UPPER MISSISSIPPI RIVER RESTORATION
FEASIBILITY REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

BEAVER ISLAND
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

POOL 14, UPPER MISSISSIPPI RIVER MILES 513.0-517.0
CLINTON COUNTY, IOWA

APPENDIX E

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE DOCUMENTATION REPORT

UPPER MISSISSIPPI RIVER RESTORATION
FEASIBILITY REPORT
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APPENDIX E

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE DOCUMENTATION REPORT

EXECUTIVE SUMMARY

A. Background. This report summarizes the Phase I and Phase II Hazardous, Toxic, and Radioactive Waste (HTRW) Environmental Site Assessments (ESA) for the Beaver Island Habitat Rehabilitation and Enhancement Project (HREP). The Phase I and Phase II ESAs were completed in accordance with Engineering Regulation (ER) 1165-2-132, *HTRW Guidance for Civil Works Projects*; ER 405-1-12, *Real Estate Handbook*; American Society for Testing and Materials (ASTM) Practice E 1527-13; and ASTM Practice E 1903-11.

B. Conclusions. The HTRW Study Area of Interest (Study Area) is comprised of 1,678 acres of interconnected backwaters, secondary channels, wetlands, and floodplain habitat. Specifically the Study Area encompasses portions of Beaver Island, which is located along the right descending bank of the Upper Mississippi River in Clinton County, Iowa. Beaver Island (previously known as Big Beaver Island) is in Pool 14, between river miles 513.0 and 517.0, adjacent to the City of Clinton, Iowa.

The Phase I ESA revealed evidence of a Recognized Environmental Condition (REC) that could potentially affect the Study Area. The REC consists of the historic and extant presence of industrial and commercial activity immediately adjacent to the Study Area, as well as a documented release of hydraulic oil into Beaver Slough.

This REC had the potential to impact sediments within the Study Area. As such a Phase II site investigation to include soil sampling was completed in March 2014 in select areas of the Study Area where sediments could be potentially disturbed during HREP construction or operation. Five borings were installed to depths of 8 to 12 feet below the sediment surface. Soil samples were collected from each boring and laboratory analyzed for pH, Volatile Organic Compounds, Semi-Volatile Organic Compounds, heavy metals, and Polychlorinated Biphenyls. The laboratory analytical results were compared to the Iowa Department of Natural Resources Soil Standards (Chapter 137 Land Recycling Program) and the US Environmental Protection Agency Region 9 Soil Screening Levels. No chemicals of concern were detected that were above the standards.

C. Recommendations. Based on the Phase 1 ESA and subsequent Phase II HTRW investigation, no further HTRW assessment is recommended. In addition, no restrictions are required on the proposed project features.

D. Limitations. No ESA can wholly eliminate uncertainty regarding the existence of recognized environmental conditions concerning a property. This assessment is intended to reduce, but not eliminate, uncertainty regarding the existence of recognized environmental conditions in connection with a property with reasonable limits of time and cost. Continuing the Environmental Due Diligence Audit process beyond these ESAs may reduce uncertainty, or reveal unidentified environmental liabilities. If any previously unaddressed recognized environmental condition should arise, this report will be revisited.

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HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE DOCUMENTATION REPORT

I. GENERAL

A. Authority. The authority for the Upper Mississippi River Restoration Beaver Island Project derives from the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662), Section 1103. The original authorizing legislation has been amended five times since its enactment; WRDA 1990, Section 405; WRDA 1992, Section 107; WRDA 1999, Section 509; 1999 Water Resources Development Technical Corrections, Section 2; and WRDA 2007, Section 3177.

B. Guidance and Policy. The Corps' Engineering Regulation (ER) providing guidance for the conduct of Civil Works Planning Studies is contained in ER 1105-2-100. The policies and authorities outlined in ER 1165-2-132, *Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works Projects*, and ER 405-1-12, *Real Estate Handbook*, were developed to facilitate the early identification and appropriate consideration of HTRW issues in all of the various phases of a water resources study or project. Division Regulation 1165-2-132 provides divisional guidance for HTRW assessment for Civil Works projects. American Society for Testing and Materials (ASTM) Practice E 1527-13 and ASTM Practice E 1903-11 provide a comprehensive guide for conducting Environmental Site Assessments (ESA). These references provide information on what considerations are to be factored into project planning and implementation. The policy of the Corps is to avoid construction of Civil Works projects when HTRW is located within project boundaries or may affect or be affected by such projects.

