

MUSCATINE COUNTY – UNIFORM LEVEE IMPROVEMENTS ENVIRONMENTAL NARRATIVE

July 1, 2020

Prepared for:

MUSCATINE ISLAND LEVEE DISTRICT

18238 County Road X61
Muscatine, IA 52761-8637

Prepared by:

KLINGNER & ASSOCIATES, P.C.

610 North 4th Street, Suite 100
Burlington, IA 52601

Project No. 6496-10/20-2942.002

Quincy, IL	Galesburg, IL	Burlington, IA	Davenport, IA	Pella, IA	Columbia, MO	Hannibal, MO
217.223.3670	309.342.4042	319.752.3603	563.359.1348	515.612.7402	573.355.5988	573.221.0020

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A. PROJECT DESCRIPTION

1. Beneficiaries

The Project is located along an existing Mississippi River mainstream levee in Muscatine in southeast Iowa (Muscatine County). The residents, major businesses and industries located within the approximate 30,000 acres of Muscatine Island will benefit from the Muscatine Island Levee District's (District) current proposed levee improvement project. A copy of the Applicant Certification Clause is provided as Appendix A.

2. Proposed Construction

A Site Location Map and Site Maps (including a Plan and Profile sheet) are provided as Appendices B and C, respectively.

A Preliminary Engineering Report was developed to describe the project components, project feasibility, proposed construction methods, cost estimate, permitting and project schedule. A copy of the report is provided as Appendix D.

3. Need and Purpose

The goal of the District's currently proposed project is to provide a more uniform flood protection for the Muscatine Island area and improve the reliability of the existing flood protection system.

According to the National Climatic Data Center, 80% of historic floods in Muscatine have occurred since 2000 with 60% of them occurring since 2010. The levee improvements will add additional flood protection to the major industrial facilities, local community water wells, waste water treatment plant, commercial offices, residential developments and agriculture ground in the area.

4. Alternatives considered for the proposed Project include:

1) Alternative 1: Do-nothing

- a. Under this alternative, the status-quo would be maintained. The more frequent and severe flooding would continue to devastate the area residents and businesses.

2) Alternative 2: Currently-Proposed Uniform Levee Improvements

- a. Under this alternative, the Project site will be improved to provide additional flood protection for the Muscatine Island area. This alternative was selected over the "Do-nothing" alternative, as the "Do-nothing" would not meet the District's purpose and need of the project.

B. HISTORIC/ARCHEOLOGICAL RESOURCES

Based on a review of I-Sites Public Data Web Map, an online GIS and database for Iowa Archaeology, it appears there are no known archaeological sensitive sites within the Project site or area of potential effect. However, in accordance with Section 106

of the National Historic Preservation Act of 1966 (NHPA), consultation with the Iowa State Historic Preservation Office will be performed during the permitting process.

C. AFFECTED ENVIRONMENT

1. Affected Area

The Project is located along an existing mainstream Mississippi River levee in Muscatine in southeast Iowa (Muscatine County). The Project activities will be confined to the crown and landside of the existing levee approximately from Station 170+00 to 330+00 (see Plan and Profile sheet in Appendix C). Some areas along this levee stretch are located in close proximity to existing commercial/industrial facilities; these areas may necessitate the erection of a flood wall where earthen berms cannot be adequately extended and/or the right-of-way cannot be extended without demolition of existing structures. Much of the landside levee has additional rights-of-way where seepage berms have been constructed at the toe of the slope. The earthen fill will be placed upon the existing seepage berms wherever possible; however, some rights-of-way may need to be obtained to extend seepage berms further inland. All construction will be conducted on the landside of the levee outside the regulated floodway.

Photographs of the proposed project areas are provided as Appendix E.

There are no designated state or national parks, wildlife refuges, game preserves or wild or scenic rivers (as designated under the Wild and Scenic Rivers Act) located within or in the local vicinity of the proposed project activities.

Due to the nature of the project (improvements to an existing levee system), direct and indirect effects on native vegetation and wildlife are expected to be minimal. In some areas, the construction easement may encroach upon agriculture fields, undeveloped parcels, existing industrial/commercial properties, and areas designated as wetlands by the National Wetland Inventory. Attempts will be made during the engineering design process to minimize or avoid negative impacts.

2. Coastal Zones

The Project is not located within a designated coastal zone subject to the Coastal Zone Management Act. There are no proposed overwater structures as part of the proposal.

3. Wetlands

A wetland delineation of the Project area is not available. There are two locations within the proposed 100-foot construction easement that appear to infringe upon areas interpreted as wetlands by the National Wetlands Inventory using 2005 aerial imagery. Attempts to avoid or minimize impacts to wetland areas will be made during the engineering design process.

4. Floodplains

National Flood Insurance Program Flood Insurance Rate Maps of the project area (map numbers 19139C0325D and 19115C0150E) are provided as Appendix F.

The Project area appears by the effective FIRM panels to be located in “Area with Reduced Flood Risk due to Levee, Zone X”. There is no work proposed within a mapped 100- or 500- year floodplain.

5. Endangered Species

Formal consultation for Section 7 of the Endangered Species Act will occur concurrently with the Corps of Engineer permitting process.

