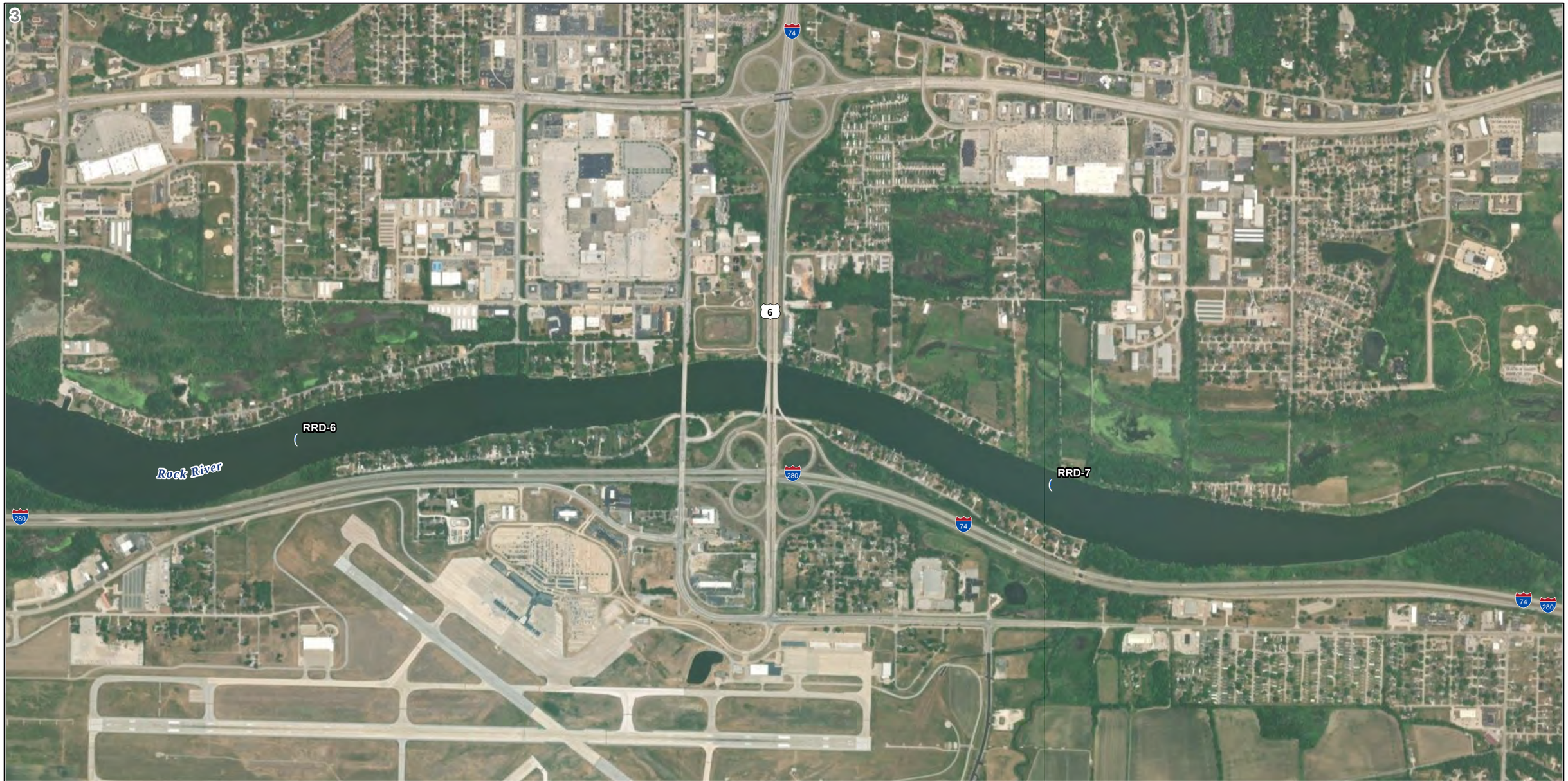





Figure 3. Field Location Plan – RRD-06 and RRD-07.
Rock Island County, Illinois.

Sample Location

0 1,000 2,000 4,000 Feet

0 250 500 1,000 Meters

N

1:15,000

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Date: 3/26/2025 Path: P:\10_Projects\P\Prairie_Engineers\24-0510_Rock_River_Survey\GIS\24-0510_Rock_River_Survey.aprx

Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet






Figure 4. Field Location Plan – RRD-08 and RRD-09.
Rock Island County, Illinois.

Sample Location

0 1,000 2,000 4,000 Feet

0 250 500 1,000 Meters

1:15,000

EnviroScience™
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Date: 3/26/2025 Path: P:\10_Projects\P\Prairie_Engineers\24-0510_Rock_River_Survey\GIS\24-0510_Rock_River_Survey.aprx

Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet






Figure 5. Field Location Plan – RRD-10.
Rock Island County, Illinois.

Sample Location

0 1,000 2,000 4,000 Feet

0 250 500 1,000 Meters

N

1:15,000

EnviroScience™
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Date: 3/26/2025 Path: P:\10_Projects\P\Prairie_Engineers\24-0510_Rock_River_Survey\GIS\24-0510_Rock_River_Survey.aprx

Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

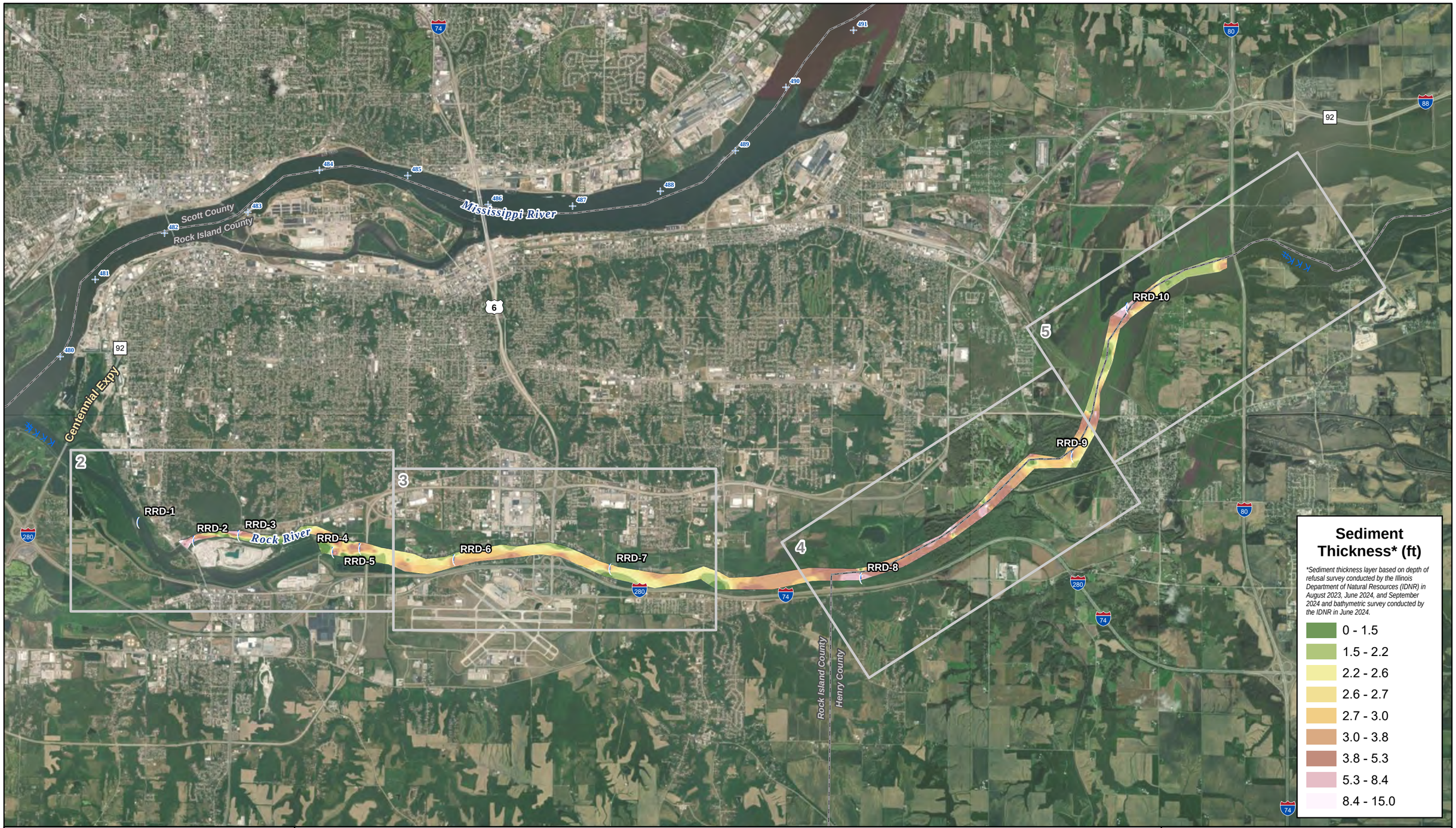



Figure 1.
Installed Vibracore
Sediment Sampling Locations.
Rock Island County, Illinois.

EnviroScience™
Excellence In Any Environment

Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

Date: 3/26/2025 Path: P:\10_Projects\P\Prairie_Engineers\24-0510_Rock_River_Survey\GIS\24-0510_Rock_River_Survey.aprx

2

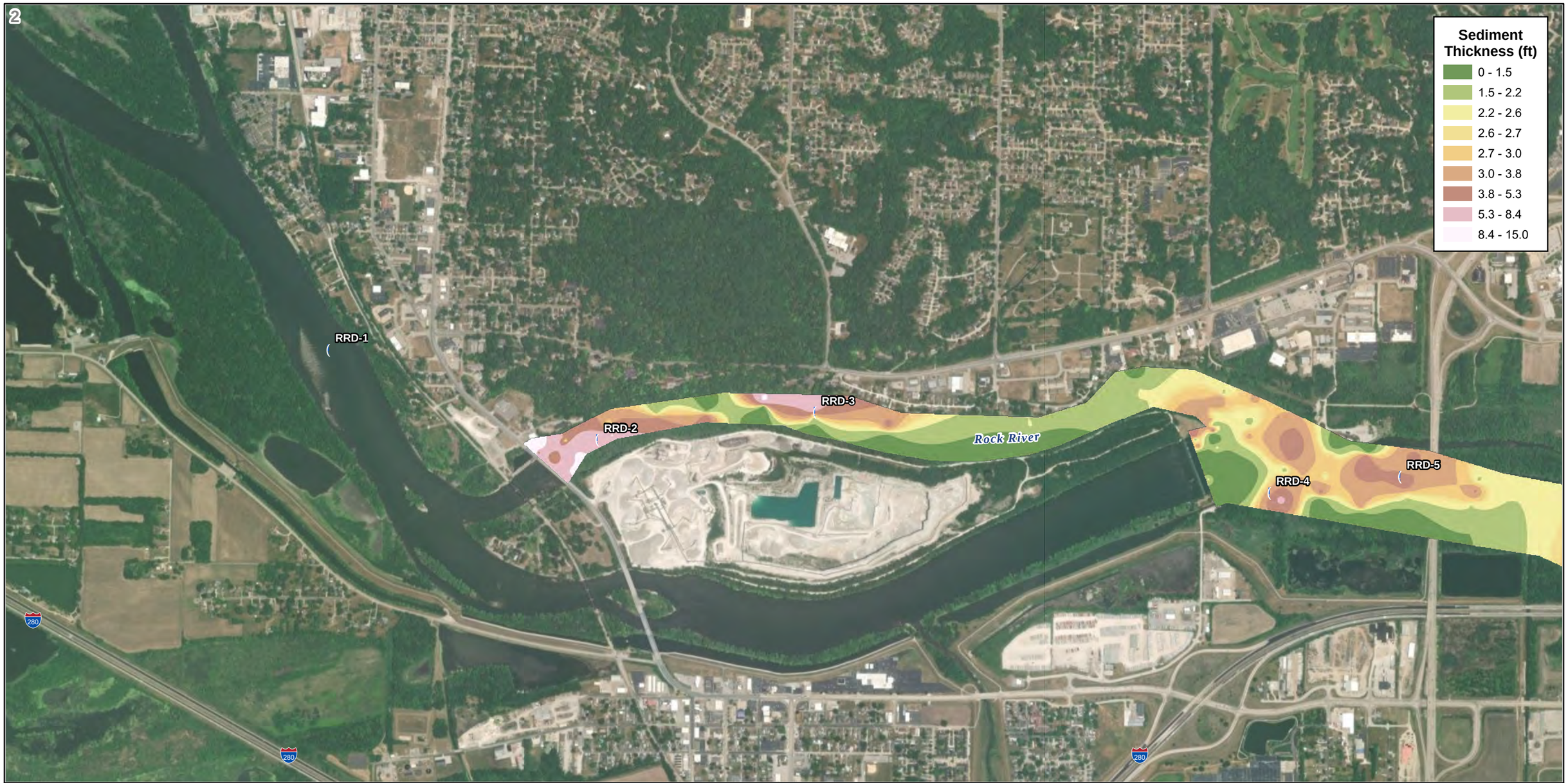





Figure 2. Field Location Plan – RRD-01 through RRD-05.
Rock Island County, Illinois.

O

Sample Location

1:15,000

0 1,000 2,000 4,000 Feet

0 250 500 1,000 Meters

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Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

Date: 3/26/2025 Path: P:\10_Projects\P\Prairie_Engineers\24-0510_Rock_River_Survey\GIS\24-0510_Rock_River_Survey.aprx

3

**Sediment Thickness (ft)**

- 0 - 1.5
- 1.5 - 2.2
- 2.2 - 2.6
- 2.6 - 2.7
- 2.7 - 3.0
- 3.0 - 3.8
- 3.8 - 5.3
- 5.3 - 8.4
- 8.4 - 15.0

RRD-6

RRD-7

Rock River



Figure 3. Field Location Plan – RRD-06 and RRD-07.
Rock Island County, Illinois.

Sample Location

1:15,000

0 1,000 2,000 4,000 Feet

0 250 500 1,000 Meters

EnviroScience™
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Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

Date: 3/26/2025 Path: P:\10_Projects\P\Prairie_Engineers\24-0510_Rock_River_Survey\GIS\24-0510_Rock_River_Survey.aprx






Figure 4. Field Location Plan – RRD-08 and RRD-09.
Rock Island County, Illinois.

Sample Location

0 1,000 2,000 4,000 Feet

0 250 500 1,000 Meters

1:15,000

EnviroScience™
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Date: 3/26/2025 Path: P:\10_Projects\P\Prairie_Engineers\24-0510_Rock_River_Survey\GIS\24-0510_Rock_River_Survey.aprx

Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

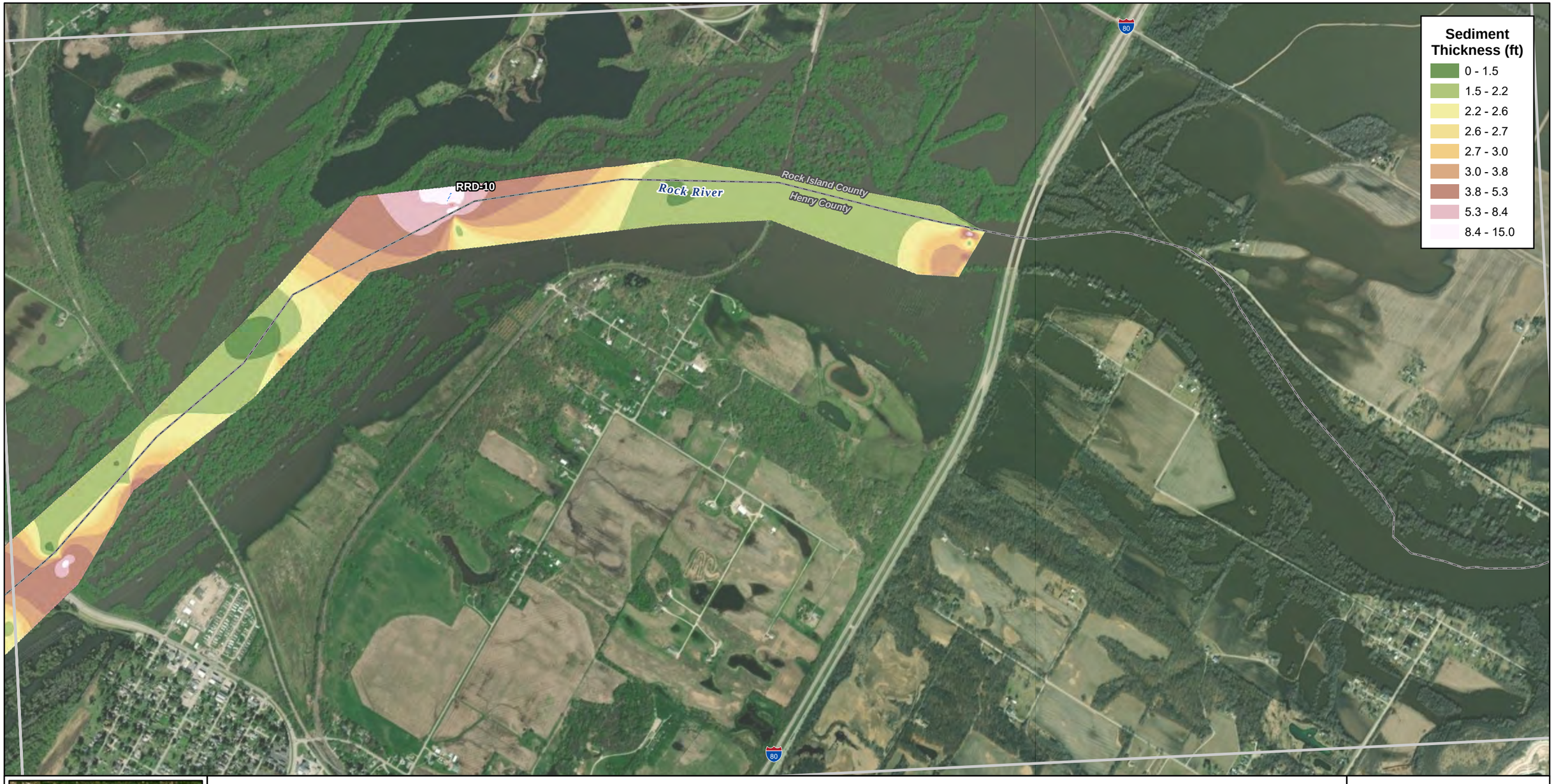





Figure 5. Field Location Plan – RRD-10.
Rock Island County, Illinois.

Sample Location

0 1,000 2,000 4,000 Feet

0 250 500 1,000 Meters

N

1:15,000

EnviroScience™
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Date: 3/26/2025 Path: P:\10_Projects\P\Prairie_Engineers\24-0510_Rock_River_Survey\GIS\24-0510_Rock_River_Survey.aprx

Basemap courtesy of Esri.

NAD 1983 HARN StatePlane Illinois West FIPS 1202 Feet

# Appendix C

Sediment Laboratory Analysis Results

eurofins | Environment Testing



# ANALYTICAL REPORT

## PREPARED FOR

Attn: Nathan Nagler
EnviroScience Inc
5070 Stow Rd.
Stow, Ohio 44224

Generated 4/9/2025 8:09:00 AM

## JOB DESCRIPTION

Prairie Rock River Survey

## JOB NUMBER

180-187841-1

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh PA 15238

See page two for job notes and contact information.



my EOL

## Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

PA Lab ID: 02-00416

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Pittsburgh Project Manager.

## Authorization



Generated
4/9/2025 8:09:00 AM

Authorized for release by
Shali Brown, Project Manager II
Shali.Brown@et.eurofinsus.com
(615)301-5031

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**Job Narrative**
**180-187841-1**

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

**Receipt**
The samples were received on 3/17/2025 8:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 14 coolers at receipt time were 1.9°C, 2.0°C, 2.1°C, 2.5°C, 2.5°C, 7.9°C, 8.7°C, 8.9°C, 9.0°C, 10.0°C, 10.4°C, 10.6°C, 10.7°C and 11.5°C.

**Receipt Exceptions**
One of the gallon containers for the following sample was received broken or leaking. It may not be needed, but some of it was able to be saved. There is still another gallon for analysis: RRD-3 (180-187841-13).

The following samples were received at the laboratory outside the required temperature criteria. All samples received out of temperature were the cubes of site water. The only exception is the sediment containers for Sample 13 were also out of temperature. All other Sediment containers were within required temperature. : RRD-10 (180-187841-1), RRD-9 (180-187841-3), RRD-8 (180-187841-5), RRD-7 (180-187841-7), RRD-6 (180-187841-9), RRD-5 (180-187841-11) and RRD-3 (180-187841-13). This does not meet regulatory requirements. The client was contacted regarding this issue, and the laboratory was instructed to proceed analysis.

**GC/MS Semi VOA**
Method 8270E_LL: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with 492636.

Method 8270E_LL: The continuing calibration verification (CCV) analyzed in 180-492790 was outside the method criteria for the following analyte(s): Di-n-octyl phthalate, Hexachlorocyclopentadiene and 4-Nitrophenol. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

**PCBs**
Method 8082A_LL: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 180-492477.

Method 8082A_LL: Surrogate DCB recovery for the following samples were outside control limits: RRD-10 (180-187841-2), RRD-9 (180-187841-4), RRD-8 (180-187841-6), RRD-7 (180-187841-8), RRD-6 (180-187841-10), RRD-5 (180-187841-12) and RRD-3 (180-187841-14). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method 8082A_LL: The TCMX surrogate recovery for the following samples was outside acceptance limits (low biased) on the primary column: RRD-10 (180-187841-2), RRD-9 (180-187841-4), RRD-8 (180-187841-6), RRD-7 (180-187841-8), RRD-6 (180-187841-10), RRD-5 (180-187841-12) and RRD-3 (180-187841-14). The recovery is within acceptance limits on the other column, indicating that the extraction process was in control.

Method 8082A_LL: The continuing calibration verification (CCV) associated with 180-492784 recovered outside the control limits for TCMX on one column. Results are confirmed on both columns and reported from the passing column. The associated samples are: (CCVIS 180-492784/48) and (CCVIS 180-492784/5). DCB passes on both columns so samples are reported as is from CCVIS

Method 8082A_LL: The following samples were diluted due to the nature of the sample matrix: RRD-10 (180-187841-2), RRD-9

(180-187841-4), RRD-8 (180-187841-6), RRD-7 (180-187841-8), RRD-6 (180-187841-10), RRD-5 (180-187841-12) and RRD-3 (180-187841-14). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

**Pesticides**
Method 8081B_LL: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 180-492477.

Method 8081B_LL: Surrogate DCB recovery for the following samples were outside control limits: RRD-10 (180-187841-2), RRD-9 (180-187841-4), RRD-8 (180-187841-6), RRD-7 (180-187841-8) and RRD-6 (180-187841-10). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method 8081B_LL: The TCMX surrogate recovery for the following samples was outside acceptance limits (low biased) on the primary column: RRD-10 (180-187841-2), RRD-8 (180-187841-6), RRD-6 (180-187841-10) and RRD-5 (180-187841-12). The recovery is within acceptance limits on the other column, indicating that the extraction process was in control.

Method 8081B_LL: Surrogate TCMX recovery for the following sample was outside control limits: RRD-3 (180-187841-14). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method 8081B_LL: The DCB surrogate recovery for the following samples was outside acceptance limits (low biased) on the confirmation column: RRD-5 (180-187841-12) and RRD-3 (180-187841-14). The recovery is within acceptance limits on the other column, indicating that the extraction process was in control.

Method 8081B_LL: The following samples were diluted due to the nature of the sample matrix: RRD-10 (180-187841-2), RRD-8 (180-187841-6), RRD-7 (180-187841-8), RRD-6 (180-187841-10), RRD-5 (180-187841-12) and RRD-3 (180-187841-14). Elevated reporting limits (RLs) are provided.

Method 8081B_LL: The following sample was diluted due to the nature of the sample matrix: RRD-9 (180-187841-4). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

**HPLC/IC**
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

**Metals**
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

**General Chemistry**
Method 350.1: The following samples were diluted to bring the concentration of target analytes within the calibration range: RRD-10 (180-187841-2), RRD-9 (180-187841-4), RRD-7 (180-187841-8), RRD-6 (180-187841-10), RRD-5 (180-187841-12) and RRD-3 (180-187841-14). Elevated reporting limits (RLs) are provided.

Method 7196A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 180-492457 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits.

Method 7196A: The following sample(s) was diluted due to the nature of the sample matrix. Samples were brown and cloudy.: RRD-10 (180-187841-2), RRD-9 (180-187841-4), RRD-8 (180-187841-6), RRD-7 (180-187841-8), RRD-6 (180-187841-10), RRD-5 (180-187841-12), RRD-3 (180-187841-14), (180-187841-I-2 MS) and (180-187841-I-2 MSD). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

**Organic Prep**
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

# Definitions/Glossary

Client: EnviroScience Inc
Job ID: 180-187841-1
Project/Site: Prairie Rock River Survey

## Qualifiers

### GC Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| *3 | ISTD response or retention time outside acceptable limits. |
| p | The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported. |
| S1- | Surrogate recovery exceeds control limits, low biased. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| F1 | MS and/or MSD recovery exceeds control limits. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ☼ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Accreditation/Certification Summary

Client: EnviroScience Inc
Job ID: 180-187841-1
Project/Site: Prairie Rock River Survey

## Laboratory: Eurofins Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| Illinois | NELAP | 200005 | 07-31-25 |

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

| Analysis Method | Prep Method | Matrix | Analyte |
|---|---|---|---|
| 2540E-2015 | | Water | Fixed Solids |
| 35 ILL C-395 | | Sediment | Elutriate Generated |
| 35 ILL C-395 | | Water | Elutriate Generated |
| PCB | | Water | Polychlorinated biphenyls, Total |

## Laboratory: Eurofins Cleveland

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| Illinois | NELAP | 200004 | 08-31-25 |

## Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| Illinois | NELAP | 200027 | 01-31-26 |

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

| Analysis Method | Prep Method | Matrix | Analyte |
|---|---|---|---|
| SM 2340B | | Water | Hardness as calcium carbonate |

# Sample Summary

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 180-187841-1 | RRD-10 | Water | 03/11/25 11:20 | 03/17/25 08:50 |
| 180-187841-2 | RRD-10 | Water | 03/24/25 10:30 | 03/17/25 08:50 |
| 180-187841-3 | RRD-9 | Sediment | 03/11/25 14:40 | 03/17/25 08:50 |
| 180-187841-4 | RRD-9 | Water | 03/24/25 10:33 | 03/17/25 08:50 |
| 180-187841-5 | RRD-8 | Sediment | 03/12/25 10:30 | 03/17/25 08:50 |
| 180-187841-6 | RRD-8 | Water | 03/24/25 10:36 | 03/17/25 08:50 |
| 180-187841-7 | RRD-7 | Sediment | 03/12/25 12:20 | 03/17/25 08:50 |
| 180-187841-8 | RRD-7 | Water | 03/24/25 10:39 | 03/17/25 08:50 |
| 180-187841-9 | RRD-6 | Sediment | 03/12/25 13:50 | 03/17/25 08:50 |
| 180-187841-10 | RRD-6 | Water | 03/24/25 10:42 | 03/17/25 08:50 |
| 180-187841-11 | RRD-5 | Sediment | 03/13/25 13:10 | 03/17/25 08:50 |
| 180-187841-12 | RRD-5 | Water | 03/24/25 10:45 | 03/17/25 08:50 |
| 180-187841-13 | RRD-3 | Sediment | 03/13/25 14:55 | 03/17/25 08:50 |
| 180-187841-14 | RRD-3 | Water | 03/24/25 10:48 | 03/17/25 08:50 |

# Method Summary

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| EPA 8270E LL | Semivolatile Organic Compounds (GC/MS) | SW846 | EET PIT |
| EPA 8081B LL | Organochlorine Pesticides (GC) | SW846 | EET PIT |
| EPA 8082A | Polychlorinated Biphenyls (PCBs) (GC) | SW846 | EET PIT |
| PCB | Total PCB Calculation | TAL SOP | EET PIT |
| EPA 9056A | Anions, Ion Chromatography | SW846 | EET PIT |
| 1631E | Mercury, Low Level (CVAFS) | EPA | EET CLE |
| 6020B | Metals (ICP/MS) | SW846 | ELLE |
| SM 2340B | Total Hardness (as CaCO3) by calculation | SM | ELLE |
| 2540B-2015 | Solids, Total | SM | EET PIT |
| 2540D-2015 | Total Suspended Solids (Dried at 103-105°C) | SM | EET PIT |
| 2540E-2015 | Solids, Volatile and Fixed (VS) | SM | EET PIT |
| EPA 1664B | HEM and SGT-HEM | EPA | EET PIT |
| EPA 350.1 | Nitrogen, Ammonia | EPA | EET PIT |
| EPA 7196A | Chromium, Hexavalent | SW846 | EET PIT |
| 35 ILL C-395 | Illinois Supernatant Test | ILL-EPA | EET PIT |
| 1631E | Preparation, Mercury, Low Level | EPA | EET CLE |
| 1664B | HEM and SGT-HEM (SPE) | 1664B | EET PIT |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | ELLE |
| 3510C | Liquid-Liquid Extraction (Separatory Funnel) | SW846 | EET PIT |
| 3520C | Liquid-Liquid Extraction (Continuous) | SW846 | EET PIT |

**Protocol References:**

1664B = EPA-821-98-002
EPA = US Environmental Protection Agency
ILL-EPA = Illinois Environmental Protection Agency
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

**Laboratory References:**

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396
EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058
ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

# Lab Chronicle

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-10
**Date Collected: 03/11/25 11:20**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-1
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 35 ILL C-395 | | 1 | 2.4 L | 12 L | 492409 | 03/24/25 07:30 | TCS | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: RRD-10
**Date Collected: 03/24/25 10:30**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-2
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3520C | | | 240 mL | 250 uL | 492636 | 03/26/25 13:53 | BJT | EET PIT |
| Total/NA | Analysis | EPA 8270E LL | | 1 | 1 mL | 1 mL | 492790 | 03/28/25 16:52 | VVP | EET PIT |
| | Instrument ID: CH722 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 980 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8081B LL | | 2 | | | 492803 | 03/28/25 23:56 | CMR | EET PIT |
| | Instrument ID: CHGC15 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 980 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8082A | | 2 | 1 mL | 1 mL | 492784 | 03/29/25 02:50 | CMR | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | PCB | | 1 | | | 492869 | 03/29/25 02:50 | SAB | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | EPA 9056A | | 1 | 1 mL | 1 mL | 492950 | 03/31/25 20:01 | ERP | EET PIT |
| | Instrument ID: INUVION | | | | | | | | | |
| Total/NA | Prep | 1631E | | | 40 mL | 40 mL | 649586 | 03/25/25 16:00 | GEV | EET CLE |
| Total/NA | Analysis | 1631E | | 4 | | | 649727 | 03/26/25 11:47 | GEV | EET CLE |
| | Instrument ID: H8 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 623674 | 03/30/25 20:30 | UAMX | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 625571 | 04/02/25 23:16 | LHF4 | ELLE |
| | Instrument ID: E07 - 27813 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 623674 | 03/30/25 20:30 | UAMX | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 626880 | 04/06/25 13:57 | SAM2 | ELLE |
| | Instrument ID: E08 - 30647 | | | | | | | | | |
| Total/NA | Analysis | SM 2340B | | 1 | | | 615287 | 03/26/25 05:49 | USJM | ELLE |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540B-2015 | | 1 | 25 mL | 100 mL | 492837 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540D-2015 | | 1 | 100 mL | 1000 mL | 492720 | 03/27/25 12:00 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540E-2015 | | 1 | 25 mL | 100 mL | 492969 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Prep | 1664B | | | 980 mL | 1000 mL | 492484 | 03/25/25 07:53 | A1K | EET PIT |
| Total/NA | Analysis | EPA 1664B | | 1 | | | 492520 | 03/25/25 10:52 | A1K | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | EPA 350.1 | | 2 | | | 492836 | 03/28/25 13:43 | BAB | EET PIT |
| | Instrument ID: BLUE-ASTORIA | | | | | | | | | |
| Total/NA | Analysis | EPA 7196A | | 5 | 4 mL | 4 mL | 492457 | 03/24/25 14:55 | RAO | EET PIT |
| | Instrument ID: RAPID-T | | | | | | | | | |

# Lab Chronicle

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-9

**Date Collected: 03/11/25 14:40**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-3

**Matrix: Sediment**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 35 ILL C-395 | | 1 | 2.4 L | 12 L | 492409 | 03/24/25 07:30 | TCS | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: RRD-9

**Date Collected: 03/24/25 10:33**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-4

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3520C | | | 230 mL | 250 uL | 492636 | 03/26/25 13:53 | BJT | EET PIT |
| Total/NA | Analysis | EPA 8270E LL | | 1 | 1 mL | 1 mL | 492790 | 03/28/25 17:15 | VVP | EET PIT |
| | Instrument ID: CH722 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 980 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8081B LL | | 5 | | | 493016 | 04/01/25 13:18 | CMR | EET PIT |
| | Instrument ID: CHGC15 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 980 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8082A | | 5 | 1 mL | 1 mL | 492784 | 03/29/25 03:08 | CMR | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | PCB | | 1 | | | 492869 | 03/29/25 03:08 | SAB | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | EPA 9056A | | 1 | 1 mL | 1 mL | 492950 | 03/31/25 20:12 | ERP | EET PIT |
| | Instrument ID: INUVION | | | | | | | | | |
| Total/NA | Prep | 1631E | | | 40 mL | 40 mL | 649586 | 03/25/25 16:00 | GEV | EET CLE |
| Total/NA | Analysis | 1631E | | 4 | | | 649727 | 03/26/25 11:51 | GEV | EET CLE |
| | Instrument ID: H8 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 623674 | 03/30/25 20:30 | UAMX | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 625571 | 04/02/25 23:18 | LHF4 | ELLE |
| | Instrument ID: E07 - 27813 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 623674 | 03/30/25 20:30 | UAMX | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 626880 | 04/06/25 13:59 | SAM2 | ELLE |
| | Instrument ID: E08 - 30647 | | | | | | | | | |
| Total/NA | Analysis | SM 2340B | | 1 | | | 615287 | 03/26/25 05:49 | USJM | ELLE |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540B-2015 | | 1 | 25 mL | 100 mL | 492837 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540D-2015 | | 1 | 100 mL | 1000 mL | 492720 | 03/27/25 12:00 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540E-2015 | | 1 | 25 mL | 100 mL | 492969 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Prep | 1664B | | | 1020 mL | 1000 mL | 492484 | 03/25/25 07:53 | A1K | EET PIT |
| Total/NA | Analysis | EPA 1664B | | 1 | | | 492520 | 03/25/25 10:52 | A1K | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | EPA 350.1 | | 10 | | | 492836 | 03/28/25 13:45 | BAB | EET PIT |
| | Instrument ID: BLUE-ASTORIA | | | | | | | | | |
| Total/NA | Analysis | EPA 7196A | | 5 | 4 mL | 4 mL | 492457 | 03/24/25 14:59 | RAO | EET PIT |
| | Instrument ID: RAPID-T | | | | | | | | | |

# Lab Chronicle

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-8
**Date Collected: 03/12/25 10:30**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-5
**Matrix: Sediment**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 35 ILL C-395 | | 1 | 2.4 L | 12 L | 492409 | 03/24/25 07:30 | TCS | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: RRD-8
**Date Collected: 03/24/25 10:36**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-6
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3520C | | | 240 mL | 250 uL | 492636 | 03/26/25 13:53 | BJT | EET PIT |
| Total/NA | Analysis | EPA 8270E LL | | 1 | 1 mL | 1 mL | 492790 | 03/28/25 17:37 | VVP | EET PIT |
| | Instrument ID: CH722 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 1000 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8081B LL | | 5 | | | 492803 | 03/29/25 00:31 | CMR | EET PIT |
| | Instrument ID: CHGC15 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 1000 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8082A | | 5 | 1 mL | 1 mL | 492784 | 03/29/25 03:26 | CMR | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | PCB | | 1 | | | 492869 | 03/29/25 03:26 | SAB | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | EPA 9056A | | 1 | 1 mL | 1 mL | 492950 | 03/31/25 20:24 | ERP | EET PIT |
| | Instrument ID: INUVION | | | | | | | | | |
| Total/NA | Prep | 1631E | | | 40 mL | 40 mL | 649586 | 03/25/25 16:00 | GEV | EET CLE |
| Total/NA | Analysis | 1631E | | 1 | | | 649727 | 03/26/25 11:56 | GEV | EET CLE |
| | Instrument ID: H8 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 623674 | 03/30/25 20:30 | UAMX | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 625571 | 04/02/25 23:22 | LHF4 | ELLE |
| | Instrument ID: E07 - 27813 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 623674 | 03/30/25 20:30 | UAMX | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 626880 | 04/06/25 14:03 | SAM2 | ELLE |
| | Instrument ID: E08 - 30647 | | | | | | | | | |
| Total/NA | Analysis | SM 2340B | | 1 | | | 615287 | 03/26/25 05:49 | USJM | ELLE |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540B-2015 | | 1 | 25 mL | 100 mL | 492837 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540D-2015 | | 1 | 200 mL | 1000 mL | 492720 | 03/27/25 12:00 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540E-2015 | | 1 | 25 mL | 100 mL | 492969 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Prep | 1664B | | | 1010 mL | 1000 mL | 492484 | 03/25/25 07:53 | A1K | EET PIT |
| Total/NA | Analysis | EPA 1664B | | 1 | | | 492520 | 03/25/25 10:52 | A1K | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | EPA 350.1 | | 1 | | | 492836 | 03/28/25 13:47 | BAB | EET PIT |
| | Instrument ID: BLUE-ASTORIA | | | | | | | | | |
| Total/NA | Analysis | EPA 7196A | | 5 | 4 mL | 4 mL | 492457 | 03/24/25 15:00 | RAO | EET PIT |
| | Instrument ID: RAPID-T | | | | | | | | | |

# Lab Chronicle

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-7
**Date Collected: 03/12/25 12:20**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-7
**Matrix: Sediment**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 35 ILL C-395 | | 1 | 2.4 L | 12 L | 492409 | 03/24/25 07:30 | TCS | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: RRD-7
**Date Collected: 03/24/25 10:39**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-8
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3520C | | | 240 mL | 250 uL | 492636 | 03/26/25 13:53 | BJT | EET PIT |
| Total/NA | Analysis | EPA 8270E LL | | 1 | 1 mL | 1 mL | 492790 | 03/28/25 18:00 | VVP | EET PIT |
| | Instrument ID: CH722 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 1000 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8081B LL | | 5 | | | 492803 | 03/29/25 00:48 | CMR | EET PIT |
| | Instrument ID: CHGC15 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 1000 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8082A | | 5 | 1 mL | 1 mL | 492784 | 03/29/25 03:43 | CMR | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | PCB | | 1 | | | 492869 | 03/29/25 03:43 | SAB | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | EPA 9056A | | 1 | 1 mL | 1 mL | 492950 | 03/31/25 20:36 | ERP | EET PIT |
| | Instrument ID: INUVION | | | | | | | | | |
| Total/NA | Prep | 1631E | | | 40 mL | 40 mL | 649586 | 03/25/25 16:00 | GEV | EET CLE |
| Total/NA | Analysis | 1631E | | 2 | | | 649727 | 03/26/25 12:01 | GEV | EET CLE |
| | Instrument ID: H8 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 623674 | 03/30/25 20:30 | UAMX | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 625571 | 04/02/25 23:20 | LHF4 | ELLE |
| | Instrument ID: E07 - 27813 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 623674 | 03/30/25 20:30 | UAMX | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 626880 | 04/06/25 14:01 | SAM2 | ELLE |
| | Instrument ID: E08 - 30647 | | | | | | | | | |
| Total/NA | Analysis | SM 2340B | | 1 | | | 615287 | 03/26/25 05:49 | USJM | ELLE |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540B-2015 | | 1 | 25 mL | 100 mL | 492837 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540D-2015 | | 1 | 100 mL | 1000 mL | 492720 | 03/27/25 12:00 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540E-2015 | | 1 | 25 mL | 100 mL | 492969 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Prep | 1664B | | | 1010 mL | 1000 mL | 492484 | 03/25/25 07:53 | A1K | EET PIT |
| Total/NA | Analysis | EPA 1664B | | 1 | | | 492520 | 03/25/25 10:52 | A1K | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | EPA 350.1 | | 50 | | | 492836 | 03/28/25 13:26 | BAB | EET PIT |
| | Instrument ID: BLUE-ASTORIA | | | | | | | | | |
| Total/NA | Analysis | EPA 7196A | | 5 | 4 mL | 4 mL | 492457 | 03/24/25 15:01 | RAO | EET PIT |
| | Instrument ID: RAPID-T | | | | | | | | | |

# Lab Chronicle

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-6

**Date Collected: 03/12/25 13:50**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-9

**Matrix: Sediment**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 35 ILL C-395 | | 1 | 2.4 L | 12 L | 492409 | 03/24/25 07:30 | TCS | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: RRD-6

**Date Collected: 03/24/25 10:42**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-10

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3520C | | | 240 mL | 250 uL | 492636 | 03/26/25 13:53 | BJT | EET PIT |
| Total/NA | Analysis | EPA 8270E LL | | 1 | 1 mL | 1 mL | 492790 | 03/28/25 18:23 | VVP | EET PIT |
| | Instrument ID: CH722 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 1000 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8081B LL | | 5 | | | 492803 | 03/29/25 01:06 | CMR | EET PIT |
| | Instrument ID: CHGC15 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 1000 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8082A | | 5 | 1 mL | 1 mL | 492784 | 03/29/25 04:01 | CMR | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | PCB | | 1 | | | 492869 | 03/29/25 04:01 | SAB | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | EPA 9056A | | 1 | 1 mL | 1 mL | 492950 | 03/31/25 21:10 | ERP | EET PIT |
| | Instrument ID: INUVION | | | | | | | | | |
| Total/NA | Prep | 1631E | | | 40 mL | 40 mL | 649586 | 03/25/25 16:00 | GEV | EET CLE |
| Total/NA | Analysis | 1631E | | 4 | | | 649727 | 03/26/25 12:06 | GEV | EET CLE |
| | Instrument ID: H8 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 622623 | 03/30/25 03:18 | UJL8 | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 625571 | 04/02/25 21:06 | LHF4 | ELLE |
| | Instrument ID: E07 - 27813 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 622623 | 03/30/25 03:18 | UJL8 | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 625935 | 04/03/25 10:17 | SAM2 | ELLE |
| | Instrument ID: E08 - 30647 | | | | | | | | | |
| Total/NA | Analysis | SM 2340B | | 1 | | | 615287 | 03/26/25 05:49 | USJM | ELLE |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540B-2015 | | 1 | 25 mL | 100 mL | 492837 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540D-2015 | | 1 | 100 mL | 1000 mL | 492720 | 03/27/25 12:00 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540E-2015 | | 1 | 25 mL | 100 mL | 492969 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Prep | 1664B | | | 1010 mL | 1000 mL | 492484 | 03/25/25 07:53 | A1K | EET PIT |
| Total/NA | Analysis | EPA 1664B | | 1 | | | 492520 | 03/25/25 10:52 | A1K | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | EPA 350.1 | | 50 | | | 492836 | 03/28/25 13:55 | BAB | EET PIT |
| | Instrument ID: BLUE-ASTORIA | | | | | | | | | |
| Total/NA | Analysis | EPA 7196A | | 5 | 4 mL | 4 mL | 492457 | 03/24/25 15:02 | RAO | EET PIT |
| | Instrument ID: RAPID-T | | | | | | | | | |

# Lab Chronicle

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-5

**Date Collected: 03/13/25 13:10**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-11

**Matrix: Sediment**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 35 ILL C-395 | | 1 | 2.4 L | 12 L | 492409 | 03/24/25 07:30 | TCS | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: RRD-5

**Date Collected: 03/24/25 10:45**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-12

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3520C | | | 230 mL | 250 uL | 492636 | 03/26/25 13:53 | BJT | EET PIT |
| Total/NA | Analysis | EPA 8270E LL | | 1 | 1 mL | 1 mL | 492790 | 03/28/25 18:46 | VVP | EET PIT |
| | Instrument ID: CH722 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 1000 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8081B LL | | 5 | | | 492803 | 03/29/25 01:23 | CMR | EET PIT |
| | Instrument ID: CHGC15 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 1000 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8082A | | 5 | 1 mL | 1 mL | 492784 | 03/29/25 04:18 | CMR | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | PCB | | 1 | | | 492869 | 03/29/25 04:18 | SAB | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | EPA 9056A | | 1 | 1 mL | 1 mL | 492950 | 03/31/25 21:22 | ERP | EET PIT |
| | Instrument ID: INUVION | | | | | | | | | |
| Total/NA | Prep | 1631E | | | 40 mL | 40 mL | 649586 | 03/25/25 16:00 | GEV | EET CLE |
| Total/NA | Analysis | 1631E | | 2 | | | 649727 | 03/26/25 12:11 | GEV | EET CLE |
| | Instrument ID: H8 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 622623 | 03/30/25 03:18 | UJL8 | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 625571 | 04/02/25 21:11 | LHF4 | ELLE |
| | Instrument ID: E07 - 27813 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 622623 | 03/30/25 03:18 | UJL8 | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 625935 | 04/03/25 10:19 | SAM2 | ELLE |
| | Instrument ID: E08 - 30647 | | | | | | | | | |
| Total/NA | Analysis | SM 2340B | | 1 | | | 615287 | 03/26/25 05:49 | USJM | ELLE |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540B-2015 | | 1 | 25 mL | 100 mL | 492837 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540D-2015 | | 1 | 100 mL | 1000 mL | 492720 | 03/27/25 12:00 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540E-2015 | | 1 | 25 mL | 100 mL | 492969 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Prep | 1664B | | | 1010 mL | 1000 mL | 492484 | 03/25/25 07:53 | A1K | EET PIT |
| Total/NA | Analysis | EPA 1664B | | 1 | | | 492520 | 03/25/25 10:52 | A1K | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | EPA 350.1 | | 10 | | | 492836 | 03/28/25 13:57 | BAB | EET PIT |
| | Instrument ID: BLUE-ASTORIA | | | | | | | | | |
| Total/NA | Analysis | EPA 7196A | | 5 | 4 mL | 4 mL | 492457 | 03/24/25 15:03 | RAO | EET PIT |
| | Instrument ID: RAPID-T | | | | | | | | | |

# Lab Chronicle

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-3

**Date Collected: 03/13/25 14:55**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-13

**Matrix: Sediment**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 35 ILL C-395 | | 1 | 2.4 L | 12 L | 492409 | 03/24/25 07:30 | TCS | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: RRD-3

**Date Collected: 03/24/25 10:48**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-14

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3520C | | | 230 mL | 250 uL | 492636 | 03/26/25 13:53 | BJT | EET PIT |
| Total/NA | Analysis | EPA 8270E LL | | 1 | 1 mL | 1 mL | 492790 | 03/28/25 19:09 | VVP | EET PIT |
| | Instrument ID: CH722 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 1000 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8081B LL | | 5 | | | 492803 | 03/29/25 01:41 | CMR | EET PIT |
| | Instrument ID: CHGC15 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 1000 mL | 1.0 mL | 492477 | 03/25/25 07:19 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8082A | | 5 | 1 mL | 1 mL | 492784 | 03/29/25 04:36 | CMR | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | PCB | | 1 | | | 492869 | 03/29/25 04:36 | SAB | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | EPA 9056A | | 1 | 1 mL | 1 mL | 492950 | 03/31/25 21:33 | ERP | EET PIT |
| | Instrument ID: INUVION | | | | | | | | | |
| Total/NA | Prep | 1631E | | | 40 mL | 40 mL | 649586 | 03/25/25 16:00 | GEV | EET CLE |
| Total/NA | Analysis | 1631E | | 1 | | | 649727 | 03/26/25 12:16 | GEV | EET CLE |
| | Instrument ID: H8 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 622623 | 03/30/25 03:18 | UJL8 | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 625571 | 04/02/25 21:13 | LHF4 | ELLE |
| | Instrument ID: E07 - 27813 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 622623 | 03/30/25 03:18 | UJL8 | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 625935 | 04/03/25 10:21 | SAM2 | ELLE |
| | Instrument ID: E08 - 30647 | | | | | | | | | |
| Total/NA | Analysis | SM 2340B | | 1 | | | 615287 | 03/26/25 05:49 | USJM | ELLE |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540B-2015 | | 1 | 25 mL | 100 mL | 492837 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540D-2015 | | 1 | 100 mL | 1000 mL | 492720 | 03/27/25 12:00 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540E-2015 | | 1 | 25 mL | 100 mL | 492969 | 03/28/25 15:07 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Prep | 1664B | | | 1010 mL | 1000 mL | 492484 | 03/25/25 07:53 | A1K | EET PIT |
| Total/NA | Analysis | EPA 1664B | | 1 | | | 492520 | 03/25/25 10:52 | A1K | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | EPA 350.1 | | 50 | | | 492836 | 03/28/25 14:04 | BAB | EET PIT |
| | Instrument ID: BLUE-ASTORIA | | | | | | | | | |
| Total/NA | Analysis | EPA 7196A | | 5 | 4 mL | 4 mL | 492457 | 03/24/25 15:06 | RAO | EET PIT |
| | Instrument ID: RAPID-T | | | | | | | | | |

# Lab Chronicle

Client: EnviroScience Inc
Job ID: 180-187841-1
Project/Site: Prairie Rock River Survey

**Laboratory References:**

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

**Analyst References:**

Lab: EET CLE

Batch Type: Prep

GEV = Grace Vannest

Batch Type: Analysis

GEV = Grace Vannest

Lab: EET PIT

Batch Type: Prep

A1K = Agnes Komlos

BJT = Bill Trout

KAV = Katelyn Voss

Batch Type: Analysis

A1K = Agnes Komlos

BAB = Brooke Batyi

CMR = Carl Reagle

ERP = Evan Papak

RAO = Rachel Oster

SAB = Sharon Bacha

SNR = Sabra Richart

TCS = Thomas Say

VVP = Vincent Piccolino

Lab: ELLE

Batch Type: Prep

UAMX = Annamaria Kuhns

UJL8 = James Mertz

Batch Type: Analysis

LHF4 = Diamond Boyer

SAM2 = Matthew Olley

USJM = Sandra Miller

# Client Sample Results

Client: EnviroScience Inc
Job ID: 180-187841-1
Project/Site: Prairie Rock River Survey

**Client Sample ID: RRD-10**
**Lab Sample ID: 180-187841-1**
**Date Collected: 03/11/25 11:20**
**Matrix: Water**
**Date Received: 03/17/25 08:50**

**Method: ILL-EPA 35 ILL C-395 - Illinois Supernatant Test - Dissolved**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Elutriate Generated | 20% | | | | ug/L | | | 03/24/25 07:30 | 1 |

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-10
**Date Collected: 03/24/25 10:30**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-2
**Matrix: Water**

### Method: SW846 EPA 8270E LL - Semivolatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 0.0010 | 0.00034 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.0010 | 0.00026 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.0010 | 0.00023 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| 2,4-Dichlorophenol | ND | | 0.00020 | 0.000053 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| 2,4-Dimethylphenol | ND | | 0.0010 | 0.00061 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| 2,4-Dinitrophenol | ND | | 0.010 | 0.0034 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| 2,6-Dichlorophenol | ND | | 0.0010 | 0.00019 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| 2-Chlorophenol | ND | | 0.0010 | 0.00023 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| 2-Methylphenol | ND | | 0.0010 | 0.00058 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| 2-Nitrophenol | ND | | 0.0010 | 0.00020 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 0.0052 | 0.0015 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| 4-Chloro-3-methylphenol | ND | | 0.0010 | 0.00045 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| Methylphenol, 3 & 4 | ND | | 0.0010 | 0.00039 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| 4-Nitrophenol | ND | | 0.0052 | 0.00098 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |
| Pentachlorophenol | ND | | 0.0052 | 0.00088 | mg/L | | 03/26/25 13:53 | 03/28/25 16:52 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *53* | | *23 - 128* | *03/26/25 13:53* | *03/28/25 16:52* | *1* |
| *2-Fluorophenol (Surr)* | *46* | | *20 - 105* | *03/26/25 13:53* | *03/28/25 16:52* | *1* |
| *Phenol-d5 (Surr)* | *48* | | *20 - 106* | *03/26/25 13:53* | *03/28/25 16:52* | *1* |

### Method: SW846 EPA 8081B LL - Organochlorine Pesticides (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | | 0.0027 | 0.00073 | ug/L | | 03/25/25 07:19 | 03/28/25 23:56 | 2 |
| Dieldrin | ND | | 0.0027 | 0.00056 | ug/L | | 03/25/25 07:19 | 03/28/25 23:56 | 2 |
| Endrin | ND | | 0.0027 | 0.00047 | ug/L | | 03/25/25 07:19 | 03/28/25 23:56 | 2 |
| Heptachlor | ND | | 0.0027 | 0.00092 | ug/L | | 03/25/25 07:19 | 03/28/25 23:56 | 2 |
| Mirex | ND | | 0.0027 | 0.00095 | ug/L | | 03/25/25 07:19 | 03/28/25 23:56 | 2 |
| Toxaphene | ND | | 0.20 | 0.10 | ug/L | | 03/25/25 07:19 | 03/28/25 23:56 | 2 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *49* | *S1-* | *55 - 128* | *03/25/25 07:19* | *03/28/25 23:56* | *2* |
| *DCB Decachlorobiphenyl (Surr)* | *38* | *S1-* | *55 - 128* | *03/25/25 07:19* | *03/28/25 23:56* | *2* |
| *Tetrachloro-m-xylene (Surr)* | *43* | *p S1-* | *56 - 125* | *03/25/25 07:19* | *03/28/25 23:56* | *2* |
| *Tetrachloro-m-xylene (Surr)* | *73* | | *56 - 125* | *03/25/25 07:19* | *03/28/25 23:56* | *2* |

### Method: SW846 EPA 8082A - Polychlorinated Biphenyls (PCBs) (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 0.020 | 0.0097 | ug/L | | 03/25/25 07:19 | 03/29/25 02:50 | 2 |
| PCB-1221 | ND | | 0.020 | 0.012 | ug/L | | 03/25/25 07:19 | 03/29/25 02:50 | 2 |
| PCB-1232 | ND | | 0.020 | 0.011 | ug/L | | 03/25/25 07:19 | 03/29/25 02:50 | 2 |
| PCB-1242 | ND | | 0.020 | 0.0073 | ug/L | | 03/25/25 07:19 | 03/29/25 02:50 | 2 |
| PCB-1248 | ND | | 0.020 | 0.016 | ug/L | | 03/25/25 07:19 | 03/29/25 02:50 | 2 |
| PCB-1254 | ND | | 0.020 | 0.0093 | ug/L | | 03/25/25 07:19 | 03/29/25 02:50 | 2 |
| PCB-1260 | ND | | 0.020 | 0.0080 | ug/L | | 03/25/25 07:19 | 03/29/25 02:50 | 2 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *38* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 02:50* | *2* |
| *DCB Decachlorobiphenyl (Surr)* | *35* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 02:50* | *2* |
| *Tetrachloro-m-xylene (Surr)* | *35* | *S1- p* | *58 - 125* | *03/25/25 07:19* | *03/29/25 02:50* | *2* |
| *Tetrachloro-m-xylene (Surr)* | *87* | | *58 - 125* | *03/25/25 07:19* | *03/29/25 02:50* | *2* |

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-10

**Date Collected: 03/24/25 10:30**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-2

**Matrix: Water**

### Method: TAL SOP PCB - Total PCB Calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Polychlorinated biphenyls, Total | ND | | 0.020 | 0.016 | ug/L | | | 03/29/25 02:50 | 1 |

### Method: SW846 EPA 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Fluoride** | **0.15** | | 0.10 | 0.026 | mg/L | | | 03/31/25 20:01 | 1 |

### Method: EPA 1631E - Mercury, Low Level (CVAFS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **33** | | 2.0 | 0.56 | ng/L | | 03/25/25 16:00 | 03/26/25 11:47 | 4 |

### Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **0.0029** | | 0.0020 | 0.00068 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| **Barium** | **0.19** | | 0.0020 | 0.00075 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| **Cadmium** | **0.00022** | **J** | 0.00050 | 0.00015 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| **Calcium** | **77** | | 0.12 | 0.050 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| **Chromium** | **0.0058** | | 0.0020 | 0.00055 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| **Copper** | **0.0059** | | 0.0010 | 0.00036 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| **Iron** | **6.5** | | 0.050 | 0.020 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| **Lead** | **0.0058** | | 0.00050 | 0.00012 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| **Magnesium** | **30** | | 0.050 | 0.016 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| **Manganese** | **2.2** | | 0.0020 | 0.00095 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| **Nickel** | **0.0061** | | 0.0010 | 0.00040 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| **Selenium** | **0.00097** | **J** | 0.0010 | 0.00028 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| Silver | ND | | 0.00050 | 0.00010 | mg/L | | 03/30/25 20:30 | 04/02/25 23:16 | 1 |
| **Zinc** | **0.026** | | 0.010 | 0.0040 | mg/L | | 03/30/25 20:30 | 04/06/25 13:57 | 1 |

### Method: SM 2340B - Total Hardness (as CaCO3) by calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Hardness as calcium carbonate** | **320** | | 0.51 | 0.19 | mg/L | | | 03/26/25 05:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Total Solids (SM 2540B-2015)** | **1000** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Total Suspended Solids (SM 2540D-2015)** | **390** | | 5.0 | 5.0 | mg/L | | | 03/27/25 12:00 | 1 |
| **Total Volatile Solids (SM 2540E-2015)** | **650** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Fixed Solids (SM 2540E-2015)** | **390** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Oil & Grease (HEM) (EPA 1664B)** | **4.5** | **J** | 5.1 | 4.4 | mg/L | | 03/25/25 07:53 | 03/25/25 10:52 | 1 |
| **Ammonia (EPA 350.1)** | **1.2** | | 0.20 | 0.18 | mg/L | | | 03/28/25 13:43 | 2 |
| Cr (VI) (SW846 EPA 7196A) | ND | F1 | 0.050 | 0.030 | mg/L | | | 03/24/25 14:55 | 5 |

# Client Sample Results

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

**Client Sample ID: RRD-9**
**Date Collected: 03/11/25 14:40**
**Date Received: 03/17/25 08:50**

**Lab Sample ID: 180-187841-3**
**Matrix: Sediment**

**Method: ILL-EPA 35 ILL C-395 - Illinois Supernatant Test - Dissolved**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Elutriate Generated | 20% | | | | ug/L | | | 03/24/25 07:30 | 1 |

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-9
**Date Collected: 03/24/25 10:33**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-4
**Matrix: Water**

### Method: SW846 EPA 8270E LL - Semivolatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 0.0011 | 0.00035 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.0011 | 0.00027 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.0011 | 0.00024 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| 2,4-Dichlorophenol | ND | | 0.00021 | 0.000055 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| 2,4-Dimethylphenol | ND | | 0.0011 | 0.00064 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| 2,4-Dinitrophenol | ND | | 0.011 | 0.0035 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| 2,6-Dichlorophenol | ND | | 0.0011 | 0.00020 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| 2-Chlorophenol | ND | | 0.0011 | 0.00024 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| 2-Methylphenol | ND | | 0.0011 | 0.00061 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| 2-Nitrophenol | ND | | 0.0011 | 0.00021 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 0.0054 | 0.0016 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| 4-Chloro-3-methylphenol | ND | | 0.0011 | 0.00047 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| **Methylphenol, 3 & 4** | **0.0033** | | 0.0011 | 0.00040 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| 4-Nitrophenol | ND | | 0.0054 | 0.0010 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |
| Pentachlorophenol | ND | | 0.0054 | 0.00092 | mg/L | | 03/26/25 13:53 | 03/28/25 17:15 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *42* | | *23 - 128* | *03/26/25 13:53* | *03/28/25 17:15* | *1* |
| *2-Fluorophenol (Surr)* | *34* | | *20 - 105* | *03/26/25 13:53* | *03/28/25 17:15* | *1* |
| *Phenol-d5 (Surr)* | *37* | | *20 - 106* | *03/26/25 13:53* | *03/28/25 17:15* | *1* |

### Method: SW846 EPA 8081B LL - Organochlorine Pesticides (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | | 0.0066 | 0.0018 | ug/L | | 03/25/25 07:19 | 04/01/25 13:18 | 5 |
| Dieldrin | ND | | 0.0066 | 0.0014 | ug/L | | 03/25/25 07:19 | 04/01/25 13:18 | 5 |
| Endrin | ND | | 0.0066 | 0.0012 | ug/L | | 03/25/25 07:19 | 04/01/25 13:18 | 5 |
| Heptachlor | ND | | 0.0066 | 0.0023 | ug/L | | 03/25/25 07:19 | 04/01/25 13:18 | 5 |
| Mirex | ND | | 0.0066 | 0.0024 | ug/L | | 03/25/25 07:19 | 04/01/25 13:18 | 5 |
| Toxaphene | ND | | 0.51 | 0.25 | ug/L | | 03/25/25 07:19 | 04/01/25 13:18 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *64* | | *55 - 128* | *03/25/25 07:19* | *04/01/25 13:18* | *5* |
| *DCB Decachlorobiphenyl (Surr)* | *30* | *p *3 S1-* | *55 - 128* | *03/25/25 07:19* | *04/01/25 13:18* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *54* | *p S1-* | *56 - 125* | *03/25/25 07:19* | *04/01/25 13:18* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *81* | | *56 - 125* | *03/25/25 07:19* | *04/01/25 13:18* | *5* |

### Method: SW846 EPA 8082A - Polychlorinated Biphenyls (PCBs) (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 0.051 | 0.024 | ug/L | | 03/25/25 07:19 | 03/29/25 03:08 | 5 |
| PCB-1221 | ND | | 0.051 | 0.029 | ug/L | | 03/25/25 07:19 | 03/29/25 03:08 | 5 |
| PCB-1232 | ND | | 0.051 | 0.027 | ug/L | | 03/25/25 07:19 | 03/29/25 03:08 | 5 |
| PCB-1242 | ND | | 0.051 | 0.018 | ug/L | | 03/25/25 07:19 | 03/29/25 03:08 | 5 |
| PCB-1248 | ND | | 0.051 | 0.041 | ug/L | | 03/25/25 07:19 | 03/29/25 03:08 | 5 |
| PCB-1254 | ND | | 0.051 | 0.023 | ug/L | | 03/25/25 07:19 | 03/29/25 03:08 | 5 |
| PCB-1260 | ND | | 0.051 | 0.020 | ug/L | | 03/25/25 07:19 | 03/29/25 03:08 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *40* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 03:08* | *5* |
| *DCB Decachlorobiphenyl (Surr)* | *36* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 03:08* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *24* | *S1- p* | *58 - 125* | *03/25/25 07:19* | *03/29/25 03:08* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *51* | *S1-* | *58 - 125* | *03/25/25 07:19* | *03/29/25 03:08* | *5* |

## Client Sample ID: RRD-9

**Date Collected: 03/24/25 10:33**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-4

**Matrix: Water**

### Method: TAL SOP PCB - Total PCB Calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Polychlorinated biphenyls, Total | ND | | 0.051 | 0.041 | ug/L | | | 03/29/25 03:08 | 1 |

### Method: SW846 EPA 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Fluoride** | **0.11** | | 0.10 | 0.026 | mg/L | | | 03/31/25 20:12 | 1 |

### Method: EPA 1631E - Mercury, Low Level (CVAFS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **42** | | 2.0 | 0.56 | ng/L | | 03/25/25 16:00 | 03/26/25 11:51 | 4 |

### Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **0.0036** | | 0.0020 | 0.00068 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| **Barium** | **0.24** | | 0.0020 | 0.00075 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| **Cadmium** | **0.00024** | **J** | 0.00050 | 0.00015 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| **Calcium** | **58** | | 0.12 | 0.050 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| **Chromium** | **0.0053** | | 0.0020 | 0.00055 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| **Copper** | **0.0057** | | 0.0010 | 0.00036 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| **Iron** | **6.2** | | 0.050 | 0.020 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| **Lead** | **0.0065** | | 0.00050 | 0.00012 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| **Magnesium** | **30** | | 0.050 | 0.016 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| **Manganese** | **2.2** | | 0.0020 | 0.00095 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| **Nickel** | **0.0044** | | 0.0010 | 0.00040 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| **Selenium** | **0.00061** | **J** | 0.0010 | 0.00028 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| Silver | ND | | 0.00050 | 0.00010 | mg/L | | 03/30/25 20:30 | 04/02/25 23:18 | 1 |
| **Zinc** | **0.026** | | 0.010 | 0.0040 | mg/L | | 03/30/25 20:30 | 04/06/25 13:59 | 1 |

### Method: SM 2340B - Total Hardness (as CaCO3) by calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Hardness as calcium carbonate** | **270** | | 0.51 | 0.19 | mg/L | | | 03/26/25 05:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Total Solids (SM 2540B-2015)** | **690** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Total Suspended Solids (SM 2540D-2015)** | **210** | | 5.0 | 5.0 | mg/L | | | 03/27/25 12:00 | 1 |
| **Total Volatile Solids (SM 2540E-2015)** | **480** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Fixed Solids (SM 2540E-2015)** | **220** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Oil & Grease (HEM) (EPA 1664B)** | **6.8** | | 4.9 | 4.2 | mg/L | | 03/25/25 07:53 | 03/25/25 10:52 | 1 |
| **Ammonia (EPA 350.1)** | **5.2** | | 1.0 | 0.88 | mg/L | | | 03/28/25 13:45 | 10 |
| Cr (VI) (SW846 EPA 7196A) | ND | | 0.050 | 0.030 | mg/L | | | 03/24/25 14:59 | 5 |

# Client Sample Results

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

**Client Sample ID: RRD-8**
**Date Collected: 03/12/25 10:30**
**Date Received: 03/17/25 08:50**

**Lab Sample ID: 180-187841-5**
**Matrix: Sediment**

**Method: ILL-EPA 35 ILL C-395 - Illinois Supernatant Test - Dissolved**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Elutriate Generated | 20% | | | | ug/L | | | 03/24/25 07:30 | 1 |

## Client Sample ID: RRD-8
**Date Collected: 03/24/25 10:36**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-6
**Matrix: Water**

### Method: SW846 EPA 8270E LL - Semivolatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 0.0010 | 0.00034 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.0010 | 0.00026 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.0010 | 0.00023 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| 2,4-Dichlorophenol | ND | | 0.00020 | 0.000053 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| 2,4-Dimethylphenol | ND | | 0.0010 | 0.00061 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| 2,4-Dinitrophenol | ND | | 0.010 | 0.0034 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| 2,6-Dichlorophenol | ND | | 0.0010 | 0.00019 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| 2-Chlorophenol | ND | | 0.0010 | 0.00023 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| 2-Methylphenol | ND | | 0.0010 | 0.00058 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| 2-Nitrophenol | ND | | 0.0010 | 0.00020 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 0.0052 | 0.0015 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| 4-Chloro-3-methylphenol | ND | | 0.0010 | 0.00045 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| Methylphenol, 3 & 4 | ND | | 0.0010 | 0.00039 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| 4-Nitrophenol | ND | | 0.0052 | 0.00098 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |
| Pentachlorophenol | ND | | 0.0052 | 0.00088 | mg/L | | 03/26/25 13:53 | 03/28/25 17:37 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *51* | | *23 - 128* | *03/26/25 13:53* | *03/28/25 17:37* | *1* |
| *2-Fluorophenol (Surr)* | *43* | | *20 - 105* | *03/26/25 13:53* | *03/28/25 17:37* | *1* |
| *Phenol-d5 (Surr)* | *46* | | *20 - 106* | *03/26/25 13:53* | *03/28/25 17:37* | *1* |

### Method: SW846 EPA 8081B LL - Organochlorine Pesticides (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | | 0.0065 | 0.0018 | ug/L | | 03/25/25 07:19 | 03/29/25 00:31 | 5 |
| Dieldrin | ND | | 0.0065 | 0.0014 | ug/L | | 03/25/25 07:19 | 03/29/25 00:31 | 5 |
| Endrin | ND | | 0.0065 | 0.0011 | ug/L | | 03/25/25 07:19 | 03/29/25 00:31 | 5 |
| Heptachlor | ND | | 0.0065 | 0.0023 | ug/L | | 03/25/25 07:19 | 03/29/25 00:31 | 5 |
| Mirex | ND | | 0.0065 | 0.0023 | ug/L | | 03/25/25 07:19 | 03/29/25 00:31 | 5 |
| Toxaphene | ND | | 0.50 | 0.25 | ug/L | | 03/25/25 07:19 | 03/29/25 00:31 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *53* | *S1-* | *55 - 128* | *03/25/25 07:19* | *03/29/25 00:31* | *5* |
| *DCB Decachlorobiphenyl (Surr)* | *48* | *S1-* | *55 - 128* | *03/25/25 07:19* | *03/29/25 00:31* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *50* | *S1-* | *56 - 125* | *03/25/25 07:19* | *03/29/25 00:31* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *64* | | *56 - 125* | *03/25/25 07:19* | *03/29/25 00:31* | *5* |

### Method: SW846 EPA 8082A - Polychlorinated Biphenyls (PCBs) (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 0.050 | 0.024 | ug/L | | 03/25/25 07:19 | 03/29/25 03:26 | 5 |
| PCB-1221 | ND | | 0.050 | 0.029 | ug/L | | 03/25/25 07:19 | 03/29/25 03:26 | 5 |
| PCB-1232 | ND | | 0.050 | 0.026 | ug/L | | 03/25/25 07:19 | 03/29/25 03:26 | 5 |
| PCB-1242 | ND | | 0.050 | 0.018 | ug/L | | 03/25/25 07:19 | 03/29/25 03:26 | 5 |
| PCB-1248 | ND | | 0.050 | 0.040 | ug/L | | 03/25/25 07:19 | 03/29/25 03:26 | 5 |
| PCB-1254 | ND | | 0.050 | 0.023 | ug/L | | 03/25/25 07:19 | 03/29/25 03:26 | 5 |
| PCB-1260 | ND | | 0.050 | 0.020 | ug/L | | 03/25/25 07:19 | 03/29/25 03:26 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *48* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 03:26* | *5* |
| *DCB Decachlorobiphenyl (Surr)* | *44* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 03:26* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *43* | *S1- p* | *58 - 125* | *03/25/25 07:19* | *03/29/25 03:26* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *67* | | *58 - 125* | *03/25/25 07:19* | *03/29/25 03:26* | *5* |

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-8
**Date Collected: 03/24/25 10:36**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-6
**Matrix: Water**

### Method: TAL SOP PCB - Total PCB Calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Polychlorinated biphenyls, Total | ND | | 0.050 | 0.040 | ug/L | | | 03/29/25 03:26 | 1 |

### Method: SW846 EPA 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Fluoride** | **0.18** | | 0.10 | 0.026 | mg/L | | | 03/31/25 20:24 | 1 |

### Method: EPA 1631E - Mercury, Low Level (CVAFS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **7.3** | | 0.50 | 0.14 | ng/L | | 03/25/25 16:00 | 03/26/25 11:56 | 1 |

### Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **0.0015** | **J** | 0.0020 | 0.00068 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| **Barium** | **0.16** | | 0.0020 | 0.00075 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| **Cadmium** | **0.00025** | **J** | 0.00050 | 0.00015 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| **Calcium** | **73** | | 0.12 | 0.050 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| **Chromium** | **0.0023** | | 0.0020 | 0.00055 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| **Copper** | **0.0020** | | 0.0010 | 0.00036 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| **Iron** | **2.9** | | 0.050 | 0.020 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| **Lead** | **0.0018** | | 0.00050 | 0.00012 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| **Magnesium** | **30** | | 0.050 | 0.016 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| **Manganese** | **1.5** | | 0.0020 | 0.00095 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| **Nickel** | **0.0024** | | 0.0010 | 0.00040 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| **Selenium** | **0.00073** | **J** | 0.0010 | 0.00028 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| Silver | ND | | 0.00050 | 0.00010 | mg/L | | 03/30/25 20:30 | 04/02/25 23:22 | 1 |
| **Zinc** | **0.011** | | 0.010 | 0.0040 | mg/L | | 03/30/25 20:30 | 04/06/25 14:03 | 1 |

### Method: SM 2340B - Total Hardness (as CaCO3) by calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Hardness as calcium carbonate** | **310** | | 0.51 | 0.19 | mg/L | | | 03/26/25 05:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Total Solids (SM 2540B-2015)** | **660** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Total Suspended Solids (SM 2540D-2015)** | **77** | | 2.5 | 2.5 | mg/L | | | 03/27/25 12:00 | 1 |
| **Total Volatile Solids (SM 2540E-2015)** | **630** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| Fixed Solids (SM 2540E-2015) | ND | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Oil & Grease (HEM) (EPA 1664B)** | **7.3** | | 5.0 | 4.3 | mg/L | | 03/25/25 07:53 | 03/25/25 10:52 | 1 |
| **Ammonia (EPA 350.1)** | **0.72** | | 0.10 | 0.088 | mg/L | | | 03/28/25 13:47 | 1 |
| Cr (VI) (SW846 EPA 7196A) | ND | | 0.050 | 0.030 | mg/L | | | 03/24/25 15:00 | 5 |

# Client Sample Results

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-7

**Date Collected: 03/12/25 12:20**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-7

**Matrix: Sediment**

### Method: ILL-EPA 35 ILL C-395 - Illinois Supernatant Test - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Elutriate Generated | 20% | | | | ug/L | | | 03/24/25 07:30 | 1 |

## Client Sample ID: RRD-7
**Date Collected: 03/24/25 10:39**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-8
**Matrix: Water**

### Method: SW846 EPA 8270E LL - Semivolatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 0.0010 | 0.00034 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.0010 | 0.00026 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.0010 | 0.00023 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| 2,4-Dichlorophenol | ND | | 0.00020 | 0.000053 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| 2,4-Dimethylphenol | ND | | 0.0010 | 0.00061 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| 2,4-Dinitrophenol | ND | | 0.010 | 0.0034 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| 2,6-Dichlorophenol | ND | | 0.0010 | 0.00019 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| 2-Chlorophenol | ND | | 0.0010 | 0.00023 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| 2-Methylphenol | ND | | 0.0010 | 0.00058 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| 2-Nitrophenol | ND | | 0.0010 | 0.00020 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 0.0052 | 0.0015 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| 4-Chloro-3-methylphenol | ND | | 0.0010 | 0.00045 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| Methylphenol, 3 & 4 | ND | | 0.0010 | 0.00039 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| 4-Nitrophenol | ND | | 0.0052 | 0.00098 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |
| Pentachlorophenol | ND | | 0.0052 | 0.00088 | mg/L | | 03/26/25 13:53 | 03/28/25 18:00 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *62* | | *23 - 128* | *03/26/25 13:53* | *03/28/25 18:00* | *1* |
| *2-Fluorophenol (Surr)* | *46* | | *20 - 105* | *03/26/25 13:53* | *03/28/25 18:00* | *1* |
| *Phenol-d5 (Surr)* | *48* | | *20 - 106* | *03/26/25 13:53* | *03/28/25 18:00* | *1* |

### Method: SW846 EPA 8081B LL - Organochlorine Pesticides (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | | 0.0065 | 0.0018 | ug/L | | 03/25/25 07:19 | 03/29/25 00:48 | 5 |
| Dieldrin | ND | | 0.0065 | 0.0014 | ug/L | | 03/25/25 07:19 | 03/29/25 00:48 | 5 |
| Endrin | ND | | 0.0065 | 0.0011 | ug/L | | 03/25/25 07:19 | 03/29/25 00:48 | 5 |
| Heptachlor | ND | | 0.0065 | 0.0023 | ug/L | | 03/25/25 07:19 | 03/29/25 00:48 | 5 |
| Mirex | ND | | 0.0065 | 0.0023 | ug/L | | 03/25/25 07:19 | 03/29/25 00:48 | 5 |
| Toxaphene | ND | | 0.50 | 0.25 | ug/L | | 03/25/25 07:19 | 03/29/25 00:48 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *50* | *S1-* | *55 - 128* | *03/25/25 07:19* | *03/29/25 00:48* | *5* |
| *DCB Decachlorobiphenyl (Surr)* | *45* | *S1-* | *55 - 128* | *03/25/25 07:19* | *03/29/25 00:48* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *46* | *p S1-* | *56 - 125* | *03/25/25 07:19* | *03/29/25 00:48* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *70* | | *56 - 125* | *03/25/25 07:19* | *03/29/25 00:48* | *5* |

### Method: SW846 EPA 8082A - Polychlorinated Biphenyls (PCBs) (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 0.050 | 0.024 | ug/L | | 03/25/25 07:19 | 03/29/25 03:43 | 5 |
| PCB-1221 | ND | | 0.050 | 0.029 | ug/L | | 03/25/25 07:19 | 03/29/25 03:43 | 5 |
| PCB-1232 | ND | | 0.050 | 0.026 | ug/L | | 03/25/25 07:19 | 03/29/25 03:43 | 5 |
| PCB-1242 | ND | | 0.050 | 0.018 | ug/L | | 03/25/25 07:19 | 03/29/25 03:43 | 5 |
| PCB-1248 | ND | | 0.050 | 0.040 | ug/L | | 03/25/25 07:19 | 03/29/25 03:43 | 5 |
| PCB-1254 | ND | | 0.050 | 0.023 | ug/L | | 03/25/25 07:19 | 03/29/25 03:43 | 5 |
| PCB-1260 | ND | | 0.050 | 0.020 | ug/L | | 03/25/25 07:19 | 03/29/25 03:43 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *43* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 03:43* | *5* |
| *DCB Decachlorobiphenyl (Surr)* | *38* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 03:43* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *37* | *S1- p* | *58 - 125* | *03/25/25 07:19* | *03/29/25 03:43* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *82* | | *58 - 125* | *03/25/25 07:19* | *03/29/25 03:43* | *5* |

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-7
**Date Collected: 03/24/25 10:39**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-8
**Matrix: Water**

### Method: TAL SOP PCB - Total PCB Calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Polychlorinated biphenyls, Total | ND | | 0.050 | 0.040 | ug/L | | | 03/29/25 03:43 | 1 |

### Method: SW846 EPA 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Fluoride** | **0.12** | | 0.10 | 0.026 | mg/L | | | 03/31/25 20:36 | 1 |

### Method: EPA 1631E - Mercury, Low Level (CVAFS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **22** | | 1.0 | 0.28 | ng/L | | 03/25/25 16:00 | 03/26/25 12:01 | 2 |

### Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **0.0051** | | 0.0020 | 0.00068 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| **Barium** | **0.23** | | 0.0020 | 0.00075 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| **Cadmium** | **0.00016** | **J** | 0.00050 | 0.00015 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| **Calcium** | **52** | | 0.12 | 0.050 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| **Chromium** | **0.0023** | | 0.0020 | 0.00055 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| **Copper** | **0.0050** | | 0.0010 | 0.00036 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| **Iron** | **4.7** | | 0.050 | 0.020 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| **Lead** | **0.0050** | | 0.00050 | 0.00012 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| **Magnesium** | **31** | | 0.050 | 0.016 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| **Manganese** | **0.90** | | 0.0020 | 0.00095 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| **Nickel** | **0.0028** | | 0.0010 | 0.00040 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| **Selenium** | **0.00051** | **J** | 0.0010 | 0.00028 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| Silver | ND | | 0.00050 | 0.00010 | mg/L | | 03/30/25 20:30 | 04/02/25 23:20 | 1 |
| **Zinc** | **0.015** | | 0.010 | 0.0040 | mg/L | | 03/30/25 20:30 | 04/06/25 14:01 | 1 |

### Method: SM 2340B - Total Hardness (as CaCO3) by calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Hardness as calcium carbonate** | **260** | | 0.51 | 0.19 | mg/L | | | 03/26/25 05:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Total Solids (SM 2540B-2015)** | **600** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Total Suspended Solids (SM 2540D-2015)** | **160** | | 5.0 | 5.0 | mg/L | | | 03/27/25 12:00 | 1 |
| **Total Volatile Solids (SM 2540E-2015)** | **410** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Fixed Solids (SM 2540E-2015)** | **190** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Oil & Grease (HEM) (EPA 1664B)** | **7.8** | | 5.0 | 4.3 | mg/L | | 03/25/25 07:53 | 03/25/25 10:52 | 1 |
| **Ammonia (EPA 350.1)** | **11** | | 5.0 | 4.4 | mg/L | | | 03/28/25 13:26 | 50 |
| Cr (VI) (SW846 EPA 7196A) | ND | | 0.050 | 0.030 | mg/L | | | 03/24/25 15:01 | 5 |

# Client Sample Results

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

**Client Sample ID: RRD-6**
**Date Collected: 03/12/25 13:50**
**Date Received: 03/17/25 08:50**

**Lab Sample ID: 180-187841-9**
**Matrix: Sediment**

**Method: ILL-EPA 35 ILL C-395 - Illinois Supernatant Test - Dissolved**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Elutriate Generated | 20% | | | | ug/L | | | 03/24/25 07:30 | 1 |

## Client Sample ID: RRD-6
**Date Collected: 03/24/25 10:42**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-10
**Matrix: Water**

### Method: SW846 EPA 8270E LL - Semivolatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 0.0010 | 0.00034 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.0010 | 0.00026 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.0010 | 0.00023 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| 2,4-Dichlorophenol | ND | | 0.00020 | 0.000053 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| 2,4-Dimethylphenol | ND | | 0.0010 | 0.00061 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| 2,4-Dinitrophenol | ND | | 0.010 | 0.0034 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| 2,6-Dichlorophenol | ND | | 0.0010 | 0.00019 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| 2-Chlorophenol | ND | | 0.0010 | 0.00023 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| 2-Methylphenol | ND | | 0.0010 | 0.00058 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| 2-Nitrophenol | ND | | 0.0010 | 0.00020 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 0.0052 | 0.0015 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| 4-Chloro-3-methylphenol | ND | | 0.0010 | 0.00045 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| Methylphenol, 3 & 4 | ND | | 0.0010 | 0.00039 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| 4-Nitrophenol | ND | | 0.0052 | 0.00098 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |
| Pentachlorophenol | ND | | 0.0052 | 0.00088 | mg/L | | 03/26/25 13:53 | 03/28/25 18:23 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *43* | | *23 - 128* | *03/26/25 13:53* | *03/28/25 18:23* | *1* |
| *2-Fluorophenol (Surr)* | *35* | | *20 - 105* | *03/26/25 13:53* | *03/28/25 18:23* | *1* |
| *Phenol-d5 (Surr)* | *38* | | *20 - 106* | *03/26/25 13:53* | *03/28/25 18:23* | *1* |

### Method: SW846 EPA 8081B LL - Organochlorine Pesticides (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | | 0.0065 | 0.0018 | ug/L | | 03/25/25 07:19 | 03/29/25 01:06 | 5 |
| Dieldrin | ND | | 0.0065 | 0.0014 | ug/L | | 03/25/25 07:19 | 03/29/25 01:06 | 5 |
| Endrin | ND | | 0.0065 | 0.0011 | ug/L | | 03/25/25 07:19 | 03/29/25 01:06 | 5 |
| Heptachlor | ND | | 0.0065 | 0.0023 | ug/L | | 03/25/25 07:19 | 03/29/25 01:06 | 5 |
| Mirex | ND | | 0.0065 | 0.0023 | ug/L | | 03/25/25 07:19 | 03/29/25 01:06 | 5 |
| Toxaphene | ND | | 0.50 | 0.25 | ug/L | | 03/25/25 07:19 | 03/29/25 01:06 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *52* | *S1-* | *55 - 128* | *03/25/25 07:19* | *03/29/25 01:06* | *5* |
| *DCB Decachlorobiphenyl (Surr)* | *38* | *S1-* | *55 - 128* | *03/25/25 07:19* | *03/29/25 01:06* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *43* | *S1-* | *56 - 125* | *03/25/25 07:19* | *03/29/25 01:06* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *59* | | *56 - 125* | *03/25/25 07:19* | *03/29/25 01:06* | *5* |

### Method: SW846 EPA 8082A - Polychlorinated Biphenyls (PCBs) (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 0.050 | 0.024 | ug/L | | 03/25/25 07:19 | 03/29/25 04:01 | 5 |
| PCB-1221 | ND | | 0.050 | 0.029 | ug/L | | 03/25/25 07:19 | 03/29/25 04:01 | 5 |
| PCB-1232 | ND | | 0.050 | 0.026 | ug/L | | 03/25/25 07:19 | 03/29/25 04:01 | 5 |
| PCB-1242 | ND | | 0.050 | 0.018 | ug/L | | 03/25/25 07:19 | 03/29/25 04:01 | 5 |
| PCB-1248 | ND | | 0.050 | 0.040 | ug/L | | 03/25/25 07:19 | 03/29/25 04:01 | 5 |
| PCB-1254 | ND | | 0.050 | 0.023 | ug/L | | 03/25/25 07:19 | 03/29/25 04:01 | 5 |
| PCB-1260 | ND | | 0.050 | 0.020 | ug/L | | 03/25/25 07:19 | 03/29/25 04:01 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *37* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 04:01* | *5* |
| *DCB Decachlorobiphenyl (Surr)* | *33* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 04:01* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *30* | *S1- p* | *58 - 125* | *03/25/25 07:19* | *03/29/25 04:01* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *76* | | *58 - 125* | *03/25/25 07:19* | *03/29/25 04:01* | *5* |

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-6

**Date Collected: 03/24/25 10:42**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-10

**Matrix: Water**

### Method: TAL SOP PCB - Total PCB Calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Polychlorinated biphenyls, Total | ND | | 0.050 | 0.040 | ug/L | | | 03/29/25 04:01 | 1 |

### Method: SW846 EPA 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Fluoride** | **0.11** | | 0.10 | 0.026 | mg/L | | | 03/31/25 21:10 | 1 |

### Method: EPA 1631E - Mercury, Low Level (CVAFS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **33** | | 2.0 | 0.56 | ng/L | | 03/25/25 16:00 | 03/26/25 12:06 | 4 |

### Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **0.0058** | | 0.0020 | 0.00068 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| **Barium** | **0.21** | | 0.0020 | 0.00075 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| **Cadmium** | **0.00048** | **J** | 0.00050 | 0.00015 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| **Calcium** | **52** | | 0.12 | 0.050 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| **Chromium** | **0.0013** | **J** | 0.0020 | 0.00055 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| **Copper** | **0.0063** | | 0.0010 | 0.00036 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| **Iron** | **6.5** | | 0.050 | 0.020 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| **Lead** | **0.0068** | | 0.00050 | 0.00012 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| **Magnesium** | **32** | | 0.050 | 0.016 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| **Manganese** | **0.75** | | 0.0020 | 0.00095 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| **Nickel** | **0.0030** | | 0.0010 | 0.00040 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| **Selenium** | **0.00043** | **J** | 0.0010 | 0.00028 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| Silver | ND | | 0.00050 | 0.00010 | mg/L | | 03/30/25 03:18 | 04/02/25 21:06 | 1 |
| **Zinc** | **0.027** | | 0.010 | 0.0040 | mg/L | | 03/30/25 03:18 | 04/03/25 10:17 | 1 |

### Method: SM 2340B - Total Hardness (as CaCO3) by calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Hardness as calcium carbonate** | **260** | | 0.51 | 0.19 | mg/L | | | 03/26/25 05:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Total Solids (SM 2540B-2015)** | **820** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Total Suspended Solids (SM 2540D-2015)** | **240** | | 5.0 | 5.0 | mg/L | | | 03/27/25 12:00 | 1 |
| **Total Volatile Solids (SM 2540E-2015)** | **800** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| Fixed Solids (SM 2540E-2015) | ND | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Oil & Grease (HEM) (EPA 1664B)** | **7.6** | | 5.0 | 4.3 | mg/L | | 03/25/25 07:53 | 03/25/25 10:52 | 1 |
| **Ammonia (EPA 350.1)** | **13** | | 5.0 | 4.4 | mg/L | | | 03/28/25 13:55 | 50 |
| Cr (VI) (SW846 EPA 7196A) | ND | | 0.050 | 0.030 | mg/L | | | 03/24/25 15:02 | 5 |

# Client Sample Results

Client: EnviroScience Inc
Job ID: 180-187841-1
Project/Site: Prairie Rock River Survey

**Client Sample ID: RRD-5**
**Lab Sample ID: 180-187841-11**
**Date Collected: 03/13/25 13:10**
**Matrix: Sediment**
**Date Received: 03/17/25 08:50**

**Method: ILL-EPA 35 ILL C-395 - Illinois Supernatant Test - Dissolved**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Elutriate Generated | 20% | | | | ug/L | | | 03/24/25 07:30 | 1 |

## Client Sample ID: RRD-5

**Date Collected: 03/24/25 10:45**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-12

**Matrix: Water**

### Method: SW846 EPA 8270E LL - Semivolatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 0.0011 | 0.00035 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.0011 | 0.00027 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.0011 | 0.00024 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| 2,4-Dichlorophenol | ND | | 0.00021 | 0.000055 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| 2,4-Dimethylphenol | ND | | 0.0011 | 0.00064 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| 2,4-Dinitrophenol | ND | | 0.011 | 0.0035 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| 2,6-Dichlorophenol | ND | | 0.0011 | 0.00020 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| 2-Chlorophenol | ND | | 0.0011 | 0.00024 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| 2-Methylphenol | ND | | 0.0011 | 0.00061 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| 2-Nitrophenol | ND | | 0.0011 | 0.00021 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 0.0054 | 0.0016 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| 4-Chloro-3-methylphenol | ND | | 0.0011 | 0.00047 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| Methylphenol, 3 & 4 | ND | | 0.0011 | 0.00040 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| 4-Nitrophenol | ND | | 0.0054 | 0.0010 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |
| Pentachlorophenol | ND | | 0.0054 | 0.00092 | mg/L | | 03/26/25 13:53 | 03/28/25 18:46 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *51* | | *23 - 128* | *03/26/25 13:53* | *03/28/25 18:46* | *1* |
| *2-Fluorophenol (Surr)* | *41* | | *20 - 105* | *03/26/25 13:53* | *03/28/25 18:46* | *1* |
| *Phenol-d5 (Surr)* | *43* | | *20 - 106* | *03/26/25 13:53* | *03/28/25 18:46* | *1* |

### Method: SW846 EPA 8081B LL - Organochlorine Pesticides (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | | 0.0065 | 0.0018 | ug/L | | 03/25/25 07:19 | 03/29/25 01:23 | 5 |
| Dieldrin | ND | | 0.0065 | 0.0014 | ug/L | | 03/25/25 07:19 | 03/29/25 01:23 | 5 |
| Endrin | ND | | 0.0065 | 0.0011 | ug/L | | 03/25/25 07:19 | 03/29/25 01:23 | 5 |
| Heptachlor | ND | | 0.0065 | 0.0023 | ug/L | | 03/25/25 07:19 | 03/29/25 01:23 | 5 |
| Mirex | ND | | 0.0065 | 0.0023 | ug/L | | 03/25/25 07:19 | 03/29/25 01:23 | 5 |
| Toxaphene | ND | | 0.50 | 0.25 | ug/L | | 03/25/25 07:19 | 03/29/25 01:23 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *61* | | *55 - 128* | *03/25/25 07:19* | *03/29/25 01:23* | *5* |
| *DCB Decachlorobiphenyl (Surr)* | *47* | *S1-* | *55 - 128* | *03/25/25 07:19* | *03/29/25 01:23* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *55* | *S1-* | *56 - 125* | *03/25/25 07:19* | *03/29/25 01:23* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *72* | | *56 - 125* | *03/25/25 07:19* | *03/29/25 01:23* | *5* |

### Method: SW846 EPA 8082A - Polychlorinated Biphenyls (PCBs) (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 0.050 | 0.024 | ug/L | | 03/25/25 07:19 | 03/29/25 04:18 | 5 |
| PCB-1221 | ND | | 0.050 | 0.029 | ug/L | | 03/25/25 07:19 | 03/29/25 04:18 | 5 |
| PCB-1232 | ND | | 0.050 | 0.026 | ug/L | | 03/25/25 07:19 | 03/29/25 04:18 | 5 |
| PCB-1242 | ND | | 0.050 | 0.018 | ug/L | | 03/25/25 07:19 | 03/29/25 04:18 | 5 |
| PCB-1248 | ND | | 0.050 | 0.040 | ug/L | | 03/25/25 07:19 | 03/29/25 04:18 | 5 |
| PCB-1254 | ND | | 0.050 | 0.023 | ug/L | | 03/25/25 07:19 | 03/29/25 04:18 | 5 |
| PCB-1260 | ND | | 0.050 | 0.020 | ug/L | | 03/25/25 07:19 | 03/29/25 04:18 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *41* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 04:18* | *5* |
| *DCB Decachlorobiphenyl (Surr)* | *37* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 04:18* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *39* | *S1- p* | *58 - 125* | *03/25/25 07:19* | *03/29/25 04:18* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *65* | | *58 - 125* | *03/25/25 07:19* | *03/29/25 04:18* | *5* |