II. INTRODUCTION

A. Purpose and Scope. The specific purpose of an HTRW Documentation Report is to adequately document an appropriate inquiry into HTRW activities on potential project lands. The scope of this report documents the HTRW investigation for the Beaver Island HREP.

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This HTRW inquiry is required in order to minimize and prevent Federal liability under the Comprehensive Environmental Response, Compensation and Liability Act and to reduce any threats to project workers and avoid costly delays associated with environmental abatement activities. Appendix E-A contains a list of acronyms used in this report. A list of documents and records reviewed or referenced is contained in Appendix E-B

B. Limiting Conditions and Methodologies Used. The techniques used to assess HTRW contamination within and adjacent to the Study Area consisted of review of aerial photographs and topographic maps, conducting interviews and site visits. Also, a search of federal and state environmental databases was conducted. The scope of inquiry was limited to investigating onsite HTRW potential within the project boundaries as well as offsite HTRW potential within a reasonable distance (according to ASTM standards) from the project.

III. SITE DESCRIPTION

The Study Area is comprised of portions of Beaver Island, which is located along the right descending bank of the Upper Mississippi River in Clinton County, Iowa. Beaver Island (previously known as Big Beaver Island) is in Pool 14 between river miles 513.0 and 517.0, adjacent to the City of Clinton, Iowa. General project coordinates for Beaver Island include portions of Sections 13, 18, 19, 23, 24, 25, 26, Township 81 North, Range 6 and 7 East of the Fifth Principal Meridian (Clinton County, Iowa). A map of the Study Area is included in Appendix E-C.

A. Physical Setting Sources. The Study Area is located within the geologic flood basin of the Mississippi River Valley; a deeply entrenched valley cut into Paleozoic sedimentary rocks and overlying Quaternary deposits. Although exposures of Paleozoic carbonate bedrock are common along the valley walls, fewer outcrops occur along this reach of the river because of extensive Illinoisan glaciation. Eroded remnants of Pre-Illinoisan till may be present on uplands along this reach.

Sediments and soils are expected to be Quaternary alluvial deposits relating to lateral accretion, vertical accretion, and/or mass-wasting, colluviation, and/or alluvial fan development along valley margins. Most pre-settlement deposits relate to a period between 21,000 to 9,500 years ago during which valley gradient changed, post-glacial valley train outwash entered the river, and a series of catastrophic floods occurred due to the drainage of glacial lakes. These events created a series of channel belts and terraces. In contrast to the early and middle Holocene, Late Holocene valley evolution in this reach is characterized by main valley aggradation and stability of the main channel. Currently the Study Area contains 1,678 acres of interconnected backwaters, secondary channels, wetlands, and floodplain habitat.

Five geotechnical borings were taken in the inundated areas of the Study Area in March 2014. These borings indicated the sloughs and backwater stratigraphy consists of 1 to 5 feet of clay overlying medium to fine sands to a depth of at least 10 feet. Sources for information on the Study Area's physical setting were the 2013 United States Geological Survey Topographic Map, and the May 2003 HTRW Documentation Report for Dredged Material Placement, Beaver Island Reach.

B. Historical Use Information. Based on aerial photos (1937, 1951, 1963, 1969, 1995, 2002, 2010 and 2012), topographic maps (1890s, 1953, 1991, and 2013) and historical references and interviews, the Study Area has remained undeveloped. The use of the Study Area appears unchanged since the 1890s. Since the end of the 19th century to the present day the Study Area has been a mix of woodlands, backwaters and floodplain habitat. To the east and northeast of the Study Area, Beaver Island has been slightly developed beginning in the early 19th Century. This area has been utilized for farming, residential homes, some commercial structures, hunting and recreation. Beaver Island (including the Study Area) has been utilized for decades for various outdoor recreation activities, including hunting, trapping, and fishing. Onshore to the west the City of Clinton, Iowa developed, as did the Village of Albany, Illinois to the east. Following the completion in the late 1930s of the 9-Foot Navigation Channel, and associated lock and dam system on the Mississippi River, water elevations and flow dynamics changed in and around Beaver Island. Since that time barges have used various locations on the perimeter of Beaver Island as mooring points.