The project was submitted through the U.S. Fish and Wildlife Service’s (USFWS) Information, Planning, and Conservation (IPaC) system to determine potential impacts to threatened or endangered species or critical habitat within the Project area. The Service indicated a total of eight (8) threatened, endangered, or candidate species that may be impacted by the proposed Project. A copy of the IPaC report is provided as Appendix G. In general, the project is not likely to impact six (6) of the eight (8) species due to specific habitat requirements and the lack of suitable habitat within the project area. If tree removal is required, a summer habitat assessment for Indiana Bat and Northern Long-eared Bat habitat may be required and coordination with USFWS may be warranted.

The Iowa Department of Natural Resources’ Natural Areas Inventory Interactive Mapping site was utilized to download a list containing endangered, threatened and special concern species within Muscatine County. A copy is provided in Appendix H.

6. Land Use and Zoning

The Project appears to be wholly outside the Muscatine corporate limit in a generally rural area of Muscatine County along the Mississippi River with no zoning. A copy of the Muscatine Zoning Map is provided as Appendix I.

7. Solid Waste Management

The proposed improvements will not result in production of solid waste.

8. Hazardous or Toxic Substances

The proposed project/improvements will not result in production of any toxic, hazardous, or radioactive substances.

9. Water Resources

There are no proposed changes to surface and/or underground water resources within the Project area. A Stormwater Pollution Prevention Plan will be required to be developed and a National Pollution Discharge Elimination System (NPDES) permit acquired by the selected Contractor performing the work.

10. Water Supply and Distribution System

Due to the nature of the project, a water supply and distribution system will not be required.

11. Wastewater Collection and Treatment Facilities

Due to the nature of the project, a wastewater collection/treatment facility will not be required.

12. Environmental Justice (Executive Order 12898)

The proposed Project is located in a rural area. There are no proposed actions which will result in adverse human health or environmental impacts; based on this information, it appears the project will be in compliance with Executive Order 12898.

13. Transportation (Streets, Traffic and Parking)

General access to the Project area can be provided from County Road X61/Steward Road. New traffic patterns are not expected as a direct result of the proposed Project.

Worth noting, the proposed Project location is under ownership of the Muscatine Island Levee District. Most, if not all, of the rights-of-way are already owned by the District but certain portions of the Project may require additional property and/or construction easements.

14. Air Quality

Due to the nature of the project, the project will not result in air emissions beyond typical construction activities. This site is not located in a “non-attainment” area for any criteria pollutants.

15. Noise

The proposed project itself will not directly increase the local ambient noise levels beyond construction activities. Due to the generally rural location of the Project, there are no sensitive receptors (e.g., residences) to be affected at this time.

16. Permits

It is anticipated that United States Army Corps of Engineer permits will be required for the work on or near the Muscatine Island Levee District’s levee (federal interest levee system). It is likely that a Section 408 Permission will be required by USACE for this portion of the work, which will include a review of the design, a National Environmental Policy Act (NEPA) review, and a review of impacted Real Estate. A 408 Permission for a uniform levee improvement project involves detailed hydraulic and hydrologic modeling that looks at offsite impacts to other properties upstream and downstream of the project in accordance with the Rivers and Harbors Act of 1899.

Wetland impacts may occur but are expected to be minimal. Archaeological resources are not expected to be disturbed, but the State Historic Preservation Office

(SHPO) will be consulted (Section 106). All of these permits will be submitted through the Joint Permit Application process that involves the U.S. Army Corps of Engineers and the State of Iowa.

A Stormwater Pollution Prevention Plan (SWPPP) plan sheet will be developed by the Project Engineer and to be completed by the Contractor. The Contractor will be required to adhere to the requirements set forth by the SWPPP and their National Pollution Discharge Elimination System (NPDES) permit.

17. Public Notification/Controversy

No public notices have been made thus far. We are unaware of any current public controversy or objections.

18. Cumulative Effects

Based on the nature of the Project and surrounding sites/projects, no significant cumulative impacts are anticipated. There are no major resources, ecosystems, or human communities which will be directly or indirectly affected and no cumulative effects are likely.

D. MITIGATION

At this time, no mitigation is proposed or anticipated.

E. LIST OF ATTACHMENTS

- 1) Appendix A – Applicant Certification Clause
- 2) Appendix B – Site Location Map
- 3) Appendix C – Site Maps
- 4) Appendix D – Preliminary Engineering Report
- 5) Appendix E – Photographs
- 6) Appendix F – Flood Insurance Rate Maps
- 7) Appendix G – USFWS – IPaC Species List
- 8) Appendix H – Iowa T&E List
- 9) Appendix I – Muscatine, IA Zoning Map

APPENDIX A

APPLICANT CERTIFICATION CLAUSE

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Appendix A: Applicant Certification Clause

The applicant represents and certifies that it has used due diligence to determine that the description of the project site described herein is accurate with respect to the presence or absence of contamination from toxic and hazardous substances. The term “site” includes the entire scope of the project, including future phases of the project and all areas where construction will occur.

1. Is the site currently, or has it in the past 50 years, been used for any of the following operations or activities:
 - a. Generation of hazardous substances or waste?
_____ Yes ☒ No
 - b. Treatment, storage (temporary or permanent), or disposal of solid or hazardous substances or waste?
_____ Yes ☒ No
 - c. Storage of petroleum products?
_____ Yes ☒ No
 - d. Used/waste oil storage or reclamation units?
_____ Yes ☒ No
 - e. Research or testing laboratory?
_____ Yes ☒ No
 - f. Ordinance research, testing, production, use, or storage?
_____ Yes ☒ No
 - g. Chemical manufacturing or storage?
_____ Yes ☒ No
 - h. Weapons or ammunition training, use, or testing?
_____ Yes ☒ No
 - i. Iron works/foundry?
_____ Yes ☒ No
 - j. Railroad yard?
_____ Yes ☒ No
 - k. Industrial or manufacturing operation?
_____ Yes ☒ No

If any of the above operations ever occurred at the site, and if appropriate cleanup or other mitigation actions were performed in accordance with the local, State, and federal laws, please attach documentation of these actions.