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-5

**Date Collected: 03/24/25 10:45**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-12

**Matrix: Water**

### Method: TAL SOP PCB - Total PCB Calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Polychlorinated biphenyls, Total | ND | | 0.050 | 0.040 | ug/L | | | 03/29/25 04:18 | 1 |

### Method: SW846 EPA 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Fluoride** | **0.12** | | 0.10 | 0.026 | mg/L | | | 03/31/25 21:22 | 1 |

### Method: EPA 1631E - Mercury, Low Level (CVAFS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **18** | | 1.0 | 0.28 | ng/L | | 03/25/25 16:00 | 03/26/25 12:11 | 2 |

### Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **0.0034** | | 0.0020 | 0.00068 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| **Barium** | **0.22** | | 0.0020 | 0.00075 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| Cadmium | ND | | 0.00050 | 0.00015 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| **Calcium** | **54** | | 0.12 | 0.050 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| **Chromium** | **0.0030** | | 0.0020 | 0.00055 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| **Copper** | **0.0038** | | 0.0010 | 0.00036 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| **Iron** | **3.2** | | 0.050 | 0.020 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| **Lead** | **0.0034** | | 0.00050 | 0.00012 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| **Magnesium** | **31** | | 0.050 | 0.016 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| **Manganese** | **1.1** | | 0.0020 | 0.00095 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| **Nickel** | **0.0028** | | 0.0010 | 0.00040 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| **Selenium** | **0.00051** | **J** | 0.0010 | 0.00028 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| Silver | ND | | 0.00050 | 0.00010 | mg/L | | 03/30/25 03:18 | 04/02/25 21:11 | 1 |
| **Zinc** | **0.013** | | 0.010 | 0.0040 | mg/L | | 03/30/25 03:18 | 04/03/25 10:19 | 1 |

### Method: SM 2340B - Total Hardness (as CaCO3) by calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Hardness as calcium carbonate** | **260** | | 0.51 | 0.19 | mg/L | | | 03/26/25 05:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Total Solids (SM 2540B-2015)** | **690** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Total Suspended Solids (SM 2540D-2015)** | **120** | | 5.0 | 5.0 | mg/L | | | 03/27/25 12:00 | 1 |
| **Total Volatile Solids (SM 2540E-2015)** | **600** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Fixed Solids (SM 2540E-2015)** | **92** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Oil & Grease (HEM) (EPA 1664B)** | **8.2** | | 5.0 | 4.3 | mg/L | | 03/25/25 07:53 | 03/25/25 10:52 | 1 |
| **Ammonia (EPA 350.1)** | **4.9** | | 1.0 | 0.88 | mg/L | | | 03/28/25 13:57 | 10 |
| Cr (VI) (SW846 EPA 7196A) | ND | | 0.050 | 0.030 | mg/L | | | 03/24/25 15:03 | 5 |

# Client Sample Results

Client: EnviroScience Inc
Job ID: 180-187841-1
Project/Site: Prairie Rock River Survey

**Client Sample ID: RRD-3**
**Lab Sample ID: 180-187841-13**
**Date Collected: 03/13/25 14:55**
**Matrix: Sediment**
**Date Received: 03/17/25 08:50**

**Method: ILL-EPA 35 ILL C-395 - Illinois Supernatant Test - Dissolved**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Elutriate Generated | 20% | | | | ug/L | | | 03/24/25 07:30 | 1 |

## Client Sample ID: RRD-3

**Date Collected: 03/24/25 10:48**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-14

**Matrix: Water**

### Method: SW846 EPA 8270E LL - Semivolatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 0.0011 | 0.00035 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.0011 | 0.00027 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.0011 | 0.00024 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| 2,4-Dichlorophenol | ND | | 0.00021 | 0.000055 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| 2,4-Dimethylphenol | ND | | 0.0011 | 0.00064 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| 2,4-Dinitrophenol | ND | | 0.011 | 0.0035 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| 2,6-Dichlorophenol | ND | | 0.0011 | 0.00020 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| 2-Chlorophenol | ND | | 0.0011 | 0.00024 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| 2-Methylphenol | ND | | 0.0011 | 0.00061 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| 2-Nitrophenol | ND | | 0.0011 | 0.00021 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 0.0054 | 0.0016 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| 4-Chloro-3-methylphenol | ND | | 0.0011 | 0.00047 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| Methylphenol, 3 & 4 | ND | | 0.0011 | 0.00040 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| 4-Nitrophenol | ND | | 0.0054 | 0.0010 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |
| Pentachlorophenol | ND | | 0.0054 | 0.00092 | mg/L | | 03/26/25 13:53 | 03/28/25 19:09 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *57* | | *23 - 128* | *03/26/25 13:53* | *03/28/25 19:09* | *1* |
| *2-Fluorophenol (Surr)* | *47* | | *20 - 105* | *03/26/25 13:53* | *03/28/25 19:09* | *1* |
| *Phenol-d5 (Surr)* | *50* | | *20 - 106* | *03/26/25 13:53* | *03/28/25 19:09* | *1* |

### Method: SW846 EPA 8081B LL - Organochlorine Pesticides (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | | 0.0065 | 0.0018 | ug/L | | 03/25/25 07:19 | 03/29/25 01:41 | 5 |
| Dieldrin | ND | | 0.0065 | 0.0014 | ug/L | | 03/25/25 07:19 | 03/29/25 01:41 | 5 |
| Endrin | ND | | 0.0065 | 0.0011 | ug/L | | 03/25/25 07:19 | 03/29/25 01:41 | 5 |
| Heptachlor | ND | | 0.0065 | 0.0023 | ug/L | | 03/25/25 07:19 | 03/29/25 01:41 | 5 |
| Mirex | ND | | 0.0065 | 0.0023 | ug/L | | 03/25/25 07:19 | 03/29/25 01:41 | 5 |
| Toxaphene | ND | | 0.50 | 0.25 | ug/L | | 03/25/25 07:19 | 03/29/25 01:41 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *55* | | *55 - 128* | *03/25/25 07:19* | *03/29/25 01:41* | *5* |
| *DCB Decachlorobiphenyl (Surr)* | *21* | *p S1-* | *55 - 128* | *03/25/25 07:19* | *03/29/25 01:41* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *51* | *S1-* | *56 - 125* | *03/25/25 07:19* | *03/29/25 01:41* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *17* | *p S1-* | *56 - 125* | *03/25/25 07:19* | *03/29/25 01:41* | *5* |

### Method: SW846 EPA 8082A - Polychlorinated Biphenyls (PCBs) (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 0.050 | 0.024 | ug/L | | 03/25/25 07:19 | 03/29/25 04:36 | 5 |
| PCB-1221 | ND | | 0.050 | 0.029 | ug/L | | 03/25/25 07:19 | 03/29/25 04:36 | 5 |
| PCB-1232 | ND | | 0.050 | 0.026 | ug/L | | 03/25/25 07:19 | 03/29/25 04:36 | 5 |
| PCB-1242 | ND | | 0.050 | 0.018 | ug/L | | 03/25/25 07:19 | 03/29/25 04:36 | 5 |
| PCB-1248 | ND | | 0.050 | 0.040 | ug/L | | 03/25/25 07:19 | 03/29/25 04:36 | 5 |
| PCB-1254 | ND | | 0.050 | 0.023 | ug/L | | 03/25/25 07:19 | 03/29/25 04:36 | 5 |
| PCB-1260 | ND | | 0.050 | 0.020 | ug/L | | 03/25/25 07:19 | 03/29/25 04:36 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *36* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 04:36* | *5* |
| *DCB Decachlorobiphenyl (Surr)* | *36* | *S1-* | *53 - 129* | *03/25/25 07:19* | *03/29/25 04:36* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *39* | *S1- p* | *58 - 125* | *03/25/25 07:19* | *03/29/25 04:36* | *5* |
| *Tetrachloro-m-xylene (Surr)* | *82* | | *58 - 125* | *03/25/25 07:19* | *03/29/25 04:36* | *5* |

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Client Sample ID: RRD-3

**Date Collected: 03/24/25 10:48**
**Date Received: 03/17/25 08:50**

## Lab Sample ID: 180-187841-14

**Matrix: Water**

### Method: TAL SOP PCB - Total PCB Calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Polychlorinated biphenyls, Total | ND | | 0.050 | 0.040 | ug/L | | | 03/29/25 04:36 | 1 |

### Method: SW846 EPA 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Fluoride** | **0.13** | | 0.10 | 0.026 | mg/L | | | 03/31/25 21:33 | 1 |

### Method: EPA 1631E - Mercury, Low Level (CVAFS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **12** | | 0.50 | 0.14 | ng/L | | 03/25/25 16:00 | 03/26/25 12:16 | 1 |

### Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **0.0047** | | 0.0020 | 0.00068 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| **Barium** | **0.23** | | 0.0020 | 0.00075 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| **Cadmium** | **0.00015** | **J** | 0.00050 | 0.00015 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| **Calcium** | **46** | | 0.12 | 0.050 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| **Chromium** | **0.0019** | **J** | 0.0020 | 0.00055 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| **Copper** | **0.0041** | | 0.0010 | 0.00036 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| **Iron** | **3.6** | | 0.050 | 0.020 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| **Lead** | **0.0049** | | 0.00050 | 0.00012 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| **Magnesium** | **31** | | 0.050 | 0.016 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| **Manganese** | **0.91** | | 0.0020 | 0.00095 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| **Nickel** | **0.0035** | | 0.0010 | 0.00040 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| **Selenium** | **0.00047** | **J** | 0.0010 | 0.00028 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| Silver | ND | | 0.00050 | 0.00010 | mg/L | | 03/30/25 03:18 | 04/02/25 21:13 | 1 |
| **Zinc** | **0.019** | | 0.010 | 0.0040 | mg/L | | 03/30/25 03:18 | 04/03/25 10:21 | 1 |

### Method: SM 2340B - Total Hardness (as CaCO3) by calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Hardness as calcium carbonate** | **240** | | 0.51 | 0.19 | mg/L | | | 03/26/25 05:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Total Solids (SM 2540B-2015)** | **540** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Total Suspended Solids (SM 2540D-2015)** | **150** | | 5.0 | 5.0 | mg/L | | | 03/27/25 12:00 | 1 |
| **Total Volatile Solids (SM 2540E-2015)** | **390** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Fixed Solids (SM 2540E-2015)** | **150** | | 40 | 40 | mg/L | | | 03/28/25 15:07 | 1 |
| **Oil & Grease (HEM) (EPA 1664B)** | **7.8** | | 5.0 | 4.3 | mg/L | | 03/25/25 07:53 | 03/25/25 10:52 | 1 |
| **Ammonia (EPA 350.1)** | **13** | | 5.0 | 4.4 | mg/L | | | 03/28/25 14:04 | 50 |
| Cr (VI) (SW846 EPA 7196A) | ND | | 0.050 | 0.030 | mg/L | | | 03/24/25 15:06 | 5 |

## Method: EPA 8270E LL - Semivolatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 180-492636/1-A**
**Matrix: Water**
**Analysis Batch: 492790**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492636**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 0.0010 | 0.00033 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.0010 | 0.00025 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.0010 | 0.00022 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| 2,4-Dichlorophenol | ND | | 0.00019 | 0.000051 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| 2,4-Dimethylphenol | ND | | 0.0010 | 0.00059 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| 2,4-Dinitrophenol | ND | | 0.010 | 0.0033 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| 2,6-Dichlorophenol | ND | | 0.0010 | 0.00019 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| 2-Chlorophenol | ND | | 0.0010 | 0.00023 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| 2-Methylphenol | ND | | 0.0010 | 0.00056 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| 2-Nitrophenol | ND | | 0.0010 | 0.00019 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 0.0050 | 0.0015 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| 4-Chloro-3-methylphenol | ND | | 0.0010 | 0.00044 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| Methylphenol, 3 & 4 | ND | | 0.0010 | 0.00037 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| 4-Nitrophenol | ND | | 0.0050 | 0.00094 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |
| Pentachlorophenol | ND | | 0.0050 | 0.00085 | mg/L | | 03/26/25 13:53 | 03/28/25 11:45 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *60* | | *23 - 128* | *03/26/25 13:53* | *03/28/25 11:45* | *1* |
| *2-Fluorophenol (Surr)* | *69* | | *20 - 105* | *03/26/25 13:53* | *03/28/25 11:45* | *1* |
| *Phenol-d5 (Surr)* | *69* | | *20 - 106* | *03/26/25 13:53* | *03/28/25 11:45* | *1* |

**Lab Sample ID: LCS 180-492636/2-A**
**Matrix: Water**
**Analysis Batch: 492790**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492636**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | 0.0200 | 0.0142 | | mg/L | | 71 | 50 - 100 |
| 2,4,5-Trichlorophenol | 0.0200 | 0.0150 | | mg/L | | 75 | 55 - 100 |
| 2,4,6-Trichlorophenol | 0.0200 | 0.0148 | | mg/L | | 74 | 54 - 100 |
| 2,4-Dichlorophenol | 0.0200 | 0.0157 | | mg/L | | 78 | 55 - 100 |
| 2,4-Dimethylphenol | 0.0200 | 0.0137 | | mg/L | | 69 | 51 - 100 |
| 2,4-Dinitrophenol | 0.0400 | 0.0274 | | mg/L | | 69 | 32 - 100 |
| 2,6-Dichlorophenol | 0.0200 | 0.0154 | | mg/L | | 77 | 54 - 100 |
| 2-Chlorophenol | 0.0200 | 0.0156 | | mg/L | | 78 | 53 - 100 |
| 2-Methylphenol | 0.0200 | 0.0153 | | mg/L | | 76 | 51 - 100 |
| 2-Nitrophenol | 0.0200 | 0.0172 | | mg/L | | 86 | 56 - 100 |
| 4,6-Dinitro-2-methylphenol | 0.0400 | 0.0285 | | mg/L | | 71 | 48 - 100 |
| 4-Chloro-3-methylphenol | 0.0200 | 0.0159 | | mg/L | | 80 | 47 - 105 |
| Methylphenol, 3 & 4 | 0.0200 | 0.0154 | | mg/L | | 77 | 51 - 100 |
| 4-Nitrophenol | 0.0400 | 0.0327 | | mg/L | | 82 | 37 - 120 |
| Pentachlorophenol | 0.0400 | 0.0226 | | mg/L | | 56 | 35 - 102 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *72* | | *23 - 128* |
| *2-Fluorophenol (Surr)* | *81* | | *20 - 105* |
| *Phenol-d5 (Surr)* | *80* | | *20 - 106* |

## Method: EPA 8270E LL - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCSD 180-492636/3-A**
**Matrix: Water**
**Analysis Batch: 492790**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 492636**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | | | 0.0200 | 0.0146 | | mg/L | | 73 | 50 - 100 | 3 | 21 |
| 2,4,5-Trichlorophenol | | | 0.0200 | 0.0154 | | mg/L | | 77 | 55 - 100 | 2 | 18 |
| 2,4,6-Trichlorophenol | | | 0.0200 | 0.0150 | | mg/L | | 75 | 54 - 100 | 1 | 16 |
| 2,4-Dichlorophenol | | | 0.0200 | 0.0157 | | mg/L | | 78 | 55 - 100 | 0 | 15 |
| 2,4-Dimethylphenol | | | 0.0200 | 0.0136 | | mg/L | | 68 | 51 - 100 | 1 | 16 |
| 2,4-Dinitrophenol | | | 0.0400 | 0.0284 | | mg/L | | 71 | 32 - 100 | 3 | 19 |
| 2,6-Dichlorophenol | | | 0.0200 | 0.0154 | | mg/L | | 77 | 54 - 100 | 0 | 16 |
| 2-Chlorophenol | | | 0.0200 | 0.0163 | | mg/L | | 81 | 53 - 100 | 4 | 17 |
| 2-Methylphenol | | | 0.0200 | 0.0153 | | mg/L | | 76 | 51 - 100 | 0 | 16 |
| 2-Nitrophenol | | | 0.0200 | 0.0174 | | mg/L | | 87 | 56 - 100 | 1 | 15 |
| 4,6-Dinitro-2-methylphenol | | | 0.0400 | 0.0300 | | mg/L | | 75 | 48 - 100 | 5 | 15 |
| 4-Chloro-3-methylphenol | | | 0.0200 | 0.0161 | | mg/L | | 81 | 47 - 105 | 1 | 18 |
| Methylphenol, 3 & 4 | | | 0.0200 | 0.0160 | | mg/L | | 80 | 51 - 100 | 4 | 18 |
| 4-Nitrophenol | | | 0.0400 | 0.0338 | | mg/L | | 85 | 37 - 120 | 3 | 18 |
| Pentachlorophenol | | | 0.0400 | 0.0235 | | mg/L | | 59 | 35 - 102 | 4 | 17 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *75* | | *23 - 128* |
| *2-Fluorophenol (Surr)* | *84* | | *20 - 105* |
| *Phenol-d5 (Surr)* | *82* | | *20 - 106* |

## Method: EPA 8081B LL - Organochlorine Pesticides (GC)

**Lab Sample ID: MB 180-492477/1-A**
**Matrix: Water**
**Analysis Batch: 492803**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492477**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | | 0.0013 | 0.00036 | ug/L | | 03/25/25 07:19 | 03/28/25 23:03 | 1 |
| Dieldrin | ND | | 0.0013 | 0.00027 | ug/L | | 03/25/25 07:19 | 03/28/25 23:03 | 1 |
| Endrin | ND | | 0.0013 | 0.00023 | ug/L | | 03/25/25 07:19 | 03/28/25 23:03 | 1 |
| Heptachlor | ND | | 0.0013 | 0.00045 | ug/L | | 03/25/25 07:19 | 03/28/25 23:03 | 1 |
| Mirex | ND | | 0.0013 | 0.00047 | ug/L | | 03/25/25 07:19 | 03/28/25 23:03 | 1 |
| Toxaphene | ND | | 0.10 | 0.049 | ug/L | | 03/25/25 07:19 | 03/28/25 23:03 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *95* | | *55 - 128* | *03/25/25 07:19* | *03/28/25 23:03* | *1* |
| *DCB Decachlorobiphenyl (Surr)* | *93* | | *55 - 128* | *03/25/25 07:19* | *03/28/25 23:03* | *1* |
| *Tetrachloro-m-xylene (Surr)* | *92* | | *56 - 125* | *03/25/25 07:19* | *03/28/25 23:03* | *1* |
| *Tetrachloro-m-xylene (Surr)* | *100* | | *56 - 125* | *03/25/25 07:19* | *03/28/25 23:03* | *1* |

**Lab Sample ID: LCS 180-492477/4-A**
**Matrix: Water**
**Analysis Batch: 492803**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492477**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aldrin | | | 0.0250 | 0.0267 | | ug/L | | 107 | 47 - 119 | | |
| Dieldrin | | | 0.0250 | 0.0246 | | ug/L | | 99 | 57 - 122 | | |

## Method: EPA 8081B LL - Organochlorine Pesticides (GC) (Continued)

**Lab Sample ID: LCS 180-492477/4-A**
**Matrix: Water**
**Analysis Batch: 492803**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492477**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Endrin | | | 0.0250 | 0.0268 | | ug/L | | 107 | 58 - 124 | | |
| Heptachlor | | | 0.0250 | 0.0270 | | ug/L | | 108 | 44 - 120 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *96* | | *55 - 128* |
| *DCB Decachlorobiphenyl (Surr)* | *91* | | *55 - 128* |
| *Tetrachloro-m-xylene (Surr)* | *94* | | *56 - 125* |
| *Tetrachloro-m-xylene (Surr)* | *101* | | *56 - 125* |

**Lab Sample ID: LCSD 180-492477/5-A**
**Matrix: Water**
**Analysis Batch: 492803**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 492477**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aldrin | | | 0.0250 | 0.0277 | | ug/L | | 111 | 47 - 119 | 4 | 33 |
| Dieldrin | | | 0.0250 | 0.0268 | | ug/L | | 107 | 57 - 122 | 8 | 30 |
| Endrin | | | 0.0250 | 0.0289 | | ug/L | | 116 | 58 - 124 | 8 | 19 |
| Heptachlor | | | 0.0250 | 0.0280 | | ug/L | | 112 | 44 - 120 | 4 | 33 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *99* | | *55 - 128* |
| *DCB Decachlorobiphenyl (Surr)* | *97* | | *55 - 128* |
| *Tetrachloro-m-xylene (Surr)* | *99* | | *56 - 125* |
| *Tetrachloro-m-xylene (Surr)* | *106* | | *56 - 125* |

## Method: EPA 8082A - Polychlorinated Biphenyls (PCBs) (GC)

**Lab Sample ID: MB 180-492477/1-A**
**Matrix: Water**
**Analysis Batch: 492861**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492477**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 0.010 | 0.0048 | ug/L | | 03/25/25 07:19 | 03/29/25 17:28 | 1 |
| PCB-1221 | ND | | 0.010 | 0.0057 | ug/L | | 03/25/25 07:19 | 03/29/25 17:28 | 1 |
| PCB-1232 | ND | | 0.010 | 0.0052 | ug/L | | 03/25/25 07:19 | 03/29/25 17:28 | 1 |
| PCB-1242 | ND | | 0.010 | 0.0036 | ug/L | | 03/25/25 07:19 | 03/29/25 17:28 | 1 |
| PCB-1248 | ND | | 0.010 | 0.0080 | ug/L | | 03/25/25 07:19 | 03/29/25 17:28 | 1 |
| PCB-1254 | ND | | 0.010 | 0.0046 | ug/L | | 03/25/25 07:19 | 03/29/25 17:28 | 1 |
| PCB-1260 | ND | | 0.010 | 0.0039 | ug/L | | 03/25/25 07:19 | 03/29/25 17:28 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *101* | | *53 - 129* | *03/25/25 07:19* | *03/29/25 17:28* | *1* |
| *DCB Decachlorobiphenyl (Surr)* | *99* | | *53 - 129* | *03/25/25 07:19* | *03/29/25 17:28* | *1* |
| *Tetrachloro-m-xylene (Surr)* | *80* | | *58 - 125* | *03/25/25 07:19* | *03/29/25 17:28* | *1* |
| *Tetrachloro-m-xylene (Surr)* | *90* | | *58 - 125* | *03/25/25 07:19* | *03/29/25 17:28* | *1* |

## Method: EPA 8082A - Polychlorinated Biphenyls (PCBs) (GC) (Continued)

**Lab Sample ID: LCS 180-492477/2-A**
**Matrix: Water**
**Analysis Batch: 492784**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492477**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | | | 1.00 | 0.892 | | ug/L | | 89 | 47 - 119 | | |
| PCB-1260 | | | 1.00 | 0.832 | | ug/L | | 83 | 43 - 116 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *71* | | *53 - 129* |
| *DCB Decachlorobiphenyl (Surr)* | *82* | | *53 - 129* |
| *Tetrachloro-m-xylene (Surr)* | *67* | | *58 - 125* |
| *Tetrachloro-m-xylene (Surr)* | *75* | | *58 - 125* |

**Lab Sample ID: LCSD 180-492477/3-A**
**Matrix: Water**
**Analysis Batch: 492784**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 492477**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | | | 1.00 | 0.845 | | ug/L | | 85 | 47 - 119 | 5 | 35 |
| PCB-1260 | | | 1.00 | 0.764 | | ug/L | | 76 | 43 - 116 | 9 | 35 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *66* | | *53 - 129* |
| *DCB Decachlorobiphenyl (Surr)* | *72* | | *53 - 129* |
| *Tetrachloro-m-xylene (Surr)* | *64* | | *58 - 125* |
| *Tetrachloro-m-xylene (Surr)* | *69* | | *58 - 125* |

## Method: EPA 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 180-492950/6**
**Matrix: Water**
**Analysis Batch: 492950**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Fluoride | ND | | 0.10 | 0.026 | mg/L | | | 03/31/25 16:07 | 1 |

**Lab Sample ID: LCS 180-492950/7**
**Matrix: Water**
**Analysis Batch: 492950**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | | | 2.50 | 2.49 | | mg/L | | 99 | 80 - 120 | | |

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 240-649586/1-A**
**Matrix: Water**
**Analysis Batch: 649727**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 649586**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ND | | 0.50 | 0.14 | ng/L | | 03/25/25 16:00 | 03/26/25 11:13 | 1 |

## Method: 1631E - Mercury, Low Level (CVAFS) (Continued)

**Lab Sample ID: LCS 240-649586/2-A**
**Matrix: Water**
**Analysis Batch: 649727**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 649586**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 5.37 | | ng/L | | 107 | 77 - 123 |

## Method: 6020B - Metals (ICP/MS)

**Lab Sample ID: MB 410-622623/1-A**
**Matrix: Water**
**Analysis Batch: 625571**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 622623**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | ND | | 0.0020 | 0.00068 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |
| Barium | ND | | 0.0020 | 0.00075 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |
| Cadmium | ND | | 0.00050 | 0.00015 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |
| Calcium | ND | | 0.12 | 0.050 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |
| Chromium | ND | | 0.0020 | 0.00055 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |
| Copper | ND | | 0.0010 | 0.00036 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |
| Iron | ND | | 0.050 | 0.020 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |
| Lead | ND | | 0.00050 | 0.00012 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |
| Magnesium | ND | | 0.050 | 0.016 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |
| Manganese | ND | | 0.0020 | 0.00095 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |
| Nickel | ND | | 0.0010 | 0.00040 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |
| Selenium | ND | | 0.0010 | 0.00028 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |
| Silver | ND | | 0.00050 | 0.00010 | mg/L | | 03/30/25 03:18 | 04/02/25 18:16 | 1 |

**Lab Sample ID: MB 410-622623/1-A**
**Matrix: Water**
**Analysis Batch: 625935**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 622623**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Zinc | ND | | 0.010 | 0.0040 | mg/L | | 03/30/25 03:18 | 04/03/25 09:39 | 1 |

**Lab Sample ID: LCS 410-622623/2-A**
**Matrix: Water**
**Analysis Batch: 625571**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 622623**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 0.500 | 0.469 | | mg/L | | 94 | 90 - 109 |
| Barium | 0.500 | 0.489 | | mg/L | | 98 | 90 - 113 |
| Cadmium | 0.0500 | 0.0493 | | mg/L | | 99 | 90 - 112 |
| Calcium | 5.00 | 4.67 | | mg/L | | 93 | 90 - 112 |
| Chromium | 0.500 | 0.471 | | mg/L | | 94 | 90 - 110 |
| Copper | 0.500 | 0.479 | | mg/L | | 96 | 90 - 110 |
| Iron | 5.00 | 4.71 | | mg/L | | 94 | 90 - 111 |
| Lead | 0.0500 | 0.0482 | | mg/L | | 96 | 90 - 110 |
| Magnesium | 5.00 | 4.74 | | mg/L | | 95 | 90 - 110 |
| Manganese | 0.500 | 0.472 | | mg/L | | 94 | 90 - 111 |
| Nickel | 0.500 | 0.471 | | mg/L | | 94 | 90 - 109 |
| Selenium | 0.100 | 0.0972 | | mg/L | | 97 | 90 - 110 |
| Silver | 0.0500 | 0.0508 | | mg/L | | 102 | 90 - 112 |

## Method: 6020B - Metals (ICP/MS) (Continued)

**Lab Sample ID: LCS 410-622623/2-A**
**Matrix: Water**
**Analysis Batch: 625935**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 622623**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Zinc | 0.500 | 0.509 | | mg/L | | 102 | 90 - 112 |

**Lab Sample ID: MB 410-623674/1-A**
**Matrix: Water**
**Analysis Batch: 625571**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 623674**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | ND | | 0.0020 | 0.00068 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |
| Barium | ND | | 0.0020 | 0.00075 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |
| Cadmium | ND | | 0.00050 | 0.00015 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |
| Calcium | ND | | 0.12 | 0.050 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |
| Chromium | ND | | 0.0020 | 0.00055 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |
| Copper | ND | | 0.0010 | 0.00036 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |
| Iron | ND | | 0.050 | 0.020 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |
| Lead | ND | | 0.00050 | 0.00012 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |
| Magnesium | ND | | 0.050 | 0.016 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |
| Manganese | ND | | 0.0020 | 0.00095 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |
| Nickel | ND | | 0.0010 | 0.00040 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |
| Selenium | ND | | 0.0010 | 0.00028 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |
| Silver | ND | | 0.00050 | 0.00010 | mg/L | | 03/30/25 20:30 | 04/02/25 23:03 | 1 |

**Lab Sample ID: MB 410-623674/1-A**
**Matrix: Water**
**Analysis Batch: 626880**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 623674**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Zinc | ND | | 0.010 | 0.0040 | mg/L | | 03/30/25 20:30 | 04/06/25 13:50 | 1 |

**Lab Sample ID: LCS 410-623674/2-A**
**Matrix: Water**
**Analysis Batch: 625571**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 623674**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 0.500 | 0.475 | | mg/L | | 95 | 90 - 109 |
| Barium | 0.500 | 0.487 | | mg/L | | 97 | 90 - 113 |
| Cadmium | 0.0500 | 0.0488 | | mg/L | | 98 | 90 - 112 |
| Calcium | 5.00 | 4.71 | | mg/L | | 94 | 90 - 112 |
| Chromium | 0.500 | 0.468 | | mg/L | | 94 | 90 - 110 |
| Copper | 0.500 | 0.475 | | mg/L | | 95 | 90 - 110 |
| Iron | 5.00 | 4.73 | | mg/L | | 95 | 90 - 111 |
| Lead | 0.0500 | 0.0488 | | mg/L | | 98 | 90 - 110 |
| Magnesium | 5.00 | 4.71 | | mg/L | | 94 | 90 - 110 |
| Manganese | 0.500 | 0.469 | | mg/L | | 94 | 90 - 111 |
| Nickel | 0.500 | 0.470 | | mg/L | | 94 | 90 - 109 |
| Selenium | 0.100 | 0.0971 | | mg/L | | 97 | 90 - 110 |
| Silver | 0.0500 | 0.0500 | | mg/L | | 100 | 90 - 112 |

## Method: 6020B - Metals (ICP/MS) (Continued)

**Lab Sample ID: LCS 410-623674/2-A**
**Matrix: Water**
**Analysis Batch: 626880**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 623674**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Zinc | | | 0.500 | 0.516 | | mg/L | | 103 | 90 - 112 | | |

## Method: 2540B-2015 - Solids, Total

**Lab Sample ID: MB 180-492837/1**
**Matrix: Water**
**Analysis Batch: 492837**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Solids | ND | | 10 | 10 | mg/L | | | 03/28/25 15:07 | 1 |

**Lab Sample ID: LCS 180-492837/2**
**Matrix: Water**
**Analysis Batch: 492837**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Solids | | | 459 | 436 | | mg/L | | 95 | 85 - 115 | | |

**Lab Sample ID: 180-187841-2 DU**
**Matrix: Water**
**Analysis Batch: 492837**

**Client Sample ID: RRD-10**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Solids | 1000 | | | 1070 | | mg/L | | | | 3 | 10 |

## Method: 2540D-2015 - Total Suspended Solids (Dried at 103-105°C)

**Lab Sample ID: MB 180-492720/1**
**Matrix: Water**
**Analysis Batch: 492720**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Suspended Solids | ND | | 0.50 | 0.50 | mg/L | | | 03/27/25 12:00 | 1 |

**Lab Sample ID: LCS 180-492720/2**
**Matrix: Water**
**Analysis Batch: 492720**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Suspended Solids | | | 39.0 | 36.0 | | mg/L | | 92 | 85 - 115 | | |

**Lab Sample ID: 180-187841-2 DU**
**Matrix: Water**
**Analysis Batch: 492720**

**Client Sample ID: RRD-10**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Suspended Solids | 390 | | | 408 | | mg/L | | | | 6 | 10 |

## Method: 2540E-2015 - Solids, Volatile and Fixed (VS)

**Lab Sample ID: MB 180-492969/1**
**Matrix: Water**
**Analysis Batch: 492969**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Volatile Solids | ND | | 10 | 10 | mg/L | | | 03/28/25 15:07 | 1 |
| Fixed Solids | ND | | 10 | 10 | mg/L | | | 03/28/25 15:07 | 1 |

**Lab Sample ID: 180-187841-2 DU**
**Matrix: Water**
**Analysis Batch: 492969**

**Client Sample ID: RRD-10**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Total Volatile Solids | 650 | | 704 | | mg/L | | 8 | 10 |
| Fixed Solids | 390 | | 368 | | mg/L | | 6 | 10 |

## Method: EPA 1664B - HEM and SGT-HEM

**Lab Sample ID: MB 180-492484/1-A**
**Matrix: Water**
**Analysis Batch: 492520**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492484**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Oil & Grease (HEM) | ND | | 5.0 | 4.3 | mg/L | | 03/25/25 07:53 | 03/25/25 10:52 | 1 |

**Lab Sample ID: LCS 180-492484/2-A**
**Matrix: Water**
**Analysis Batch: 492520**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492484**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Oil & Grease (HEM) | 40.0 | 40.70 | | mg/L | | 102 | 78 - 114 |

**Lab Sample ID: LCSD 180-492484/3-A**
**Matrix: Water**
**Analysis Batch: 492520**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 492484**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Oil & Grease (HEM) | 40.0 | 36.30 | | mg/L | | 91 | 78 - 114 | 11 | 18 |

## Method: EPA 350.1 - Nitrogen, Ammonia

**Lab Sample ID: MB 180-492836/49**
**Matrix: Water**
**Analysis Batch: 492836**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | ND | | 0.10 | 0.088 | mg/L | | | 03/28/25 13:11 | 1 |

**Lab Sample ID: LCS 180-492836/53**
**Matrix: Water**
**Analysis Batch: 492836**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Ammonia | 0.500 | 0.523 | | mg/L | | 105 | 90 - 110 |

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187841-1

## Method: EPA 7196A - Chromium, Hexavalent

**Lab Sample ID: MB 180-492457/19**
**Matrix: Water**
**Analysis Batch: 492457**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cr (VI) | ND | | 0.010 | 0.0060 | mg/L | | | 03/24/25 14:54 | 1 |

**Lab Sample ID: LCS 180-492457/20**
**Matrix: Water**
**Analysis Batch: 492457**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cr (VI) | | | 0.500 | 0.522 | | mg/L | | 104 | 85 - 115 | | |

**Lab Sample ID: 180-187841-2 MS**
**Matrix: Water**
**Analysis Batch: 492457**

**Client Sample ID: RRD-10**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cr (VI) | ND | F1 | 2.50 | 1.90 | F1 | mg/L | | 76 | 85 - 115 | | |

**Lab Sample ID: 180-187841-2 MSD**
**Matrix: Water**
**Analysis Batch: 492457**

**Client Sample ID: RRD-10**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cr (VI) | ND | F1 | 2.50 | 1.85 | F1 | mg/L | | 74 | 85 - 115 | 3 | 20 |

## GC/MS Semi VOA

### Prep Batch: 492636

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | 3520C | |
| 180-187841-4 | RRD-9 | Total/NA | Water | 3520C | |
| 180-187841-6 | RRD-8 | Total/NA | Water | 3520C | |
| 180-187841-8 | RRD-7 | Total/NA | Water | 3520C | |
| 180-187841-10 | RRD-6 | Total/NA | Water | 3520C | |
| 180-187841-12 | RRD-5 | Total/NA | Water | 3520C | |
| 180-187841-14 | RRD-3 | Total/NA | Water | 3520C | |
| MB 180-492636/1-A | Method Blank | Total/NA | Water | 3520C | |
| LCS 180-492636/2-A | Lab Control Sample | Total/NA | Water | 3520C | |
| LCSD 180-492636/3-A | Lab Control Sample Dup | Total/NA | Water | 3520C | |

### Analysis Batch: 492790

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | EPA 8270E LL | 492636 |
| 180-187841-4 | RRD-9 | Total/NA | Water | EPA 8270E LL | 492636 |
| 180-187841-6 | RRD-8 | Total/NA | Water | EPA 8270E LL | 492636 |
| 180-187841-8 | RRD-7 | Total/NA | Water | EPA 8270E LL | 492636 |
| 180-187841-10 | RRD-6 | Total/NA | Water | EPA 8270E LL | 492636 |
| 180-187841-12 | RRD-5 | Total/NA | Water | EPA 8270E LL | 492636 |
| 180-187841-14 | RRD-3 | Total/NA | Water | EPA 8270E LL | 492636 |
| MB 180-492636/1-A | Method Blank | Total/NA | Water | EPA 8270E LL | 492636 |
| LCS 180-492636/2-A | Lab Control Sample | Total/NA | Water | EPA 8270E LL | 492636 |
| LCSD 180-492636/3-A | Lab Control Sample Dup | Total/NA | Water | EPA 8270E LL | 492636 |

## GC Semi VOA

### Prep Batch: 492477

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | 3510C | |
| 180-187841-4 | RRD-9 | Total/NA | Water | 3510C | |
| 180-187841-6 | RRD-8 | Total/NA | Water | 3510C | |
| 180-187841-8 | RRD-7 | Total/NA | Water | 3510C | |
| 180-187841-10 | RRD-6 | Total/NA | Water | 3510C | |
| 180-187841-12 | RRD-5 | Total/NA | Water | 3510C | |
| 180-187841-14 | RRD-3 | Total/NA | Water | 3510C | |
| MB 180-492477/1-A | Method Blank | Total/NA | Water | 3510C | |
| LCS 180-492477/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCS 180-492477/4-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 180-492477/3-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |
| LCSD 180-492477/5-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |

### Analysis Batch: 492784

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | EPA 8082A | 492477 |
| 180-187841-4 | RRD-9 | Total/NA | Water | EPA 8082A | 492477 |
| 180-187841-6 | RRD-8 | Total/NA | Water | EPA 8082A | 492477 |
| 180-187841-8 | RRD-7 | Total/NA | Water | EPA 8082A | 492477 |
| 180-187841-10 | RRD-6 | Total/NA | Water | EPA 8082A | 492477 |
| 180-187841-12 | RRD-5 | Total/NA | Water | EPA 8082A | 492477 |
| 180-187841-14 | RRD-3 | Total/NA | Water | EPA 8082A | 492477 |
| LCS 180-492477/2-A | Lab Control Sample | Total/NA | Water | EPA 8082A | 492477 |

## GC Semi VOA (Continued)

### Analysis Batch: 492784 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCSD 180-492477/3-A | Lab Control Sample Dup | Total/NA | Water | EPA 8082A | 492477 |

### Analysis Batch: 492803

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | EPA 8081B LL | 492477 |
| 180-187841-6 | RRD-8 | Total/NA | Water | EPA 8081B LL | 492477 |
| 180-187841-8 | RRD-7 | Total/NA | Water | EPA 8081B LL | 492477 |
| 180-187841-10 | RRD-6 | Total/NA | Water | EPA 8081B LL | 492477 |
| 180-187841-12 | RRD-5 | Total/NA | Water | EPA 8081B LL | 492477 |
| 180-187841-14 | RRD-3 | Total/NA | Water | EPA 8081B LL | 492477 |
| MB 180-492477/1-A | Method Blank | Total/NA | Water | EPA 8081B LL | 492477 |
| LCS 180-492477/4-A | Lab Control Sample | Total/NA | Water | EPA 8081B LL | 492477 |
| LCSD 180-492477/5-A | Lab Control Sample Dup | Total/NA | Water | EPA 8081B LL | 492477 |

### Analysis Batch: 492861

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| MB 180-492477/1-A | Method Blank | Total/NA | Water | EPA 8082A | 492477 |

### Analysis Batch: 492869

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | PCB | |
| 180-187841-4 | RRD-9 | Total/NA | Water | PCB | |
| 180-187841-6 | RRD-8 | Total/NA | Water | PCB | |
| 180-187841-8 | RRD-7 | Total/NA | Water | PCB | |
| 180-187841-10 | RRD-6 | Total/NA | Water | PCB | |
| 180-187841-12 | RRD-5 | Total/NA | Water | PCB | |
| 180-187841-14 | RRD-3 | Total/NA | Water | PCB | |

### Analysis Batch: 493016

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-4 | RRD-9 | Total/NA | Water | EPA 8081B LL | 492477 |

## HPLC/IC

### Analysis Batch: 492950

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | EPA 9056A | |
| 180-187841-4 | RRD-9 | Total/NA | Water | EPA 9056A | |
| 180-187841-6 | RRD-8 | Total/NA | Water | EPA 9056A | |
| 180-187841-8 | RRD-7 | Total/NA | Water | EPA 9056A | |
| 180-187841-10 | RRD-6 | Total/NA | Water | EPA 9056A | |
| 180-187841-12 | RRD-5 | Total/NA | Water | EPA 9056A | |
| 180-187841-14 | RRD-3 | Total/NA | Water | EPA 9056A | |
| MB 180-492950/6 | Method Blank | Total/NA | Water | EPA 9056A | |
| LCS 180-492950/7 | Lab Control Sample | Total/NA | Water | EPA 9056A | |

## Metals

### Analysis Batch: 615287

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | SM 2340B | |
| 180-187841-4 | RRD-9 | Total/NA | Water | SM 2340B | |

## Metals (Continued)

### Analysis Batch: 615287 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-6 | RRD-8 | Total/NA | Water | SM 2340B | |
| 180-187841-8 | RRD-7 | Total/NA | Water | SM 2340B | |
| 180-187841-10 | RRD-6 | Total/NA | Water | SM 2340B | |
| 180-187841-12 | RRD-5 | Total/NA | Water | SM 2340B | |
| 180-187841-14 | RRD-3 | Total/NA | Water | SM 2340B | |

### Prep Batch: 622623

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-10 | RRD-6 | Total Recoverable | Water | 3005A | |
| 180-187841-12 | RRD-5 | Total Recoverable | Water | 3005A | |
| 180-187841-14 | RRD-3 | Total Recoverable | Water | 3005A | |
| MB 410-622623/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 410-622623/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 623674

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total Recoverable | Water | 3005A | |
| 180-187841-4 | RRD-9 | Total Recoverable | Water | 3005A | |
| 180-187841-6 | RRD-8 | Total Recoverable | Water | 3005A | |
| 180-187841-8 | RRD-7 | Total Recoverable | Water | 3005A | |
| MB 410-623674/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 410-623674/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Analysis Batch: 625571

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total Recoverable | Water | 6020B | 623674 |
| 180-187841-4 | RRD-9 | Total Recoverable | Water | 6020B | 623674 |
| 180-187841-6 | RRD-8 | Total Recoverable | Water | 6020B | 623674 |
| 180-187841-8 | RRD-7 | Total Recoverable | Water | 6020B | 623674 |
| 180-187841-10 | RRD-6 | Total Recoverable | Water | 6020B | 622623 |
| 180-187841-12 | RRD-5 | Total Recoverable | Water | 6020B | 622623 |
| 180-187841-14 | RRD-3 | Total Recoverable | Water | 6020B | 622623 |
| MB 410-622623/1-A | Method Blank | Total Recoverable | Water | 6020B | 622623 |
| MB 410-623674/1-A | Method Blank | Total Recoverable | Water | 6020B | 623674 |
| LCS 410-622623/2-A | Lab Control Sample | Total Recoverable | Water | 6020B | 622623 |
| LCS 410-623674/2-A | Lab Control Sample | Total Recoverable | Water | 6020B | 623674 |

### Analysis Batch: 625935

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-10 | RRD-6 | Total Recoverable | Water | 6020B | 622623 |
| 180-187841-12 | RRD-5 | Total Recoverable | Water | 6020B | 622623 |
| 180-187841-14 | RRD-3 | Total Recoverable | Water | 6020B | 622623 |
| MB 410-622623/1-A | Method Blank | Total Recoverable | Water | 6020B | 622623 |
| LCS 410-622623/2-A | Lab Control Sample | Total Recoverable | Water | 6020B | 622623 |

### Analysis Batch: 626880

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total Recoverable | Water | 6020B | 623674 |
| 180-187841-4 | RRD-9 | Total Recoverable | Water | 6020B | 623674 |
| 180-187841-6 | RRD-8 | Total Recoverable | Water | 6020B | 623674 |
| 180-187841-8 | RRD-7 | Total Recoverable | Water | 6020B | 623674 |

## Metals (Continued)

### Analysis Batch: 626880 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| MB 410-623674/1-A | Method Blank | Total Recoverable | Water | 6020B | 623674 |
| LCS 410-623674/2-A | Lab Control Sample | Total Recoverable | Water | 6020B | 623674 |

### Prep Batch: 649586

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | 1631E | |
| 180-187841-4 | RRD-9 | Total/NA | Water | 1631E | |
| 180-187841-6 | RRD-8 | Total/NA | Water | 1631E | |
| 180-187841-8 | RRD-7 | Total/NA | Water | 1631E | |
| 180-187841-10 | RRD-6 | Total/NA | Water | 1631E | |
| 180-187841-12 | RRD-5 | Total/NA | Water | 1631E | |
| 180-187841-14 | RRD-3 | Total/NA | Water | 1631E | |
| MB 240-649586/1-A | Method Blank | Total/NA | Water | 1631E | |
| LCS 240-649586/2-A | Lab Control Sample | Total/NA | Water | 1631E | |

### Analysis Batch: 649727

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | 1631E | 649586 |
| 180-187841-4 | RRD-9 | Total/NA | Water | 1631E | 649586 |
| 180-187841-6 | RRD-8 | Total/NA | Water | 1631E | 649586 |
| 180-187841-8 | RRD-7 | Total/NA | Water | 1631E | 649586 |
| 180-187841-10 | RRD-6 | Total/NA | Water | 1631E | 649586 |
| 180-187841-12 | RRD-5 | Total/NA | Water | 1631E | 649586 |
| 180-187841-14 | RRD-3 | Total/NA | Water | 1631E | 649586 |
| MB 240-649586/1-A | Method Blank | Total/NA | Water | 1631E | 649586 |
| LCS 240-649586/2-A | Lab Control Sample | Total/NA | Water | 1631E | 649586 |

## General Chemistry

### Analysis Batch: 492457

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | EPA 7196A | |
| 180-187841-4 | RRD-9 | Total/NA | Water | EPA 7196A | |
| 180-187841-6 | RRD-8 | Total/NA | Water | EPA 7196A | |
| 180-187841-8 | RRD-7 | Total/NA | Water | EPA 7196A | |
| 180-187841-10 | RRD-6 | Total/NA | Water | EPA 7196A | |
| 180-187841-12 | RRD-5 | Total/NA | Water | EPA 7196A | |
| 180-187841-14 | RRD-3 | Total/NA | Water | EPA 7196A | |
| MB 180-492457/19 | Method Blank | Total/NA | Water | EPA 7196A | |
| LCS 180-492457/20 | Lab Control Sample | Total/NA | Water | EPA 7196A | |
| 180-187841-2 MS | RRD-10 | Total/NA | Water | EPA 7196A | |
| 180-187841-2 MSD | RRD-10 | Total/NA | Water | EPA 7196A | |

### Prep Batch: 492484

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | 1664B | |
| 180-187841-4 | RRD-9 | Total/NA | Water | 1664B | |
| 180-187841-6 | RRD-8 | Total/NA | Water | 1664B | |
| 180-187841-8 | RRD-7 | Total/NA | Water | 1664B | |
| 180-187841-10 | RRD-6 | Total/NA | Water | 1664B | |
| 180-187841-12 | RRD-5 | Total/NA | Water | 1664B | |

## General Chemistry (Continued)

### Prep Batch: 492484 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-14 | RRD-3 | Total/NA | Water | 1664B | |
| MB 180-492484/1-A | Method Blank | Total/NA | Water | 1664B | |
| LCS 180-492484/2-A | Lab Control Sample | Total/NA | Water | 1664B | |
| LCSD 180-492484/3-A | Lab Control Sample Dup | Total/NA | Water | 1664B | |

### Analysis Batch: 492520

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | EPA 1664B | 492484 |
| 180-187841-4 | RRD-9 | Total/NA | Water | EPA 1664B | 492484 |
| 180-187841-6 | RRD-8 | Total/NA | Water | EPA 1664B | 492484 |
| 180-187841-8 | RRD-7 | Total/NA | Water | EPA 1664B | 492484 |
| 180-187841-10 | RRD-6 | Total/NA | Water | EPA 1664B | 492484 |
| 180-187841-12 | RRD-5 | Total/NA | Water | EPA 1664B | 492484 |
| 180-187841-14 | RRD-3 | Total/NA | Water | EPA 1664B | 492484 |
| MB 180-492484/1-A | Method Blank | Total/NA | Water | EPA 1664B | 492484 |
| LCS 180-492484/2-A | Lab Control Sample | Total/NA | Water | EPA 1664B | 492484 |
| LCSD 180-492484/3-A | Lab Control Sample Dup | Total/NA | Water | EPA 1664B | 492484 |

### Analysis Batch: 492720

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | 2540D-2015 | |
| 180-187841-4 | RRD-9 | Total/NA | Water | 2540D-2015 | |
| 180-187841-6 | RRD-8 | Total/NA | Water | 2540D-2015 | |
| 180-187841-8 | RRD-7 | Total/NA | Water | 2540D-2015 | |
| 180-187841-10 | RRD-6 | Total/NA | Water | 2540D-2015 | |
| 180-187841-12 | RRD-5 | Total/NA | Water | 2540D-2015 | |
| 180-187841-14 | RRD-3 | Total/NA | Water | 2540D-2015 | |
| MB 180-492720/1 | Method Blank | Total/NA | Water | 2540D-2015 | |
| LCS 180-492720/2 | Lab Control Sample | Total/NA | Water | 2540D-2015 | |
| 180-187841-2 DU | RRD-10 | Total/NA | Water | 2540D-2015 | |

### Analysis Batch: 492836

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | EPA 350.1 | |
| 180-187841-4 | RRD-9 | Total/NA | Water | EPA 350.1 | |
| 180-187841-6 | RRD-8 | Total/NA | Water | EPA 350.1 | |
| 180-187841-8 | RRD-7 | Total/NA | Water | EPA 350.1 | |
| 180-187841-10 | RRD-6 | Total/NA | Water | EPA 350.1 | |
| 180-187841-12 | RRD-5 | Total/NA | Water | EPA 350.1 | |
| 180-187841-14 | RRD-3 | Total/NA | Water | EPA 350.1 | |
| MB 180-492836/49 | Method Blank | Total/NA | Water | EPA 350.1 | |
| LCS 180-492836/53 | Lab Control Sample | Total/NA | Water | EPA 350.1 | |

### Analysis Batch: 492837

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | 2540B-2015 | |
| 180-187841-4 | RRD-9 | Total/NA | Water | 2540B-2015 | |
| 180-187841-6 | RRD-8 | Total/NA | Water | 2540B-2015 | |
| 180-187841-8 | RRD-7 | Total/NA | Water | 2540B-2015 | |
| 180-187841-10 | RRD-6 | Total/NA | Water | 2540B-2015 | |
| 180-187841-12 | RRD-5 | Total/NA | Water | 2540B-2015 | |

## General Chemistry (Continued)

### Analysis Batch: 492837 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-14 | RRD-3 | Total/NA | Water | 2540B-2015 | |
| MB 180-492837/1 | Method Blank | Total/NA | Water | 2540B-2015 | |
| LCS 180-492837/2 | Lab Control Sample | Total/NA | Water | 2540B-2015 | |
| 180-187841-2 DU | RRD-10 | Total/NA | Water | 2540B-2015 | |

### Analysis Batch: 492969

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-2 | RRD-10 | Total/NA | Water | 2540E-2015 | |
| 180-187841-4 | RRD-9 | Total/NA | Water | 2540E-2015 | |
| 180-187841-6 | RRD-8 | Total/NA | Water | 2540E-2015 | |
| 180-187841-8 | RRD-7 | Total/NA | Water | 2540E-2015 | |
| 180-187841-10 | RRD-6 | Total/NA | Water | 2540E-2015 | |
| 180-187841-12 | RRD-5 | Total/NA | Water | 2540E-2015 | |
| 180-187841-14 | RRD-3 | Total/NA | Water | 2540E-2015 | |
| MB 180-492969/1 | Method Blank | Total/NA | Water | 2540E-2015 | |
| 180-187841-2 DU | RRD-10 | Total/NA | Water | 2540E-2015 | |

## Organic Prep

### Analysis Batch: 492409

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187841-1 | RRD-10 | Dissolved | Water | 35 ILL C-395 | |
| 180-187841-3 | RRD-9 | Dissolved | Sediment | 35 ILL C-395 | |
| 180-187841-5 | RRD-8 | Dissolved | Sediment | 35 ILL C-395 | |
| 180-187841-7 | RRD-7 | Dissolved | Sediment | 35 ILL C-395 | |
| 180-187841-9 | RRD-6 | Dissolved | Sediment | 35 ILL C-395 | |
| 180-187841-11 | RRD-5 | Dissolved | Sediment | 35 ILL C-395 | |
| 180-187841-13 | RRD-3 | Dissolved | Sediment | 35 ILL C-395 | |

**Eurofins Pittsburgh**
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

# Chain of Custody Record

eurofins | Environment Testing

| Client Information | Sampler: Nathan Nagler | Lab PM: Colussy, Jill L | Carrier Tracking No(s): | COC No.: 180-108090-19333.1 |
|---|---|---|---|---|
| Client Contact: ~~Dan Schweitzer~~ Nathan Nagler | Phone: 740-816-2868 | E-Mail: Jill.Colussy@et.eurofinsus.com | State of Origin: | Page: Page 1 of 2 |
| Company: EnviroScience Inc | PWSID: | | | Job #: |
| Address: 5070 Stow Rd. | Due Date Requested: | | | |
| City: Stow | TAT Requested (days): | | | |
| State, Zip: OH, 44224 | Compliance Project: Δ Yes Δ No | | | |
| Phone: ~~330-554-1877(Tel)~~ 740-816-2868 | PO #: Purchase Order Requested | | | |
| Email: ~~dschweitzer@enviroscienceinc.com~~ nnagler@enviroscienceinc.com | WO #: | | | |
| Project Name: Prairie Rock River Survey | Project #: 18029449 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

Preservation Codes:

180-187841 Chain of Custody

| Sample Identification | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | Sediment | Sediment | Water | 8270E, 8081B-LL, 25408, 35D, 1, 7196A, 9056A, D125FM_28D, 90.1-13 | 1631E | 1620B | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | | | |
| RRD-10 | 031125 | 1120 | G | W/S | | | 2 | 2 | | | | | 4 | |
| RRD-9 | 031125 | 1440 | G | W/S | | | 2 | 2 | | | | | 4 | |
| RRD-8 | 031125 | 1030 | G | W/S | | | 2 | 2 | | | | | 4 | |
| RRD-7 | 031225 | 1220 | G | W/S | | | 2 | 2 | | | | | 4 | |
| RRD-6 | 031225 | 1350 | G | W/S | | | 2 | 2 | | | | | 4 | |
| RRD-5 | 031325 | 1310 | G | W/S | | | 2 | 2 | | | | | 4 | |
| RRD-4 | 031325 | 1345 | G | ~~W~~/S S | | | ~~X~~ | ~~X~~ | 1 | | 1 | 1 | 4 3 | |
| RRD-3 | 031325 | 1455 | G | W/S | | | 2 | 2 | ~~X~~ | | | | 3 4 | |
| RRD-2 | 031325 | 1530 | G | S | | | | | 1 | | 1 | 1 | 3 | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

***Possible Hazard Identification***
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)***
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

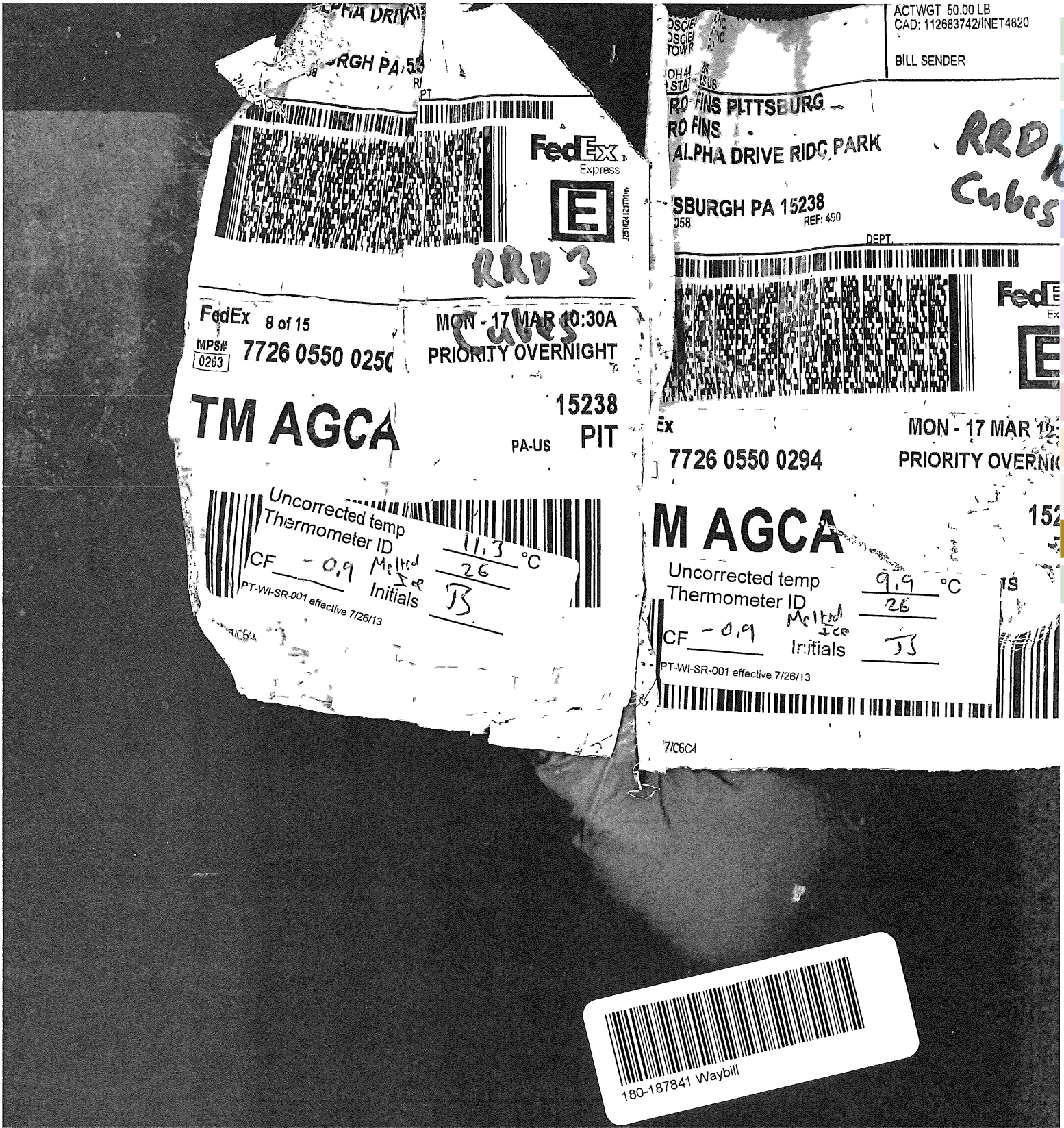
Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| | 031325 @ 1830 | ES | | 3/17/25 850 | USPH NE |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks

Ver: 10/10/2024


ACTWGT 50.00 LB
CAD: 112683742/INET4820
BILL SENDER
ALPHA DRIVE RIDC PARK
SBURGH PA 15238
REF: 490
DEPT.
RRD 10
Cubes
FedEx Express
RRD 3
Cubes
FedEx 8 of 15
MPS# 0283
7726 0550 0250
MON - 17 MAR 10:30A
PRIORITY OVERNIGHT
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PA-US
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M AGCA
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Thermometer ID
CF -0.9
Initials
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26
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9.9 °C
PT-WI-SR-001 effective 7/26/13
7/C6C4
180-187841 Waybill



ENVIROSCIENCE INC.
ENVIROSCIENCE INC
5070 STOW ROAD

STOW, OH 44224
UNITED STATES US

ACTWGT 50.00 LB
CAD 112683742/INET4820

BILL SENDER

TO EUROFINS PITTSBURG
EUROFINS
301 ALPHA DRIVE RIDC PARK

PITTSBURGH PA 15238
(412) 963-7058 REF 490
INV:
PO: DEPT

FedEx 13 of 15
MPS# 0263 7726 0550 8799
MON - 17 MAR 10:30A
PRIORITY OVERNIGHT

TM AGCA
15238
PA-US PIT

Uncorrected temp 9.8 °C
Thermometer ID 26
CF -0.6 Initials TJ

PT-WI-SR-001 effective 7/26/13

58GJ3/5027/C6C4

ENVIROSCIENCE INC.
ENVIROSCIENCE INC
5070 STOW ROAD

STOW, OH 44224
UNITED STATES US

ACTWGT 50.00 LB
CAD 112683742/INET4820

BILL SENDER

TO EUROFINS PITTSBURG
EUROFINS
301 ALPHA DRIVE RIDC PARK

PITTSBURGH PA 15238
(412) 963-7058 REF: 490
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PO: DEPT

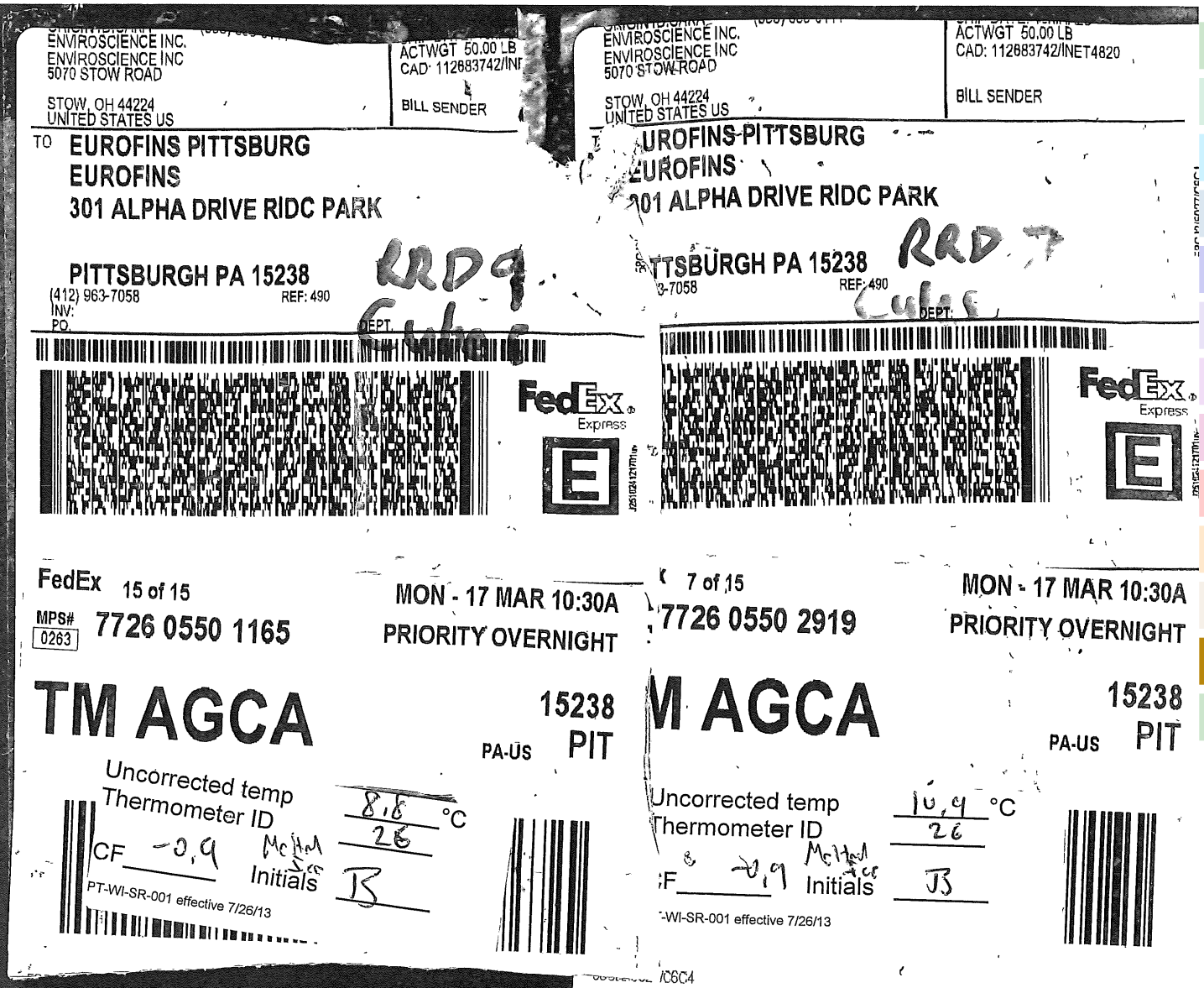
FedEx 3 of 15
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Uncorrected temp 12.4 °C
Thermometer ID 26
CF -0.9 Initials TJ

PT-WI-SR-001 effective 7/26/13

58GJ3/5027/C6C4



ENVIROSCIENCE INC.
ENVIROSCIENCE INC
5070 STOW ROAD

STOW, OH 44224
UNITED STATES US

ACTWGT 50.00 LB
CAD: 112883742/INET4820

BILL SENDER

TO EUROFINS PITTSBURG
EUROFINS
301 ALPHA DRIVE RIDC PARK

PITTSBURGH PA 15238
(412) 963-7058 REF: 490
INV:
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RRD 9
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FedEx Express

FedEx 15 of 15
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MON - 17 MAR 10:30A
PRIORITY OVERNIGHT

TM AGCA

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PA-US PIT

Uncorrected temp 8.8 °C
Thermometer ID 26
CF -0.9 Initials JB

PT-WI-SR-001 effective 7/26/13

ENVIROSCIENCE INC.
ENVIROSCIENCE INC
5070 STOW ROAD

STOW, OH 44224
UNITED STATES US

ACTWGT 50.00 LB
CAD: 112883742/INET4820

BILL SENDER

TO EUROFINS PITTSBURG
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ENVIROSCIENCE INC.
ENVIROSCIENCE INC
5070 STOW ROAD
STOW, OH 44224
UNITED STATES US
EUROFINS PITTSBURG
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FedEx 5 of 15
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Thermometer ID
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PT-WI-SR-001 effective 7/26/13


ENVIROSCIENCE INC.
ENVIROSCIENCE INC
5070 STOW ROAD
STOW, OH 44224
UNITED STATES US
ACTWGT 50.00 LB
CAD 112683742/INET4820
BILL SENDER
TO EUROFINS PITTSBURG
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301 ALPHA DRIVE RIDC PARK
PITTSBURGH PA 15238
(412) 963-7058
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ENVIROSCIENCE INC.
ENVIROSCIENCE INC
5070 STOW ROAD
STOW, OH 44224
UNITED STATES US
ACTWGT 50.00 LB
CAD 112683742/INET4820
BILL SENDER
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Uncorrected temp 11.5 °C
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ENVIROSCIENCE INC.
ENVIROSCIENCE INC
5070 STOW ROAD
STOW, OH 44224
UNITED STATES US
BILL SENDER
TO EUROFINS PITTSBURG
EUROFINS
301 ALPHA DRIVE RIDC PARK
PITTSBURGH PA 15238
(412) 963-7058
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TM AGCA
PA-US
Uncorrected temp 3.4 °C
Thermometer ID 26
CF -0.9 Initials B
PT-WI-SR-001 effective 7/26/13
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FedEx 14 of 15
7726 0550 8137
TM AGCA
Uncorrected temp 3.4 °C
Thermometer ID 26
CF -0.9 Initials B
PT-WI-SR-001 effective 7/26/13


ENVIROSCIENCE INC.
ENVIROSCIENCE INC
5070 STOW ROAD
STOW, OH 44224
UNITED STATES US
ACTWGT 50.00 LB
CAD 112683742/INET4820
BILL SENDER
TO EUROFINS PITTSBURG
EUROFINS
301 ALPHA DRIVE RIDC PARK
PITTSBURGH PA 15238
(412) 963-7058
REF: 490
INV:
PO:
DEPT:
FedEx Express
FedEx
MPS# 0263
7726 0550 3823
MON - 17 MAR 10:30A
PRIORITY OVERNIGHT
TM AGCA
15238
PA-US
PIT
Uncorrected temp 3.0 °C
Thermometer ID 26
CF -0.9
Initials JB
PT-WI-SR-001 effective 7/26/13
ENVIROSCIENCE INC.
ENVIROSCIENCE INC
5070 STOW ROAD
STOW, OH 44224
UNITED STATES US
ACTWGT 50.00 LB
CAD 112683742/INET4820
BILL SENDER
TO EUROFINS PITTSBURG
EUROFINS
301 ALPHA DRIVE RIDC PARK
PITTSBURGH PA 15238
(412) 963-7058
REF: 490
INV:
PO:
DEPT:
MON - 17 MAR 10:30
PRIORITY OVERNIGH
PA-US
AGCA
Uncorrected temp 2.9 °C
Thermometer ID 26
CF -0.9
Initials JB
PT-WI-SR-001 effective 7/26/13

**Eurofins Pittsburgh**
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

# Chain of Custody Record

eurofins Environment Testing

| Client Information (Sub Contract Lab) | Sampler: N/A | Lab PM: Brown, Shali | Carrier Tracking No(s): N/A | COC No: 180-535318.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: N/A | E-Mail: Shali.Brown@et.eurofinsus.com | State of Origin: Illinois | Page: Page 1 of 1 |
| Company: Eurofins Environment Testing North Centr | | Accreditations Required (See note): NELAP Illinois | | Job #: 180-187841 1 |
| Address: 180 S. Van Buren Avenue, | Due Date Requested: 4/7/2025 | | | Preservation Codes: |
| City: Barberton | TAT Requested (days): N/A | | | |
| State, Zip: OH, 44203 | | | | |
| Phone: 330-497-9396(Tel) 330-497-0772(Fax) | PO #: N/A | | | |
| Email: N/A | WO #: N/A | | | |
| Project Name: Prairie Rock River Survey | Project #: 18029449 | | | |
| Site: N/A | SSOW#: N/A | | | Other: N/A |

Analysis Requested

| Sample Identification Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 1631E/1631E_Prep Mercury | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| RRD-10 (180-187841-2) | 3/24/25 | 10:30 Central | G | Water | | | X | 2 | |
| RRD-9 (180-187841-4) | 3/24/25 | 10:33 Central | G | Water | | | X | 2 | |
| RRD-8 (180-187841-6) | 3/24/25 | 10:36 Central | G | Water | | | X | 2 | |
| RRD-7 (180-187841-8) | 3/24/25 | 10:39 Central | G | Water | | | X | 2 | |
| RRD-6 (180-187841 10) | 3/24/25 | 10:42 Central | G | Water | | | X | 2 | |
| RRD-5 (180-187841-12) | 3/24/25 | 10:45 Central | G | Water | | | X | 2 | |
| RRD-3 (180-187841-14) | 3/24/25 | 10:48 Central | G | Water | | | X | 2 | |
| | | | | | | | | | |
| | | | | | | | | | |

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

| *Possible Hazard Identification* Unconfirmed | *Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)* ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months |
|---|---|
| *Deliverable Requested:* I, II, III IV Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| | 3-24-25 1700 | EPITNE | | 3/25/25 0930 | EC |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No. | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

**Eurofins – Cleveland Sample Receipt Form/Narrative** Login # :
**Barberton Facility**

Client Eurofins Site Name

Cooler unpacked by:

Cooler Received on 3/25/25 Opened on 3/25/25

FedEx: 1st Grd Exp UPS FAS Waypoint Client Drop Off Eurofins Courier Other

**Receipt After-hours** Drop-off Date/Time Storage Location

Eurofins Cooler # Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN # (CF °C) Observed Cooler Temp °C Corrected Cooler Temp. °C

| | | |
|---|---|---|
| 2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 | Yes | No |
| -Were the seals on the outside of the cooler(s) signed & dated? | Yes | No NA |
| -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? | Yes | No |
| -Were tamper/custody seals intact and uncompromised? | Yes | No NA |
| 3 Shippers' packing slip attached to the cooler(s)? | Yes | No |
| 4. Did custody papers accompany the sample(s)? | Yes | No |
| 5 Were the custody papers relinquished & signed in the appropriate place? | Yes | No |
| 6 Was/were the person(s) who collected the samples clearly identified on the COC? | Yes | No |
| 7 Did all bottles arrive in good condition (Unbroken)? | Yes | No |
| 8 Could all bottle labels (ID/Date/Time) be reconciled with the COC? | Yes | No |
| 9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? | | |
| 10 Were correct bottle(s) used for the test(s) indicated? | Yes | No |
| 11 Sufficient quantity received to perform indicated analyses? | Yes | No |
| 12 Are these work share samples and all listed on the COC? | Yes | No |
| If yes, Questions 13-17 have been checked at the originating laboratory | | |
| 13 Were all preserved sample(s) at the correct pH upon receipt? | Yes | No NA pH Strip Lot# HC448976 |
| 14 Were VOAs on the COC? | Yes | No |
| 15 Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. | Yes | No NA |
| 16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # | Yes | No |
| 17 Was a LL Hg or Me Hg trip blank present? | Yes | No |

**Tests that are not checked for pH by Receiving:**
**VOAs**
**Oil and Grease**
**TOC**

Contacted PM Date by via Verbal Voice Mail Other

Concerning

**18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES** ☐ additional next page

Samples processed by:

Label date & time does not match COC

**19 SAMPLE CONDITION**

Sample(s) were received after the recommended holding time had expired

Sample(s) were received in a broken container

Sample(s) were received with bubble >6 mm in diameter (Notify PM)

**20. SAMPLE PRESERVATION**

Sample(s) were further preserved in the laboratory

Time preserved. Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen

Login # ____________

## Eurofins - Cleveland Sample Receipt Multiple Cooler Form

| Cooler Description (Circle) | IR Gun # (Circle) | Observed Temp °C | Corrected Temp °C | Coolant (Circle) |
|---|---|---|---|---|
| EC Client Box Other | IR GUN #: 20 | 10.6 | 12.6 | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: 20 | 14.0 | 16.0 | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: 20 | 1.5 | 3.5 | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: 20 | 10.8 | 12.8 | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: | | | Wet Ice Blue Ice Dry Ice Water None |

☐ See Temperature Excursion Form

*WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers*

4/9/2025

ORIGIN ID AGCA (412) 963-7530
SAMPLE RECEIVING DEPARTMENT
EUROFINS ENVIRO TESTING PITT N E
301 ALPHA DRIVE

PITTSBURGH, PA 152382907
UNITED STATES US

SHIP DATE 24MAR25
ACTWGT 40.00 LB MAN
CAD 0522321/CAFE3855

BILL SENDER

Part # 156469-434 MTW EXP 11/25

TO SHIPPING/RECEIVING
EUROFINS ENVIRONMENT TESTING NORTH
180 S. VAN BUREN AVENUE

BARBERTON OH 44203
(330) 497-9396
PO: YES

REF 6180-111875

FedEx Express

3 of 4
MPS# 0263 4359 6080 2103
Mstr# 4359 6080 2088

TUE - 25 MAR 10:30A
PRIORITY OVERNIGHT

0201

64 CAKA

44203
OH-US CLE

**Eurofins Pittsburgh**
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

# Chain of Custody Record

eurofins | Environment Testing

| Client Information (Sub Contract Lab) | Sampler: N/A | Lab PM: Brown, Shali | Carrier Tracking No(s): N/A | COC No: 180-535349.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: N/A | E-Mail: Shali.Brown@et.eurofinsus.com | State of Origin: Illinois | Page: Page 1 of 1 |
| Company: Eurofins Lancaster Laboratories Environm | | Accreditations Required (See note): NELAP - Illinois | | Job #: 180-187841-1 |
| Address: 2425 New Holland Pike, , | Due Date Requested: 4/7/2025 | | | |
| City: Lancaster | TAT Requested (days): N/A | | | |
| State, Zip: PA, 17601 | | | | |
| Phone: 717-656-2300(Tel) | PO #: N/A | | | |
| Email: N/A | WO #: N/A | | | |
| Project Name: Prairie Rock River Survey | Project #: 18029449 | | | |
| Site: N/A | SSOW#: N/A | | | |

**Analysis Requested**

**Preservation Codes:**

Other: N/A

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 6020B/3005A Project Metals | SM2340B_ICPMS/ Total Hardness (as CaCO3) by calculation | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| RRD-10 (180-187841-2) | 3/24/25 | 10:30 Central | G | Water | | | X | X | 1 | |
| RRD-9 (180-187841-4) | 3/24/25 | 10:33 Central | G | Water | | | X | X | 1 | |
| RRD-8 (180-187841-6) | 3/24/25 | 10:36 Central | G | Water | | | X | X | 1 | |
| RRD-7 (180-187841-8) | 3/24/25 | 10:39 Central | G | Water | | | X | X | 1 | |
| RRD-6 (180-187841-10) | 3/24/25 | 10:42 Central | G | Water | | | X | X | 1 | |
| RRD-5 (180-187841-12) | 3/24/25 | 10:45 Central | G | Water | | | X | X | 1 | |
| RRD-3 (180-187841-14) | 3/24/25 | 10:48 Central | G | Water | | | X | X | 1 | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

| *Possible Hazard Identification* | *Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)* |
|---|---|
| *Unconfirmed* | ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|---|
| 1 | | 3/25/25 1330 | EHTNE | | 3/25/25 1405 | ELLE |
| 2 | | 3/25/25 1847 | ELLE | | | |
| 3 | | | | | 3/25/25 18:47 | ELLE |

| Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 3.2 3.1 |
|---|---|---|

CW

Ver: 10/10/2024

**ICOC No:**
180-535349

## Containers

| Count | Container Type | Preservative |
|---|---|---|
| 7 | Plastic 250ml - with Nitric Acid | Nitric Acid |

# Login Sample Receipt Checklist

Client: EnviroScience Inc

Job Number: 180-187841-1

**Login Number: 187841**
**List Number: 1**
**Creator: Say, Thomas C**

**List Source: Eurofins Pittsburgh**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | False | |
| Cooler Temperature is acceptable. | False | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: EnviroScience Inc

Job Number: 180-187841-1

**Login Number: 187841**
**List Number: 3**
**Creator: Cyms, Carolyn M**

**List Source: Eurofins Lancaster Laboratories Environment Testing, LLC**
**List Creation: 03/25/25 03:07 AM**

| Question | Answer | Comment |
|---|---|---|
| The cooler's custody seal is intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen). | True | |
| Cooler Temperature is recorded. | True | |
| WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen). | N/A | |
| WV:  Container Temperature is recorded. | N/A | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| There is sufficient vol. for all requested analyses. | True | |
| Is the Field Sampler's name present on COC? | False | Received project as a subcontract. |
| Sample custody seals are intact. | N/A | Not present. |
| VOA sample vials do not have headspace >6mm in diameter (none, if from WV)? | N/A | |

eurofins | Environment Testing

1 2 3 4 5 6 7 8 9 10 11 12 13

# ANALYTICAL REPORT

## PREPARED FOR

Attn: Nathan Nagler
EnviroScience Inc
5070 Stow Rd.
Stow, Ohio 44224

Generated 4/8/2025 6:18:30 PM

## JOB DESCRIPTION

Prairie Rock River Survey

## JOB NUMBER

180-187858-1

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh PA 15238

See page two for job notes and contact information.



myEOL

## Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

PA Lab ID: 02-00416

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Pittsburgh Project Manager.

## Authorization



Generated
4/8/2025 6:18:30 PM

Authorized for release by
Shali Brown, Project Manager II
Shali.Brown@et.eurofinsus.com
(615)301-5031

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**Job Narrative**
**180-187858-1**

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

**Receipt**
The samples were received on 3/18/2025 8:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.1°C.

**Receipt Exceptions**
The following sample was received outside of holding time for 7196: RRD_01 (180-187858-3). The client was contacted and the lab was instructed to proceed with analysis.

**GC/MS Semi VOA**
Method 8270E_LL: The continuing calibration verification (CCV) analyzed in 180-492487 was outside the method criteria for the following analyte(s): Hexachlorobutadiene, Hexachlorocyclopentadiene, 4-Nitrophenol and 4-Chlorophenyl phenyl ether. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated.

Method 8270E_LL: The continuing calibration verification (CCV) analyzed in 180-492213 was outside the method criteria for the following analyte(s): 4-Bromophenyl phenyl ether and Pentachlorophenol. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

**PCBs**
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

**Pesticides**
Method 8081B_LL: The continuing calibration verification (CCV) associated with 180-492904 recovered outside the control limits for TCMX on one column. Results are confirmed on both columns and reported from the passing column. The associated sample is: (CCVIS 180-492904/32).

Method 8081B_LL: The following samples were diluted due to the nature of the sample matrix: RRD-4 (180-187858-1), RRD-2 (180-187858-2), (180-187842-A-8-R), (180-187842-A-8-P MS) and (180-187842-A-8-Q MSD). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

**HPLC/IC**
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

**Metals**
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

**General Chemistry**
Method 350.1: The following samples were diluted to bring the concentration of target analytes within the calibration range: RRD-4 (180-187858-1), RRD-2 (180-187858-2), (180-187842-A-8-D), (180-187842-A-8-E MS) and (180-187842-A-8-F MSD). Elevated reporting limits (RLs) are provided.

## Job ID: 180-187858-1 (Continued) Eurofins Pittsburgh

Method 7196A: The following sample was received outside of holding time: RRD_01 (180-187858-3).

Method SM2540B: The sample duplicate precision for the following sample associated with analytical batch 180-492244 was outside control limits: RRD_01 (180-187858-3). The associated Laboratory Control Sample / Laboratory Control Sample Duplicate (LCS/LCSD) precision met acceptance criteria.