At the northern end of Beaver Island an area known as Gasoline Alley was utilized as a boat refueling station. For the most part the properties located on the island were used for residential homes, farming and ranching, hunting, and recreation. The primary structures built on the island since the early 1900s included a grocery store and general store, a schoolhouse, various barns, and houses and cabins.

Based on the 1953 topographic map, a pipeline was present, traversing from east to west across the island, with a spur to the north. In the 1950s electricity was brought to the island, and high voltage power lines are present today, entering from the south and crossing the island, eventually exiting on the west border. The power lines follow the same path as the aforementioned pipeline. These power lines do not appear to provide power to any structures on Beaver Island, and merely pass through the island to reach the opposite shore.

Dredging has occurred in Beaver Slough 15 times since 1942, and the dredged material was placed numerous places outside of the Study Area. However, it appears placement occurred prior to the 1940s along the western shore of Beaver Island. The last dredging event in Beaver Slough occurred in 1999. Dredging has also occurred in the Mississippi River Channel to the east of Beaver Island. Ten dredging events have occurred in the Mississippi River Channel since the early 1940s, with placement outside the Beaver Island area. The last dredging event occurred in 2013.

Currently the Study Area is utilized as part of the Upper Mississippi River National Wildlife and Fish Refuge. The Study Area contains 1,678 acres of interconnected backwaters, secondary channels, wetlands, and floodplain habitat. To the northeast of the Study Area, Beaver Island has been slightly developed, utilized for farming, residential homes, some commercial structures, hunting and recreation. To the north and west the Study Area is bounded by Beaver Slough, and the City of Clinton, Iowa. To the south and east is the main channel of the Mississippi River, and the Village of Albany, Illinois.

IV. FINDINGS

This section serves to summarize the Recognized Environmental Conditions (RECs) determined by the Phase I ESA. The results of the records review, interviews and site reconnaissance identified the following HTRW related concerns:

- 4 Resource Conservation and Recovery Act (RCRA) Small Quantity Generator sites are located within 1 mile from the Study Area. Archer Daniels Midland (ADM) Polymer and ADM Corn Processing are the closest, located adjacent to Beaver Slough.
- 12 RCRA Conditional Exempt Small Quantity Generator sites are located within 1 mile of the Study Area. Darling International is the closest, located adjacent to Beaver Slough.
- 5 RCRA Non Generator sites are located within 1 mile of the Study Area. The nearest is Former Waukesha Engine Division, adjacent to Beaver Slough.
- 59 Emergency Response Notification System sites are located within 1 mile of the Study Area. ADM Corn Processing is the closest, located adjacent to Beaver Slough.
- 3 Hazardous Materials Incident Report System sites are located within 1 mile of the Study Area. ADM Corn Processing is the closest, located adjacent to Beaver Slough.
- 43 US Brownfields sites are located within 1 mile of the Study Area. These sites are located in the City of Clinton, to the west and north of Beaver Island.
- 4 Toxic Chemical Release Inventory System sites are located within 1 mile of the Study Area. Darling International is the closest, located adjacent to Beaver Slough.
- 5 Toxic Substances Control Act sites are located within 1 mile of the Study Area. ADM Corn Processing is the closest, located adjacent to Beaver Slough.
- 4 FIFRA/TSCA Tracking System pesticide compliance sites are located within 1 mile of the Study Area. ADM Corn Processing is the closest, located adjacent to Beaver Slough.
- 2 Section Seven Tracking System insecticide, fungicide and rodenticide compliance sites are located within 1 mile of the Study Area. Vertex Chemical is the closest, located southwest of Beaver Island adjacent to Beaver Slough.
- 1 Polychlorinated biphenyl (PCB) Activity Database site is located within 1 mile of the Study Area. Clinton Steel and Salvage is located ¼ mile west of Beaver Island.
- 109 Facility Index System sites are located within 1 mile of the Study Area. Darling International is the closest, located adjacent to Beaver Slough.
- 5 PCB Transformer registration sites are located within 1 mile of the Study Area. ICP-Beaver Channel Substation is the closest, located adjacent to Beaver Slough.
- 9 US Aerometric Information Retrieval System (AIRS) regulated air pollution source sites are located within 1 mile of the Study Area. Darling International is the closest, located adjacent to Beaver Slough.
- 7 Iowa (IA) Contaminated Sites Database sites are located within 1 mile of the Study Area. Union Pacific Railroad is the closest, located ¾ mile northwest of Beaver Island.
- 1 IA Solid Waste Facility is located within 1 mile of the Study Area. Hawkeye Disposal Services is located ½ mile west of Beaver Island.