Appendix A: Applicant Certification Clause

2. Do wells draw from an underlying aquifer to provide the local domestic water supply?
☒ Yes ☐ No
3. Has a federal, State, or local regulatory authority ever conducted an environmental assessment, environmental impact statement, or a preliminary assessment/site inspection, or similar environmental surveyor inspection report at the site? If yes, please list here and attach copies of these reports or results.
☐ Yes ☒ No
- 1)
-
- 2)
-
- 3)
-
- 4)
-
- 5)
-
4. Have any environmental or OSHA citations or notices of violation been issued to a facility at the site? If yes, please attach copies.
☐ Yes ☒ No
5. Have any unauthorized releases of hazardous substances occurred at any facility at the site which resulted in notification of the EPA's National Response Center?
☐ Yes ☒ No
6. Is any material containing asbestos or lead paint located at the site? If yes, please attach information concerning State and federal regulatory compliance.
☐ Yes ☒ No
7. Is there any equipment (electrical transformers, etc.) containing polychlorinated biphenyls (PCB) on the site? If yes, please attach a description of the equipment.
☐ Yes ☒ No
8. Are there underground or above ground storage tanks on the site? If yes, please attach a detailed description, including the number of underground storage tanks on the site, whether the tanks have been inspected (or removed) and the results of such inspections.
☐ Yes ☒ No
9. Has the site been tested for radon? If yes, please attach results.
☐ Yes ☒ No

Appendix A: Applicant Certification Clause

10. Have there been, or are there now any environmental investigations by federal, State or local government agencies that could affect the site in question? If yes, please attach available information.

_____ Yes ☒ No

The applicant acknowledges that this certification regarding hazardous substances and/or waste is a material representation of fact upon which EDA relies when making and executing an award. EDA reserves the right to terminate any award made in conjunction with the representations contained herein if, at any time during the useful life of the project, EDA becomes aware of the presence of hazardous materials or waste at the site, or that hazardous materials or waste have been inappropriately handled thereon.

Further, if it is determined at any time that the presence of hazardous materials or waste, or handling thereof, has been misrepresented, EDA may pursue other available legal remedies against the applicant.

Applicant's Name

Name and Title of Applicant's Authorized Representative

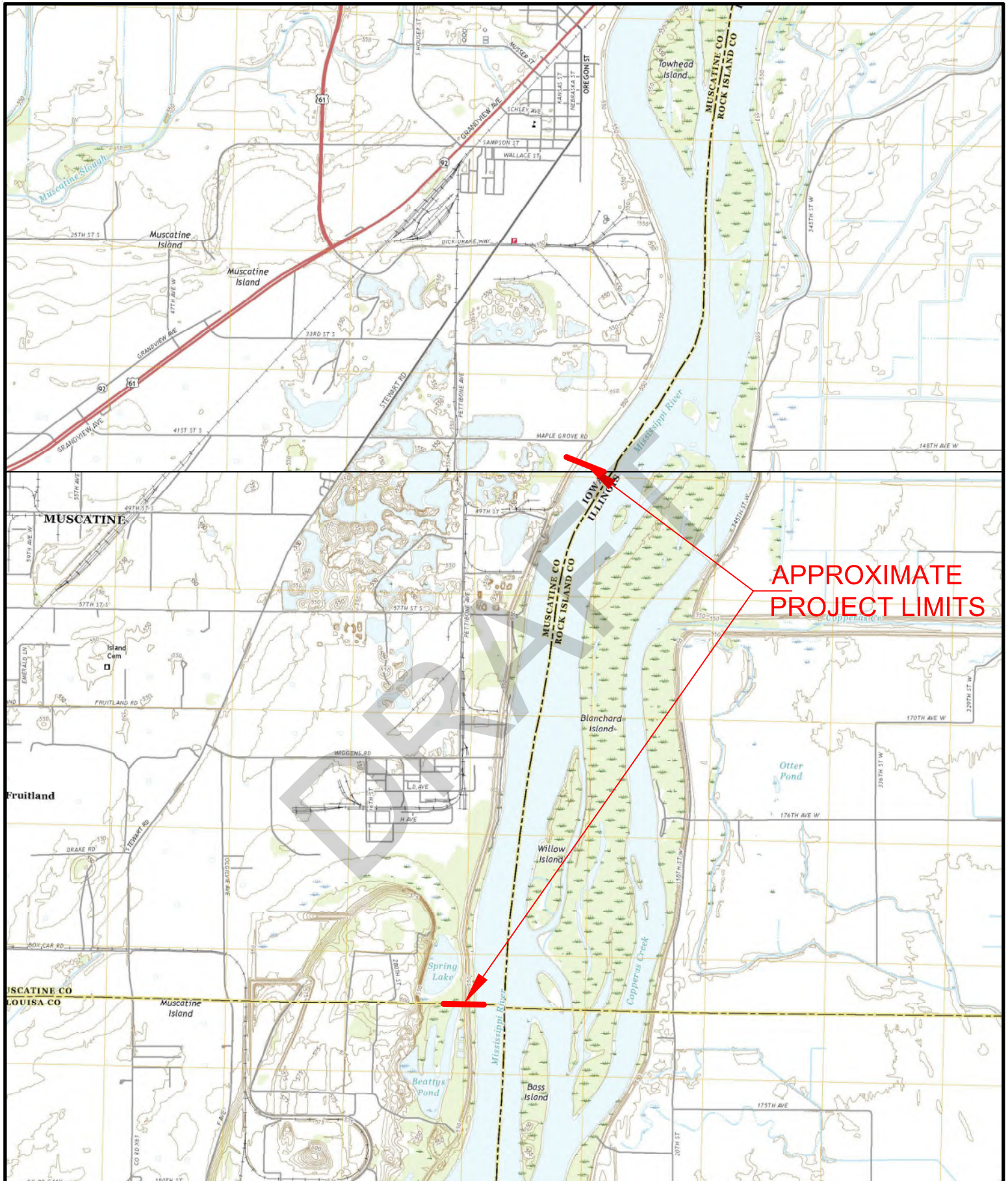
Signature of Applicant's Authorized Representative