Method SM2540E_VS: The sample duplicate precision for the following sample associated with analytical batch 180-492430 was outside control limits: RRD_01 (180-187858-3). The associated Laboratory Control Sample / Laboratory Control Sample Duplicate (LCS/LCSD) precision met acceptance criteria. LCS was run in TS batch 492244.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

# Definitions/Glossary

Client: EnviroScience Inc
Job ID: 180-187858-1
Project/Site: Prairie Rock River Survey

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| ^2 | Calibration Blank (ICB and/or CCB) is outside acceptance limits. |
| B | Compound was found in the blank and sample. |
| F1 | MS and/or MSD recovery exceeds control limits. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| F3 | Duplicate RPD exceeds the control limit |
| H | Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements. |
| H3 | Sample was received and analyzed past holding time. This does not meet regulatory requirements. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ☼ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Accreditation/Certification Summary

Client: EnviroScience Inc
Job ID: 180-187858-1
Project/Site: Prairie Rock River Survey

## Laboratory: Eurofins Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| Illinois | NELAP | 200005 | 07-31-25 |

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

| Analysis Method | Prep Method | Matrix | Analyte |
|---|---|---|---|
| 2540G | | Sediment | Percent Moisture |
| 2540G-2015 | | Sediment | Total Solids |
| 2540G-2015 | | Sediment | Total Volatile Solids |
| PCB | | Water | Polychlorinated biphenyls, Total |

## Laboratory: Eurofins Cleveland

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| Illinois | NELAP | 200004 | 08-31-25 |

## Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| Illinois | NELAP | 200027 | 01-31-26 |

# Sample Summary

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187858-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Sediment | 03/13/25 13:45 | 03/18/25 08:50 |
| 180-187858-2 | RRD-2 | Sediment | 03/13/25 15:30 | 03/18/25 08:50 |
| 180-187858-3 | RRD_01 | Water | 03/13/25 09:30 | 03/18/25 08:50 |

# Method Summary

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187858-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| EPA 8270E LL | Semivolatile Organic Compounds (GC/MS) | SW846 | EET PIT |
| EPA 8081B LL | Organochlorine Pesticides (GC) | SW846 | EET PIT |
| EPA 8082A | Polychlorinated Biphenyls (PCBs) (GC) | SW846 | EET PIT |
| PCB | Total PCB Calculation | TAL SOP | EET PIT |
| EPA 9056A | Anions, Ion Chromatography | SW846 | EET PIT |
| 1631E | Mercury, Low Level (CVAFS) | EPA | EET CLE |
| 6020B | Metals (ICP/MS) | SW846 | ELLE |
| 2540B-2015 | Solids, Total | SM | EET PIT |
| 2540D-2015 | Total Suspended Solids (Dried at 103-105°C) | SM | EET PIT |
| 2540E-2015 | Solids, Volatile and Fixed (VS) | SM | EET PIT |
| 2540G | SM 2540G | SM22 | EET PIT |
| 2540G-2015 | Total, Fixed, and Volatile Solids | SM | EET PIT |
| EPA 1664B | HEM and SGT-HEM | EPA | EET PIT |
| EPA 350.1 | Nitrogen, Ammonia | EPA | EET PIT |
| EPA 7196A | Chromium, Hexavalent | SW846 | EET PIT |
| EPA 9071B | HEM and SGT-HEM | SW846 | EET PIT |
| 1631E | Preparation, Mercury, Low Level | EPA | EET CLE |
| 1664B | HEM and SGT-HEM (SPE) | 1664B | EET PIT |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | ELLE |
| 3050B | Preparation, Metals | SW846 | ELLE |
| 3060A | Alkaline Digestion (Chromium, Hexavalent) | SW846 | EET PIT |
| 350.1 | Distillation, Ammonia | EPA | EET PIT |
| 3510C | Liquid-Liquid Extraction (Separatory Funnel) | SW846 | EET PIT |
| 3520C | Liquid-Liquid Extraction (Continuous) | SW846 | EET PIT |
| 3541 | Automated Soxhlet Extraction (Low Level) | SW846 | EET PIT |
| 9071B | Preparation, HEM and SGT-HEM | SW846 | EET PIT |
| DI Leach | Deionized Water Leaching Procedure | ASTM | EET PIT |

**Protocol References:**

1664B = EPA-821-98-002
ASTM = ASTM International
EPA = US Environmental Protection Agency
SM = "Standard Methods For The Examination Of Water And Wastewater"
SM22 = Standard Methods For The Examination Of Water And Wastewater, 22nd Edition
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

**Laboratory References:**

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396
EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058
ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

# Lab Chronicle

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187858-1

## Client Sample ID: RRD-4
**Date Collected: 03/13/25 13:45**
**Date Received: 03/18/25 08:50**

## Lab Sample ID: 180-187858-1
**Matrix: Sediment**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 2540G | | 1 | | | 492178 | 03/19/25 13:00 | EBA | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540G-2015 | | 1 | | | 492077 | 03/18/25 13:47 | ELS | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: RRD-4
**Date Collected: 03/13/25 13:45**
**Date Received: 03/18/25 08:50**

## Lab Sample ID: 180-187858-1
**Matrix: Sediment**
**Percent Solids: 71.4**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3541 | | | 30.0 g | 0.5 mL | 492196 | 03/19/25 20:41 | DVC | EET PIT |
| Total/NA | Analysis | EPA 8270E LL | | 1 | 1 mL | 1 mL | 492213 | 03/20/25 17:35 | VVP | EET PIT |
| | Instrument ID: CH733 | | | | | | | | | |
| Total/NA | Prep | 3541 | | | 30.2 g | 1.0 mL | 492212 | 03/20/25 06:03 | MKK | EET PIT |
| Total/NA | Analysis | EPA 8081B LL | | 10 | | | 492904 | 03/31/25 20:13 | CMR | EET PIT |
| | Instrument ID: CHGC15 | | | | | | | | | |
| Soluble | Leach | DI Leach | | | 10.0629 g | 100 mL | 492438 | 03/24/25 12:59 | ERP | EET PIT |
| Soluble | Analysis | EPA 9056A | | 1 | 1 mL | 1 mL | 492425 | 03/24/25 21:01 | ERP | EET PIT |
| | Instrument ID: INUVION | | | | | | | | | |
| Total/NA | Prep | 1631E | | | 1.03 g | 40 mL | 649316 | 03/24/25 10:30 | GEV | EET CLE |
| Total/NA | Analysis | 1631E | | 4 | 2 mL | 40 mL | 649524 | 03/25/25 12:36 | GEV | EET CLE |
| | Instrument ID: H8 | | | | | | | | | |
| Total/NA | Prep | 3050B | | | 1.21 g | 100 mL | 621685 | 03/25/25 22:00 | UAMX | ELLE |
| Total/NA | Analysis | 6020B | | 2 | | | 623536 | 03/28/25 22:38 | LHF4 | ELLE |
| | Instrument ID: E09 - 30921 | | | | | | | | | |
| Total/NA | Prep | 350.1 | | | 0.21 g | 10 mL | 492166 | 03/19/25 12:01 | BAB | EET PIT |
| Total/NA | Analysis | EPA 350.1 | | 2 | | | 492293 | 03/20/25 15:17 | BAB | EET PIT |
| | Instrument ID: BLUE-ASTORIA | | | | | | | | | |
| Total/NA | Prep | 3060A | | | 2.51 g | 100 mL | 492142 | 03/19/25 10:13 | CMC | EET PIT |
| Total/NA | Analysis | EPA 7196A | | 1 | 4 mL | 4 mL | 492354 | 03/21/25 11:59 | CMC | EET PIT |
| | Instrument ID: RAPID-T | | | | | | | | | |
| Total/NA | Prep | 9071B | | | 30.0 g | 30.0 g | 492199 | 03/19/25 20:46 | DVC | EET PIT |
| Total/NA | Analysis | EPA 9071B | | 1 | | | 492259 | 03/20/25 12:09 | A1K | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: RRD-2
**Date Collected: 03/13/25 15:30**
**Date Received: 03/18/25 08:50**

## Lab Sample ID: 180-187858-2
**Matrix: Sediment**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 2540G | | 1 | | | 492286 | 03/20/25 15:49 | LWM | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540G-2015 | | 1 | | | 492077 | 03/18/25 13:47 | ELS | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

# Lab Chronicle

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187858-1

## Client Sample ID: RRD-2

**Date Collected: 03/13/25 15:30**
**Date Received: 03/18/25 08:50**

## Lab Sample ID: 180-187858-2

**Matrix: Sediment**
**Percent Solids: 67.1**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3541 | | | 30.3 g | 0.5 mL | 492196 | 03/19/25 20:41 | DVC | EET PIT |
| Total/NA | Analysis | EPA 8270E LL | | 1 | 1 mL | 1 mL | 492213 | 03/20/25 17:57 | VVP | EET PIT |
| | Instrument ID: CH733 | | | | | | | | | |
| Total/NA | Prep | 3541 | | | 30.1 g | 1.0 mL | 492212 | 03/20/25 06:03 | MKK | EET PIT |
| Total/NA | Analysis | EPA 8081B LL | | 10 | | | 492904 | 03/31/25 20:30 | CMR | EET PIT |
| | Instrument ID: CHGC15 | | | | | | | | | |
| Soluble | Leach | DI Leach | | | 10.0636 g | 100 mL | 492438 | 03/24/25 12:59 | ERP | EET PIT |
| Soluble | Analysis | EPA 9056A | | 1 | 1 mL | 1 mL | 492425 | 03/24/25 21:13 | ERP | EET PIT |
| | Instrument ID: INUVION | | | | | | | | | |
| Total/NA | Prep | 1631E | | | 1.00 g | 40 mL | 649316 | 03/24/25 10:30 | GEV | EET CLE |
| Total/NA | Analysis | 1631E | | 4 | 2 mL | 40 mL | 649524 | 03/25/25 12:50 | GEV | EET CLE |
| | Instrument ID: H8 | | | | | | | | | |
| Total/NA | Prep | 3050B | | | 1.19 g | 100 mL | 621685 | 03/25/25 22:00 | UAMX | ELLE |
| Total/NA | Analysis | 6020B | | 2 | | | 623536 | 03/28/25 22:42 | LHF4 | ELLE |
| | Instrument ID: E09 - 30921 | | | | | | | | | |
| Total/NA | Prep | 350.1 | | | 0.21 g | 10 mL | 492166 | 03/19/25 12:01 | BAB | EET PIT |
| Total/NA | Analysis | EPA 350.1 | | 2 | | | 492293 | 03/20/25 15:18 | BAB | EET PIT |
| | Instrument ID: BLUE-ASTORIA | | | | | | | | | |
| Total/NA | Prep | 3060A | | | 2.53 g | 100 mL | 492142 | 03/19/25 10:13 | CMC | EET PIT |
| Total/NA | Analysis | EPA 7196A | | 1 | 4 mL | 4 mL | 492354 | 03/21/25 12:00 | CMC | EET PIT |
| | Instrument ID: RAPID-T | | | | | | | | | |
| Total/NA | Prep | 9071B | | | 30.2 g | 30.0 g | 492199 | 03/19/25 20:46 | DVC | EET PIT |
| Total/NA | Analysis | EPA 9071B | | 1 | | | 492259 | 03/20/25 12:09 | A1K | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: RRD_01

**Date Collected: 03/13/25 09:30**
**Date Received: 03/18/25 08:50**

## Lab Sample ID: 180-187858-3

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3520C | | | 200 mL | 250 uL | 492174 | 03/19/25 12:25 | BJT | EET PIT |
| Total/NA | Analysis | EPA 8270E LL | | 1 | 1 mL | 1 mL | 492487 | 03/25/25 17:39 | VVP | EET PIT |
| | Instrument ID: CH731 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 1000 mL | 1.0 mL | 492129 | 03/19/25 08:31 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8081B LL | | 1 | | | 493453 | 04/08/25 13:00 | CMR | EET PIT |
| | Instrument ID: CHGC15 | | | | | | | | | |
| Total/NA | Prep | 3510C | | | 1000 mL | 1.0 mL | 492129 | 03/19/25 08:31 | KAV | EET PIT |
| Total/NA | Analysis | EPA 8082A | | 1 | 1 mL | 1 mL | 492206 | 03/20/25 20:46 | JMO | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | PCB | | 1 | | | 492380 | 03/20/25 20:46 | SAB | EET PIT |
| | Instrument ID: CHGC20 | | | | | | | | | |
| Total/NA | Analysis | EPA 9056A | | 1 | 1 mL | 1 mL | 492231 | 03/21/25 02:50 | M1D | EET PIT |
| | Instrument ID: INUVION | | | | | | | | | |

# Lab Chronicle

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187858-1

## Client Sample ID: RRD_01

**Date Collected: 03/13/25 09:30**
**Date Received: 03/18/25 08:50**

## Lab Sample ID: 180-187858-3

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 1631E | | | 40 mL | 40 mL | 649039 | 03/20/25 15:30 | TQ6W | EET CLE |
| Total/NA | Analysis | 1631E | | 1 | | | 649135 | 03/21/25 10:36 | TQ6W | EET CLE |
| | Instrument ID: H8 | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 621309 | 03/25/25 21:00 | UAMX | ELLE |
| Dissolved | Analysis | 6020B | | 1 | | | 622222 | 03/26/25 10:25 | SAM2 | ELLE |
| | Instrument ID: E08 - 30647 | | | | | | | | | |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 620648 | 03/24/25 21:00 | UAMX | ELLE |
| Total Recoverable | Analysis | 6020B | | 1 | | | 621729 | 03/25/25 20:07 | LHF4 | ELLE |
| | Instrument ID: E07 - 27813 | | | | | | | | | |
| Total/NA | Analysis | 2540B-2015 | | 1 | 50 mL | 100 mL | 492244 | 03/20/25 10:43 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540D-2015 | | 1 | 1000 mL | 1000 mL | 492113 | 03/19/25 07:32 | CMC | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | 2540E-2015 | | 1 | 50 mL | 100 mL | 492430 | 03/20/25 10:43 | SNR | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Prep | 1664B | | | 1050 mL | 1000 mL | 492309 | 03/21/25 07:21 | A1K | EET PIT |
| Total/NA | Analysis | EPA 1664B | | 1 | | | 492340 | 03/21/25 11:09 | A1K | EET PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |
| Total/NA | Analysis | EPA 350.1 | | 1 | | | 493200 | 04/03/25 13:35 | BAB | EET PIT |
| | Instrument ID: BLUE-ASTORIA | | | | | | | | | |
| Total/NA | Analysis | EPA 7196A | | 1 | 4 mL | 4 mL | 492083 | 03/18/25 11:05 | CMC | EET PIT |
| | Instrument ID: RAPID-T | | | | | | | | | |

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

**Laboratory References:**

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396
EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058
ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

# Lab Chronicle

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187858-1

**Analyst References:**

Lab: EET CLE
- Batch Type: Prep
  - GEV = Grace Vannest
  - TQ6W = Bryan Perelka
- Batch Type: Analysis
  - GEV = Grace Vannest
  - TQ6W = Bryan Perelka

Lab: EET PIT
- Batch Type: Leach
  - ERP = Evan Papak
- Batch Type: Prep
  - A1K = Agnes Komlos
  - BAB = Brooke Batyi
  - BJT = Bill Trout
  - CMC = Candace California
  - DVC = Daniel Capodanno
  - KAV = Katelyn Voss
  - MKK = Mary Kenny
- Batch Type: Analysis
  - A1K = Agnes Komlos
  - BAB = Brooke Batyi
  - CMC = Candace California
  - CMR = Carl Reagle
  - EBA = Elizabeth Arbster
  - ELS = Edwin Shireman
  - ERP = Evan Papak
  - JMO = John Oravec
  - LWM = Leslie McIntire
  - M1D = Maureen Donlin
  - SAB = Sharon Bacha
  - SNR = Sabra Richart
  - VVP = Vincent Piccolino

Lab: ELLE
- Batch Type: Prep
  - UAMX = Annamaria Kuhns
- Batch Type: Analysis
  - LHF4 = Diamond Boyer
  - SAM2 = Matthew Olley

## Client Sample ID: RRD-4
**Date Collected: 03/13/25 13:45**
**Date Received: 03/18/25 08:50**

## Lab Sample ID: 180-187858-1
**Matrix: Sediment**
**Percent Solids: 71.4**

### Method: SW846 EPA 8270E LL - Semivolatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 23 | 9.7 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| 2,4,5-Trichlorophenol | ND | | 23 | 8.1 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| 2,4,6-Trichlorophenol | ND | | 23 | 7.7 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| 2,4-Dichlorophenol | ND | | 4.7 | 1.8 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| 2,4-Dimethylphenol | ND | | 23 | 7.8 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| 2,4-Dinitrophenol | ND | | 230 | 140 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| 2,6-Dichlorophenol | ND | | 23 | 8.1 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| 2-Chlorophenol | ND | | 23 | 8.6 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| 2-Methylphenol | ND | | 23 | 6.7 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| 2-Nitrophenol | ND | | 23 | 8.6 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 120 | 40 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| 4-Chloro-3-methylphenol | ND | | 23 | 8.2 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| Methylphenol, 3 & 4 | ND | | 23 | 6.9 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| 4-Nitrophenol | ND | | 120 | 16 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |
| Pentachlorophenol | ND | | 120 | 38 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:35 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *77* | | *20 - 119* | *03/19/25 20:41* | *03/20/25 17:35* | *1* |
| *2-Fluorophenol (Surr)* | *60* | | *32 - 105* | *03/19/25 20:41* | *03/20/25 17:35* | *1* |
| *Phenol-d5 (Surr)* | *58* | | *34 - 105* | *03/19/25 20:41* | *03/20/25 17:35* | *1* |

### Method: SW846 EPA 8081B LL - Organochlorine Pesticides (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | | 0.58 | 0.18 | ug/Kg | ☼ | 03/20/25 06:03 | 03/31/25 20:13 | 10 |
| Dieldrin | ND | | 0.58 | 0.15 | ug/Kg | ☼ | 03/20/25 06:03 | 03/31/25 20:13 | 10 |
| Endrin | ND | | 0.58 | 0.11 | ug/Kg | ☼ | 03/20/25 06:03 | 03/31/25 20:13 | 10 |
| Heptachlor | ND | | 0.58 | 0.18 | ug/Kg | ☼ | 03/20/25 06:03 | 03/31/25 20:13 | 10 |
| Mirex | ND | | 0.58 | 0.42 | ug/Kg | ☼ | 03/20/25 06:03 | 03/31/25 20:13 | 10 |
| Toxaphene | ND | | 23 | 16 | ug/Kg | ☼ | 03/20/25 06:03 | 03/31/25 20:13 | 10 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *69* | | *30 - 150* | *03/20/25 06:03* | *03/31/25 20:13* | *10* |
| *DCB Decachlorobiphenyl (Surr)* | *68* | | *30 - 150* | *03/20/25 06:03* | *03/31/25 20:13* | *10* |
| *Tetrachloro-m-xylene (Surr)* | *60* | | *32 - 147* | *03/20/25 06:03* | *03/31/25 20:13* | *10* |
| *Tetrachloro-m-xylene (Surr)* | *44* | | *32 - 147* | *03/20/25 06:03* | *03/31/25 20:13* | *10* |

### Method: SW846 EPA 9056A - Anions, Ion Chromatography - Soluble

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Fluoride** | **1.7** | | 1.4 | 0.95 | mg/Kg | ☼ | | 03/24/25 21:01 | 1 |

### Method: EPA 1631E - Mercury, Low Level (CVAFS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **41** | **B F1** | 5.4 | 2.1 | ug/Kg | ☼ | 03/24/25 10:30 | 03/25/25 12:36 | 4 |

### Method: SW846 6020B - Metals (ICP/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **4.0** | | 0.46 | 0.15 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:38 | 2 |
| **Barium** | **100** | | 0.46 | 0.21 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:38 | 2 |
| **Cadmium** | **0.16** | | 0.12 | 0.046 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:38 | 2 |
| **Chromium** | **17** | | 0.46 | 0.22 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:38 | 2 |
| **Copper** | **8.5** | | 0.46 | 0.21 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:38 | 2 |

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187858-1

## Client Sample ID: RRD-4

**Date Collected: 03/13/25 13:45**
**Date Received: 03/18/25 08:50**

## Lab Sample ID: 180-187858-1

**Matrix: Sediment**
**Percent Solids: 71.4**

### Method: SW846 6020B - Metals (ICP/MS) (Continued)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 14000 | ^2 | 23 | 11 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:38 | 2 |
| Lead | 8.7 | | 0.23 | 0.088 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:38 | 2 |
| Manganese | 470 | | 0.46 | 0.23 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:38 | 2 |
| Nickel | 12 | | 0.46 | 0.22 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:38 | 2 |
| Selenium | 0.22 | J | 0.46 | 0.12 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:38 | 2 |
| Silver | ND | | 0.12 | 0.047 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:38 | 2 |
| Zinc | 43 | | 35 | 4.6 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:38 | 2 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture (SM22 2540G) | 28.6 | | 0.1 | 0.1 | % | | | 03/19/25 13:00 | 1 |
| Total Volatile Solids (SM 2540G-2015) | 2.8 | | 0.50 | 0.50 | % | | | 03/18/25 13:47 | 1 |
| Total Solids (SM 2540G-2015) | 67 | | 0.50 | 0.50 | % | | | 03/18/25 13:47 | 1 |
| Ammonia (EPA 350.1) | 120 | | 27 | 15 | mg/Kg | ☼ | 03/19/25 12:01 | 03/20/25 15:17 | 2 |
| Cr (VI) (SW846 EPA 7196A) | ND | | 0.56 | 0.30 | mg/Kg | ☼ | 03/19/25 10:13 | 03/21/25 11:59 | 1 |
| Oil & Grease (HEM) (SW846 EPA 9071B) | 170 | J | 230 | 100 | mg/Kg | ☼ | 03/19/25 20:46 | 03/20/25 12:09 | 1 |

## Client Sample ID: RRD-2
**Date Collected: 03/13/25 15:30**
**Date Received: 03/18/25 08:50**

## Lab Sample ID: 180-187858-2
**Matrix: Sediment**
**Percent Solids: 67.1**

### Method: SW846 EPA 8270E LL - Semivolatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 24 | 10 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| 2,4,5-Trichlorophenol | ND | | 24 | 8.5 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| 2,4,6-Trichlorophenol | ND | | 24 | 8.1 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| 2,4-Dichlorophenol | ND | | 4.9 | 1.9 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| 2,4-Dimethylphenol | ND | | 24 | 8.3 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| 2,4-Dinitrophenol | ND | | 240 | 150 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| 2,6-Dichlorophenol | ND | | 24 | 8.6 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| 2-Chlorophenol | ND | | 24 | 9.0 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| 2-Methylphenol | ND | | 24 | 7.1 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| 2-Nitrophenol | ND | | 24 | 9.1 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 130 | 43 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| 4-Chloro-3-methylphenol | ND | | 24 | 8.6 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| Methylphenol, 3 & 4 | ND | | 24 | 7.2 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| 4-Nitrophenol | ND | | 130 | 17 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |
| Pentachlorophenol | ND | | 130 | 40 | ug/Kg | ☼ | 03/19/25 20:41 | 03/20/25 17:57 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *89* | | *20 - 119* | *03/19/25 20:41* | *03/20/25 17:57* | *1* |
| *2-Fluorophenol (Surr)* | *69* | | *32 - 105* | *03/19/25 20:41* | *03/20/25 17:57* | *1* |
| *Phenol-d5 (Surr)* | *67* | | *34 - 105* | *03/19/25 20:41* | *03/20/25 17:57* | *1* |

### Method: SW846 EPA 8081B LL - Organochlorine Pesticides (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | | 0.62 | 0.19 | ug/Kg | ☼ | 03/20/25 06:03 | 03/31/25 20:30 | 10 |
| Dieldrin | ND | | 0.62 | 0.16 | ug/Kg | ☼ | 03/20/25 06:03 | 03/31/25 20:30 | 10 |
| Endrin | ND | | 0.62 | 0.12 | ug/Kg | ☼ | 03/20/25 06:03 | 03/31/25 20:30 | 10 |
| Heptachlor | ND | | 0.62 | 0.19 | ug/Kg | ☼ | 03/20/25 06:03 | 03/31/25 20:30 | 10 |
| Mirex | ND | | 0.62 | 0.45 | ug/Kg | ☼ | 03/20/25 06:03 | 03/31/25 20:30 | 10 |
| Toxaphene | ND | | 25 | 17 | ug/Kg | ☼ | 03/20/25 06:03 | 03/31/25 20:30 | 10 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *73* | | *30 - 150* | *03/20/25 06:03* | *03/31/25 20:30* | *10* |
| *DCB Decachlorobiphenyl (Surr)* | *72* | | *30 - 150* | *03/20/25 06:03* | *03/31/25 20:30* | *10* |
| *Tetrachloro-m-xylene (Surr)* | *72* | | *32 - 147* | *03/20/25 06:03* | *03/31/25 20:30* | *10* |
| *Tetrachloro-m-xylene (Surr)* | *52* | | *32 - 147* | *03/20/25 06:03* | *03/31/25 20:30* | *10* |

### Method: SW846 EPA 9056A - Anions, Ion Chromatography - Soluble

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Fluoride** | **2.2** | | 1.5 | 1.0 | mg/Kg | ☼ | | 03/24/25 21:13 | 1 |

### Method: EPA 1631E - Mercury, Low Level (CVAFS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **64** | **B** | 6.0 | 2.3 | ug/Kg | ☼ | 03/24/25 10:30 | 03/25/25 12:50 | 4 |

### Method: SW846 6020B - Metals (ICP/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **5.7** | | 0.50 | 0.17 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:42 | 2 |
| **Barium** | **120** | | 0.50 | 0.23 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:42 | 2 |
| **Cadmium** | **0.43** | | 0.13 | 0.050 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:42 | 2 |
| **Chromium** | **20** | | 0.50 | 0.24 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:42 | 2 |
| **Copper** | **12** | | 0.50 | 0.23 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:42 | 2 |

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187858-1

## Client Sample ID: RRD-2
**Date Collected: 03/13/25 15:30**
**Date Received: 03/18/25 08:50**

## Lab Sample ID: 180-187858-2
**Matrix: Sediment**
**Percent Solids: 67.1**

### Method: SW846 6020B - Metals (ICP/MS) (Continued)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 16000 | ^2 | 25 | 12 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:42 | 2 |
| Lead | 12 | | 0.25 | 0.095 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:42 | 2 |
| Manganese | 610 | | 0.50 | 0.25 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:42 | 2 |
| Nickel | 15 | | 0.50 | 0.24 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:42 | 2 |
| Selenium | 0.22 | J | 0.50 | 0.13 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:42 | 2 |
| Silver | 0.067 | J | 0.13 | 0.051 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:42 | 2 |
| Zinc | 68 | | 38 | 5.0 | mg/Kg | ☼ | 03/25/25 22:00 | 03/28/25 22:42 | 2 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture (SM22 2540G) | 32.9 | | 0.1 | 0.1 | % | | | 03/20/25 15:49 | 1 |
| Total Volatile Solids (SM 2540G-2015) | 2.5 | | 0.50 | 0.50 | % | | | 03/18/25 13:47 | 1 |
| Total Solids (SM 2540G-2015) | 70 | | 0.50 | 0.50 | % | | | 03/18/25 13:47 | 1 |
| Ammonia (EPA 350.1) | 220 | | 28 | 15 | mg/Kg | ☼ | 03/19/25 12:01 | 03/20/25 15:18 | 2 |
| Cr (VI) (SW846 EPA 7196A) | ND | | 0.59 | 0.31 | mg/Kg | ☼ | 03/19/25 10:13 | 03/21/25 12:00 | 1 |
| Oil & Grease (HEM) (SW846 EPA 9071B) | 200 | J | 250 | 110 | mg/Kg | ☼ | 03/19/25 20:46 | 03/20/25 12:09 | 1 |

## Client Sample ID: RRD_01

**Date Collected: 03/13/25 09:30**
**Date Received: 03/18/25 08:50**

## Lab Sample ID: 180-187858-3

**Matrix: Water**

### Method: SW846 EPA 8270E LL - Semivolatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 0.0013 | 0.00041 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.0013 | 0.00032 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.0013 | 0.00028 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| 2,4-Dichlorophenol | ND | | 0.00024 | 0.000064 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| 2,4-Dimethylphenol | ND | | 0.0013 | 0.00073 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| 2,4-Dinitrophenol | ND | | 0.013 | 0.0041 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| 2,6-Dichlorophenol | ND | | 0.0013 | 0.00023 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| 2-Chlorophenol | ND | | 0.0013 | 0.00028 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| 2-Methylphenol | ND | | 0.0013 | 0.00070 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| 2-Nitrophenol | ND | | 0.0013 | 0.00024 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 0.0063 | 0.0018 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| 4-Chloro-3-methylphenol | ND | | 0.0013 | 0.00054 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| Methylphenol, 3 & 4 | ND | | 0.0013 | 0.00047 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| 4-Nitrophenol | ND | | 0.0063 | 0.0012 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |
| Pentachlorophenol | ND | | 0.0063 | 0.0011 | mg/L | | 03/19/25 12:25 | 03/25/25 17:39 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *52* | | *23 - 128* | *03/19/25 12:25* | *03/25/25 17:39* | *1* |
| *2-Fluorophenol (Surr)* | *37* | | *20 - 105* | *03/19/25 12:25* | *03/25/25 17:39* | *1* |
| *Phenol-d5 (Surr)* | *35* | | *20 - 106* | *03/19/25 12:25* | *03/25/25 17:39* | *1* |

### Method: SW846 EPA 8081B LL - Organochlorine Pesticides (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | | 0.0013 | 0.00036 | ug/L | | 03/19/25 08:31 | 04/08/25 13:00 | 1 |
| Dieldrin | ND | | 0.0013 | 0.00027 | ug/L | | 03/19/25 08:31 | 04/08/25 13:00 | 1 |
| Endrin | ND | | 0.0013 | 0.00023 | ug/L | | 03/19/25 08:31 | 04/08/25 13:00 | 1 |
| Heptachlor | ND | | 0.0013 | 0.00045 | ug/L | | 03/19/25 08:31 | 04/08/25 13:00 | 1 |
| Mirex | ND | | 0.0013 | 0.00047 | ug/L | | 03/19/25 08:31 | 04/08/25 13:00 | 1 |
| Toxaphene | ND | | 0.10 | 0.049 | ug/L | | 03/19/25 08:31 | 04/08/25 13:00 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *62* | | *55 - 128* | *03/19/25 08:31* | *04/08/25 13:00* | *1* |
| *DCB Decachlorobiphenyl (Surr)* | *64* | | *55 - 128* | *03/19/25 08:31* | *04/08/25 13:00* | *1* |
| *Tetrachloro-m-xylene (Surr)* | *63* | | *56 - 125* | *03/19/25 08:31* | *04/08/25 13:00* | *1* |
| *Tetrachloro-m-xylene (Surr)* | *77* | | *56 - 125* | *03/19/25 08:31* | *04/08/25 13:00* | *1* |

### Method: SW846 EPA 8082A - Polychlorinated Biphenyls (PCBs) (GC)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 0.010 | 0.0048 | ug/L | | 03/19/25 08:31 | 03/20/25 20:46 | 1 |
| PCB-1221 | ND | | 0.010 | 0.0057 | ug/L | | 03/19/25 08:31 | 03/20/25 20:46 | 1 |
| PCB-1232 | ND | | 0.010 | 0.0052 | ug/L | | 03/19/25 08:31 | 03/20/25 20:46 | 1 |
| PCB-1242 | ND | | 0.010 | 0.0036 | ug/L | | 03/19/25 08:31 | 03/20/25 20:46 | 1 |
| PCB-1248 | ND | | 0.010 | 0.0080 | ug/L | | 03/19/25 08:31 | 03/20/25 20:46 | 1 |
| PCB-1254 | ND | | 0.010 | 0.0046 | ug/L | | 03/19/25 08:31 | 03/20/25 20:46 | 1 |
| PCB-1260 | ND | | 0.010 | 0.0039 | ug/L | | 03/19/25 08:31 | 03/20/25 20:46 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *64* | | *53 - 129* | *03/19/25 08:31* | *03/20/25 20:46* | *1* |
| *DCB Decachlorobiphenyl (Surr)* | *66* | | *53 - 129* | *03/19/25 08:31* | *03/20/25 20:46* | *1* |
| *Tetrachloro-m-xylene (Surr)* | *64* | | *58 - 125* | *03/19/25 08:31* | *03/20/25 20:46* | *1* |
| *Tetrachloro-m-xylene (Surr)* | *63* | | *58 - 125* | *03/19/25 08:31* | *03/20/25 20:46* | *1* |

# Client Sample Results

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187858-1

## Client Sample ID: RRD_01

**Date Collected: 03/13/25 09:30**
**Date Received: 03/18/25 08:50**

## Lab Sample ID: 180-187858-3

**Matrix: Water**

### Method: TAL SOP PCB - Total PCB Calculation

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Polychlorinated biphenyls, Total | ND | | 0.010 | 0.0080 | ug/L | | | 03/20/25 20:46 | 1 |

### Method: SW846 EPA 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Fluoride** | **0.099** | **J** | 0.10 | 0.026 | mg/L | | | 03/21/25 02:50 | 1 |

### Method: EPA 1631E - Mercury, Low Level (CVAFS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **1.3** | | 0.50 | 0.14 | ng/L | | 03/20/25 15:30 | 03/21/25 10:36 | 1 |

### Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **0.00077** | **J** | 0.0020 | 0.00068 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| **Barium** | **0.055** | | 0.0020 | 0.00075 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| Cadmium | ND | | 0.00050 | 0.00015 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| **Calcium** | **62** | **B ^2** | 0.12 | 0.050 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| Chromium | ND | | 0.0020 | 0.00055 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| **Copper** | **0.0011** | | 0.0010 | 0.00036 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| **Iron** | **0.25** | | 0.050 | 0.020 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| **Lead** | **0.00033** | **J** | 0.00050 | 0.00012 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| **Magnesium** | **35** | **^2** | 0.050 | 0.016 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| **Manganese** | **0.042** | **B** | 0.0020 | 0.00095 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| **Nickel** | **0.00081** | **J** | 0.0010 | 0.00040 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| **Selenium** | **0.00048** | **J** | 0.0010 | 0.00028 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| Silver | ND | | 0.00050 | 0.00010 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |
| Zinc | ND | | 0.010 | 0.0040 | mg/L | | 03/24/25 21:00 | 03/25/25 20:07 | 1 |

### Method: SW846 6020B - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Iron** | **290** | | 50 | 20 | ug/L | | 03/25/25 21:00 | 03/26/25 10:25 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Total Solids (SM 2540B-2015)** | **530** | | 20 | 20 | mg/L | | | 03/20/25 10:43 | 1 |
| **Total Suspended Solids (SM 2540D-2015)** | **16** | | 0.50 | 0.50 | mg/L | | | 03/19/25 07:32 | 1 |
| **Total Volatile Solids (SM 2540E-2015)** | **290** | | 20 | 20 | mg/L | | | 03/20/25 10:43 | 1 |
| **HEM (EPA 1664B)** | **4.8** | | 4.8 | 4.1 | mg/L | | 03/21/25 07:21 | 03/21/25 11:09 | 1 |
| Ammonia (EPA 350.1) | ND | | 0.10 | 0.088 | mg/L | | | 04/03/25 13:35 | 1 |
| Cr (VI) (SW846 EPA 7196A) | ND | H H3 | 0.010 | 0.0060 | mg/L | | | 03/18/25 11:05 | 1 |

## Method: EPA 8270E LL - Semivolatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 180-492174/1-A**
**Matrix: Water**
**Analysis Batch: 492487**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492174**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 0.0010 | 0.00033 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.0010 | 0.00025 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.0010 | 0.00022 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| 2,4-Dichlorophenol | ND | | 0.00019 | 0.000051 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| 2,4-Dimethylphenol | ND | | 0.0010 | 0.00059 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| 2,4-Dinitrophenol | ND | | 0.010 | 0.0033 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| 2,6-Dichlorophenol | ND | | 0.0010 | 0.00019 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| 2-Chlorophenol | ND | | 0.0010 | 0.00023 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| 2-Methylphenol | ND | | 0.0010 | 0.00056 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| 2-Nitrophenol | ND | | 0.0010 | 0.00019 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 0.0050 | 0.0015 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| 4-Chloro-3-methylphenol | ND | | 0.0010 | 0.00044 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| Methylphenol, 3 & 4 | ND | | 0.0010 | 0.00037 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| 4-Nitrophenol | ND | | 0.0050 | 0.00094 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |
| Pentachlorophenol | ND | | 0.0050 | 0.00085 | mg/L | | 03/19/25 12:24 | 03/25/25 12:53 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *62* | | *23 - 128* | *03/19/25 12:24* | *03/25/25 12:53* | *1* |
| *2-Fluorophenol (Surr)* | *57* | | *20 - 105* | *03/19/25 12:24* | *03/25/25 12:53* | *1* |
| *Phenol-d5 (Surr)* | *50* | | *20 - 106* | *03/19/25 12:24* | *03/25/25 12:53* | *1* |

**Lab Sample ID: LCS 180-492174/2-A**
**Matrix: Water**
**Analysis Batch: 492487**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492174**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | 0.0200 | 0.0176 | | mg/L | | 88 | 50 - 100 |
| 2,4,5-Trichlorophenol | 0.0200 | 0.0168 | | mg/L | | 84 | 55 - 100 |
| 2,4,6-Trichlorophenol | 0.0200 | 0.0167 | | mg/L | | 84 | 54 - 100 |
| 2,4-Dichlorophenol | 0.0200 | 0.0171 | | mg/L | | 86 | 55 - 100 |
| 2,4-Dimethylphenol | 0.0200 | 0.0138 | | mg/L | | 69 | 51 - 100 |
| 2,4-Dinitrophenol | 0.0400 | 0.0348 | | mg/L | | 87 | 32 - 100 |
| 2,6-Dichlorophenol | 0.0200 | 0.0162 | | mg/L | | 81 | 54 - 100 |
| 2-Chlorophenol | 0.0200 | 0.0153 | | mg/L | | 76 | 53 - 100 |
| 2-Methylphenol | 0.0200 | 0.0139 | | mg/L | | 70 | 51 - 100 |
| 2-Nitrophenol | 0.0200 | 0.0181 | | mg/L | | 91 | 56 - 100 |
| 4,6-Dinitro-2-methylphenol | 0.0400 | 0.0356 | | mg/L | | 89 | 48 - 100 |
| 4-Chloro-3-methylphenol | 0.0200 | 0.0167 | | mg/L | | 83 | 47 - 105 |
| Methylphenol, 3 & 4 | 0.0200 | 0.0133 | | mg/L | | 66 | 51 - 100 |
| 4-Nitrophenol | 0.0400 | 0.0398 | | mg/L | | 100 | 37 - 120 |
| Pentachlorophenol | 0.0400 | 0.0211 | | mg/L | | 53 | 35 - 102 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *88* | | *23 - 128* |
| *2-Fluorophenol (Surr)* | *76* | | *20 - 105* |
| *Phenol-d5 (Surr)* | *68* | | *20 - 106* |

## Method: EPA 8270E LL - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: MB 180-492196/1-A**
**Matrix: Sediment**
**Analysis Batch: 492213**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492196**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | ND | | 17 | 7.0 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| 2,4,5-Trichlorophenol | ND | | 17 | 5.8 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| 2,4,6-Trichlorophenol | ND | | 17 | 5.5 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| 2,4-Dichlorophenol | ND | | 3.4 | 1.3 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| 2,4-Dimethylphenol | ND | | 17 | 5.6 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| 2,4-Dinitrophenol | ND | | 170 | 100 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| 2,6-Dichlorophenol | ND | | 17 | 5.8 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| 2-Chlorophenol | ND | | 17 | 6.1 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| 2-Methylphenol | ND | | 17 | 4.8 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| 2-Nitrophenol | ND | | 17 | 6.1 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| 4,6-Dinitro-2-methylphenol | ND | | 85 | 29 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| 4-Chloro-3-methylphenol | ND | | 17 | 5.9 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| Methylphenol, 3 & 4 | ND | | 17 | 4.9 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| 4-Nitrophenol | ND | | 85 | 12 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |
| Pentachlorophenol | ND | | 85 | 27 | ug/Kg | | 03/19/25 20:41 | 03/20/25 09:07 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *89* | | *20 - 119* | *03/19/25 20:41* | *03/20/25 09:07* | *1* |
| *2-Fluorophenol (Surr)* | *69* | | *32 - 105* | *03/19/25 20:41* | *03/20/25 09:07* | *1* |
| *Phenol-d5 (Surr)* | *66* | | *34 - 105* | *03/19/25 20:41* | *03/20/25 09:07* | *1* |

**Lab Sample ID: LCS 180-492196/2-A**
**Matrix: Sediment**
**Analysis Batch: 492213**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492196**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| 2,3,4,6-Tetrachlorophenol | 333 | 245 | | ug/Kg | | 73 | 43 - 107 |
| 2,4,5-Trichlorophenol | 333 | 231 | | ug/Kg | | 69 | 47 - 108 |
| 2,4,6-Trichlorophenol | 333 | 250 | | ug/Kg | | 75 | 47 - 108 |
| 2,4-Dichlorophenol | 333 | 242 | | ug/Kg | | 73 | 48 - 101 |
| 2,4-Dimethylphenol | 333 | 199 | | ug/Kg | | 60 | 46 - 103 |
| 2,4-Dinitrophenol | 667 | 368 | | ug/Kg | | 55 | 31 - 112 |
| 2,6-Dichlorophenol | 333 | 241 | | ug/Kg | | 72 | 48 - 100 |
| 2-Chlorophenol | 333 | 238 | | ug/Kg | | 72 | 43 - 100 |
| 2-Methylphenol | 333 | 234 | | ug/Kg | | 70 | 43 - 101 |
| 2-Nitrophenol | 333 | 254 | | ug/Kg | | 76 | 48 - 108 |
| 4,6-Dinitro-2-methylphenol | 667 | 418 | | ug/Kg | | 63 | 47 - 104 |
| 4-Chloro-3-methylphenol | 333 | 234 | | ug/Kg | | 70 | 47 - 108 |
| Methylphenol, 3 & 4 | 333 | 232 | | ug/Kg | | 69 | 43 - 104 |
| 4-Nitrophenol | 667 | 468 | | ug/Kg | | 70 | 33 - 131 |
| Pentachlorophenol | 667 | 474 | | ug/Kg | | 71 | 34 - 112 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2,4,6-Tribromophenol (Surr)* | *85* | | *20 - 119* |
| *2-Fluorophenol (Surr)* | *70* | | *32 - 105* |
| *Phenol-d5 (Surr)* | *67* | | *34 - 105* |

## Method: EPA 8081B LL - Organochlorine Pesticides (GC)

**Lab Sample ID: MB 180-492212/1-A**
**Matrix: Sediment**
**Analysis Batch: 492904**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492212**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | | 0.042 | 0.013 | ug/Kg | | 03/20/25 06:03 | 03/31/25 11:46 | 1 |
| Dieldrin | ND | | 0.042 | 0.010 | ug/Kg | | 03/20/25 06:03 | 03/31/25 11:46 | 1 |
| Endrin | ND | | 0.042 | 0.0078 | ug/Kg | | 03/20/25 06:03 | 03/31/25 11:46 | 1 |
| Heptachlor | ND | | 0.042 | 0.013 | ug/Kg | | 03/20/25 06:03 | 03/31/25 11:46 | 1 |
| Mirex | ND | | 0.042 | 0.030 | ug/Kg | | 03/20/25 06:03 | 03/31/25 11:46 | 1 |
| Toxaphene | ND | | 1.7 | 1.1 | ug/Kg | | 03/20/25 06:03 | 03/31/25 11:46 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *84* | | *30 - 150* | *03/20/25 06:03* | *03/31/25 11:46* | *1* |
| *DCB Decachlorobiphenyl (Surr)* | *79* | | *30 - 150* | *03/20/25 06:03* | *03/31/25 11:46* | *1* |
| *Tetrachloro-m-xylene (Surr)* | *72* | | *32 - 147* | *03/20/25 06:03* | *03/31/25 11:46* | *1* |
| *Tetrachloro-m-xylene (Surr)* | *89* | | *32 - 147* | *03/20/25 06:03* | *03/31/25 11:46* | *1* |

**Lab Sample ID: LCS 180-492212/2-A**
**Matrix: Sediment**
**Analysis Batch: 492904**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492212**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Aldrin | 0.833 | 0.815 | | ug/Kg | | 98 | 47 - 123 |
| Dieldrin | 0.833 | 0.806 | | ug/Kg | | 97 | 50 - 137 |
| Endrin | 0.833 | 0.872 | | ug/Kg | | 105 | 49 - 142 |
| Heptachlor | 0.833 | 0.905 | | ug/Kg | | 109 | 45 - 123 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *85* | | *30 - 150* |
| *DCB Decachlorobiphenyl (Surr)* | *81* | | *30 - 150* |
| *Tetrachloro-m-xylene (Surr)* | *76* | | *32 - 147* |
| *Tetrachloro-m-xylene (Surr)* | *91* | | *32 - 147* |

## Method: EPA 8082A - Polychlorinated Biphenyls (PCBs) (GC)

**Lab Sample ID: MB 180-492129/1-A**
**Matrix: Water**
**Analysis Batch: 492206**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492129**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 0.010 | 0.0048 | ug/L | | 03/19/25 08:31 | 03/20/25 19:54 | 1 |
| PCB-1221 | ND | | 0.010 | 0.0057 | ug/L | | 03/19/25 08:31 | 03/20/25 19:54 | 1 |
| PCB-1232 | ND | | 0.010 | 0.0052 | ug/L | | 03/19/25 08:31 | 03/20/25 19:54 | 1 |
| PCB-1242 | ND | | 0.010 | 0.0036 | ug/L | | 03/19/25 08:31 | 03/20/25 19:54 | 1 |
| PCB-1248 | ND | | 0.010 | 0.0080 | ug/L | | 03/19/25 08:31 | 03/20/25 19:54 | 1 |
| PCB-1254 | ND | | 0.010 | 0.0046 | ug/L | | 03/19/25 08:31 | 03/20/25 19:54 | 1 |
| PCB-1260 | ND | | 0.010 | 0.0039 | ug/L | | 03/19/25 08:31 | 03/20/25 19:54 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl (Surr)* | *106* | | *53 - 129* | *03/19/25 08:31* | *03/20/25 19:54* | *1* |
| *DCB Decachlorobiphenyl (Surr)* | *111* | | *53 - 129* | *03/19/25 08:31* | *03/20/25 19:54* | *1* |
| *Tetrachloro-m-xylene (Surr)* | *109* | | *58 - 125* | *03/19/25 08:31* | *03/20/25 19:54* | *1* |

## Method: EPA 8082A - Polychlorinated Biphenyls (PCBs) (GC) (Continued)

**Lab Sample ID: MB 180-492129/1-A**
**Matrix: Water**
**Analysis Batch: 492206**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492129**

| Surrogate | MB %Recovery | MB Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| Tetrachloro-m-xylene (Surr) | 115 | | 58 - 125 | 03/19/25 08:31 | 03/20/25 19:54 | 1 |

**Lab Sample ID: LCS 180-492129/2-A**
**Matrix: Water**
**Analysis Batch: 492206**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492129**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | | | 1.00 | 1.03 | | ug/L | | 103 | 47 - 119 | | |
| PCB-1260 | | | 1.00 | 0.861 | | ug/L | | 86 | 43 - 116 | | |

| Surrogate | LCS %Recovery | LCS Qualifier | Limits |
|---|---|---|---|
| DCB Decachlorobiphenyl (Surr) | 95 | | 53 - 129 |
| DCB Decachlorobiphenyl (Surr) | 102 | | 53 - 129 |
| Tetrachloro-m-xylene (Surr) | 100 | | 58 - 125 |
| Tetrachloro-m-xylene (Surr) | 105 | | 58 - 125 |

**Lab Sample ID: LCSD 180-492129/3-A**
**Matrix: Water**
**Analysis Batch: 492206**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 492129**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | | | 1.00 | 0.988 | | ug/L | | 99 | 47 - 119 | 4 | 35 |
| PCB-1260 | | | 1.00 | 0.856 | | ug/L | | 86 | 43 - 116 | 1 | 35 |

| Surrogate | LCSD %Recovery | LCSD Qualifier | Limits |
|---|---|---|---|
| DCB Decachlorobiphenyl (Surr) | 95 | | 53 - 129 |
| DCB Decachlorobiphenyl (Surr) | 96 | | 53 - 129 |
| Tetrachloro-m-xylene (Surr) | 99 | | 58 - 125 |
| Tetrachloro-m-xylene (Surr) | 102 | | 58 - 125 |

## Method: EPA 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 180-492231/42**
**Matrix: Water**
**Analysis Batch: 492231**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Fluoride | ND | | 0.10 | 0.026 | mg/L | | | 03/20/25 21:47 | 1 |

**Lab Sample ID: LCS 180-492231/43**
**Matrix: Water**
**Analysis Batch: 492231**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | | | 2.50 | 2.41 | | mg/L | | 96 | 80 - 120 | | |

## Method: EPA 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: MB 180-492438/1-A**
**Matrix: Sediment**
**Analysis Batch: 492425**

**Client Sample ID: Method Blank**
**Prep Type: Soluble**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Fluoride | ND | | 1.0 | 0.68 | mg/Kg | | | 03/24/25 16:36 | 1 |

**Lab Sample ID: LCS 180-492438/2-A**
**Matrix: Sediment**
**Analysis Batch: 492425**

**Client Sample ID: Lab Control Sample**
**Prep Type: Soluble**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Fluoride | 12.5 | 12.6 | | mg/Kg | | 101 | 80 - 120 |

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 240-649039/1-A**
**Matrix: Water**
**Analysis Batch: 649135**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 649039**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ND | | 0.50 | 0.14 | ng/L | | 03/20/25 15:30 | 03/21/25 09:43 | 1 |

**Lab Sample ID: LCS 240-649039/2-A**
**Matrix: Water**
**Analysis Batch: 649135**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 649039**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 5.57 | | ng/L | | 111 | 77 - 123 |

**Lab Sample ID: MB 240-649316/1-A**
**Matrix: Sediment**
**Analysis Batch: 649524**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 649316**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.428 | J | 1.0 | 0.39 | ug/Kg | | 03/24/25 10:30 | 03/25/25 12:26 | 1 |

**Lab Sample ID: LCS 240-649316/2-A**
**Matrix: Sediment**
**Analysis Batch: 649524**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 649316**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 10.0 | 11.7 | | ug/Kg | | 117 | 55 - 120 |

**Lab Sample ID: 180-187858-1 MS**
**Matrix: Sediment**
**Analysis Batch: 649524**

**Client Sample ID: RRD-4**
**Prep Type: Total/NA**
**Prep Batch: 649316**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 41 | B F1 | 14.0 | 41.3 | F1 | ug/Kg | ☼ | 3 | 28 - 136 |

## Method: 1631E - Mercury, Low Level (CVAFS) (Continued)

**Lab Sample ID: 180-187858-1 MSD**
**Matrix: Sediment**
**Analysis Batch: 649524**

**Client Sample ID: RRD-4**
**Prep Type: Total/NA**
**Prep Batch: 649316**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 41 | B F1 | 14.0 | 43.3 | F1 | ug/Kg | ☼ | 18 | 28 - 136 | 5 | 30 |

## Method: 6020B - Metals (ICP/MS)

**Lab Sample ID: MB 410-621685/1-A ^2**
**Matrix: Sediment**
**Analysis Batch: 623536**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 621685**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | ND | | 0.40 | 0.13 | mg/Kg | | 03/25/25 22:00 | 03/28/25 21:29 | 2 |
| Barium | ND | | 0.40 | 0.18 | mg/Kg | | 03/25/25 22:00 | 03/28/25 21:29 | 2 |
| Cadmium | ND | | 0.10 | 0.040 | mg/Kg | | 03/25/25 22:00 | 03/28/25 21:29 | 2 |
| Chromium | ND | | 0.40 | 0.19 | mg/Kg | | 03/25/25 22:00 | 03/28/25 21:29 | 2 |
| Copper | ND | | 0.40 | 0.18 | mg/Kg | | 03/25/25 22:00 | 03/28/25 21:29 | 2 |
| Lead | ND | | 0.20 | 0.076 | mg/Kg | | 03/25/25 22:00 | 03/28/25 21:29 | 2 |
| Manganese | ND | | 0.40 | 0.20 | mg/Kg | | 03/25/25 22:00 | 03/28/25 21:29 | 2 |
| Nickel | ND | | 0.40 | 0.19 | mg/Kg | | 03/25/25 22:00 | 03/28/25 21:29 | 2 |
| Selenium | ND | | 0.40 | 0.10 | mg/Kg | | 03/25/25 22:00 | 03/28/25 21:29 | 2 |
| Silver | ND | | 0.10 | 0.041 | mg/Kg | | 03/25/25 22:00 | 03/28/25 21:29 | 2 |
| Zinc | ND | | 30 | 4.0 | mg/Kg | | 03/25/25 22:00 | 03/28/25 21:29 | 2 |
| Iron | ND | | 20 | 9.2 | mg/Kg | | 03/25/25 22:00 | 03/28/25 21:29 | 2 |

**Lab Sample ID: LCS 410-621685/2-A ^2**
**Matrix: Sediment**
**Analysis Batch: 623536**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 621685**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 50.0 | 49.0 | | mg/Kg | | 98 | 87 - 114 |
| Barium | 50.0 | 52.6 | | mg/Kg | | 105 | 87 - 117 |
| Cadmium | 5.00 | 5.16 | | mg/Kg | | 103 | 88 - 117 |
| Chromium | 50.0 | 50.4 | | mg/Kg | | 101 | 86 - 116 |
| Copper | 50.0 | 51.0 | | mg/Kg | | 102 | 84 - 115 |
| Lead | 5.00 | 5.33 | | mg/Kg | | 107 | 88 - 117 |
| Manganese | 50.0 | 51.2 | | mg/Kg | | 102 | 87 - 116 |
| Nickel | 50.0 | 49.8 | | mg/Kg | | 100 | 87 - 115 |
| Selenium | 10.0 | 9.90 | | mg/Kg | | 99 | 87 - 115 |
| Silver | 5.00 | 5.26 | | mg/Kg | | 105 | 88 - 117 |
| Zinc | 50.0 | 51.9 | | mg/Kg | | 104 | 86 - 116 |
| Iron | 500 | 529 | | mg/Kg | | 106 | 87 - 117 |

**Lab Sample ID: MB 410-620648/1-A**
**Matrix: Water**
**Analysis Batch: 621729**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 620648**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | ND | | 0.0020 | 0.00068 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |
| Barium | ND | | 0.0020 | 0.00075 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |
| Cadmium | ND | | 0.00050 | 0.00015 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |
| Calcium | 0.0571 | J | 0.12 | 0.050 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |

## Method: 6020B - Metals (ICP/MS) (Continued)

**Lab Sample ID: MB 410-620648/1-A**
**Matrix: Water**
**Analysis Batch: 621729**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 620648**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chromium | ND | | 0.0020 | 0.00055 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |
| Copper | ND | | 0.0010 | 0.00036 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |
| Lead | ND | | 0.00050 | 0.00012 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |
| Magnesium | ND | | 0.050 | 0.016 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |
| Manganese | 0.00258 | | 0.0020 | 0.00095 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |
| Nickel | ND | | 0.0010 | 0.00040 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |
| Selenium | ND | | 0.0010 | 0.00028 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |
| Silver | ND | | 0.00050 | 0.00010 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |
| Zinc | ND | | 0.010 | 0.0040 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |
| Iron | ND | | 0.050 | 0.020 | mg/L | | 03/24/25 21:00 | 03/25/25 18:53 | 1 |

**Lab Sample ID: LCS 410-620648/2-A**
**Matrix: Water**
**Analysis Batch: 621729**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 620648**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 0.500 | 0.479 | | mg/L | | 96 | 90 - 109 |
| Barium | 0.500 | 0.493 | | mg/L | | 99 | 90 - 113 |
| Cadmium | 0.0500 | 0.0487 | | mg/L | | 97 | 90 - 112 |
| Calcium | 5.00 | 4.73 | | mg/L | | 95 | 90 - 112 |
| Chromium | 0.500 | 0.467 | | mg/L | | 93 | 90 - 110 |
| Copper | 0.500 | 0.473 | | mg/L | | 95 | 90 - 110 |
| Lead | 0.0500 | 0.0487 | | mg/L | | 97 | 90 - 110 |
| Magnesium | 5.00 | 4.70 | | mg/L | | 94 | 90 - 110 |
| Manganese | 0.500 | 0.470 | | mg/L | | 94 | 90 - 111 |
| Nickel | 0.500 | 0.474 | | mg/L | | 95 | 90 - 109 |
| Selenium | 0.100 | 0.0954 | | mg/L | | 95 | 90 - 110 |
| Silver | 0.0500 | 0.0503 | | mg/L | | 101 | 90 - 112 |
| Zinc | 0.500 | 0.474 | | mg/L | | 95 | 90 - 112 |
| Iron | 5.00 | 4.72 | | mg/L | | 94 | 90 - 111 |

**Lab Sample ID: MB 410-621309/1-A**
**Matrix: Water**
**Analysis Batch: 622222**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 621309**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | ND | | 50 | 20 | ug/L | | 03/25/25 21:00 | 03/26/25 09:22 | 1 |

**Lab Sample ID: LCS 410-621309/2-A**
**Matrix: Water**
**Analysis Batch: 622222**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 621309**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4990 | | ug/L | | 100 | 90 - 111 |

## Method: 2540B-2015 - Solids, Total

**Lab Sample ID: MB 180-492244/1**
**Matrix: Water**
**Analysis Batch: 492244**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Solids | ND | | 10 | 10 | mg/L | | | 03/20/25 10:43 | 1 |

**Lab Sample ID: LCS 180-492244/2**
**Matrix: Water**
**Analysis Batch: 492244**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Total Solids | 269 | 268 | | mg/L | | 100 | 85 - 115 |

**Lab Sample ID: 180-187858-3 DU**
**Matrix: Water**
**Analysis Batch: 492244**

**Client Sample ID: RRD_01**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Total Solids | 530 | | 462 | F3 | mg/L | | 13 | 10 |

## Method: 2540D-2015 - Total Suspended Solids (Dried at 103-105°C)

**Lab Sample ID: MB 180-492113/2**
**Matrix: Water**
**Analysis Batch: 492113**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Suspended Solids | ND | | 0.50 | 0.50 | mg/L | | | 03/19/25 07:32 | 1 |

**Lab Sample ID: LCS 180-492113/1**
**Matrix: Water**
**Analysis Batch: 492113**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Total Suspended Solids | 29.8 | 26.0 | | mg/L | | 87 | 85 - 115 |

## Method: 2540E-2015 - Solids, Volatile and Fixed (VS)

**Lab Sample ID: MB 180-492430/1**
**Matrix: Water**
**Analysis Batch: 492430**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Volatile Solids | ND | | 10 | 10 | mg/L | | | 03/20/25 10:43 | 1 |

**Lab Sample ID: 180-187858-3 DU**
**Matrix: Water**
**Analysis Batch: 492430**

**Client Sample ID: RRD_01**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Total Volatile Solids | 290 | | 246 | F3 | mg/L | | 17 | 10 |

## Method: EPA 1664B - HEM and SGT-HEM

**Lab Sample ID: MB 180-492309/1-A**
**Matrix: Water**
**Analysis Batch: 492340**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492309**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| HEM | ND | | 5.0 | 4.3 | mg/L | | 03/21/25 07:21 | 03/21/25 11:09 | 1 |

**Lab Sample ID: LCS 180-492309/2-A**
**Matrix: Water**
**Analysis Batch: 492340**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492309**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| HEM | 40.0 | 37.30 | | mg/L | | 93 | 78 - 114 |

**Lab Sample ID: LCSD 180-492309/3-A**
**Matrix: Water**
**Analysis Batch: 492340**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 492309**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| HEM | 40.0 | 40.80 | | mg/L | | 102 | 78 - 114 | 9 | 18 |

## Method: EPA 350.1 - Nitrogen, Ammonia

**Lab Sample ID: MB 180-492166/4-A**
**Matrix: Sediment**
**Analysis Batch: 492293**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492166**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | ND | | 11 | 6.1 | mg/Kg | | 03/19/25 12:00 | 03/20/25 15:01 | 1 |

**Lab Sample ID: LCS 180-492166/5-A**
**Matrix: Sediment**
**Analysis Batch: 492293**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492166**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Ammonia | 95.2 | 94.5 | | mg/Kg | | 99 | 90 - 110 |

**Lab Sample ID: MB 180-493200/17**
**Matrix: Water**
**Analysis Batch: 493200**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | ND | | 0.10 | 0.088 | mg/L | | | 04/03/25 13:10 | 1 |

**Lab Sample ID: MB 180-493200/49**
**Matrix: Water**
**Analysis Batch: 493200**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Ammonia | ND | | 0.10 | 0.088 | mg/L | | | 04/03/25 14:11 | 1 |

## Method: EPA 350.1 - Nitrogen, Ammonia (Continued)

**Lab Sample ID: LCS 180-493200/18**
**Matrix: Water**
**Analysis Batch: 493200**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Ammonia | 0.500 | 0.529 | | mg/L | | 106 | 90 - 110 |

**Lab Sample ID: LCS 180-493200/53**
**Matrix: Water**
**Analysis Batch: 493200**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Ammonia | 0.500 | 0.479 | | mg/L | | 96 | 90 - 110 |

## Method: EPA 7196A - Chromium, Hexavalent

**Lab Sample ID: MB 180-492083/12**
**Matrix: Water**
**Analysis Batch: 492083**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cr (VI) | ND | | 0.010 | 0.0060 | mg/L | | | 03/18/25 11:03 | 1 |

**Lab Sample ID: LCS 180-492083/13**
**Matrix: Water**
**Analysis Batch: 492083**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Cr (VI) | 0.500 | 0.515 | | mg/L | | 103 | 85 - 115 |

**Lab Sample ID: 180-187858-3 MS**
**Matrix: Water**
**Analysis Batch: 492083**

**Client Sample ID: RRD_01**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|---|---|
| Cr (VI) | ND | H H3 | 0.500 | 0.449 | | mg/L | | 90 | 85 - 115 |

**Lab Sample ID: 180-187858-3 MSD**
**Matrix: Water**
**Analysis Batch: 492083**

**Client Sample ID: RRD_01**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cr (VI) | ND | H H3 | 0.500 | 0.451 | | mg/L | | 90 | 85 - 115 | 0 | 20 |

**Lab Sample ID: MB 180-492142/1-A**
**Matrix: Sediment**
**Analysis Batch: 492354**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492142**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cr (VI) | ND | | 0.40 | 0.21 | mg/Kg | | 03/19/25 10:13 | 03/21/25 11:20 | 1 |

## Method: EPA 7196A - Chromium, Hexavalent (Continued)

**Lab Sample ID: LCSI 180-492142/3-A**
**Matrix: Sediment**
**Analysis Batch: 492354**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492142**

| Analyte | Spike Added | LCSI Result | LCSI Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Cr (VI) | 708 | 647 | | mg/Kg | | 91 | 80 - 120 |

**Lab Sample ID: LCSS 180-492142/2-A**
**Matrix: Sediment**
**Analysis Batch: 492354**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492142**

| Analyte | Spike Added | LCSS Result | LCSS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Cr (VI) | 20.0 | 19.8 | | mg/Kg | | 99 | 80 - 120 |

## Method: EPA 9071B - HEM and SGT-HEM

**Lab Sample ID: MB 180-492199/1-A**
**Matrix: Sediment**
**Analysis Batch: 492259**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 492199**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Oil & Grease (HEM) | ND | | 170 | 74 | mg/Kg | | 03/19/25 20:44 | 03/20/25 12:09 | 1 |

**Lab Sample ID: LCS 180-492199/2-A**
**Matrix: Sediment**
**Analysis Batch: 492259**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 492199**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---|---|---|---|---|---|---|---|
| Oil & Grease (HEM) | 1330 | 1040 | | mg/Kg | | 78 | 78 - 114 |

# QC Association Summary

Client: EnviroScience Inc
Project/Site: Prairie Rock River Survey

Job ID: 180-187858-1

## GC/MS Semi VOA

### Prep Batch: 492174

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | 3520C | |
| MB 180-492174/1-A | Method Blank | Total/NA | Water | 3520C | |
| LCS 180-492174/2-A | Lab Control Sample | Total/NA | Water | 3520C | |

### Prep Batch: 492196

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | 3541 | |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | 3541 | |
| MB 180-492196/1-A | Method Blank | Total/NA | Sediment | 3541 | |
| LCS 180-492196/2-A | Lab Control Sample | Total/NA | Sediment | 3541 | |

### Analysis Batch: 492213

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | EPA 8270E LL | 492196 |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | EPA 8270E LL | 492196 |
| MB 180-492196/1-A | Method Blank | Total/NA | Sediment | EPA 8270E LL | 492196 |
| LCS 180-492196/2-A | Lab Control Sample | Total/NA | Sediment | EPA 8270E LL | 492196 |

### Analysis Batch: 492487

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | EPA 8270E LL | 492174 |
| MB 180-492174/1-A | Method Blank | Total/NA | Water | EPA 8270E LL | 492174 |
| LCS 180-492174/2-A | Lab Control Sample | Total/NA | Water | EPA 8270E LL | 492174 |

## GC Semi VOA

### Prep Batch: 492129

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | 3510C | |
| MB 180-492129/1-A | Method Blank | Total/NA | Water | 3510C | |
| LCS 180-492129/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 180-492129/3-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |

### Analysis Batch: 492206

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | EPA 8082A | 492129 |
| MB 180-492129/1-A | Method Blank | Total/NA | Water | EPA 8082A | 492129 |
| LCS 180-492129/2-A | Lab Control Sample | Total/NA | Water | EPA 8082A | 492129 |
| LCSD 180-492129/3-A | Lab Control Sample Dup | Total/NA | Water | EPA 8082A | 492129 |

### Prep Batch: 492212

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | 3541 | |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | 3541 | |
| MB 180-492212/1-A | Method Blank | Total/NA | Sediment | 3541 | |
| LCS 180-492212/2-A | Lab Control Sample | Total/NA | Sediment | 3541 | |

### Analysis Batch: 492380

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | PCB | |

## GC Semi VOA

### Analysis Batch: 492904

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | EPA 8081B LL | 492212 |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | EPA 8081B LL | 492212 |
| MB 180-492212/1-A | Method Blank | Total/NA | Sediment | EPA 8081B LL | 492212 |
| LCS 180-492212/2-A | Lab Control Sample | Total/NA | Sediment | EPA 8081B LL | 492212 |

### Analysis Batch: 493453

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | EPA 8081B LL | 492129 |

## HPLC/IC

### Analysis Batch: 492231

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | EPA 9056A | |
| MB 180-492231/42 | Method Blank | Total/NA | Water | EPA 9056A | |
| LCS 180-492231/43 | Lab Control Sample | Total/NA | Water | EPA 9056A | |

### Analysis Batch: 492425

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Soluble | Sediment | EPA 9056A | 492438 |
| 180-187858-2 | RRD-2 | Soluble | Sediment | EPA 9056A | 492438 |
| MB 180-492438/1-A | Method Blank | Soluble | Sediment | EPA 9056A | 492438 |
| LCS 180-492438/2-A | Lab Control Sample | Soluble | Sediment | EPA 9056A | 492438 |

### Leach Batch: 492438

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Soluble | Sediment | DI Leach | |
| 180-187858-2 | RRD-2 | Soluble | Sediment | DI Leach | |
| MB 180-492438/1-A | Method Blank | Soluble | Sediment | DI Leach | |
| LCS 180-492438/2-A | Lab Control Sample | Soluble | Sediment | DI Leach | |

## Metals

### Prep Batch: 620648

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total Recoverable | Water | 3005A | |
| MB 410-620648/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 410-620648/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 621309

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Dissolved | Water | 3005A | |
| MB 410-621309/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 410-621309/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 621685

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | 3050B | |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | 3050B | |
| MB 410-621685/1-A ^2 | Method Blank | Total/NA | Sediment | 3050B | |
| LCS 410-621685/2-A ^2 | Lab Control Sample | Total/NA | Sediment | 3050B | |

## Metals

### Analysis Batch: 621729

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total Recoverable | Water | 6020B | 620648 |
| MB 410-620648/1-A | Method Blank | Total Recoverable | Water | 6020B | 620648 |
| LCS 410-620648/2-A | Lab Control Sample | Total Recoverable | Water | 6020B | 620648 |

### Analysis Batch: 622222

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Dissolved | Water | 6020B | 621309 |
| MB 410-621309/1-A | Method Blank | Total Recoverable | Water | 6020B | 621309 |
| LCS 410-621309/2-A | Lab Control Sample | Total Recoverable | Water | 6020B | 621309 |

### Analysis Batch: 623536

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | 6020B | 621685 |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | 6020B | 621685 |
| MB 410-621685/1-A ^2 | Method Blank | Total/NA | Sediment | 6020B | 621685 |
| LCS 410-621685/2-A ^2 | Lab Control Sample | Total/NA | Sediment | 6020B | 621685 |

### Prep Batch: 649039

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | 1631E | |
| MB 240-649039/1-A | Method Blank | Total/NA | Water | 1631E | |
| LCS 240-649039/2-A | Lab Control Sample | Total/NA | Water | 1631E | |

### Analysis Batch: 649135

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | 1631E | 649039 |
| MB 240-649039/1-A | Method Blank | Total/NA | Water | 1631E | 649039 |
| LCS 240-649039/2-A | Lab Control Sample | Total/NA | Water | 1631E | 649039 |

### Prep Batch: 649316

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | 1631E | |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | 1631E | |
| MB 240-649316/1-A | Method Blank | Total/NA | Sediment | 1631E | |
| LCS 240-649316/2-A | Lab Control Sample | Total/NA | Sediment | 1631E | |
| 180-187858-1 MS | RRD-4 | Total/NA | Sediment | 1631E | |
| 180-187858-1 MSD | RRD-4 | Total/NA | Sediment | 1631E | |

### Analysis Batch: 649524

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | 1631E | 649316 |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | 1631E | 649316 |
| MB 240-649316/1-A | Method Blank | Total/NA | Sediment | 1631E | 649316 |
| LCS 240-649316/2-A | Lab Control Sample | Total/NA | Sediment | 1631E | 649316 |
| 180-187858-1 MS | RRD-4 | Total/NA | Sediment | 1631E | 649316 |
| 180-187858-1 MSD | RRD-4 | Total/NA | Sediment | 1631E | 649316 |

## General Chemistry

### Analysis Batch: 492077

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | 2540G-2015 | |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | 2540G-2015 | |

### Analysis Batch: 492083

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | EPA 7196A | |
| MB 180-492083/12 | Method Blank | Total/NA | Water | EPA 7196A | |
| LCS 180-492083/13 | Lab Control Sample | Total/NA | Water | EPA 7196A | |
| 180-187858-3 MS | RRD_01 | Total/NA | Water | EPA 7196A | |
| 180-187858-3 MSD | RRD_01 | Total/NA | Water | EPA 7196A | |

### Analysis Batch: 492113

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | 2540D-2015 | |
| MB 180-492113/2 | Method Blank | Total/NA | Water | 2540D-2015 | |
| LCS 180-492113/1 | Lab Control Sample | Total/NA | Water | 2540D-2015 | |

### Prep Batch: 492142

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | 3060A | |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | 3060A | |
| MB 180-492142/1-A | Method Blank | Total/NA | Sediment | 3060A | |
| LCSI 180-492142/3-A | Lab Control Sample | Total/NA | Sediment | 3060A | |
| LCSS 180-492142/2-A | Lab Control Sample | Total/NA | Sediment | 3060A | |

### Prep Batch: 492166

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | 350.1 | |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | 350.1 | |
| MB 180-492166/4-A | Method Blank | Total/NA | Sediment | 350.1 | |
| LCS 180-492166/5-A | Lab Control Sample | Total/NA | Sediment | 350.1 | |

### Analysis Batch: 492178

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | 2540G | |

### Prep Batch: 492199

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | 9071B | |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | 9071B | |
| MB 180-492199/1-A | Method Blank | Total/NA | Sediment | 9071B | |
| LCS 180-492199/2-A | Lab Control Sample | Total/NA | Sediment | 9071B | |

### Analysis Batch: 492244

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | 2540B-2015 | |
| MB 180-492244/1 | Method Blank | Total/NA | Water | 2540B-2015 | |
| LCS 180-492244/2 | Lab Control Sample | Total/NA | Water | 2540B-2015 | |
| 180-187858-3 DU | RRD_01 | Total/NA | Water | 2540B-2015 | |

## General Chemistry

### Analysis Batch: 492259

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | EPA 9071B | 492199 |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | EPA 9071B | 492199 |
| MB 180-492199/1-A | Method Blank | Total/NA | Sediment | EPA 9071B | 492199 |
| LCS 180-492199/2-A | Lab Control Sample | Total/NA | Sediment | EPA 9071B | 492199 |

### Analysis Batch: 492286

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-2 | RRD-2 | Total/NA | Sediment | 2540G | |

### Analysis Batch: 492293

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | EPA 350.1 | 492166 |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | EPA 350.1 | 492166 |
| MB 180-492166/4-A | Method Blank | Total/NA | Sediment | EPA 350.1 | 492166 |
| LCS 180-492166/5-A | Lab Control Sample | Total/NA | Sediment | EPA 350.1 | 492166 |

### Prep Batch: 492309

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | 1664B | |
| MB 180-492309/1-A | Method Blank | Total/NA | Water | 1664B | |
| LCS 180-492309/2-A | Lab Control Sample | Total/NA | Water | 1664B | |
| LCSD 180-492309/3-A | Lab Control Sample Dup | Total/NA | Water | 1664B | |

### Analysis Batch: 492340

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | EPA 1664B | 492309 |
| MB 180-492309/1-A | Method Blank | Total/NA | Water | EPA 1664B | 492309 |
| LCS 180-492309/2-A | Lab Control Sample | Total/NA | Water | EPA 1664B | 492309 |
| LCSD 180-492309/3-A | Lab Control Sample Dup | Total/NA | Water | EPA 1664B | 492309 |

### Analysis Batch: 492354

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-1 | RRD-4 | Total/NA | Sediment | EPA 7196A | 492142 |
| 180-187858-2 | RRD-2 | Total/NA | Sediment | EPA 7196A | 492142 |
| MB 180-492142/1-A | Method Blank | Total/NA | Sediment | EPA 7196A | 492142 |
| LCSI 180-492142/3-A | Lab Control Sample | Total/NA | Sediment | EPA 7196A | 492142 |
| LCSS 180-492142/2-A | Lab Control Sample | Total/NA | Sediment | EPA 7196A | 492142 |

### Analysis Batch: 492430

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | 2540E-2015 | |
| MB 180-492430/1 | Method Blank | Total/NA | Water | 2540E-2015 | |
| 180-187858-3 DU | RRD_01 | Total/NA | Water | 2540E-2015 | |

### Analysis Batch: 493200

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-187858-3 | RRD_01 | Total/NA | Water | EPA 350.1 | |
| MB 180-493200/17 | Method Blank | Total/NA | Water | EPA 350.1 | |
| MB 180-493200/49 | Method Blank | Total/NA | Water | EPA 350.1 | |
| LCS 180-493200/18 | Lab Control Sample | Total/NA | Water | EPA 350.1 | |
| LCS 180-493200/53 | Lab Control Sample | Total/NA | Water | EPA 350.1 | |

**Eurofins Pittsburgh**
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone 412-963-7058 Fax 412-963-2468

# Chain of Custody Record

eurofins | Environment Testing

| Client Information | Sampler: Nathan Nagler | Lab PM: Colussy, Jill L | Carrier Tracking No(s): | COC No: 180-108090-19333 1 |
|---|---|---|---|---|
| Client Contact: ~~Dan Schweitzer~~ Nathan Nagler | Phone: 740-816-2868 | E-Mail: Jill.Colussy@et.eurofinsus.com | State of Origin: | Page: Page 1 of 2 |
| Company: EnviroScience Inc | PWSID: | Analysis Requested | | Job #: |
| Address: 5070 Stow Rd | Due Date Requested: | | | Preservation Codes: |
| City: Stow | TAT Requested (days): | | | |
| State, Zip: OH, 44224 | Compliance Project: Δ Yes Δ No | | | |
| Phone: ~~330-554-1677(Tel)~~ 740-816-2868 | PO #: Purchase Order Requested | | | |
| Email: ~~dschweitzer@enviroscienceinc.com~~ nnagler@enviroscienceinc.com | WO #: | | | Other: |
| Project Name: Prairie Rock River Survey | Project #: 18029449 | | | |
| Site: | SSOW#: | | | |

| Sample Identification | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | Preservation Code | Sr-90 Strontium-90 | Cs-137 Cesium-137 | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RRD-10 | 031125 | 1120 | G | W/S | | | 2 | 2 | | 4 | |
| RRD-9 | 031125 | 1440 | G | W/S | | | 2 | 2 | | 4 | |
| RRD-8 | 031125 | 1030 | G | W/S | | | 2 | 2 | | 4 | |
| RRD-7 | 031225 | 1220 | G | W/S | | | 2 | 2 | | 4 | |
| RRD-6 | 031225 | 1350 | G | W/S | | | 2 | 2 | | 4 | |
| RRD-5 | 031325 | 1310 | G | W/S | | | 2 | 2 | | 4 | |
| RRD-4 | 031325 | 1345 | G | ~~W/S~~ S | | | ~~2~~ | ~~2~~ | 1 | 4 | MS |
| RRD-3 | 031325 | 1455 | G | W/S | | | 2 | 2 | ~~1~~ | 3 | MSD |
| RRD-2 | 031325 | 1530 | G | S | | | | | 1 | 3 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Sr-90 Strontium-90 (Yes or No): Sediment
Cs-137 Cesium-137 (Yes or No): Water
8270E, 8081B-U, 25406.350 1, 7196A, 9056A/9056FM_28D, 9071-B
1631E
1602B

180-187858 Chain of Custody

***Possible Hazard Identification***
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)***
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III, IV, Other (specify)

Special Instructions/QC Requirements

| Empty Kit Relinquished by: | Date | Time | Method of Shipment: |
|---|---|---|---|
| | | | |

| | Relinquished by: | Date/Time | Company | Received by: | Date/Time | Company |
|---|---|---|---|---|---|---|
| 1 | | 031325 @ 1630 | ES | | 3/27/25 850 | ESPitt NE |
| 2 | Relinquished by: | Date/Time | Company | Received by: | Date/Time | Company |
| 3 | Relinquished by: | Date/Time | Company | Received by: | Date/Time | Company |

Custody Seals Intact: Δ Yes Δ No | Custody Seal No | Cooler Temperature(s) °C and Other Remarks

Ver: 10/10/2024

**Eurofins Pittsburgh**
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone 412-963-7058 Fax: 412-963-2468

# Chain of Custody Record

eurofins | Environment Testing

| Client Information | Sampler: Nathan Nagler (NN) | Lab PM: Colussy, Jill L | Carrier Tracking No(s): | COC No: 180-108090-19333 2 |
|---|---|---|---|---|
| Client Contact: ~~Dan Schweitzer~~ Nathan Nagler | Phone: 740-816-2668 | E-Mail: Jill Colussy@et.eurofinsus com | State of Origin: | Page: Page 2 of 2 |
| Company: EnviroScience Inc | PWSID: | Analysis Requested | | Job #: |
| Address: 5070 Stow Rd | Due Date Requested: | | | Preservation Codes: |
| City: Stow | TAT Requested (days): | | | |
| State, Zip: OH, 44224 | Compliance Project: Δ Yes Δ No | | | |
| Phone: ~~330-554-1877(Tel)~~ 740-816-2868 | PO #: Purchase Order Requested | | | |
| Email: ~~dschweitzer~~Nnagler@enviroscienceinc com | WO #: | | | Other: |
| Project Name: Prairie Rock River Survey | Project #: 18029449 | | | |
| Site: | SSOW#: | | | |

| Sample Identification | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 8270E-LL | 8081B-LL, 8082A-LL | 6020B - Project metals | 6020B - Dissolved metals | 160.2 | 160.3 | SM2540B, SM2540E-US, 7196A, 9056A | 2540D | 350.1 | | | | | | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | | | | | | | | | | | |
| RRD_01 | 031325 | 0930 | G | W | | | 2 | 4 | 1 | 1 | 2 | 3 | 2 | 1 | 1 | | | | | | 17 | NO Supernatant Samples collected. No sediment Observed |

***Possible Hazard Identification***
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)***
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III, IV, Other (specify)

Special Instructions/QC Requirements

| Empty Kit Relinquished by | Date | Time | Method of Shipment: |
|---|---|---|---|
| | | | |

| | Relinquished by | Date/Time | Company | Received by | Date/Time | Company |
|---|---|---|---|---|---|---|
| | [signature] | 031325 1830 | ES | [signature] | 3/17/25 850 | ESPitt NE |
| | Relinquished by: | Date/Time | Company | Received by: | Date/Time | Company |
| | Relinquished by: | Date/Time | Company | Received by: | Date/Time | Company |

| Custody Seals Intact Δ Yes Δ No | Custody Seal No. | Cooler Temperature(s) °C and Other Remarks |
|---|---|---|
| | | |

Ver: 10/10/2024


TO EUROFINS PITTSBURG
EUROFINS
301 ALPHA DRIVE RIDC PARK
PITTSBURGH PA 15238
(412) 963-7058
REF: 490
DEPT:
ACTWGT 50.00 LB
CAD: 112683742/INET4820
BILL SENDER
FedEx Express
TUE - 11 MAR 10:30A
FedEx 2 of 15
MPS# 0263 7726 0550 7244
PRIORITY OVERNIGHT
TM AGCA
15238
PA-US PIT
Uncorrected temp
Thermometer ID
CF -0.9
Initials
PT-WI-SR-001 effective 7/26/13
58CJ3/5027/C6C4
FedEx 10 of 15
MPS# 0263 7726 0550 2286
MON - 17 MAR
PRIORITY OVER
TM AGCA
PA-US
Uncorrected temp 9.4 °C
Thermometer ID 26
CF -0.9 Melted ice
Initials JB
PT-WI-SR-001 effective 7/26/13
58CJ3/5027/C6C4

**Eurofins Pittsburgh**
301 Alpha Drive RIDC Park
Pittsburgh PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

# Chain of Custody Record

eurofins
Environment Testing

| Client Information (Sub Contract Lab) | Sampler: N/A | Lab PM: Brown, Shali | Carrier Tracking No(s): N/A | COC No: 180-535077 1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: N/A | E-Mail: Shali.Brown@et.eurofinsus.com | State of Origin: Illinois | Page: Page 1 of 1 |
| Company: Eurofins Environment Testing North Centr | | Accreditations Required (See note): NELAP Illinois | | Job #: 180-187858-1 |
| Address: 180 S. Van Buren Avenue, | Due Date Requested: 4/7/2025 | | | |
| City: Barberton | TAT Requested (days): N/A | | | |
| State, Zip: OH, 44203 | | | | |
| Phone: 330-497-9396(Tel) 330-497-0772(Fax) | PO #: N/A | | | |
| Email: N/A | WO #: N/A | | | |
| Project Name: Prairie Rock River Survey | Project #: 18029449 | | | |
| Site: N/A | SSOW#: N/A | | | |

**Analysis Requested**

**Preservation Codes:**

Other: N/A

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 1631E/1631E_Prep Mercury, Low Level | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| RRD-4 (180-187858-1) | 3/13/25 | 13:45 Central | G | Sediment | | | X | 1 | |
| RRD-2 (180-187858-2) | 3/13/25 | 15:30 Central | G | Sediment | | | X | 1 | |
| RRD_01 (180-187858-3) | 3/13/25 | 09:30 Central | G | Water | | | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

| Possible Hazard Identification: Unconfirmed | Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months |
|---|---|
| Deliverable Requested: I, II, III IV Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|---|
| 1 | | 3/19/25 1200 | ERTAH | | 3/20/25 915 | Euro |
| 2 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| 3 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No. | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

**Eurofins – Cleveland Sample Receipt Form/Narrative** Login # :
**Barberton Facility**

Client Interlab Pit Site Name
Cooler Received on 3/20/25 Opened on 3/20/25
Cooler unpacked by: TF
FedEx· 1st Grd (Exp) UPS FAS Waypoint Client Drop Off Eurofins Courier Other
Receipt After-hours, Drop-off Date/Time Storage Location
Eurofins Cooler # 8C Foam Box Client Cooler Box Other
Packing material used: (Bubble Wrap) Foam Plastic Bag None Other
COOLANT· (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☑ See Multiple Cooler Form
IR GUN # 13 (CF +0 °C) *Observed Cooler Temp* °C *Corrected Cooler Temp.* °C

| | | |
|---|---|---|
| 2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 | (Yes) No | |
| -Were the seals on the outside of the cooler(s) signed & dated? | (Yes) No NA | |
| -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? | Yes (No) | |
| -Were tamper/custody seals intact and uncompromised? | Yes No (NA) | |
| 3 Shippers' packing slip attached to the cooler(s)? | (Yes) No | |
| 4. Did custody papers accompany the sample(s)? | (Yes) No | |
| 5 Were the custody papers relinquished & signed in the appropriate place? | (Yes) No | |
| 6. Was/were the person(s) who collected the samples clearly identified on the COC? | Yes (No) | |
| 7 Did all bottles arrive in good condition (Unbroken)? | (Yes) No | |
| 8 Could all bottle labels (ID/Date/Time) be reconciled with the COC? | (Yes) No | |
| 9 For each sample, does the COC specify preservatives (Y/N)? # of containers (Y/N), and sample type of grab/comp (Y/N)? | | |
| 10 Were correct bottle(s) used for the test(s) indicated? | (Yes) No | |
| 11 Sufficient quantity received to perform indicated analyses? | (Yes) No | |
| 12 Are these work share samples and all listed on the COC? | (Yes) No | |
| If yes, Questions 13-17 have been checked at the originating laboratory | | |
| 13 Were all preserved sample(s) at the correct pH upon receipt? | Yes No NA | pH Strip Lot# HC448976 |
| 14 Were VOAs on the COC? | Yes No | |
| 15 Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. | Yes No NA | |
| 16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # | Yes No | |
| 17 Was a LL Hg or Me Hg trip blank present? | Yes No | |

**Tests that are not checked for pH by Receiving·**
**VOAs**
**Oil and Grease**
**TOC**

Contacted PM Date by via Verbal Voice Mail Other

Concerning

**18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES** ☐ additional next page — Samples processed by·

**19 SAMPLE CONDITION**
Sample(s) were received after the recommended holding time had expired
Sample(s) were received in a broken container
Sample(s) were received with bubble >6 mm in diameter (Notify PM)

**20. SAMPLE PRESERVATION**
Sample(s) were further preserved in the laboratory
Time preserved. Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen.

Login # : _____

## Eurofins - Cleveland Sample Receipt Multiple Cooler Form

| Cooler Description (Circle) | IR Gun # (Circle) | Observed Temp °C | Corrected Temp °C | Coolant (Circle) |
|---|---|---|---|---|
| EC Client Box Other | IR GUN #: _____ | 12.4 | 12.4 | Wet Ice Blue Ice Dry Ice Water (None) |
| EC Client Box Other | IR GUN #: _____ | 12.1 | 12.1 | Wet Ice Blue Ice Dry Ice Water (None) |
| EC Client Box Other | IR GUN #: _____ | 3.6 | 3.6 | (Wet Ice) Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | 2.4 | 2.4 | (Wet Ice) Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | 2.3 | 2.3 | (Wet Ice) Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | 3.7 | 3.7 | (Wet Ice) Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | | | Wet Ice Blue Ice Dry Ice Water None |
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| EC Client Box Other | IR GUN #: _____ | | | Wet Ice Blue Ice Dry Ice Water None |
| EC Client Box Other | IR GUN #: _____ | | | Wet Ice Blue Ice Dry Ice Water None |

☐ See Temperature Excursion Form

4/8/2025

**t lift using this tag.**

(412) 963-7530
G DEPARTMENT
TESTING PITT N E

152382907
S

SHIP DATE 19MAR25
ACTWGT 25 00 LB MAN
CAD 0522321/CAFE3855

BILL SENDER

Part # 159469-494 RRDB2 EXP 02/26
SBCB/5027/FE2B

/RECEIVING
S ENVIRONMENT TESTING NORTH
N BUREN AVENUE

'ON OH 44203
REF 8100-111684

FedEx
Express

J243024070401 wv

THU - 20 MAR 10:30A
079 9169 PRIORITY OVERNIGHT
Place la

AKA

44203
OH-US CLE

CLP

**Eurofins Pittsburgh**
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

# Chain of Custody Record

eurofins | Environment Testing

| Client Information (Sub Contract Lab) | Sampler: N/A | Lab PM: Brown, Shali | Carrier Tracking No(s): N/A | COC No: 180-535115.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: N/A | E-Mail: Shali.Brown@et.eurofinsus.com | State of Origin: Illinois | Page: Page 1 of 1 |
| Company: Eurofins Lancaster Laboratories Environm | | Accreditations Required (See note): NELAP - Illinois | | Job #: 180-187858-1 |
| Address: 2425 New Holland Pike, , | Due Date Requested: 4/7/2025 | | | |
| City: Lancaster | TAT Requested (days): N/A | | | |
| State, Zip: PA, 17601 | | | | |
| Phone: 717-656-2300(Tel) | PO #: N/A | | | |
| Email: N/A | WO #: N/A | | | |
| Project Name: Prairie Rock River Survey | Project #: 18029449 | | | |
| Site: N/A | SSOW#: N/A | | | |

**Analysis Requested**

**Preservation Codes:** -

**Other:** N/A

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 6020B/3050B Project Metals | 6020B/3005A Project Metals | 6020B/FIELD_FLTRD (MOD) Dissolved Iron | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | |
| RRD-4 (180-187858-1) | 3/13/25 | 13:45 Central | G | Sediment | | | X | | | 1 | |
| RRD-2 (180-187858-2) | 3/13/25 | 15:30 Central | G | Sediment | | | X | | | 1 | |
| RRD_01 (180-187858-3) | 3/13/25 | 09:30 Central | G | Water | | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

| *Possible Hazard Identification* | *Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)* |
|---|---|
| *Unconfirmed* | ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|---|
| 1 | [signature] | 3-20-25 1300 | EPIAMF | [signature] Clarence Williams | 3/20/25 1300 | ELE |
| 2 | [signature] Clarence Williams | 3/20/25 1930 | ELE | Received by: | Date/Time: | Company |
| 3 | Relinquished by: | Date/Time: | Company | [signature] Received by: | Date/Time: 3/20/25 1939 | Company ELET |

| Custody Seals Intact: ∆ Yes ∆ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 5.8/5.8 2.8/2.8 |
|---|---|---|

Ver: 10/10/2024

# Login Sample Receipt Checklist

Client: EnviroScience Inc

Job Number: 180-187858-1

**Login Number: 187858**
**List Number: 1**
**Creator: Abernathy, Eric L**

**List Source: Eurofins Pittsburgh**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | False | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: EnviroScience Inc

Job Number: 180-187858-1

**Login Number: 187858**
**List Number: 3**
**Creator: McCaskey, Jonathan**

**List Source: Eurofins Lancaster Laboratories Environment Testing, LLC**
**List Creation: 03/22/25 10:28 AM**

| Question | Answer | Comment |
|---|---|---|
| The cooler's custody seal is intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen). | True | |
| Cooler Temperature is recorded. | True | |
| WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen). | N/A | |
| WV:  Container Temperature is recorded. | N/A | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| There is sufficient vol. for all requested analyses. | True | |
| Is the Field Sampler's name present on COC? | False | Received project as a subcontract. |
| Sample custody seals are intact. | N/A | |
| VOA sample vials do not have headspace >6mm in diameter (none, if from WV)? | N/A | |

# Appendix D

Grain Size Distribution Results

12460 Plaza Drive
Parma, Ohio 44130
P (216) 459-8378
**Terracon.com**

April 4, 2025

EnviroScience, Inc.
5070 Stow Road
Stow, Ohio 44224

**Attn:** Nathan Nagler – Environmental Compliance Manager
P: (740) 816-2868
E: nnagler@enviroscienceinc.com

**RE:** Laboratory Testing Results
2025 EnviroScience Lab Testing
Sears and Steel Dam – Rock River (24-510.001)
Terracon Project No. LN255008, Task 2

Dear Mr. Nagler:

Please find attached for your use the laboratory testing results for the Sears and Steel Dam – Rock River Project which were performed in accordance with Terracon's 2025 Laboratory Testing Services authorized by EnviroScience on March 17, 2025. The following laboratory testing results are attached:

Grain Size Distribution (2 pages)
Atterberg Limits (1 page)

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this transmittal or if we may be of further service, please contact us.

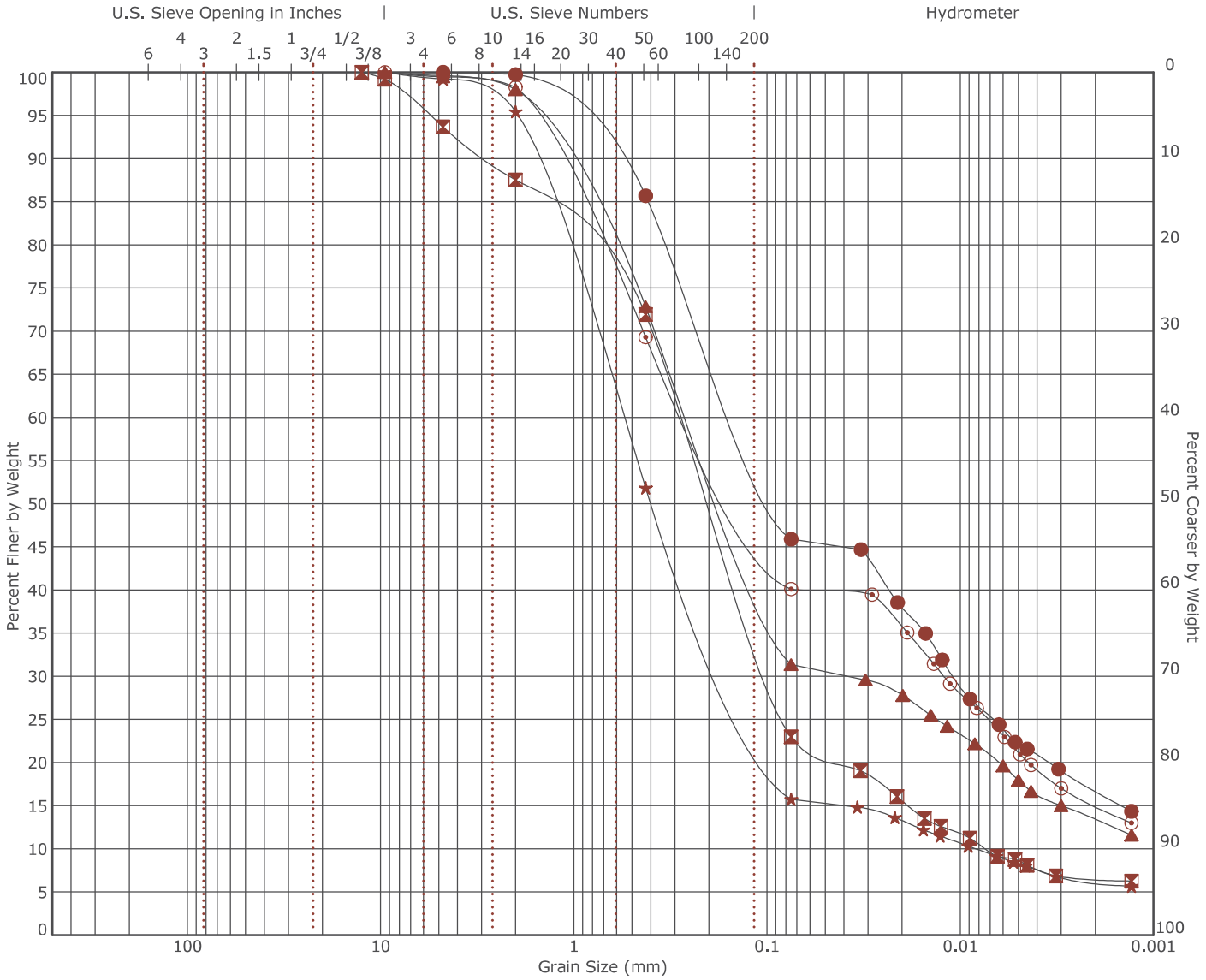
Sincerely,
**Terracon**

Daniel R. Pratt, P.E., P.G.
Senior Geotechnical Engineer

Thomas F. McDonnell, P.E.
Principal

# Grain Size Distribution

## ASTM D422 / ASTM C136




| Cobbles | Gravel | | Sand | | | Silt or Clay |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

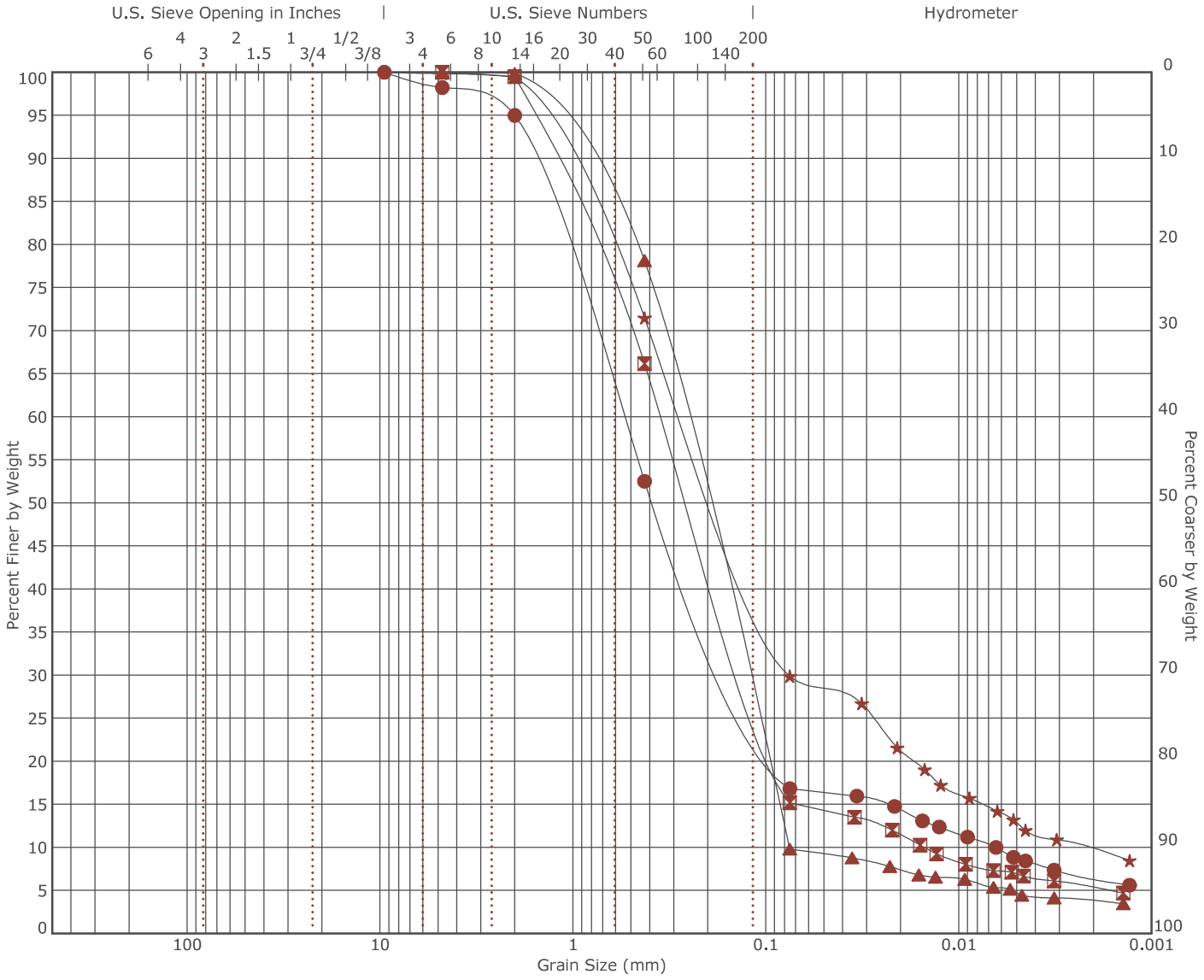
| Boring ID | Depth (Ft) | Description | USCS | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|---|
| ● RRD-02 | 0 | CLAYEY SAND | SC | 27 | 13 | 14 | | |
| ⊠ RRD-03 | 0 | SILTY SAND | SM | NP | NP | NP | 4.54 | 38.05 |
| ▲ RRD-04 | 0 | CLAYEY SAND | SC | 25 | 13 | 12 | | |
| ★ RRD-05 | 0 | SILTY SAND | SM | NP | NP | NP | 4.70 | 68.45 |
| ⊙ RRD-06 | 0 | CLAYEY SAND | SC | 31 | 15 | 16 | | |

| Boring ID | Depth (Ft) | $D_{100}$ | $D_{60}$ | $D_{30}$ | $D_{10}$ | %Cobbles | %Gravel | %Sand | %Fines | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ● RRD-02 | 0 | 4.75 | 0.139 | 0.011 | | 0.0 | 0.0 | 54.1 | 45.9 | 23.7 | 22.1 |
| ⊠ RRD-03 | 0 | 12.5 | 0.278 | 0.096 | 0.007 | 0.0 | 6.3 | 70.7 | 23.0 | 14.4 | 8.6 |
| ▲ RRD-04 | 0 | 9.5 | 0.248 | 0.038 | | 0.0 | 0.5 | 68.1 | 31.4 | 13.4 | 17.9 |
| ★ RRD-05 | 0 | 9.5 | 0.568 | 0.149 | 0.008 | 0.0 | 0.8 | 83.5 | 15.7 | 7.5 | 8.3 |
| ⊙ RRD-06 | 0 | 9.5 | 0.244 | 0.012 | | 0.0 | 0.4 | 59.5 | 40.1 | 18.9 | 21.2 |

EnviroScience 2025 Lab Testing
5070 Strow Rd | Stow, OH
Terracon Project No. LN255008

# Grain Size Distribution

## ASTM D422 / ASTM C136



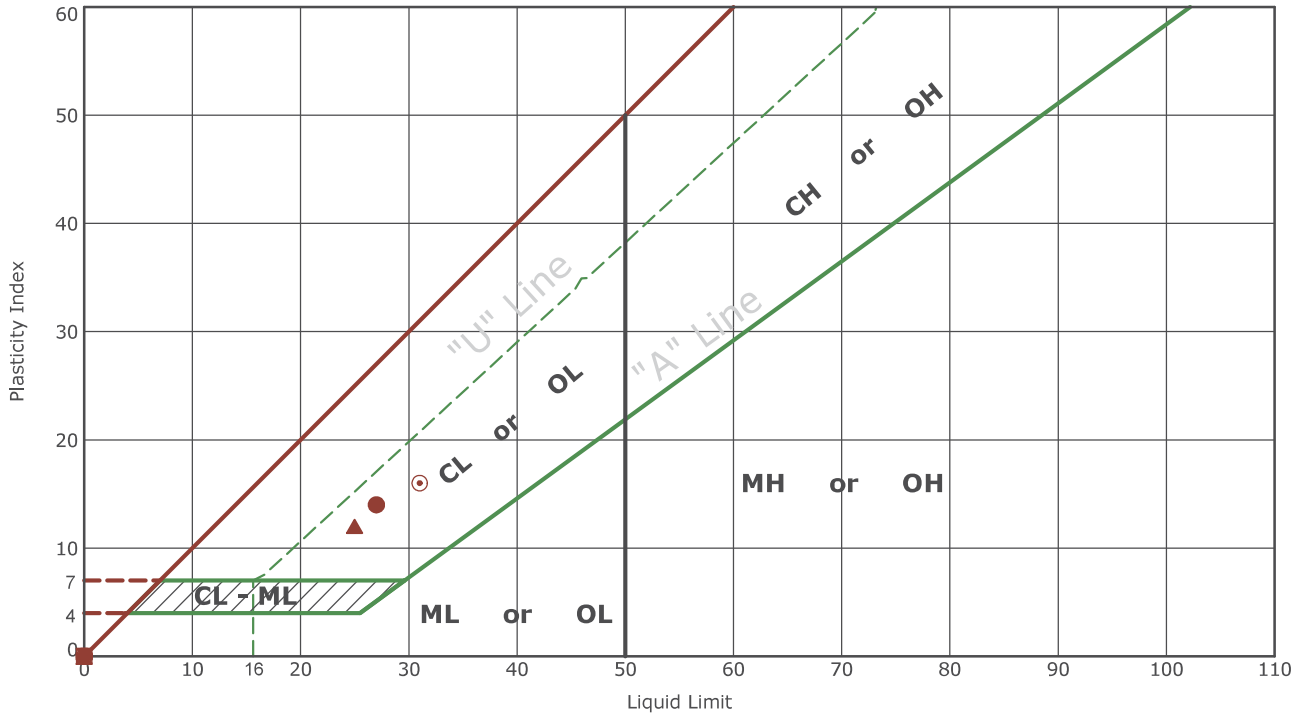

| Cobbles | Gravel | | Sand | | | Silt or Clay |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| Boring ID | Depth (Ft) | Description | USCS | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|---|
| ● RRD-07 | 0 | SILTY SAND | SM | NP | NP | NP | 5.65 | 87.00 |
| ⊠ RRD-08 | 0 | SILTY SAND | SM | NP | NP | NP | 2.97 | 22.88 |
| ▲ RRD-09 | 0 | POORLY GRADED SAND with SILT | SP-SM | NP | NP | NP | 0.78 | 3.56 |
| ★ RRD-10 | 0 | SILTY SAND | SM | NP | NP | NP | 9.58 | 116.90 |

| Boring ID | Depth (Ft) | $D_{100}$ | $D_{60}$ | $D_{30}$ | $D_{10}$ | %Cobbles | %Gravel | %Sand | %Fines | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ● RRD-07 | 0 | 9.5 | 0.559 | 0.142 | 0.006 | 0.0 | 1.8 | 81.4 | 16.8 | 8.1 | 8.7 |
| ⊠ RRD-08 | 0 | 4.75 | 0.345 | 0.124 | 0.015 | 0.0 | 0.0 | 84.8 | 15.2 | 8.3 | 6.9 |
| ▲ RRD-09 | 0 | 4.75 | 0.268 | 0.125 | 0.075 | 0.0 | 0.0 | 90.2 | 9.8 | 5.1 | 4.7 |
| ★ RRD-10 | 0 | 9.5 | 0.263 | 0.075 | 0.002 | 0.0 | 0.1 | 70.0 | 29.9 | 17.0 | 12.9 |

# Atterberg Limit Results

## ASTM D4318




| | Boring ID | Depth (Ft) | LL | PL | PI | Fines | USCS | Description |
|---|---|---|---|---|---|---|---|---|
| ● | RRD-02 | 0 | 27 | 13 | 14 | 45.9 | SC | CLAYEY SAND |
| ⊠ | RRD-03 | 0 | NP | NP | NP | 23.0 | SM | SILTY SAND |
| ▲ | RRD-04 | 0 | 25 | 13 | 12 | 31.4 | SC | CLAYEY SAND |
| ★ | RRD-05 | 0 | NP | NP | NP | 15.7 | SM | SILTY SAND |
| ⊙ | RRD-06 | 0 | 31 | 15 | 16 | 40.1 | SC | CLAYEY SAND |
| ✿ | RRD-07 | 0 | NP | NP | NP | 16.8 | SM | SILTY SAND |
| ○ | RRD-08 | 0 | NP | NP | NP | 15.2 | SM | SILTY SAND |
| △ | RRD-09 | 0 | NP | NP | NP | 9.8 | SP-SM | POORLY GRADED SAND with SILT |
| ⊗ | RRD-10 | 0 | NP | NP | NP | 29.9 | SM | SILTY SAND |

# Appendix E

Sand/Fine Split Analysis Result

**Illinois State Geological Survey and Illinois State Water Survey Sediment Laboratory**
**Report of Particle Size Analysis by Sand/Fine Split**

**Date of Report** 5/23/2025
**Batch Name** RockRiver
**Job Number** 450

| Lab # | Sample ID | Sample weight after OMR | sand beaker tare weight (g) | sand beaker gross weight (g) | Net sand weight (g) | % sample weight over 63 µm | % sample weight under 63 µm |
|---|---|---|---|---|---|---|---|
| 7082 | RRD-10 | 86.88 | 105.95 | 162.66 | 56.71 | 65.28% | 34.72% |
| 7083 | RRD-9 | 114.02 | 98.93 | 193.49 | 94.56 | 82.93% | 17.07% |
| 7084 | RRD-8 | 163.87 | 103.05 | 244.25 | 141.20 | 86.17% | 13.83% |
| 7085 | RRD-7 | 104.65 | 100.09 | 178.31 | 78.22 | 74.74% | 25.26% |
| 7086 | RRD-6 | 136.28 | 104.98 | 188.14 | 83.16 | 61.02% | 38.98% |
| 7087 | RRD-5 | 165.47 | 100.70 | 240.96 | 140.26 | 84.76% | 15.24% |
| 7088 | RRD-4 | 164.95 | 100.80 | 222.73 | 121.93 | 73.92% | 26.08% |
| 7089 | RRD-3 | 155.57 | 109.15 | 233.46 | 124.31 | 79.91% | 20.09% |
| 7090 | RRD-2 | 141.89 | 106.96 | 182.41 | 75.45 | 53.17% | 46.83% |

# APPENDIX E - Steel Dam Construction Plans 1987

HANSON™

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF WATER RESOURCES

# STEEL DAM ON ROCK RIVER AT MILAN ILLINOIS

## FR-320

## 1987

**INDEX**


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GENERAL PLAN ____ 3
STEEL DAM REPLACEMENT, SUBSURFACE EXPLORATION LOCATIONS & PROFILE ____ 4
BORING LOGS ____ 5
GRADING PLAN - SOUTH ABUTMENT ____ 6
PLAN AND DETAILS - SOUTH ABUTMENT ____ 7
DETAILS - SOUTH ABUTMENT ____ 8
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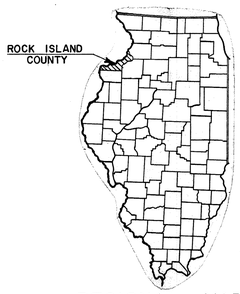

JAMES N. PEARCE 3207 REGISTERED STRUCTURAL ENGINEER OF ILLINOIS

James N. Pearce 5-22-87

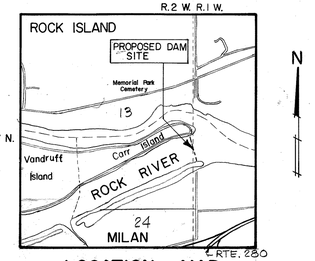
ILLINOIS REGISTERED STRUCTURAL ENGINEER NO. 81-3207

SUBMITTED BY _____ DATE 5/26/87
CHIEF, BUREAU OF DESIGN AND LAND RIGHTS

APPROVED BY _____ DATE 5/26/87
DIRECTOR




REGIONAL MAP



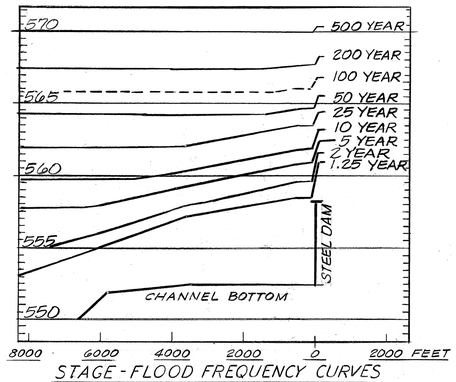

LOCATION MAP

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
SCALE

AS BUILT PLANS
SUBMITTED BY DON PRATHER
11-29-88

## SUMMARY OF QUANTITIES

| ITEM | UNIT | QUANTITY | AS BUILT |
|---|---|---|---|
| Cofferdams | lump sum | 1 | 1 |
| Structure Excavation | cu. yd. | 4,251 | 4,094 |
| Rock Excavation for Structures | cu.yd. | 604 | 938 |
| Removal of Existing Structures | each | 1 | 1 |
| Concrete Removal | cu.yd. | 16.5 | 16.5 |
| Class A Concrete | cu.yd. | 3,663.1 | 3757.8 |
| Class X Concrete | cu.yd. | 238.4 | 235.8 |
| Lean Concrete | cu.yd. | 422.6 | 489.7 |
| Reinforcement Bars | lb. | 83,480 | 122,052 |
| Name Plates | each | 2 | 2 |
| Pipe Handrail | lin.ft. | 176 | 176 |
| Stone Riprap | cu.yd. | 187 | 187 |
| Bedding | cu.yd. | 61 | 61 |
| Pipe Underdrains 6" | lin.ft. | 91 | 91 |
| Seeding, Mulching and Fertilizing | acre | 5.0 | 5.0 |
| Engineer's Field Office, Type A | Cal. Mo. | 18 | 15 |
| Expansion Bolts 3/4 inch | each | 20 | 10 |
| Rock Anchors, Complete | each | 47 | 47 |
| Water Tests | each | 94 | 82 |
| Cement, Grout | bag | 194 | 197 |
| Redrilling | lin.ft. | 743 | 1,538 |
| | | | |
| | | | |
| | | | |




STAGE - FLOOD FREQUENCY CURVES
*Uncorrected for partially closed channel*

## GENERAL NOTES

All elevations refer to N.G.V.D. (National Geodetic Vertical Datum) 1929 Adj.