- 21 IA Leaking Underground Storage Tanks (LUST) sites are located within 1 mile of the Study Area. The sites are located within ½ mile of the north end of Beaver Island.
- 1 IL LUST site is located within 1 mile of the Study Area. Expressland #24 is located ¾ mile southeast of Beaver Island.
- 33 IA Spill Incidents sites are located within 1 mile of the Study Area. A hydraulic oil release at an ADM Municipal Dock is the closest, located within Beaver Slough.
- 2 IA Land Recycling Program Voluntary Cleanup sites are located within 1 mile of the Study Area. Union Pacific Railroad Company is closest, located ¾ mile northwest of Beaver Island.
- 9 IA National Pollutant Discharge Elimination System permitted sites are located within 1 mile of the Study Area. Darling International is the closest, located adjacent to Beaver Slough.
- 9 IA AIRS Minor and Title V air pollution source sites are located within 1mile of the Study Area. Darling International is the closest, located adjacent to Beaver Slough.
- 1 IL AIRS air permit site is located within 1 mile of the Study Area. Agri Bunge LLC is located ¾ mile southeast of Beaver Island.
- 13 IA Tier 2 chemical storage sites are located within 1 mile of the Study Area. Darling International is the closest, located adjacent to Beaver Slough.
- 12 RCRA Conditional Exempt Small Quantity Generator sites are located within 1 mile of the Study Area. Darling International is the closest, located adjacent to Beaver Slough.
- 13 US Historic Auto Stations service station sites are located within 1 mile of the Study Area. 2573 Camanche Avenue is the closest, located ¼ mile northwest of Beaver Island.
- 2 Historic Cleaners sites are located within 1 mile of the Study Area. 2502 Camanche Avenue is the closest, located ¼ mile northwest of Beaver Island.

The records review indicated the presence of many industrial faculties to the immediate north and west of the Study Area, a historic hydraulic oil spill in Beaver Slough, and historical commercial and industrial development adjacent to the Study Area dating back to the 1930s. Interviews and site reconnaissance indicated that significant sedimentation has occurred within the Study Area since the 1930s.

The proximity of commercial/industrial development near the Study Area, a documented release adjacent to the Study Area, and the sedimentation of the lakes and backwaters within the Study Area combine to indicate a REC. As commercial and industrial development has occurred adjacent to and upstream of the Study Area over the past 100 years, it is presumed that disposal, spillage and releases of hazardous substances and/or petroleum products has occurred due to the length of time that has passed and the significant amount of locations where such materials have been used. Prior to the 1970s, these disposal, spills and releases would not have been documented. The occurrence of spills is demonstrated by a spill of hydraulic oil in Beaver Slough in 2005.

Given the riverine environment in which the Study Area occurs, most releases of hazardous substances and/or petroleum products would simply be carried downstream by the Mississippi River and therefore cease being a localized concern. However, numerous sources indicate that significant sedimentation has occurred in the Study Area since the 1930s. This sedimentation is the main reason for the implementation of an HREP. Soil borings were conducted in March 2014 that indicated that unconsolidated silts and clays are present in the backwaters of the Study Area.

Therefore, there exists the potential for these silts and clays to have come in contact with hazardous substances and/or petroleum products upstream of the Study Area, and transported with river flow into the Study Area, to be eventually deposited in the lakes, streams, marshes and backwaters of the Study Area.

V. HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE SOIL SAMPLING

Phase II HTRW soil sampling was conducted based on the REC concerns from the Phase I ESA, to determine the presence and magnitude of any contaminants in the proposed work area sediments, five locations were selected for sample collecting. These locations were selected based on known sediment accumulation, areas likely to require work, including dredging, and accessibility. Borings were hand-augured using stainless steel sampling equipment on March 29, 2014. The borings were installed from a boat into the bottom of the submerged location. The boring depths ranged from 8 to 12 feet in depth from the lake/stream bottom. Typical boring lithology consisted of lean to fat clays (2 to 5 feet thick), overlying fine to medium grained sand. Sediment samples were collected from the clay layers, homogenized in a stainless steel bowl, placed in sterile marked jars, and placed in an iced cooler for shipping to a laboratory for analysis. See Appendix E-D for a map with sample locations.

Six sediments samples were collected; one each from borings B1-14-01, B1-14-03, B1-14-04 and B1-14-05, and two from B1-14-02 (one was a duplicate sample). Boring B1-14-01 was installed in the southern end of a main channel flowing through the middle of Beaver Island. Borings B1-14-02 and B1-14-03 were installed in backwater “finger” lakes. Boring B1-14-04 was installed at the mouth of the stream that flows from Beaver Slough south into Beaver Island. Boring B1-14-05 was installed at the head of that stream immediately adjacent to Beaver Slough

Each sample was analyzed by Test America Inc., a National Environmental Laboratory Certified Laboratory, of Cedar Rapids, Iowa. The samples were analyzed for pH, volatile organic carbons, semi-volatile organic carbons, metals and poly-chlorinated hydrocarbons. The laboratory analytical results were compared to the Iowa Department of Natural Resources Soil Standards (Chapter 137 Land Recycling Program) and the US Environmental Protection Agency Region 9 Soil Screening Levels. No chemicals of concern were detected that exceeded the standards.

VI. CONCLUSIONS

Based on the lack of or low concentrations of chemicals of concern in the sediment samples, it appears the REC concern has been mitigated.

VII. RECOMMENDATIONS

No further HTRW assessments are required for the Beaver Island HREP. If the scope of work for restoration changes significantly, it is recommended that further HTRW assessments be conducted for this project.

VIII. LIMITATIONS

No ESA can wholly eliminate uncertainty regarding the existence of recognized environmental conditions concerning a property. This assessment is intended to reduce, but not eliminate, uncertainty regarding the existence of recognized environmental conditions in connection with a property with reasonable limits of time and cost. If any previously unaddressed recognized environmental condition should arise, this HTRW Documentation Report will be revisited. Title searches and research into environmental liens were not conducted for this report, but will be required prior to the construction phase of the preferred alternative.

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APPENDIX E-A
ACRONYMS

Appendix E-A
Acronyms

ADM	Archer Daniels Midland
AIRS	Aerometric Information Retrieval System
ASTM	American Society for Testing and Materials
EM	Engineering Manual
ER	Engineering Regulation
ESA	Environmental Site Assessment
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
HREP	Habitat Rehabilitation and Enhancement Project
HTRW	Hazardous, Toxic, and Radioactive Waste
LUST	Leaking Underground Storage Tanks
PCB	Polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
TSCA	Toxic Chemical Substance Inventory
USACE	United States Army Corps of Engineers
WRDA	Water Resources Development Act

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APPENDIX E-B
REFERENCES AND ABSTRACTS

Foth Infrastructure & Environment LLC, Phase I Environmental Site Assessment, Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 - Cedar Rapids, Iowa, February 2010 and Sections 11, 12 and 13, April, 2010

ASTM E 1527-05, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process

ASTM E 1528-06, Standard Practice for Environmental Site Assessments: Transaction Screen Process

ASTM, Standard E-1903-97 (2002)-Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process. ASTM, Philadelphia, PA, 1997

USACE, Division Regulation 1165-2-9, *Water Resources Policies and Authorities - Hazardous, Toxic and Radioactive Waste Guidance for Civil Works Projects*

USACE, EM 385-1-1, *Safety and Health Requirements Manual*, ENG Form 5044-R, September 3, 1996. http://www.hnd.usace.army.mil/techinfo/engpubs.htm

USACE, EM 200-1-3, *Requirements for the Preparation of Sampling and Analysis Plans*, February 1, 2001. http://www.hnd.usace.army.mil/techinfo/engpubs.htm

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USACE, ER 405-1-12, *Real Estate Handbook*, Chapter 8

USACE, ER 500-1-1, *Natural Disaster Procedures*

USACE, Policy Guidance Letter ER 1105-2-100 No. 34, CECW-PA, *Non-CERCLA Regulated Contaminated Materials at Civil Works Projects*, 5 May 1992