Date

APPENDIX B

SITE LOCATION MAP

DRAFT



APPROXIMATE
PROJECT LIMITS

KLINGNER
& ASSOCIATES, P.C.
Engineers • Architects • Surveyors

Quincy, Illinois
616 North 24th Street
217.223.3670

www.klingner.com
Galesburg, IL Burlington, IA Pella, IA
Davenport, IA Hannibal, MO Columbia, MO

REVISION HISTORY	DATE	BY	DESCRIPTION

SITE LOCATION

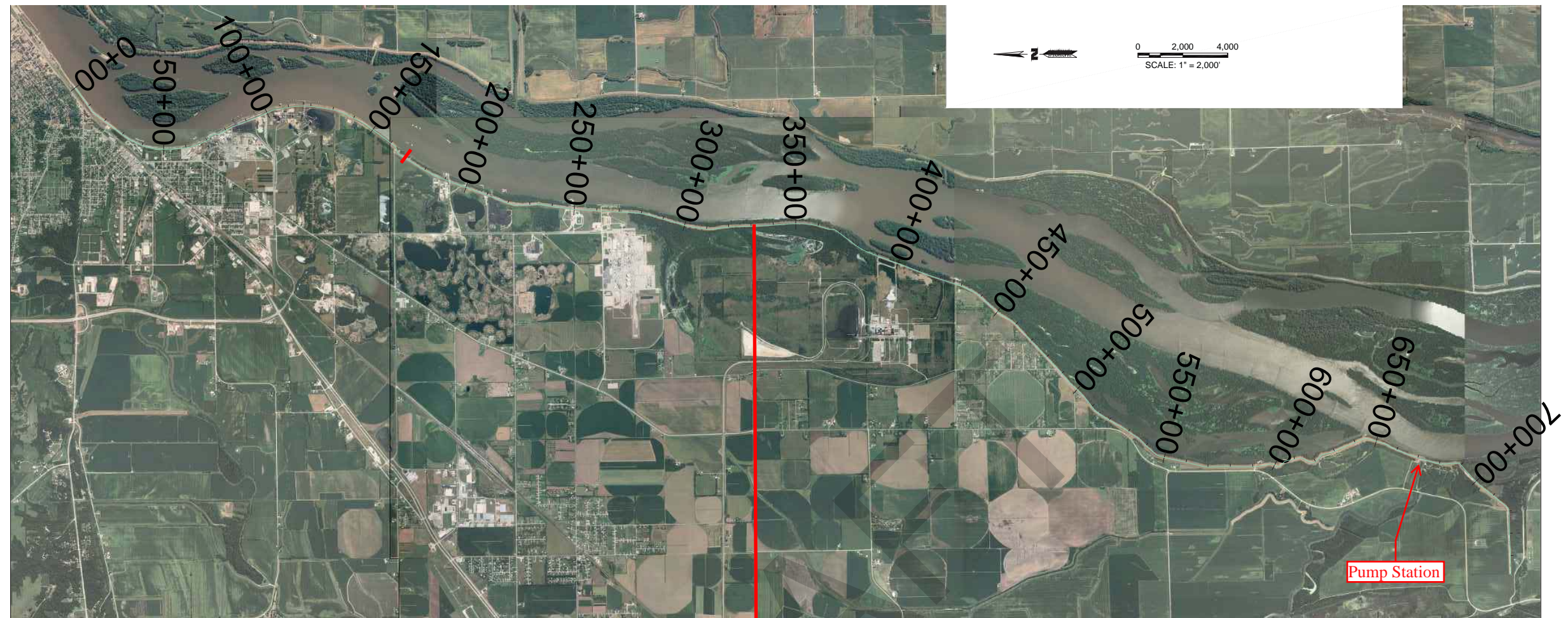
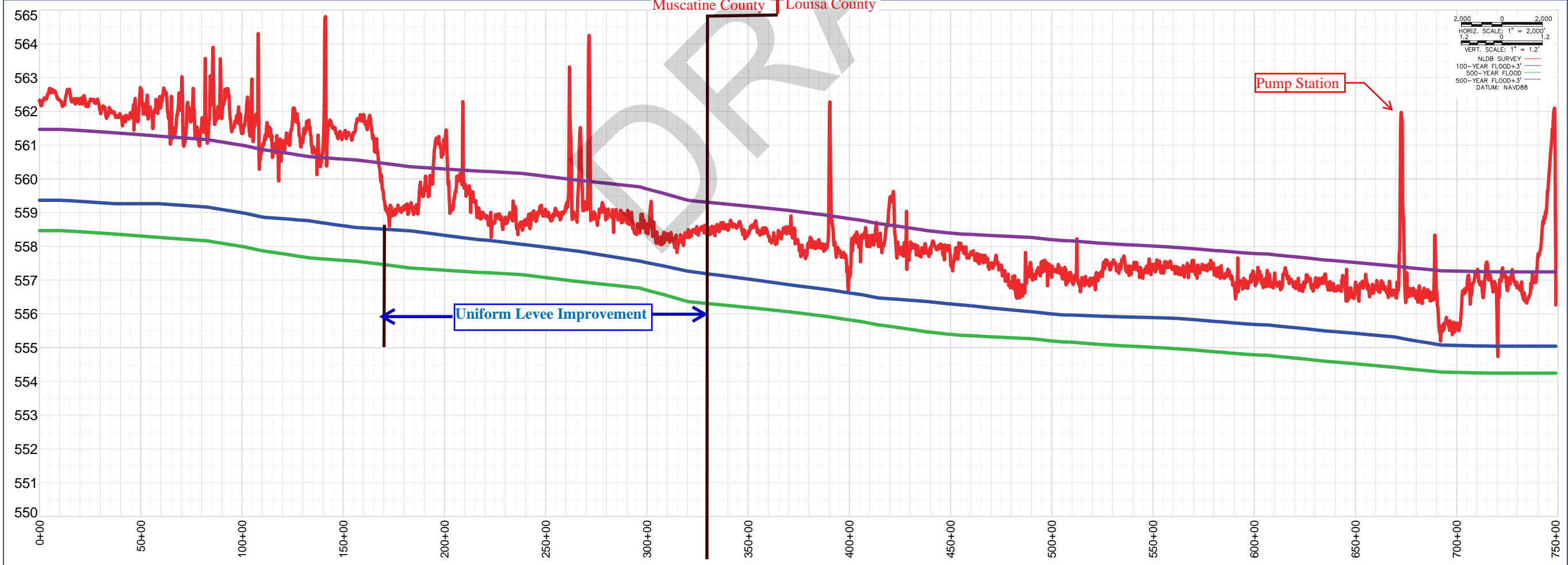
MUSCATINE COUNTY
UNIFORM LEVEE IMPROVEMENTS