The Contractor's construction procedures shall conform to E.P.A. #430/9-73-007 entitled, Processes, Procedures and Methods to Control Pollution Resulting from all Construction Activities, dated October, 1973.

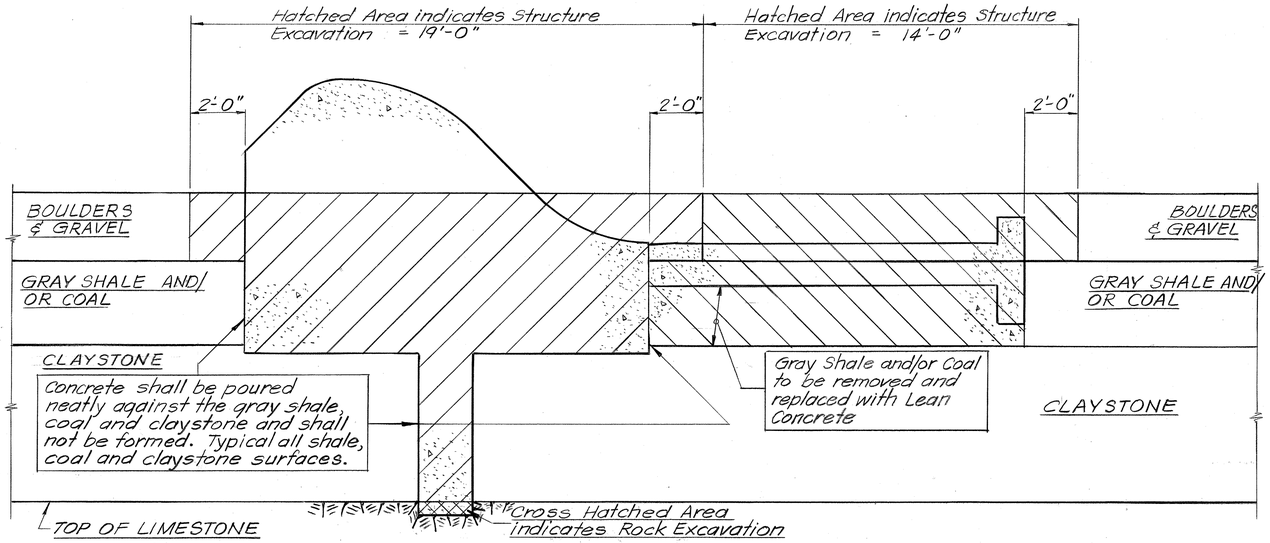
The Contractor shall furnish, erect and when directed by the Engineer, shall completely remove one (1) Construction Sign. The exact location of the Sign shall be established by the Engineer in the field.

The dam and abutments shall be founded on Sound limestone or Claystone as directed by the Engineer. The Contractor's attention is directed to the fact that the Claystone may be deeper, more extensive or generally shallower than the borings which encountered that zone indicate. The Quantities shown on the Plans are an estimate only. Payment shall be made on the basis of the actual quantity completed at the unit price for such item named in the proposal.

Class X Concrete shall be used in the abutments.

Class A Concrete shall be used in the dam overflow section and apron except as noted.

Surplus excavated materials shall be disposed of by the Contractor at his expense, outside the limits of the right of way.




TYPICAL DAM SECTION
SHOWING STRUCTURE AND ROCK EXCAVATION PAY LIMITS.

DESIGNED BY W.J.S. DATE 11-29-82
CHECKED BY J.N.P. DATE 11-24-82
ORIGINAL SURVEY BOOK
DRAWN BY V.L.S. DATE 6-22-82

REVISIONS

| ISSUE | REVISION LETTER | REVISED BY | DATE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

SCALE: AS SHOWN

FR-320

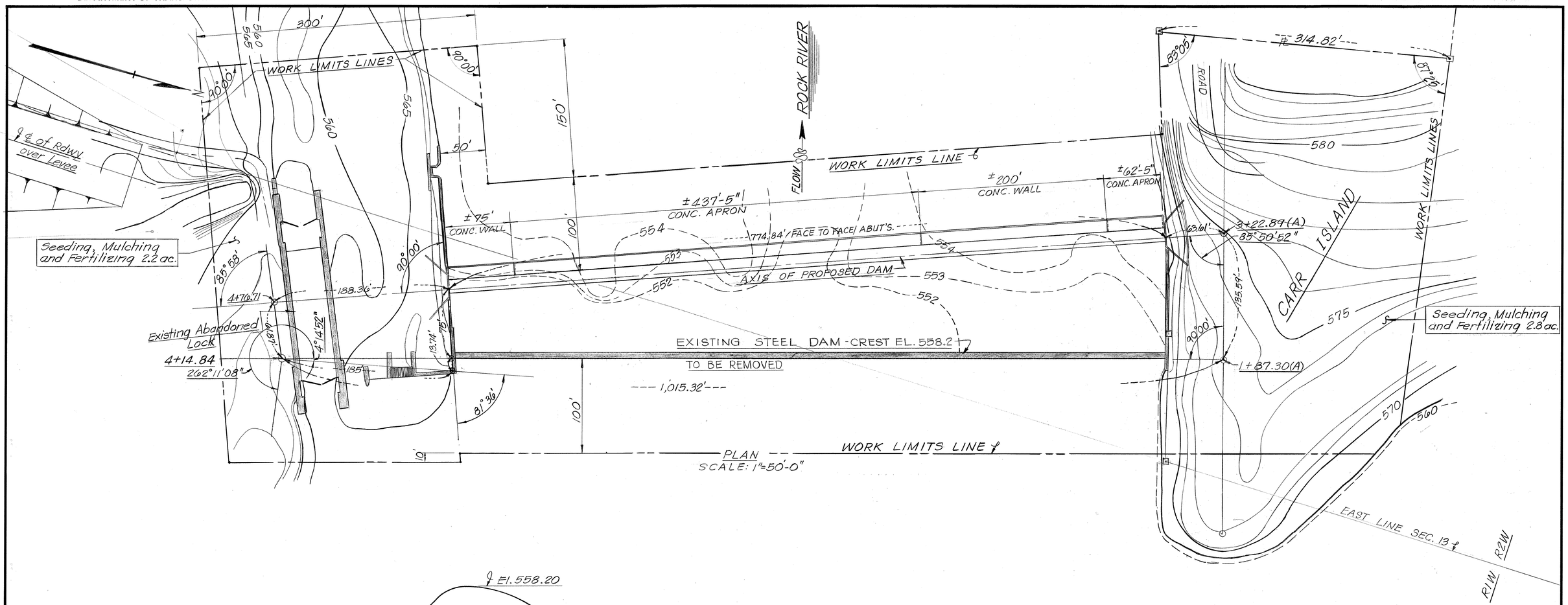
SUMMARY OF QUANTITIES AND GENERAL NOTES

FILE NO.
CLASSIFICATION NO.
SHEET NO. 2 OF 19 SHEETS

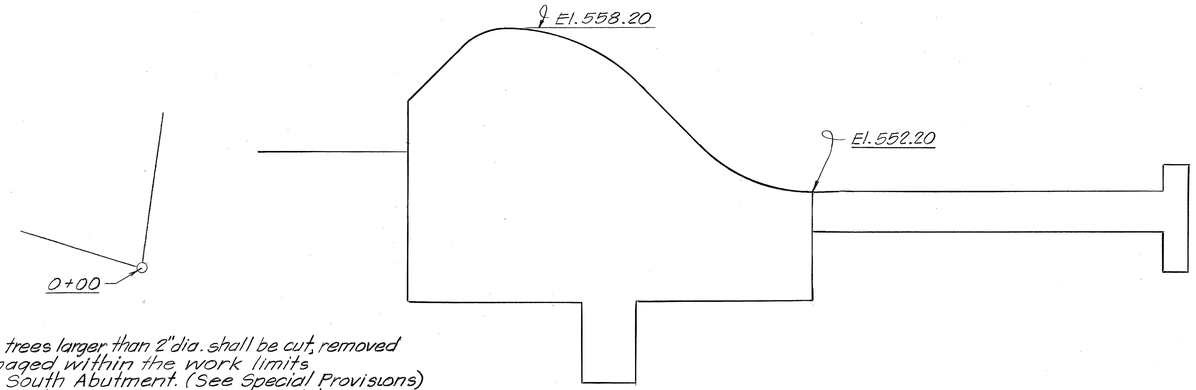
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

# STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

DIVISION OF WATER RESOURCES




PLAN
SCALE: 1"=50'-0"




TYPICAL SECTION

Note: No trees larger than 2" dia. shall be cut, removed or damaged within the work limits at the South Abutment. (See Special Provisions) The total area for Seeding, Mulching and Fertilizing has been estimated using the area inside the work limits line to the approximate waters edge. The final quantity shall be determined by the Engineer in the field.

BILL OF MATERIAL

| | |
|---|---|
| Seeding, Mulching and Fertilizing ac. | 5.0 |
| | |

FR-320

DESIGNED BY W.J.S. DATE 11-29-82
CHECKED BY J.N.P. DATE 11-29-82
ORIGINAL SURVEY BOOK
DRAWN BY V.I.S. DATE 6-15-82

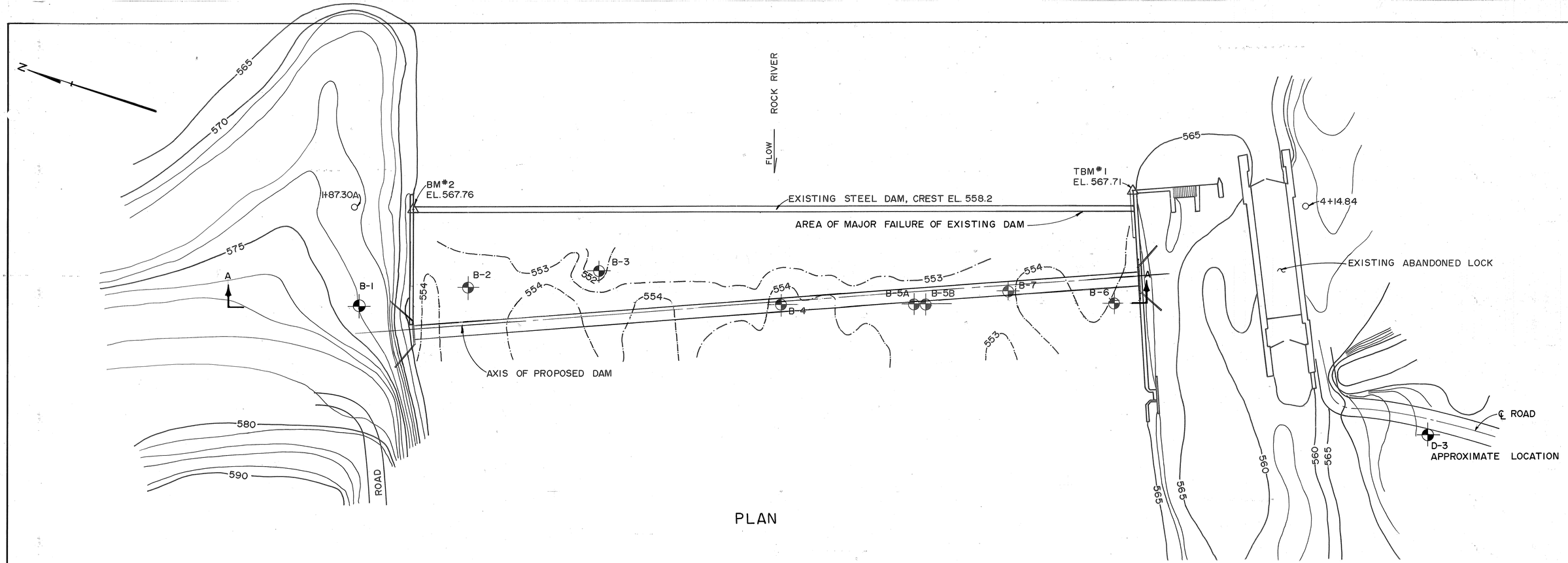
REVISIONS

| ISSUE | REVISION LETTER | REVISED BY | DATE |
|---|---|---|---|
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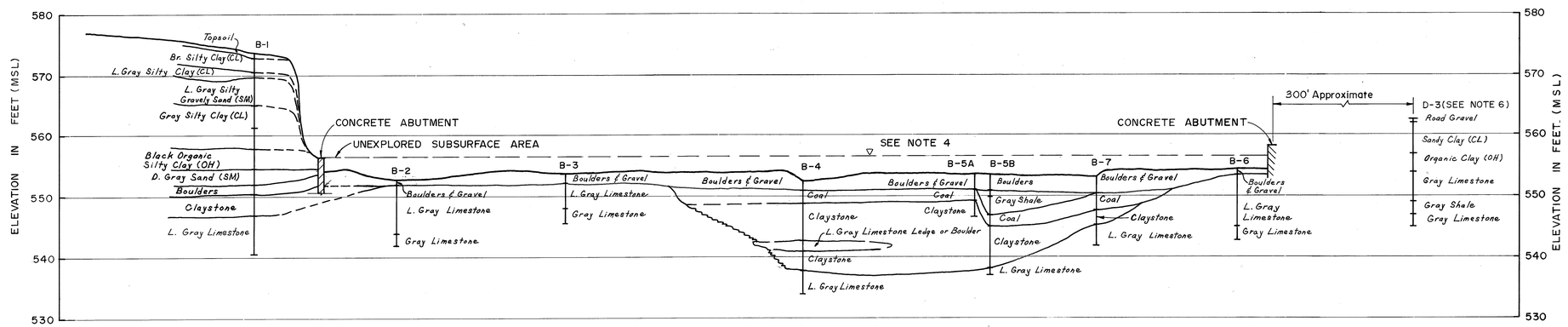
SCALE: AS SHOWN

GENERAL PLAN

FILE NO.
CLASSIFICATION NO.
SHEET NO. 3 OF 19 SHEETS




PLAN




INTERPRETATION OF SUBSURFACE CONDITIONS ALONG SECTION A-A

LEGEND

- B-7 — BORING LOCATION
- △ BM*2 — BENCHMARK
- ○ 4+14.84 — IDOT CONTROL POINT
- —554— CONTOUR OF RIVER BED
- —575— CONTOUR OF LAND SURFACE

NOTES

1. River bed topography obtained on December 8, 1981. Data is considered an approximate representation due to the presence of loose boulders and swift current.
2. Land surface topography taken from drawing prepared by Illinois Department of Transportation (IDOT), Division of Water Resources .
3. Benchmark TBM #1 and BM #2, are chiseled squares in top face of concrete abutments, as supplied by IDOT.
4. Water level of Rock River varied from 555.4 (12/21/81) to 556.7 (12/7/81) during river bed topography field survey.
5. The subsurface conditions between borings indicated on this drawing are an interpretation and may not be representative of the actual conditions to be encountered during construction. The thickness of loose gravel and boulders varies both with minor changes in location and with time. The possibility of an old fault zone or other localized discontinuity is suggested in the vicinity of Boring B-5B.
6. Boring D-3, supplied by U.S. Army Corps of Engineers, Rock Island District, was drilled May 21, 1975.

DANIEL P. DIETZLER 35645 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

SCALES

HORIZONTAL 0 — 50 FEET  VERTICAL 0 — 10 FEET

ILLINOIS DEPARTMENT OF TRANSPORTATION
DIVISION OF WATER RESOURCES
SPRINGFIELD, ILLINOIS

| | | |
|---|---|---|
| SCALE: AS NOTED | APPROVED BY: Daniel P. Dietzler | DRAWN BY: WM |
| DATE: 1/82 | | REVISED: |

STEEL DAM REPLACEMENT
SUBSURFACE EXPLORATION LOCATIONS & PROFILE

PATRICK ENGINEERING INC. — DRAWING NUMBER 099B-101

# BORING B-1

LOCATION: 52'N, 100'W DATE DRILLED: 1/22/82

WATER LEVEL: 18.8' During Drilling

| ELEV. (MSL) | DEPTH (FT) | DESCRIPTION | SAMPLE TYPE & NO. DEPTH(FT.) | SPT 6" | REC. (in.) | MOIST. % |
|---|---|---|---|---|---|---|
| 573.3 | 0.0 | 2" of snow & ice cover | HSA with center plug | | | |
| 572.8 | 0.5 | Brown silty topsoil | | | | |
| | | Brown silty clay, some gravel, $q_u$* > 4.5 tsf, frozen FILL | SS-1 1.0-2.5 | 41 80/3" | 9 | |
| 570.3 | 3.0 | At 3.0', 1" of light gray fractured limestone. | SS-2 2.5-4.0 | 35 50 | 12 | |
| 569.5 | 3.8 | Very hard light gray silty clay, $q_u$* > 4.5 tsf, frozen CL | SS-3 4.0-5.5 | 14 18 10 | 6 | |
| | | Dense light gray silty gravelly sand (angular gravel), dry SM | SS-4 5.5-7.0 | 13 15 15 | 6 | |
| | | | SS-5 7.0-8.5 | 14 26 23 | 9 | |
| 564.8 | 8.5 | Stiff gray silty clay, some gravel, little sand, low to high plasticity, $q_u$* = 1.5 to 2.0 tsf, moist to dry CL | SS-6 8.5-10.0 | 5 9 7 | 12 | 11.5 |
| | | | SS-7 11.0-12.5 | 3 11 12 | 12 | |
| 561.3 | 12.0 | Very stiff gray silty clay and medium dense sandy gravel, dry to moist CL | SS-8 13.5-15.0 | 11 17 6 | 9 | |
| 557.8 | 15.5 | Medium cohesive black organic silty clay, root fibers, med. plasticity, $q_u$* = 0.75 tsf, moist OH | SS-9 16.0-17.5 | 2 4 5 | 9 | 33.7 |
| 554.5 | 18.8 | Loose dark gray silty sand, saturated SM | SS-10 18.5-20.0 | 4 4 7 | 8 | |
| 551.9 | 21.4 | Limestone boulders | SS-11 21.0-21.4 | 50/3" | 3 | |
| 550.4 | 22.9 | Pale olive gray argillaceous claystone, with occasional fractured limestone, joint spacing is 2" to 7", 40° slick joint at 24', 25° slick joint at 25.5', 30° joint in parting of soft claystone (1" thick) at 25.7' | | | | |
| 546.8 | 26.5 | Light gray fine-grained limestone, coarse sand joint filling at 27.3', 1" to 6" joint spacing, clayey silt filled joints with some uncemented gravel-sized fractured limestone, some solutioning below 30.0' filled with clayey silt | | | | |
| 540.8 | 32.5 | End of boring at 32.5' in limestone. | | | | |

Run #1
22.5' to 27.5'
Recovery = 60"/60"
= 100%
RQD = 5"/60" = 8%
Good water return.

Run #2
27.5' to 32.5'
Recovery = 60"/60"
= 100%
RQD = 44"/60"
= 73%
Good water return.

# BORING B-5A

LOCATION: 542'S, 100'W DATE DRILLED: 12/23/81

RIVER DEPTH: 2.2'

| ELEV. (MSL) | DEPTH (FT) | DESCRIPTION | NOTES & TEST RESULTS |
|---|---|---|---|
| 553.8 | 0.0 | Limestone boulder and rounded fine gravel. | 4'-5" of 3" I.D.steel casing. 1.8' of casing stickup. Down pressure = 300 psi (avg.) |
| 551.5 | 2.3 | Black highly fractured slickensided bituminous COAL with alternating layers of weathered carboniferous shale | Run #1: 0.0' to 2.0' Recovery = 5"/24" = 21% (due to probable boulder) RQD = 0"/24" = 0% Casing stickup dropped to 0.7'. Added 1.0' casing. No (little) water return. Casing set on probable boulder. |
| 549.5 | 4.3 | Pale light olive gray argillaceous sandy CLAYSTONE, occasional horizontal joint at 5.2', 6.6', 6.8' (possible mechanical breaks) | Run #2: 2.0' to 7.0' Recovery = 48"/60" = 80% RQD = 0"/60" = 0% Down pressure = 150 psi No water return. Suspended fines downstream of barge, occasionally. Core very tight in barrel. |
| 546.8 | 7.0 | End of boring at 7.0' due to loose casing and caved hole. | |

# BORING B-2

LOCATION: 65'S, 82'W DATE DRILLED: 12/21/81

RIVER DEPTH: 2.6'

| ELEV. (MSL) | DEPTH (FT) | DESCRIPTION | NOTES & TEST RESULTS |
|---|---|---|---|
| 552.8 | 0.0 | Loose gravel and boulders | 4'- 5" of 3" I.D. steel casing. |
| 551.9 | 0.9 | Light gray very fine grained LIMESTONE, moderate to highly jointed, 2" to 4" joint spacing, weathered along joints, joints filled with clay, sand, and fine gravel, primary jointing is horizontal, very slight solutioning, fractured brecciated zone between 3.4' and 4.5'. Lithographic below 4.5 feet. | Down pressure = 100 to 350 psi Run #1: 0.9' to 5.9' Recovery = 52"/60" = 87% RQD = 16"/60" = 27% Good water return. Rock reacts strongly to 10% HCl. |
| 549.4 | 3.4 | | |
| 548.3 | 4.5 | Gray fine grained LIMESTONE, moderately jointed, 2" to 8" joint spacing, slight weathering at joints, very little clay filling, primary jointing is horizontal, very slight solutioning | Run #2: 5.9' to 10.9' Recovery = 59½"/60" = 99% RQD = 34"/60" = 57% No (little) water return, probably due to loss at casing seal. |
| 543.9 | 8.9 | | |
| 541.9 | 10.9 | End of boring at 10.9' in gray limestone. | |

# BORING B-5B

LOCATION: 554'S, 100'W DATE DRILLED: 12/28/81 & 12/29/81

RIVER DEPTH: 2.8'

| ELEV. (MSL) | DEPTH (FT) | DESCRIPTION | NOTES & TEST RESULTS |
|---|---|---|---|
| 553.4 | 0.0 | Probable boulders | 7'-5" of 3" I.D. steel casing. Casing stickup above well = 0.8' Run #1: 2.5' to 7.5' Down pressure = 175 to 400 psi Recovery = 58"/60" = 97% RQD = 24"/60" = 40% Good water return. |
| 550.9 | 2.5 | Dark gray fissile SHALE, very thin bedded, fine grained, $q_u$* = 3.0 tsf | |
| 550.1 | 3.3 | Dark gray fissile SHALE, occasional horizontal random jointing, very slight weathering, no joint filling, very thin bedded, slick (greasy surfaces), dip = 10°, fine grained, $q_u$* > 4.5 tsf | |
| 546.8 | 6.6 | Black highly fractured bituminous COAL and carboniferous shale, ½" to 1" horizontal jointing, severely weathered | Run #2: 7.5' to 12.5' Recovery = 51"/60" = 85% RQD = 0"/60" = 0% Good water return. |
| 544.9 | 8.5 | Pale light olive gray argillaceous CLAYSTONE, occasional random horizontal joints (possible mechanical breaks), fine grained | Run #3: 11.5' to 16.5' Recovery = 48"/60" = 80% (10" of cave-in) RQD = 0% Good water return. Water pressure went up at limestone. Casing came loose and jammed with core barrel. |
| 538.1 | 15.3 | Light gray, very fine grained LIMESTONE with pale light olive gray clayey silt partings, moderately jointed, ½" to 2½" joint spacing | End of drilling on 12/28/81 at 12.5' due to darkness. Continue drilling from 12.5' on 12/29/81 to 16.5'. |
| 536.9 | 16.5 | End of boring at 16.5' due to dislodged casing. | |

# BORING B-3

LOCATION: 205'S, 65'W DATE DRILLED: 12/30/81

RIVER DEPTH: 2.4'

| ELEV. (MSL) | DEPTH (FT) | DESCRIPTION | NOTES & TEST RESULTS |
|---|---|---|---|
| 553.6 | 0.0 | Boulders and river gravel | 5.4' of 3" I.D. steel casing Run #1 0.5' to 3.0' Recovery = 26"/30" = 87% RQD = 0% Little water return. Down pressure = 150 psi Suspended fines in river downstream. |
| 552.3 | 1.3 | Light gray very fine grained LIMESTONE, highly fractured and jointed, some clay filling, slightly weathered, some solutioning | |
| 548.1 | 5.5 | Gray fine grained LIMESTONE, moderately jointed, 3½" to 5" spacing, horizontal joints, no clay filling, slight solutioning | Run #2 3.0' to 8.0' Recovery = 59½"/60" = 99% RQD = 22"/60" = 37% Down pressure = 200 psi Water pressure = 100 psi No water return. |
| 545.6 | 8.0 | End of boring at 8.0' in gray limestone. | |

# BORING B-6

LOCATION: 756'S, 100W DATE DRILLED: 12/23/81

RIVER DEPTH: 2.2'

| ELEV. (MSL) | DEPTH (FT) | DESCRIPTION | NOTES & TEST RESULTS |
|---|---|---|---|
| 554.3 | 0.0 | Light gray limestone boulder with shells underneath and iron stained fragments, and gravel | 3'-5" of 3" I.D. steel casing. 1.0' of casing stickup. Down pressure = 200 psi (avg.) |
| 553.4 | 0.9 | Light gray very fine grained LIMESTONE, very severely jointed and highly broken above 5.5', ½" average to 2" horizontal joint spacing, weathered along joints, very little clay filling, primary jointing is horizontal, occasional vertical joint and occasional 60° to horizontal joint, moderate solutioning, with vertical solution planes between 7.5' and 10' and at 5'. Below 5.5', avg. 2½" joint spacing. Two sandy clayey seams ¼" thick spaced 1" apart @ 9.5' | Run #1: 0.0' to 1.5' Recovery = 14"/18" = 78% RQD = 0"/18" = 0% Little water return, probably due to loss at bottom of casing. Run #2: 1.5' to 6.5' Strong reaction to 10% HCl. Recovery = 59"/60" = 99% RQD = 0"/60" = 0% No water return due to casing loss. Fines suspended in water downstream of hole. |
| 544.8 | 9.5 | Gray fine grained LIMESTONE moderately jointed, 2" to 6" horizontal joint spacing, moderately weathered at joints, very little clay filling, slight solutioning | Run #3: 6.5' to 11.5' Strong reaction to 10% HCl. Recovery = 59"/60" = 99% RQD = 11"/60" = 18% Could not perform perm. test due to loose casing. |
| 542.8 | 11.5 | End of boring at 11.5' in gray limestone. | |

NOTES:

1. Rock cores were obtained with a double-tube NX core barrel equipped with a side-discharge, diamond bit.
2. Casing stickup is referenced to top of water surface unless otherwise noted.
3. The "claystone" is generally a slightly to strongly cemented preconsolidated silty sand soil, with gravel sized sandstone fragments. RQD is not reported for the claystone as the material is not considered sound and durable.
4. The dip of bedding in the limestone is nearly horizontal. Occasional vertical joints as noted on the boring logs were observed.
5. Pyrite and calcite filled hairline fractures and elongate nodules were abundant in the bituminous coal layers.
6. The coal is considered to have little or no commercial value due to a high sulphur content.
7. Rock quality designation, RQD, is defined as the percentage ratio between the total length of pieces of rock core recovered that are at least 4 in. long and are hard and sound and the length of core drilled on a given run.

# BORING B-4

LOCATION: 400'S, 100'W DATE DRILLED: 12/30/81

RIVER DEPTH: 3.8'

| ELEV. | DEPTH | DESCRIPTION | NOTES & TEST RESULTS |
|---|---|---|---|
| 552.5 | 0.0 | Probable boulders and river gravel | 7.4' of 3" I.D. steel casing Run #1: 1.1' to 6.1' Water pressure = 200 psi Down pressure = 200 psi Recovery = 33"/60" = 55% RQD = 0% Good water return. Water take = 6" drop in 3" I.D. in 5 sec. Water and cuttings appeared black from 1.4' to 3.6' |
| 551.1 | 1.4 | Black highly fractured bituminous COAL with alternating layers of weathered carboniferous shale | |
| 548.9 | 3.6 | Pale light olive gray argillaceous CLAYSTONE | |
| 545.4 | 7.1 | Pale light olive gray argillaceous CLAYSTONE, thinly horizontally laminated, occ. rounded fine gravel of various colors, some small cavities and solutioning, more rock-type structure than above material, medium grained | Run #2: 6.1' to 11.1' Water pressure = 150 psi Down pressure = 200 psi No water take. Recovery = 33"/60" = 55% RQD = 0% 16" of material left at bottom of hole. |
| 542.7 | 9.8 | Light gray very fine grained LIMESTONE, highly fractured and jointed, some clayey silt filling, slightly weathered, some solutioning | Run #3: 9.8' to 13.6' Recovery = 43"/46" = 93% RQD = 0% |
| 541.0 | 11.5 | Pale light olive gray argillaceous CLAYSTONE, thinly laminated, course to med. grained | |
| 537.7 | 14.8 | Light gray fine grained LIMESTONE, moderately jointed, 1½" to 4" joint spacing, primary jointing is horizontal, very little clay filling, some med. sand filling, moderately weathered joints, brecciated, some solutioning | Run #4: 13.6' to 18.6' Recovery = 59"/60" = 98% RQD = 13"/60" = 22% Water pressure =200 psi Down pressure =150 psi Good water return. |
| 533.9 | 18.6 | End of boring at 18.6' in light gray limestone. | |

# BORING B-7

LOCATION: 642'S, 87'W DATE DRILLED: 12/28/81

RIVER DEPTH: 3.2'

| ELEV. (MSL) | DEPTH (FT) | DESCRIPTION | NOTES & TEST RESULTS |
|---|---|---|---|
| 553.0 | 0.0 | Loose limestone boulders and river gravel | 7'-5" of 3" I.D. steel casing, 1.0' of casing stickup above well. Run #1: 1.9' to 6.9' Recovery = 54"/60" = 90% RQD = 0"/60" = 0% Down pressure = 175 psi Good water return. |
| 550.5 | 2.5 | Black highly fractured bituminous COAL with alternating layers of carboniferous shale, ½" to 1" joint spacing, horizontally jointed | |
| 547.9 | 5.1 | Pale light olive gray argillaceous CLAYSTONE, occasional joints at 5.8', 5.9', & 6.0' (possible mechanical breaks), fine grained | Run #2: 6.9' to 11.2' Recovery = 51"/52" = 99% RQD = 4"/52" = 8% Down pressure = 175 psi Good water return. |
| 545.2 | 7.8 | Light gray very fine grained LIMESTONE with occasional partings of pale light olive gray clayey silt, moderately jointed, 2" to 4" joint spacing, moderately weathered at joints, some solutioning, random joint pattern | Two core boxes combined back in lab to easily fit into one box. |
| 541.8 | 11.2 | End of boring at 11.2' in light gray limestone. | |

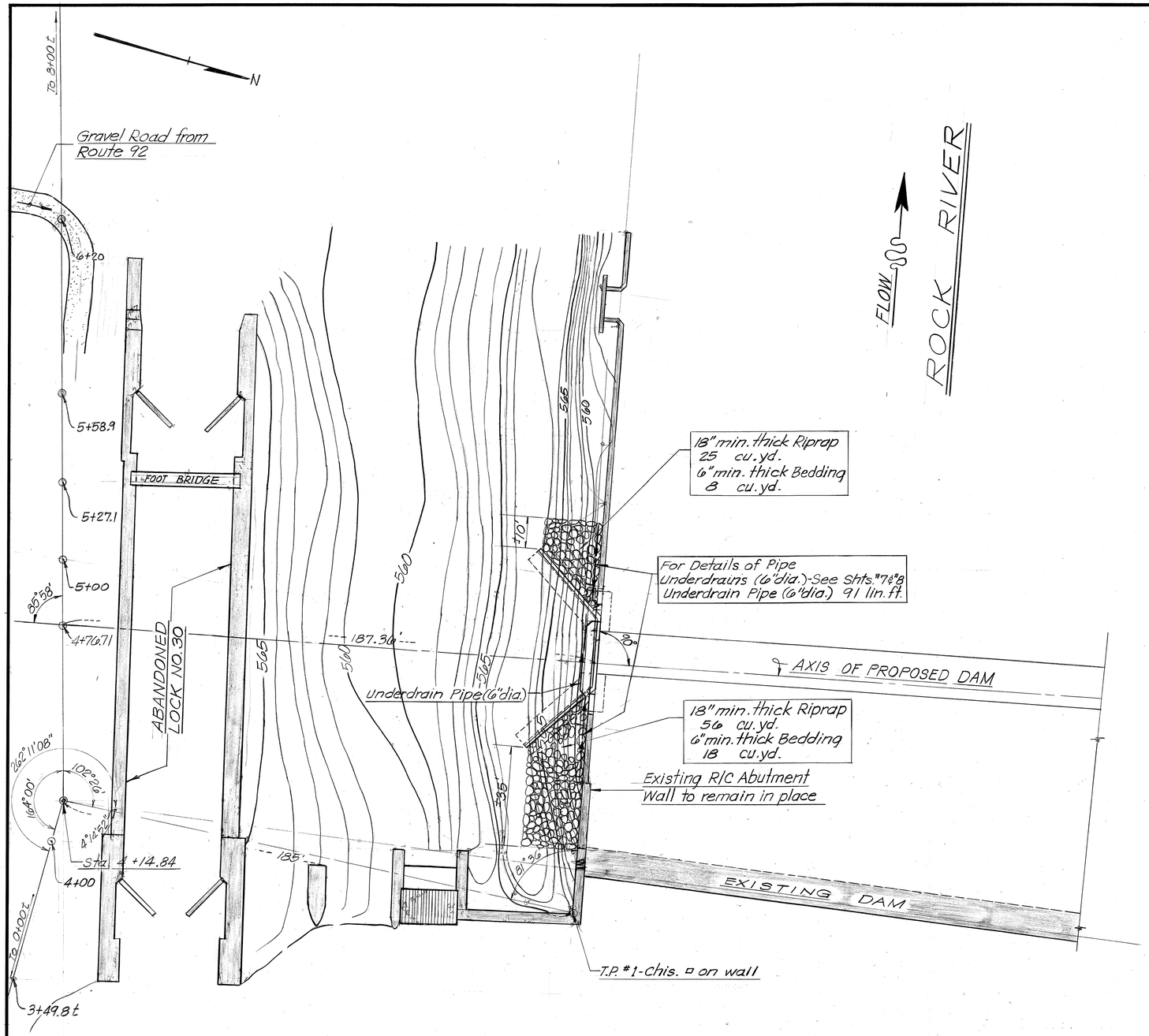



ILLINOIS DEPARTMENT OF TRANSPORTATION
DIVISION OF WATER RESOURCES
SPRINGFIELD, ILLINOIS

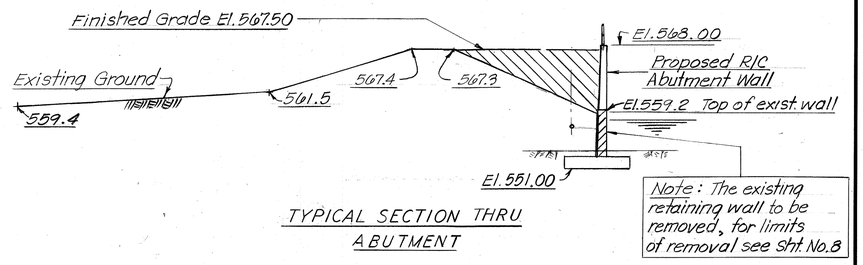
| SCALE: Vert. 3/8"=1' | APPROVED BY: Daniel P. Dietzler | DRAWN BY: WM |
|---|---|---|
| DATE: 1/82 | | REVISED: |

BORING LOGS

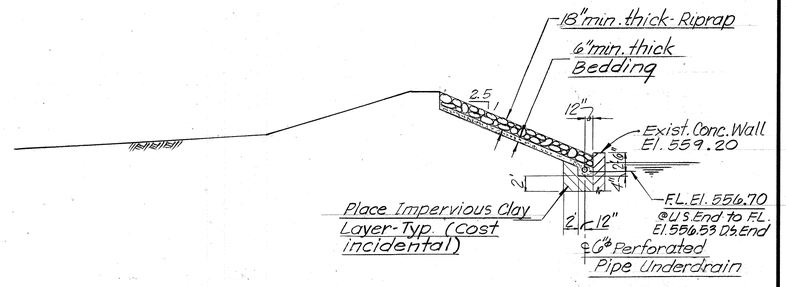
PATRICK ENGINEERING INC. DRAWING NUMBER 0998-102




PLAN
SCALE: 1"=20'-0"




TYPICAL SECTION THRU
ABUTMENT




TYPICAL SECTION THRU
RIPRAP SLOPE PROTECTION

Note: The cost of excavation for Riprap, Bedding, and Impervious Clay layer shall be incidental to the bid item Stone Riprap.

BILL OF MATERIAL

| | | |
|---|---|---|
| Pipe Underdrains (6"Dia.) | lin.ft. | 91 |
| Stone Riprap | cu.yd. | 81 |
| Bedding | cu.yd. | 26 |
| Structure Excavation | cu.yd | 313 |
| Rock Excavation for Structures | cu.yd. | 58 |

FR-320

DESIGNED BY W.J.S. DATE 11-29-92
CHECKED BY J.N.P. DATE 12-29-92
ORIGINAL SURVEY Rock River BOOK 3406
DRAWN BY W.J.S. DATE 3-23-92

REVISIONS

| ISSUE | REVISION LETTER | REVISED BY | DATE |
|---|---|---|---|
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SCALE: AS SHOWN

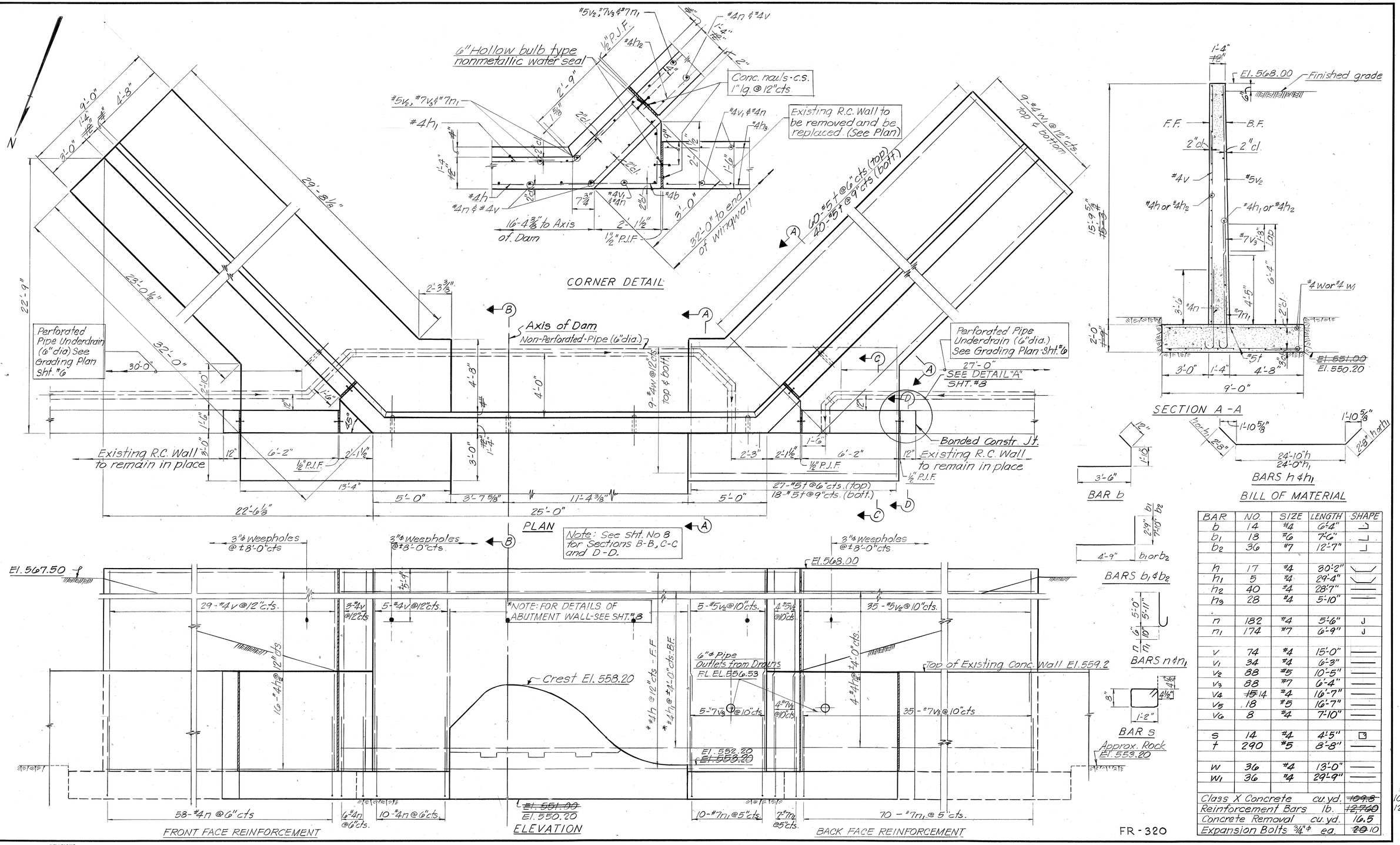
GRADING PLAN - SOUTH ABUTMENT

FILE NO.
CLASSIFICATION NO.
SHEET NO. 6 OF 19 SHEETS

STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DIVISION OF WATER RESOURCES




BILL OF MATERIAL

| BAR | NO. | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| b | 14 | #4 | 6'-4" | L |
| b1 | 18 | #6 | 7'-6" | L |
| b2 | 36 | #7 | 12'-7" | L |
| h | 17 | #4 | 30'-2" | |
| h1 | 5 | #4 | 29'-4" | |
| h2 | 40 | #4 | 28'-7" | |
| h3 | 28 | #4 | 5'-10" | |
| n | 182 | #4 | 5'-6" | J |
| n1 | 174 | #7 | 6'-9" | J |
| v | 74 | #4 | 15'-0" | |
| v1 | 34 | #4 | 6'-3" | |
| v2 | 88 | #5 | 10'-5" | |
| v3 | 88 | #7 | 6'-4" | |
| v4 | ~~15~~ 14 | #4 | 16'-7" | |
| v5 | 18 | #5 | 16'-7" | |
| v6 | 8 | #4 | 7'-10" | |
| s | 14 | #4 | 4'-5" | |
| t | 290 | #5 | 8'-8" | |
| w | 36 | #4 | 13'-0" | |
| w1 | 36 | #4 | 29'-9" | |
| Class X Concrete | | | cu. yd. | ~~159.5~~ 107.2 |
| Reinforcement Bars | | | lb. | ~~12,760~~ 12,750 |
| Concrete Removal | | | cu. yd. | 16.5 |
| Expansion Bolts ¾"ϕ | | | ea. | ~~20~~ 10 |

DESIGNED BY W.J.S. DATE 11-24-82
CHECKED BY J.N.P. DATE 11-29-82
ORIGINAL SURVEY BOOK 342-06
DRAWN BY V.L.S. DATE 4-15-82

REVISIONS

| ISSUE | REVISION LETTER | REVISED BY | DATE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

SCALE: AS SHOWN

FR-320

PLAN AND DETAILS - SOUTH ABUTMENT

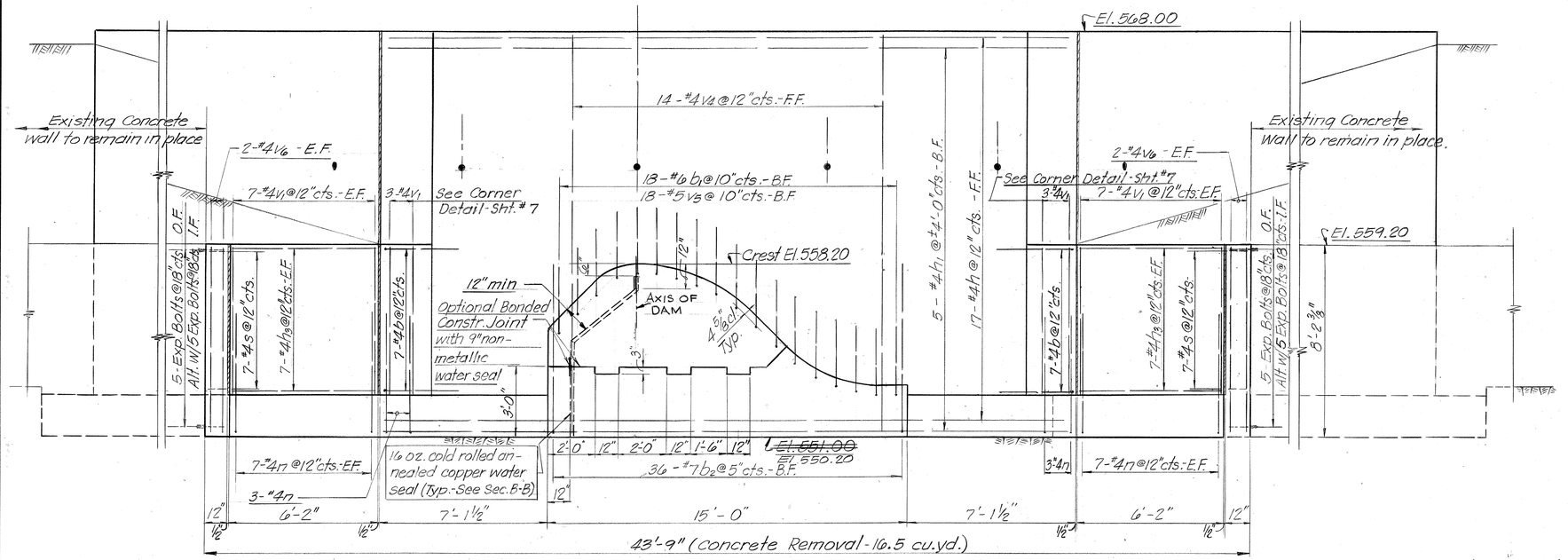
FILE NO.
CLASSIFICATION NO.

SHEET NO. 7 OF 19 SHEETS

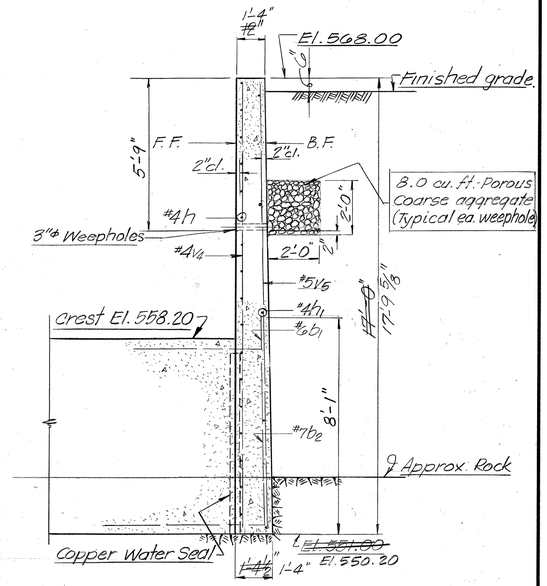
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

# STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

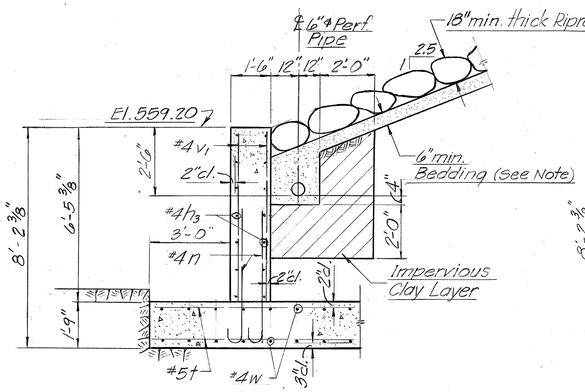
DIVISION OF WATER RESOURCES



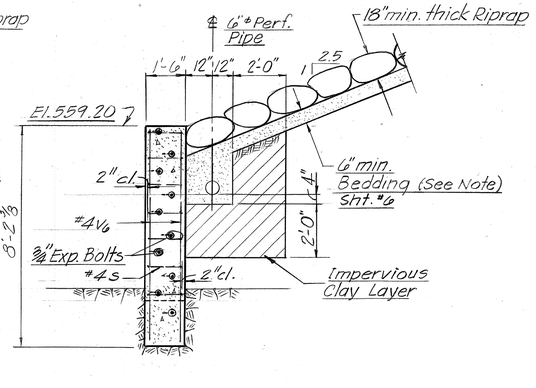

ELEVATION



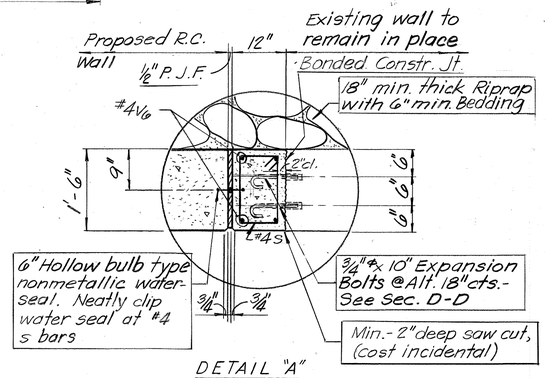

SECTION B-B



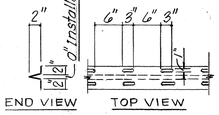

SECTION C-C




SECTION D-D




DETAIL "A"
TYPICAL AT EACH END OF RETAINING WALL
SEE SHT. NO. 7




DETAILS OF WATER SEAL

TYPICAL NORTH AND SOUTH ABUT'S, AND 3/4" EXPANSION JOINTS.

Note: The water seal shall be fabricated from .043" thick cold rolled annealed copper sheets, ASTM B152, type ETP.

All joints in copper water seal shall be lapped a min. of 2" and soldered.

The cost of furnishing and installing approximately 7 lin.ft. of water seal at each abutment shall be considered incidental to Class X Concrete.

DESIGN STRESSES

$f_c$ = 1,000 p.s.i.
$f_s$ = 20,000 p.s.i.
$n$ = 9

DESIGNED BY W.J.S. DATE 11-24-82
CHECKED BY J.N.P. DATE 11-29-82
ORIGINAL SURVEY BOOK 340G DATE 4-27-82
DRAWN BY V.I.S.

REVISIONS

| ISSUE | REVISION LETTER | REVISED BY | DATE |
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SCALE: AS SHOWN

DETAILS - SOUTH ABUTMENT

FR-320

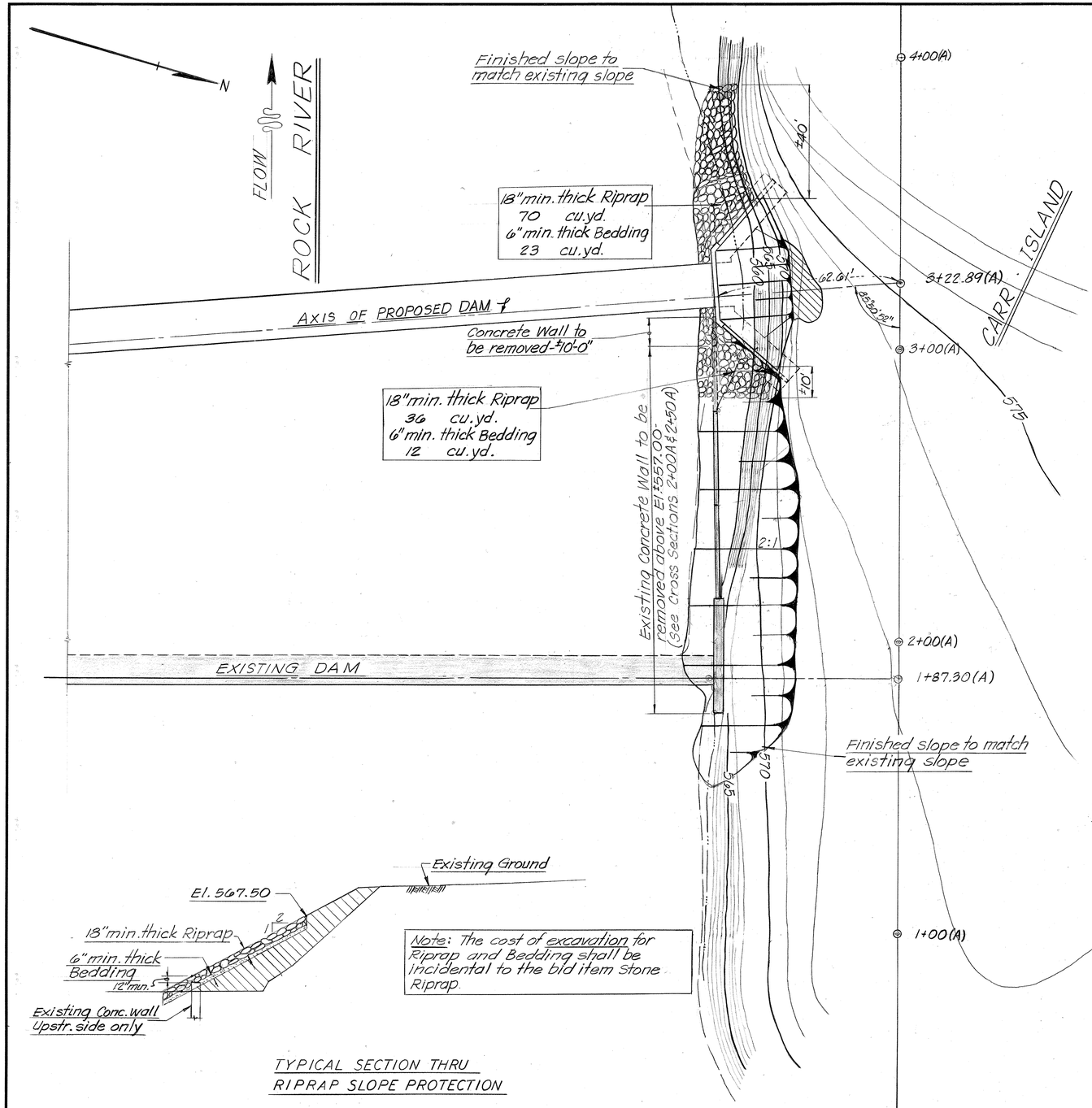
FILE NO.
CLASSIFICATION NO.

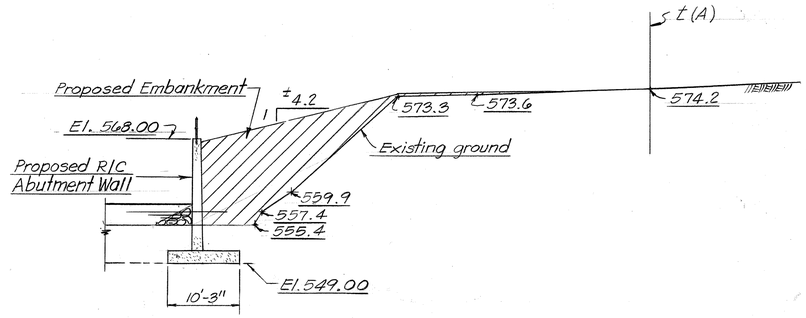
SHEET NO. 8 OF 19 SHEETS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

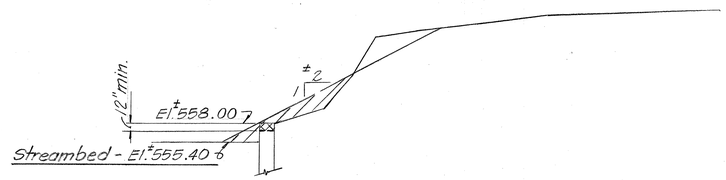
# STEEL DAM
# ROCK RIVER
ROCK ISLAND COUNTY

DIVISION OF WATER RESOURCES

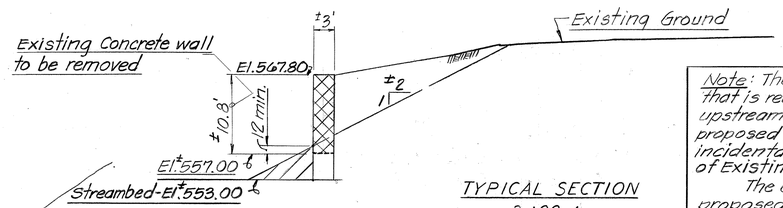



TYPICAL SECTION




TYPICAL SECTION
2+50 A




TYPICAL SECTION
2+00 A

Note: The cost of excavating and filling that is required to shape the River Bank upstream and downstream of the proposed North Abutment shall be incidental to the bid item, Removal of Existing Structures.

The cost of filling behind the proposed North Abutment shall be incidental to Structure Excavation. (Estimated 475 cu. yd. of fill required and 470 cu. yd. of excavation available)




Note: The cost of excavation for Riprap and Bedding shall be incidental to the bid item Stone Riprap.

TYPICAL SECTION THRU
RIPRAP SLOPE PROTECTION

PLAN
SCALE: 1"=20'-0"

BILL OF MATERIAL

| | | | |
|---|---|---|---|
| Stone Riprap | cu. yd. | 106 | |
| Bedding | cu. yd. | 35 | |
| Structure Excavation | cu. yd. | ~~503~~ | 402.9 |
| Rock Excavation | | 99.9 | |

FR-320

DESIGNED BY W. J. S. DATE 11-21-62
CHECKED BY J. N. P. DATE 11-29-62
ORIGINAL SURVEY BOOK
DRAWN BY V. I. S. DATE 3-25-32

REVISIONS

| ISSUE | REVISION LETTER | REVISED BY | DATE |
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SCALE: AS SHOWN

GRADING PLAN - NORTH ABUTMENT

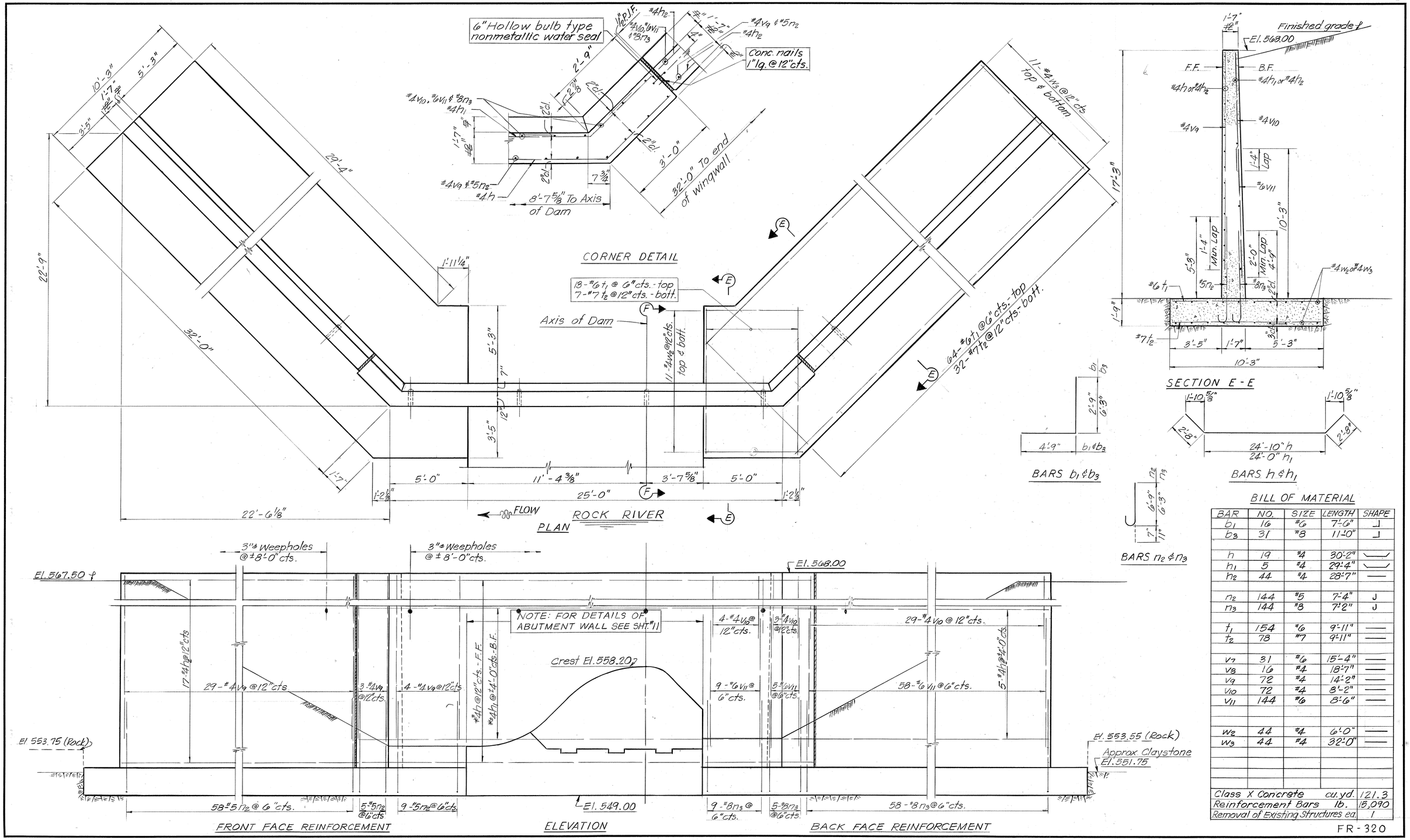
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CLASSIFICATION NO.

SHEET NO. 9 OF 19 SHEETS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

# STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

DIVISION OF WATER RESOURCES




BILL OF MATERIAL

| BAR | NO. | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| $b_1$ | 16 | #6 | 7'-6" | ⌋ |
| $b_3$ | 31 | #8 | 11'-0" | ⌋ |
| | | | | |
| h | 19 | #4 | 30'-2" | ⌒ |
| $h_1$ | 5 | #4 | 29'-4" | ⌒ |
| $h_2$ | 44 | #4 | 28'-7" | — |
| | | | | |
| $n_2$ | 144 | #5 | 7'-4" | J |
| $n_3$ | 144 | #8 | 7'-2" | J |
| | | | | |
| $t_1$ | 154 | #6 | 9'-11" | — |
| $t_2$ | 78 | #7 | 9'-11" | — |
| | | | | |
| $V_7$ | 31 | #6 | 15'-4" | — |
| $V_8$ | 16 | #4 | 18'-7" | — |
| $V_9$ | 72 | #4 | 14'-2" | — |
| $V_{10}$ | 72 | #4 | 8'-2" | — |
| $V_{11}$ | 144 | #6 | 8'-6" | — |
| | | | | |
| $w_2$ | 44 | #4 | 6'-0" | — |
| $w_3$ | 44 | #4 | 32'-0" | — |
| | | | | |
| Class X Concrete | | | cu. yd. | 121.3 |
| Reinforcement Bars | | | lb. | 15,090 |
| Removal of Existing Structures | | | ea. | 1 |

FR-320

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REVISIONS

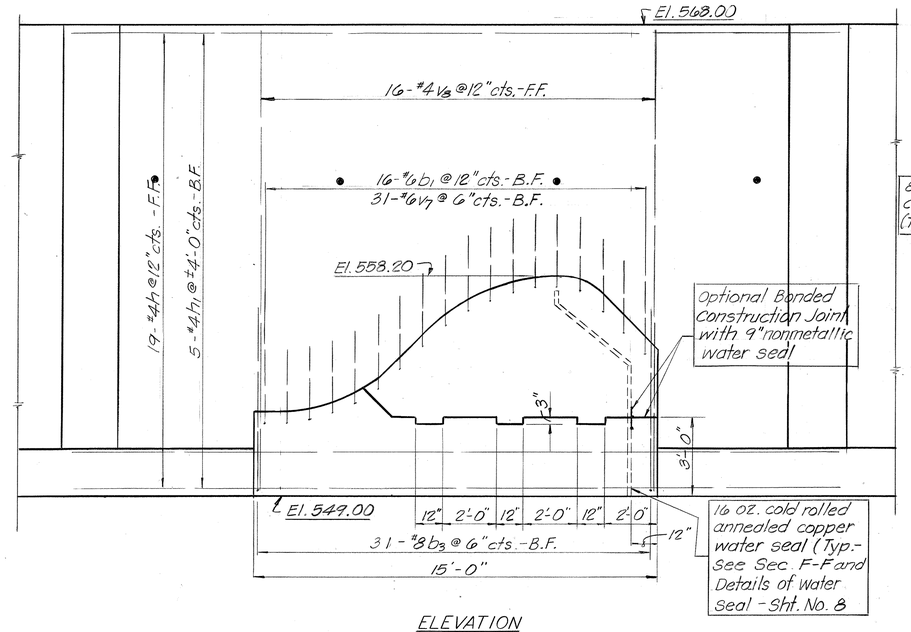
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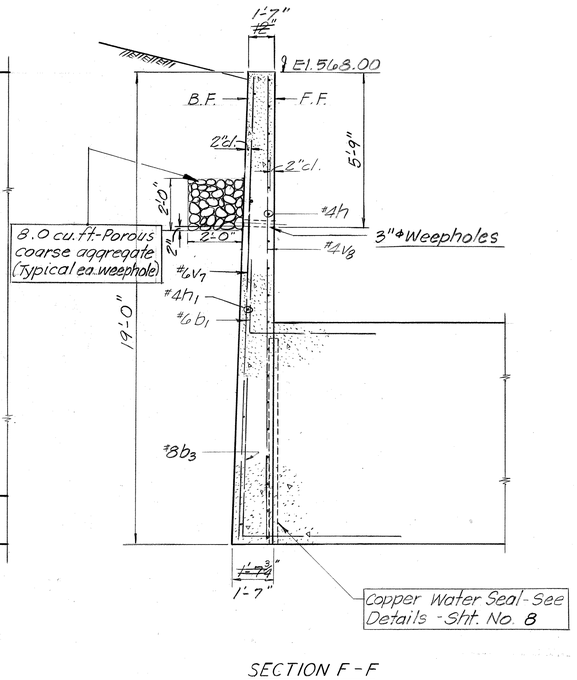
PLAN AND DETAILS - NORTH ABUTMENT

FILE NO.
CLASSIFICATION NO.

SHEET NO. 10 OF 19 SHEETS




ELEVATION




SECTION F-F

DESIGN STRESSES

$f_c$ = 1,000 p.s.i.
$f_s$ = 20,000 p.s.i.
$n$ = 9

DESIGNED BY W.J.S. DATE 11-29-82
CHECKED BY J.N.P. DATE 11-29-82
ORIGINAL SURVEY BOOK
DRAWN BY V.L.S. DATE 6-1-82

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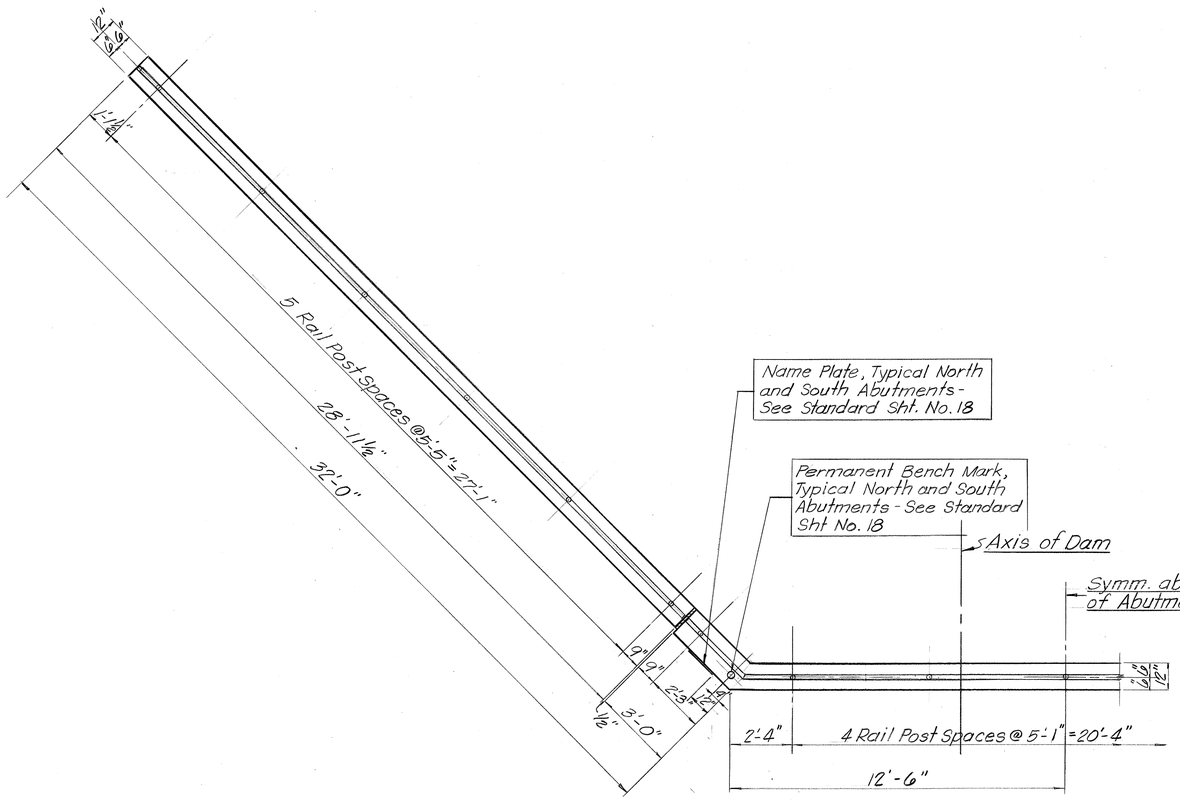
SCALE: AS SHOWN

DETAILS - NORTH ABUTMENT

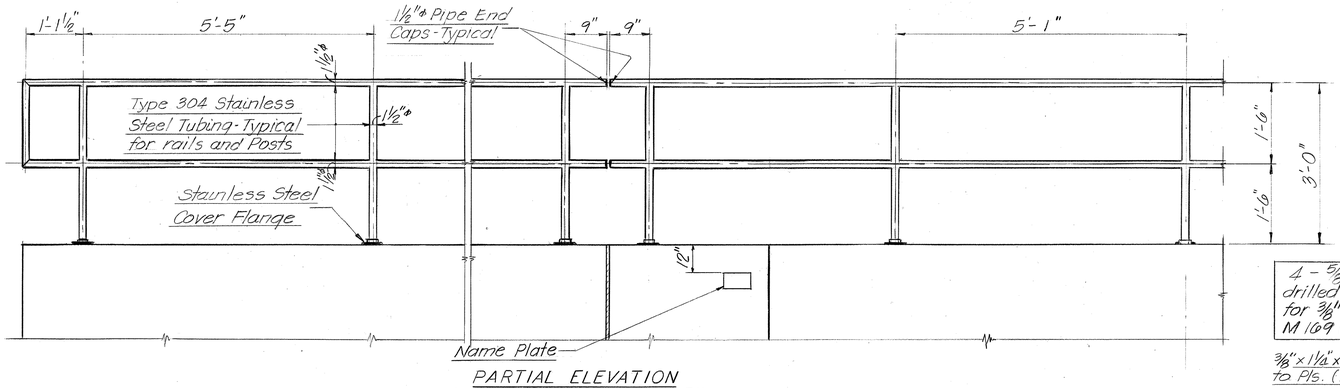
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CLASSIFICATION NO.

SHEET NO. 11 OF 19 SHEETS




HALF PLAN




PARTIAL ELEVATION
SHOWING TYPICAL MATERIAL REQUIREMENTS AND DIMENSIONS

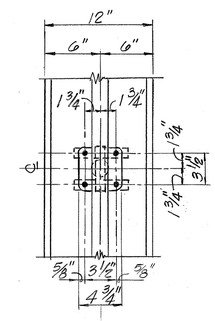
DIVISION OF WATER RESOURCES
STEEL DAM
ROCK RIVER
BUILT 1987 FR-320

LETTERING FOR NAME PLATE

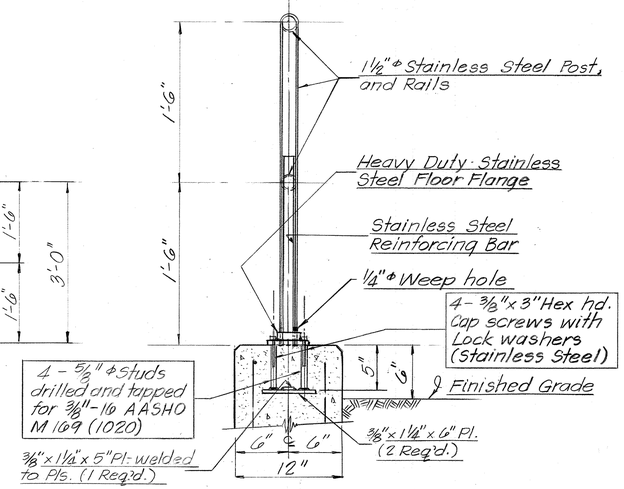
BILL OF MATERIAL

| | | |
|---|---|---|
| Pipe Handrail | lin.ft. | 176 |
| Name Plates | ea. | 2 |

Note: North and South Abutments each require 88 lin. ft. of Stainless Steel Handrail and 1 Name Plate.




PLAN-DETAIL
SHOWING POST ANCHOR




TYPICAL SECTION THRU HANDRAIL

DESIGNED BY W.J.S. DATE 11-29-82
CHECKED BY J.N.P. DATE 11-29-82
ORIGINAL SURVEY BOOK
DRAWN BY V.I.S. DATE 6-21-82

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HANDRAIL PLAN AND DETAILS

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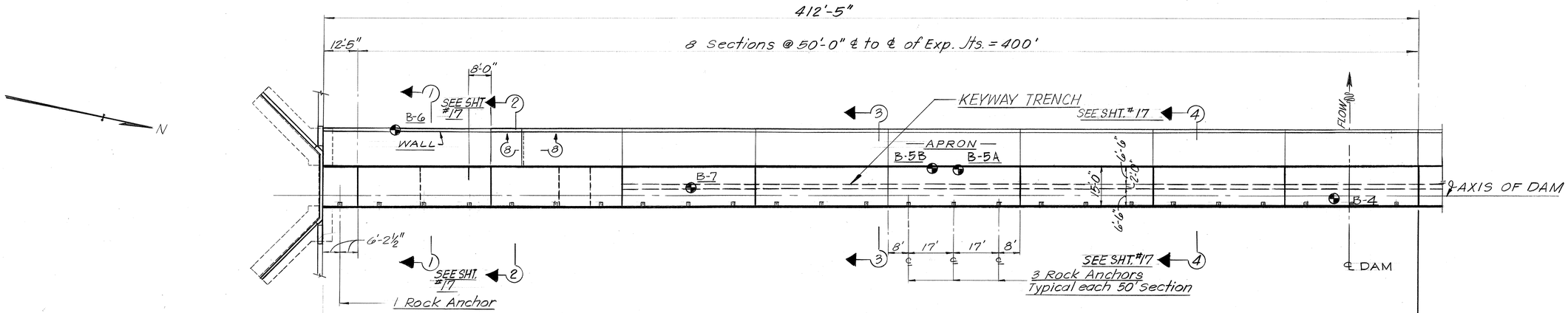
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CLASSIFICATION NO.

SHEET NO. 12 OF 19 SHEETS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

# STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

DIVISION OF WATER RESOURCES




FR-320

DESIGNED BY W. J. S. DATE 11-27-82
CHECKED BY WSP DATE 12-28-82
ORIGINAL SURVEY BOOK 6-15-82
DRAWN BY V.I.S. DATE

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SCALE: AS SHOWN

DAM CONSTRUCTION PLAN AND DETAILS

FILE NO.
CLASSIFICATION NO.
SHEET NO. 13 OF 19 SHEETS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

# STEEL DAM
# ROCK RIVER
ROCK ISLAND COUNTY

DIVISION OF WATER RESOURCES

412'-5"

8 Sections @ 50'-0" ℄ to ℄ of Exp. Jts. = 400'

1-Section @ 12'-5" from face of Abut. to ℄ of Exp. Jt.

75'-0" CONC. ~~WALL~~ APRON

337'-5" - CONC. APRON

75-#5b26@12"cts.

4x3-#5h12 (See Sec. 1-1)

225-#8h14@18"cts. (Apron slab)

338-#5b25 @12"cts. (Apron-wall)

338-#5h18@12"cts. (Apron-slab)

12x2-#4h11@18"cts. (Top)

7x2-#4h11@30"cts (Bott.)

8 Sections Thus

17x13-#5h12@12"cts. (Apron-Slab & wall)

12-#4h10@18"cts. (Top)

7-#4h10@30"cts. (Bott.)

17-#5h13@12"cts. (Apron-Slab & wall)

8'-0"

2-#5b24 (Top)

SEE SEC. 8-8, SHT. #16

SEE JOINT DETAIL

7-#4h10@30"cts. (Bott.)

SEE DETAIL "A"

FLOW

℄ DAM

16-#5b11 (Top) 12-#5b23 (Top)
16-#5b12 (Top) 12-#5b24 (Top)
16-#5b22 (Bott.) 12-#5b14 (Bott.)

1-#5b22, 6-#5b10, 7-#5b14
7-#5b15 & 13-#5b17 (Bott.)
34-#5b12 (Top)

34-#5b12 (Top)
34-#5b16 (Top)
34-#5b17 (Bott.)

34-#5b12 (Top)
34-#5b16 (Top)
34-#5b15 (Bott.)

16-#5b18 (Top) 18-#5b26 (Top)
16-#5b16 (Top) 18-#5b16 (Top)
16-#5b17 (Bott.) 18-#5b15 (Bott.)

34-#5b12 (Top)
34-#5b16 (Top)
34-#5b15 (Bott.)

9-#5 b11 (Top)
9-#5b12 (Top)
9-#5b22 (Bott.)

6-#5b24 (Top)
6-#5b12 (Top)
8-#5b22 (Bott.)

32-#5b16 (Top)

34-#5b12 (Top)
34-#5b14, 21-#5b15 &
9-#5b17 (Bott.)

PLAN

MATCH LINE SEE SHT. NO. 16

SEE EXP. JT. DET.-SHT. NO. 16

1'-5"

194 FLASHBOARD SOCKETS @ 4'-0" cts. (SEE DETAIL)

El. 568.00 ℄

9-#5b13-U.F.
9-#5V18-U.F.

FOR DETAILS OF PROPOSED ABUTMENT WALL - SEE SHT. NO. 7

16-#5b13-U.F.
16-#5V18-U.F.

18-#5b13-U.F.
12-#5V16 & 6-#5V14

34-#5b19-U.F.
34-#5V14-U.F.
30-#5V20-D.F.

34-#5b19-U.F.
34-#5V17-U.F.
34-#5V15-D.F.

34-#5b19-U.F.
17-#5V17 & 17-#5V12-U.F.
34-#5V16 D.F.

16-#5b19-U.F.
16-#5V12-U.F.
16-#5V16 D.F.

18-#5b19-U.F.
18-#5V13-U.F.

34-#5b19-U.F
34-#5V13-U.F
3 Sections Thus

4x2-#4h11-U.F.
2x2-#4h11-D.F.
3 Sections Thus

DAM CREST-EL. 558.20

El. 552.20 ~~El. 553.20~~ ℄ FLIP BUCKET

El. 551.00 ℄

FLIP BUCKET EL. 552.20

BOTTOM OF DAM

BOTTOM-KEYWAY TRENCH

2-#4h10-U.F.

2-#4h11-U.F.

3-#4h11-U.F.
1-#4h11-D.F.

Bend and lap #4h11 bars in both

#4h10

BOTTOM OF DAM El. 550.00

BOTTOM-KEYWAY TRENCH

4-#4h11-U.F.
2-#4h11-D.F.

5-#4h11-U.F.
3-#4h11-D.F.

4-#4h11-U.F.
2-#4h11-D.F.

5-#4h11-U.F.
3-#4h11-D.F.

4-#4h11-U.F.
2-#4h11-D.F.

6-#4h11-U.F.
4-#4h11-D.F.

6-#4h11-U.F.
4-#4h11-D.F.

4-#4h11-U.F.
2-#4h11-D.F.

* 4-#4h11-E.F.

* 4-#4h11-E.F.

*5-#4h11 E.F.

*6-#4h11 E.F.

*6-#4h11 E.F.

*6-#4h11 E.F.

*6x2-#4h11-E.F.-3 Sections Thus

* 50-#6V11@12"cts. E.F.
* 100-#4b18@12"cts
3 Sections Thus

* 28-#6V21@12"cts-E.F.
* 44-#4b18@12"cts.

* 28-#6V19@12"cts E.F.
* 56-#4b18@12"cts

* 50-#6V11@12"cts.-E.F.
* 100-#4b18@12"cts.

* 26-#6V19@12"cts. E.F.
* 52-#4b18@12"cts.

* 24-#6V11@12"cts E.F.
* 48-#4b18@12"cts.

Note: * Indicates reinforcement located in lower part of dam or keyway Trench. (See Sec's 3-3, 4-4 & 5-5)

ELEVATION

U.F.-Indicates-Upstream Face
D.F.-Indicates-Downstream Face
E.F.-Indicates-Each Face

Note: The cost of furnishing and installing dowel bar assemblies and trowelled bit. mastic shall be incidental to Class A Concrete.

2" ℄ x 12"lg. extra strong galv. steel pipe @ 4'-0" cts. (See Elevation)

AXIS OF DAM

Note: The inside of the 2" ℄ pipe at the top of the socket shall be reamed to remove any ridges caused by the cutting of the pipe.

The pipe bottom shall be plugged to prevent the intrusion of any concrete

FLASHBOARD SOCKET DETAIL

Note: The cost of furnishing and installing 2" ℄ galv. pipe sockets shall be incidental to Class A Concrete. The flashboard pins shall be ⅜" ℄ x 2'-0" Standard Steel pipe. (Not part of this contract)

4-#4h11 bars to be ordered full length and cut in the field (See Plan)

4-#4b21@18"cts

#5b23
#5b24
#5b23
#5b22
#5b14
#4h11
#5b22
#4b21
#4h11

1'-3"

2'-1"

SIDE VIEW

SECTION 10-10

DETAIL "A"

Apron
Dam
1¼"dia. x 18"lg. smooth coated dowel bars @ 12"cts. 14 Req'd. ea. jt.
½" Chamfer
⅜" P.J.F.

JOINT DETAIL

4"cl.-Typ.
Apron ℄
⅛" Trowelled bituminous mastic
9"
⅛" Contraction Joint

SECTION 9-9

Notes:
Reinforcement bars are spaced at 18" centers unless otherwise noted.

The reinforcement bars shall be cut and/or adjusted in the field to fit actual field conditions as directed by the Engineer.

The cost of this work shall be considered incidental to the unit price bid for Reinforcement Bars.