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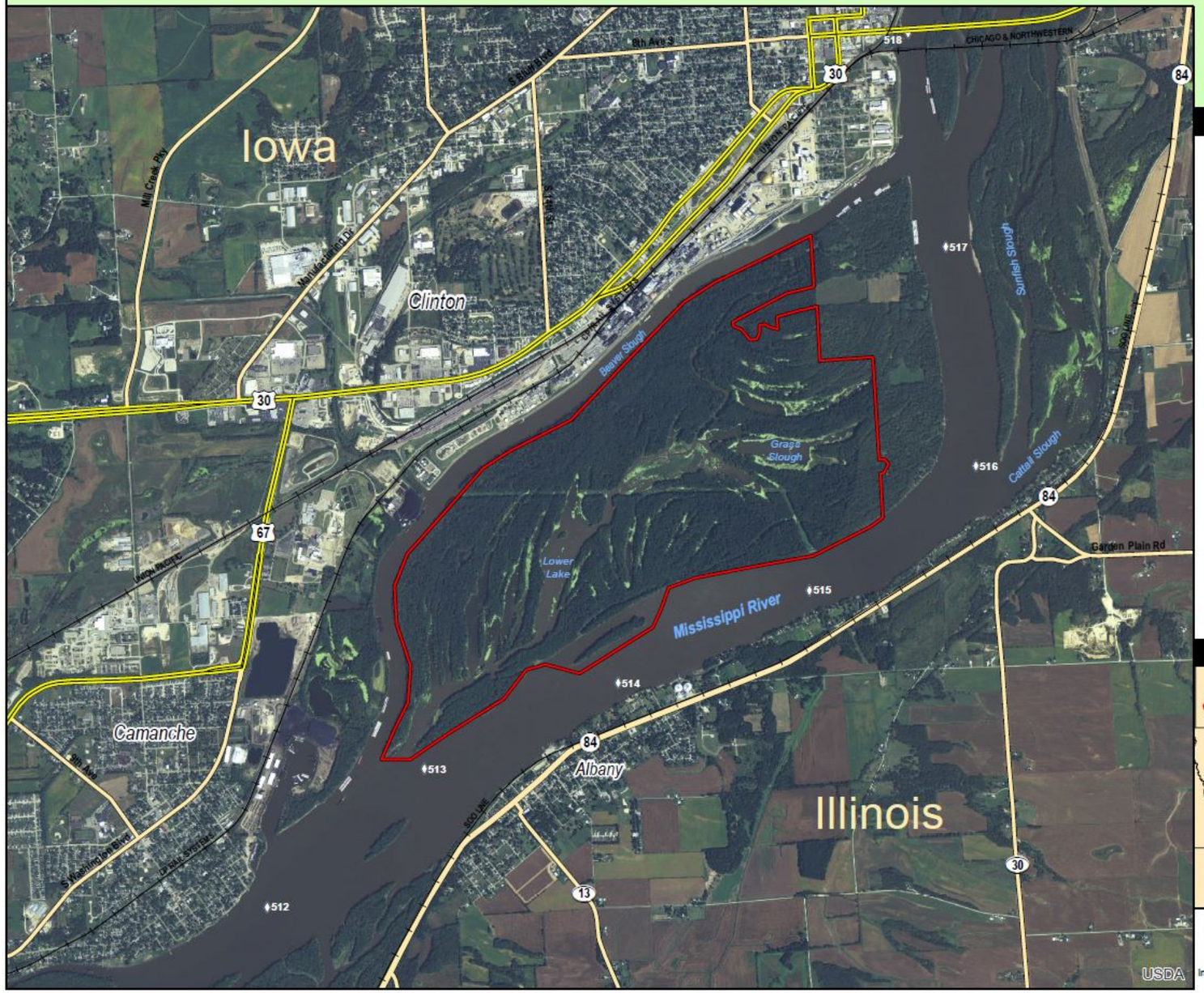
APPENDIX E-C
STUDY AREA MAP

Beaver Island HREP - Overview



Legend

- Project Boundary
- US Highways
- State Highways
- Major Roads
- Railroads
- River Miles