SHEET TITLE		SHEET	
DESIGNED	DRAWN	DRAWING ISSUED DATE: 7/11/2020 PROJECT NO. 20-2942	
FIELD	FIELD BOOK		
CHECKED	CHECK DATE		

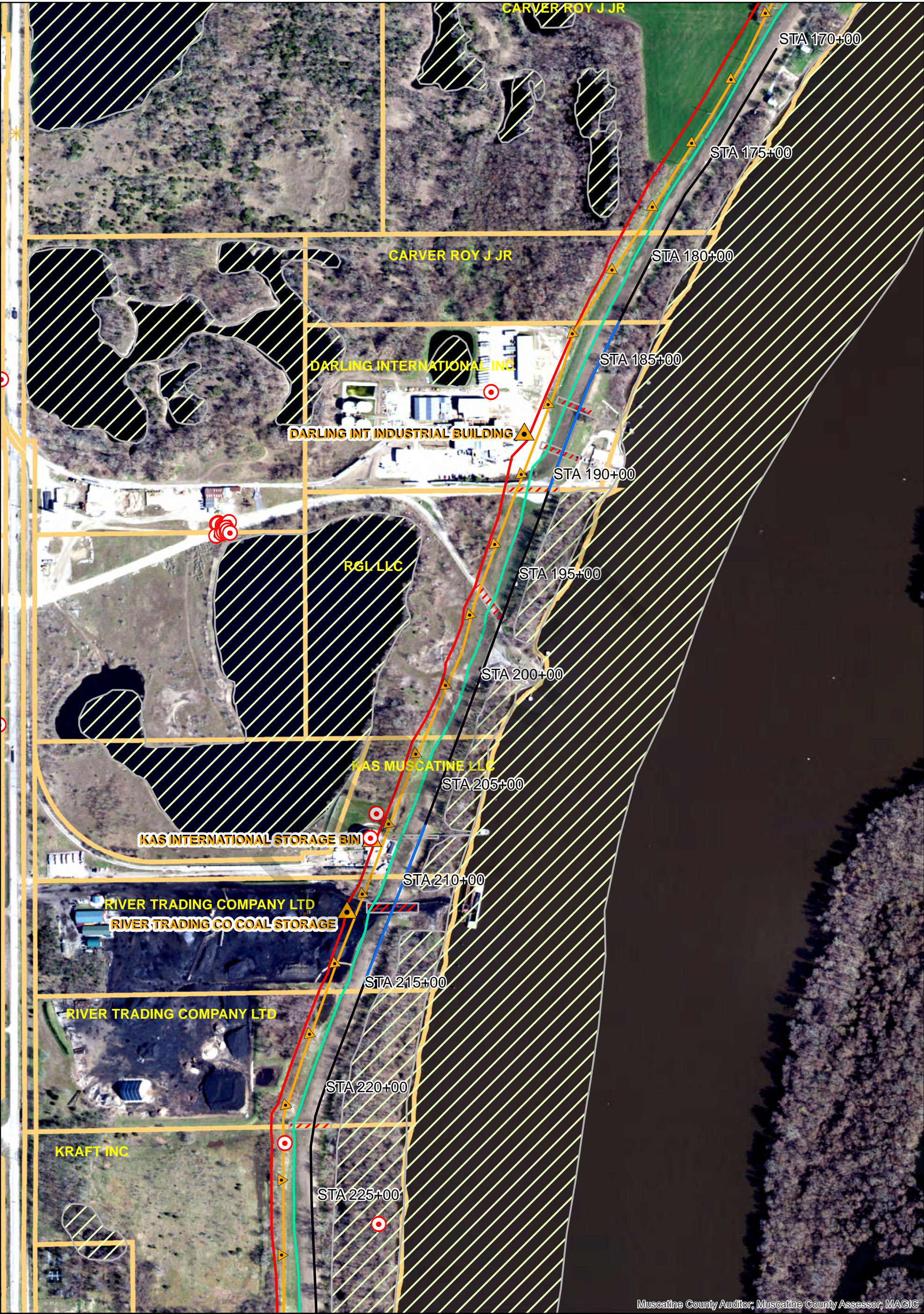
APPENDIX C

SITE MAPS

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SCALE:	AS SHOWN	DESIGNED	DRAWN	BY	DATE
BCB	ANP	FOR	ANP	DATE	
XXX	XXX	FIELD BOOK	XXX	DATE	
CHECKED	CHECK DATE	CHECK DATE	CHECK DATE	CHECK DATE	CHECK DATE
FILE NAME	FILE NAME	FILE NAME	FILE NAME	FILE NAME	FILE NAME
Exhibit: IA South.dwg	Exhibit: IA South.dwg	Exhibit: IA South.dwg	Exhibit: IA South.dwg	Exhibit: IA South.dwg	Exhibit: IA South.dwg



Levee Improvement Impact

0 200 400