FR-320

DESIGNED BY W.J.S. DATE 11-29-82
CHECKED BY J.N.P. DATE 11-29-82
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DRAWN BY V.I.S. DATE 9-15-82

REVISIONS

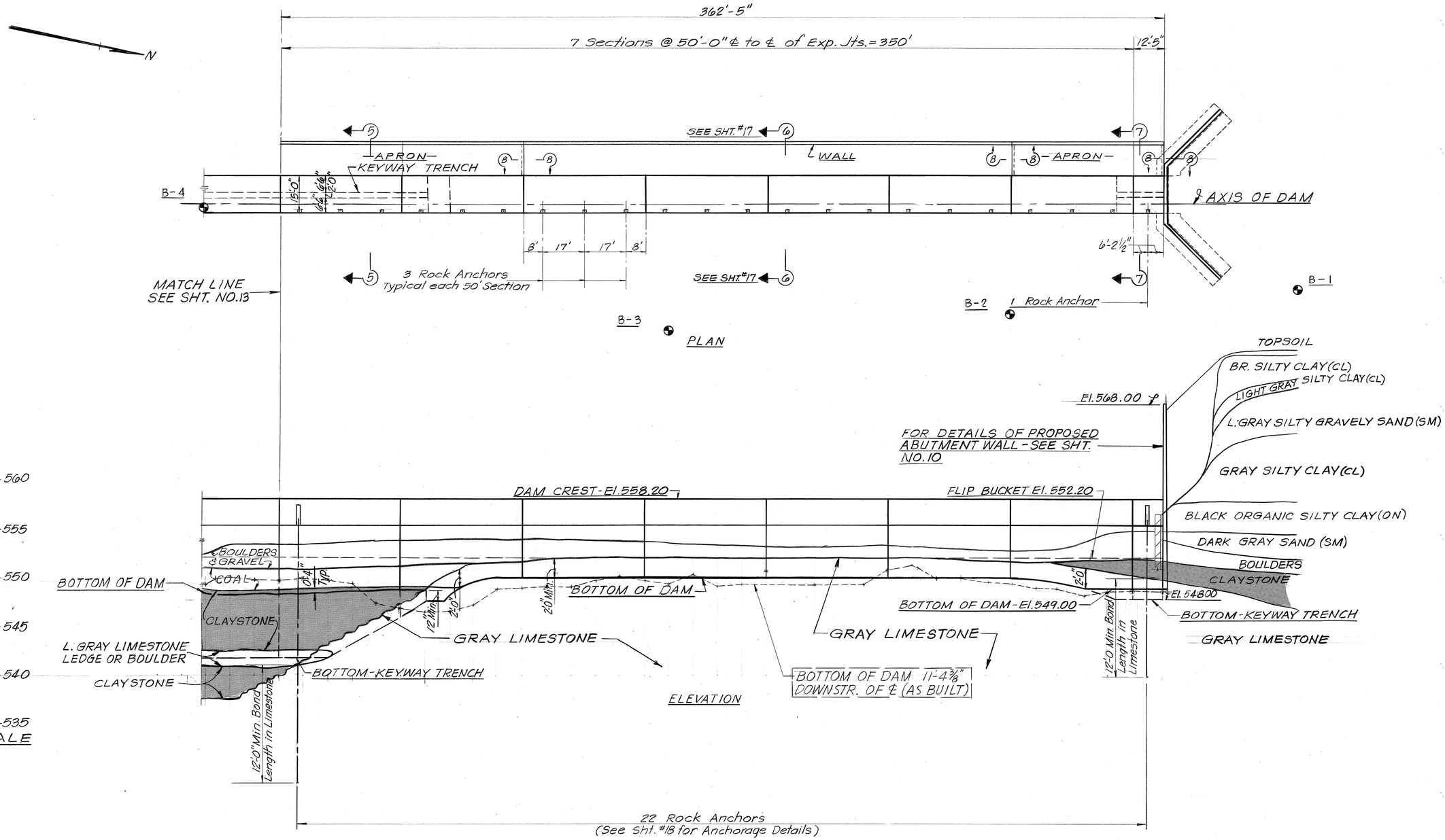
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DAM CONSTRUCTION PLAN AND DETAILS

FILE NO.
CLASSIFICATION NO.

SHEET NO. 14 OF 19 SHEETS




DESIGNED BY W.J.S. DATE 11-29-82
CHECKED BY JNP DATE 11-29-82
ORIGINAL SURVEY BOOK
DRAWN BY V.I.S. DATE 6-18-82

REVISIONS

| ISSUE | REVISION LETTER | REVISED BY | DATE |
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| | AS BUILT | V.I.S. | 7-7-89 |
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SCALE: AS SHOWN

# DAM CONSTRUCTION PLAN AND DETAILS

FR-320

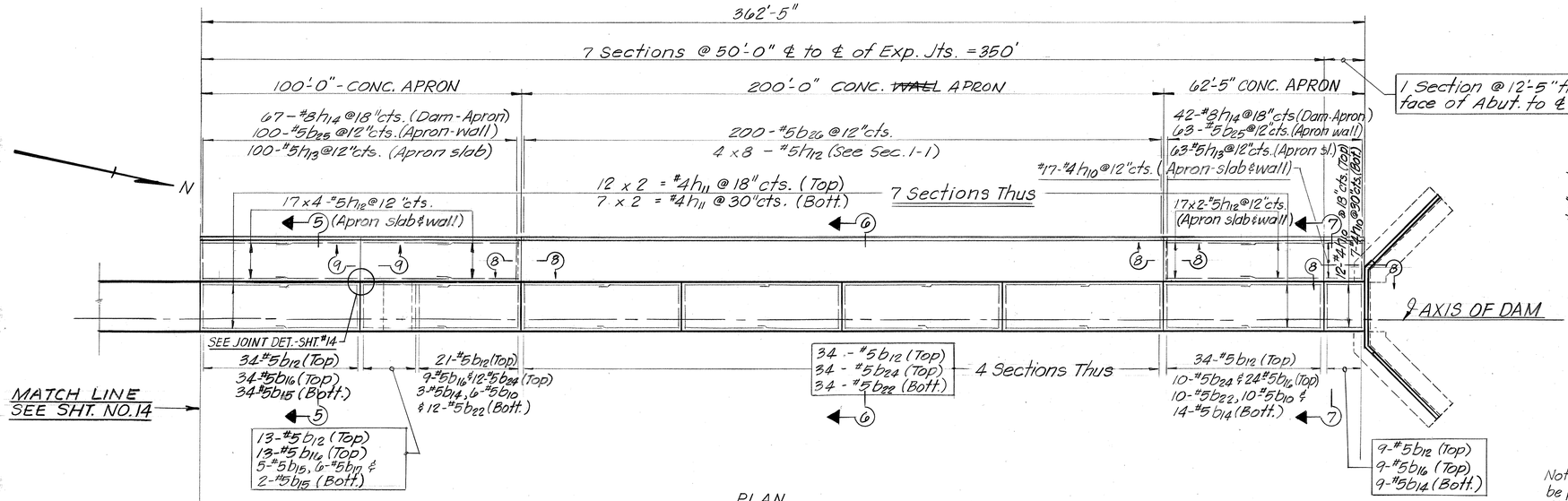
FILE NO.
CLASSIFICATION NO.

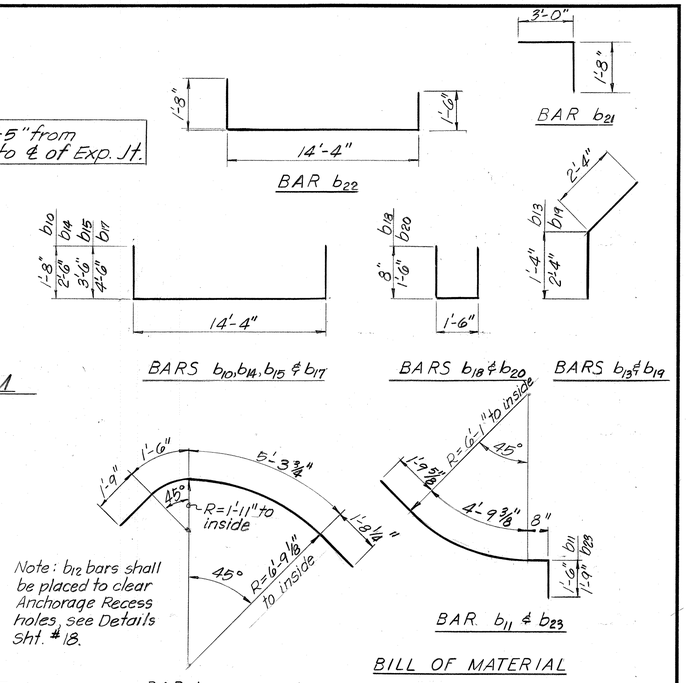
SHEET NO. 15 OF 19 SHEETS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

# STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

DIVISION OF WATER RESOURCES

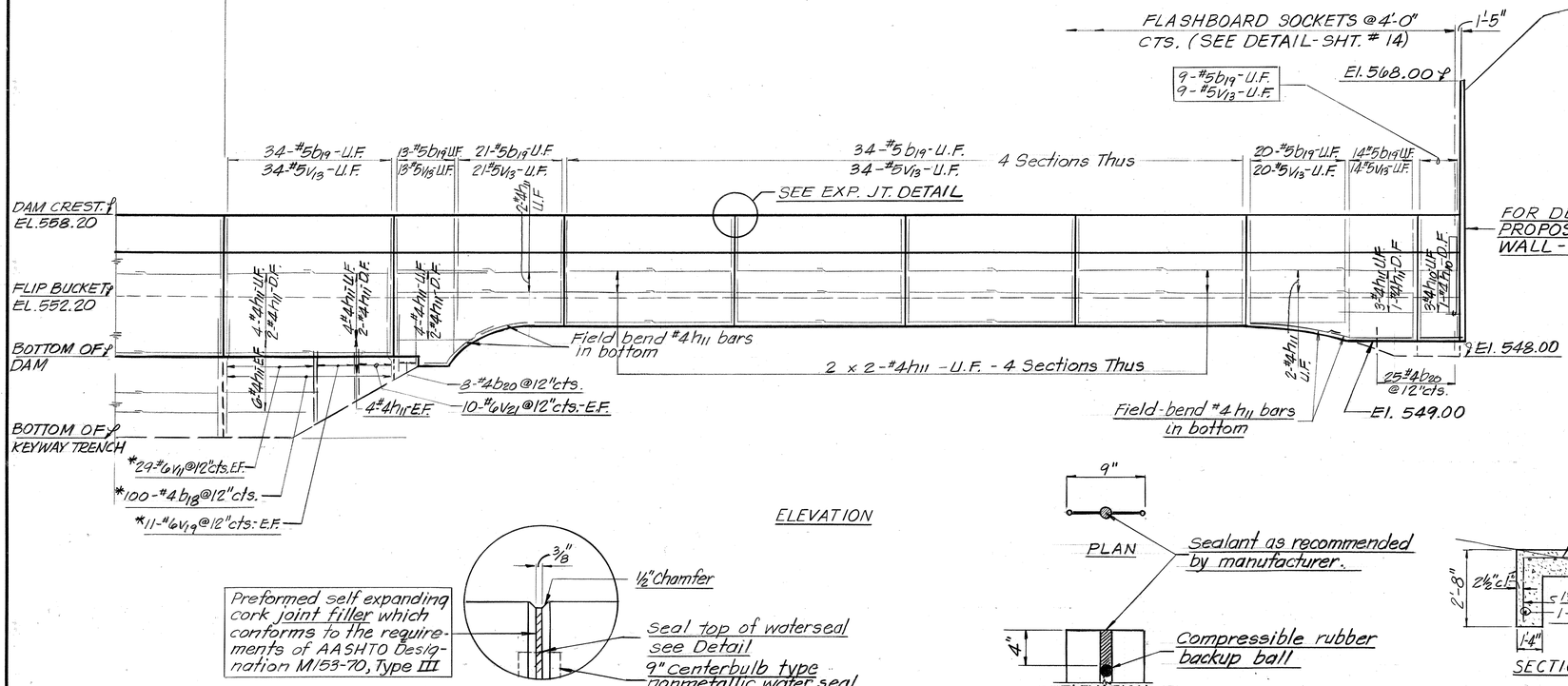



## BILL OF MATERIAL

| BAR | NO. Sht #14 | NO. Sht #16 | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|---|
| b10 | 6 | 16 | #5 | 17'-8" | |
| b11 | 25 | | | 8'-9" | |
| b12 | 281 | 247 | | 10'-3" | |
| b13 | 43 | | | 3'-8" | |
| b14 | 23 | 26 | | 19'-4" | |
| b15 | 148 | 41 | | 21'-4" | |
| b16 | 236 | 89 | | 9'-9" | |
| b17 | 72 | 6 | #5 | 23'-4" | |
| b18 | ~~122~~ ~~300~~ | ~~18~~ ~~100~~ | #4 | 2'-10" | |
| b19 | 238 | 247 | #5 | 4'-8" | |
| b20 | ~~182~~ | ~~55~~ | #4 | 4'-6" | |
| b21 | ~~4~~ | | #5 | 4'-8" | |
| b22 | 32 | 158 | | 17'-6" | |
| b23 | 12 | | | 9'-0" | |
| b24 | 8 | 158 | | 9'-6" | |
| b25 | ~~333~~ | ~~193~~ | | 7'-9" | |
| ~~b26~~ | ~~75~~ | ~~200~~ | | ~~6'-11"~~ | |
| b27 | 12 | ~~52~~ 12 | #5 | 3'-10" | |
| h10 | ~~58~~ 58 | ~~42~~ 42 | #4 | 11'-9" | |
| h11 | ~~340~~ 340 | ~~334~~ 334 | #4 | 26'-8" | |
| h12 | ~~288~~ 288 | ~~134~~ 134 | #5 | 25'-6" | |
| h13 | ~~224~~ 224 | ~~167~~ 167 | #5 | 13'-4" | |
| h14 | ~~224~~ 224 | ~~132~~ 132 | #8 | 6'-0" | |
| v11 | ~~300~~ 300 | ~~52~~ 52 | #6 | 9'-6" | |
| v12 | 33 | | #5 | 7'-3" | |
| v13 | 120 | 247 | | 4'-9" | |
| v14 | 40 | | | 5'-2" | |
| v15 | 34 | | | 6'-8" | |
| v16 | 62 | | | 4'-4" | |
| v17 | 51 | | | 6'-0" | |
| v18 | 25 | | #5 | 4'-1" | |
| v19 | ~~50~~ | 22 | #6 | 8'-2" | |
| v20 | 30 | | #5 | 4'-2" | |
| v21 | ~~44~~ | 20 | #6 | 6'-6" | |

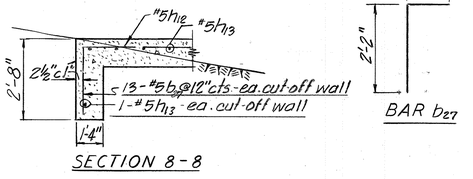
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|---|---|---|
| Structure Excavation cu.yd | ~~3,495~~ | 3,381.1 |
| Rock Excavation for Structures cu.yd | ~~546~~ | 788.1 |
| Class A Concrete cu.yd. | ~~498.7~~ | 375.8 |
| Lean Concrete cu.yd. | ~~422.6~~ | 489.7 |
| Class X Concrete cu.yd. | 7.3 | |
| Reinforcement Bars lb. | ~~53,450~~ | 94,202 |

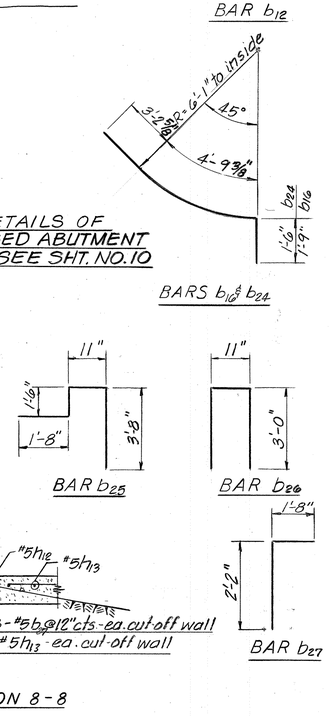









FR - 320

SCALE: AS SHOWN

DAM CONSTRUCTION PLAN AND DETAILS

FILE NO.
CLASSIFICATION NO.
SHEET NO. 16 OF 19 SHEETS

DESIGNED BY W.J.S. DATE 11-29-82
CHECKED BY J.J.P. DATE 11-29-82
ORIGINAL SURVEY BOOK -
DRAWN BY V.L.S. DATE 6-15-92

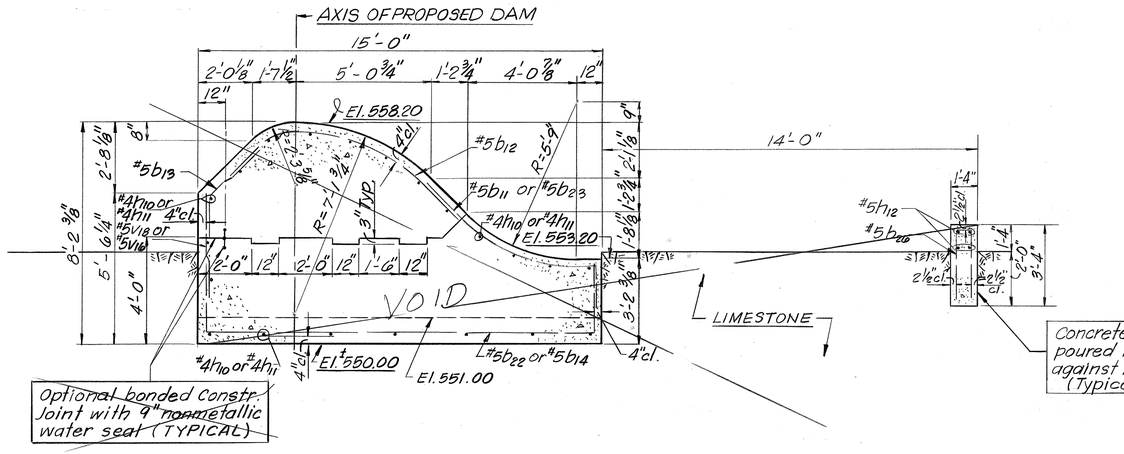
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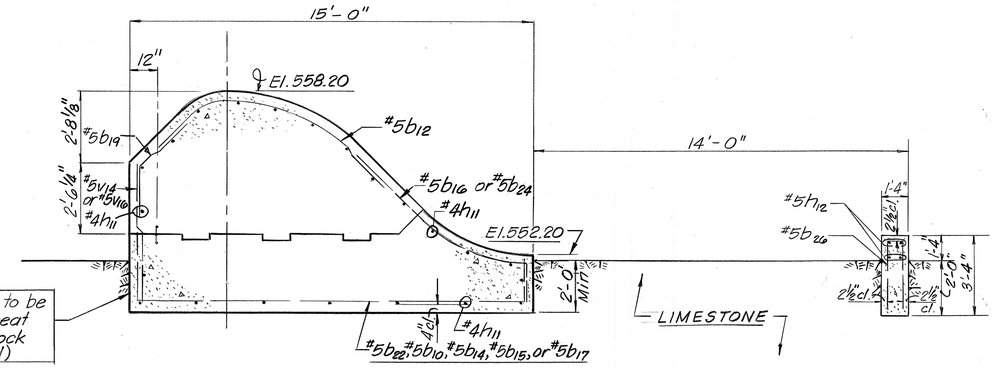
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

# STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

DIVISION OF WATER RESOURCES

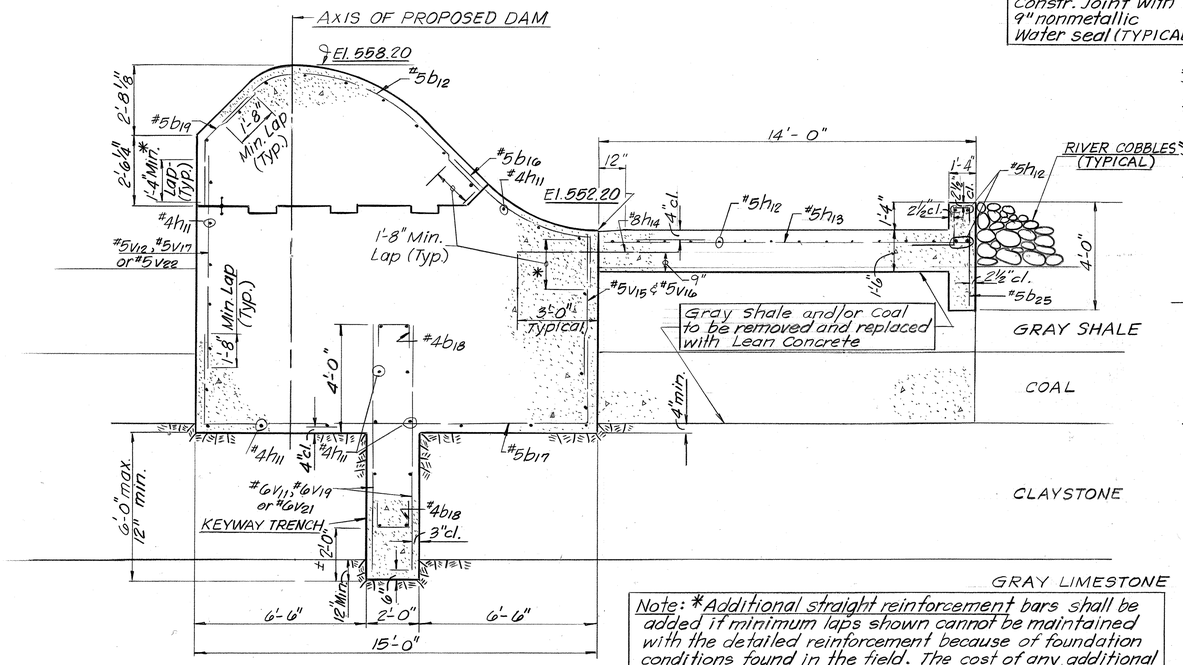



SECTION 1-1



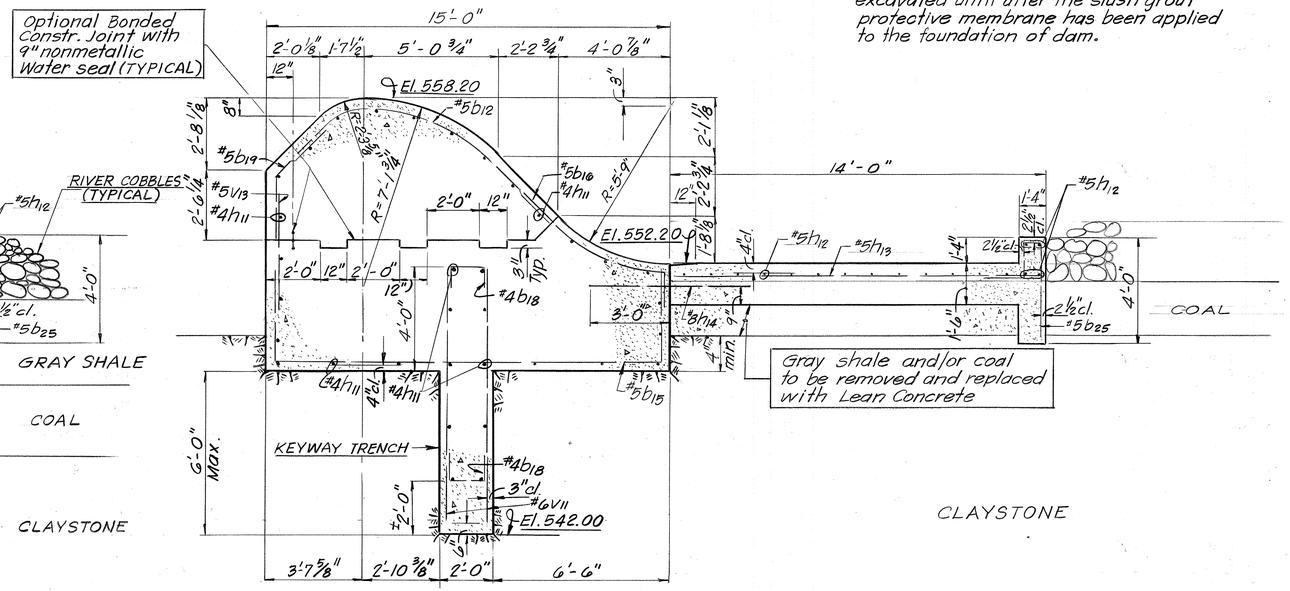

SECTION 2-2

Notes: The dimensions for circular curve co-ordinates and radii as shown in Sections 4-4 and 5-5 are typical for Sections 2-2, 3-3, 6-6, and 7-7.
The keyway trench shall not be excavated until after the slush grout protective membrane has been applied to the foundation of dam.




Note: *Additional straight reinforcement bars shall be added if minimum laps shown cannot be maintained with the detailed reinforcement because of foundation conditions found in the field. The cost of any additional reinforcement shall be paid for at unit price bid for Reinforcement Bars.

SECTION 3-3




SECTION 4-4

FR-320

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CHECKED BY
ORIGINAL SURVEY DATE 4-11-83
DRAWN BY V.I.S. DATE
BOOK
DATE

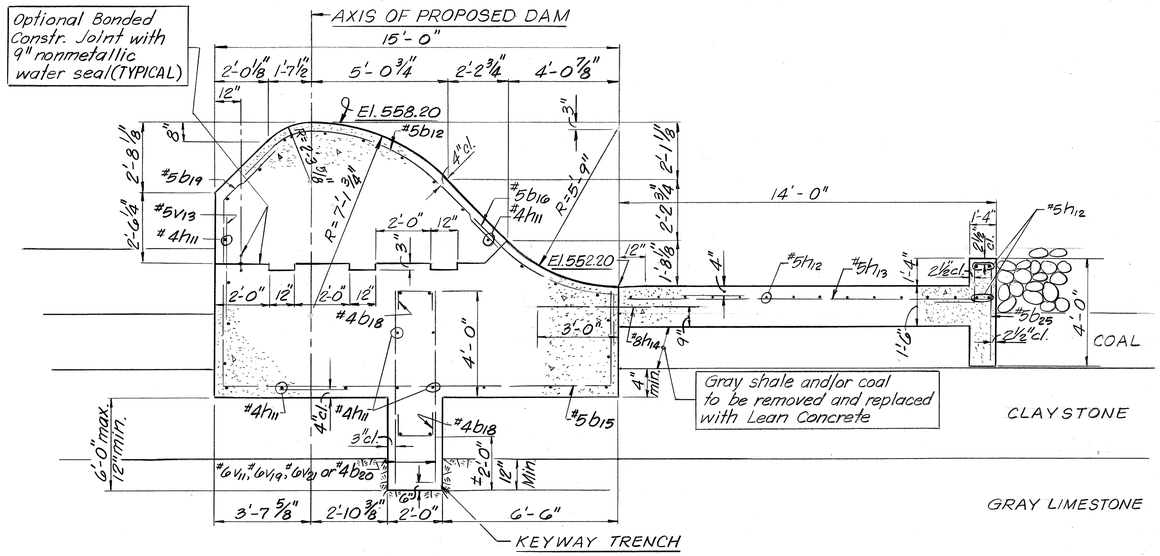
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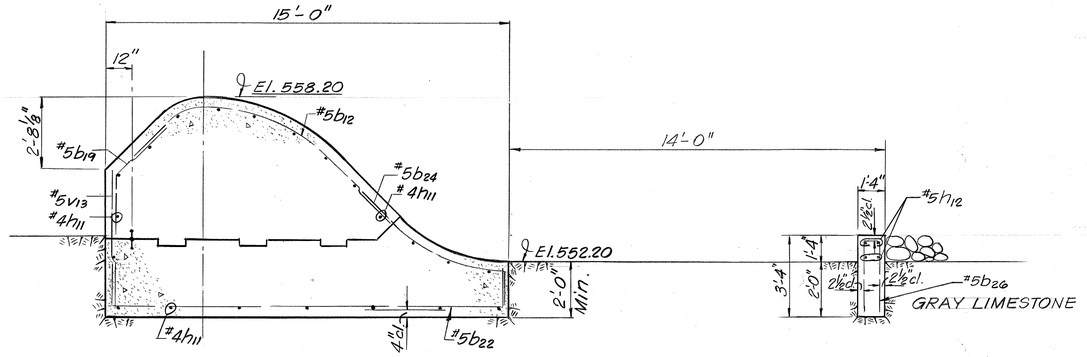
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DAM CONSTRUCTION · CROSS SECTIONS

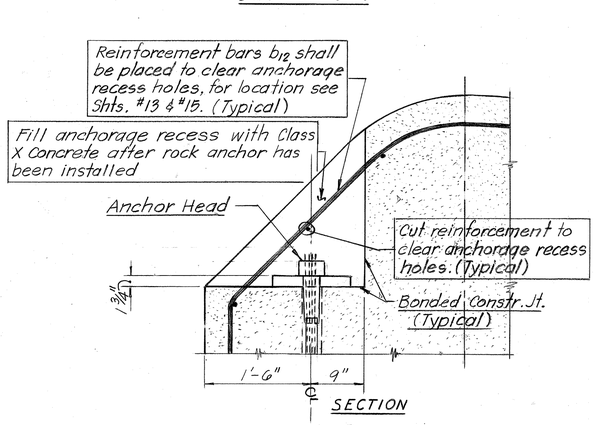
FILE NO.
CLASSIFICATION NO.
SHEET NO. 17 OF 19 SHEETS

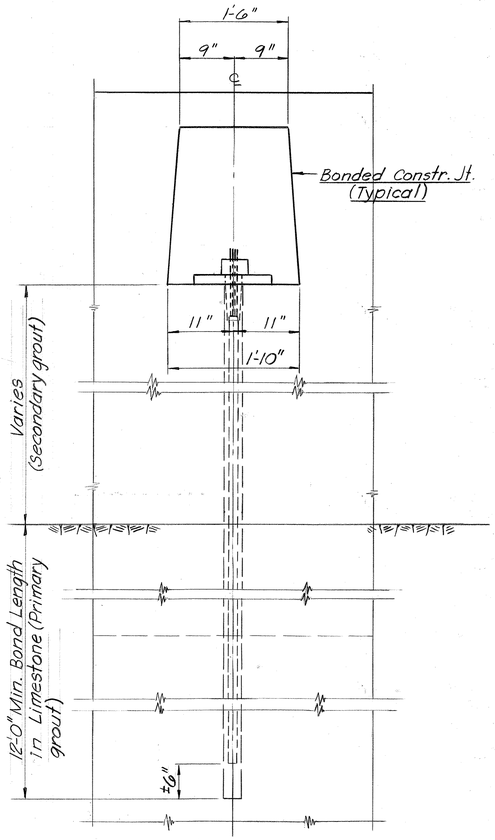



SECTION 5-5

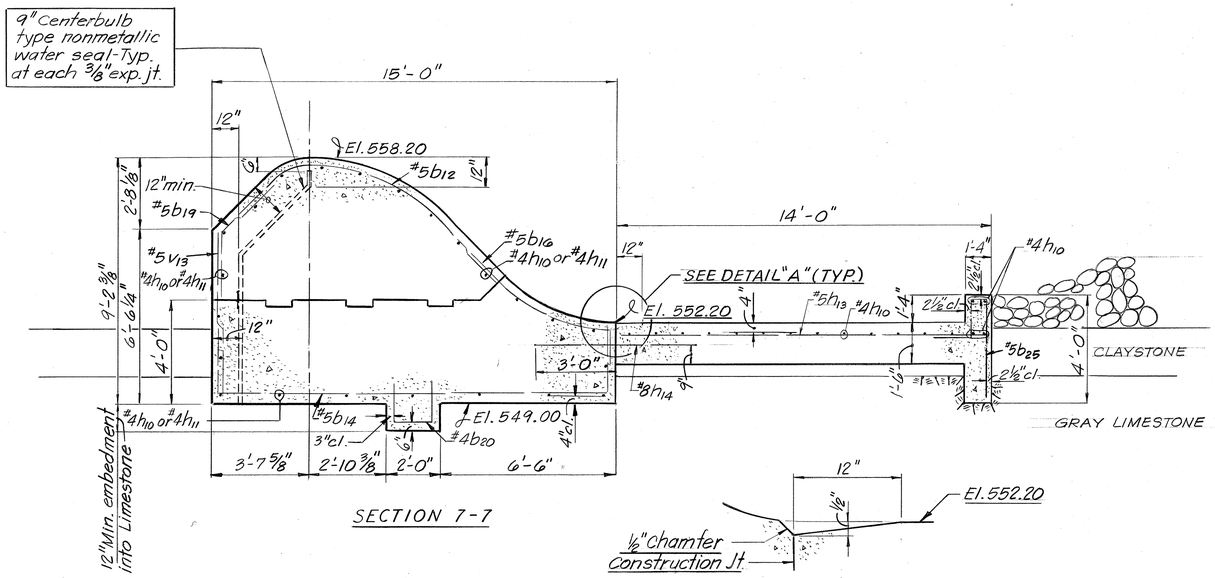



SECTION 6-6




ANCHORAGE DETAILS







DETAIL "A"
TYPICAL

Note: Each Rock Anchor shall have a minimum working load equal to 103 kips. For location of Rock Anchors see Construction Plan and Details Shts. #13 & #15.

DESIGNED BY
CHECKED BY
ORIGINAL SURVEY
DRAWN BY V.I.S.
DATE
DATE
BOOK
DATE 4-15-83

REVISIONS

| ISSUE | REVISION LETTER | REVISED BY | DATE |
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DAM CONSTRUCTION · CROSS SECTIONS

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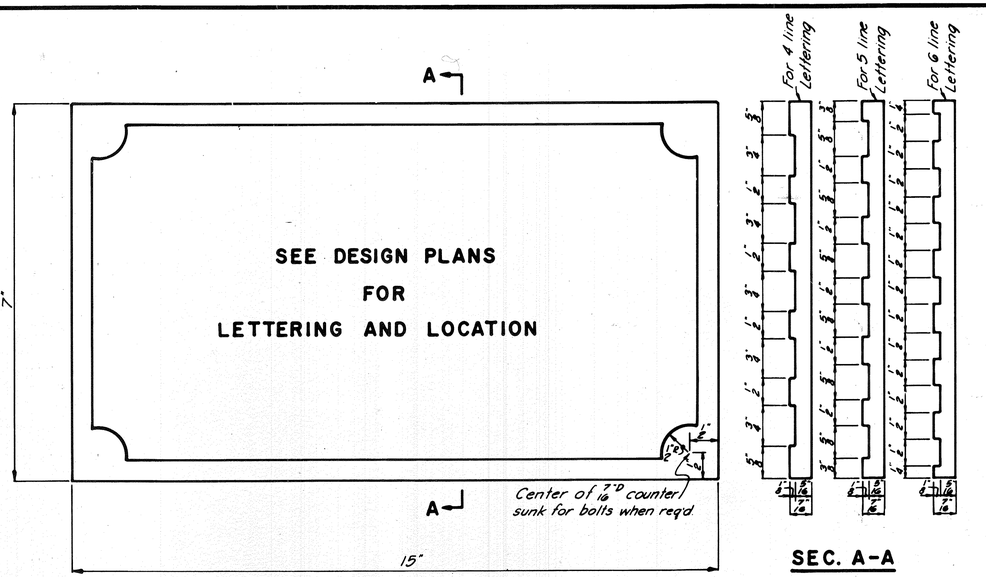
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CLASSIFICATION NO.
SHEET NO. 18 OF 19 SHEETS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

CENTER LINE
RIGHT OF WAY
TEMPORARY EASEMENT LINE
RAILROADS
MANHOLE
PIPES — Under 24" ----- Over 24"
GUY WIRE or ANCHOR
GUY POLE
POLES
POWER LINE
TELEPHONE LINE
TELEGRAPH LINE
POWER & TELEPHONE (Combined on same poles)
POWER & TELEPHONE (Combined on same poles crossing creek)
CROSSING
UNDERGROUND CABLE
GAS LINES
WATER MAINS
OIL LINES
VENTS
STORM SEWER INLETS & CATCH BASINS
FIRE HYDRANT
METER BOXES
TRAPS, GREASE etc.
CISTERN or WELL
CESSPOOL or SEPTIC TANK
FOUNTAIN
CITY LIMITS
VALVE
DIRECTION OF FLOW
BRIDGE OR CULVERT

## STANDARD SYMBOLS




Material: Best quality brass or bronze.
Bordering & Lettering: Raised 1/8", Square cut and not tapered, Top surface polished.
Fastenings: For concrete rails, abutment headwalls: 4 lugs at least 3" long, cast on back of plate.

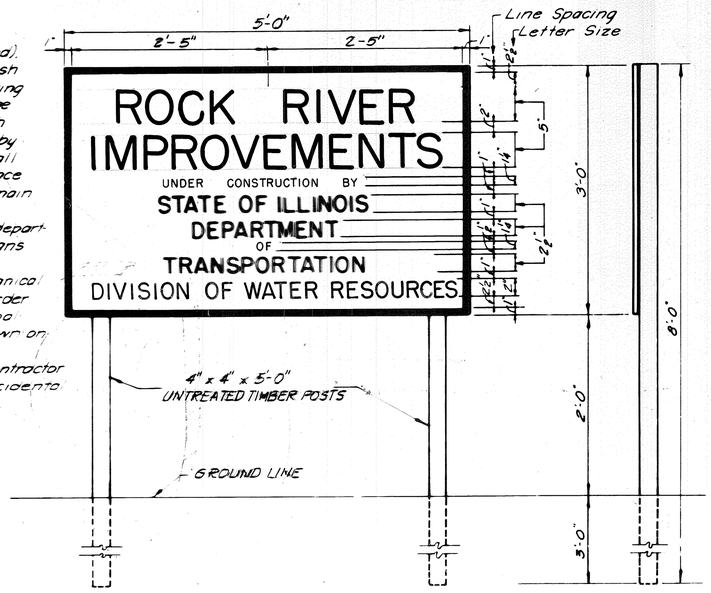
## DETAIL OF NAME PLATE

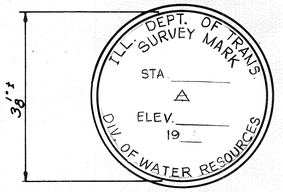
### GENERAL NOTES

Signs shall be made of (1" lumber rigidly cleated) or of metal (18 ga). The Contractor shall furnish all material and labor for constructing and erecting the signs. The signs shall be placed prior to the starting of actual construction operations at each end of the construction section, or as directed by the Engineer. Before any sign is erected, it shall be approved by the Engineer as to its appearance and quality of construction. The signs shall remain in place and shall be maintained in satisfactory condition until the project is accepted by the department. The Contractor shall then remove the signs and the material will become his property.

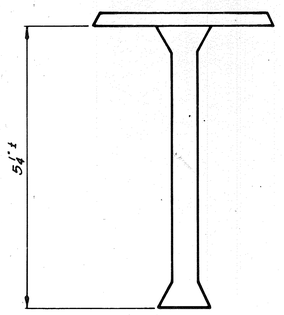
The letters on the signs shall be black mechanical style on a white background and appropriate border line. The signs shall be painted by a professional painter and the size of the letters shall be as shown on these Plans.

No extra compensation will be allowed the Contractor for these signs and the cost shall be considered incidental to the Contract.




Bench Mark to be furnished by the Division of Water Resources
See Design Plans for location.
Cost of placing shall be considered incidental to contract.




## DETAIL OF BENCH MARK

DESIGNED BY W.J.S. DATE 11-29-82
CHECKED BY J.N.P. DATE 11-29-82
ORIGINAL SURVEY BOOK
DRAWN BY V.I.S. DATE 6-22-82

REVISIONS

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STANDARD SHEET

FR-320

FILE NO.
CLASSIFICATION NO.

SHEET NO. 19 OF 19 SHEETS

# APPENDIX F - Existing Conditions Hydrology and Hydraulics

HANSON

# MEMORANDUM

| |
|---|
| Date: 11/12/2024 |
| To: Terra McParland, P.E., CFM; Wes Cattoor, P.E., CFM (IDNR/OWR) |
| From: Marian Domanski, P.E., CFM; Garrett Litteken, P.E., CFM |
| Project No.: 22G0045 |
| Project Name: Sears and Steel Dam Study |
| Subject: 2D Existing Conditions Model Development |
| Copy to File, Others: |

Hanson Professional Services Inc. (Hanson) has developed a 2-dimensional (2D) model of existing conditions at the state-owned Sears and Steel Dams to explore potential public safety improvements. The dams are situation on the Rock River in Rock Island County, Illinois. Vandruff Island separates the Rock River into north and south channels in the vicinity of the dams. Sears Dam lies at river mile 2.78 in the channel north of the island, and Steel Dam lies at river mile 4.42 in the south channel. The modeled reach is approximately 2.6 miles long and extends approximately 2,200 feet upstream of the Steel Dam and approximately 3,200 feet downstream of the Sears Dam. The existing condition model will provide baseline water surface elevations, depth-average channel velocities, and bed shear in support of a sediment management evaluation and subsequent alternatives analysis for the modifications and/or removal of the dams. The existing condition model provides hydraulic conditions at the Sears and Steel Dams prior to any proposed considerations for modification. The existing conditions model will serve as the baseline model for the proposed dam removal alternatives analysis. The model was developed using the Hydrologic Engineering Center River Analysis System (HEC-RAS v6.5) developed by the US Army Corps of Engineers (USACE).

The existing conditions model geometry was developed from a combination of light detection and ranging (LiDAR) elevation data collected by the US Geological Survey (USGS) in 2019 (USGS, 2023), bathymetric data collected by the Illinois Department of Natural Resources Office of Water Resources (IDNR-OWR) in late 2023 and 2024, and a 1-dimensional (1D) unsteady hydraulic model developed by the USACE Rock Island District in 2014 (USACE, 2014). Attachment 1 shows the 1- and 2D model extents.

Water-surface elevation profiles computed with the existing conditions model were compared to field observations made by the IDNR-OWR survey teams during the collection of bathymetric survey on June 5, 6, 14, and 15 of 2024, and used to calibrate the existing conditions. Results of the existing conditions 2D analysis show the maximum magnitude of error in water-surface elevation is 0.28 ft, with a mean error of -0.05 ft. Hanson considers the model results to be within acceptable range of error for calibration.

Preliminary depth-of-refusal (DOR) explorations of the riverbed determined that the existing sediment pool extends beyond the limits of the existing conditions 2D hydraulic model. The sediment fate analysis (performed by others), proposed as part of the Sears and Steel Dam modification/removal investigation, requires an understanding of bed velocities and shears through the entire reach of the sediment pool. The USACE Rock Island District 1D HEC-RAS model will be used to extend the limits of computed bed shears and velocities upstream of the detailed 2D hydraulic investigation in support of the sediment fate analysis. The 1D model geometry was updated with the bathymetric data collected by IDNR-OWR from cross-section 0.19 to 17, to a distance of approximately 12-miles upstream of the 2D hydraulic model limits.

Based on the model report, the 1D HEC-RAS model was previously calibrated to the USACE gage at Moline and the USGS gages at Joslin and Como (USACE, 2014). Updates to the 1D hydraulic model were limited to incorporation of IDNR-OWR recent bathymetric survey below the channel top of bank and no additional calibration of the 1D model was conducted.

## Datum

Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88).

## 2D Model Development

### Terrain

The 2D model terrain was developed from a combination of publicly available 2019 LiDAR data, 2023 and 2024 bathymetric survey conducted by IDNR-OWR for this study, and historic bridge and dam plans. The floodplain overbank was defined from one-meter resolution elevation data represented by digital elevation model (DEM) files. The DEM files were produced from LiDAR data collected by the USGS in 2019 (USGS, 2023). The DEM files were downloaded from The National Map through the HEC-RAS RAS Mapper graphical interface. The Rock River channel below the top of bank was created from bathymetric data collected by IDNR-OWR in 2023 and 2024. Bathymetric survey sections were converted to 1D HEC-RAS cross-sections which were subsequently used to generate a channel interpolation surface using RAS Mapper. A triangulated irregular network TIN surface was created from high-density bathymetric data collected by IDNR-OWR near the Sears and Steel Dams. The LiDAR DEM, channel interpolation surface, and TIN surface were combined into a single model terrain using the RAS Mapper terrain generation tool.

Terrain modifications were created within RAS Mapper to capture vertical structures such as building and bridges. Terrain modifications include

- Buildings in or near the floodplain,
- The vertical transition immediately upstream and downstream of dam crests,
- Dam abutments,
- The Sears Powerhouse platform,
- Piers and abutments for the US Route 67 bridge over the north channel,
- Filling LiDAR gaps at levees around the Hennepin Canal, and
- Fill in Vandruff Island to accommodate steady-state solution convergence.

Survey data collected by IDNR-OWR were used to inform the elevations and positions of the dam abutments, Sears Powerhouse platform, and piers and abutments for the US Route 67 bridge over the north channel. The widths for the pier terrain modifications were taken from as-built plans for the US Route 67 bridge over the north channel.

The US Route 67 bridge over the channel of the Rock River south of Vandruff Island is significantly downstream of the influence from Steel Dam (9,900 ft) and was modeled as a Storage Area/2D Flow Area (SA/2D) connection. In HEC-RAS, SA/2D connections are used to model 1D structures, such as bridges and weirs, inside 2D flow areas (USACE, 2024a). The SA/2D connections that represent the bridge deck and pier geometry were imported from the 1D USACE model. The US Route 67 bridge over the south channel is immediately downstream of the Sears Dam. Flow around the bridge piers is significantly impacted by the flow patterns generated by Sears Dam. Water reaches the low chord of the US Route 67 bridge at a flood event greater than the 0.2% annual exceedance probability (AEP) or 500-year. As such, the US Route 67 crossing over the north Rock River channel is not modeled as a SA/2D connection and the bridge piers and abutment were modeled using streambed terrain modifications, which is commonly how these types of structures are modeled in 2D HEC-RAS. Modeling the piers as terrain modifications improves the assessment of changes in flow patterns and peak scour velocities local to the bridge piers. The placement and geometry of the terrain modifications for the bridge piers are based on survey data and existing bridge plans, respectively.

### Land Cover

Land cover was defined by visual observation of site orthophoto datasets. Manning's n values in the 2D domain were divided into nine (9) categories (Attachment 2). For comparison, the land cover from the National Land Cover Database is shown in Attachment 3 (USGS, 2024). The categories and corresponding Manning's n values are show in Table 1. The values used match the 1D model and were verified with the HEC-RAS Hydraulic Reference Manual (USACE, 2024b). The river Manning's n value of 0.025 is within a reasonable range for 2D modeling and was not adjusted.

*Table 1 – Land cover type and corresponding Manning's n values applied in the existing 2D model.*

| Land Cover Type | Manning's n |
|---|---|
| Crops | 0.050 |
| Grass | 0.045 |
| Gravel | 0.050 |
| Open Water | 0.040 |
| Pavement | 0.013 |
| River | 0.025 |
| Light Vegetation | 0.060 |
| Moderate Vegetation | 0.080 |
| Heavy Vegetation | 0.100 |

## 2D Model Grid Cell Size

The model domain used an average grid cell size of 50-ft by 50-ft. Breaklines were used to capture key hydraulic elements such as levees, roadway embankments, bridge piers, and abutments (Attachment 4). Breakline spacing varied from 2- to 50-ft to ensure high ground was captured and to maintain cell orientation orthogonal to flow where feasible.

Breaklines with a cell spacing of 2-ft were placed around the US Route 67 bridge piers. The cells surrounding the piers expand to 4-ft within refinement regions (Attachment 5). The breaklines ensure that hydraulic elements are aligned to the vertical face of the bridge pier and that the "no-slip" condition generated by the piers is adequately represented (Figure 1).

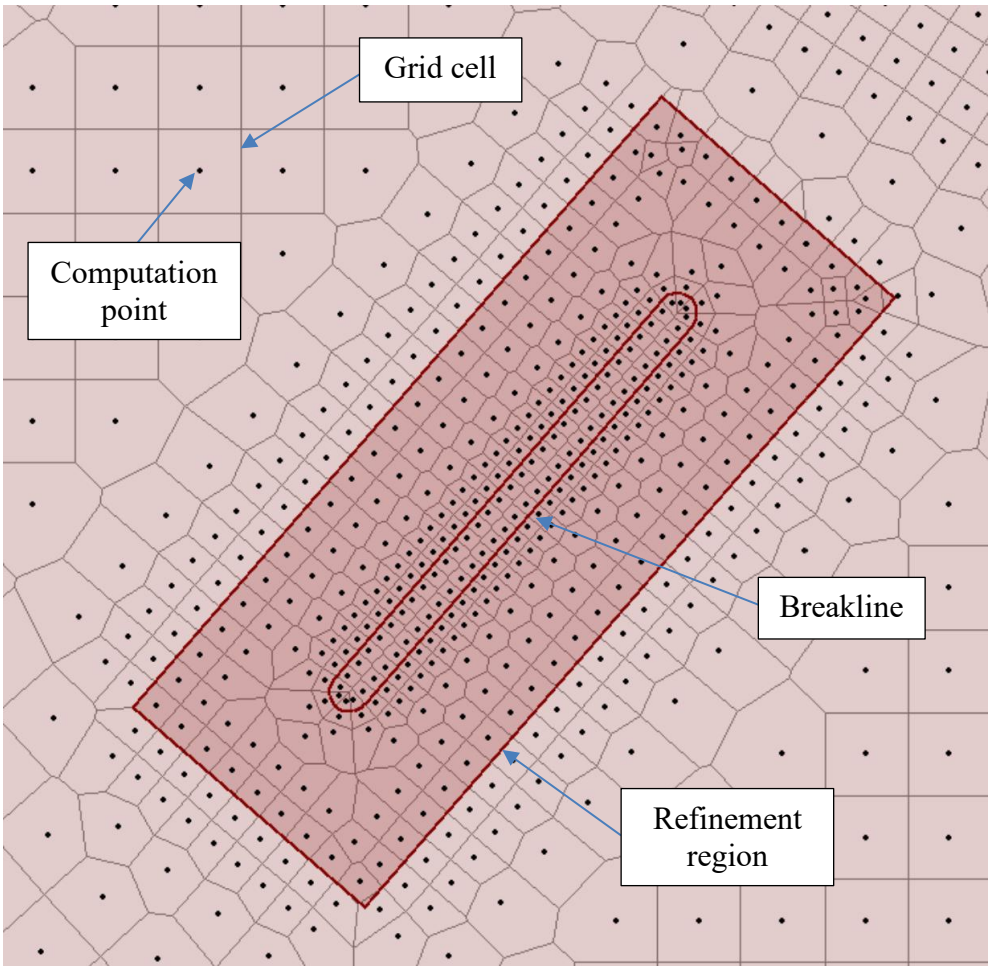



*Figure 1 – Grid cells, computation points, breaklines, and the refinement region around Pier 3 of the US Route 67 bridge over the north channel of the Rock River. The breakline around the pier ensures the cell faces are aligned with the vertical pier face.*

The breakline that outlines the Sears Dam crest was set to a cell spacing of 5-ft, and the breakline at the Steel Dam crest was set to a cell spacing of 25-ft. A smaller cell spacing was used for the Sears Dam to accommodate the complex flow patterns that occur between the dam and the US Route 67 bridge piers. A refinement region with a cell size of 10-ft by 10-ft was placed around the area upstream and downstream of the Sears Dam to capture the contraction of flow upstream of the dam and the dissipator pool downstream of the dam. Refinement regions, with cell sizes of 4-ft by 4-ft, were also placed within the Sears Dam area of influence around the US Route 67 bridge piers.

### Bridges

The railroad bridge segments that cross both the north and south Rock River channels west (downstream) of the dams are represented by internal SA/2D connections. The US Route 67 bridge segment that crosses the south channel of the Rock River is also represented by a SA/2D connection (Figure 2).

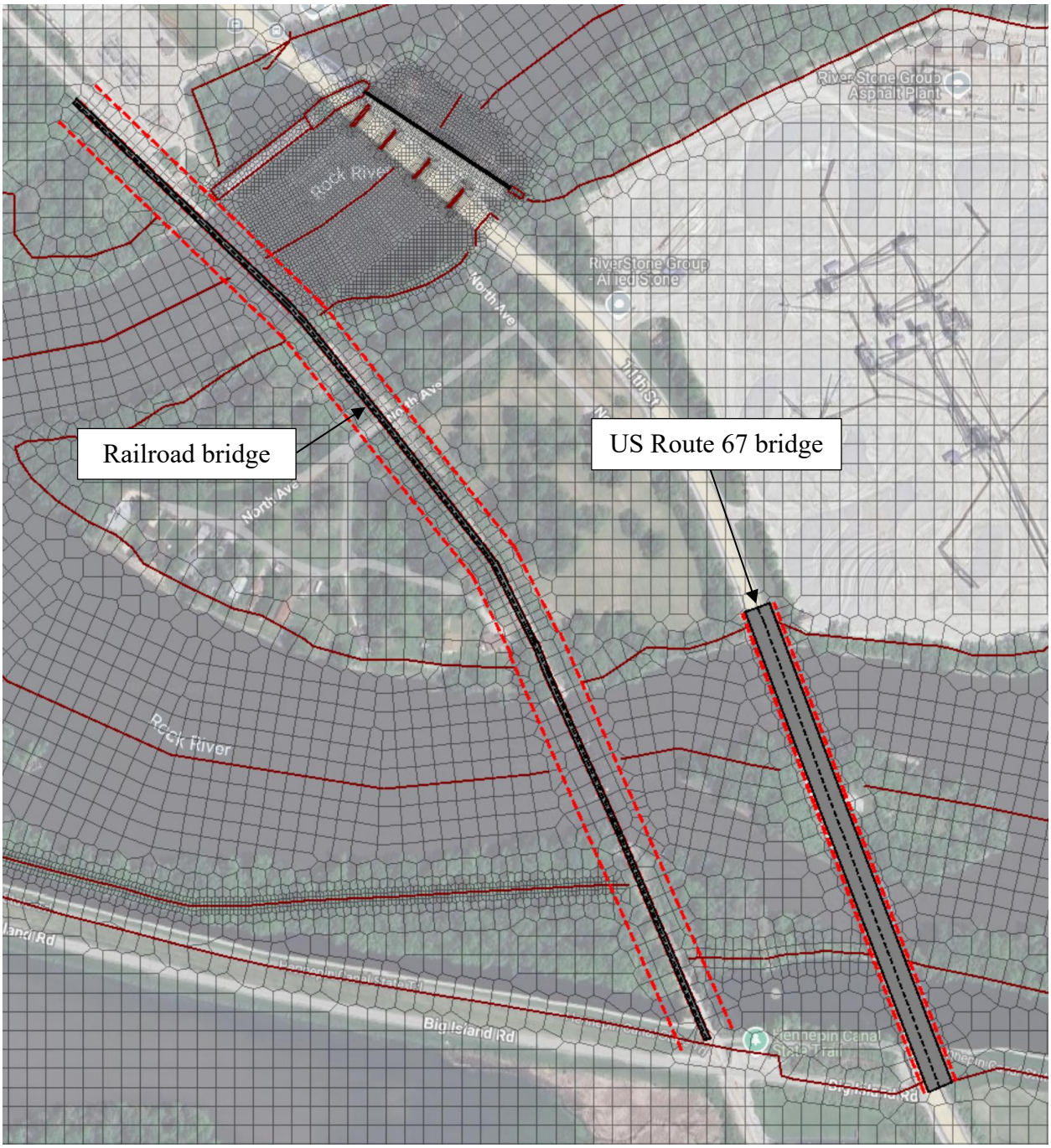



*Figure 2 – The railroad bridges and US Route 67 bridge over the south channel of the Rock River are represented by SA/2D connections.*

### Sears and Steel Dams

The Sears and Steel Dams are both represented by internal SA/2D connections. Dam crest elevation, weir length, and weir coefficient data were based on the 1D USACE HEC-RAS model and updated to reflect recent survey data and As-Built plans for Steel Dam. The Sears and Steel Dams are both modeled with an ogee weir crest shape. HEC-RAS automatically increases or decreases the applied weir coefficient, based on whether the energy head is greater or less than the design energy head (USACE, 2024b). The dam crest elevations were verified with survey data. The ogee weir discharge coefficients were acquired from the 1D USACE HEC-RAS model. The coefficients were reviewed against standard ogee weir equations and observed water surface data. The ogee weir discharge coefficient is determined based on a combination of spillway approach height and design energy head.

Review of the 1D USACE HEC-RAS coefficients determined that the applied discharge coefficients were outside the standard range for an ogee crest and did not correlate well with observed water surface data. The sum of design discharges computed from the design energy heads in the 1D model for the Sears and Steel Dams is 4.9 times greater than the 1% AEP (100-year) discharge on the Rock River. The weir discharge coefficients were adjusted based on calibration to observed water-surface elevations upstream and downstream of the structures. Table 2 provides the model parameters from the 1D USACE HEC-RAS model (USACE, 2014), and Table 3 provides the calibrated model parameters applied in the existing 2D HEC-RAS model. The source of the spillway approach heights and design energy heads listed in Table 2 is not documented in the model report (USACE, 2014). The spillway approach heights applied in the 2D model (Table 3) were measured as the difference between the dam crest elevation and the mean channel elevation immediately upstream of the dam. The design energy heads in Table 3 were estimated as the difference between the dam abutments elevations from the IDNR-OWR survey and the dam crest elevation.

*Table 2 – Existing dam model parameters, from the 1D USACE HEC-RAS model*

| Dam | Crest Elevation (ft) | Spillway Approach Height (ft) | Design Energy Head (ft) | Weir Coefficient |
|---|---|---|---|---|
| Sears | 557.64 | 13.00 | 22.00 | 3.60 |
| Steel | 558.00 | 3.50 | 12.50 | 3.60 |

*Table 3 – Calibrated dam model parameters, applied in the 2D HEC-RAS model*

| Dam | Crest Elevation (ft) | Spillway Approach Height (ft) | Design Energy Head (ft) | Weir Coefficient |
|---|---|---|---|---|
| Sears | 557.64 | 5.00 | 8.00 | 3.80 |
| Steel | 558.00 | 4.00 | 9.70 | 3.79 |

### Initial Conditions

A HEC-RAS restart file serves as initial conditions for all flow computations. The restart file was computed from a converging solution for a flow of 15,500-cfs. A restart file was used to improve model stability.

## Boundary Conditions

The upstream boundary has been determined to be adequately upstream of the area of interest as the flow enters the computational domain orthogonally to the boundary. Discharges ranging from 1,520-cfs (7Q10) to 54,900-cfs (0.2% AEP or 500-year flow) were applied to the upstream boundary of the 2D domain (Tables 4, 5, and 6). Each flow hydrograph begins at 15,500-cfs, to match the initial conditions flow, and reaches the plan flow over a six-hour period. The 7Q10 flow of 1,520-cfs is the flow reported by the Illinois State Water Survey for the project reach. The 7Q10 flow is the lowest 7-day average flow that occurs (on average) once every 10 years. The 7Q10 flow is the defined flow flow for the purpose of setting permit discharge limits. Recreational and fish passage flows were determined by Inter-Fluve as a part of this dam removal study (Inter-Fluve, 2024). Flood flows were taken from the USACE Rock Island District 1D HEC-RAS model.

*Table 4 – Recreational flows*

| Description | Flow (cfs) |
|---|---|
| Low Flow | 2,700 |
| Average Recreational Flow | 7,900 |
| High Paddling Flow | 11,500 |
| High Flow for Recreational Usage | 16,000 |

*Table 5 – Fish passage flows*

| Percent of Time Exceeded | Average Flow (cfs) |
|---|---|
| 95 | 4,410 |
| 90 | 5,510 |
| 80 | 6,860 |
| 70 | 8,200 |
| 60 | 9,360 |
| 50 | 10,900 |
| 40 | 12,300 |
| 30 | 14,400 |
| 20 | 17,100 |
| 10 | 21,800 |

*Table 6 – Flood flows*

| AEP (%) | Recurrence Interval (years) | Flow (cfs) |
|---|---|---|
| 10.0 | 10 | 47,400 |
| 4.0 | 25 | 49,800 |
| 2.0 | 50 | 50,900 |
| 1.0 | 100 | 51,900 |
| 0.2 | 500 | 54,900 |

A river stage-discharge rating curve was applied as the downstream boundary condition across the full range of flows. The rating curve was developed from a combination of steady and unsteady flow profile computations in 1D HEC-RAS plans and is representative of normal depth conditions on the Rock River without backwater influence from the confluence at the Mississippi River. The 1D USACE HEC-RAS model was updated with the bathymetric survey where applicable prior to development of the stage-discharge rating curve.

### Unsteady Solution Method

While the 2D-model is run under steady state discharge conditions, the model utilizes unsteady flow computations. As a result, the model requires adequate simulation time to reach steady state flow conditions. This is achieved when the model has reached a stable computational solution as demonstrated by the constant flow rate. To evaluate convergence of the model solution, time series of the modeled flows over the Sears and Steel Dams were plotted in Figure 3. This figure shows the time series of flows converging to a steady-state value which indicates that the model reached a stable computational solution.

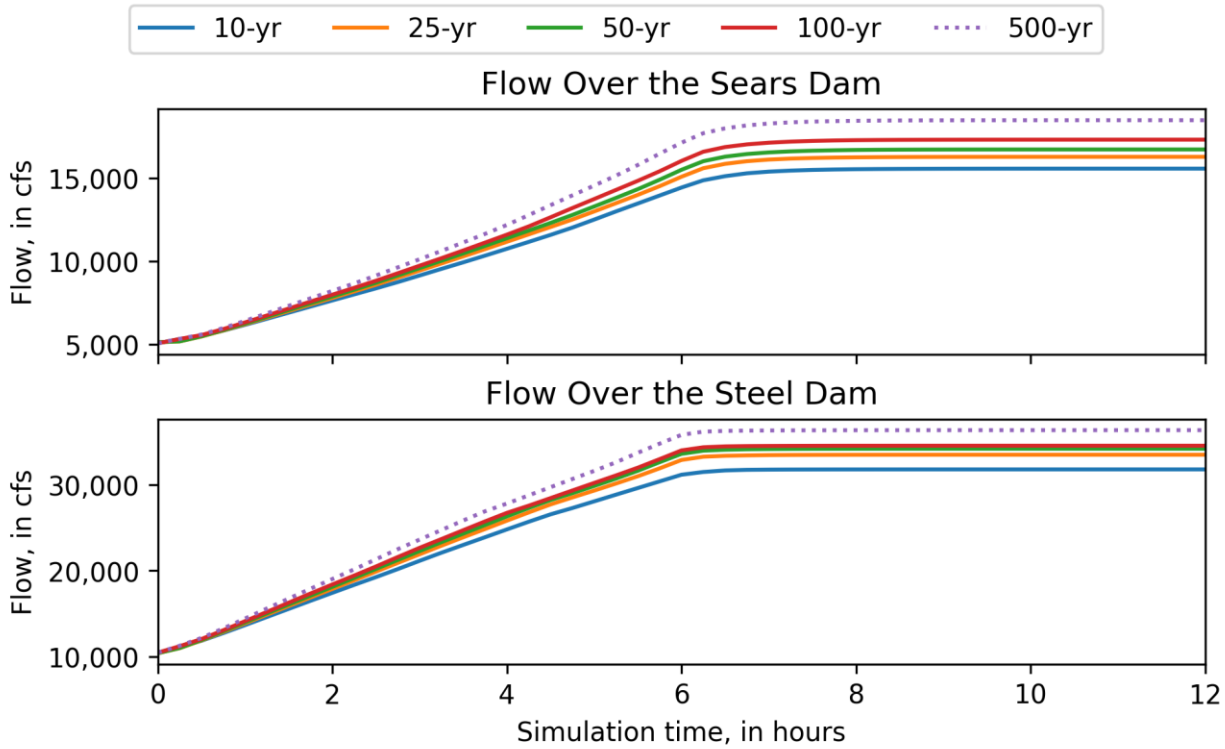



*Figure 3 – Time series of flows over the Sears and Steel Dams, computed for the flood flow plans.*

Two HEC-RAS plans were created for the fish passage and recreational flows (Tables 4 and 5). For each plan, a stepped hydrograph was developed for the upstream boundary condition. The hydrograph begins at 15,500 cfs to match initial conditions, linearly decreases over 6 hours to the lowest flow rate in the flow category (e.g. 4,410 cfs for fish passage flows), is held steady at the target flow rate for 6 hours, then increases to the next-highest flow rate in the flow category (e.g. 5,510 cfs for fish passage flows). The steps continue until the highest flow rate in the flow category is reached (e.g. 21,800 cfs for fish passage flows). This method was employed to simplify the process of computing the flow profiles.

### Computational Parameters

The 2D shallow water equation solver (SWE-EM) was used for all model simulations. The SWE-EM equation solution method is suggested when details in "changes in water surfaces in velocities at and around hydraulic structures, piers/abutments, and tight contractions and expansions" (USACE, 2024a). Results from other solution methods were not compared. The default 2D computation options and tolerances were used for the hydraulic model. The turbulence model solver was not employed to improve computation time. Losses from 2D turbulence will be low, as there is minimal 2D recirculation observed in the model.

For all plans, the Advanced Time Step Control feature of HEC-RAS was used. The feature selects the time step based on the Courant numbers computed within the model domain. The Courant number is a dimensionless number that is used in assessing numerical accuracy (USACE, 2024a). The Courant number was computed as $(v \cdot dt)/L$, where $v$ is cell face velocity, $dt$ is the computational time step, and $L$ is the cell-to-cell distance. A target range of 0.5 to 2.0 was set for the Courant number. During the computation of all study plans, a time step of 0.402 seconds was automatically selected by HEC-RAS during the convergence of the solution for the flood flows, and 0.408 seconds for the fish passage and recreational flows.

## Model Calibration

Computed water surface elevations were compared to surveyed water surface elevations collected during the bathymetric survey conducted by IDNR-OWR. The observed water surface elevations were used to validate selected Manning's n values and adjust the ogee crest discharge coefficients.

### Observed Water Surface Elevations

A summary of observed water surface elevations is provided in Table 7. Water surface elevations were reported at surveyed cross-sections. The surveyed cross-section distances were computed along the centerlines shown in Attachment 6.

### Moline Gage

Calibration flows corresponding to the dates survey was collected were taken from the USACE gage at Moline, Illinois. The USACE gage at Moline is 7.2 miles upstream of the mouth of the Rock River and 2.4 miles upstream of the 2D model domain. The discharge applied to the 2D model domain correspond to the flows reported on the day of the observation at the USACE gage (Table 7).

*Table 7 – Comparison of observed and computed water-surface elevation for model validation. Reported flows are from the USACE gage at Moline, IL.*

| Time of Observation | Survey Cross Section | Reported Flow (cfs) | Observed WSE (ft) | Computed WSE (ft) | Obs. - Comp. WSE (ft) |
|---|---|---|---|---|---|
| 6/6/24 12:30 PM | 3 | 14,200 | 559.94 | 559.83 | 0.11 |
| 6/6/24 11:23 AM | 4 | 14,200 | 559.87 | 559.85 | 0.02 |
| 6/6/24 11:12 AM | 5 | 14,200 | 559.61 | 559.88 | -0.27 |
| 6/6/24 10:58 AM | 6 | 14,200 | 560.07 | 559.94 | 0.14 |
| 6/6/24 10:56 AM | 7 | 14,200 | 560.06 | 559.96 | 0.10 |
| 6/6/24 10:39 AM | 8 | 14,200 | 560.00 | 560.03 | -0.03 |
| 6/6/24 10:25 AM | 9 | 14,200 | 559.86 | 560.14 | -0.28 |
| 6/6/24 10:10 AM | 10 | 14,200 | 560.20 | 560.36 | -0.16 |
| 6/5/24 9:24 AM | 11 | 13,800 | 560.26 | 560.42 | -0.16 |
| 6/5/24 9:50 AM | 14 | 13,800 | 560.33 | 560.43 | -0.10 |
| 6/5/24 10:22 AM | 15 | 13,800 | 560.36 | 560.47 | -0.11 |
| 6/5/24 10:38 AM | 16 | 13,800 | 560.27 | 560.50 | -0.23 |
| 6/5/24 10:41 AM | 17 | 13,800 | 560.46 | 560.52 | -0.06 |
| 6/12/24 10:38 AM | 52[1] | 15,300 | 553.72 | 553.72 | 0.00 |
| 6/12/24 10:10 AM | 53 | 15,300 | 553.75 | 553.78 | -0.03 |
| 6/12/24 9:12 AM | 54 | 15,300 | 553.84 | 553.84 | 0.00 |
| 6/12/24 8:50 AM | 55 | 15,300 | 553.84 | 553.85 | -0.01 |
| 6/12/24 8:12 AM | 56 | 15,300 | 554.20 | 554.26 | -0.06 |
| 6/11/24 3:58 PM | 57 | 15,400 | 555.08 | 555.12 | -0.04 |
| 6/11/24 3:35 PM | 58 | 15,400 | 555.36 | 555.27 | 0.09 |
| 6/11/24 3:14 PM | 59 | 15,400 | 556.87 | 556.86 | 0.01 |
| 6/11/24 3:00 PM | 60 | 15,400 | 557.16 | 557.17 | -0.01 |
| 6/11/24 2:45 PM | 61 | 15,400 | 557.27 | 557.37 | -0.10 |
| 6/12/24 9:40 AM | 62 | 15,300 | 553.89 | 553.81 | 0.08 |
| 6/12/24 10:02 AM | RR | 15,300 | 553.70 | 553.83 | -0.13 |

[1] The downstream boundary condition of the 2D model domain was set to the observed water-surface elevation at this location. The tailwater boundary in the 2D model was set to a known water-surface elevation, instead of a normal depth boundary condition, to capture any influence from the Mississippi River during the survey.

## Computed Profiles

Model results were computed for the four (4) flows that were reported on days the water-surface elevations were surveyed. The flows are 13,800, 14,200, 15,300, and 15,400 cfs. These flows fall between 1- and 2-year flows, computed at the USGS gage Rock River Near Joslin, Illinois (USGS gage number 05446500). For profile computations during the 15,300- and 15,400-cfs flows, the downstream boundary was set to the observed water-surface elevation of 553.72 ft at survey cross section 52. An observed water-surface elevation was not available at the 2D model boundary during the June 5 and 6 surveys. As such, the rating curve boundary condition was applied for the 13,800 and 14,200 cfs computations. The computed water-surface elevation profiles were extracted along the Rock River channel centerlines to compare the 2D results to the observed water-surface elevations.

## Calibration Results

Water-surface elevation profiles computed with the existing conditions model were compared to field observations made during the collection of bathymetric data on June 5, 6, 11, and 12 of 2024 and used to calibrate the existing conditions (Figure 4). Results of the existing conditions 2D analysis match field observations with a maximum magnitude of error of 0.28-ft and a mean error of -0.05-ft. The maximum magnitude of error occurs at cross section 9.

The 2D results computed using the ogee crest discharge coefficients from the 1D model give a maximum difference between observed and computed water-surface elevations of 0.42-ft upstream, and 0.10-ft downstream, of the dams. Calibration of the 2D model evaluated potential changes to both Manning's n values and ogee crest weir discharge coefficients. Calibration using Manning’s n values would improve upstream agreement between the computed and observed water surface elevations; however, it would result in diminished agreement downstream of the dams. Calibration of weir discharge coefficients would target changes to upstream water surface elevations and maintain the good correlation downstream of the dam.

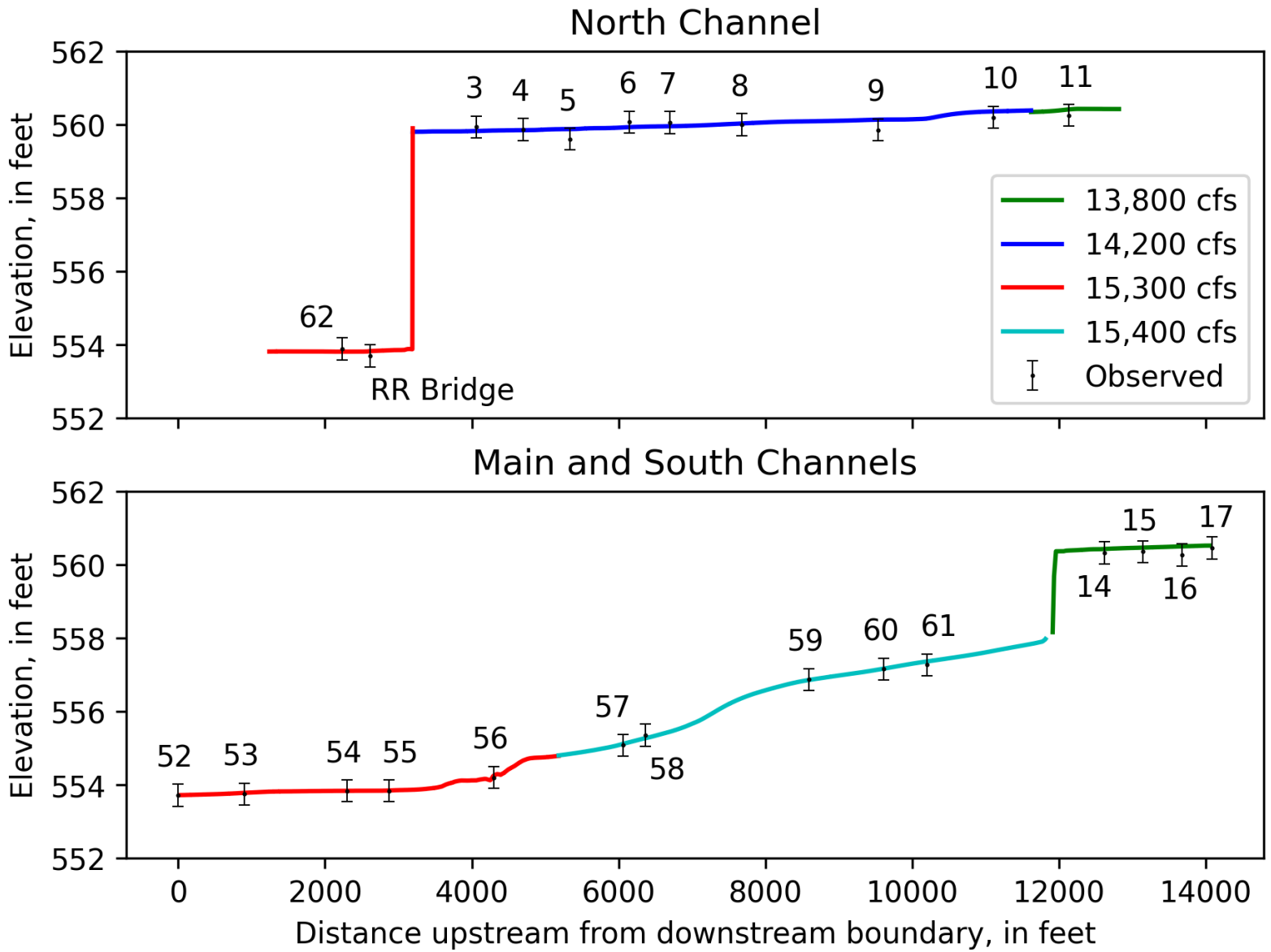



*Figure 4 – Comparison of observed and computed water-surface elevation profiles. Observed water-surface elevations are shown with flow reported at the US Army Corps of Engineers gage at Moline, Illinois. The survey cross section is noted for observed locations. Observed water-surface elevation points are shown with +/- 0.30-ft vertical bars.*

## 1D Model Update and Results

The USACE Rock Island District 1D HEC-RAS model will be used to extend the limits of computed bed shear and velocities upstream of the detailed 2D hydraulic investigation in support of the sediment fate analysis (performed by others). The geometry of the 1D model developed by USACE was updated using the 2024 IDNR-OWR bathymetric survey from cross-section 0.19 to 17. The 1D model was developed by the USACE Rock Island District on behalf of IDNR-OWR to develop the 10, 4, 2, 1, and 0.2 AEP water-surface elevations for the Lower Rock River (USACE, 2014). Using RAS Mapper, a 1D interpolation surface was created from the survey cross sections. The channel subsections of the model cross sections were updated from the surface.

Results of the 1D model were validated using the flows reported by the USACE gage at Moline, Illinois on the dates of the observed water surface survey. The profiles were computed with 1D steady HEC-RAS plans. The flow optimization option for the computation of flow around Vandruff Island was enabled in the HEC-RAS steady flow plan. As with the 2D computations, a known water-surface elevation of 553.72 ft was set at survey cross section 52 for the 15,300- and 15,400-cfs profiles.

A comparison of flows over the Sears and Steel Dams for the 1D and 2D plans are shown in Table 8. The 2D hydraulic and 1D junction methodologies compute identical flow splits between the two structures.

*Table 8 – Comparison of flows over the Sears and Steel Dams in 1D and 2D HEC-RAS plans.*

| Plan Flow (cfs) | Flow Over Sears Dam (cfs) | | Flow Over Steel Dam (cfs) | |
|---|---|---|---|---|
| | 2D | 1D | 2D | 1D |
| 13,800 | 4,700 | 4,700 | 9,100 | 9,100 |
| 14,200 | 4,800 | 4,800 | 9,400 | 9,400 |
| 15,300 | 5,100 | 5,100 | 10,200 | 10,200 |
| 15,400 | 5,100 | 5,100 | 10,300 | 10,300 |

Computed water-surface elevation profiles for the 1D and 2D plans are shown in Figure 5 and show the water-surface elevation profiles are in reasonable agreement.

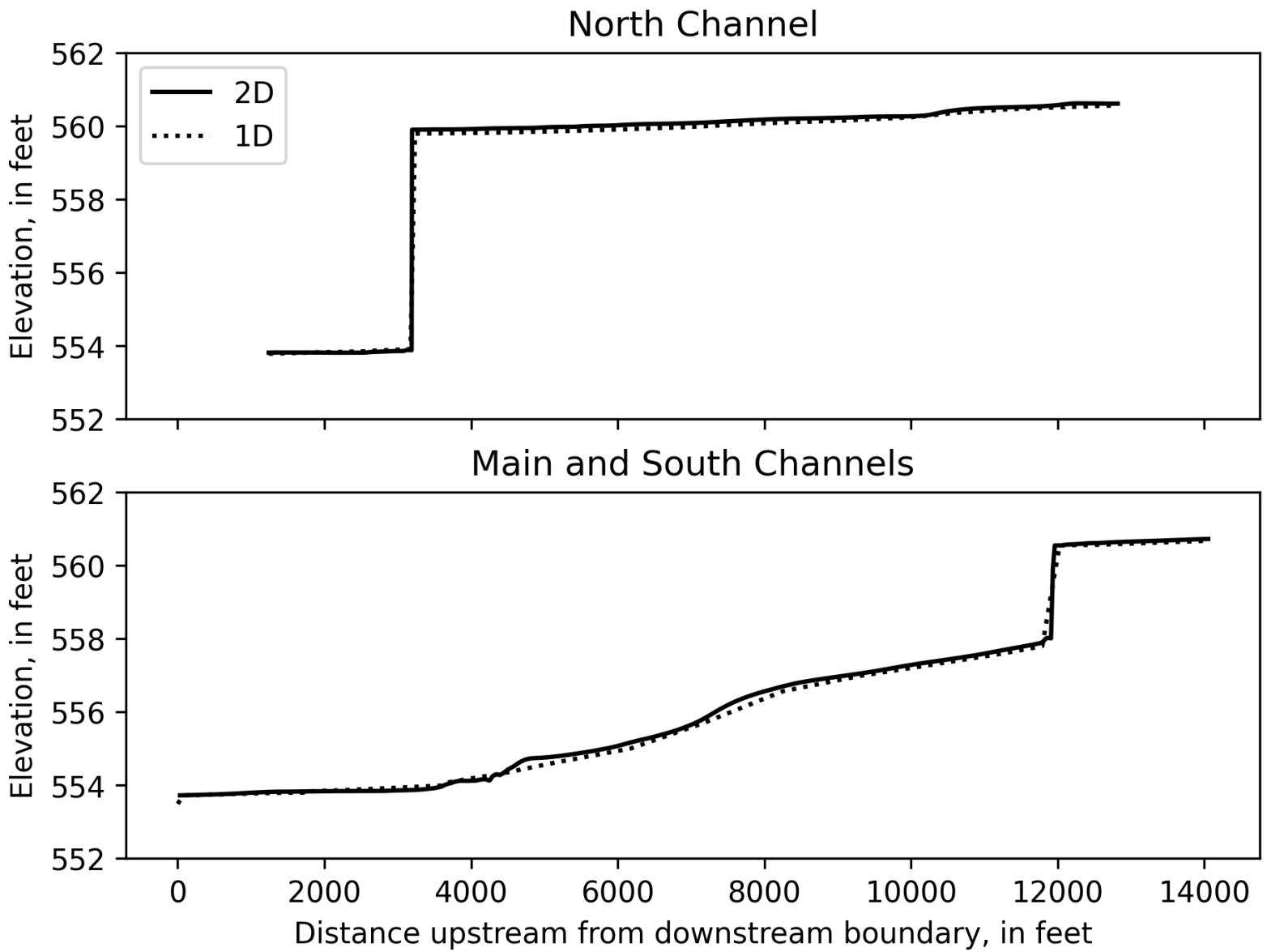



*Figure 5 – Comparison of the computed profiles for the 2D and 1D HEC-RAS plans within the 2D model domain. The water-surface elevations shown were computed for the 15,300 cfs profile.*

## Conclusion

Hanson has developed a 2D model of existing conditions at the state-owned Sears and Steel Dams to explore potential public safety improvements. The existing condition model will provide baseline water surface elevations, depth-average channel velocities, and bed shear in support of a sediment management evaluation and subsequent alternatives analysis for the modifications and/or removal of the dams.

The existing conditions model geometry was developed from a combination of LiDAR elevation data collected by the USGS (USGS, 2023), bathymetric data collected by IDNR-OWR in late 2023 and 2024, and a 1D unsteady hydraulic model developed by the USACE Rock Island District in 2014 (USACE, 2014). Land cover was defined by visual observation of site orthophoto datasets. Manning's n values in the 2D domain were divided into nine (9) categories. The model domain used an average grid cell size of 50-ft by 50-ft. Breaklines were used to capture key hydraulic elements such as levees, roadway embankments, bridge piers, and abutments. Breakline spacing varied from 2- to 50-ft to ensure high ground was captured and to maintain cell orientation orthogonal to flow where feasible. The 2D shallow water equation solver (SWE-EM) was used for all model simulations. The default 2D computation options and tolerances were used for the hydraulic model. The turbulence model solver was not employed to improve computation time.

Water-surface elevation profiles computed with the existing conditions model were compared to field observations made by the IDNR-OWR survey teams during the collection of bathymetric survey on June 5, 6, 14, and 15 of 2024, and used to calibrate the existing conditions model. As the downstream water surface elevations were well correlated to the field observations, weir modeling parameters were modified to calibrate the model to water surface elevations upstream of the dams. Results of the existing conditions 2D analysis match field observations with maximum magnitude of error of 0.28 ft and a mean error of -0.05 ft.

The USACE Rock Island District 1D HEC-RAS model will be used to extend the limits of computed bed shear and velocities upstream of the detailed 2D hydraulic investigation in support of the sediment fate analysis (performed by others). The geometry of the 1D model developed by USACE was updated using the 2024 IDNR-OWR bathymetric survey from cross-section 0.19 to 17.

## References

Inter-Fluve. (2024). Existing Conditions Summary Report for the Dam Safety Feasibility Study for Sears & Steel Dams. Manuscript in preparation.

U.S. Army Corps of Engineers, Rock Island District. (2014). Rock River Hydraulic Analysis, Whiteside, Henry and Rock Island Counties, Illinois.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. (2024a). Hydraulic Engineering Center River Analysis System (HEC-RAS) 2D User's Manual.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. (2024b). Hydraulic Engineering Center River Analysis System (HEC-RAS) Hydraulic Reference Manual.

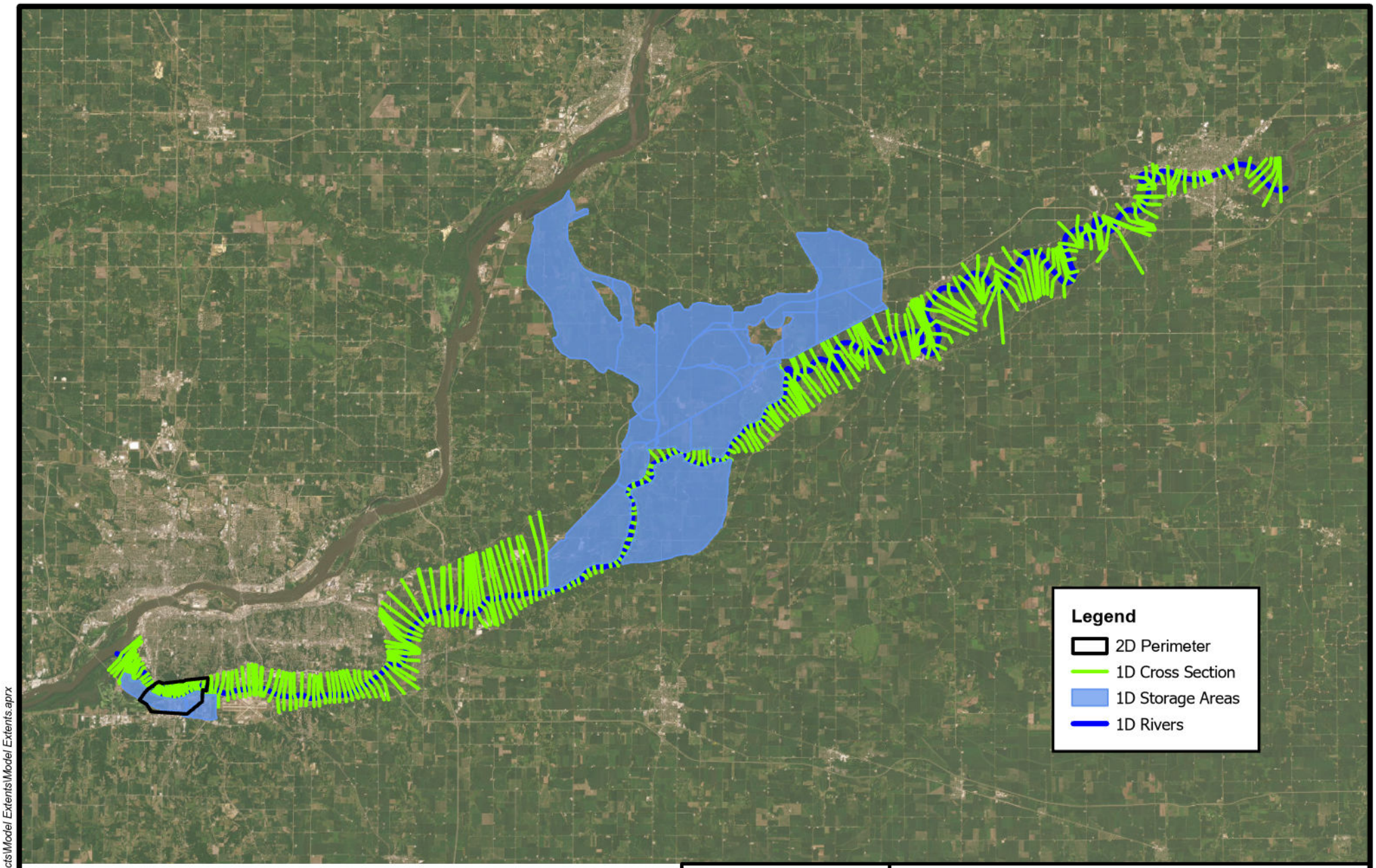
U.S. Geological Survey. (2023). 1 meter Digital Elevation Models (DEMs) - USGS National Map 3DEP Downloadable Data Collection: U.S. Geological Survey.

U.S. Geological Survey. (2024). Annual NLCD Collection 1 Science Products: U.S. Geological Survey data release.

## List of Attachments

Attachment 1 – 1D and 2D Model Extents
Attachment 2 – Existing 2D Model Land Cover
Attachment 3 – NLCD Land Cover
Attachment 4 – Existing 2D Model Geometry
Attachment 5 – Existing 2D Model Geometry: Sears Detail
Attachment 6 – Survey Cross Sections Within the 2D Model Domain
Attachment 7 - **Proposed** Condition Exhibits

# Attachment 1 – 1D and 2D Model Extents




30,000 0 30,000 Feet

1 inch = 30,000 feet

N W E S

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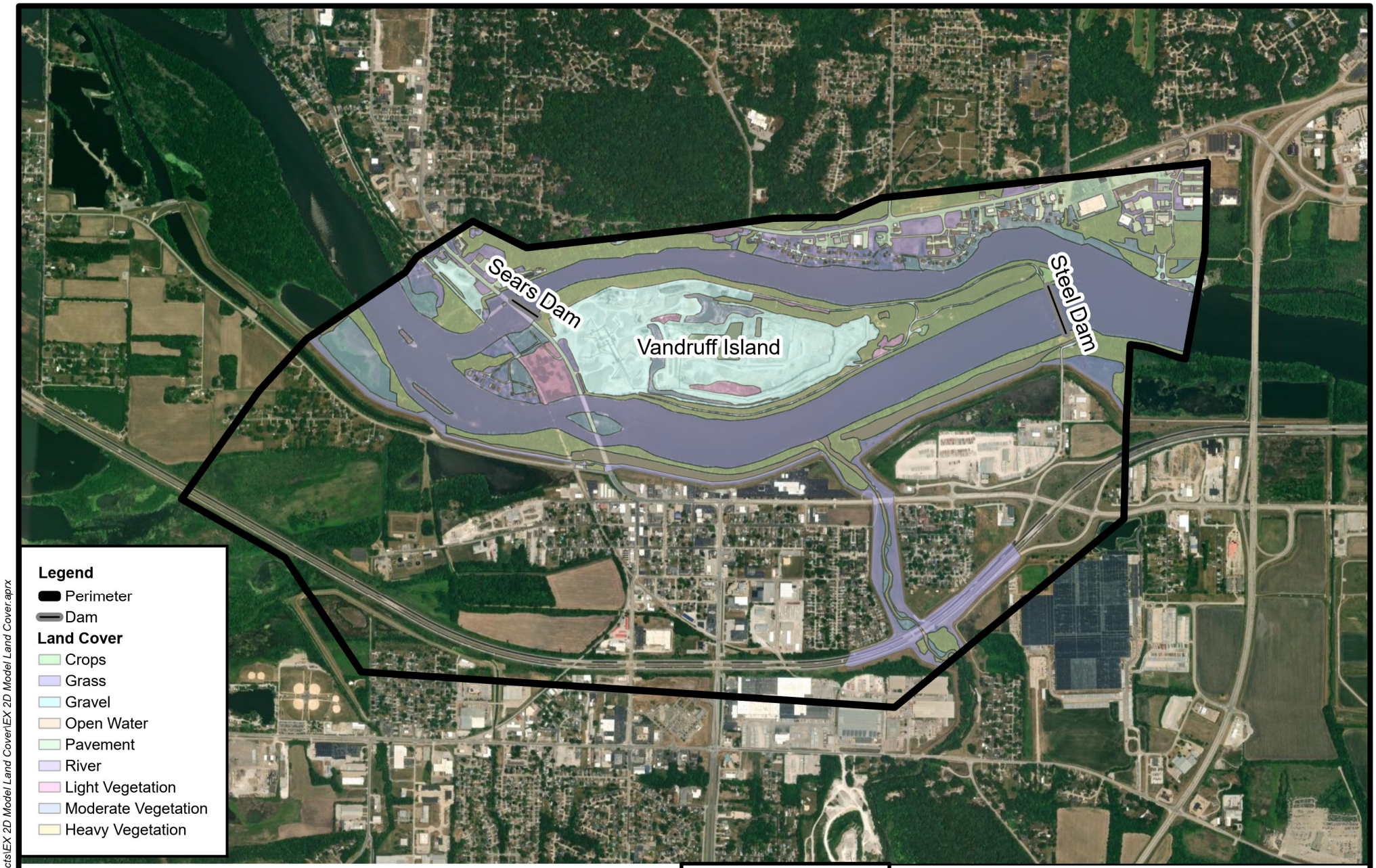
# HEC-RAS Model Extents

IDNR-OWR: SEARS & STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

Project: 22G0045

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**Attachment 2 – Existing 2D Model Land Cover**




0 2,000 4,000 Feet

1 inch = 2,000 feet

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9/30/2024

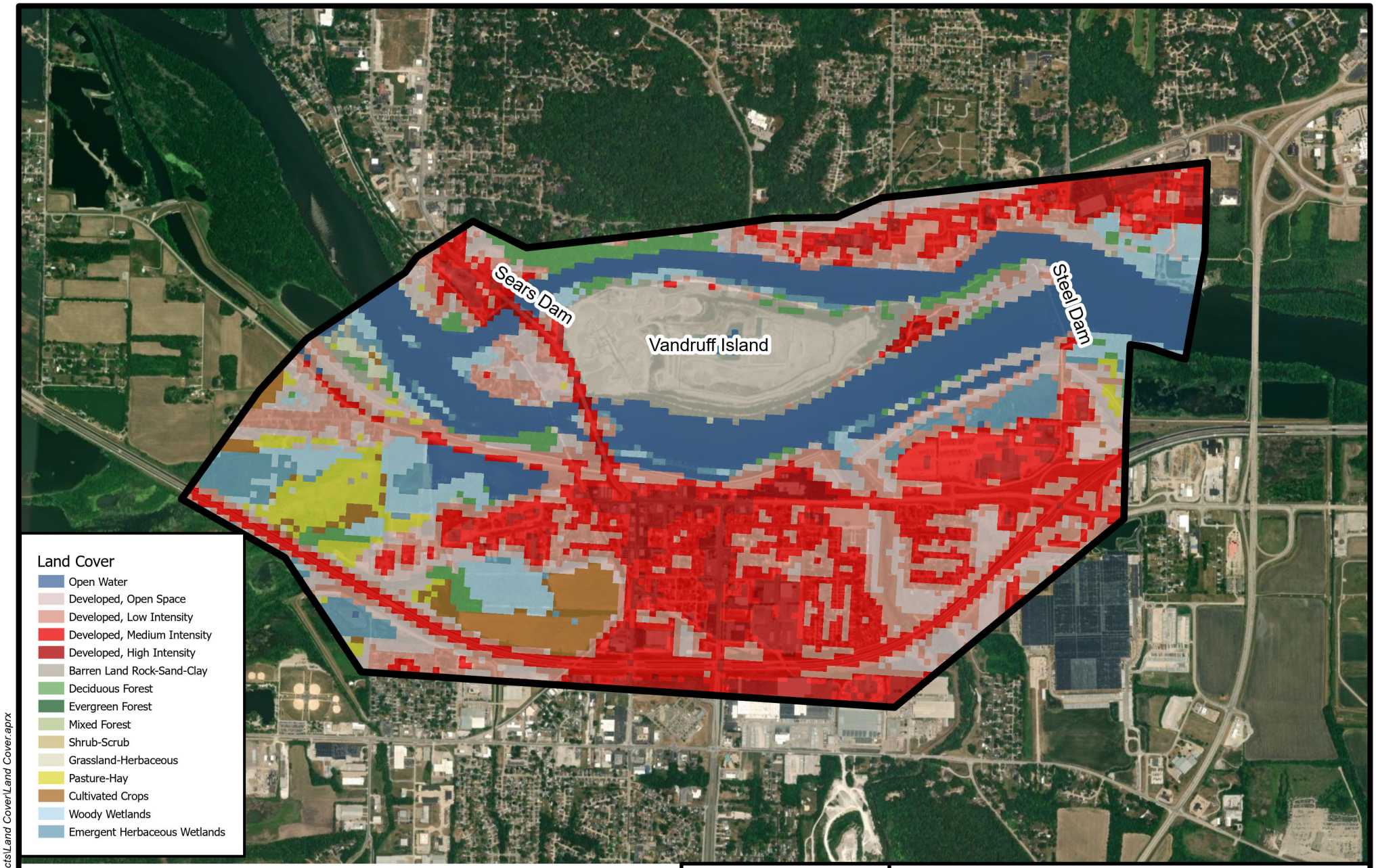
# Existing 2D Model Land Cover

IDNR-OWR: SEARS & STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

Project: 22G0045

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**Attachment 3 – NLCD Land Cover**




0 2,000 4,000 Feet

1 inch = 2,000 feet

N W E S

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11/05/2024

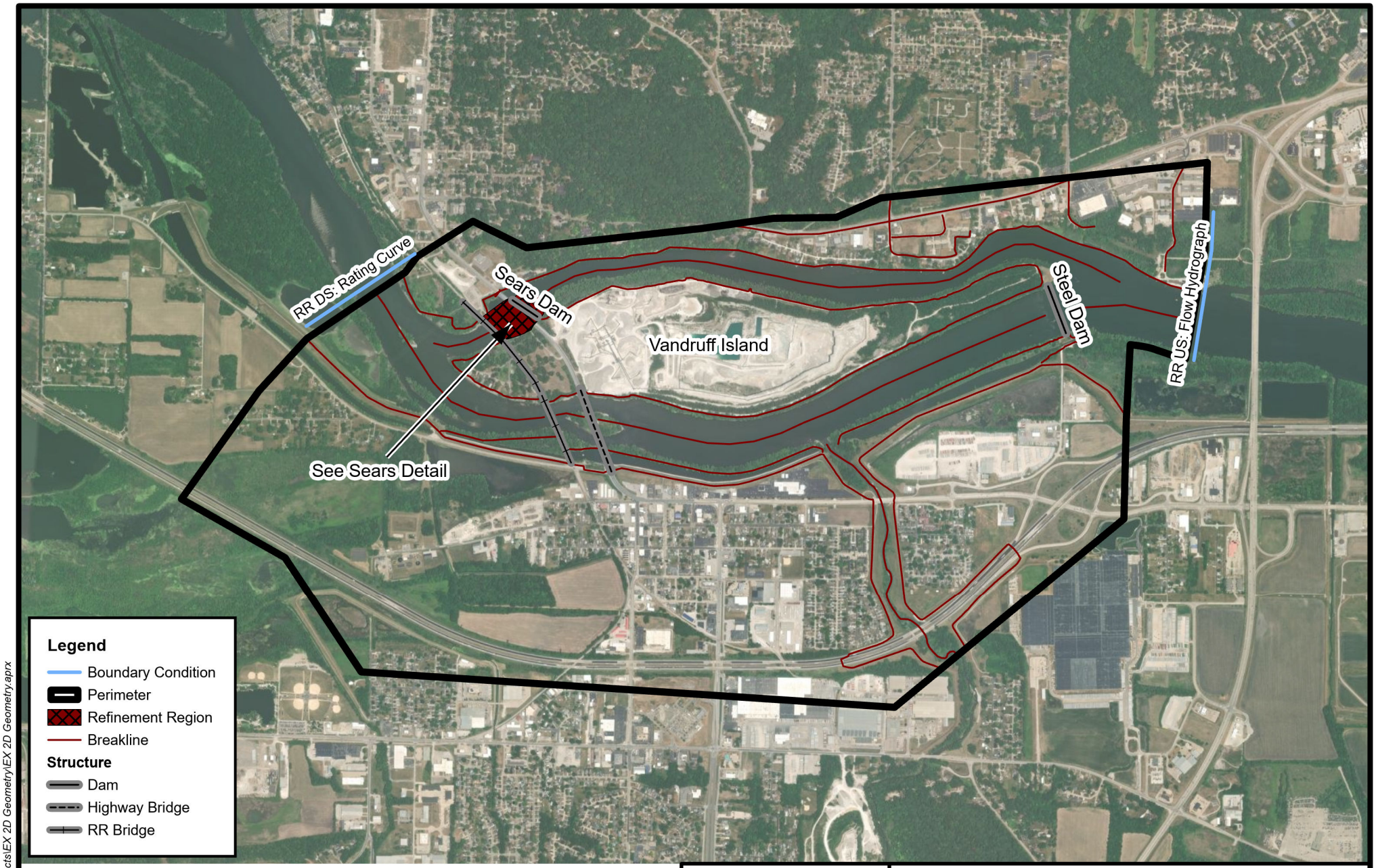
# NLCD Land Cover

IDNR-OWR: SEARS & STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

Project: 22G0045

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**Attachment 4 – Existing 2D Model Geometry**




0 2,000 4,000 Feet

1 inch = 2,000 feet

N W E S

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Hanson Professional Services Inc.