N

0 2,000 4,000

Feet

Location Map

Map Production Date: 2014-05-06

Imagery Source: USDA NAIP

US Army Corps of Engineers
Rock Island District

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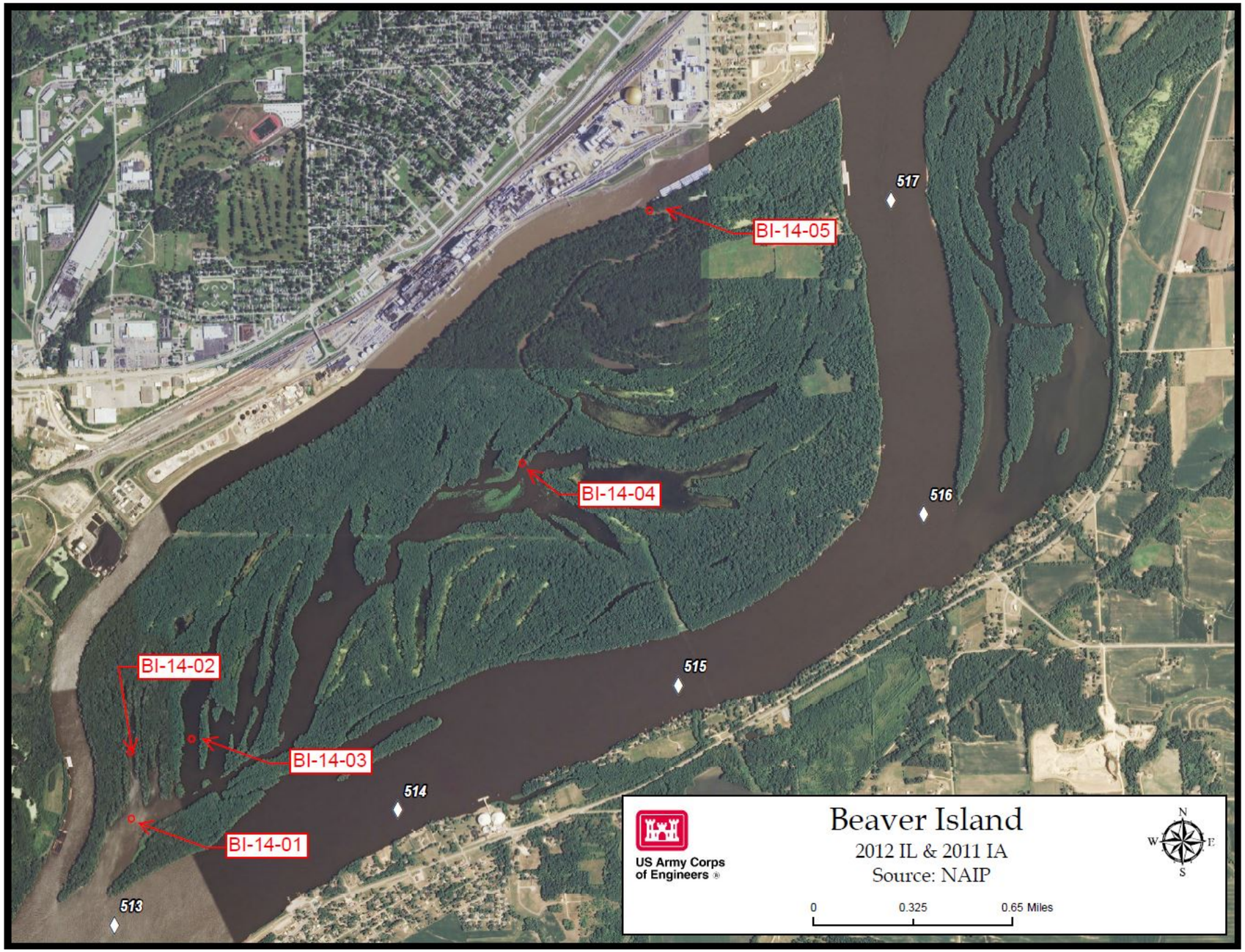
APPENDIX E-D
SEDIMENT SAMPLING LOCATIONS MAP


BI-14-05
BI-14-04
BI-14-02
BI-14-03
BI-14-01
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US Army Corps of Engineers
Beaver Island
2012 IL & 2011 IA
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