Feet

KLINGNER
& ASSOCIATES, P. C.
Engineers • Architects • Surveyors

Map 4
Prepared By: JAC
Prepared On: 5/12/2020



Legend	
	Levee Toe
	100' Construction Easement
	Wells
	Parcels
	Levee Crossing
	Possible Flood Wall
	National Wetland Inventory
	Underground Storage Tank
	Structure within 100' Construction Easement
	Overhead Utility in Construction Easement
	Possible Raised Earthen Levee or Concrete Wall



Muscatine County Auditor, Muscatine County Assessor, MAGIC

0 200 400
Feet

Levee Improvement Impact

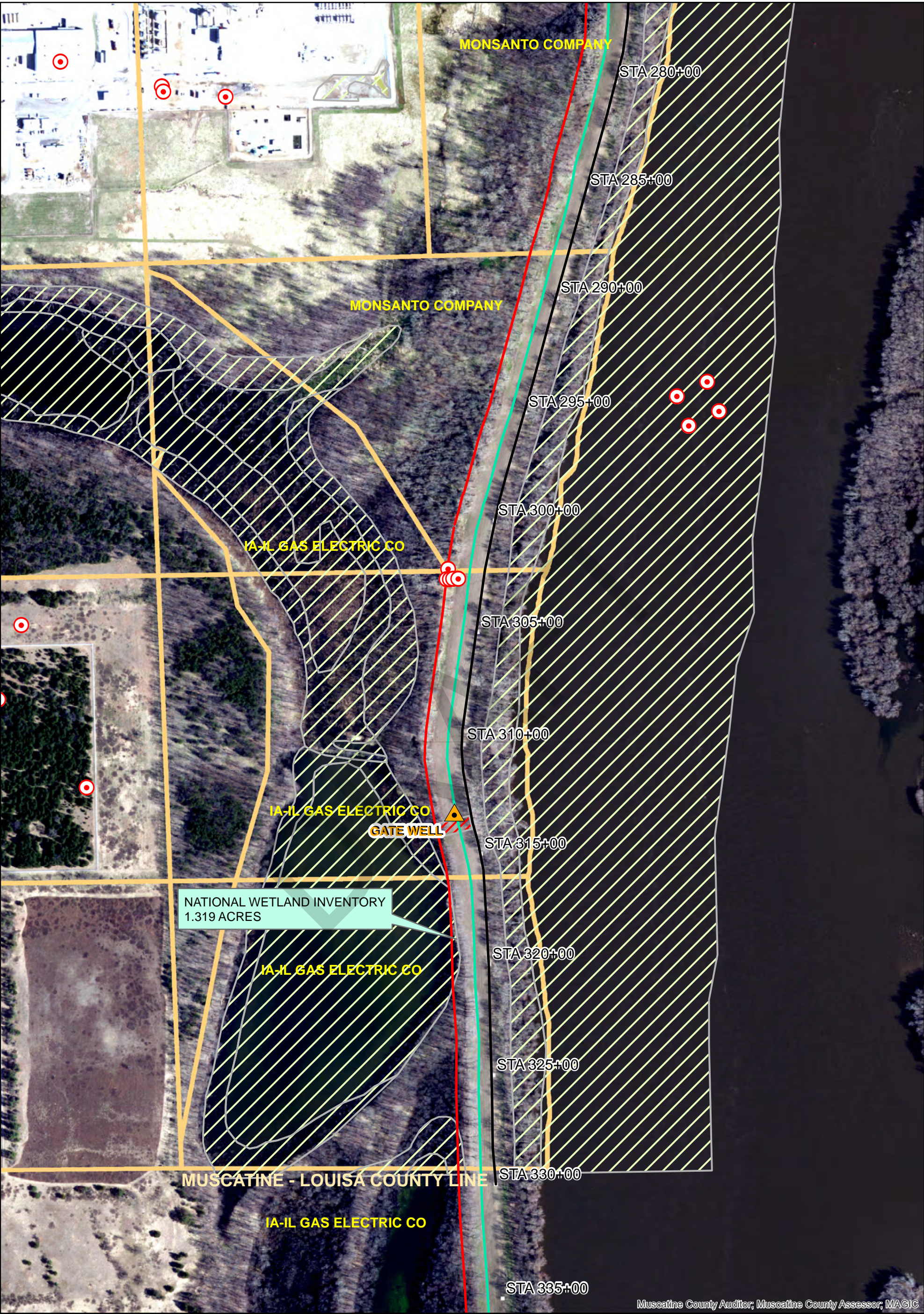
KLINGNER
& ASSOCIATES, P. C.
Engineers • Architects • Surveyors