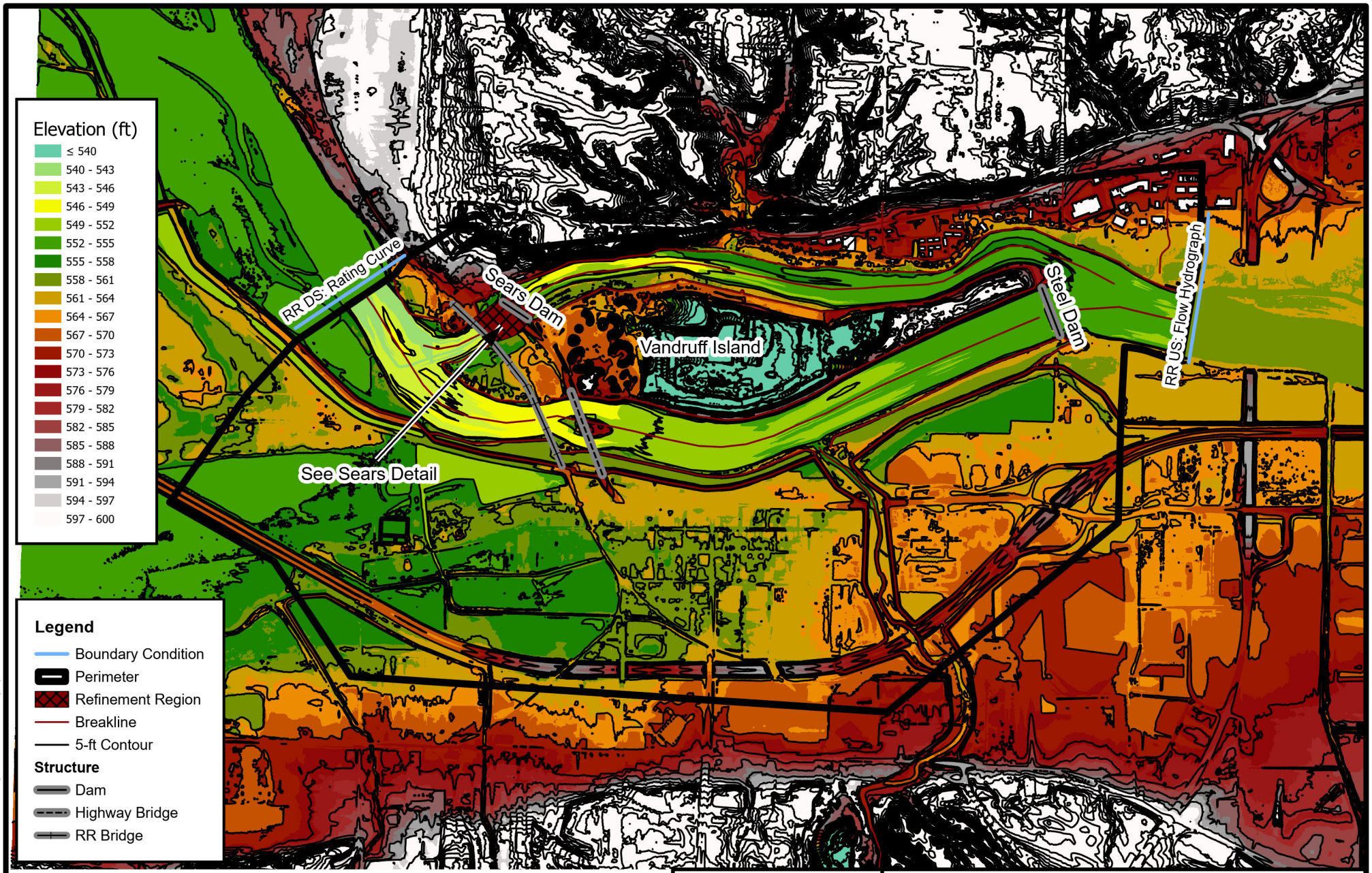
9/30/2024

# Existing 2D Model Geometry

IDNR-OWR: SEARS & STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

Project: 22G0045

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0 2,000 4,000 Feet

1 inch = 2,000 feet

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9/30/2024

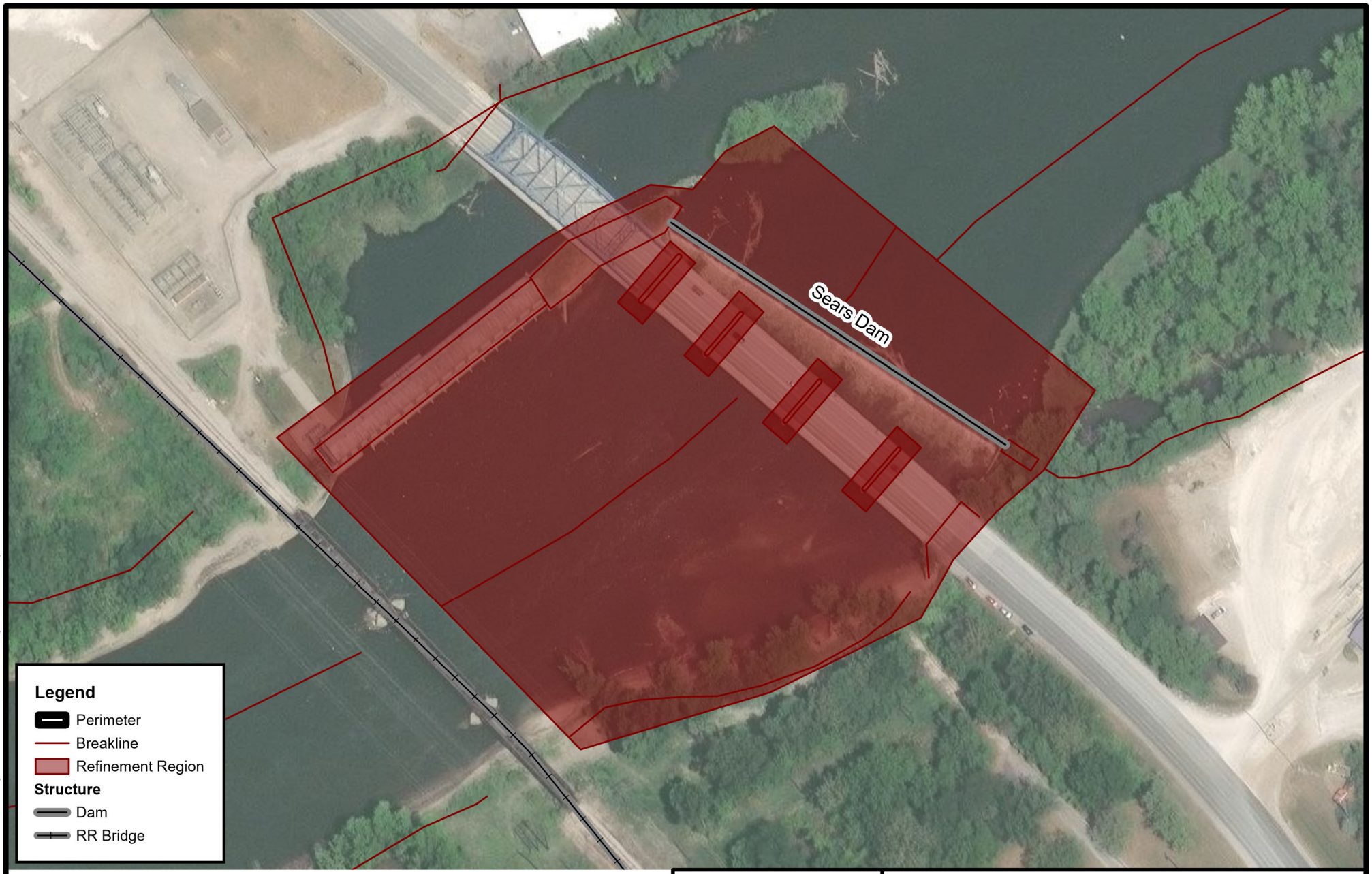
# Existing 2D Model Geometry

IDNR-OWR: SEARS & STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

Project: 22G0045

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**Attachment 5 – Existing 2D Model Geometry: Sears Detail**




0 150 300 Feet

1 inch = 150 feet

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Hanson Professional Services Inc.

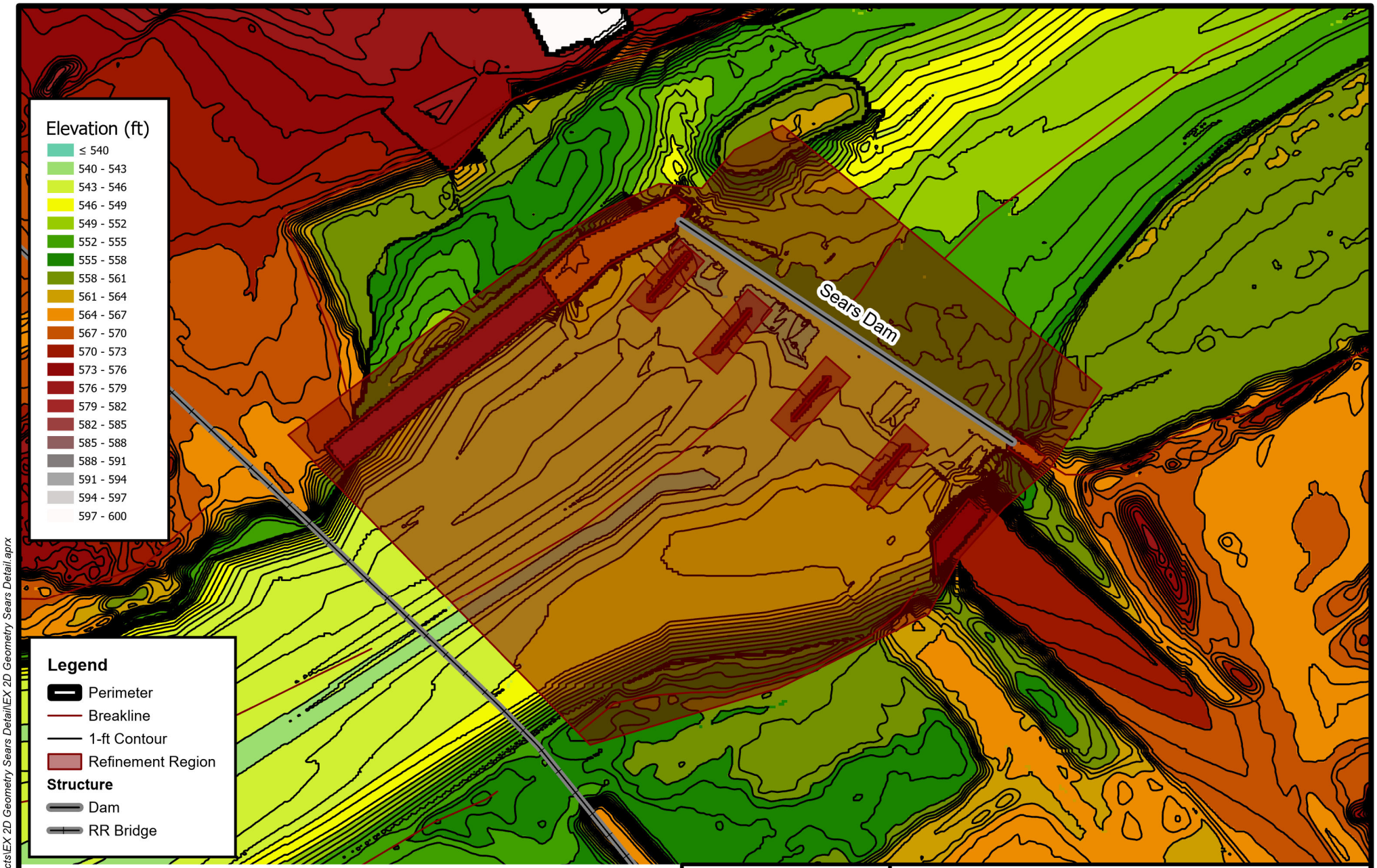
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# Existing 2D Model Geometry Sears Detail

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ROCK RIVER
ROCK ISLAND COUNTY

Project: 22G0045

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0 150 300 Feet

1 inch = 150 feet

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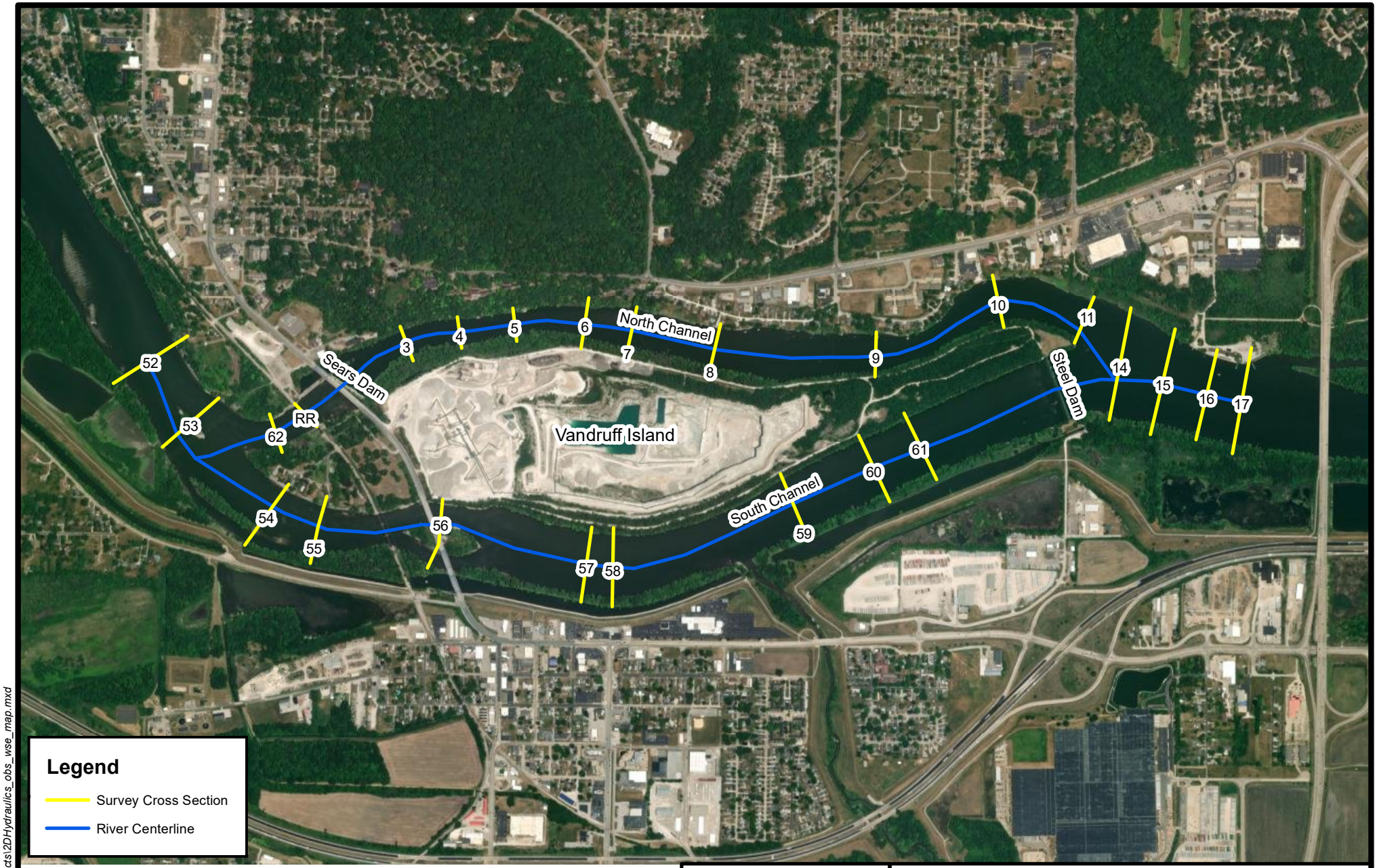
# Existing 2D Model Geometry Sears Detail

IDNR-OWR: SEARS & STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

Project: 22G0045

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# Attachment 6 – Survey Cross Sections Within the 2D Model Domain




0 1,500 3,000 Feet

1 inch = 1,500 feet

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9/30/2024

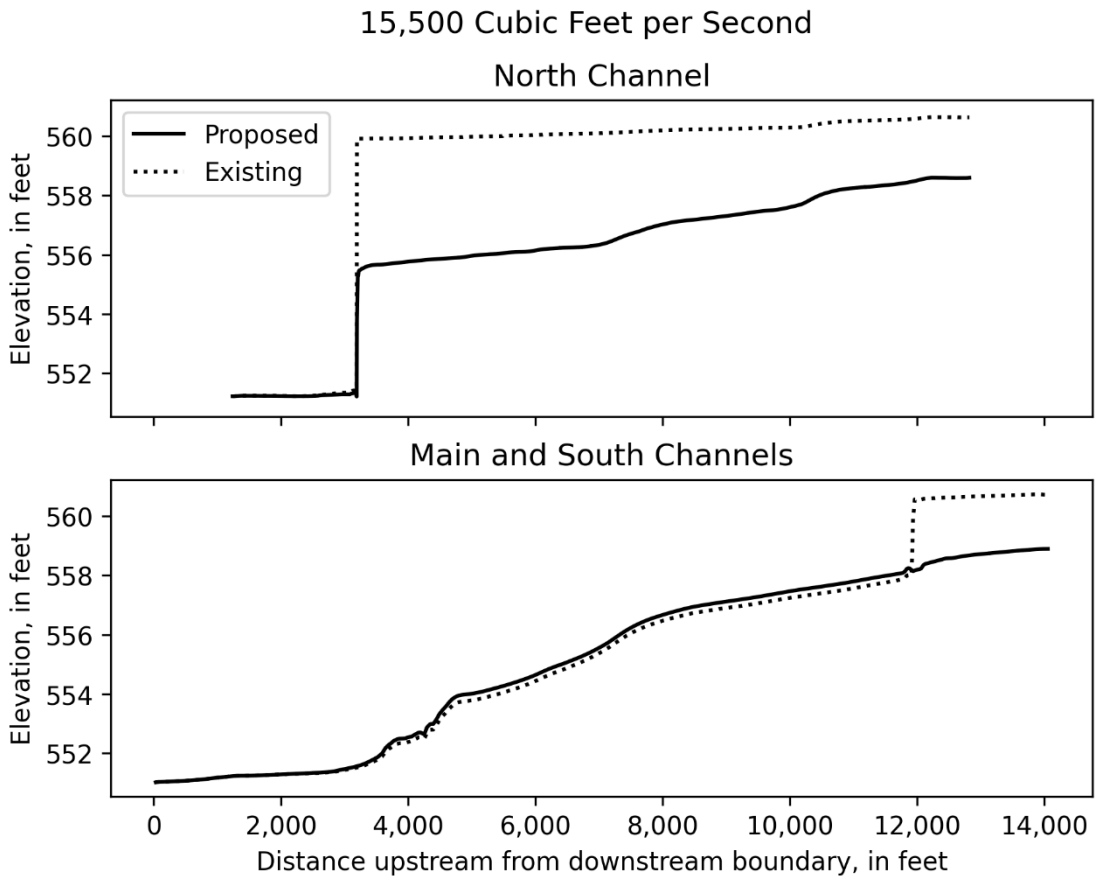
# Survey Cross Sections

IDNR-OWR: SEARS & STEEL DAM
ROCK RIVER
ROCK ISLAND COUNTY

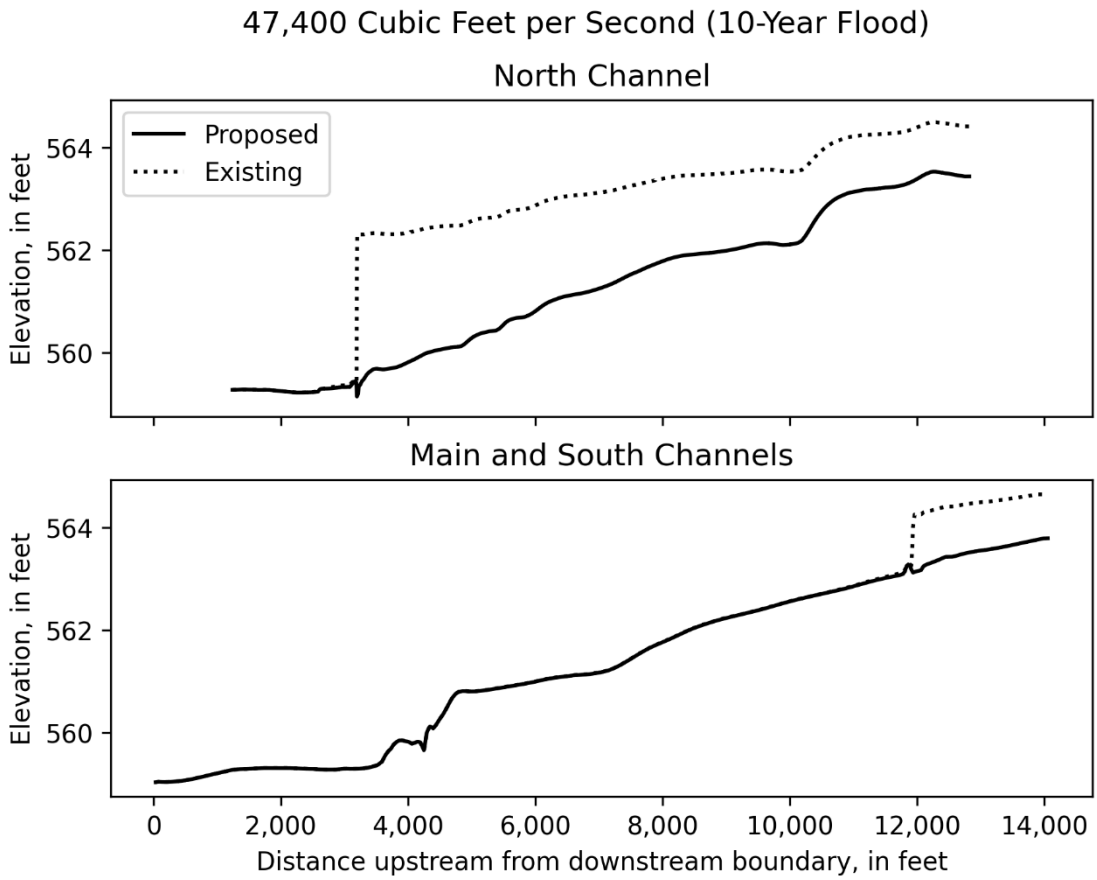
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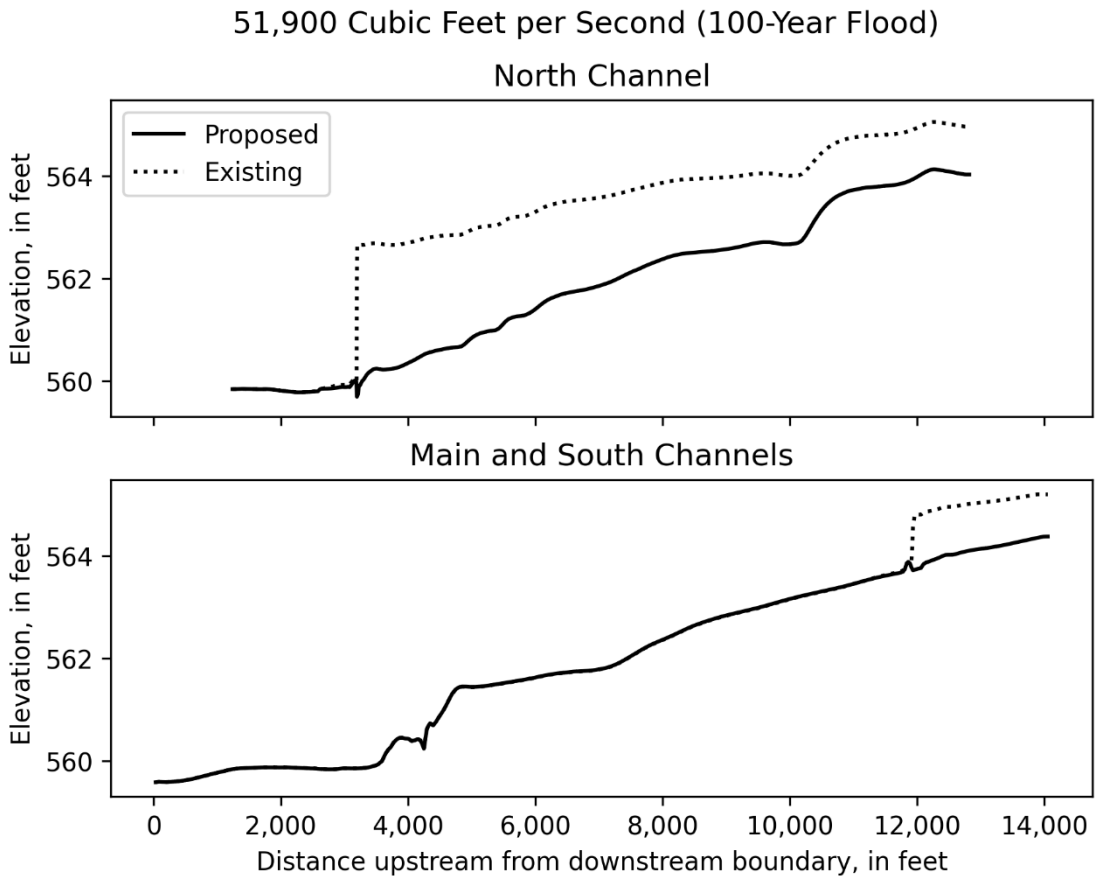
**Attachment 7 - Proposed Condition Exhibits**



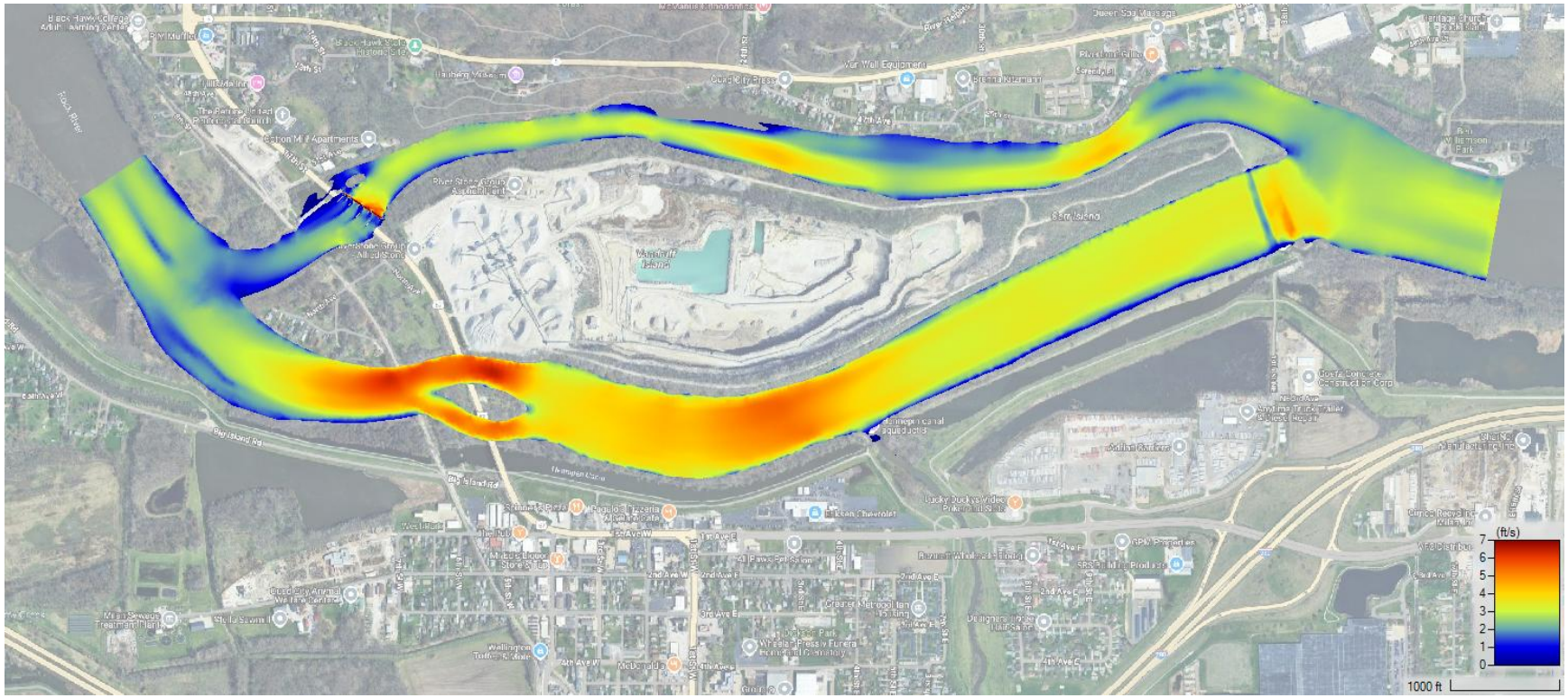

*Comparison of water-surface elevation profiles in the north and south channels computed with a flow of 15,500 cubic feet per second.*



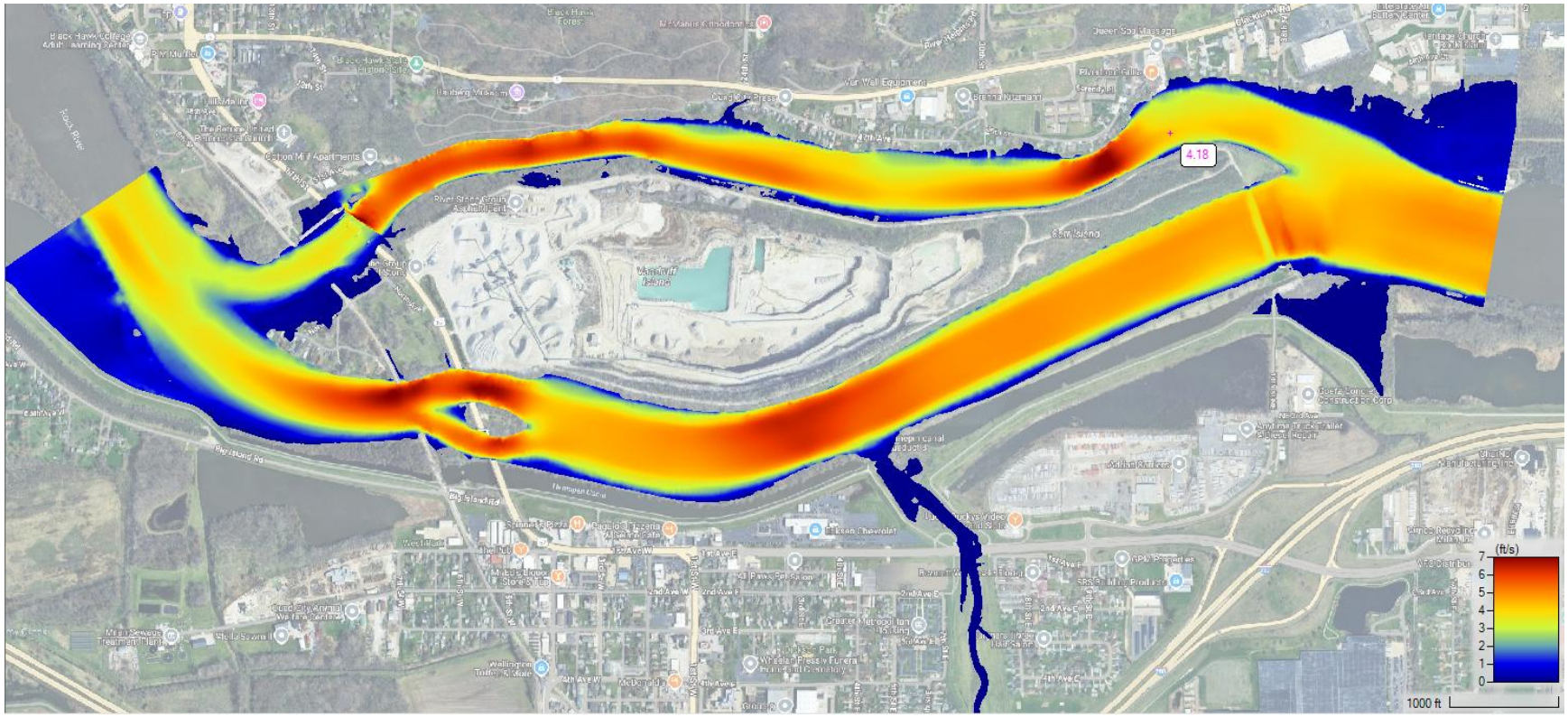

*Comparison of water-surface elevation profiles in the north and south channels computed with a flow of 47,400 cubic feet per second (10-year flood flow).*



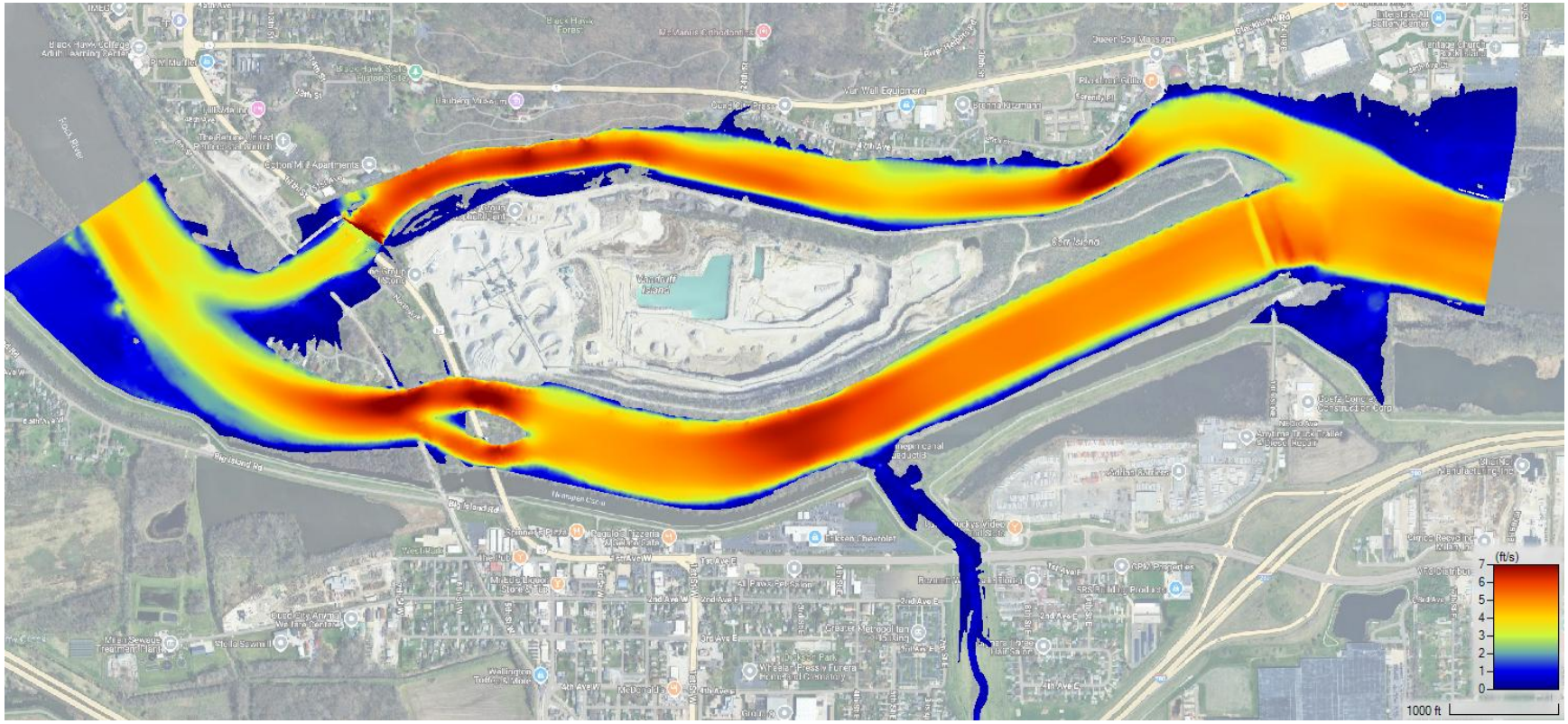

*Comparison of water-surface elevation profiles in the north and south channels computed with a flow of 51,900 cubic feet per second (100-year flood flow).*



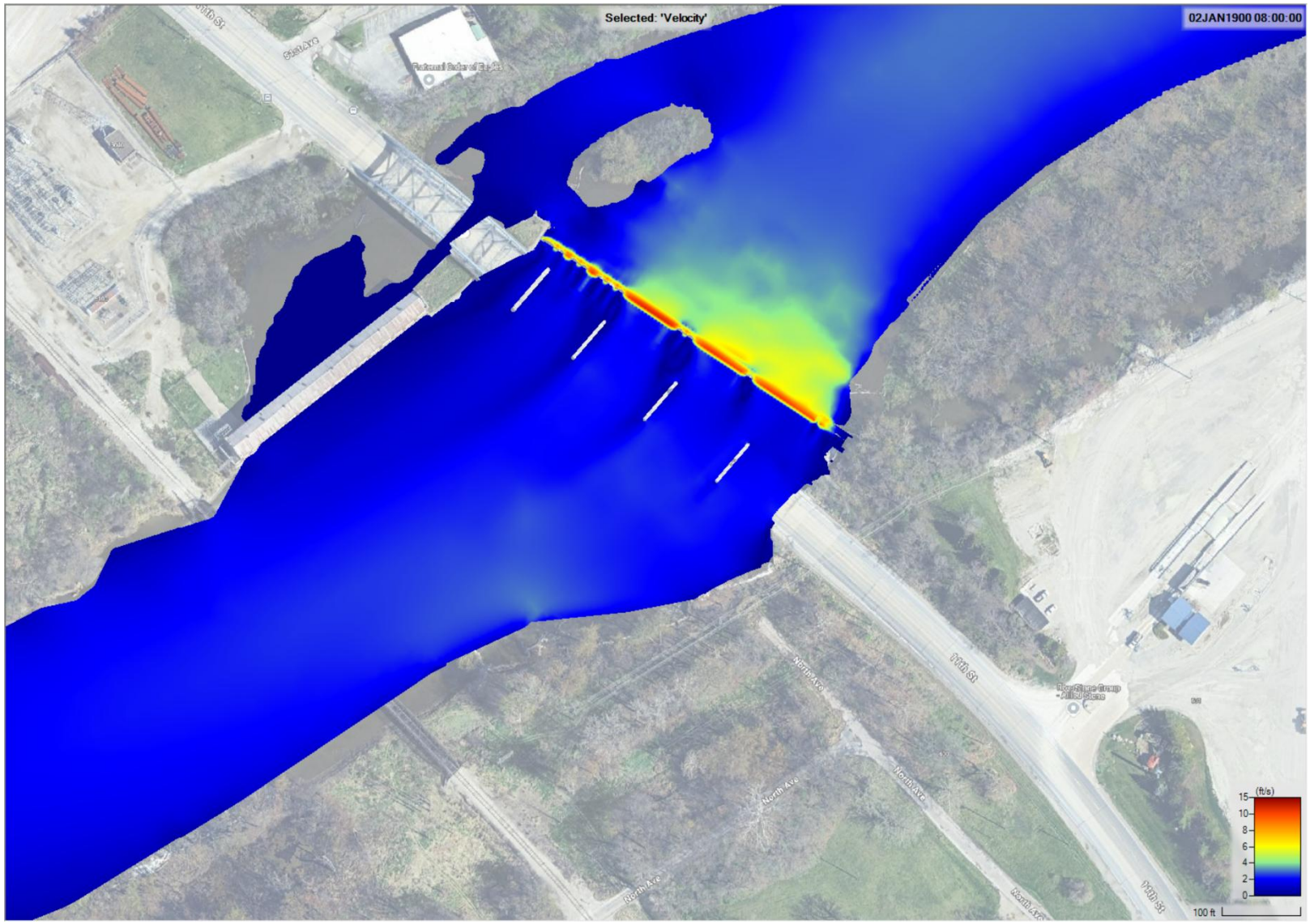

*Proposed conditions velocity, in feet per second, computed with a flow of 15,500 cubic feet per second.*



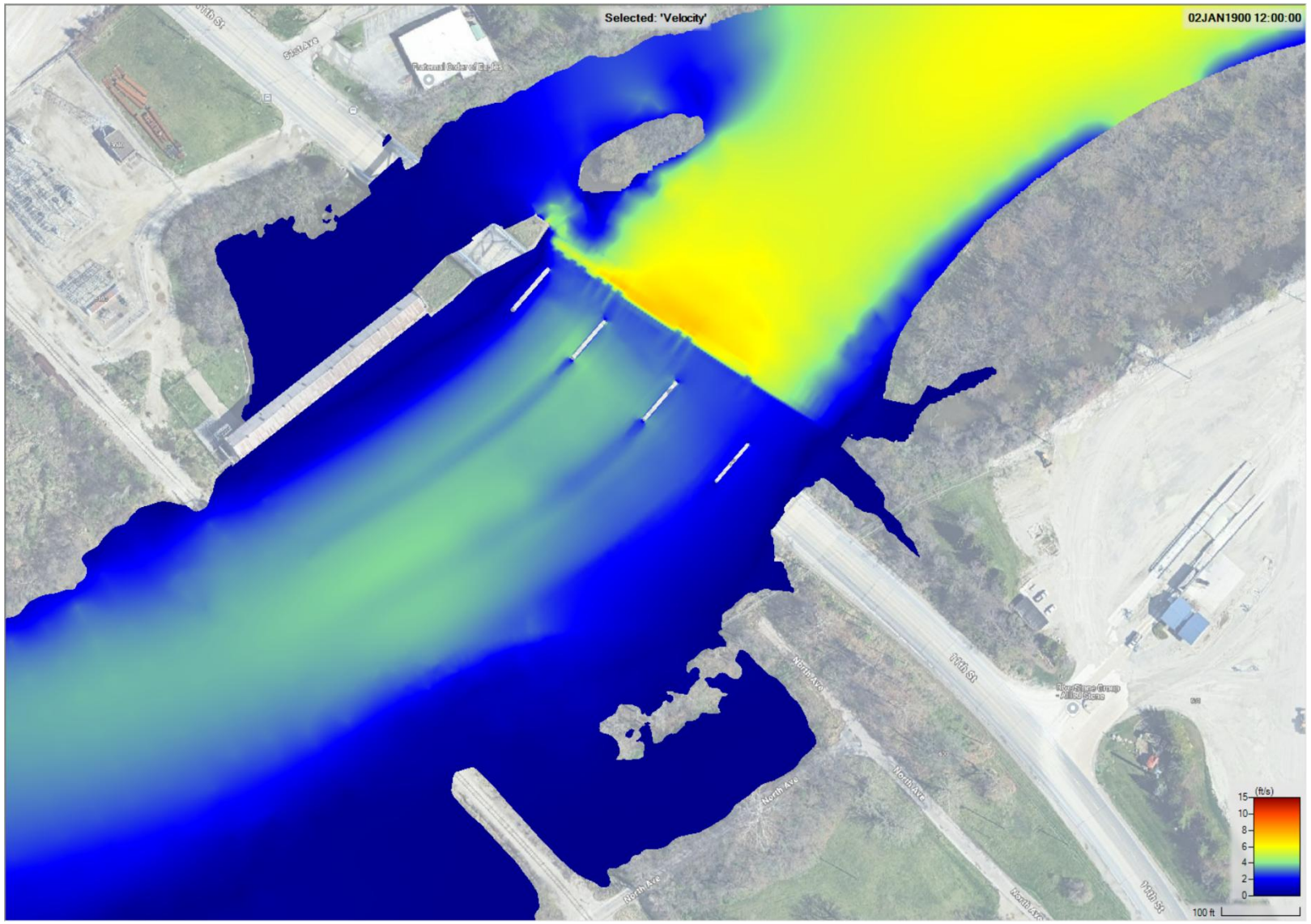

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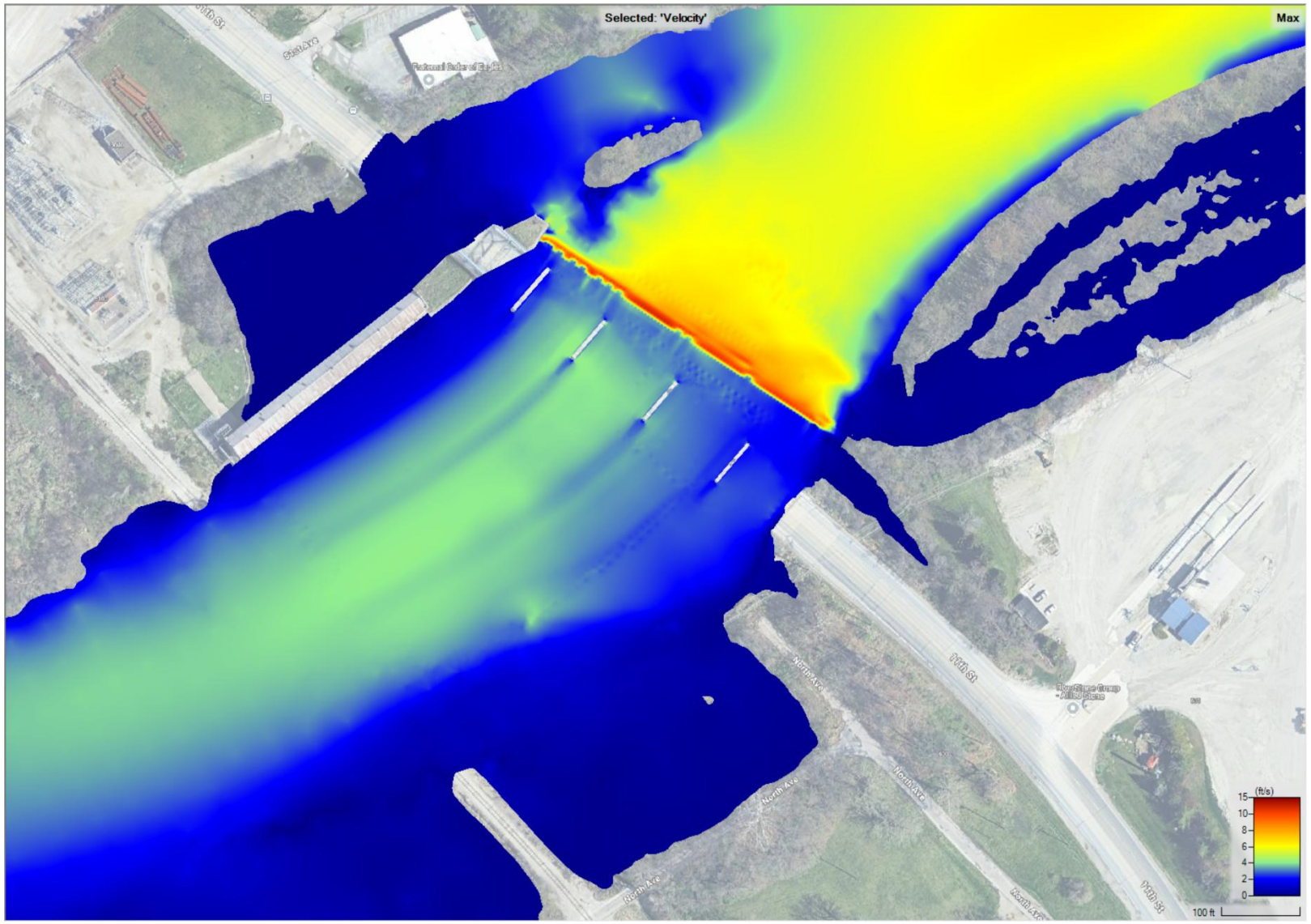

*Proposed conditions velocity, in feet per second, computed with a flow of 51,900 cubic feet per second (100-year flood flow).*



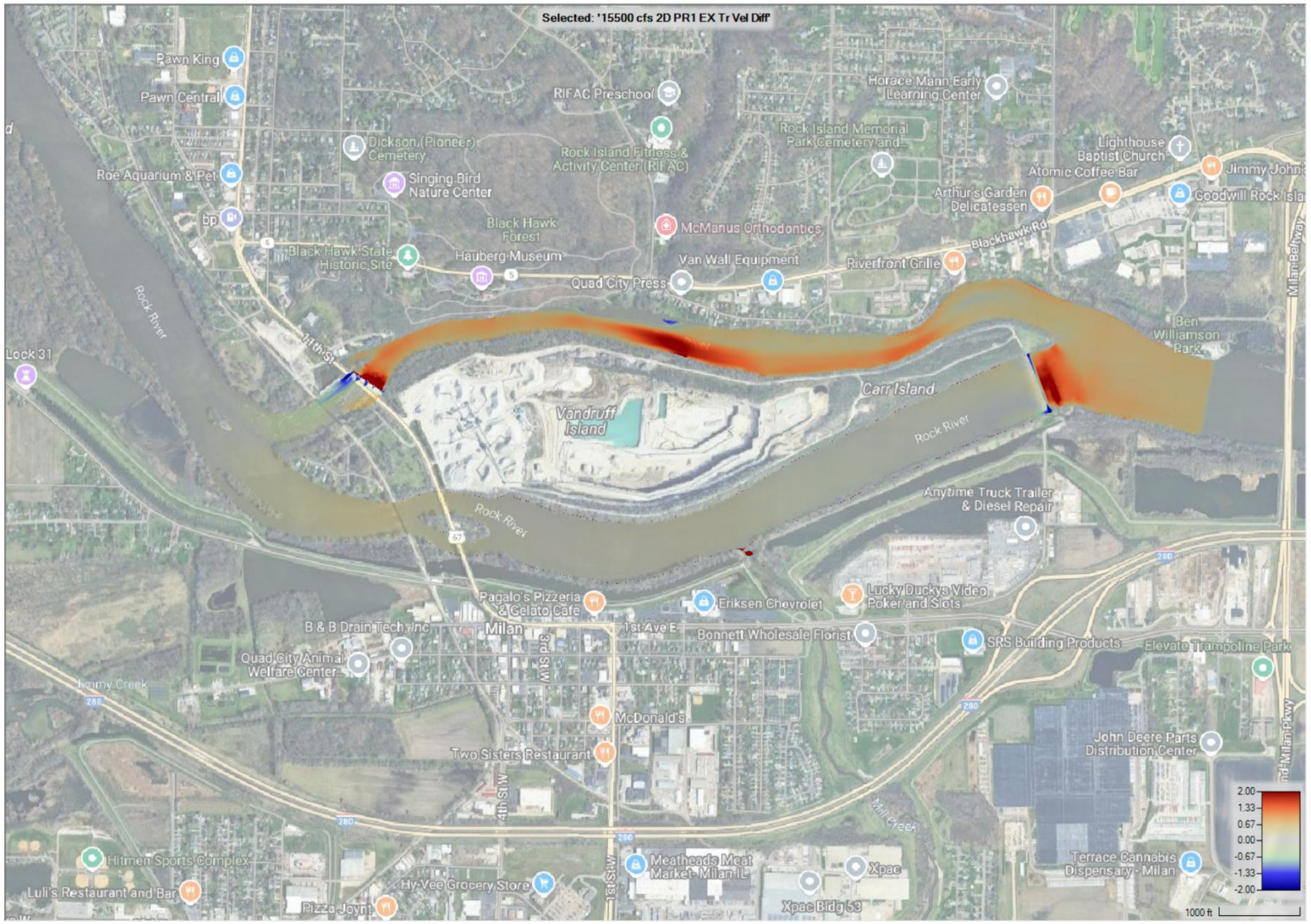

*Proposed conditions velocity, in feet per second, computed with a flow of 15,500 cubic feet per second.*



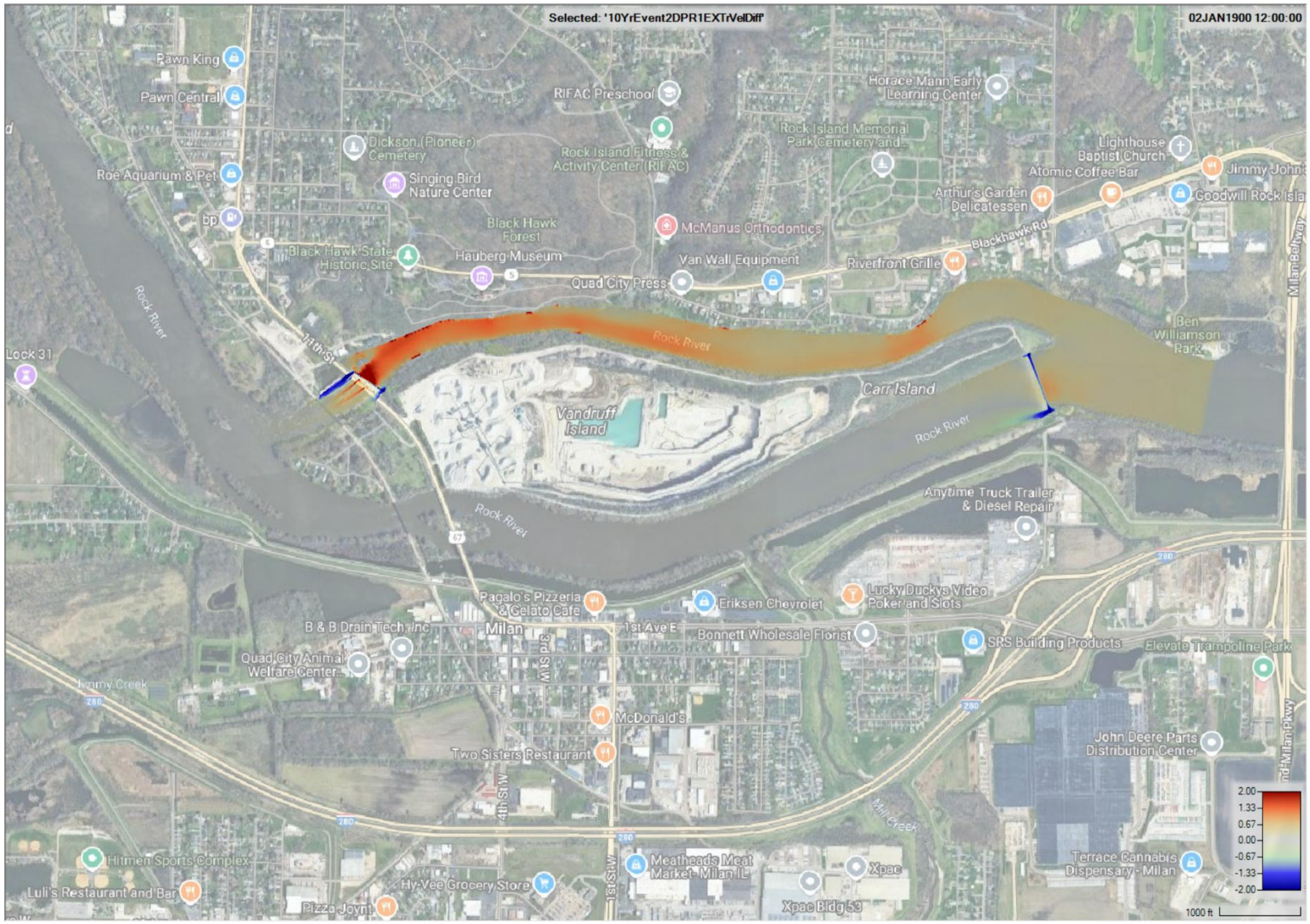

*Proposed conditions velocity, in feet per second, computed with a flow of 47,400 cubic feet per second (10-year flood flow).*



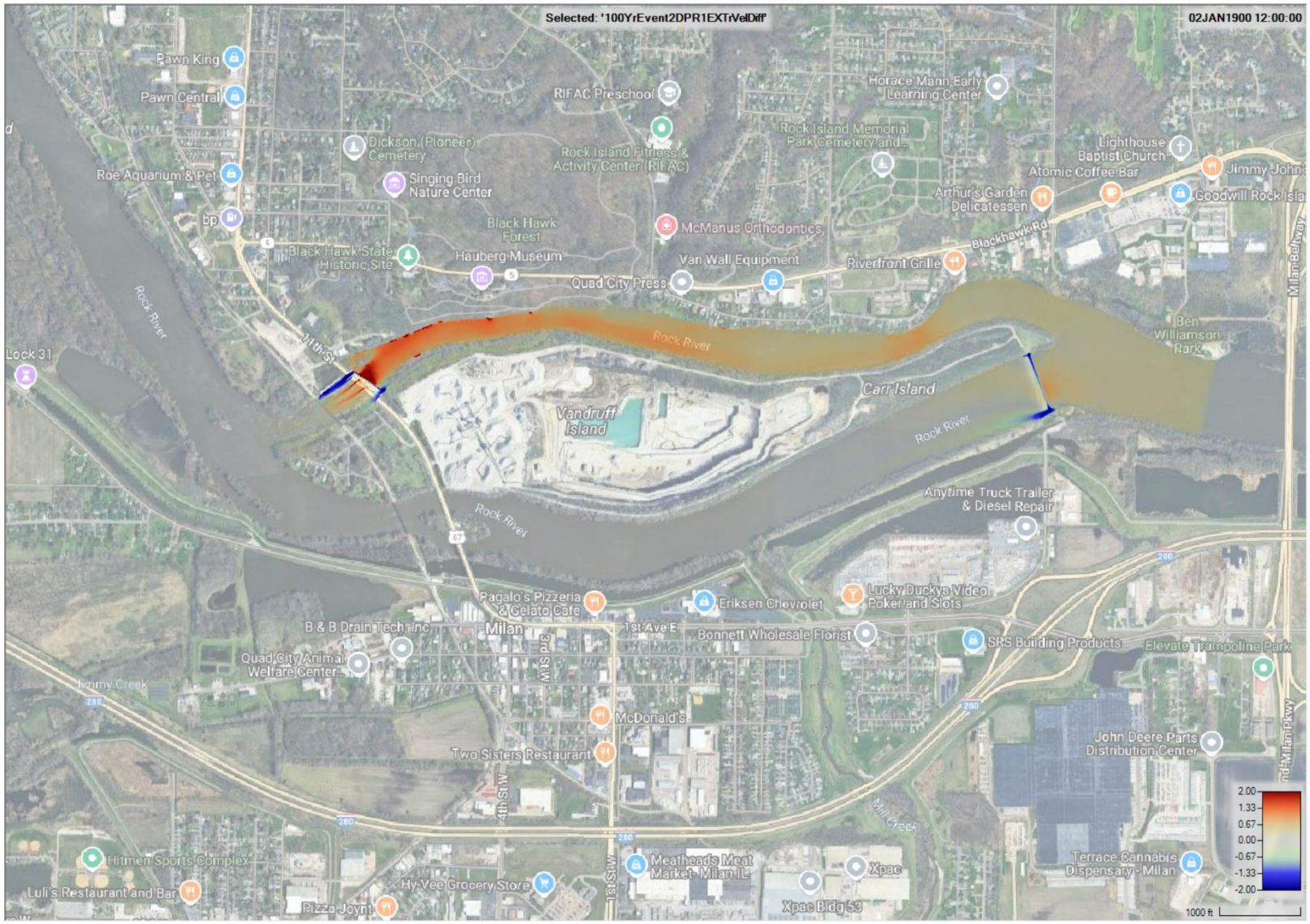

*Proposed conditions velocity, in feet per second, computed with a flow of 51,900 cubic feet per second (100-year flood flow).*



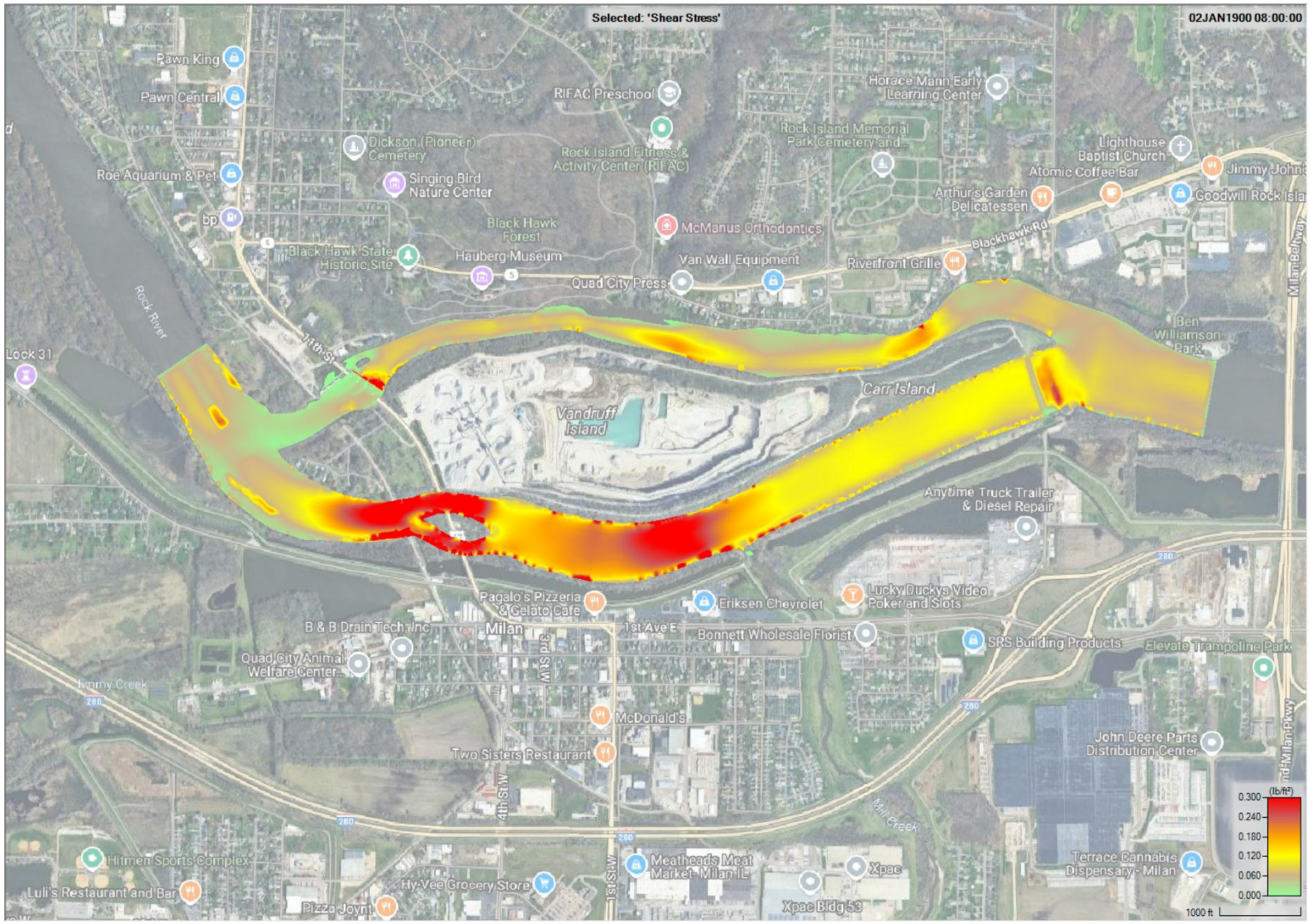

*Change in velocity, in feet per second, computed with a flow of 15,500 cubic feet per second. The change in velocity is computed as the proposed minus existing velocity.*



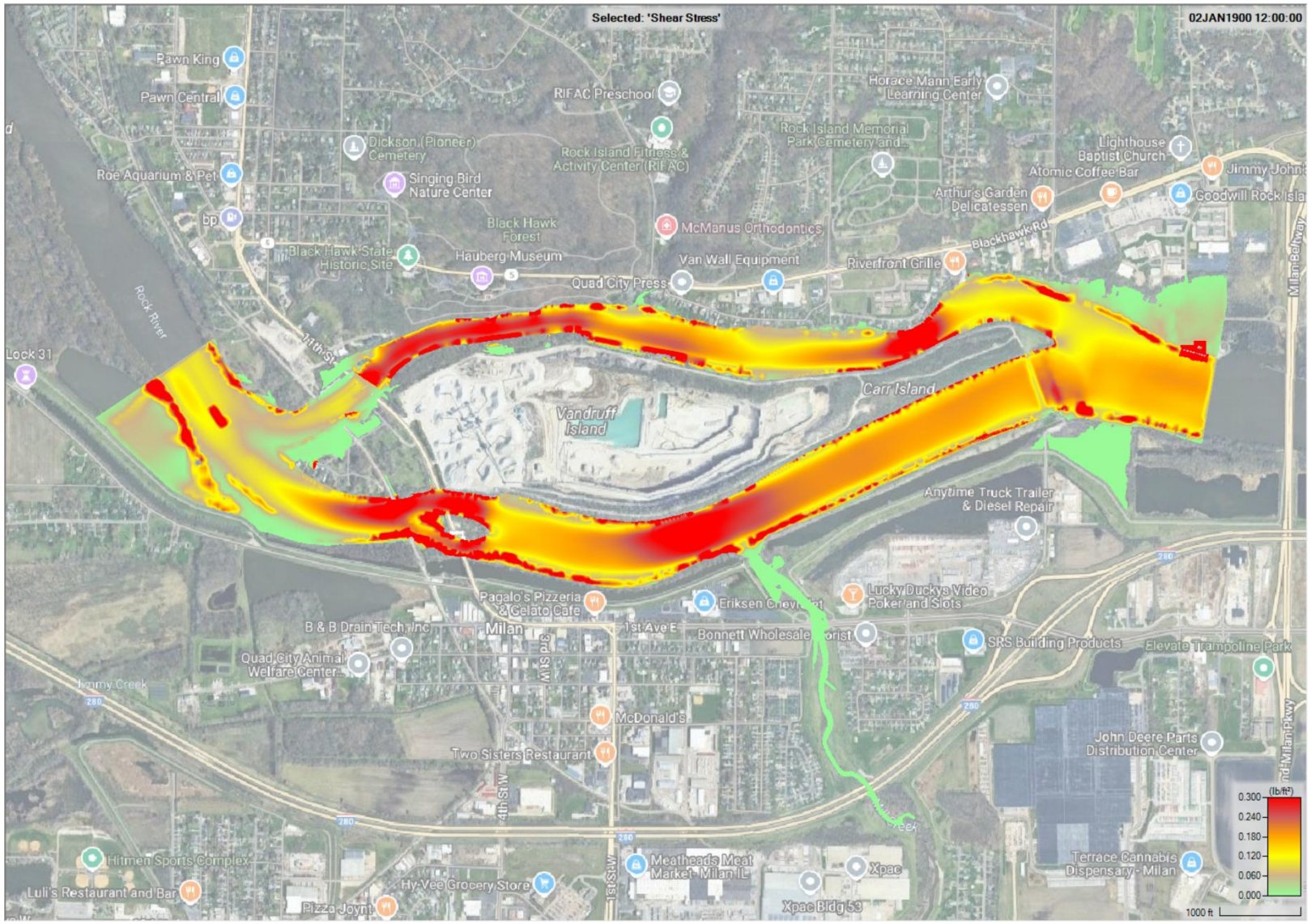

*Change in velocity, in feet per second, computed with a flow of 47,400 cubic feet per second (10-year flood flow). The change in velocity is computed as the proposed minus existing velocity.*



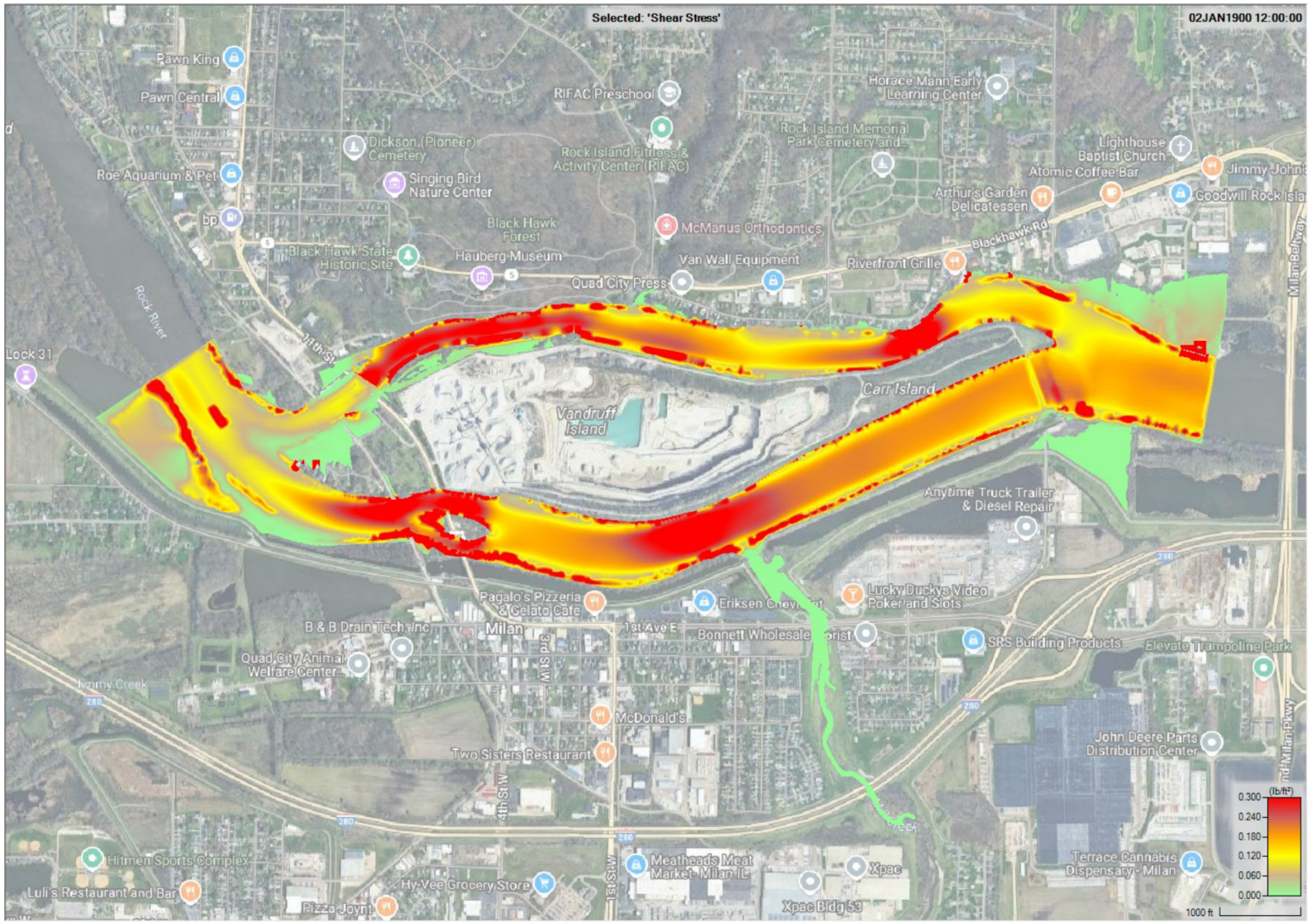

*Change in velocity, in feet per second, computed with a flow of 51,900 cubic feet per second (100-year flood flow). The change in velocity is computed as the proposed minus existing velocity.*



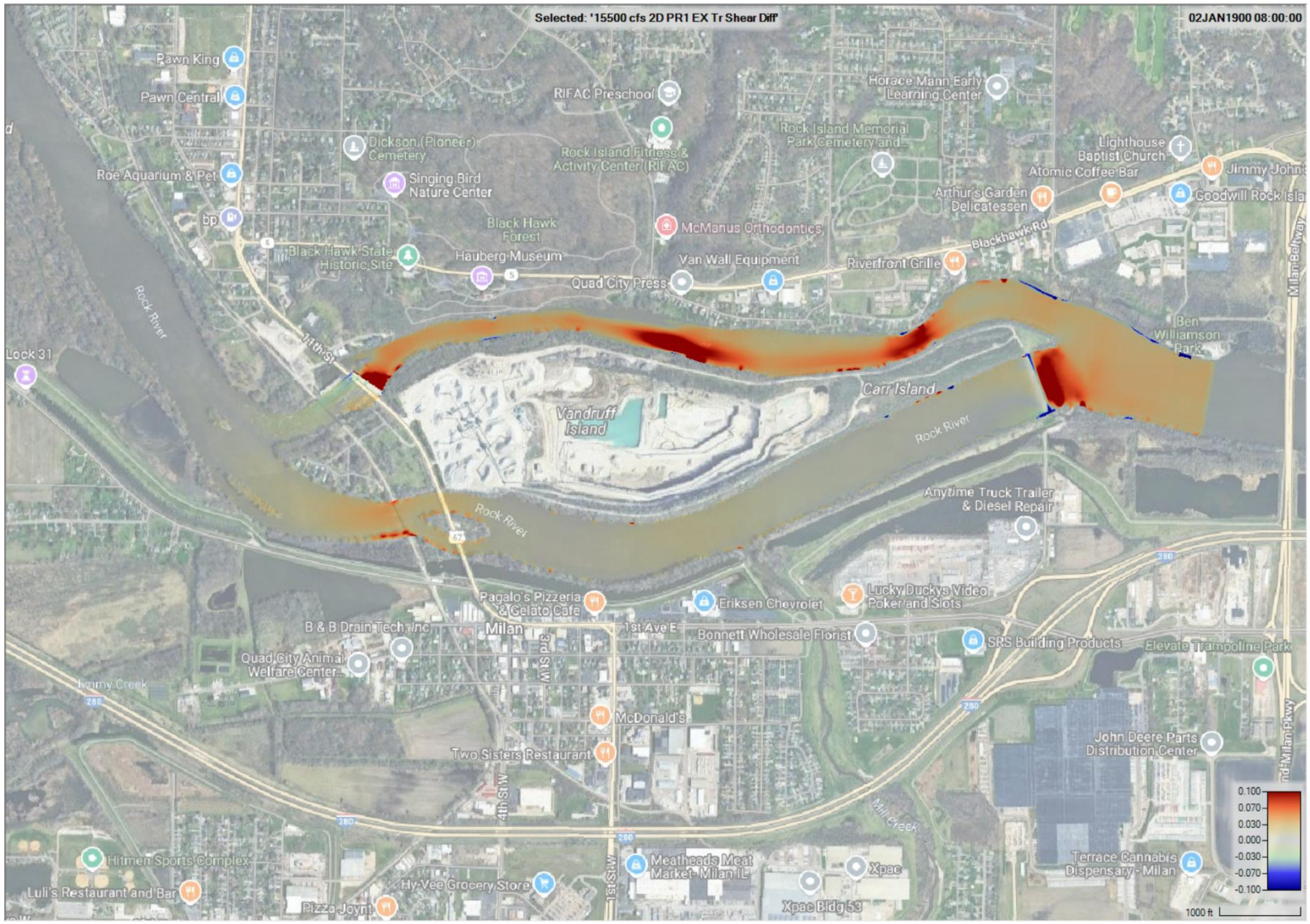

*Proposed conditions bed shear stress, in pounds per square foot, computed with a flow of 15,500 cubic feet per second.*



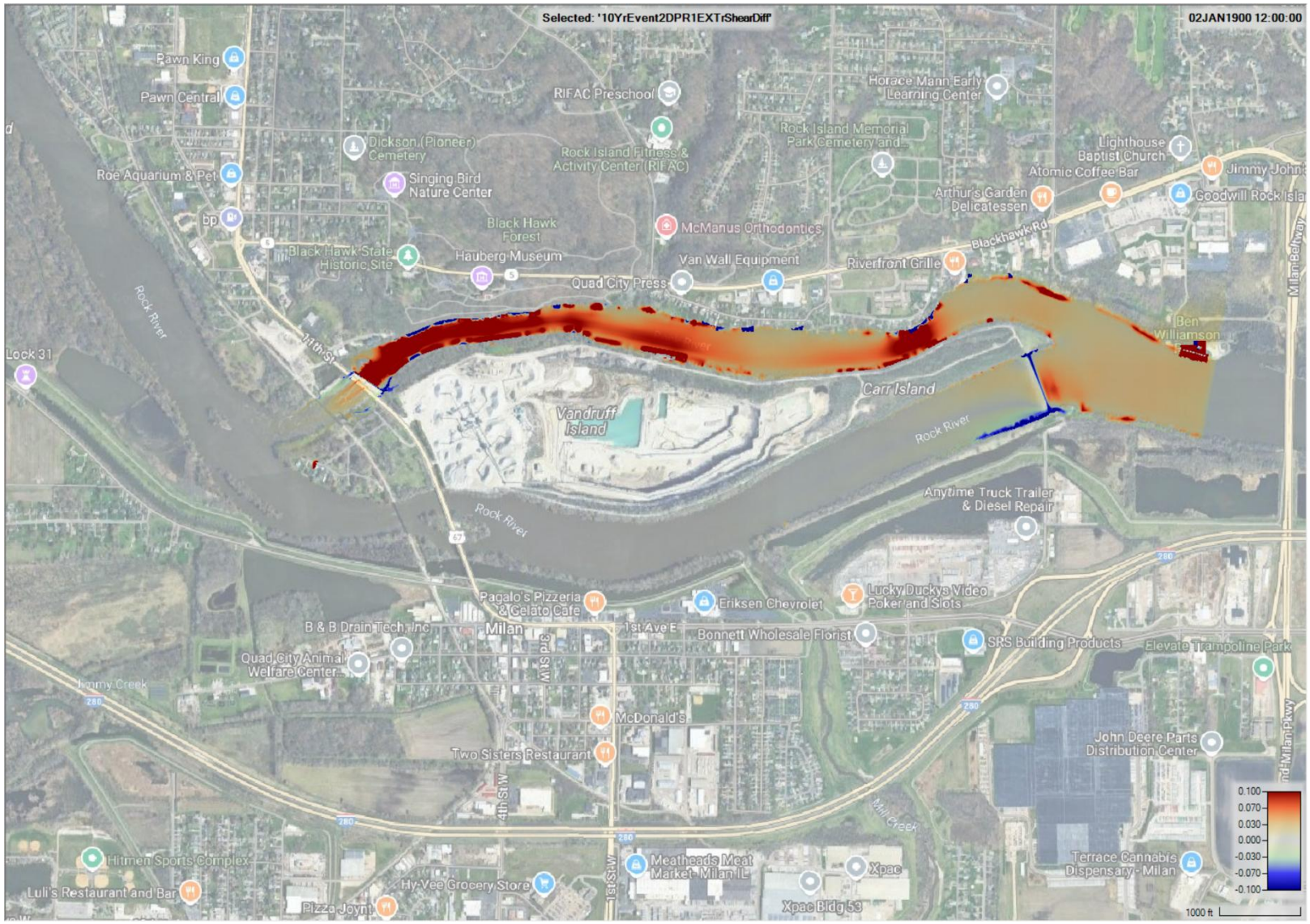

*Proposed conditions bed shear stress, in pounds per square foot, computed with a flow of 47,400 cubic feet per second (10-year flood flow).*



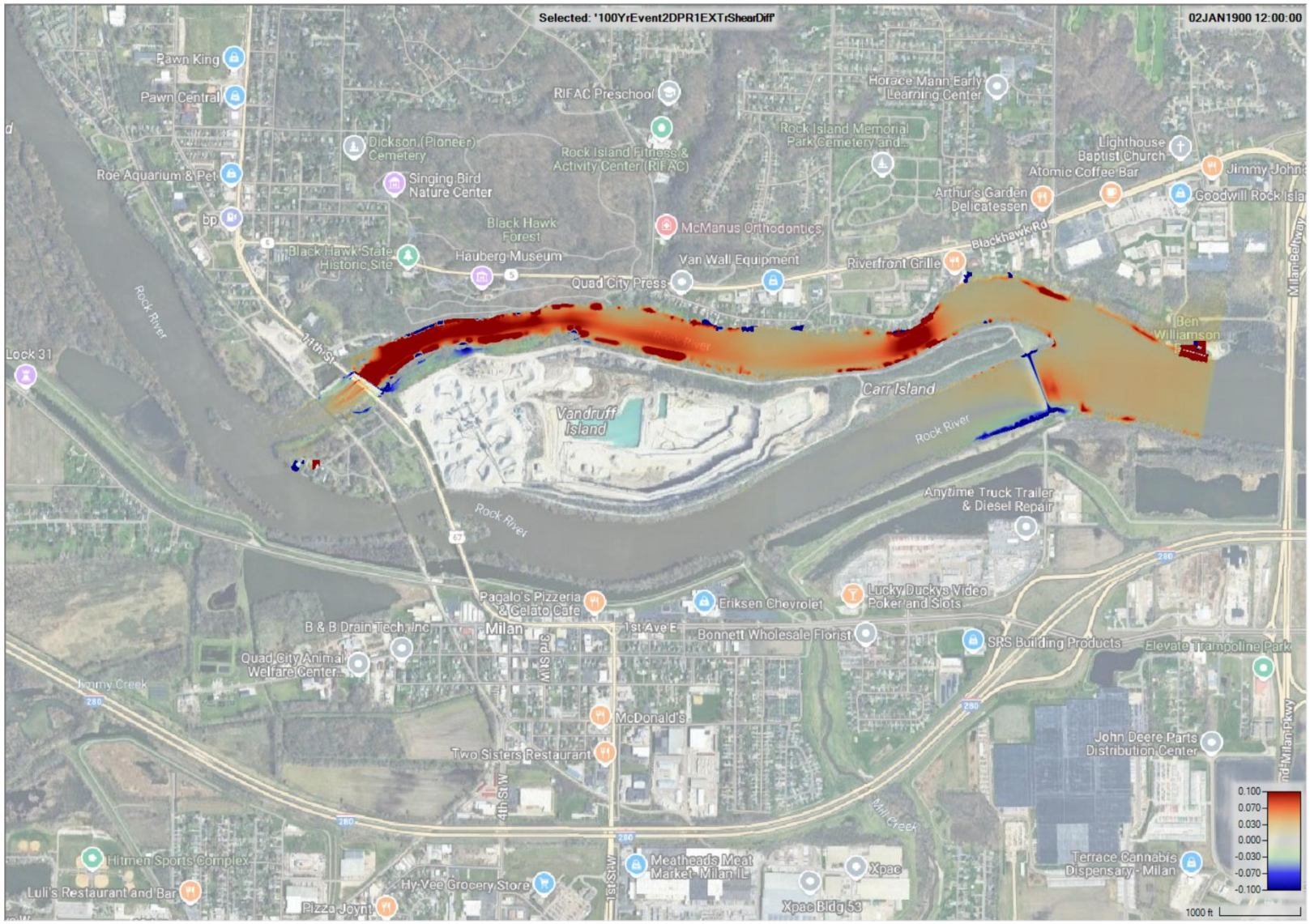

*Proposed conditions bed shear stress, in pounds per square foot, computed with a flow of 51,900 cubic feet per second (100-year flood flow).*




*Change in bed shear stress, in pounds per square foot, computed with a flow of 15,500 cubic feet per second. Change is computed as the proposed minus existing shear stress.*




*Change in bed shear stress, in pounds per square foot, computed with a flow of 47,400 cubic feet per second (10-year flood flow). Change is computed as the proposed minus existing shear stress.*




*Change in bed shear stress, in pounds per square foot, computed with a flow of 51,900 cubic feet per second (100-year flood flow). Change is computed as the proposed minus existing shear stress.*

# APPENDIX G - Wetland Delineation Report

# Sears and Steel Dams Wetland Delineation Report

Sears and Steel Dams Wetland Delineation
Rock Island County, IL
29.2213

***Prepared for:***

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ENGINEERS · SURVEYORS · SCIENTISTS

April 24, 2025

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Exhibit B National Wetland Inventory
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# 1. EXECUTIVE SUMMARY

Prairie Engineers conducted a Waters of the U.S. (WOTUS) delineation near the Sears and Steel Dams on the Rock River near Milan, Illinois. A desktop review of potential wetlands in the riparian area of the Rock River downstream of the dams to its junction with the Mississippi River was also conducted. Three wetlands were identified and field verified within a 1,000-foot radius of the Sears and Steel Dams, and approximately 216 acres of potential wetlands were identified through desktop investigations within the riparian area of the Rock River downstream of the dams.

# 2. INTRODUCTION

Prairie Engineers (Prairie) was retained by Hanson Professional Services Inc. to complete a Waters of the U.S. (WOTUS) delineation within 1,000 feet of the Sears and Steel Dams on the Rock River near Milan, Illinois. The dams are both located within Milan municipal boundaries. Steel Dam is located at approximately 41°27'40.78N, 90°32'53.88W and Sears Dam is located at approximately 41°27"40.72N, 90°34'41.68 W. Prairie scientists also conducted desktop review of potential wetland features along the Rock River downstream of the dam locations to its junction with the Mississippi River. See Exhibit A for the project location map.

Prairie scientists conducted the wetland delineation within the evaluation area on September 3-4, 2024. This WOTUS Delineation Report has been prepared following guidance provided by the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (USACE 2010).

# 3. METHODS

### *3.1. Desktop Review*

Prairie reviewed the National Wetlands Inventory (NWI) maps and aerial imagery of the project site to determine specific areas that warranted field investigation. Aerial imagery was reviewed for 2011, 2014, 2016, 2019, 2020, and 2022 to map areas that were commonly saturated or inundated within a 1,000-foot radius of each dam.

In addition to desktop review of the area within a 1,000-foot radius of each dam, Prairie conducted a desktop review of wetlands using the NWI, hydric soil mapping, and review of aerial photography for areas along the Rock River downstream of the dam locations to its junction with the Mississippi River.

### *3.2. Field Investigations*

Prairie conducted field investigations of each NWI mapped wetland and areas of repeated saturation based on aerial imagery to assess whether each exhibited wetland characteristics within the 1,000-foot radius delineated around each dam. Vegetation inventories, soil borings, and hydrologic conditions were evaluated at each potential wetland site. Vegetation inventories included species, percent coverage, and wetland indicator status. Soil borings collected in and around the wetland areas to a depth of at least 12 inches were examined for the presence of hydric soil indicators. Hydrology was assessed by evaluating hydrological indicators which would support the presence of hydrophytic plants and hydric soils. One sample point was taken from within each area exhibiting wetland characteristics, and one sample point

outside of the apparent wetland area to determine the boundary between the wetland and surrounding upland.

Findings from each assessment were documented on Wetland Determination Data Forms (Appendix A).

Prairie also delineated the Ordinary High-Water Mark (OHWM) within the study area in accordance with the *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams: Final Version* (2025). The indicators assessed include breaks in bank slope, changes in sediment characteristics, and a clear, natural line impressed upon concrete structures along the river. GPS points and photographs were taken along the OHWM in the study area.

Areas that are only accessible by boat (e.g. islands) and where private landowners did not allow access were excluded from evaluation.

# 4. RESULTS AND DISCUSSION

### *4.1. Description of the Site*

The site evaluated is the area within a 1,000-foot radius from the centers of the Sears and Steel dams, comprising approximately 144 acres immediately adjacent to the Rock River. The area is dominated by open water (Rock River) and land developed for recreational access and industrial uses. There are small inclusions of wooded areas and other land cover classifications. Sears Dam is approximately 2.5 miles upstream of the Rock River's junction with the Mississippi River. Steel Dam is located approximately 1.5 miles upstream of Sears Dam. The topography is relatively flat with the main local relief provided by areas that have been raised for roads and levees. Just north of the Sears Dam, the topography becomes quite steep beyond the floodplain of the Rock River.

The NWI database indicates that there are seven water or wetland features within the evaluation area, including temporarily and seasonally flooded palustrine wetlands dominated by deciduous woody plants and deep-water habitats associated with the river channel itself. The river channel between the two dams is mapped as lacustrine due to the presence of the dams. Prairie identified one additional area of potential saturation based on a review of aerial imagery. See Exhibit B for a map of NWI wetlands.

Soils in the project area are generally silt/clay loams that range from very poorly drained to well drained. Soils information was accessed from the Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS). Table 1 summarizes the soil map unit name, hydric rating, drainage class, and total area of each soil within the project area. Exhibit C includes soils maps for the project area.