Map 5
Prepared By: JAC
Prepared On: 5/12/2020



Legend

- | | |
|----------------------------|--|
| Levee Toe | National Wetland Inventory |
| 100' Construction Easement | Underground Storage Tank |
| Wells | Structure within 100' Construction Easement |
| Parcels | Overhead Utility in Construction Easement |
| Levee Crossing | Possible Raised Earthen Levee or Concrete Wall |
| Possible Flood Wall | |



Muscatine County Auditor, Muscatine County Assessor, MAGIC

Levee Improvement Impact

0 200 400
Feet

KLINGNER
& ASSOCIATES, P. C.
Engineers • Architects • Surveyors

Map 6
Prepared By: JAC
Prepared On: 5/12/2020



Legend

- | | |
|----------------------------|--|
| Levee Toe | National Wetland Inventory |
| 100' Construction Easement | Underground Storage Tank |
| Wells | Structure within 100' Construction Easement |
| Parcels | Overhead Utility in Construction Easement |
| Levee Crossing | Possible Raised Earthen Levee or Concrete Wall |
| Possible Flood Wall | |

APPENDIX D

PRELIMINARY ENGINEERING REPORT

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MUSCATINE COUNTY UNIFORM LEVEE IMPROVEMENTS

July 1, 2020

Prepared for:

MUSCATINE ISLAND LEVEE DISTRICT

18238 County Road X61
Muscatine, IA 52761-8637



Prepared by:

KLINGNER & ASSOCIATES, P.C.

610 North 4th Street, Suite 100
Burlington, IA 52601

Project No. 6496-10/20-2942.002

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Appendix A PROJECT PLANS

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1.0 DESCRIPTION OF PROJECT COMPONENTS & PROJECT FEASIBILITY

The Muscatine Island Levee District, along with a cohort of governmental and business community stakeholders, is proposing a project to uniformly improve approximately 16,000 lineal feet of mainstem Mississippi River levee in Muscatine County, Iowa. The proposed project will include placement of additional earthen fill upon the landside and crown of the levee to improve the level of protection from recurring floods on the Mississippi River from station 170+00 to 330+00 at the southern boundary between Muscatine County and Louisa County. Due to some locations being close to existing commercial/industrial facilities, approximately 2,000 lineal feet of flood wall may be necessary where earthen berms cannot be adequately extended and right-of-way cannot be extended without demolition of existing structures. Much of the landside levee has additional rights-of-way where seepage berms have been constructed at the toe of the slope. The earthen fill will be placed upon the existing seepage berms wherever possible. However, some rights-of-way may need to be obtained to extend seepage berms further inland. All construction will be conducted on the landside of the levee outside the regulated floodway. The Muscatine Island levee is currently certified by FEMA under 44 CFR 65.10.

The goal of the currently proposed project is to provide for more uniform flood protection for the Muscatine Island area. The original design and construction of the levee system in this area allowed for a lower level of flood protection (~1% Annual Chance) in the southern areas of Muscatine County and in the northern portion of Louisa County. The levee north of this project is at a higher level of flood protection (~0.2% Annual Chance). However, subsequent inundation modeling by the U.S. Army Corps of Engineers showed that a breach anywhere on the levee system resulted in the same catastrophic loss to property and the need for emergency evacuation of residents and workers. The project will improve the reliability of the flood protection system which protects major industrial facilities, the local community water wells, the waste water treatment plant, commercial offices, residential developments, and agricultural ground. This project will not eliminate the requirement for flood insurance. However, flood insurance rates for industrial facilities should improve from a risk management perspective.

The construction of this uniform levee improvement will include the stripping of top soil and depositing it at the landside toe of the levee to be improved. Sand meeting the requirements of the U.S. Army Corps of Engineers will be sourced (~50,000 cubic yards of earthen materials) within the area, excavated, hauled, placed, graded, and compacted as necessary to meet the necessary lines and grades of the uniform levee design. The final improvements will be reseeded to establish vegetative cover which will retard erosion and loss of material.