**Table 1.** Hydric rating, drainage class, and total area of each soil map unit with the Sears and Steel Study area.

| Map Unit Number | Map Unit Name | Hydric Rating | Drainage Class | Total Area (ac) |
|---|---|---|---|---|
| 198746 | Millsdale silty clay loam, 0 to 2 percent slopes | Yes | Very poorly drained | 5.9 |
| 198754 | Orthents, loamy, undulating | No | Well drained | 20.5 |
| 198755 | Pits, quarries | N/a | N/a | 25.2 |
| 198761 | Marseilles-Hickory silt loams, 35 to 60 percent slopes | No | Well drained | 3.5 |
| 198762 | Seaton-Timula silt loams, 18 to 35 percent slopes, eroded | No | Well drained | 3.2 |
| 198690 | Moline silty clay, undrained, 0 to 2 percent slopes, frequently flooded | Yes | Poorly drained | 2.8 |
| 198703 | Dorchester silt loam, 0 to 2 percent slopes, rarely flooded | No | Well drained | 5.2 |
| 198687 | Millington silt loam, undrained, 0 to 2 percent slopes, frequently flooded | Yes | Poorly Drained | 2.8 |
| 198693 | Millington silt loam, 0 to 2 percent slopes, frequently flooded | Yes | Poorly drained | 0.7 |
| 198694 | Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded | Yes | Poorly drained | 4.7 |
| 198704 | Landes fine sandy loam, 0 to 2 percent slopes, rarely flooded | No | Well drained | 2.4 |
| 198707 | Coffeen silt loam, 0 to 2 percent slopes, rarely flooded | No | Somewhat poorly drained | 4.3 |
| 271425 | Water | N/a | N/a | 62.7 |
| | **Total** | | | **144** |

## *4.2. Findings*

### 4.2.A. Wetlands

All wetland determination forms for the wetlands described below can be found in Appendix A. See Exhibit D for a map of the study area showing the identified wetlands.

Wetland 1

Wetland 1 (S-1 on field data sheet) is an emergent wetland of which approximately 1.6 acres falls within the study area. This wetland is located approximately 400 feet south of the Rock River, and 40 feet east of 14th St NE. It lies in a depressed area and is bordered on the south and west by a levee and road embankment, and to the north by a stand of timber with slightly higher elevation. The soil has a silty clay loam texture to at least 12 inches. Redox Dark Surface (F6) features were found in the soil borings; this is a typical hydric soil indicator. The matrix soil color comprised 95 percent of the soil sample and had a moist color of 10YR 2/1. The redox features within the sample had a color of 7.5YR 4/6.

The vegetation at the sample site was comprised of three species that are considered either Obligate Wetland (OBL) or Facultative Wetland (FACW) plants. The area was dominated by *Phalaris arundinaceae* (Reed canary grass, FACW) and contained smaller amounts of *Verbena hastata* (Blue vervain, FACW) and *Boehmeria cylindrica* (False nettle, OBL). This site passed the dominance test for hydrophytic vegetation.

Wetland hydrology indicators including Saturation (A3) and Inundation Visible on Aerial Imagery (B7) were observed. The soil was saturated to a depth of at least 12 inches.

The border of the wetland was visually obvious with a stark contrast in vegetation. The upland sample (S-2) was comprised of exclusively Upland (UPL), Facultative Upland (FACU), and Facultative (FAC) plants. The species observed included *Poa pratensis* (Kentucky bluegrass, FAC)*, Festuca arundinacea* (Tall fescue, FACU)*, Setaria pumila* (Yellow foxtail, FAC)*, and Dipsacus laciniatus* (Cutleaf teasel, UPL). The soils and hydrology lacked any distinct wetland indicators. The wetland boundary was determined using a combination of visible saturation, vegetation changes, and change in local relief.

Wetland 2

Wetland 2 (S-3 on field data sheet) is a forested wetland of which approximately 0.55 acres falls within the study area. This wetland is located adjacent to the southern bank of the northern fork of the Rock River, 200 feet northwest of North Avenue, and 800 feet downstream of the Sears Dam. It lies in a depressed area and is bordered to the north by the Rock River and to the south and east by slightly higher elevation.

The soil has a loamy clay texture to at least 12 inches. Redox Dark Surface (F6) features were found in the soil borings; this is a typical hydric soil indicator. In the first four inches of the sample, the matrix soil color comprised 100 percent of the soil sample and had a moist color of 10YR 2/1. From 4-12 inches, the matrix had a color of 7.5YR 3/1 at 85 percent and contained 15 percent redox features with a color of 7.5YR 4/6.

The vegetation at the sample site was comprised of five species that are considered either OBL, FACW, or FAC plants. The area was dominated by *Acer saccharinum* (Silver maple, FACW) and *Bidens frondose* (Beggarticks, FACW) and contained smaller amounts of *Salix nigra* (Black willow, OBL), *Vitis vulpine* (Wild grape, FAC) and *Chenopodium album* (Lambsquarters, OBL). This site passed the dominance test for hydrophytic vegetation.

Wetland hydrology indicators including Saturation (A3), Water Marks (B1), Inundation Visible on Aerial Imagery (B7), and Sparsely Vegetated Concave Surface (B8) were observed. The soil was saturated to a depth of at least 4 inches.

The border of the wetland was somewhat ambiguous as the vegetation was not drastically different, and local relief was present but slight. The upland sample (S-4) was comprised of primarily the same species, with the addition of *Persicaria pennsylvanica* (Pennsylvania smartweed, FACW) and *Echinochloa crus-galli* (Barnyardgrass, FACW). The vegetation passed the dominance test for the presence of hydrophytic vegetation, however the soils and hydrology lacked any distinct wetland indicators. The wetland boundary was determined using a combination of visible saturation, vegetation changes, and change in local relief.

Wetland 3

Wetland 3 (S-5 on field data sheet) is an emergent wetland of which approximately 0.32 acres falls within the study area. This wetland is located adjacent to North Avenue, approximately 400 feet southeast of the southern bank of the northern fork of the Rock River and 700 feet west of Highway 67/11$^{th}$ Street. It lies within a depression and is bordered to the west by a road embankment and surrounded by forested areas with slightly higher elevation.

The soil had a loamy clay texture to at least 12 inches and exhibited features consistent with the Redox Dark Surface (F6) hydric soil indicator. From 0-6 inches the soil consisted 100 percent of a color 10YR 3/1. From 6-12 inches, it contained 95 percent color 5YR 2.5/1 with 5 percent redox features within the pore linings exhibiting a color of 10YR 5/8.

The area lacked any living vegetation but had a crust of dried algae and *Lemna minor (*Duckweed, OBL) covering approximately 95 percent of the sample plot. The site passed the dominance test for the presence of hydrophytic vegetation.

Wetland hydrology indicators including Saturation (A3), Algal Mat or Crust (B4), and Inundation Visible on Aerial Imagery (B7) were observed. The soil was saturated to a depth of 2-6 inches. Due

to the presence of an algal crust and desiccated duckweed, this site appears to hold water frequently enough and for a long enough duration for these species to proliferate.

The wetland boundary was quite distinct due to changes in vegetation and relief. The upland sample (S-6) had vegetation comprised of *Celtis occidentalis* (Hackberry, FAC), *Acer saccharinum* (Silver Maple, FACW), *Potentilla simplex* (Common Cinquefoil, FACU), *Bidens frondosa* (Common Beggarticks, FACW), *Asclepias incarnata* (Swamp Milkweed, OBL), and *Miscanthus sinensis* (Chinese Silver Grass, UPL). The vegetation passed the dominance test for the presence of hydrophytic vegetation, however the soils and hydrology lacked any distinct wetland indicators. The wetland boundary was determined using the drastic change in vegetation along with the change in relief.

Other Observations

There were several small areas, particularly within sloughs and other backwaters, that exhibited potential wetland characteristics, such as hydrology and hydrophytic vegetation. However, these areas were not delineated as they fell below the Ordinary High-Water Mark (OHWM). The OHWM is the boundary along a waterway that marks the point where the water's presence and effects are frequent and persistent enough to create a distinct mark.

### 4.2.B Ordinary High-Water Mark

The OHWM was typically well defined by changes in bank slope or vegetation, or by lines impressed on concrete structures. Data points were collected using GPS equipment along the OHWM in areas that were accessible. Some areas were inaccessible due to safety and lack of landowner permission. In these areas, the OHWM was estimated via desktop analysis of LiDAR and other publicly available data. A map showing the collected data points and estimated OHWM is included in Exhibit E. Photographs showing the OHWM are included in Appendix B.

### 4.2.C. Desktop Review of Streams and Wetlands Downstream of the Dams

From the project site, the Rock River continues northwest for approximately 2.5 miles until it joins the Mississippi River. A desktop review was performed to identify areas that may contain wetlands that may be impacted by the removal of the dams. The area analyzed consisted of a 1,000-foot buffer from the centerline of the Rock River. The NWI identifies approximately 706 acres of wetlands within this buffer, including 208 acres of Deepwater Lake, 192 acres of Perennial Deepwater River, 144 acres of Bottomland Forest, 39 acres of Shallow Marsh/Wet Meadow, 32 acres of Open Water Wetlands, and 0.7 acres of Shrub-Scrub Wetlands (Exhibit B). According to the WSS, approximately 39% of the soils within the buffer have a hydric rating, meaning that the presence of wetlands is likely (Exhibit C). Additionally, aerial imagery was analyzed within the buffer area and approximately 90 acres were found to be inundated during at least one of the imagery dates. Taking these observations into consideration, it is highly likely that numerous wetlands exist in close proximity to the river, downstream of the project sites.

## 5. CONCLUSION

The Sears and Steel Dams project area consists of land adjacent to the Rock River in an area that contains numerous wetlands. Three wetlands totaling approximately 2.5 acres were delineated within a 1,000-foot radius of the existing dams. Additionally, numerous potential wetlands downstream of the dams were identified through a desktop review. Many of these wetlands are likely jurisdictional and would require permitting under Section 404 of the Clean Water Act if they will be disturbed. The USACE and United States Environmental Protection Agency (USEPA) have the final authority to determine which features are jurisdictional and would need to be consulted prior to any disturbance taking place.

# 6. REFERENCES

Environmental Laboratory. 1987. "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Google Earth Pro. 2023. Current and historical aerial images.

U.S. Army Corps of Engineers (USACE). 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0). USACE Engineer Research and Development Center. Vicksburg, Mississippi. August 2010.

U.S. Department of Agriculture - National Resources Conservation Service (USDA-NRCS). 2022. Web Soil Survey for Rock Island County, Illinois. https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

U.S. Fish and Wildlife Service (USFWS). 2023b. National Wetland Inventory. https://www.fws.gov/wetlands/data/mapper.html. Accessed June 2024.

US. Geologic Survey. (USGS) 2019. National Land Cover Database 2019 – Landcover & Imperviousness (NLCD 2019). https://www.usgs.gov/centers/eros/science/national-land-cover-database. 2019.

# APPENDIX A
# FIELD DATA SHEETS

Reset Form | Print Form

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Sears and Steel Dam Safety Study City/County: Milan, Rock Island County Sampling Date: 9/3/2024

Applicant/Owner: IDNR-OWR State: IL Sampling Point: S-1

Investigator(s): Trevor Cunningham, Marina Osier Section, Township, Range: 18, 17N, 1W

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): concave

Slope (%): 0-2 Lat: 41.459201° Long: -90.547706° Datum: NAD83

Soil Map Unit Name: Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded NWI or WWI classification: PF01Ah

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No _____ | **Is the Sampled Area within a Wetland?** **Yes X No _____** |
| Hydric Soil Present? | Yes X No _____ | |
| Wetland Hydrology Present? | Yes X No _____ | |

Remarks:

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | _____ = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | _____ = Total Cover | | |
| **Herb Stratum** (Plot size: 30') | | | |
| 1. *Phalaris arundinaceae* | 90 | yes | FACW |
| 2. *Verbena hastata* | 5 | | FACW |
| 3. *Boehmeria cylindrica* | 10 | | OBL |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 105 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = 0 |
| FACW species _____ | x 2 = 0 |
| FAC species _____ | x 3 = 0 |
| FACU species _____ | x 4 = 0 |
| UPL species _____ | x 5 = 0 |
| Column Totals: _____ (A) | 0 (B) |

Prevalence Index = B/A = 0

**Hydrophytic Vegetation Indicators:**

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** **Yes X No _____**

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: S-1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-12 | 10YR 2/1 | 95 | 7.5YR 4/6 | 5 | C | PL | Silty Clay Lo | Water table present 10-12" deep |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]:**

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 0-12"

**Wetland Hydrology Present?** **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reset Form | Print Form

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Sears and Steel Dam Safety Study City/County: Milan, Rock Island County Sampling Date: 9/3/2024

Applicant/Owner: IDNR-OWR State: IL Sampling Point: S-2

Investigator(s): Trevor Cunningham, Marina Osier Section, Township, Range: 18, 17N, 1W

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex

Slope (%): 15-30 Lat: 41.459155° Long: -90.547659° Datum: NAD83

Soil Map Unit Name: Coffeen silt loam, 0 to 2 percent slopes, rarely flooded NWI or WWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes _____ | No X | **Is the Sampled Area within a Wetland?** **Yes** _____ **No** X |
| Hydric Soil Present? | Yes _____ | No X | |
| Wetland Hydrology Present? | Yes _____ | No X | |

Remarks:

Sample point taken at toe of levee slope which forms the wetland boundary. Vegetation, soils, and hydrology have likely been significantly disturbed by the levee construction.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | _____ = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | _____ = Total Cover | | |
| **Herb Stratum** (Plot size: 30') | | | |
| 1. *Poa pratensis* | 50 | yes | FAC |
| 2. *Festuca arundinacea* | 20 | yes | FACU |
| 3. *Setaria pumila* | 10 | | FAC |
| 4. *Dipsacus laciniatus* | 15 | | UPL |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 95 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = 0 |
| FACW species _____ | x 2 = 0 |
| FAC species _____ | x 3 = 0 |
| FACU species _____ | x 4 = 0 |
| UPL species _____ | x 5 = 0 |
| Column Totals: _____ (A) | 0 (B) |

Prevalence Index = B/A = 0

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** **Yes** _____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: S-2

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type[1] | Redox Features Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-12 | 10YR 2/1 | 100 | | | | | Silty Clay Lo | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]:**

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present? Yes _____ No X**

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present? Yes _____ No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reset Form | Print Form

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Sears and Steel Dam Safety Study City/County: Milan, Rock Island County Sampling Date: 9/3/2024

Applicant/Owner: IDNR-OWR State: IL Sampling Point: S-3

Investigator(s): Trevor Cunningham, Marina Osier Section, Township, Range: 14, 17N, 2W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Concave

Slope (%): 3-5 Lat: 41.459369° Long: -90.580046° Datum: NAD83

Soil Map Unit Name: Millsdale silty clay loam, 0 to 2 percent slopes NWI or WWI classification: PUBF

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No _____ | **Is the Sampled Area within a Wetland?** **Yes X No _____** |
| Hydric Soil Present? | Yes X No _____ | |
| Wetland Hydrology Present? | Yes X No _____ | |

Remarks:

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer saccharinum* | 90 | Yes | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 90 = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 30' ) | | | |
| 1. *Acer saccharinum* | 40 | Yes | FACW |
| 2. *Salix nigra* | 10 | | OBL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 50 = Total Cover | | |
| **Herb Stratum** (Plot size: 30' ) | | | |
| 1. *Bidens frondosa* | 80 | Yes | FACW |
| 2. *Chenopodium album* | 10 | | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 90 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30' ) | | | |
| 1. *Vitis vulpina* | 10 | | FAC |
| 2. | | | |
| | 10 = Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = 0 |
| FACW species _____ | x 2 = 0 |
| FAC species _____ | x 3 = 0 |
| FACU species _____ | x 4 = 0 |
| UPL species _____ | x 5 = 0 |
| Column Totals: _____ (A) | 0 (B) |

Prevalence Index = B/A = 0

**Hydrophytic Vegetation Indicators:**

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** **Yes X No _____**

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: S-3

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-4 | 10YR 2/1 | 100 | | | | | Loamy Clay | |
| 4+ | 7.5YR 3/1 | 85 | 7.5YR 5/8 | 15 | C | PL | Loamy Clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]:**

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present? Yes** X **No** ___

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 4+"

**Wetland Hydrology Present? Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reset Form | Print Form

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Sears and Steel Dam Safety Study City/County: Milan, Rock Island County Sampling Date: 9/3/2024

Applicant/Owner: IDNR-OWR State: IL Sampling Point: S-4

Investigator(s): Trevor Cunningham, Marina Osier Section, Township, Range: 14, 17N, 2W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 2-4 Lat: 41.459216° Long: -90.579980° Datum: NAD83

Soil Map Unit Name: Millsdale silty clay loam, 0 to 2 percent slopes NWI or WWI classification: PF01A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No _____ | **Is the Sampled Area within a Wetland?** Yes _____ No X |
| Hydric Soil Present? | Yes _____ No X | |
| Wetland Hydrology Present? | Yes _____ No X | |

Remarks:

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer saccharinum* | 50 | Yes | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 50 = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 30' ) | | | |
| 1. *Acer saccharinum* | 20 | Yes | FACW |
| 2. *Salix nigra* | 10 | | OBL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 30 = Total Cover | | |
| **Herb Stratum** (Plot size: 30' ) | | | |
| 1. *Bidens frondosa* | 10 | | FACW |
| 2. *Chenopodium album* | 5 | | FACU |
| 3. *Persicaria pennsylvanica* | 40 | Yes | FACW |
| 4. *Echinochloa crus-galli* | 20 | | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 75 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30' ) | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = 0 |
| FACW species _____ | x 2 = 0 |
| FAC species _____ | x 3 = 0 |
| FACU species _____ | x 4 = 0 |
| UPL species _____ | x 5 = 0 |
| Column Totals: _____ (A) | 0 (B) |

Prevalence Index = B/A = 0

**Hydrophytic Vegetation Indicators:**

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: S-4

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type[1] | Redox Features Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-12 | 7.5YR 2.5/1 | 100 | | | | | Loamy Clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]:**

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present? Yes _____ No X**

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present? Yes _____ No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reset Form | Print Form

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Sears and Steel Dam Safety Study City/County: Milan, Rock Island County Sampling Date: 9/4/2024

Applicant/Owner: IDNR-OWR State: IL Sampling Point: S-5

Investigator(s): Trevor Cunningham, Marina Osier Section, Township, Range: 14, 17N, 2W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): concave

Slope (%): 2-4 Lat: 41.458817° Long: -90.578839° Datum: NAD83

Soil Map Unit Name: Millsdale silty clay loam, 0 to 2 percent slopes NWI or WWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No _____ | **Is the Sampled Area within a Wetland?** Yes X No _____ |
| Hydric Soil Present? | Yes X No _____ | |
| Wetland Hydrology Present? | Yes X No _____ | |

Remarks:

Site appears to hold water frequently and for a duration that allows the proliferation of Common Duckweed (Lemna minor), but was dry at the time of sampling.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 30' ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | = Total Cover | | |
| **Herb Stratum** (Plot size: 30' ) | | | |
| 1. *Lemna minor* | 95 | Yes | OBL |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 95 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30' ) | | | |
| 1. | | | |
| 2. | | | |
| | = Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = 0 |
| FACW species _____ | x 2 = 0 |
| FAC species _____ | x 3 = 0 |
| FACU species _____ | x 4 = 0 |
| UPL species _____ | x 5 = 0 |
| Column Totals: _____ (A) | 0 (B) |

Prevalence Index = B/A = 0

**Hydrophytic Vegetation Indicators:**

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: S-5

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-6 | 10YR 3/1 | 100 | | | | | Loamy Clay | |
| 6-12 | 5YR 2.5/1 | 95 | 10YR 5/8 | 5 | C | PL | Loamy Clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]:**

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present? Yes** X **No** ___

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- X True Aquatic Plants (B14)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 2-6"

**Wetland Hydrology Present? Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reset Form | Print Form

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Sears and Steel Dam Safety Study City/County: Milan, Rock Island County Sampling Date: 9/4/2024

Applicant/Owner: IDNR-OWR State: IL Sampling Point: S-6

Investigator(s): Trevor Cunningham, Marina Osier Section, Township, Range: 14, 17N, 2W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): concave

Slope (%): 3-30 Lat: 41.459092° Long: -90.578887° Datum: NAD83

Soil Map Unit Name: Millsdale silty clay loam, 0 to 2 percent slopes NWI or WWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No _____ | **Is the Sampled Area within a Wetland?** Yes _____ No X |
| Hydric Soil Present? | Yes _____ No X | |
| Wetland Hydrology Present? | Yes _____ No X | |

Remarks:

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Celtis occidentalis* | 40 | Yes | FAC |
| 2. *Acer saccharinum* | 10 | | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 50 | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 30' ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | | = Total Cover | |
| **Herb Stratum** (Plot size: 30' ) | | | |
| 1. *Potentilla simplex* | 45 | Yes | FACU |
| 2. *Bidens frondosa* | 10 | | FACW |
| 3. *Asclepias incarnata* | 5 | | OBL |
| 4. *Miscanthus sinensis* | 25 | Yes | UPL |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 85 | = Total Cover | |
| **Woody Vine Stratum** (Plot size: 30' ) | | | |
| 1. | | | |
| 2. | | | |
| | | = Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = 0 |
| FACW species _____ | x 2 = 0 |
| FAC species _____ | x 3 = 0 |
| FACU species _____ | x 4 = 0 |
| UPL species _____ | x 5 = 0 |
| Column Totals: _____ (A) | 0 (B) |

Prevalence Index = B/A = 0

**Hydrophytic Vegetation Indicators:**

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: S-6

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 10YR 2/2 | 100 | | | | | Loamy Clay | |
| 8-12 | 7.5YR 3/1 | 100 | | | | | Loamy Clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]:**

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present? Yes _____ No X**

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

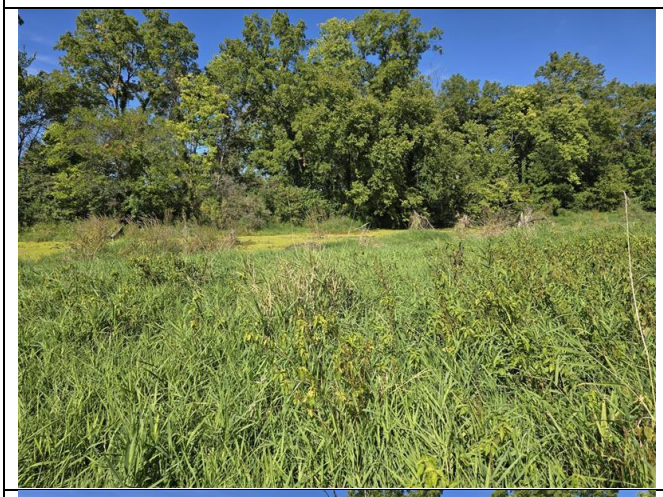
Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

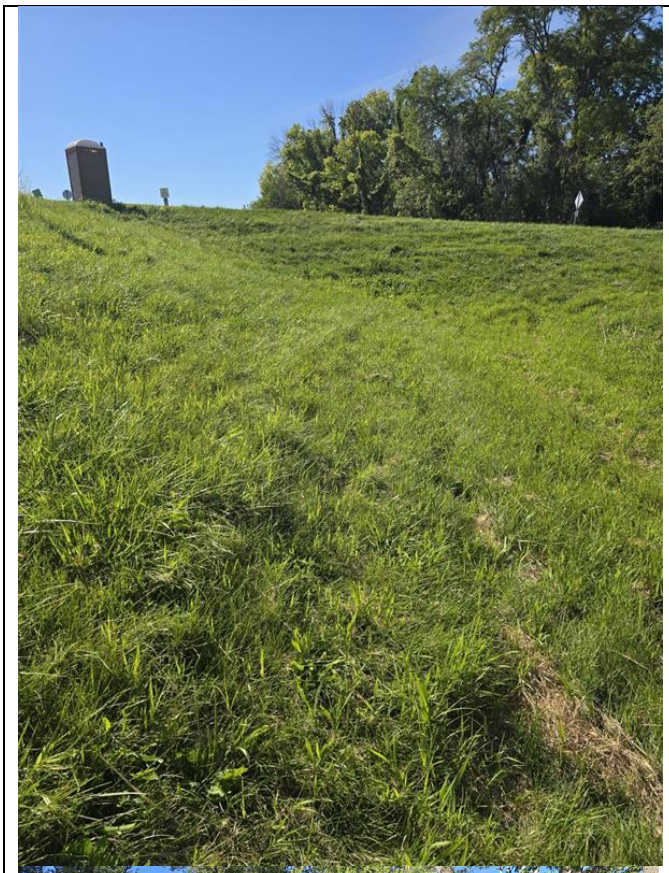
**Wetland Hydrology Present? Yes _____ No X**

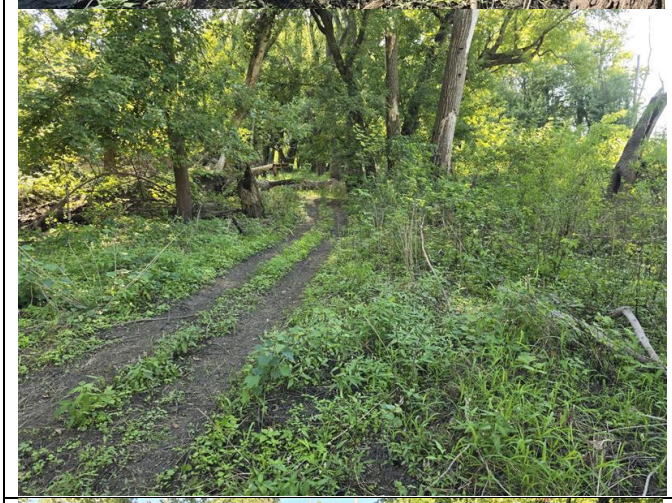
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

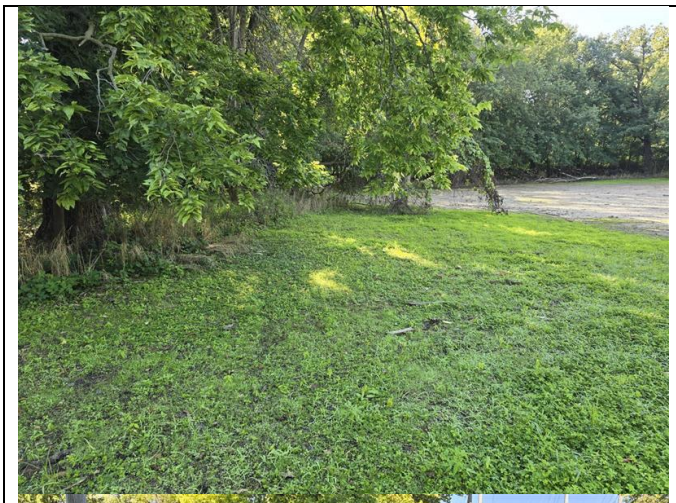
# APPENDIX B
# PHOTOGRAPHS

| Photograph | Description |
|---|---|
|  | Wetland 1, an emergent wetland, at sampling point S-1 |
|  | Wetland 1 at sampling point S-1 |
|  | Upland adjacent to Wetland 1 at sampling point S-2 |

| | |
|---|---|
|  | Upland adjacent to Wetland 1 at sampling point S-2 |
|  | Wetland 2, a forested wetland, at sampling point S-3 |

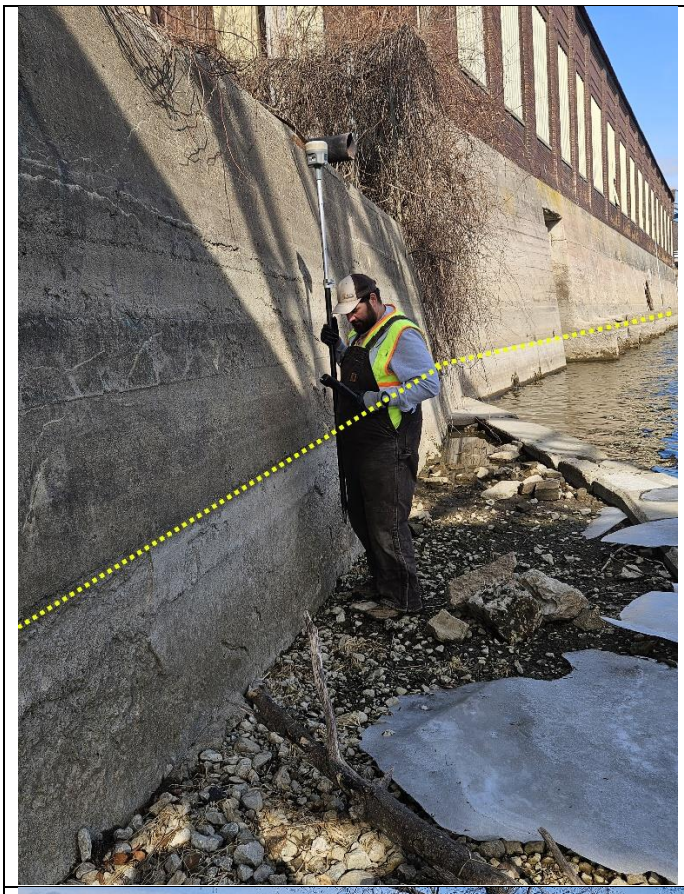
| | |
|---|---|
|  | Wetland 2 at sampling point S-3 |
|  | Upland adjacent to Wetland 2 at sampling point S-4 |
|  | Upland adjacent to Wetland 2 at sampling point S-4 |

| | |
|---|---|
|  | Wetland 3, an emergent wetland, at sampling point S-5 |
|  | Wetland 3 at sampling point S-5 |

| | |
|---|---|
|  | Upland adjacent to Wetland 3 at sampling point S-6 |
|  | Upland adjacent to Wetland 3 at sampling point S-6 |
|  | OHWM along side channel, just upstream of Steel Dam |

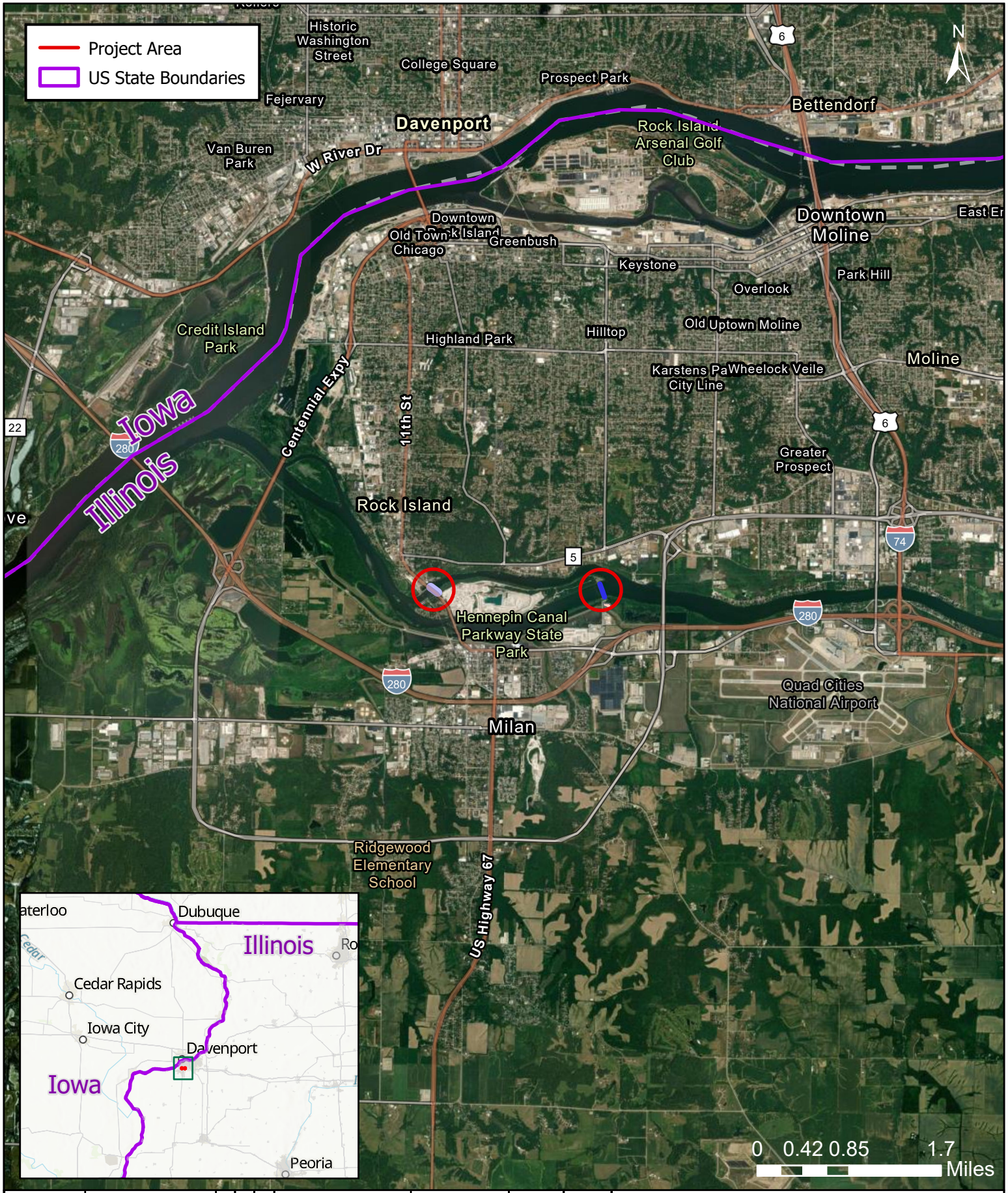
| | |
|---|---|
|  | OHWM on the south bank of the Rock River, downstream of Steel Dam |
|  | OHWM on the south bank of the Rock River, downstream of Steel Dam |
|  | OHWM along Hennepin Canal, just below Steel Dam |

| | |
|---|---|
|  | OHWM on the north bank of the Rock River, downstream of Sears Dam |
|  | OHWM on the south bank of the Rock River downstream of Sears Dam |

| | |
|---|---|
|  | OHWM shown on the concrete structure of the old power plant downstream of Sears Dam |
|  | OHWM on the south bank of the Rock River downstream of Sears Dam |

# EXHIBIT A

# PROJECT LOCATION MAP



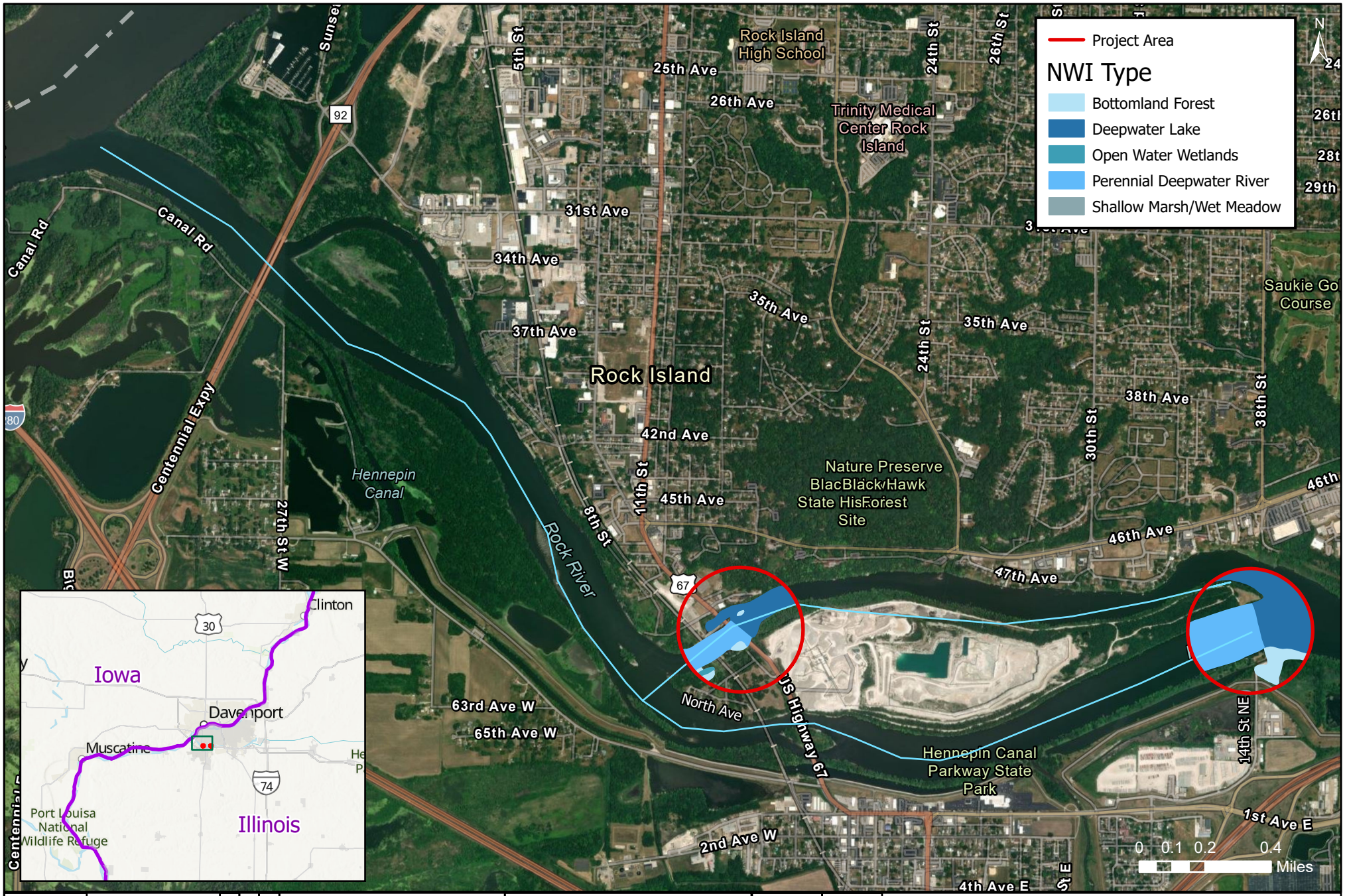

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| of xxx sheets | X - XX | SHEET NAME: Project Location | 2 By/Date | 1 By/Date | Revision | PE PROJECT NAME: Sears & Steel Dam Study | Date: 12/2/2024<br>Exp. Date: 11/30/20xx | PE Project No. 29.2213<br>Drawing Date 12/2/2024<br>Designed By MKL<br>Drawn By MKL<br>Approved By XXX |

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# EXHIBIT B

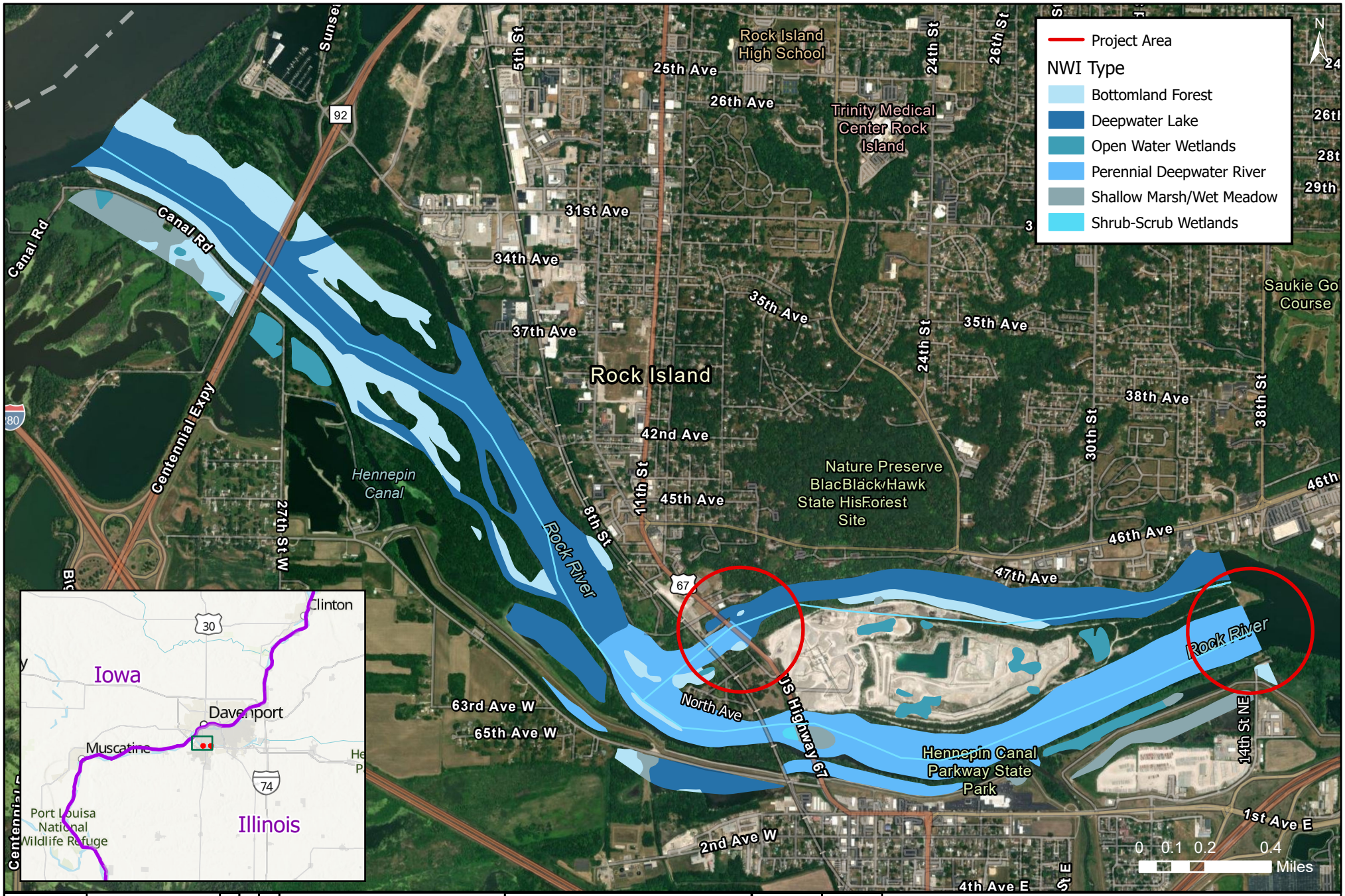
# NATIONAL WETLAND INVENTORY




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X - X.X of xxx sheets | SHEET NAME: NWI Area | 2 By/Date | 1 By/Date | Revision | PE PROJECT NAME: Sears & Steel Dam Study | Date: 12/31/2024<br>Exp. Date: 11/30/20xx | PE Project No. 29.2213<br>Drawing Date 12/31/2024<br>Designed By MKL<br>Drawn By MKL<br>Approved By XXX |

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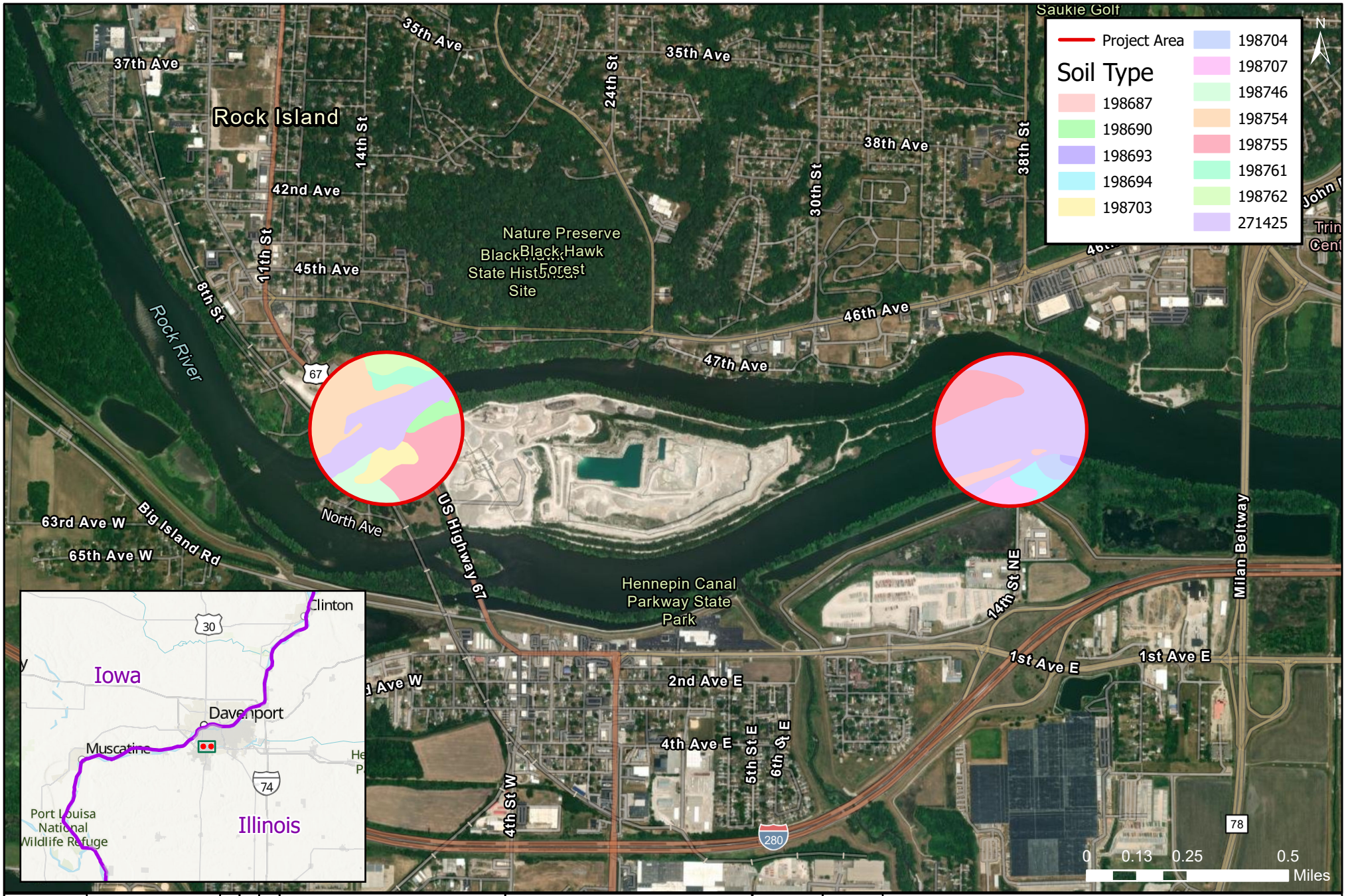

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X - X.X of xxx sheets | SHEET NAME: NWI Area | 2 By/Date | 1 By/Date | Revision | PE PROJECT NAME: Sears & Steel Dam Study | Date: 12/31/2024<br>Exp. Date: 11/30/20xx | PE Project No. 29.2213<br>Drawing Date 12/31/2024<br>Designed By MKL<br>Drawn By MKL<br>Approved By XXX |

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# EXHIBIT C

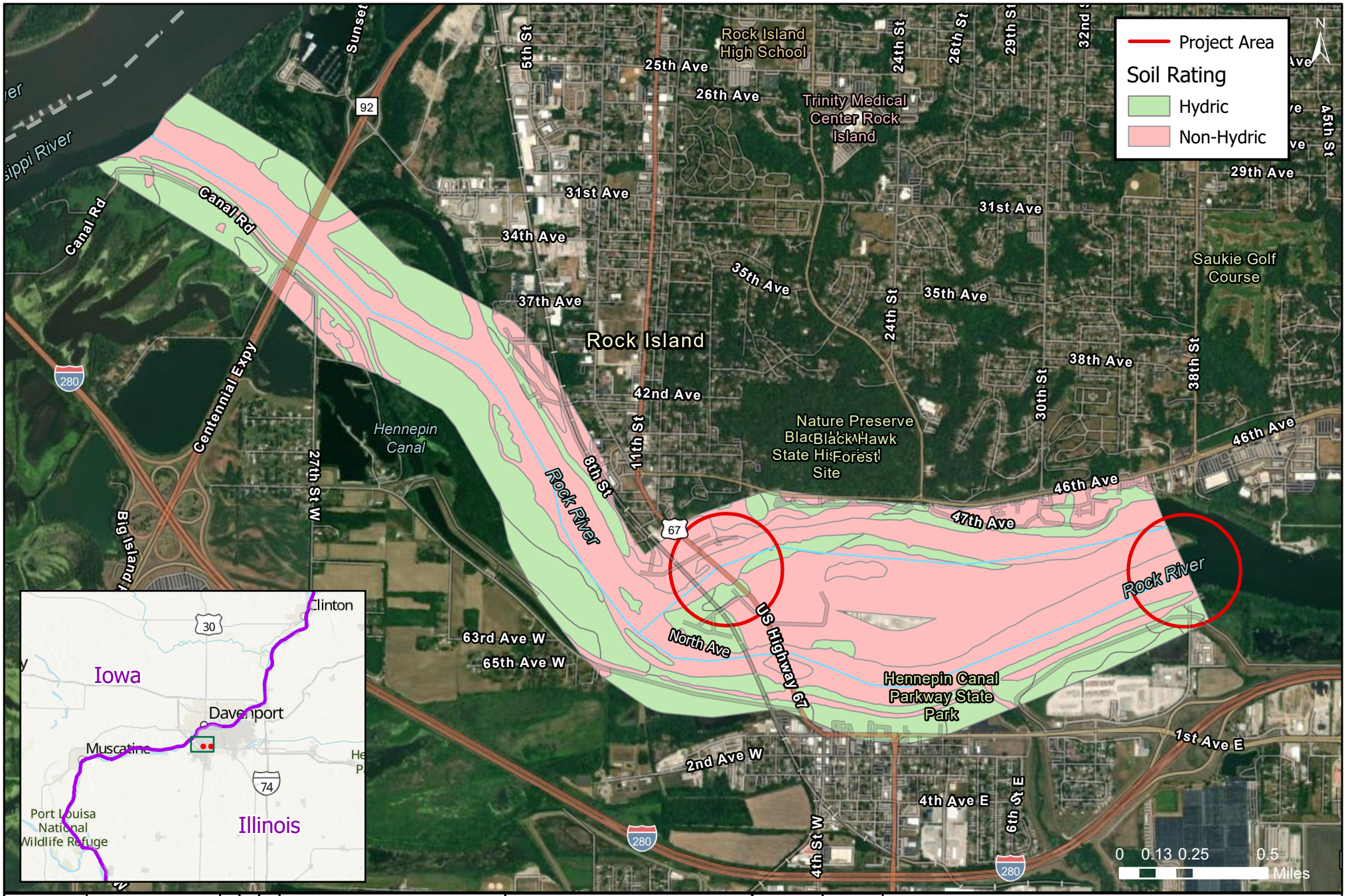
# SOILS MAPS




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X - X.X of xxx sheets | SHEET NAME: Soil | 2 By/Date | 1 By/Date | Revision | PE PROJECT NAME: Sears & Steel Dam Study | Date: 12/31/2024<br>Exp. Date: 11/30/20xx | PE Project No. 29.2213<br>Drawing Date 12/31/2024<br>Designed By MKL<br>Drawn By MKL<br>Approved By XXX |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X - X.X of xxx sheets | SHEET NAME: Hydric Soil | 2 By/Date | 1 By/Date | Revision | PE PROJECT NAME: Sears & Steel Dam Study | Date: 12/31/2024<br>Exp. Date: 11/30/20xx | PE Project No. 29.2213<br>Drawing Date 12/31/2024<br>Designed By MKL<br>Drawn By MKL<br>Approved By XXX |

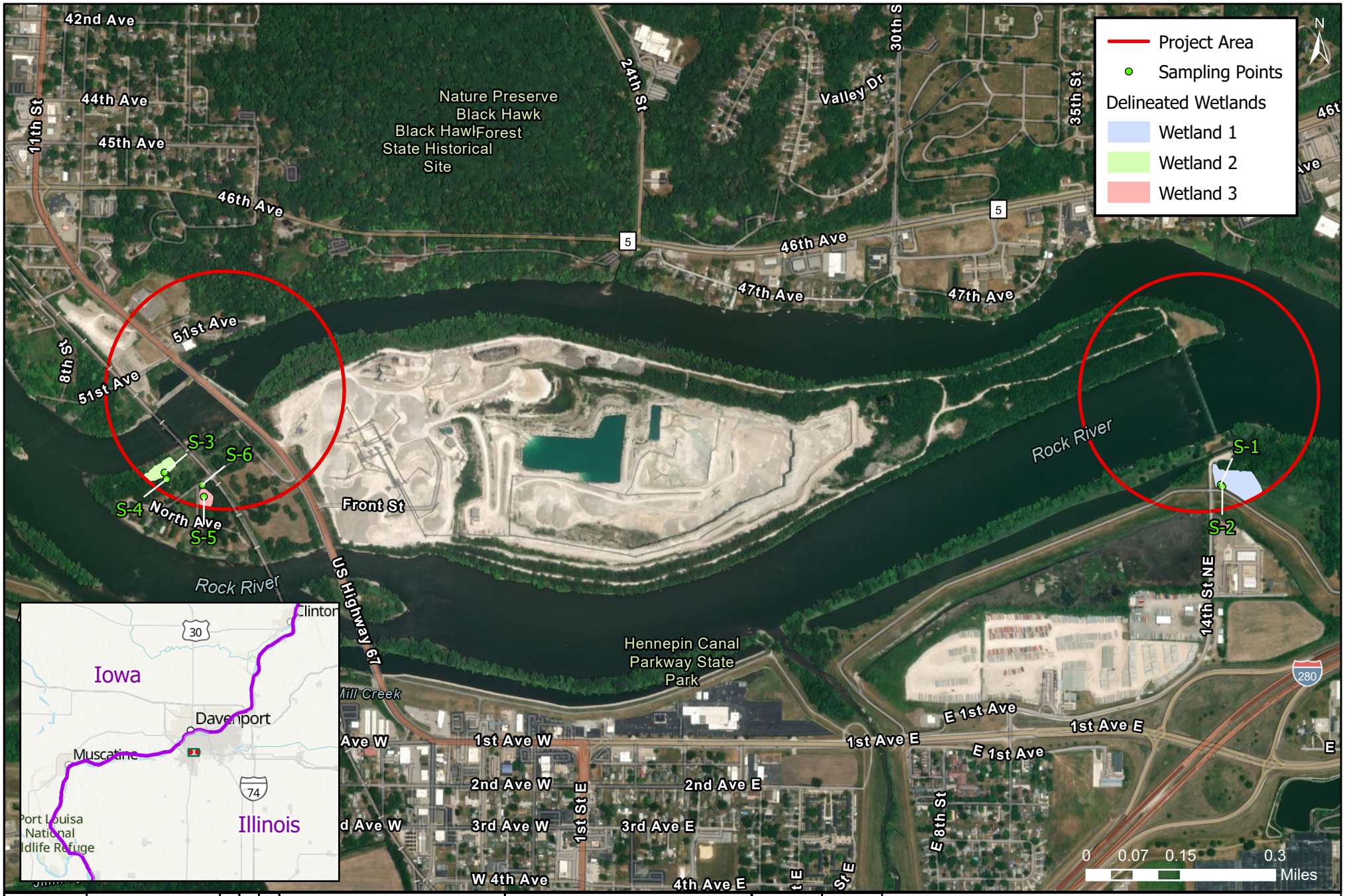

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# EXHIBIT D

# DELINEATED WETLANDS MAP




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X.X - X.X of xxx sheets | SHEET NAME: Delineated Wetlands | 2 By/Date | 1 By/Date | Revision | PE PROJECT NAME: Sears & Steel Dam Study | Date: 12/31/2024<br>Exp. Date: 11/30/20xx | PE Project No. 29.2213<br>Drawing Date 12/31/2024<br>Designed By MKL<br>Drawn By MKL<br>Approved By XXX |

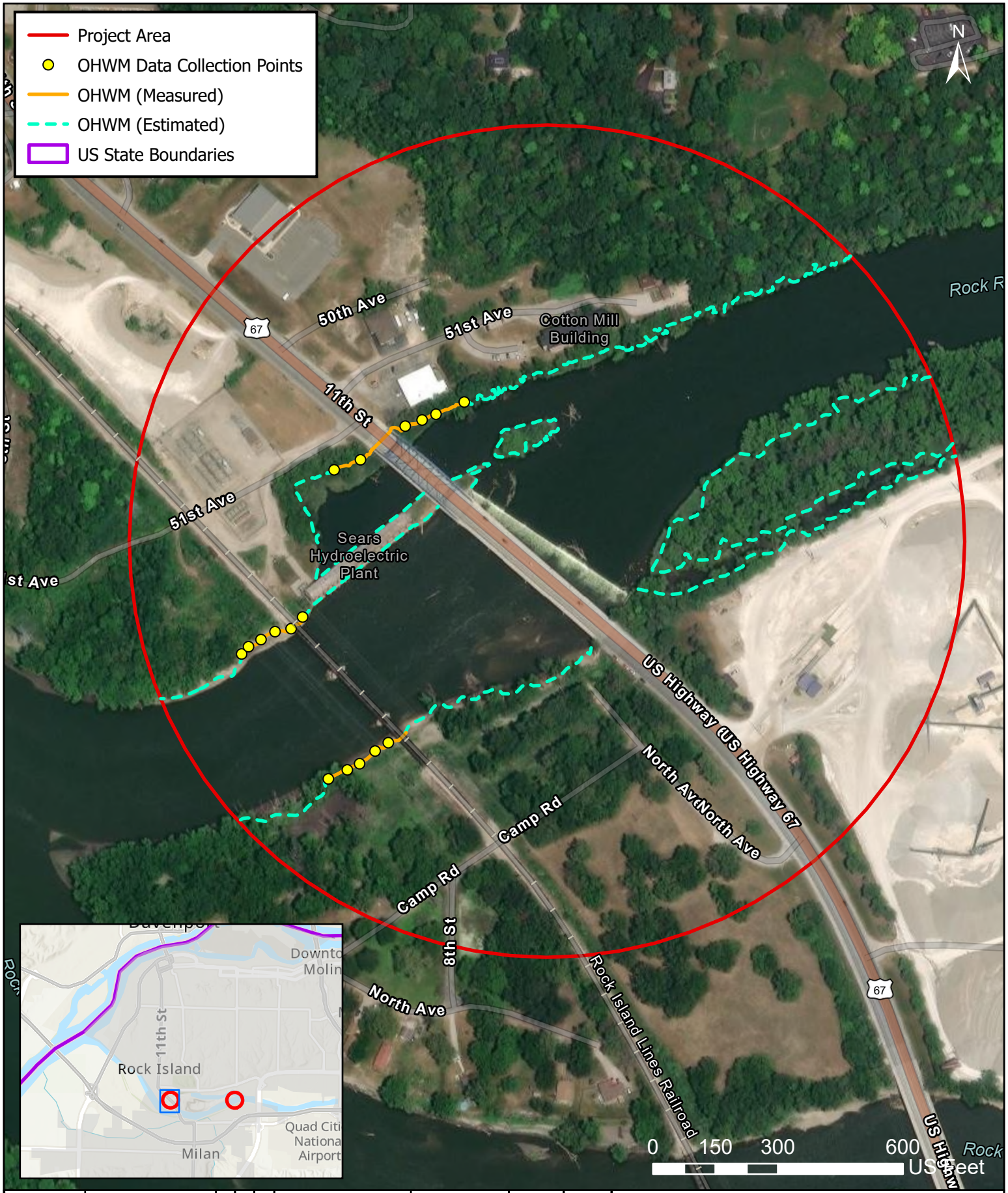

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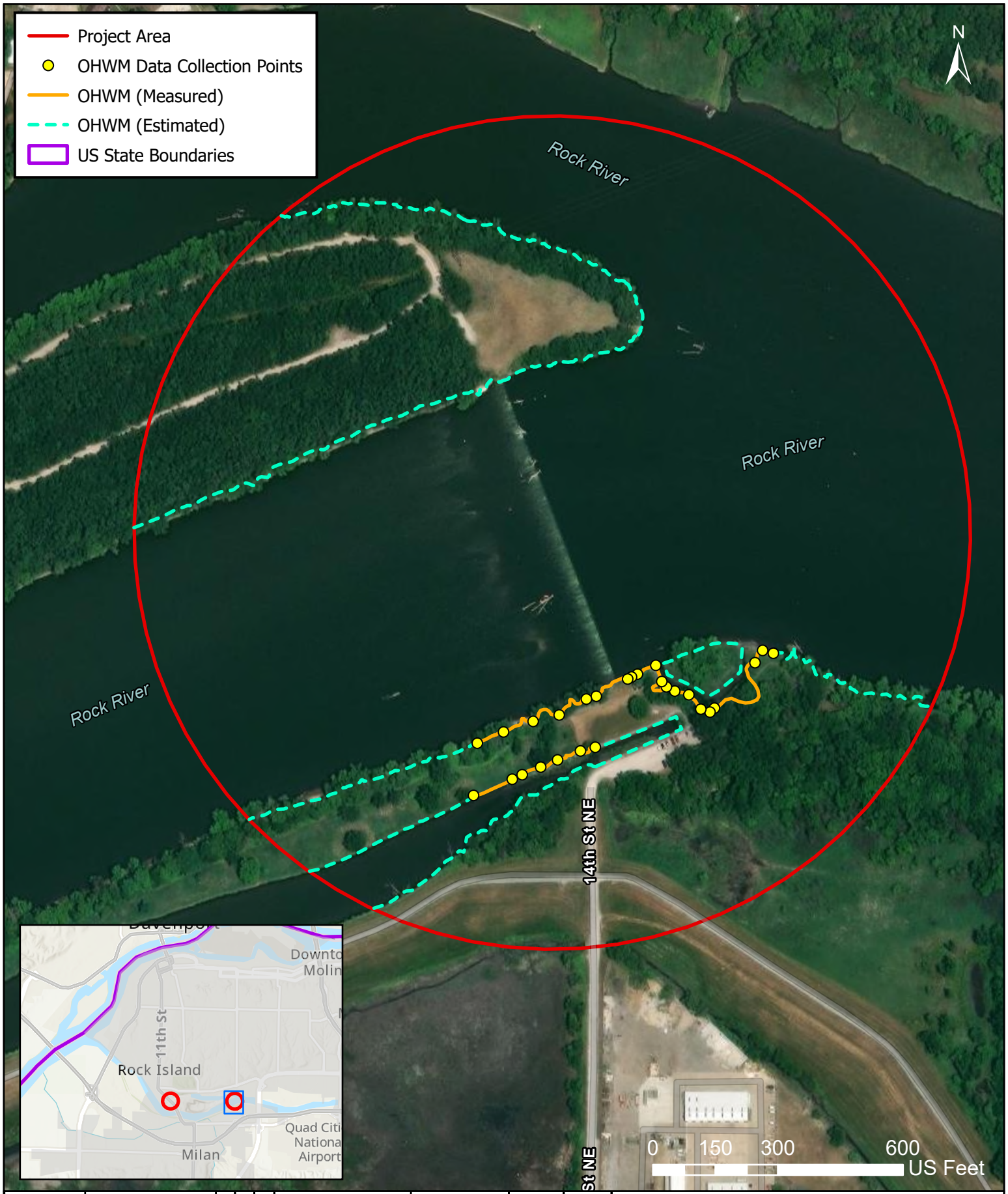
# EXHIBIT E

# ORDINARY HIGH-WATER MARK




| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X - XX of xxx sheets | SHEET NAME: Ordinary High Water Mark | 2 By/Date | 1 By/Date | Revision | PE PROJECT NAME: Sears & Steel Dam Study | Date: 5/12/2025<br>Exp. Date: 11/30/20xx | PE Project No. 29.2213<br>Drawing Date 5/12/2025<br>Designed By MKL<br>Drawn By MKL<br>Approved By XXX | Prairie Engineers, P.C.<br>9025 IL Route 127<br>Hillsboro, IL 62049<br>(217) 532-9233<br>www.prairieengineers.com<br>Professional Design Firm<br>No. 184-005965 |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X - X.X of xxx sheets | SHEET NAME: Ordinary High Water Mark | 2 By/Date | 1 By/Date | Revision | PE PROJECT NAME: Sears & Steel Dam Study | Date: 5/12/2025<br>Exp. Date: 11/30/20xx | PE Project No. 29.2213<br>Drawing Date 5/12/2025<br>Designed By MKL<br>Drawn By MKL<br>Approved By XXX | Prairie Engineers, P.C.<br>9025 IL Route 127<br>Hillsboro, IL 62049<br>(217) 532-9233<br>www.prairieengineers.com<br>Professional Design Firm<br>No. 184-005965 |

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# APPENDIX H - Public Hearing Comments

**From:** joseph.collins9613@gmail.com
**To:** DNR.OWRPlanning
**Subject:** [External] Sears Dam , Steel Dam comments
**Date:** Wednesday, April 1, 2026 6:14:43 PM
**Attachments:** Rock River Dam modifications.docx

---

Please see the attached

Thanks

Joe Collins

Rock River Dam modifications

Let me introduce myself:

My name is Joe Collins and I have been a life long resident of the Rock River basin for my entire life (66 years). I grew up respecting and understanding the eco system that encompasses the area of this study. I have fished, hunted and raised a family on this river. I have rescued people in trouble, supported activities on the river and been involved in restoration projects along the river.

With that said I find it hard to understand why taxpayers would spend $800,000 on a study that has not until 3/16/26 involved any comments from the people that this study impacts. The results of the study are being rushed to completion in an unacceptable time frame and the comment time frame is too short for such a study to be effective for the dollars spent.

I believe that at the meeting on 3/16/2026 the public concerns were echoed in the room.

The informational meeting was held on 3/16/2026 at the IBEW hall concerning a study commissioned by the Illinois DNR. The information from this study was presented by the DNR and Representative Mike Halpin.

The main reasoning is for modification of this waterway was public safety (loss of life due to the roller currents at the Steel dam). There are drownings that take place at the Steel dam from inexperienced boaters as well as experienced boaters. The meeting started off providing very limited information of the reasoning behind the 5 alternatives presented. Each one of the alternatives involved the removal of the Sears Dam. There was no alternatives given other than removal.

The engineering firm that performed the study provided very little information in the way of details as far as actual elevations of watershed compared to FEMA flood zones, no data on volume of flows in each of the channels, no flood impact, no economic impact, no environmental impact other than speculation. ( I personal asked the engineer and he indicated I would have to find this data on my own).

I understand there is a push by certain groups to remove these structures for public safety and ecological restoration on a national level. I see these efforts as a way for those that are not impacted directly to exert their will on those people of the areas involved. That is not how our country was founded and has operated for over 250 years! The will of the people on the east coast does not relate to the Midwest.

If an alternative for public safety should happen I offer the following solutions:

Steel Dam solutions

1. Add a stepped structure to the Steel Dam. This will eliminate the currents that pose a safety risk.
2. Install structural piers above the Steel dam and attach a steel cable from one side of the river on the Milan side to the piers and to the Island in the middle of the river creating a safety barrier should someone enter the area.
3. Install appropriate warning signage indicating a hazard in the river.
4. Install warning signage at the river access near the old Hennepin canal.

This type of installation is common across the country and would maintain river levels for all involved.

Sears Dam

1. Install a stepped structure below the dam like the Steel Dam that would extend from the current train bridge to below the HWY 67 bridge reducing the river level in increments. This will calm the turbulent waters below the dam.
2. Install a cable barrier and structures to create a safety barrier above the dam.
3. Install proper warning signage at all access locations including the bridge.

My recommendations are just that, recommendations to consider through much study and lots of data. The ecological effects from fish migration and invasive species into our watershed is another topic that was not discussed and outside of my wheelhouse!!

For the record, the removal of the dams is not an acceptable solution. Loss of life is also not acceptable due to hazards and the risk of the river currents. We live in an age of AI, modern marvels and sending people into space. I have worked in heavy construction industry all of my life and I find it hard to understand that a modern solution cannot be found other that the same old thing!!

If the Dutch can change the ocean floor (Home - Deltapark Neeltje Jans) I am sure that we can modify these 2 small dams to accommodate the needs of the local residents.

Sincerely

Joe Collins

9613 N Thompson St

Colona, Il 61241

309-945-2678

Joseph.collins9613@gmail.com

| | |
|---|---|
| **From:** | Mitch Zimmerman |
| **To:** | DNR.OWRPlanning; EXT Halpin, Mike Senator; Cattoor, Wes; McParland, Terra |
| **Subject:** | [External] Public Comment - Steel and Sears Dam Project |
| **Date:** | Tuesday, March 31, 2026 4:50:06 PM |
| **Attachments:** | Rock River Valley Assocation Public Statement_Final.pdf |

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IDRN, Senator Halpin, Wes Cattoor, and Tara McParland,

Please see the attached public comment in regard to the Illinois DNR study of the Steel and Sears dam.

We appreciate the opportunity to comment.

Mitch Zimmerman on behalf of the Members of the Rock River Valley Associations

# PUBLIC COMMENT – Steel and Sears Dam Project Planning & Feasibility Study

**Opposition to the Proposed Removal or Modification of the Steel and Sears Dams**
**Rock River – Rock Island, Illinois**

Submitted on behalf of:
**Members of the Rock River Valley Association**

The members of the Rock River Valley Association appreciate the opportunity to submit comments regarding the Steel and Sears Dam Project Planning and Feasibility Study. We represent residents, recreational users, small businesses, property owners, and local organizations with direct and longstanding ties to the Rock River above and below the Steel and Sears Dams. To date, we have collected 267 signatures of local individuals who oppose any project or action that would change or reduce the current level of the Rock River upstream of the Steel and Sears dams.

We recognize that public safety on the Rock River is an important concern and support thoughtful, effective actions to reduce risk to river users. However, after careful review, we believe the study does not provide a defensible basis for dam removal, particularly given its failure to analyze economic impacts and its exclusion of reasonable safety alternatives.

The members of the association request the **IDNR** to respond to the following requests either in writing or public hearing:

1. Acknowledge that the study lacks comprehensive content required to make any decision regarding modifications to the dams.
2. Complete additional studies that include alternatives leaving the Sears dam intact.
3. Provide a complete breakdown of the companies involved in the study, the work they completed, and the total amount of taxpayer dollars spent on their contributions.
4. The IDNR is ensuring that safety protocols at the Steel and Sears dams are implemented and maintained.
5. Provide comment on how the alternatives impact the Moline water treatment plant (South Slope) project.
6. Provide comments on the impact to the quality and quantity of drinking water supported by the current water table along the stretch of river affected in each scenario.

The members of the association request **Senator Mike Halpin** to respond to the following requests either in writing or public hearing:

1. What are the outcomes you hope to see as a result of this study?

Public

    a. If stated outcome was not included in this study, are you committed to ensuring additional studies and analysis before any decision is pursued?
2. Are you committed to ensuring a full, comprehensive analysis including net safety impact, economic impact, and ecological impact is completed and provided publicly before any actions are pursued?
3. What actions are you considering immediately to improve the safety of the Steel and Sears dam?

We acknowledge that:

- Low-head dams can present hazards under certain flow and use conditions
- Public awareness and risk mitigation are essential components of river management
- Preventable accidents on Illinois waterways are unacceptable

Our association does not dismiss safety concerns. Rather, we object to the use of an incomplete and analytically deficient study to justify irreversible changes to a vital piece of community infrastructure without demonstrating necessity, proportionality, or net benefit.

On behalf of our members, we respectfully request that prior to any dam modifications the decisionmakers:

1. Reject the sole use of this study as a safety-based justification for dam removal
2. Require a stand-alone, site-specific safety risk assessment
3. Require evaluation of non-destructive safety alternatives
4. Require a comprehensive economic impact analysis, including effects on local businesses, property values, recreation, and tourism
5. Ensure that any proposed action demonstrates net public benefit proportional to its impacts

The Rock River is not an abstract engineering exercise—it is a working, living system that supports families, businesses, recreation, and community identity. Safety improvements must be real, measurable, and achieved without unnecessarily dismantling the social and economic fabric built around this river.

We urge decisionmakers to pause, require complete analysis, and pursue solutions that protect both public safety, preservation of the current pool, and the Rock River community.

**Respectfully submitted,**

**Members of the Rock River Valley Association**

Public

## Supporting Context

## The Study Fails to Establish a Safety Necessity for Removal

Although the study identifies public safety as its *primary objective*, it does not include:

- Site-specific fatality or injury history for the Steel or Sears Dams
- Any exposure-based risk analysis tied to actual river use
- Comparative safety benchmarking against similar Illinois dams
- Quantification of safety improvement achieved by removal

Without this information, the study does not demonstrate that dam removal is necessary to address public safety concerns, nor that it is more effective than lower-impact alternatives.

## Complete Absence of Economic Impact Analysis

Critically, the study contains no meaningful economic impact analysis, despite proposing actions that would permanently alter the river system and the community built around it.

The study does not evaluate impacts to:

- River-dependent small businesses
- Waterfront residential property values
- Tourism and regional recreation spending
- Organized recreational clubs and events
- Municipal tax base and long-term economic activity

This omission alone renders the study incomplete for public decision-making.

## Impacts to Local Businesses and Tourism

The navigable pool created by the Steel and Sears Dams supports:

- Marinas and boat service providers
- Restaurants, bars, and retail businesses that rely on boating traffic
- Events, tournaments, and seasonal tourism tied to predictable water levels

Reducing upstream depth and navigability will materially diminish boating activity, visitor traffic, and discretionary spending. The study does not analyze these impacts, nor does it quantify anticipated business losses.

## Impacts to Property Values and Waterfront Investment

For decades, property owners have invested in homes along a stable, navigable reach of the Rock River. These investments were made with the reasonable expectation that water levels would be maintained.

The study does not address:

Public

- Loss of waterfront access and usability
- Degradation of views, shoreline stability, and recreational value
- Resulting impacts on assessed property values and property tax revenue

Ignoring these effects shifts economic costs onto residents without analysis or mitigation.

## Impacts to Recreation and Community Institutions

The Rock River pool above the Steel and Sears Dams supports a wide range of recreational activities, including:

- Boating and paddling
- Fishing and angling access
- Organized water sports

Notably, the study fails to consider the impacts on longstanding community institutions such as the Backwater Gamblers Ski Club, which depends on consistent water depth and flow conditions to safely operate. The loss or impairment of these activities represents both cultural and economic harm that is not acknowledged or analyzed.

## Internal Inconsistencies and Excluded Safety Alternatives

The study states that dam modification removes dangerous hydraulics, yet still concludes that removal is necessary. No objective safety thresholds are provided to justify this conclusion.

Additionally, the study excludes evaluation of widely used safety measures such as:

- Safety booms or barriers
- Enhanced warning systems
- Improved portage and access design
- Seasonal or flow-based controls

A safety-driven process must evaluate least-impact solutions first. This study did not.

## Community Impact and Public Trust

Proposing dam removal without fully analyzing safety effectiveness, economic consequences, or community impacts undermines public confidence in the process. Decisions of this magnitude must be grounded in complete, transparent, and technically sound analysis—not assumptions or narrowly framed objectives.

Public

**From:** John Amea
**To:** DNR.OWRPlanning
**Subject:** [External] Rock River Valley Association
**Date:** Tuesday, March 31, 2026 8:33:45 AM
**Attachments:** cover letter.pdf
rock river.pdf

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Please see the attached. Thank you.

John G. Ames
Ames Law Offices
1000 Third Street
PO Box 55
Orion, IL 61273
309-526-3374
jga@ameslawil.com

**Ames Law Offices**

1000 Third Street
Orion, Illinois 61273
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# *AMES LAW OFFICES*

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**TEL (309)526-3374**
**FEIN: 36-2516697**

**saa@ameslawil.com**


**March 30, 2026**

DNR.OWRPlanning@illinois.gov

Re: Sears and Steel Dam
Rock River, Rock Island County, IL
Dam Removal Project Report

Ladies & Gentlemen:

We respectfully submit this commentary by the Rock River Valley Association regarding the above designated matter.

If you have any questions or concerns, feel free to contact me.

Yours very truly,

JOHN G. AMES

SAA/me
Encls.

# Rock River Valley Association

AN ILLINOIS NOT FOR-PROFIT CORPORATION
John G. Ames, President
1000 North Shore Drive — Moline, Illinois 61265
Cell (309) 230-1290 Office (309-526-3374


DNR.OWRPlanning@illinois.gov

Re: Sears and Steel Dam Rock River, Rock Island, County, IL
Dam Removal Project Report

COMMENTARY OF THE ROCK RIVER VALLEY ASSOCIATION

The project and report raise some serious taxpayer and private rights concerns:

1. Hydrologic modeling is needed to determine pool levels, variations and distances upriver of the dam removal project.
2. The economic and special damages to be suffered by river front owners; cause for inverse condemnation. (Riparian interference)
3. Wetland delineation: connected ponds and extensive acreage of wetlands which will be totally dehydrated.
4. Ecological imbalance between the river and adjacent and connected wetlands (the current ecosystem will be destroyed).
5. Displacement of wild game habitat and water dependent mammals.
6. Sedimentation patterns in the channel and adjacent areas; mud flats.
7. Ground water levels.
8. Effect on shallow wells.
9. Effect on deep wells.
10. Major loss of recreational use of the river (such as boating and water skiing).

This all translates into huge expenses for Illinois tax payers.

For example:

a. State and federal environmental studies involving the Ill. Environmental Protection Agency, I.D.N.R. permitting, Federal Clean Water Act, etc.
b. Hydrologic studies – nature, effect and extent of damages;
c. Engineering; hydraulic; structural;
d. Inverse condemnation claims of hundreds of river front property owners – for loss of market value & special use value;
e. Other related damages (such as wells);
f. Reduced property tax base;
g. The actual destruction/construction costs to complete the project.

NOTES:

Federal Jurisdiction: The Rock River is a "navigable" waterway in Corp of Engineers jargon, and hence is subject to all applicable federal environmental laws and regulations.

Inverse Condemnation. The concept does not require a total "taking" in Illinois. The Illinois Constitution requires compensation for damages (reduction in value) (fair market value before and after dam removal).

Cost Effective Safety. We believe that dam alteration or fill on the downstream side, and better safety devices upstream, would significantly mitigate public safety risk. This could be done with a small percentage of the cost compared with dam removal.

Respectfully submitted,

Rock River Valley Association

John G. Ames - President

| | |
|---|---|
| **From:** | Steve Poulos |
| **To:** | Cattoor, Wes; McParland, Terra; DNR.OWRPlanning |
| **Subject:** | [External] Fwd: Sears & Steel Dam Removal - Opposition |
| **Date:** | Sunday, March 29, 2026 6:43:29 PM |
| **Attachments:** | Steve Poulos Opposition Letter - Sears & Steel Dam Removal.pdf |

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Greetings,

While I appreciate your time presenting the study to interested parties a few weeks ago, I am attaching my formal opposition to the proposed solutions to be included in your appendices.

Regards,

Steve Poulos

March 29, 2026

Illinois Department of Natural Resources

Office of Water Resources

One Natural Resources Way

Springfield, IL 62702

Re: Formal Opposition to Removal of Sears & Steel Dams

To Whom It May Concern:

I write to express my strong and unequivocal opposition to any proposal that would result in the removal of the Sears & Steel dams.

There should be no ambiguity on this point: dam removal is not an acceptable outcome under any circumstances. At most, only engineered solutions that fully maintain existing upstream water levels and preserve current river conditions should be considered, and even those should be treated as a last-resort scenario.

It is deeply concerning that no comprehensive economic impact study has been conducted. Decisions of this magnitude while affecting public infrastructure, recreation, tourism, surrounding communities, and critical utilities must not proceed without rigorous, transparent economic analysis. The permanent alteration or removal of these dams without such analysis represents a failure of responsible public planning.

Beyond general economic considerations, the study fails to account for direct impacts to essential infrastructure, including the upriver water treatment plant. Changes in water levels, flow characteristics, and sediment behavior could materially affect intake reliability, water quality, and operational costs. The absence of any meaningful evaluation of these risks is a glaring omission, particularly given the critical public health role such facilities serve.

It is also worth noting that proposed removal scenarios carry costs reportedly exceeding $10 million while simultaneously degrading river usability. In effect, public funds would be used to eliminate a long-standing, functional recreational resource while introducing additional infrastructure risks and economic harm without clear evidence of proportional benefit.

At its core, this issue is about responsible stewardship of public resources. The burden of proof for any major structural intervention must be exceptionally high. In this case, that burden has not been met.

In closing, I strongly urge the Department to:

1. Reject outright any proposal involving dam removal.

2. Require a full and transparent economic impact study before considering any structural changes.

3. Fully evaluate impacts to critical infrastructure, including the upriver water treatment plant.

4. Recognize and properly weigh over 100 years of safe, continuous public river use.

5. Prioritize non-structural safety measures, including restricted access at key upstream points and comprehensive warning systems.

The Sears & Steel dams are essential to maintaining the character, usability, and safety of this river. Removing them would be an irreversible mistake that disregards both historical evidence and the economic and infrastructure realities of the community.

Respectfully,

Steve Poulos

**From:** Nick Passini
**To:** DNR.OWRPlanning
**Subject:** [External] Comment – Sears & Steel Dam Study (Backwater Gamblers)
**Date:** Sunday, March 29, 2026 11:28:20 AM
**Attachments:** Backwater_Gamblers_Public_Comment_Sears_Steel_Dam_Study.pdf

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To Whom It May Concern,

Attached please find a public comment submitted on behalf of the Backwater Gamblers Water Ski Team regarding the Sears & Steel Dam Study.

We appreciate the opportunity to provide input and would welcome the opportunity to discuss any of the points raised in more detail if helpful.

Please confirm receipt of this submission.

Thank you for your time and consideration.

Nick Passini
President
Backwater Gamblers Water Ski Team

BACKWATER GAMBLERS
WATER SKI SHOWS

5000 44th Street
Rock Island, IL 61201
backwatergamblers.com

March 18, 2026

Illinois Department of Natural Resources
Office of Water Resources
One Natural Resources Way
Springfield, IL 62702

Re: Sears & Steel Dam Study – Public Comment

To Whom It May Concern:

The Backwater Gamblers Water Ski Club appreciates the opportunity to provide public comment on the Sears & Steel Dam study and the alternatives evaluated.

The Backwater Gamblers are a nonprofit, community-based water ski organization that has operated continuously on this stretch of the Rock River for more than 40 years. Our primary show site is located approximately 600 yards upstream of the Steel dam. Each year, we host weekly public performances that attract over 30,000 spectators and generate an estimated $900,000 in annual economic impact to the surrounding community.

**Key Points**

- Practical and cost-effective safety solutions exist that address risk without altering upstream water levels.
- The study does not evaluate non-structural safety measures or broader community, recreational, and economic impacts.
- Dam removal would lower water levels by approximately three feet at our site, effectively ending our operations and materially impairing recreational use in the area.
- Our organization has safely operated complex water ski activities in close proximity to the dam for decades.
- Dam removal scenarios exceed $10 million in cost while eliminating a recreational waterway that is central to the community.

Over decades of operation, we have demonstrated that this section of the river can be used safely and consistently. Our shows include advanced maneuvers such as four-tier pyramids performed in close proximity to the dam. These activities have been conducted safely for decades and are only possible because of stable, predictable water levels and well-understood river conditions.

Based on the information presented, removal or modification could reduce water levels by approximately three feet at our site. A reduction of this magnitude would render our site unusable and effectively eliminate our ability to operate in this location. Accordingly, the Backwater Gamblers respectfully submit that alternatives which reduce upstream water levels or degrade usable river conditions should not be pursued.

We also note that the study appears limited in scope. The analysis focuses on construction-based solutions and does not evaluate non-structural safety measures such as improved signage, barriers, or public education. It also does not consider broader impacts to recreational use, community programming, or economic activity, nor does it address potential impacts to nearby infrastructure within the affected river corridor. Additionally, the study appears constrained to a predefined set of alternatives, limiting meaningful consideration of more balanced or less disruptive approaches.

The presented alternatives indicate costs exceeding $10 million for dam removal scenarios, funding actions that would eliminate an established community asset. In contrast, practical non-structural safety measures, including signage, warning systems, and access control, would be significantly lower cost while directly addressing safety concerns without altering existing river conditions.

The Backwater Gamblers support efforts to improve safety on the river. However, our long-standing record of safe operation in this exact location demonstrates that non-structural approaches can be effective and should be fully evaluated.

Our comments specifically cover the following areas:

I. Impact of Water Level Changes on Existing River Use
II. Limitations of the Study Scope and Analysis
III. Cost Considerations and Practical Alternatives
IV. Recommended Non-Structural Safety Measures

The Backwater Gamblers represent only a small fraction of the larger long-standing community use of this river. Any decision that alters conditions in this area should fully account for the demonstrated, safe, and beneficial use that already exists today.

We appreciate your consideration of these comments and welcome the opportunity to discuss these issues further. If you have any questions, please contact Nick Passini, President at Nick.Passini@gmail.com.

Respectfully submitted,

Backwater Gamblers Water Ski Club



Nick Passini, President

## I. Impact of Water Level Changes on Existing River Use

The Backwater Gamblers Water Ski Club has operated continuously on this stretch of the Rock River for over 40 years. Our primary show site is located approximately 600 yards upstream of the Steel dam.

Each year, we host weekly public performances that attract more than 30,000 spectators and generate an estimated $900,000 in annual economic impact. Our site has also been used for regional and national competitions, with national governing bodies and safety officials approving its use for high-level events.

This section of the river is not used solely by our organization. It supports a broad recreational community, including boaters, anglers, and other river users who rely on stable water levels and predictable conditions. These users, like our organization, depend on consistent depth and flow to safely and effectively utilize this portion of the river.

Our operations include complex and highly controlled activities, including four-tier pyramids that are performed in close proximity to the dam without incident. These maneuvers require consistent depth, predictable flow, and precise control.

These activities have been conducted safely for decades.  This represents a long-standing, demonstrated record proving that with proper awareness, training, and conditions, this stretch of river can be used safely.

Our organization, along with community partners and the City of Rock Island, has made significant long-term investments into this site and surrounding infrastructure. Based on the scenarios presented, certain alternatives would reduce water levels by approximately three feet in our area. A reduction of this magnitude would make our site unusable and effectively end our ability to operate in this location.

These impacts would be permanent and cannot be reversed once implemented.

## II. Limitations of the Study Scope and Analysis

While we appreciate the effort behind the study, its scope significantly limits its usefulness in informing real-world decisions.

The analysis focused exclusively on construction-based solutions, specifically removal or modification of the dams. It did not evaluate non-structural safety measures such as signage, barriers, upstream warnings, or public education.

The study also did not consider broader impacts, including recreational use, community programming, or economic contributions tied to this section of the river.

In addition, potential impacts to nearby infrastructure, including municipal and private discharge locations within the affected corridor, were not evaluated.

Finally, the study appears constrained to a fixed set of predefined alternatives. This limits the ability to meaningfully incorporate stakeholder input or consider more balanced solutions.

It also remains unclear how impacts vary across different points along the river. In addition, depth measurements appear to reflect the deepest portion of the channel rather than the usable depth across the full navigable width of the river.

For actual river users, usable conditions, not isolated channel depth, determine whether the river can be safely and effectively used.

## III. Cost Considerations and Practical Alternatives

The presented alternatives indicate project costs exceeding $10 million for dam removal scenarios. These expenditures would fund actions that materially reduce water levels while eliminating an established recreational, economic, and community asset.

In contrast, practical, non-structural safety measures, such as signage, warning systems, and access control, would be significantly lower cost while directly addressing safety concerns without harming existing river use.

## IV. Recommended Non-Structural Safety Measures

We support efforts to improve safety. However, our experience demonstrates that safety can be achieved without fundamentally changing river conditions.

There are multiple practical, widely used measures that could be implemented, including:

- Enhanced and earlier signage, including at upstream bridges and entry points
- Adjustments to access points or launch locations near the dam
- In-water warning systems such as buoys or day markers
- Physical warning or deterrent systems, such as cables or similar barriers
- Increased public education and awareness

At a minimum, these alternatives should be fully evaluated before any permanent structural changes are considered.

## Conclusion

An established and irreplaceable community asset is at stake. Our organization represents a long-standing, community-supported use of this river. We provide free public shows, host events, and offer inclusive programming.

Our site also represents significant long-term investment by both our organization and the surrounding community. Eliminating this use of the river would result in the loss of a unique recreational, cultural, and economic asset.

Similarly, the study ignores the inevitable and significant degradation of property values for hundreds of homes situated along this stretch of river. Waterfront property value is inherently tied to stable water levels, navigability, and recreational usability. Any action that lowers water levels or diminishes river access will directly erode property values, reduce local tax bases, and impose long-term financial harm on residents; none of which has been quantified or even acknowledged.

Equally troubling is the failure to properly account for the extensive and historic recreational use of this river. For more than a century, thousands of individuals have safely used this stretch of water for boating, fishing, skiing, and other activities. This is a long-established, multi-generational use pattern that cannot be dismissed or minimized.

The safety record is clear. When considered against the volume of use over decades, the number of fatalities or serious incidents is extraordinarily low. Any objective evaluation must recognize that this river has supported widespread public use with minimal loss of life. This reality directly undermines any narrative suggesting that drastic structural intervention, such as dam removal, is necessary or justified.

The study's narrow focus on structural solutions suggests a predetermined outcome rather than a balanced evaluation. Non-structural safety measures such as enhanced signage, upstream warning systems, public education, and targeted access control have not been seriously evaluated despite being widely used and cost-effective.

A particularly practical and immediate step would be to close the public boat ramp located approximately 1,600 feet upstream of the dam near the Backwater Gamblers site. Restricting access at this location to only authorized users, such as the Backwater Gamblers and fire and rescue personnel, would significantly reduce risk exposure while preserving the river's usability and character. In addition, clear and highly visible warning signage should be installed on every bridge pillar immediately upstream of the Backwater Gamblers site. With the public boat ramp closed and extensive signage placed directly in the path of travel, river users would receive repeated, unavoidable warnings of the dams ahead and does more to improve safety at a fraction of the cost of the currently proposed structural solutions.

We respectfully request that alternatives which materially reduce upstream water levels or degrade usable river conditions not be pursued.

We further request that non-structural safety solutions and broader community impacts be fully considered before any action is taken.

The Backwater Gamblers represent a proven, safe, and valuable use of this river. Any decision affecting this area should fully account for what already exists today.

| | |
|---|---|
| **From:** | Gregg Brandyberry |
| **To:** | Cattoor, Wes; McParland, Terra; EXT Halpin, Mike Senator; DNR.OWRPlanning |
| **Subject:** | [External] My formal request related to my previous message of objection |
| **Date:** | Sunday, March 29, 2026 11:00:26 AM |
| **Attachments:** | Rock_River_Legal_Packet.docx |

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Subject: Formal Legal Comment – Sears & Steel Dam Removal (Property Value & Regulatory Impact)

March 28th, 2026

To Whom It May Concern,

Attached please find my formal legal comment and property impact statement regarding the proposed removal of the Sears & Steel Dam on the Rock River.

This submission documents substantial private investment made in reliance on existing river conditions and regulatory requirements, including mandated flood elevation compliance. It further outlines material concerns regarding diminution of property value, altered flood behavior, and shoreline stability.

Given the nature of these concerns, I respectfully request that this submission be entered into the official administrative record and that all requested impact studies and protections be fully addressed prior to any project approval.

Please confirm receipt of this correspondence.

Sincerely,
Gregg Brandyberry 3220 North Shore Dr. Moline, IL 61265 212-203-2400

Please see attached

**GREGG BRANDYBERRY**
**3220 North Shore Drive**
**Moline, Illinois 61265**
**Phone: 212-203-2400**
**Email: greggbrandyberry@gmail.com**

Date: March 28, 2026

RE: Formal Objection – Proposed Removal of Sears & Steel Dam (Rock River)

# LEGAL COMMENT AND PROPERTY IMPACT STATEMENT

To Whom It May Concern:

I submit this formal objection to the proposed removal of the Sears & Steel Dam on the Rock River. This objection is based on direct financial impact, regulatory reliance, and the risk of uncompensated property value loss.

I have invested in excess of $500,000 into my property, including more than $100,000 required by the Rock Island County Code Department to elevate my residence to the 500-year flood level. This requirement was imposed despite the property already meeting FEMA standards.

These investments were made in good faith reliance on existing river conditions and regulatory expectations. The proposed dam removal materially alters those conditions and introduces significant risks including property value diminution, erosion, and altered flood behavior.

REQUIRED ACTIONS PRIOR TO ANY APPROVAL:

1. Independent third-party property value impact study

2. Updated hydrological and flood modeling

3. Shoreline and erosion impact analysis

4. Formal compensation framework for affected property owners

5. Full public disclosure and review process

LEGAL POSITION:
Government action that results in measurable diminution of property value following mandated compliance investments raises serious concerns under regulatory takings and due process principles. Property owners should not bear financial loss caused by changes to conditions they were required to rely upon.

Should this project proceed without appropriate safeguards and compensation mechanisms, I reserve all rights to pursue further remedies.

Sincerely,

Gregg Brandyberry

**EXHIBIT A – PROPERTY INVESTMENT SUMMARY**

Total Property Investment: $500,000+

Flood Elevation Compliance Investment: $100,000+

Mandated by: Rock Island County Code Department

Basis: Required elevation to 500-year flood level

| | |
|---|---|
| **From:** | Tamara Wendt |
| **To:** | DNR.OWRPlanning |
| **Cc:** | Cattoor, Wes; McParland, Terra; EXT Halpin, Mike Senator |
| **Subject:** | [External] Public Comment Submission – Sears & Steel Dam Study |
| **Date:** | Friday, March 27, 2026 4:25:48 PM |
| **Attachments:** | Rock River Rebuttal for Public Comment.pdf |
| **Importance:** | High |

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Dear Senator Mike Halpin, Wes Cattoor, and Terra McParland,

Please find attached our formal public comment and rebuttal regarding the *Sears and Steel Dam Planning & Feasibility Study*.

As residents and stakeholders along the Rock River in the Quad Cities, we strongly oppose all proposed alternatives presented in the study, as each includes the removal of the Sears Dam. We believe the study fails to accurately identify the true source of safety concerns, does not adequately consider less disruptive solutions, and overlooks the significant economic, environmental, and community impacts that dam removal would create.

Our attached submission outlines these concerns in detail and offers a more practical, targeted approach that addresses safety at the Steel Dam while preserving the integrity of the river, surrounding properties, and long-standing recreational use.

We respectfully request that our comments be entered into the official record and fully considered in any future decision-making process.

Thank you for your time and consideration.

Sincerely,

Earl “Boo” Wendt
Tamara Wendt


**Tamara Wendt**
Marketing Director, Wendt Funeral Home

**A** 1811 15th Street Place, Moline, IL 61265
**O** 309.764.6781 **M** 309.644.2441 **E** tamara@wendtfuneralhome.com
**W** www.wendtfuneralhome.com

# Public Comment & Rebuttal

**Sears & Steel Dam Planning & Feasibility Study – Rock River**
Submitted by: Earl "Boo" Wendt & Tamara Wendt
Quad Cities Residents & Rock River Stakeholders

We respectfully submit this formal comment in opposition to the *Sears and Steel Dam Project Planning & Feasibility Report*.

As long-time residents and stakeholders along the Rock River, we strongly oppose **all proposed alternatives** outlined in this study. Each alternative includes removal of the Sears Dam—an approach that is fundamentally flawed, unsupported by the actual safety record, and dismissive of significant economic and community impacts.

## Misidentification of the Safety Problem

The study identifies public safety as its primary objective, citing risks such as hydraulic rollers, watercraft incidents, and drowning hazards. However, this analysis fails to distinguish between the two structures.

Historically, safety incidents have been associated with the **Steel Dam—not the Sears Dam**. There is no comparable pattern of fatalities or systemic safety concerns tied to the Sears Dam. Yet, every alternative removes the Sears Dam while modifying the Steel Dam.

This represents a critical disconnect:
**the study proposes eliminating a structure that is not responsible for the identified hazard.**

## Lack of a True "No-Removal" Alternative

All five evaluated alternatives include removal of the Sears Dam. Not a single option considers preserving it, despite its importance to:

- Maintaining river pool levels
- Supporting recreation (boating, fishing, tubing)
- Sustaining property values along the river

This omission demonstrates that the study is not presenting balanced alternatives, but rather advancing a **pre-determined outcome**.

## Economic and Property Value Impacts

The report acknowledges that dam removal would significantly reduce the recreational pool of the river. However, it fails to adequately assess or quantify the broader consequences, including:

- Loss of waterfront property value
- Reduced usability of the river for recreation
- Negative impacts on tourism and local businesses

For hundreds of homeowners and families, the Rock River is a long-standing investment and way of life. Lowering water levels would fundamentally alter that reality.

## Viable, Targeted Safety Solutions Were Overlooked

On March 19, 2026, we spoke directly with Senator Mike Halpin, who expressed clear opposition to any solution that would significantly impact pool levels. A more balanced and effective approach exists:

- **Preserve the Sears Dam**
- **Modify the Steel Dam only**, using a rock ramp or stepped system to eliminate the hydraulic roller effect

This solution directly addresses the documented safety hazard while maintaining the integrity of the river system and surrounding communities. Despite its practicality, this option was not meaningfully evaluated in the study.

## Additional Safety Measures Not Considered

Before pursuing irreversible structural changes, a range of proven safety improvements should be implemented, including:

- Enhanced warning signage at access points, bridges, and upstream locations
- Solar-powered markers and buoy systems
- Public education initiatives
- Improved emergency access, including a dedicated ramp downstream of the Steel Dam

- Additionally, the public boat ramp located near the Steel Dam—often used by individuals unfamiliar with the river—should be reevaluated. Adjustments to access and usage could significantly reduce risk.

## Misrepresentation of Risk

While the study emphasizes the potential for loss of life, it does so without proper context. These dams have existed for over a century, during which time tens of thousands of individuals have safely used the river.

Fatal incidents, while tragic, are **extremely rare relative to overall usage**. Presenting risk without this context leads to disproportionate conclusions and overly aggressive solutions.

## Environmental Concerns: Invasive Species

The study highlights ecological benefits such as improved fish passage and water quality. However, it does not adequately address the increased risk of invasive species migration, including Asian carp and zebra mussels.

These species have already caused significant ecological and economic damage in other Illinois waterways. Removing the Sears Dam could accelerate their spread into the Rock River, creating long-term consequences far beyond those considered in this report.

## Conclusion

We respectfully but firmly oppose all alternatives presented in this study.

We support a more balanced and responsible approach that:

- Addresses safety concerns specifically at the Steel Dam
- Preserves the Sears Dam and existing pool levels
- Implements practical, layered safety improvements
- Conducts further analysis of economic and environmental impacts before any irreversible action

The Rock River is not simply a waterway—it is a vital part of our community, economy, and heritage. Removing the Sears Dam would result in permanent and unnecessary harm without addressing the true source of the problem.

We urge decision-makers to reject the current alternatives and pursue a solution that is targeted, data-driven, and reflective of the community it will affect.

**From:** Colleen Borts
**To:** DNR.OWRPlanning
**Subject:** [External] Follow-up to Rock River Town Hall Meeting held March 16
**Date:** Wednesday, March 18, 2026 3:02:54 PM
**Attachments:** Rock River Dam Proposal.docx

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Sent from my iPhone

David and Colleen Borts

4736 55th Avenue

Moline, Illinois 61265

davidborts4@gmail.com

309-235-7274

March 17,2026

Dear Sir or Madam,

We attended the town hall meeting on March 16th hosted by Illinois State Senator Mike Halpin and the Illinois Department of Natural Resources. As Rock River residents, we were very anxious to learn the results of the study regarding the future plans of the Sears and Steel Dams on the Rock River. We listened carefully to the presentation and the voices of our community members. We are looking forward to receiving the printed presentation materials to get an even better understanding of how each of these proposals would affect the river and our lives.

Based on our understanding thus far, we do have a few thoughts and questions.

1. From the information presented at the meeting, it appears the only options considered for making the river safer were to remove or modify the dams. We believe that the first order of business should be thoroughly exploring all safety related opportunities (i.e., education, signage, barriers, etc.). Some great ideas were expressed during the town meeting, and it would be a good place to start the discussion.
2. Have there been any economic impact studies done regarding this issue to date? We need to understand how removing or modifying the dams would impact homeowners along the river. What impact would this have on tourism, recreation and the river ecosystem?
3. Representatives from the DNR discussed modifying the dams in such a way as allowing fish and wildlife to move from the Mississippi into the Rock River. Would it then be possible for evasive spices such as Asian Carp to then move into the Rock River? I have seen videos of the Asian Carp in the Illinois River and would never want something like that to happen to the Rock River. I'm afraid the effects could be devastating.

We have lived on the Rock River for 44 years, raising our children, and now our grand and great-grandchildren are enjoying it as well. They were all raised to have a healthy respect for the river through training and education. We have always felt blessed to live here and want our same experience to be available for generations to come.

Thank you in advance for giving our thoughts and comments your consideration. We appreciate your efforts in trying to make our community safer and more enjoyable for everyone.

Sincerely,

David and Colleen Borts

| | |
|---|---|
| **From:** | Pierce VanValkenburg |
| **To:** | DNR.OWRPlanning |
| **Cc:** | Katherine Schmidt; Michael Sertle; Mike Shannon; Elizabeth Riggs; Cattoor, Wes; McParland, Terra |
| **Subject:** | [External] Comment Letter: Sears Dam & Steel Dam Projects (Rock River, IL) |
| **Date:** | Tuesday, March 31, 2026 4:01:10 PM |
| **Attachments:** | Outlook-Text Desc.png<br>Outlook-ORBFHP.png<br>Sears Dam & Steel Dam Letter.pdf |

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Dear Office of Water Resources Team,

I hope you are doing well. On behalf of American Rivers, I am submitting the attached comment letter regarding the Sears Dam and Steel Dam projects on the Rock River in Illinois.

Our comments emphasize the significant public safety risks associated with these structures, the long-term liability and cost considerations of retaining them, and the ecological benefits of full dam removal. We respectfully recommend advancing an alternative that prioritizes full barrier removal and the restoration of a natural, free-flowing river system.

Please feel free to reach out if you have any questions or would like to discuss our comments further. We would welcome the opportunity to engage.

Thank you for your time and consideration.

Best regards,
Pierce VanValkenburg

**Pierce VanValkenburg** (they/them)
Associate Director, River Restoration
Coordinator, Ohio River Basin Fish Habitat Partnership
414-263-9633

AmericanRivers.org | Instagram | Facebook | Twitter
**Take action for clean water!** Use your voice for rivers — and the clean water all of us need and deserve.



**March 31, 2026**

**Illinois Department Natural Resources**
One Natural Resources Way
Springfield, IL 62702

**Re: Sears Dam and Steel Dam Projects, Rock River, Illinois**

Dear Office of Water Resources,

American Rivers appreciates the opportunity to comment on the proposed actions related to the Sears Dam and Steel Dam on the Rock River in Illinois. We recognize and value the engagement process undertaken to evaluate alternatives for these structures.

American Rivers strongly supports advancing alternatives that prioritize full dam removal and restoration of a free-flowing river. This approach best addresses both public safety concerns and long-term ecological health. The Sears Dam and Steel Dam are obsolete, state-owned low head dams that pose well-documented public safety risks and limit ecological function in the Rock River system.

Dam removal is a well-established and widely implemented solution. Dam removal has become a common practice for dealing with unsafe, obsolete, and uneconomical dams, with 2,354 dams removed nationwide, including at least 50 in Illinois.[1] These numbers reflect a growing consensus among federal and state agencies and dam owners that removal is often the most effective strategy for addressing aging, unsafe infrastructure. Illinois has been an active participant in this effort, with ongoing efforts targeting additional low head dams for removal as part of its safety and restoration mission.[2]

**Low head dams endanger public safety**

Low head dams are widely recognized as dangerous structures, often referred to as "drowning machines" due to their ability to trap even strong swimmers in recirculating hydraulics at the base of the dam. Nationwide, these structures are responsible for an estimated 50 fatalities per year and have caused over 750 known fatalities.[3] Illinois is not immune to these risks. The Illinois Department of Natural Resources (IDNR) has documented over 30 fatalities associated with low head dams across the state, including

[1] Map of U.S. dams removed since 1912. Map of US Dams Removed Since 1912 Comments. (2026, March 26). https://www.americanrivers.org/threats-solutions/restoring-damaged-rivers/dam-removal-map/

[2] Safety at dams. Illinois Department of Natural Resources. (n.d.). https://dnr.illinois.gov/waterresources/safetyatdams.html

[3] *Low head dam fatalities database*. Low Head Dam Fatalities Database. (n.d.). https://www.lowheaddamfatalities.org/

incidents at the Steel Dam and the Wilmington Dam on the Kankakee River.[4] IDNR has further acknowledged that such dams routinely contribute to accidents and fatalities during typical recreation seasons.

Importantly, the planning materials for this project already identify the presence of hydraulic hazards and risk of life loss. These risks are inherent to the structure type and cannot be fully mitigated through partial measures.

**Low head dams degrade native ecology**

In addition to public safety concerns, low head dams significantly degrade ecological function and river health. These structures fragment aquatic habitat, disrupt fish passage, alter natural flow regimes, and contribute to decline in native species. On the Rock River, these impacts limit connectivity and reduce the river's ability to support healthy fish and mussel populations for species like the smallmouth bass, walleye, northern pike, channel catfish and the federally endangered higgins eye pearlymussel. Dam removal restores natural flow and supports the recovery of native species.

Across the country, dam removal projects have consistently demonstrated rapid ecological benefits. For example, the removal of multiple dams on the Baraboo River in Wisconsin restored over 100 miles of free-flowing river. Following removal, researchers documented rapid improvements in fish diversity and recolonization of previously inaccessible habitat. This project is widely cited as a model for how dam removal restores ecological connectivity in Midwestern river systems similar to the Rock River, including increased biodiversity, improved habitat conditions, and enhanced resilience to changing environmental conditions.[5]

**Obsolete dams incur ongoing costs and liability for the owner**

Both the Sears Dam and the Steel Dam no longer serve their original purpose, have been decommissioned from FERC licensing, and represent legacy infrastructure that now imposes risk, cost, and liability without providing commensurate benefit. As state-owned structures, they also fall under a clear public responsibility to address known hazards. Illinois law and policy do not support knowingly maintaining infrastructure that poses a documented risk to public safety when feasible alternatives exist.[6]

We are concerned with alternatives that retain the dam structures while attempting to mitigate risk through signage, portage routes, or public education alone. While these measures may have value as interim steps, they do not eliminate the hydraulic hazard and instead rely on controlled human behavior in inherently dangerous conditions. Public education alone will not alleviate the safety risks posed by these structures. These approaches create ongoing liability and maintenance costs, further burdening the state and private individuals without addressing the underlying issue.

Retaining obsolete infrastructure results in ongoing and indefinite costs for inspection, repair, liability management, and emergency response. These long-term maintenance obligations have not been fully

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[4] *Low head dam fatalities database*. Low Head Dam Fatalities Database. (n.d.). https://www.lowheaddamfatalities.org/

[5] Carleton College. (2024, February 28). *A decade of stream response to the La Valle Dam Removal, Baraboo River, Wisconsin*. Vignette Collection. https://serc.carleton.edu/vignettes/collection/68168.html

[6] (615 ILCS 5/) Rivers, Lakes, and Streams Act. ILGA.GOV. (n.d.). https://www.ilga.gov/Legislation/ILCS/Articles?ActID=1781&ChapterID=47&Print=True

presented or compared alongside the option for full removal. In contrast, dam removal represents a one-time investment that eliminates the need for future maintenance, significantly reduces liability exposure, and avoids the accumulation of recurring public costs over time. While upfront costs may appear higher, removal is often the most cost-effective option when evaluated over the full lifecycle of the structure. Failing to account for these long-term costs presents an incomplete picture of the true financial implications of the alternatives under consideration.

**Managing public perceptions and expectations**

Community concerns including perceptions around property values and river aesthetics are an important part of this process. Evidence from dam removal projects across the country consistently shows that river restoration can enhance recreational opportunities, improve water quality, and maintain or increase adjacent property values over time. For example, removal of the Elwha and Glines Canyon Dams in Washington restored over 70 miles of habitat, increased recreation and tourism, and supported the return of salmon populations.[7] Similarly, removal of the Edwards Dam on the Kennebec River in Maine led to the return of millions of migratory fish, improved water quality, and enhanced waterfront recreation and economic activity in surrounding communities.[8] Addressing these community questions through clear communication and case studies will be critical to building public understanding.

Illinois is among many states moving toward dam removal as a preferred solution. Indiana has explicitly recognized dam removal as being in the public interest. Massachusetts set a state goal to remove 300 obsolete and unsafe dams. States across the country are establishing dedicated funding programs to address unsafe dams by removing them. Removal of the Sears Dam and the Steel Dam align with these broader state and national trends.

American Rivers respectfully recommends the following:

- Advance an alternative that prioritizes full removal of both the Sears Dam and Steel Dam and restoration of a natural, free-flowing river system
- Avoid alternatives that maintain or perpetuate low head dam hazards
- Elevate public safety as the primary decision-making criterion
- Evaluate and communicate the full lifecycle cost savings associated with removal
- Leverage available state and federal funding sources to support implementation
- Continue coordination with experienced practitioners, including IDNR and national partners, to ensure successful project delivery

We recognize that change can be challenging, particularly for communities with long-standing relationships to these structures. However, this project represents a critical opportunity to eliminate known hazards, reduce long-term liability, and restore the ecological integrity of the Rock River.

Thank you for the opportunity to submit these comments. American Rivers stands ready to support this effort and to assist in providing technical expertise, case studies, and coordination resources as needed.

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[7] U.S. Department of the Interior. (n.d.). *Restoration and current research*. National Parks Service. https://www.nps.gov/olym/learn/nature/restoration-and-current-research.htm

[8] *The removal of one Maine dam 20 years ago changed everything*. Earth Island Journal. (n.d.). https://www.earthisland.org/journal/index.php/articles/entry/removal-maine-dam-river-conservation

Sincerely,

Katie Schmidt
Director,
National Dam Removal Program
American Rivers

Pierce VanValkenburg
Associate Director,
River Restoration
Ohio River Basin Fish Habitat Partnership Coordinator
American Rivers

Elizabeth Riggs
Great Lakes Regional Director
American Rivers

Michael Sertle
Central Regional Director
American Rivers

**From:** 3099456392@mms.uscc.net
**To:** DNR.OWRPlanning
**Subject:** [External]
**Date:** Wednesday, March 18, 2026 2:23:43 PM
**Attachments:** ATT00001.txt

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Please keep river, we love our river.

**From:** Kevin Palmer
**To:** DNR.OWRPlanning
**Subject:** [External] Comments on rock river dams
**Date:** Wednesday, March 18, 2026 7:22:06 AM

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I live on south shore drive moline . Just upstream from I74 bridge. My property has a real nice seawall with steps to the river. Every year I put a doc into the river for my boats. I'm an avid fisherman. During the summer when the river is low the water level around the doc is maybe 3 foot deep. So you can imagine I'm against removal of the dams . Very against removal . My suggestion for improving the safety is more warning signs. Warning signs placed on starting with the I74 bridge. All boat ramps in area large enough to get people's attention. Signs are cheaper than millions of dollars for modifications to the dams. Thank you Kevin palmer

**From:** Alina Hall
**To:** DNR.OWRPlanning
**Subject:** [External] Concerns Regarding Proposed Changes to the Rock River Dam near Moline/Milan
**Date:** Tuesday, March 31, 2026 1:07:45 PM

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Dear Illinois Department of Natural Resources,

I am writing as a lifelong resident of the Quad Cities area to share my concerns regarding the proposed plans to address safety issues at the dam on the Rock River near Moline and Milan.

Having grown up on the Rock River and spent years around experienced boat operators, I understand both the power of the river and the importance of respecting it. There is no question that the river can be dangerous. However, in my experience, the greatest risk often comes not from the river itself or the dam, but from individuals on the water who lack proper education, awareness, or sound judgment.

There is a quote by Steve Irwin that has always stuck with me: “It’s never an animal’s fault when an accident happens; it’s always the human’s responsibility.” I believe that same principle applies to our rivers. The Rock River is not inherently unsafe—rather, the risk comes from how individuals choose to navigate and respect it.

I am concerned that the proposed multi-million dollar structural changes may not address the root of the issue. Instead of permanently altering the river and surrounding landscape, I strongly believe those resources would be better invested in increased on-water enforcement and education. This could include increasing the number of conservation officers actively monitoring the river, ensuring boat operators are knowledgeable and capable of understanding river conditions, and expanding boater education efforts so individuals fully understand the risks and responsibilities.

Additionally, I believe there should be more opportunities for community input. Holding a single meeting near the dam is not sufficient for a decision that will impact a large stretch of the river. Any changes made at this location will affect communities and river users all the way upstream to the next dam in Rockford.

This area is heavily used and valued by the community. There are two public boat launches near the dam, as well as a well-established water ski team that regularly performs in this stretch of the river. These shows involve multiple boats operated by experienced drivers, and they have safely navigated these waters for years without issue. This further supports the idea that education, experience, and accountability are key factors in preventing incidents.

I respectfully urge the Department to reconsider the current approach and to prioritize solutions focused on education, enforcement, and broader community engagement before pursuing irreversible structural changes.

Thank you for your time and for considering the perspective of those who use and value this river regularly.

Sincerely,
[Your Name]
[Your Contact Information]

**Alina Hall**
3093730894

**From:** Melissa Birdsell
**To:** DNR.OWRPlanning
**Subject:** [External] Dam removal study
**Date:** Monday, March 30, 2026 1:38:56 PM

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Dear Sir or Madam,

As a longtime resident along the Rock River, I am writing to express my opposition to the proposed removal of both the Sears Dam and the Steel Dam on the Rock River in Moline, Illinois.

While I understand the importance of evaluating river safety and ecological health, I have significant concerns that the current study and proposal do not fully account for several critical factors that could have lasting negative impacts on our community.

First, the economic implications of lowering the river level appear to have been insufficiently considered. A reduced water level could adversely affect property values along the river, diminish recreational usage, and negatively impact local businesses that rely on boating, fishing, and tourism tied to the river. Reduced property values would also result in decreased property tax revenues, which support local services and infrastructure.

Second, I am concerned about the potential effects on the wastewater treatment system in Moline. Lower river levels may alter how treated wastewater is discharged and diluted, which could have consequences for water quality and public health. This is particularly important for those who use the river for recreation, including boating and fishing. A thorough evaluation of how these changes could affect water safety should be conducted before any action is taken.

Additionally, while safety concerns are often cited in discussions about dam removal, it is important to place this in proper context. Since the installation of these dams in the late 1800s, there have not been a significant number of fatalities directly associated with them when compared to other common risks. More importantly, there has been little to no effort to implement modern safety measures that could mitigate these risks without removing the dams altogether.

For example, there is a lack of adequate warning systems such as clear signage, flashing lights, or alert mechanisms to notify river users of the dams' locations. This becomes especially concerning during flood events when safety cables or barriers may be removed or compromised, leaving individuals unaware of the hazard downstream. These are preventable risks that could be addressed with proper investment in safety infrastructure.

Furthermore, I urge the Department to examine the proximity of the boat launch located approximately 1,600 feet from the Steel Dam in Rock Island. A study analyzing any correlation between this launch location and past incidents or fatalities could provide valuable insight and help inform more targeted safety solutions.

In summary, I oppose any action that would:

- Decrease river water levels
- Require significant public expenditure without fully understanding the consequences
- Reduce property values, which would in turn lower property tax revenues that support local services and infrastructure
- Limit recreational opportunities
- Potentially compromise water quality and public health

I strongly encourage the Illinois Department of Natural Resources to conduct a more comprehensive analysis that includes economic impact, infrastructure considerations, water quality implications, and the implementation of modern safety measures before proceeding with dam removal.

Thank you for your time and consideration of these concerns.

Sincerely,

Melissa Birdsell

**From:** Heather Scrowther
**To:** DNR.OWRPlanning
**Subject:** [External] Deep Concerns Regarding the Removal of the Steel Dam and Sears Dam on the Rock River
**Date:** Sunday, March 22, 2026 2:54:26 PM

Illinois Department of Natural Resources
Office of Water Resources

I am writing not only as a resident of Illinois, but as someone whose family has lived, breathed, and built memories along the Rock River for decades. Our cabin on the river has been the backdrop of our lives, where my children learned to fish, where friends gathered for summer evenings on the water, and where generations of my family have found peace, connection, and joy. The Rock River is not just a waterway to us; it is part of our identity.

Because of this, I am deeply concerned about the potential removal of the Steel Dam and Sears Dam. While I understand the intention behind restoration efforts, the projected water‑level changes estimated at only 6 to 12 inches, are being presented as minimal. But anyone who has lived on this river knows that even a few inches can dramatically alter its character, depth, and navigability.

For my family, the river has been a constant. My children grew up casting lines off the dock, learning patience and respect for nature. We've spent countless days boating through calm stretches of water that simply would not exist without the stability these dams provide. Removing them threatens to erase the very experiences that shaped our family's connection to this place.

It is heartbreaking to imagine our children and grandchildren unable to navigate the river by boat, or to fish the same waters their parents and grandparents did. These are not small losses. They are the unraveling of traditions that have lasted lifetimes.

The claim that water levels would drop only 6 to 12 inches may sound insignificant on paper, but on the Rock River, that difference can be devastating. Even a half‑foot reduction can:

- Turn navigable channels into shallow, rock‑strewn hazards
- Make boating impossible in long stretches between Sterling and Rock Island
- Expose sandbars and riverbed that currently sit safely underwater
- Reduce access to docks, ramps, and shoreline recreation
- Disrupt fish habitat and spawning areas that rely on deeper pools

For those of us who live on the river and use it daily, these changes would fundamentally alter

how the river can be enjoyed, if it can be enjoyed at all.

Beyond the personal impact, the dams help maintain stable water levels that support fish populations, wetlands, and shoreline ecosystems. Their removal risks accelerating erosion, degrading habitat, and diminishing the river's recreational value for thousands of residents and visitors.

Communities along the Rock River depend on boating, fishing, and tourism. Lower water levels could severely limit these activities, affecting local businesses and the regional economy.

I respectfully ask the Illinois DNR to fully evaluate the long-term consequences of removing these dams, not just through models and projections, but through the lived experiences of the people who know this river intimately.

Please consider:

- A comprehensive environmental and hydrological impact study
- Transparent modeling of water-level changes and navigability
- Public hearings that include riverfront residents, recreational users, and local businesses
- Alternatives to full removal, such as structural modification and public education to increase safety.

The Rock River is more than a resource; it is a lifeline for families like mine. Decisions made now will shape the river for generations. I urge you to proceed with caution, compassion, and a full understanding of what stands to be lost.

Thank you for your time and for your commitment to managing Illinois' natural resources. I hope you will take the voices of those who love this river into account as you move forward.

Sincerely,
Heather Scrowther
520 39th Ave
East Moline, IL 61255
309-738-9942

Additional residence:
7 Shadybeach Lane
Geneseo, IL 61254

Public

**From:** Gregg Brandyberry
**To:** DNR.OWRPlanning; Wes.Cattor@illinois.gov; McParland, Terra; EXT Halpin, Mike Senator
**Subject:** [External] Formal Objection to Proposed Rock River Dam Removals
**Date:** Sunday, March 29, 2026 10:45:40 AM

---

GREGG BRANDYBERRY
3220 North Shore Drive
Moline, Illinois 61265
Phone: 212-203-2400 Email: greggbrandyberry@gmail.com

Date: March 28, 2026

RE: Formal Objection – Proposed Removal of Sears & Steel Dam (Rock River)

LEGAL COMMENT AND PROPERTY IMPACT STATEMENT

To Whom It May Concern:

I submit this formal objection to the proposed removal of the Sears & Steel Dam on the Rock River. This objection is based on direct financial impact, regulatory reliance, and the risk of uncompensated property value loss.

I have invested in excess of $500,000 into my property, including more than $100,000 required by the Rock Island County Code Department to elevate my residence to the 500-year flood level. This requirement was imposed despite the property already meeting FEMA standards.

These investments were made in good faith reliance on existing river conditions and regulatory expectations. The proposed dam removal materially alters those conditions and introduces significant risks including property value diminution, erosion, and altered flood behavior.

REQUIRED ACTIONS PRIOR TO ANY APPROVAL:

1. Independent third-party property value impact study
2. Updated hydrological and flood modeling
3. Shoreline and erosion impact analysis
4. Formal compensation framework for affected property owners
5. Full public disclosure and review process

LEGAL POSITION:
Government action that results in measurable diminution of property value following mandated compliance investments raises serious concerns under regulatory takings and due process principles. Property owners should not bear financial loss caused by changes to conditions they were required to rely upon.

Should this project proceed without appropriate safeguards and compensation mechanisms, I reserve all rights to pursue further remedies.

Sincerely,

Gregg Brandyberry

**From:** Julie Benson
**To:** DNR.OWRPlanning
**Subject:** [External] Fwd: Delivery Status Notification (Failure)
**Date:** Monday, March 30, 2026 6:21:45 PM
**Attachments:** icon.png
icon.png

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---------- Forwarded message ---------
From: **Mail Delivery Subsystem** <mailer-daemon@googlemail.com>
Date: Sun, Mar 22, 2026, 12:22 PM
Subject: Delivery Status Notification (Failure)
To: <jbenson1963@gmail.com>



## Address not found

Your message wasn't delivered to **dnr.owrplanning@illinois.go** because the domain illinois.go couldn't be found. Check for typos or unnecessary spaces and try again.

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The response was:

```
DNS Error: DNS type 'mx' lookup of illinois.go responded with code NXDOMAIN
Domain name not found: illinois.go For more information, go to
https://support.google.com/mail/?p=BadRcptDomain
```

**From:** Melissa Sovey
**To:** DNR.OWRPlanning
**Subject:** [External] Fwd: Rock River Damn Study
**Date:** Monday, March 16, 2026 7:36:01 PM

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---------- Forwarded message ---------
From: **Melissa Sovey** <msovey0527@gmail.com>
Date: Mon, Mar 16, 2026 at 7:23 PM
Subject: Rock River Damn Study
To: <wes.cattoor@illinois.gov>, <terra.mcparland@illinois.gov>

Hi Wes and Terra,
Thank you for your presentation on 3/16/2026. It was very informative and great information. I understand June 2026 is when the report is due. My question is who makes the final decision on what option to do and how soon after the report is released will a decision be made?
Thank you
Melissa Sovey
563-299-1247

**From:** Seth Reyes
**To:** DNR.OWRPlanning
**Subject:** [External] IDNR Sears & Steel Dam Study – Feedback
**Date:** Tuesday, March 31, 2026 7:53:25 PM

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To whom it may concern,

I appreciate the opportunity to hear the action proposals for the potential changes to the Sears & Steel Dams. After attending the session, I wanted to express my concern for the options studied to address river safety.

Moving from Omaha recently, one of the major draws to the area is the local recreational opportunities. While it seems like other areas are investing in creating river recreation areas, the proposals I heard all would diminish use of the Rock River, while seemingly ignoring other obvious potential remedies like amplified signage and community education for safe boating practices.

I noticed the presentation seemed to focus on those who "Live and work," by the river, but what about those of us who play? Maintaining the existing depth and channel width is important for my safe use of the Rock River for recreation.

Ideally, I'd like to see emphasis on keeping the dams to maintain current, safe water level. Steps or rock fill below the Steel dam while leaving the Sears Dam in place with a better barrier and/or signage could go a long way to helping improve safety without extreme impact.

Thank you for considering our comments,

Jacob Kruger
Seth Reyes
3518 39th St
Moline, IL 61265

**From:** msdiz@mchsi.com
**To:** EXT Halpin, Mike Senator; DNR.OWRPlanning
**Subject:** [External] IDNR presentation - Sears & Steel Dams
**Date:** Monday, March 30, 2026 10:17:11 AM

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Sears & Steel Dams Hearing
March 16, 2026 I
IBEW Hall, Moline, IL

I attended the March 16th public meeting concerning the removal or changes to the dams along the Rock River in Rock Island County, presented by Sen. Mike Halpin and the Illinois Department of Natural Resources. I hope the comments and suggestions made by those attending made it clear that this study is inadequate to be the sole factor on any decision on changing the water flow in the pool. While it was repeatedly stated that this was limited to a "safety study" it became glaringly apparent that an economic impact and environmental study are needed to make an informed decision on changing the dams.

There were suggestions made that would make the river safer without damaging the current nature of the river. The existing warning signs are too few, poorly placed, and should be the first element considered in improved safety. Signs (or kiosks, as was suggested at the meeting) should be placed at every public location that people use to launch boats, jet skis, kayaks, canoes, and flotation rafts. Launch points like the Colona/Hennepin Canal ramp, the Green Valley Park and parking lot, Harold's Landing, Len Brown's North Shore Inn, Ben Williamson Park/ Backwater Gambler's, and Black Hawk State Park should have signs specifying the danger of the dams and location of the dams. Attractive signs could double as tourism guides of local features along this stretch of the river, such as all the launch locations as well as TPC golf course, Mill Creek, Vandruff Island, the bridges, and any other landmarks that would help recreational users to orient their current location to the dams. It was suggested at the meeting that signs could be mounted on the bridge piers, which would be especially important at the Milan Beltway Bridge given its proximity to the Steel Dam.

Two suggestions were made at the meeting to improve navigational signage that should be investigated as well. One person suggested warning buoys on pontoons could be placed well in advance of the dams to allow recreational users to steer to a safer route. Another suggestion was to set permanent posts in concrete, similar to signage in the Mississippi River. The dam safety booms need to be improved so that the tree and limb debris during high water doesn't eliminate that safety and warning element.

The study presented that evening completely failed to recognize the Rock River as it currently used, as recreation and neighborhood. The Rock is an easy and slower paced river to enjoy and is complimentary to the Mississippi River. Together, they are part of the character of the Quad Cities. Essentially making the Rock River a creek will harm that aspect of our area. All summer long, we enjoy watching kayakers, skiers, "floaters", fishermen, and boaters enjoy this river. In all seasons, we enjoy the wild life and birds. Reducing the water flow to a narrow trickle will not be an improvement.

In the almost 20 years my family and I have lived along the Rock, I have watched investments made on riverfront homes. Every year, more homes are being raised, which usually means improving the homes with new windows, porches, decks, patios, and yard improvements. These investments in older homes have increased the quality and assessed value of homes along the river. Beautiful new homes have been built. We are a strong, vibrant neighborhood that grew around the benefits (and challenges) of living on a beautiful body of water. The value of these residential properties as well as riverfront public properties would tank both economically and by quality of life if the wide pool was shrunk to a few yards wide.

All the options presented at the meeting , except for the "change nothing" option, had multi-million price tags but failed to address the economic loss to the Quad Cities. Please consider a safety plan that does not damage our community.

Martha Dismer
3401 S. Shore Drive, Moline, IL

**From:** Jessica Ege
**To:** DNR.OWRPlanning
**Subject:** [External] Moline rock River steel dam
**Date:** Tuesday, March 17, 2026 8:27:04 AM

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Please leave the steel dam.  Education is better.

Thank you.
Jessica

**From:** Cara Hammond
**To:** DNR.OWRPlanning
**Subject:** [External] Opposition to Proposed Steel Dam Removal – Rock River, Moline, IL
**Date:** Tuesday, March 31, 2026 9:08:56 PM

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Dear Illinois Department of Natural Resources,

I am writing to formally express my opposition to the proposed removal of the steel dam on the Rock River in Moline, Illinois.

This decision carries significant ecological, economic, and cultural consequences that warrant careful reconsideration. The current structure supports an established aquatic ecosystem that has developed over generations. Its removal risks disrupting fish habitats, reducing biodiversity, and negatively impacting the overall health of the river system.

Additionally, the area surrounding the dam has become an important habitat for bald eagles and other wildlife. Any alteration to the river's flow and ecosystem could directly affect these species, diminishing a valued natural resource for the community and the state.

From an economic standpoint, the proposed removal raises serious concerns for local property owners. Riverfront properties derive substantial value from the current river conditions. Altering the water levels and flow could lead to decreased property values and long-term financial impact for residents.

Equally important is the cultural and historical significance of this location. Families in the region have built traditions around this river dating back to the late 1800s. The dam is not just infrastructure—it is part of the community's identity. Its removal would permanently alter a shared heritage that has been preserved for generations.

It is also difficult to ignore that the primary beneficiaries of this project

appear to be large corporate interests, rather than the local community and environment. Decisions of this magnitude should prioritize public benefit, environmental stewardship, and preservation of local history.

I respectfully urge the Department to reconsider this proposal and to engage more deeply with local stakeholders before moving forward. A comprehensive review of environmental impacts, economic consequences, and community input is essential.

Thank you for your time and consideration.

Sincerely,

Cara Hammond

**From:** Jamie Sevier
**To:** DNR.OWRPlanning
**Subject:** [External] Practical Safety Alternatives to Removing Steel and Sears Dams
**Date:** Tuesday, March 17, 2026 8:04:22 PM

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My name is Jamie Sevier and I live in Silvis, IL. I am writing to express my strong opposition to the potential removal of the Steel and Sears Dams.

The Quad Cities is a unique community defined by our two beautiful rivers. Taking away the ability for people to enjoy the Rock River would be a devastating blow to fishermen, boaters, property owners, and the many residents who value the beauty of this area. Before the state considers a drastic, expensive project that permanently alters our region's character, I'm requesting consideration for common-sense safety measures instead:

- **Targeted Access Control:** If the dock nearest to the Backwater Gamblers is a public city launch, we should consider closing it or significantly restricting access to prevent accidental drift toward the dam.
- **Permanent "Bridge-Style" Signage:** Buoys are often dislodged by ice. Instead, the state should install permanent, bridge-style columns that can withstand the winter. These would provide a massive, immovable "DANGER: DAM AHEAD" notification that is visible to every boater.
- **Enhanced Entry Warnings:** We need unmistakable signage at every public river entrance nearby, making the hazard clear before anyone puts a boat, canoe or kayak in the water.

Safety is a priority, but we can protect lives through better infrastructure and education without destroying the water levels that make the Rock River special. I urge you to consider these practical and less expensive solutions as the IDNR concludes its study this month.

Thank you for your consideration.

Jamie Sevier

| | |
|---|---|
| **From:** | david birdsell |
| **To:** | DNR.OWRPlanning |
| **Subject:** | [External] Proposed altering of Steel and Sears dams on the Rock River |
| **Date:** | Tuesday, March 31, 2026 7:27:17 AM |

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To whom it may concern,

I am a resident of Moline and have lived along the Rock River for over 25 years.
The proposed possible changes to the Steel and Sears roller dams that control the river flow would be potentially very disruptive of the Rock River life style that I have grown accustomed to.
It is true that participation for an individual for boating , swimming,, fishing , ect can pose a potential danger to individuals , regardless of Steel and Sears dams.
Public education is the key to public safety on the Rock River and other locations.
I think to disrupt the steel and Sears dams is very radical and not a valid consideration for structures that have been established for generations and not to disrupt our citizens dwellings and properties.

Sincerely,
Dr. David Birdsell
309 235-3132

**From:** Tagen Dressman
**To:** DNR.OWRPlanning
**Subject:** [External] Removal of Sears & Steel dams
**Date:** Thursday, March 26, 2026 12:59:02 PM

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To whom it may concern,

I am a skiing member of the Backwater Gamblers and have been since 1993 when I was 9 years old. My husband is a 10 year member and current boat driver. My children, ages 20, 18, 13, 11, 6 and 3, have all been actively involved with skiing on the team for all of their lives.

Our family skis and boats with the team and recreationally on the Rock River at our ski site at 5000 44th Street in Rock Island on nearly a daily basis all summer. My 3 year old went skiing at our ski site last summer on her own skis when she was just 2 years old. I was not concerned for her safety because we know the river and how to keep her safe. I was also in charge of the skiing portion of our show for 7 different summers from 2011 to 2019. In 2016 we successfully pulled a pyramid of 47 people behind one boat. We turned that around to come into the beach near the dam without issue. We also have held multiple Guinness World Record events at our ski site with record numbers of skiers behind one boat. No issues.

We - our family, our teammates, our team - know the dam is there. We know it is dangerous. And yet, we still operate safely day in and day out since 1983. Without issue. We take precautions. We make everyone aware of the dam and it's location at any event and with all new members. We post safety boats in the necessary places on the river.

Knowledge is power, and the study did nothing to address how the issues could be addressed with knowledge like more signage, barriers, and education to the public.

The study also did nothing to evaluate the economical impacts of removing or altering the dams and essentially rendering our team inoperable due to the drop in safe water depth. Like I said before, we've had World Record events where people have come from all over the country to ski. National and Regional tournaments where thousands of other skiers have come to the Quad Cities and stayed in hotels for weekends, ate at restaurants, and boosted the local tourism. Even our home shows we have people travel for hours just to come watch us. We are good for the community, for both our members of family volunteers and our spectators who get free family- friendly entertainment.

Please consider not taking all of that away from the Quad Cities.

Regards,
Tagen Dressman

**From:** Brenda Wild
**To:** DNR.OWRPlanning
**Subject:** [External] Rock River Comments
**Date:** Sunday, March 29, 2026 6:56:29 PM
**Attachments:** Apply-Now-20220603_trans.png
Rate-Logo-3.png
Download-The-Rate-App.png

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Dear DNR Planning Team,

We are writing to express our serious concerns regarding the proposed changes to the dam on the Rock River.

Our home was built just seven years ago on the Rock River. We worked over 50 years to save for building this home with intentions of spending our remaining days of retirement living on the Rock River. We built on the Rock because of the beauty, recreation, and lifestyle the river provides.

We are deeply worried that the proposed changes could significantly impact water levels, recreation opportunities, and the overall character of the river. Any reduction in water levels or usability could negatively affect boating, fishing, and other recreational activities that many of us rely on and enjoy.

In addition, we are very concerned about the potential impact on property values. Changes that diminish the appeal and usability of the river could result in a substantial loss in home values, which is especially troubling given the recent investment we made in building our home.

We respectfully ask that you carefully consider the impact these plans may have on homeowners, recreation, and the long-term health and enjoyment of the Rok River community.

I would also appreciate any additional information you can provide regarding how these concerns are being addressed in your planning process.

Thank you for your time and consideration.

Benny and Brenda Wild
2516 47th Ave., Rock Island, IL
309-781-6274

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Headshot

Brenda Wild

NMLS# 40542

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**From:** Angi Varner
**To:** DNR.OWRPlanning
**Subject:** [External] Rock River Steel Dam
**Date:** Tuesday, March 24, 2026 9:25:57 PM

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Hi, I am writing to express concerns about the future of the Rock River in Moline and Rock Island. I grew up water skiing with the Backwater Gamblers. I joined in 1989 and have skied with the team and on our own personal boats ever since. We have a lot of friends that live on North Shore drive and love living on the river! We were always warned and cautious about getting too close to the portion of the river that leads to the steel dam. There used to always be ropes and signage up but the ropes were not put back up for several years after flooding. Backwater has been safely practicing and putting on shows there since 1984!

From what I understand, the recent study did not evaluate other options like more signage, barriers and education. Why not post warning signs on the bridge upriver from there? The signs on the island could be put back up. Why not put up elevated ropes that would not get taken down each time it floods? Dam removal would lower water levels by 3-5 feet or more? What about the property values of the homes on the river? Or all the people that love to boat, fish, ski, etc? Or the thousands of people that come down to watch ski shows of a nationally ranked team?

The summer of 2018 when a 5 year old tragically lost her life on the river, our team was there pulling our equipment out of the water and preparing to be flooded for a little while. One of our members actually went to the public ramp and warned the Mother that it's not safe and told her that she should not put her canoe in. It's a tragic accident, I'm not trying to place the blame on the Mom but I wish she had taken it seriously and listened to my teammates warning.

So instead of spending a fortune on removing the dam, causing property values to plummet and essentially closing down the Backwater Gamblers site, why not invest in education, signage and safety barriers?

Thank you for listening and hopefully considering alternative solutions.

Angi Varner

**From:** Carol Jorgensen
**To:** DNR.OWRPlanning
**Subject:** [External] Rock River Survey
**Date:** Friday, March 27, 2026 1:58:13 PM

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Attn: Wes Cattoor, OWR, Acting Division Chief
Terra McParland, OWR, Acting Engineering Studies Chief

Thank you so very much for sharing your findings with us on Monday March 16th concerning the two dams located on the Rock River. Our family has owned property on the Rock River for 29 years. We raised our children here and our grandchildren have grown to love being on the river. Although your studies and solutions that were proposed were fully presented to us based on other rivers located near the Chicagoland area, we all know that the Quad Cities and the Rock River are not comparable.

Rock river residents gave good representation tonight and did suggest some cost effective ways to help notify individuals that the two dams are there, such as with anchoring down markers indicating that the dams are there and not to pass a certain point for safety reasons. There could be several places starting from where the Back Water Gamblers launch. You have stated that evening that ramps located on the river are for public access, but should some signage not be placed there as well, since it is so close to the dams?

While our hearts go out to anyone that has lost a loved one on any body of water, it comes down simply to education as well as respect for the river. Those of us who live on the river, respect it. She can be absolutely awesome but then again she can be pretty cruel to us. We all know that we can flood on a few days' notice. So we prepare our properties and wait it out. After the flooding is done, we get to work on cleaning up. We know what needs to be done, and we take care of our homes and yards. Sitting here writing this letter to you, I am looking out our front windows admiring the beauty of the water. I don’t want to look out and see 4ft grass as one of you noted that night with a creek behind it.

Education is the answer! The river is open to everyone to enjoy, not just those that live here on the water, but we ALL need to understand how to approach and enjoy time spent on the river.

Thank you for your time and I hope that we can all come to a reasonable solution to this matter.

Carol Jorgensen
3808 North Shore Drive
Moline, IL 61265

**From:** Dawn Starr
**To:** DNR.OWRPlanning
**Subject:** [External] Rock River dam removal
**Date:** Tuesday, March 17, 2026 4:58:16 PM

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I am seriously concerned about the Ecological effects of removing the dams. Fish with toxic levels of polutants would swim into the rock distroying fishing.. Invasive carp would also polute the rock. You seem to have no plan to address these issues. Polutants from the Mississippi will be able to flow freely into the Rock river. There needs to be a better solution that won't distroy the Rock and it's wild life.

Thank you,
Dawn Starr
Land owner on the rock river

**From:** Tara Smith
**To:** DNR.OWRPlanning
**Subject:** [External] Rock River dam
**Date:** Thursday, March 19, 2026 4:54:57 PM

---

Hello,

My wife and I are currently building a home on the Rock River in Moline. I attended Monday nights meeting and I am against what is being proposed.

I suggest we use signage, education, and advertisements about boater and swimmer safety. Set up floating docks with signs before people reach the dam.
Yes, the river can be dangerous for those that don't respect it. People need to be properly educated. Just because things can be dangerous for those who aren't careful and do not use common sense does not mean we should prevent those who have enjoyed it for generations.to use it. You can't expect people to live in a bubble.

This will drive the property taxes down as well as tourism and will also decrease area fishing licenses. Our area needs the river.

Thank you for your time.

Sincerely,

John and Tara Smith
3730 N Shore Dr
Moline, IL 61265
(309)781-6635

**From:** Candace Weiss
**To:** DNR.OWRPlanning
**Subject:** [External] Rock river dam project
**Date:** Tuesday, March 31, 2026 6:52:49 PM

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I invested about 1 million in the home I built 5 years ago on the Rock River. I'm worried if the river level goes down my property value will as well. Is there a plan to reimburse property owners for the loss of value. Also where will the money come from to pay for this project if it happens. I vote to keep the river as it is.
Candy Weise
3624 47th Ave
Rock Island, IL
3097212972

Sent from my iPhone

| | |
|---|---|
| **From:** | Brian Weber |
| **To:** | DNR.OWRPlanning |
| **Subject:** | [External] Rock river dam, please don't remove !! |
| **Date:** | Tuesday, March 31, 2026 8:14:00 PM |

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**Dear Illinois Department of Natural Resources,**

**I am writing to express my strong opposition to the proposed removal of the dams along the Rock River. These structures are not only an important part of the river's history, but they also play a critical role in the surrounding communities, ecosystems, and local economies.**

**For many of us, the Rock River is more than just a body of water—it is a place where families gather, where traditions are built, and where livelihoods are supported. The dams help maintain water levels that are essential for recreational activities such as boating, fishing, and tourism, all of which contribute to the vitality of our local communities.**

**Beyond recreation, the dams serve practical and environmental purposes. They help regulate water flow, reduce erosion in certain areas, and support habitats that have developed over decades. Abruptly removing them risks unintended ecological consequences, including disruption to established wildlife patterns and water quality concerns.**

**We understand the importance of environmental stewardship and appreciate the IDNR's efforts to improve river health. However, we strongly urge a more balanced approach—one that carefully weighs the long-standing benefits of the dams against the potential impacts of their removal. Community input, transparent studies, and consideration of alternative solutions are essential before making a decision of this magnitude.**

**Please take into account the voices of the residents, businesses, and families who depend on the Rock River as it exists today. We respectfully ask that you reconsider or pause any plans for dam removal until a more thorough and inclusive evaluation has been conducted.**

**Thank you for your time and consideration.**

**Sincerely,**
**Brian Weber**
**Shady Beach Resident**
Sent from my iPhone

**From:** Todd Jacquin
**To:** DNR.OWRPlanning
**Subject:** [External] Rock river damn
**Date:** Tuesday, March 17, 2026 7:54:26 PM

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Hello, I would really appreciate you all to do the best research not to take out either damn but for the foremost is to keep whatever water we can here if you do have to remove the Sears dam I mean this is our waterway and fun for our family . This is why we property on the rock river

from my iPhone

**From:** Jeffrey S. Dismer, AIA
**To:** DNR.OWRPlanning
**Subject:** [External] Sears & Steel Dam Report
**Date:** Sunday, March 29, 2026 5:41:45 PM

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29 March 2026

To All Concerned:

Re: Sears and Steel Dam Report
Rock River, Illinois

My wife and I own a residence on the Rock River. We enjoy everything the river has to offer, and greatly enjoy boating and recreation on the river, as well as experiencing the wildlife and nature though all seasons. We searched for a residential property along the Rock River in Moline & Rock Island for the river life experience, and we purchase our home 28 years ago. We attended the public meeting and hearing to review the DNR study about options to alter or remove the two dams on March 16th.

I have a great concern for the changes in the river levels and navigation on a shallower and narrower river if both dams are removed. I feel a vital component that was not included in the study was what Economic Impact these alterations have on the adjacent properties. As the river becomes less navigable with reduced opportunity for boating and recreation on the river, I am concerned our properties values will decrease and home be less desirable.

I understand safety was the highest priority in the study. The Steel Dam is the area of highest incident, and I feel some of the proposals to reduce danger by modifying that dam to be stepped or rippled are some good options, as it would increase safety but not change the river level. I also feel there needs to be much more public education and notices at various locations on the river to increase awareness of the dangers of the dam need to be greatly enhanced.

I am not in favor of the removal of the Sears Dam, as this will greatly affect the river levels and navigability. The options to create the ripple modifications upriver will cut off boat access in these public and private properties for visitor to the park and homes. I am in favor of no changes to the Sears Dam.

Another component missing from the study was an Environmental Impact Study. I have a concern with removal of the dams this would allow for the potential migration of invasive species such as Asian Carp to move into these areas of the Rock River.

I feel it would be very short sighted and irresponsible to move forward with any removal option without expanding the study to include Economic and Environmental impacts. Also, further study further options that maintain the viability of recreation and enjoyment of our Rock River for the property owners and the public, and alternative means to improve safety.

Regards,
Jeff Dismer
3401 South Shore Drive
Moline, IL 61265

**From:** Tom Freymann
**To:** DNR.OWRPlanning
**Subject:** [External] Sears Dam/Steel Dam Rock River
**Date:** Friday, March 20, 2026 3:22:50 PM

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Dear DNR,
To whom it may concern,
I live on the Rock River upstream by Joslin IL. If you take out the Sears & Steel dams by Carr Island in Rock Island County, because people have gotten themselves killed while boating & recreating on the river, because of their own irresponsibility, it will dramatically reduce river levels upstream to Dixon, IL. I feel bad for those that have lost their lives. This Is the height of irresponsibility and over stepping of State Control. You say it's a matter of Public Safety. What about Personal Responsibility? If you've never been on the river then decide to do it in a water vessel, when the water is high and the current is strong, and have no idea what you're doing, and tragedy happens, is that not personal responsibility? It's not the dams or the rivers fault that people do stupid things that put them in danger! People get killed climbing mountains. Are you in favor of toppling mountains? How many people are killed in Rock Island County in car accidents in a ten or fifteen year time increment? Life is inherently unpredictable and dangerous. And when you do something to recreate, that in and of itself is a dangerous act. One should prepare and learn about the dangers of boating on a river like the Rock. Not just haphazardly deciding too take a boat out with children and not knowing what the hell you're doing!
There's also the matter of declining property values for those that own property on both the North Shore and South Shore shorelines! By lowering the level of the Rock you'll be disrupting recreational activities: boating, fishing, hunting etc., and have you considered the effects on the wildlife that inhabit this river? Bottom line this is one of the most boneheaded idea ever conceived. There was a reason those dams were built in the first place. Have you even considered the unintended consequences of this project? You're searching for a solution that's not a problem in the first place if PEOPLE wouldn't be idiots when recreating on the Rock River! Put up more warning signs & buoys! Put signs up at all docking points where you put boats in the river warning of the dangers of recreating down by Carr Island where these dams are located and point the dams out on a map at each location up to Colona,IL. There are more practical and cheaper solutions to the problem you're addressing! I say NO on the destruction of the Sears & Steel Dam located on the Rock River by Carri Island in Rock Island County ILlinois.

Sincerely,
Thomas E Freymann
9567-N. Thompson St.
Colona, IL 61241

**From:** Gene Hast
**To:** DNR.OWRPlanning
**Subject:** [External] Sears and Steel Dam Comments
**Date:** Saturday, March 21, 2026 10:46:12 AM
**Attachments:** image003.png

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Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702
To whom it may concern,

**Let me tell you about the Backwater Gamblers Water Ski Club inc.**

The Backwater Gamblers is a $90,000+ Tax Exempt Business
The Backwater Gamblers have been in existence for 45 years.
Record attendances, over 30,000 spectators.

**The weekly ski shows have an economic impact of: $900,000 per year**

Media Recognition brings positive exposure to the Rock Island Park Board and the City of Rock Island.
We have hosted multiple Central region Tournaments
We have hosted Division II National Tournaments
In the future we would like to host:

Host the Division I National Show Ski Tournament
**D1 Nationals has an economic impact of $1,260,000**
Host the World Show Ski Tournament
For the spectators this is a 6 day event
**The World Tournament has an economic impact of $1,700,000**

**Comments**

The DNR proposed 5 options. The first proposal was to remove both dams. The next 4 proposals were to remove the Sears dam and various changes to the Steel Dam. It was stated that this would lower the river ~3 feet. Is this change measured at the Harold's Landing River Gauge or at the tip of the island? This will direct all the river flow down the Sears Dam slough. The closer to the island you get, the lower the pool will be.
The Backwater Gamblers will not be able to perform with a level drop.
I have been involved with the 2 of the rescues on the Steel Dam. I will not comment on the parties involved, that's not appropriate at this time.
Any actions that lower the Rock River level would eliminate river use for the Backwater Gamblers. The ~3 foot of drop, as discussed reduces the width by how much? Any action that reduces the level needs to be immediately rejected.

There are a couple actions that can be taken to improve information and safety on the Rock River.

- Electronic signs.
    - Signs on the Milan Beltway Bridge and at the Ben Williamson Ramp.
    - Signs could include river speed, river level and safety indication.
- Reinstall the safety cable across the River in front of the Steel Dam. Install quick releases on a stainless steel chain.
- If there is money to be spent, spend it on a Rock Ramp on the Steel Dam.

Gene Hast

gphast@mchsi.com

309 230-7130

| | |
|---|---|
| **From:** | Walter PMC |
| **To:** | DNR.OWRPlanning |
| **Cc:** | EXT Halpin, Mike Senator |
| **Subject:** | [External] Sears and Steel Dam Hearing |
| **Date:** | Thursday, March 26, 2026 10:02:14 AM |

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To whom it may concern,

I am writing to address my concerns after attending the Sears and Steel Dam Hearing on March 16th in Moline, Illinois.

First and foremost, I do agree that the dams can be a danger to the community without proper knowledge, and further signage, education and additional measures should be taken. I appreciated the ideas from community members of floating billboards, metal cables and kiosks at boat ramps explaining the danger. I also thought that the restriction of the public to the Backwaters Gamblers ramp, was a very good suggestion.

I do not support the proposal of removing the dams. We are property owners on 3709 South Shore Drive. We enjoy the Rock River for recreational boating, kayaking, fishing and viewing wildlife. The possibility in that removing the dams would decrease water levels, threatens all that we love about the Rock River; this is of grave concern. I have numerous concerns with another being the economic impact. What will this do to our property values? What will this do to local tourism? To the local boating sales in our community that produces sales tax?

The unknown effects on fish and wildlife is also daunting. My family greatly enjoys fishing on the river, as well as watching the eagles, cranes and turtles in their habitats.

The proposed modifications of removing the dams ranged from $11 Million – $24 Million. I believe the solutions suggested by our community would be of far less. Anchored signs, steel cables and even education in our schools could be provided by far less of taxpayer dollars.

I would like to work with the DNR and local government to accomplish the goal of safety without disturbing the river level. Please contact me at 563-320-4233.

Nick DeVolder
Angie DeVolder
3709 South Shore Dr.
Moline, Il 61265

**From:** Dalton DePaepe
**To:** DNR.OWRPlanning
**Subject:** [External] Sears and Steel Dam commentary
**Date:** Tuesday, March 31, 2026 10:10:41 PM

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Hello, my name is Dalton DePaepe. I own riverfront property at 3310 47th Ave in Rock Island along the channel north of Vandruff Island.

My lot is situated on the narrowest developed point between the north shore and Vandruff Island, and the slight extra depth here allows me to park my 3 boats directly along my concrete seawall spanning my entire shoreline that was built long ago for that purpose. Current water levels allow me, as well as friends, family and neighbors to easily park boats here at the riverbank without the need for a dock. To remove the Sears dam and permanently lower the water in the channel north of Vandruff Island by multiple feet would substantially diminish this expensive and longstanding asset to my property and require costly renovations and investment in demolition, docks, ramps and labor to ever make use of any boats at my home in the future. This property of mine was selected, purchased, built, upgraded and maintained with boating and water sports in mind. To substantially diminish the functionality and recreational opportunities at my property would be a devastating blow. For that reason, I ask you to please consider leaving the sears dam intact or at least find another solution to maintain water levels for the neighborhoods north of Vandruff Island.

In the study documents, there were five proposed alternatives. Every scenario in the study studied involved removing the Sears Dam, with no outlined scenario for leaving it intact or rebuilding it. I was told that there is insufficient room between the current Sears Dam and the bridge for any alternative to be feasible. In that case, if it can't be left alone, then why not replace the dam slightly upstream of the current one? There is over a half mile of undeveloped public park land upstream of the dam which would not interfere with anyone's current river navigation if a new structure were put anywhere in that stretch.

Also in the study, scenario #4 proports to maintain current water levels for the boating public by adding four "riffles" along the navigation channel north of Vandruff Island. The western two of these structures, according to the map, are planned within the area I outlined above- undeveloped wilderness along public land at Blackhawk Park. That same area could be used for more riffles or dams or any other alternative that maintains current channel depth north of the island, without interfering with anyone's river access, which seemingly should be the entire point of adding these structures back in the first place.

My biggest problem with your proposal is the suggestion that the eastern two riffles in scenario #4 should be placed directly in front of private residential property. The easternmost riffle on your map is actually in my front yard, where I park my 3 boats and have enjoyed navigating the river for my entire life. Not only would this "riffle" make use of my entire concrete shoreline meant for parking my boats, but it would permanently cut off myself and all of my neighbors downstream from ever having any access to their properties by boat ever again. The fact that this was even suggested, let alone studied in a serious manner as one of only five scenarios in this expensive yearslong study, is absolutely revolting and completely unacceptable. I will do everything in my power to prevent this particular ridiculous scenario from ever coming to fruition.

Between my property and Blackhawk Park, where your planned riffle would segregate myself and my neighbors, there are 43 private residential lots, most of which are developed and lived in with people's homes and boats. You should not dam us all in both upstream, downstream and down the middle with "riffles" to preserve a few inches of water further upstream. This river and its access are of course important to those upstream, but it should be noted that it is equally as important to the dozens of property owners along this residentially developed main extension of the current navigation channel north of Vandruff Island. The Edgewater and Welch's neighborhoods have been here for a century. We are not a wilderness backwater fit for barges full of rocks to start dumping new dams in people's front yards. With or without the current dams in place, and with or without the current water levels being maintained, we deserve the connection to the Rock River that we purchased without being forcefully segregated by these structures. Again, it is unbelievable that something so hostile would ever be threatened upon my

neighborhood in such a serious and imminent context. I implore you to cease and desist your plans for scenario #4 in its current form.

Yahoo Mail: Search, Organize, Conquer

**From:** Jayson Sevier
**To:** DNR.OWRPlanning
**Subject:** [External] Sears and Steel Dam
**Date:** Tuesday, March 17, 2026 5:29:31 PM

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I am in favor of keeping both the Sears and Steel dams as they are, but putting up better signage throughout the whole slough of the Sears dam; because it is a more narrow slough it would be easier for recreational users to reach the bank. As for the Steel dam I would wish for it to stay as well but I think the best alternative is to put in large pillars, similar to a bridge with a huge sign saying there is a dam ahead. That side of the river is often too shallow for a boat to even go through meaning it would not affect the Backwater Gamblers. I understand the thoughts with fishing and wildlife but my biggest concern is having any sort of entry for fish or invasive species of the Mississippi to reach the Rock. It is not a commercial fishing location nor is it a HUGE fishing attraction. A lot of the boats in this location of the river are pontoons which can't afford for any drop in the water level during the summer. It is already dangerous enough for people that don't know the river as well as the locals but any drop in the water could cause even more logs and trees to get caught up in the middle of the stream, most of which are hidden or barely visible making it even more dangerous for boats or PWC's. I am aware of liability being a huge issue so if this is not taken into consideration my next best alternative would be the stairs behind the dams. These stairs would make it very difficult for invasive species to reach the rock but also takes away getting trapped behind the dam from the vortex. If this is what happens I think there still should be a lot better signage and the boat ramps by the Backwater Gamblers and Harolds should make it very very very clear that there are dams close. Thank you for taking the time to read this and I hope my thoughts are taken into consideration!

**From:** Trista Foster
**To:** DNR.OWRPlanning
**Subject:** [External] Sears and steel dams
**Date:** Sunday, March 29, 2026 1:56:39 PM

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To whom it may concern,

I am a lifelong resident of the Quad Cities and a 36 year member of the Backwater Gamblers Waterski Show Team. I am urging you to consider the economic and societal impact a change to the Sears and Steel dams would have on our community if water levels are decreased. Our rivers, and river recreation, make our area unique. The rivers are a source of fun, family entertainment both in terms of recreational boating and fishing as well as our waterski shows. Removing the dams and lowering the usable water levels removes our community's ability to use a significant stretch of river. It would take away a waterski show that no other area within 75 miles has. Our shows draw in audiences from around the country and our tournaments provide a significant boost to the local economy with hotel rentals, food, and other entertainment for the people visiting to partake in those events.

I strongly support all safety measures aimed to keep people safe on the rivers. However, removal of the dams seems to be a drastic measure to promote safety, when other, safe, non-construction and more economically feasible options have not yet been fully explored. I'm sure if asked our team will be happy to assist with education of the public of the dam and how to best navigate the river safely.

Please consider all available options that maintain current river levels.

Thank you for your consideration.

Sincerely,
Trista Foster

Sent from my iPhone

**From:** Adam Cater
**To:** DNR.OWRPlanning
**Subject:** [External] Sears/Steel Dam
**Date:** Thursday, March 19, 2026 6:42:33 PM

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Hello, my name is Adam Cater, and I live in Silvis, IL. My Wife and I frequent the Rock River for boating, fishing, and cooling off on the sand bars. We don't want to lose our River, but I'm all for safety improvements. I really like the "steps" or "rock" option. I am wondering how the river would be affected during the construction process though. Any information on this would appreciated. Thanks, Adam

Yahoo Mail: Search, Organize, Conquer

**From:** John Fariss
**To:** DNR.OWRPlanning; EXT Halpin, Mike Senator; Kara Bancks
**Subject:** [External] Steel Dam & Sears Dam on Rock River meeting
**Date:** Monday, March 30, 2026 4:08:36 PM

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DNR OWR Planning ,

We live at 3700
N Shore Dr, Moline, IL 61265. My husband built this house specifically so he could live on the river with the beautiful river view. If you remove the dams, there will be major changes up and down the Rock River. You are looking at the safety aspect, but there will be many major repercussions from it.

Living on the Rock River, we all have wells that provide water to our homes. If the dams are removed, that will affect the level of the river. When the river levels drop or dries up, the groundwater table falls accordingly, reducing the water available to the wells. Will we have water in our wells, or will we have to dig deeper wells?

A lot of people fish on the Rock River. If the dams are removed, that opens the river up for the invasive carp to migrate into the Rock River, These invasive carp which are large, fast-reproducing fish dominate the river ecosystems, reducing biodiversity and threatening the other fish in the river. The carp feed on plankton, starving native fish. Black carp eat mussels and snails, while grass carp consume aquatic vegetation destroying habitats.

Many people flock to live on riverfront properties for many reasons: the beautiful view, recreation of boating, canoeing, skiing, Plus we see wonderful wildlife: Blue Herons, Eagles,white pelicans and many other creatures. Removal of the dams will affect the habitat for all the wildlife around here.

Our property values will change if we no longer have this million dollar view,. Plus not being able to boat on the river with the water levels being lowered without the dams to control the water pool level. Our taxes are also assessed because of this prime location. It won't be a prime location if the river levels lower and we only have a small pool, prairie grasses instead of a river we can do activities on. We have enjoyed boating, fishing and watching the water skiing shows at Back Water Gamblers.

People need to be educated about the danger of being on the river. They need to be educated about dams and how dangerous they can be. People get hurt and killed in car accidents all the time, so for safety lets get rid of cars. People are careless and accidents happen. So let's find a solution that is a win win for everyone.

Susan & John Fariss
3700 North Shore Drive
Moline, IL 61265

**From:** Susan Michelle Jepsen
**To:** DNR.OWRPlanning
**Subject:** [External] Steel Dam Concerns
**Date:** Thursday, March 26, 2026 1:35:47 PM

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To Whom it may concern,

I'm writing to share some thoughts regarding the proposed dam removal and what it could mean for the Backwater Gamblers' stretch of the river and the broader community.

First, I want to acknowledge something upfront: the dam is dangerous. Everyone who uses the river should understand that. That's exactly why I believe the focus should be on practical, effective ways to improve safety—without drastically changing the river itself.

The Backwater Gamblers were formed in 1980 in Andalusia, IL and moved to Harold's on the Rock in 1982. From there we moved to our current site at 5000 44th St in Rock Island in 1983, very near to the Steel Dam.

Our show site sits about 600 yards from the dam, and we regularly perform complex acts in that area without incident. Safe use of the river is already happening, not just by our team, but by boaters, fishermen and others who enjoy it responsibly every day.

From the beginning, we have been very aware of the dangers of the dam. We are careful to place our pick-up boats in the appropriate places to cut down on the possibility of fallen skiers even getting close to the dam. In our over 40 years of performing ski shows at our current location, we have never had even a close call.

Measures I believe could help improve the safety include:

- better, BIGGER and MORE signage
- physical barriers that are easy to see and make boaters aware that something dangerous is approaching
- barriers that stretch across the ENTIRE dam area that boaters could grab onto and pull themselves up on to
- stronger education and awareness efforts

These are practical, lower-cost solutions that deserve serious consideration before moving toward something as permanent and expensive as dam removal.

Removing the dam would significantly lower water levels, by about 3', which would make our show site unusable. That would effectively end a long-standing community tradition. Each year, we host twice weekly FREE water ski shows for the entire Quad Cities area and beyond, that draw more than 30,000 spectators and contribute meaningful economic impact to the area.

This isn't just about the Backwater Gamblers. The current water levels support a wide range of recreational activities, boating, fishing and more, that many people in the community rely on and enjoy.

It's also worth noting that dam removal is estimated to cost over $10 million. Given that, it seems only reasonable to fully explore more targeted, cost-effective safety improvements first, especially those that can address the real issue: awareness and informed river use.

At the end of the day, we all share the same goal…making the river as safe as possible. The question is how to do that in a way that preserves what's already working and valued by the community.

Thanks for taking the time to consider my perspective.

Sincerely,
Susan Michelle Jepsen
PROUD 45-year BWG member
309-738-0946 Cell

**From:** Jones, Joella W
**To:** DNR.OWRPlanning
**Subject:** [External] Steel Dam on Rock River
**Date:** Tuesday, March 17, 2026 9:57:51 AM
**Attachments:** Outlook-az3wjtaz.png

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Good morning,

I was reaching out to get a copy of the PowerPoint presentation from last night.

Thank you,

**Joella Jones | divvyDOSE - Optum Rx**
**Fill Operations Supervisor**
**Moline, IL**
joella.jones@optum.com
This e-mail, including attachments, may include confidential and/or proprietary information, and may be used only by the person or entity to which it is addressed. If the reader of this e-mail is not the intended recipient or intended recipient's authorized agent, the reader is hereby notified that any dissemination, distribution or copying of this e-mail is prohibited. If you have received this e-mail in error, please notify the sender by replying to this message and delete this e-mail immediately.

**From:** Trey Hammond
**To:** DNR.OWRPlanning
**Subject:** [External] Steel Dam removal
**Date:** Tuesday, March 31, 2026 9:29:08 PM

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Ladies & Gentlemen:

I'd like to express my deepest desire to maintain the steel dam that allows the Rock River to stay as it is. We have multiple friends and families in the Shady Beach area who spend many days on the river making memories. It seems a shame to lose the river. Please reconsider. It would seem cannabis taxes would pay for a good portion of the monies required to maintain this structure.


**Trey Hammond**
CEO
309-220-8101
trey@realeafbotanicals.com
www.realeafbotanicals.com


logo

logo

head

call to action

call to action

A portion of all Realeaf Botanical's sales goes to the Last Prisoner Project, aimed at freeing people who are unjustly imprisoned due to cannabis offenses (dealing or possession). This is a cause we believe in and one we are committed to supporting. More info here: https://www.lastprisonerproject.org/

**From:** Patience Rayshel
**To:** DNR.OWRPlanning
**Subject:** [External] Steel Dam
**Date:** Thursday, March 19, 2026 6:54:35 AM

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Dear Senator Halpin and Members of the IDNR,

Thank you for the time, care, and diligence you have devoted to studying ways to improve safety at the Sears and Steel Dams. As residents of the Quad Cities region, we deeply value the well-being of our community, and we are grateful for your commitment to addressing these concerns.

For those of us who live, work, and raise our families here, safety is not an abstract issue—it is personal. Every decision made about these dams has a direct impact on the lives of our neighbors, friends, and loved ones. That is why we strongly support the proposed measures, including dam removal, installation of steel steps, and the creation of rock ramps or riffles.

Of all these options, what matters most is choosing the path that best protects our community. We firmly believe that removing the hydroelectric dams is the most effective way to prevent future tragedies and ensure lasting safety for everyone who uses and enjoys our waterways.

We respectfully urge you to prioritize this course of action and continue placing public safety at the forefront of your decisions.

Thank you again for your dedication to our region and for hearing the voices of those you serve.

Sincerely,
A Concerned Citizen of the Quad Cities

**From:** Mitch Zimmerman
**To:** DNR.OWRPlanning
**Subject:** [External] Steel and Sears Dam Project Public Comment Inquiry
**Date:** Monday, March 23, 2026 11:30:57 AM

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Hi - I have several questions about the study that I would like addressed. Also, the PDF has not been sent. I put my email address on the sign-in. I got the PDF from another resource who got it directly from you. When can we expect that to be sent out?

Evaluation Matrix (Slide 31)

1. Was any sort of weighting applied or considered?
2. What recreational considerations are being considered? How would removing the dams improve the recreational use? "Full Removal" is rated the highest at a 4, while doing nothing which would best preserve the pool is the lowest rating of a 1? Explain the reasoning that full removal ranks highest for recreational use.
3. What aquatic habitat improvements were considered? What things were factored into "do nothing" being rated a 1 vs other alternatives that preserve the water level being 3 or 4?
4. What environmental considerations are being considered? The sediment study showed the river sediment is healthy. Assuming fish migration is considered in Aquatic habitat improvement, what other environmental considerations were evaluated that made "Do nothing" a 1?
5. What permitting considerations were considered? What permits would the state need to get to do nothing with existing structure? How is it possible that doing nothing has more permitting considerations (rated a 2) than full removal (rated a 3)? How is it possible that all the alternatives have the same permitting requirements as doing nothing?

Were any other safety factors considered other than just dam safety? As the primary intent of this study being public safety, what considerations were made for the new river system that would be created. Thing like:

1. Loss of safer flatwater boating
2. Higher-risk shallow, faster water
3. Increased hazard to paddlers during low flows
4. Concentration of recreational users into fewer navigable reaches

To what extent was Inter-Fluve, Inc involved in the study and what were their contributions? How much of the $800,000 was allocated to Inter-Fluve, Inc?

Mitch Zimmerman
932 N Shore Dr.
Moline, IL 61265
mitchzimy@gmail.com

**From:** Jody Schultz
**To:** DNR.OWRPlanning
**Subject:** [External] Steel and Sears Dam comments
**Date:** Monday, March 30, 2026 8:34:22 PM

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We recently attended a meeting with Mike Halpin and the DNR about the $800,000.00 study that was conducted about the Steel and Sears Dam and the possible removal of one or both dams.

I have lived on the Rock River for almost 33 years but, my family has lived here for 42 years and now, our children live on the river. To remove the Steel and Sears dam is unthinkable for the residents and the community. During this meeting, not once did they discuss the economic or ecological impact of taking out the Dams. Nor, was this part of the study that they did above.

Mike Halpin continues to talk about "public safety" however, in most of the instances that he is using, the individuals were at fault for the tragedies that happened. Mike Halpin wrote this bill in 2021 yet, he's done nothing to assist with the "public safety" he's so concerned about.

Did Mike Halpin consider all the wildlife from the past 100 years that now inhabit our river. The fish, the eagles and other wild life that we have here on the river. The DNR reassured us that we would have "chest high grass" with a creek sorry, no one wants chest high grass and a stream with invasive species because Mike Halpin and the DNR did not bother to look at the ecological impact.

What about our property values? Who's going to compensate us for lowering our property values? Riverfront property is very sought after along the Rock River so, what's going to happen to that value once the dams are pulled and we have a creek and chest high grass?

Has Mike Halpin or the DNR thought about what's going to happen with the South Slope wastewater treatment plant that is getting updated for $120 million dollars?

Why not place signs at each boat ramp along the river and the Milan bridge? What about more buoys by the dams? Why not work together with the City of Rock Island and either pull the ramp that is close to the dam or, give to the Backwater Gamblers ski team to keep the public out. Almost all these tragedies, the individuals put in at that boat ramp.

Again, this feels very calculated by Mike Halpin and I continue to wonder what he's getting out of this?

Concerned resident-

Jody Schultz
Sent from my iPhone

**From:** lauriesevier
**To:** DNR.OWRPlanning
**Subject:** [External] Steel and Sears dam study
**Date:** Friday, March 20, 2026 6:49:45 PM

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Hi. My name is Laurie Evans. Thank you for taking the time to read this.
My thoughts on the Steel and Sears dam study: I do not feel that a high cost dollar project is necessary at this point. I would like to see something simpler, more cost efficient tried before we jump head first into such a huge and drastic undertaking. If safety is the biggest concern then we should focus on the simple, yet effective basic safety precautions. SIGNAGE. Highly visible, durable signage is the most universal precaution that can be understood by everyone, even children. I feel that the signage up right now lacks its initial purpose. It is not big, or bright, or flashing or impactful.
I think that starting with something simple, back to the basics idea, such as focusing on signage would help eliminate our safety concerns.
Thank you for your time,
Laurie Evans

Sent from my Galaxy

| | |
|---|---|
| **From:** | Joan Keemle |
| **To:** | DNR.OWRPlanning |
| **Cc:** | Cattoor, Wes; McParland, Terra; EXT Halpin, Mike Senator; Joan Keemle; Randy |
| **Subject:** | [External] Submittal of Comments to IDNR Study |
| **Date:** | Monday, March 30, 2026 8:29:17 PM |

30 March 2026
To Whom It May Concern:
We vehemently oppose the IDNR's five alternatives presented to mitigate safety concerns with the Steel Dam and Sears Dam.
There were no considerations given to adverse ecological impacts (mussels, Asian carp), the negative economic impact resulting from the elimination of recreational water activity, and the adverse impact to property values all along and adjacent to the waterway.
We have built a life here of 35 years for sole purpose of living, boating, and enjoying the river. The elimination of Sears damn would eliminate this way of life and greatly reduce property values. We live on the North slough (Sears slough).
And by the way, Rock Island has slowly dismantled the leanest, greenest energy it has by decommissioning the Sears Dam Hydroelectric plant. Instead of repairing the Hydroelectric plant, Rock Island chose to slowly dismantle it, even while continuing to pay it off. Before any consideration is given to elimination of the Sears Damn, there should be a review of decision to dismantle the Hydroelectric plant. Despite Rock Island City Management's claims of too little waterflow, it did provide power, as detailed below.

Quote from Dispatch 6/4/2021:

"The hydroelectric plant provides energy for Mill Street wastewater treatment(45%), raw water pump station(20%), water treatment plant(35%). The City still owes 1.1M on purchase of the plant, with payoff expected in 2028. Estimated cost of repair is $182,285."

We are supportive of safety improvements such as increased signage on both land and river, adding "steps" to the downstream side of Steel Dam, and limiting the Rock Island boat ramp to BackWater Gamblers and Emergency services.

Thanks for your consideration,

Joan and Randall Keemle
2602 47th Avenue
Rock Island, IL 61201

**From:** lexi gordon
**To:** DNR.OWRPlanning
**Subject:** [External] The Damages of the Dam Removel
**Date:** Tuesday, March 31, 2026 9:22:02 AM

Dear DNR,

I am writing to express my opposition to the proposal to remove the two dams on the Rock River. While I understand that such projects are often undertaken with environmental goals in mind, I believe removing these dams would have significant negative impacts on the surrounding communities, the local ecosystem, and the economic stability of the area.

Many residents rely on the stable water levels created by these dams for boating, fishing, kayaking, and other recreational activities that support both quality of life and local businesses. Eliminating the dams could reduce water depth, limit navigability, and diminish the river's appeal as a community resource. It could essentially turn the river into a creek.

There is also a serious concern about property value loss. Homes and businesses along the river benefit from the scenic waterfront created by the dams. Lower water levels and exposed riverbeds often lead to less attractive shorelines, reduced recreational access, and increased erosion—all of which can directly decrease property values. For many residents, their property is their largest investment, and the removal of the dams puts that investment at risk.

In addition, the community could face significant revenue loss. Local businesses —such as marinas, bait shops, restaurants, and tourism-dependent establishments—benefit from the steady flow of visitors who come to enjoy the river as it currently exists. Reduced water levels and diminished recreational opportunities could lead to fewer visitors, lower spending, and long-term economic decline for businesses that rely on river activity.

There are also infrastructure and safety concerns associated with dam removal. Lower water levels can expose unstable banks, old debris, or buried infrastructure that becomes hazardous once uncovered. Shoreline stabilization projects may be required afterward, often at the expense of local governments or property owners.

While environmental restoration is often cited as a benefit of dam removal, outcomes vary widely. Not all removals result in improved fish passage or habitat restoration, especially in rivers affected by upstream development, runoff, or altered hydrology. Sudden sediment release can temporarily harm water quality, wildlife, and downstream property, raising questions about whether the ecological benefits outweigh the risks. Tyson's has tones of waste going into the water if there isn't an equal amount or more water flow this could be harmful. Tysons amount of waste going into the water has already been a concern. So taking away water flow would make it even worse. Not to mention the run off from farms.

Another concern is the lack of clear long-term planning. Without detailed modeling of future water levels, erosion patterns, and sediment movement, the community is being asked to accept significant and potentially irreversible changes without fully understanding the consequences.

Additionally, the dams contribute to the aesthetic, cultural, and historical identity of the area. They have shaped the character of the riverfront for generations and supported traditions that bring people together. Removing them risks altering a landscape that many consider an important part of the region's heritage.

On a personal level I've grown up on the river and I can't imagine it just being gone. It would be absolutely heartbreaking if you completely take out the dams. It would take away wildlife, kayaking, fishing, boating and more. Putting steps in after the dam and taking out the water turbines would be a better option. As this would keep the dams but take out the safety risk. Taking out the danger while still keeping the river it self. Or put up cement pillars with a sign of the danger and to turn back. I know people have died by the turbines but look at how dangerous the Mississippi is. The rock river should not be a concern. Proper education before going on the water should be done.

Finally, the loss of the dams would reduce the diversity of recreational opportunities. Flatwater activities such as kayaking, paddleboarding, and canoeing may decline if water levels drop significantly, and tubing/skiing events or fishing tournaments that rely on stable conditions may no longer be viable. Invasive species will make their way through with no dam preventing them to enter. Back water gamblers the ski club would have to relocate as there wouldn't be enough water to continue. This decision will effect so many things so please don't take it lightly.

I respectfully urge the DNR to reconsider this proposal and explore alternative solutions that preserve the dams while still addressing environmental goals. Community input and long-term impacts should remain central to any decision affecting such an important shared resource.

Thank you for your time and consideration.

Sincerely,
Lexi Gordon

**From:** John Peed
**To:** DNR.OWRPlanning
**Subject:** [External] rock river
**Date:** Tuesday, March 24, 2026 8:41:10 AM

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I am writing this in response to recent proposals to alter the Rock River dam to a roller dam issue. I have river front property on the Rock and have lived here for 40 plus years. I have boated, fished and tubed on this river with no imminent danger to myself. All waterways have danger and it is beyond me why the negligence of some will create a situation that will destroy the ecological structure of this waterway. There is no way removing these dams would do anything but permanently eliminate the fish/ birds and wildlife that we have enjoyed all these years. It seems that education and some good old common sense is what is needed here. Please don't take my home that I have spent more than 1/2 my life making my little piece of heaven...it is a petrifying thought the damage this would cause. Thank you for your time and consideration in this matter.
Sincerely
John & Roxanne Peed

Public Hearing Comments Sears and Steel

SusanJfariss@gmail.com
"Water levels too low for boating. No dam removal."

Anonymous
"Is there a reason the DNR/State of Ill has stopped caring for the dams? No cables, no warning bouys, etc? Rivers are inherently dangerous. DNR might look into mitigating this problem. Destroying our backyard is/should NOT be an option."

Anonymous
"Don't remove the dams!"

Josh
"I'm building a new house on North Shore. And required to build to a certain height. I do not want the river level to drop at all. Education is key to safety."

Rick Wiffles- 3319 N. Shore Dr (309) 781-1008
"Do not remove the dams. Add Rock River ramps. I own 13 acres on N. Shore Dr."

Anonymous
"Much better safety measures upriver from the dams. Do not drop the river level. Enviornmental and economic impact need to be considered also."

Anonymous
"How many people have drown on other parts of the Rock River? What is this going to do to the value of property along the Rock River?"

Anonymous
"If you come to us with improvements to the river, depth (increase) and usability we will be behind you 100%. The river depth is not something residents are willing to have you decrease. You did not come up with acceptable solutions to the issue of safety at the dam."

Anonymous
"More time to ensure as not making a mistake!"

Anonymous
"Please, leave the dams in place."

Anonymous
"Removal of any dams is going to decrease property value and also water levels are already low we can not afford to lose 2-3 foot!"

Anonymous
"Can we study the possibility of dredging the Rock River to offset the water surface elevation drop?"

Anonymous
"I am from the Back water Gamblers, the city has poored thousands of dollars into our site and it would be awful if that was nothing. Save Back water Gamblers!

Anonymous
"More visible signs for the dam need to be put in place and leave dams as is."

Anonymous
"The Backwater Gamblers, the fan, the community need the best case scenario, no matter what."

Anonymous
"Removal of the dams is ridiculous. Maybe instead of putting dam signs out of view and behind trees, you make them visible. Easily could make a banner and hang it from the Milan bridge. Have maps at the ramps where the dams are located. Make the dams more known and educate people about them and their whereabouts. You will destroy one of the few good things about Moline and the Quad Cities."

Anonymous
"My family moved to the river because of the river, we've spent tens of thousands of dollars on boats, jet ski, and other recreational river toys. If dams are removed, anyone with money will leave and then we'll be Fruitland. Please install signage at every public boat ramp to the dangers and signage up to the dams. Our property value will plummet with the removal of the dams because river will become a creek."

Anonymous
"I believe in safety and the pure intent behind this study. However, there are so many ways to increase signage and awareness without interfering with our economy, water and recreation. Please don't proceed on any removal options without more effort at alternatives. My email was not on the sign in sheet. Please add strafcat@gmail.com"

| | |
|---|---|
| **From:** | Randy Heggen |
| **To:** | DNR.OWRPlanning |
| **Subject:** | [External] Sears and Steel Dam |
| **Date:** | Monday, March 30, 2026 4:34:06 PM |
| **Attachments:** | BEST plan.docx<br>plan observations.docx<br>buoys.docx |

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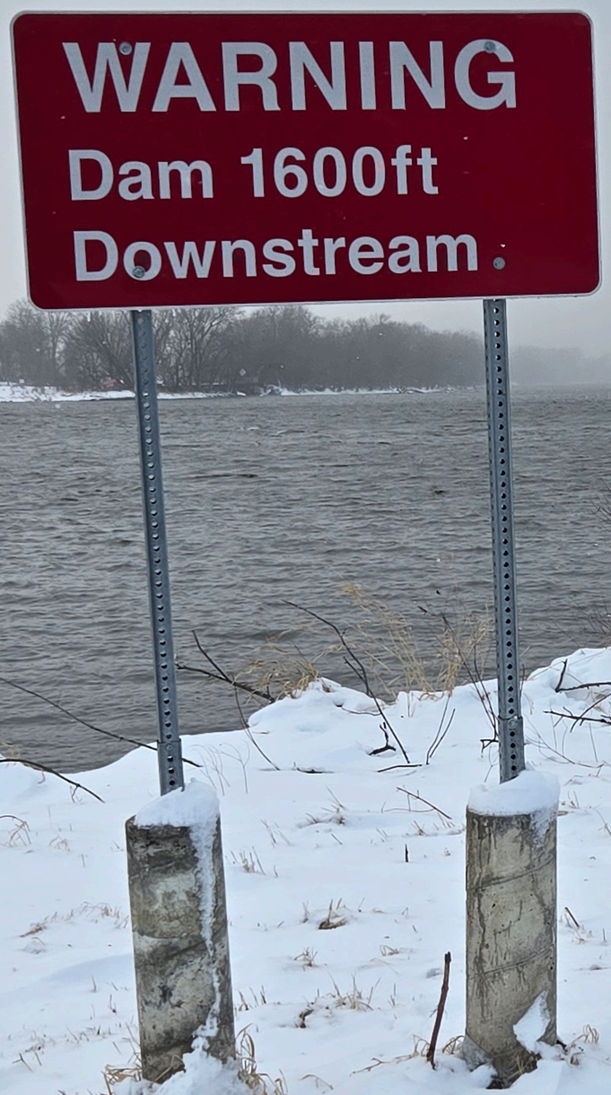
Dear DNR Folks,

I am adamantly opposed to all plans presented at the public forum hosted by DNR and Sen. Michael Halpin.

Attached are options and ideas to make the river enjoyable and safer.

Please let me know if you have any questions.

--
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WARNING
Dam 1600ft
Downstream

# B.E.S.T.

BEST is a safety plan! **"Boating Enjoyed SAFELY Together"**

Education is the key point of SAFETY!!

Providing education and a "safety checklist" is the GOAL!!

Signage located at docks, boat ramps and recreation area.

Suggesting to boaters, swimmers, kayak and canoeing enthusiasts AND those who do "floating" expeditions on the QC waterways!! Smaller craft without motors are more at risk!! Swimming ALONE is never a good idea!

Checklists for ALL participants, PFD's, throwable seat cushion even an anchor for a canoe IS advisable, FIRE extinguishers AND WARNING and SIGNALING devices. Voices do not travel far over water. A horn for proper use on boats, whistles or air horns for other purposes is a must!!

A program (administered by DNR perhaps) conducted in classrooms.

Coast Guard Auxiliary offers certifications for ALL people!

If you purchase a kayak OR a canoe, take first voyages on a LAKE or POND. Never on a river with current, which affects can be dangerous!!

# BUOYS

**Placement of additional buoys is KEY to safety!! The distance across the dam is 712 feet. Instead of a SINGLE cable running across, TWO intermediate anchors are suggested, making 3 sections approximately 237 feet long. This would provide EASIER and safer to install and repairs if damage occurs as opposed to complete damage to buoy system. Also with 3 sections in place, using stainless chain of appropriate size facilitates repairs if needed. Determining size, strength etc. The anchors could be TWO weights, creating better holding strength and easier installation initially. Sub buoys just above river floor for locating with GPS which would be recorded when installed. Proper spacing of buoys also TBD. And fastening to chain would be easier than cable used previously.**

Video detail | Watch Live: | when does | Artemis 2 r | Rock Island | Ask Gemini

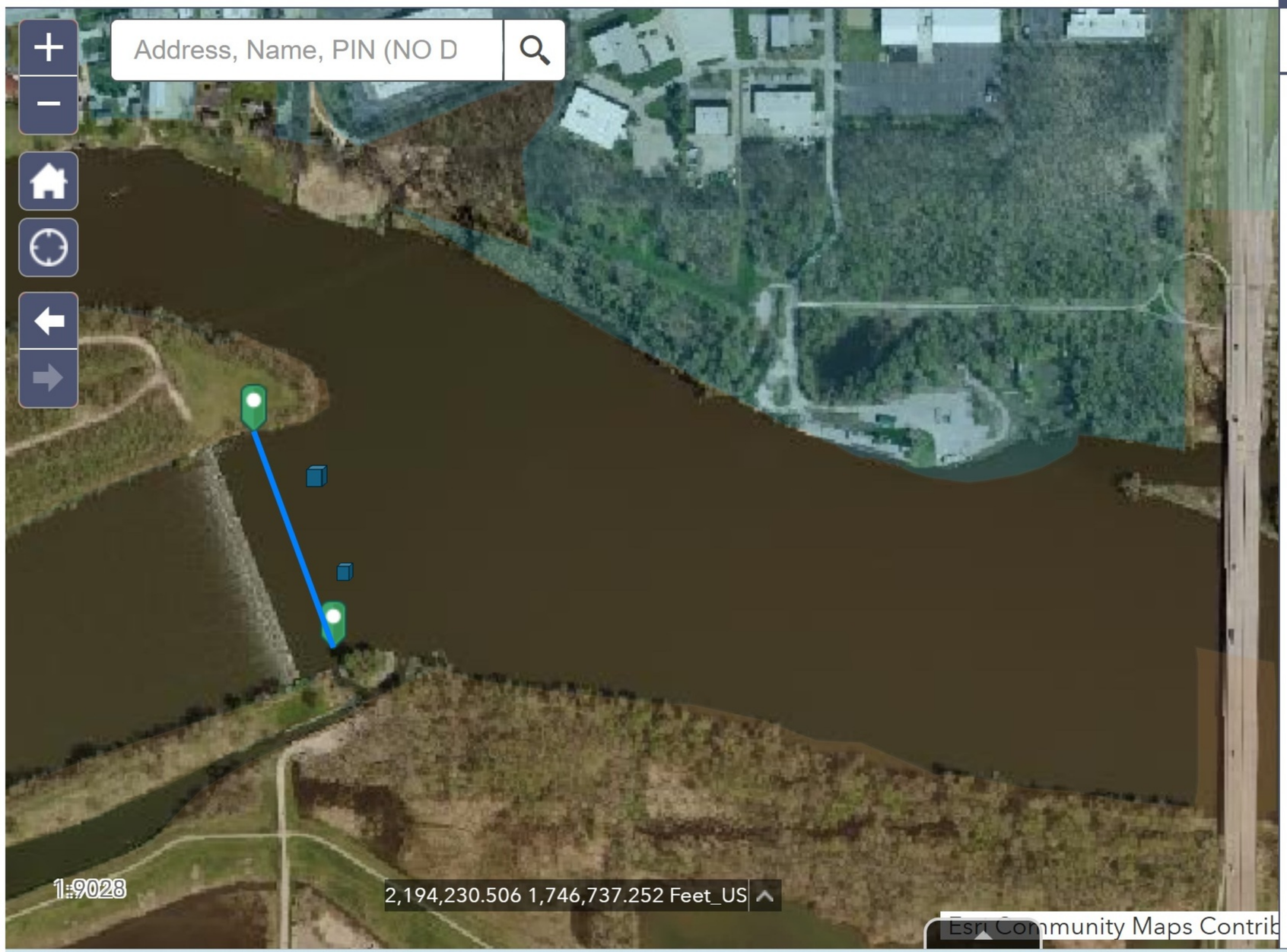
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Rock Island County GIS DEPARTMENT

# Rock Island Co GIS

Public Mapping App RICO GIS

Address, Name, PIN (NO D




## Measurement

Feet

Measurement Result

712.2 Feet

Clear

Press **CTRL** to enable snapping

55°F Clear

Search

4:21 AM 3/21/2026

# Obvious flaws in plans presented.

The plans discussed at the forum overlooked the entirety of the areas that would be impacted by Dam modifications. The next Dam UP is 40 miles. Water levels would be affected the ENTIRE distance. Focus was only placed on the immediate areas adjacent to Steel Dam and Sears Dam. HUGE oversight to say the least.

The Hennepin Canal is fed VIA water upstream. Loss of depth WILL affect the HUC area and marsh areas wildlife depend on as well. NOTHING was examined in the plans.

Corps of Engineers collaboration is needed.