The proposed project location is under ownership of the Muscatine Island Levee District, with the necessary fill materials readily available in the nearby area. Most, if not all, of the rights-of-way are already owned by Muscatine Island Levee District. Similar projects have occurred on the levee system in the past and on other levees in the region along the Mississippi River, therefore the Project appears extremely feasible.

The proposed project as described is consistent with the project description included in Section B.2 of ED-900.

2.0 METHOD OF CONSTRUCTION

The project is proposed to be performed under the Design-Bid-Build method with bidding being performed competitively. The project design will be completed first with bidding documents prepared and ready for the advertisement for bids. It is anticipated that all improvements (earthwork and floodwalls) will be performed under single construction contract.

None of the project will be performed under design-build, construction management at risk, the applicant's own forces (with exception to in-kind match of material purchases or right-of-way acquisition), or a third-party construction manager.

The project will largely be completed under one phase. However, the work could be broken into more than one phase if it is determined to be expedient due to funding, permitting, or property access issues.

3.0 CONSTRUCTION COST ESTIMATE

Client		Project			
Muscatine Island Levee District		Uniform Levee Improvement - Muscatine County			
Mechanical Dredge from Interior Borrow Site, Haul, and Place On-Site (Stations 170+00 to 330+00)					
NO	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL COST
1	Admin + Legal	1	LS	\$75,000	\$ 75,000.00
2	Wetland Mitigation	5	ACRE	\$25,000	\$ 125,000.00
3	ROW Acquisition	10	ACRE	\$7,500	\$ 75,000.00
4	Mob/Demob	1	LS	\$100,000	\$ 100,000.00
5	Strip & Relocate Top Soil	60,000	CY	\$5	\$ 300,000.00
6	Concrete Flood Walls (~184 • ~190, ~207 • ~215, ~246 • ~252)	2,000	LF	\$2,000	\$ 4,000,000.00
7	Mechanical Dredge Fill, Haul, & Place	50,000	CY	\$25	\$ 1,250,000.00
8	Erosion Control • Silt Fence or Wattles	16,000	LF	\$8	\$ 128,000.00
9	Crossing Restoration	1	LS	\$25,000	\$ 25,000.00
10	Project Inspection	1	LS	\$100,000	\$ 100,000.00
11	Project Contingency	1	LS	5%	\$ 308,900.00
Total Opinion of Probable Construction Costs:				\$	6,486,900

A five (5) percent contingency is included on the project due to several factors including: (1) current status of the design, (2) the availability of recent bid information used for unit price reference, and (3) uncertainty associated in competitive bidding (i.e. fuel price fluctuations).

4.0 PROPERTY ACQUISITION

It is anticipated that property acquisition may be required as a part of this project. The Muscatine Island Levee District owns right-of-way for the mainstem levee, but certain portions of the uniform levee improvement project may require additional property. In addition, some construction easements may be necessary in order to complete the construction activities.

5.0 PERMITS

It is anticipated that United States Army Corps of Engineer permits will be required for the work on or near the Muscatine Island Levee District's levee (federal interest levee system). It is likely that a Section 408 Permission will be required by USACE for this portion of the work, which will include a review of the design, a National Environmental Policy Act (NEPA) review, and a review of impacted Real Estate. A 408 Permission for a uniform levee improvement project involves detailed hydraulic and hydrologic modeling that looks at offsite impacts to other properties upstream and downstream of the project in accordance with the Rivers and Harbors Act of 1899.

Wetland impacts (Sections 401/404) and Threatened & Endangered Species (Section 10) are anticipated, but are expected to be minimal. Additionally, archaeological resources are not expected to be disturbed, but the State Historic Preservation Office (SHPO) will be consulted (Section 106). All of these permits will be submitted through the Joint Permit Application process that involves the U.S. Army Corps of Engineers and the State of Iowa.

A Stormwater Pollution Prevention Plan (SWPPP) plan sheet will be developed by the Project Engineer and to be completed by the Contractor. The Contractor will be required to adhere to the requirements set forth by the SWPPP and their National Pollution Discharge Elimination System (NPDES) permit. This includes the proper installation, monitoring, and maintenance of silt fence and other means to control erosion and runoff during the project. Final grades of the levee improvement will be developed to reduce erosion or route runoff into a stormwater drainage system. The uniform levee improvements will receive fertilizer, seed, and mulch to slow runoff and reduce erosion potential.

6.0 PROJECT SCHEDULE

Design Period – The design plans and specifications for all project components have not been developed beyond a basic conceptual stage. It is estimated that it would take approximately six (6) months to complete the plans and specifications for bidding. This design will be completed in conjunction with the USACE 408 Permission process.

Period of Time to Obtain Required Permits – USACE Section 408 permission will be required for the uniform levee improvement. It is believed that to obtain this permission it will take approximately twelve (12) to eighteen (18) months. The USACE 408 permission request has not been initiated. All of the rest of the anticipated permitting previously outlined can occur within the same timeline.

Period of Time to Obtain any Required Easements or Rights-of-way – The location and quantity of easement and/or rights-of-way anticipated for the proposed project has not been determined, but can be obtained during the design and permitting phase schedule.

Solicitation of Bids and Awarding of Contracts – It is anticipated that bidders would be provided four (4) weeks to review the bid documents and formulate / submit their bid. Bidding would not be allowed to commence until both the permitting and right-of-way / easement acquisition was complete.

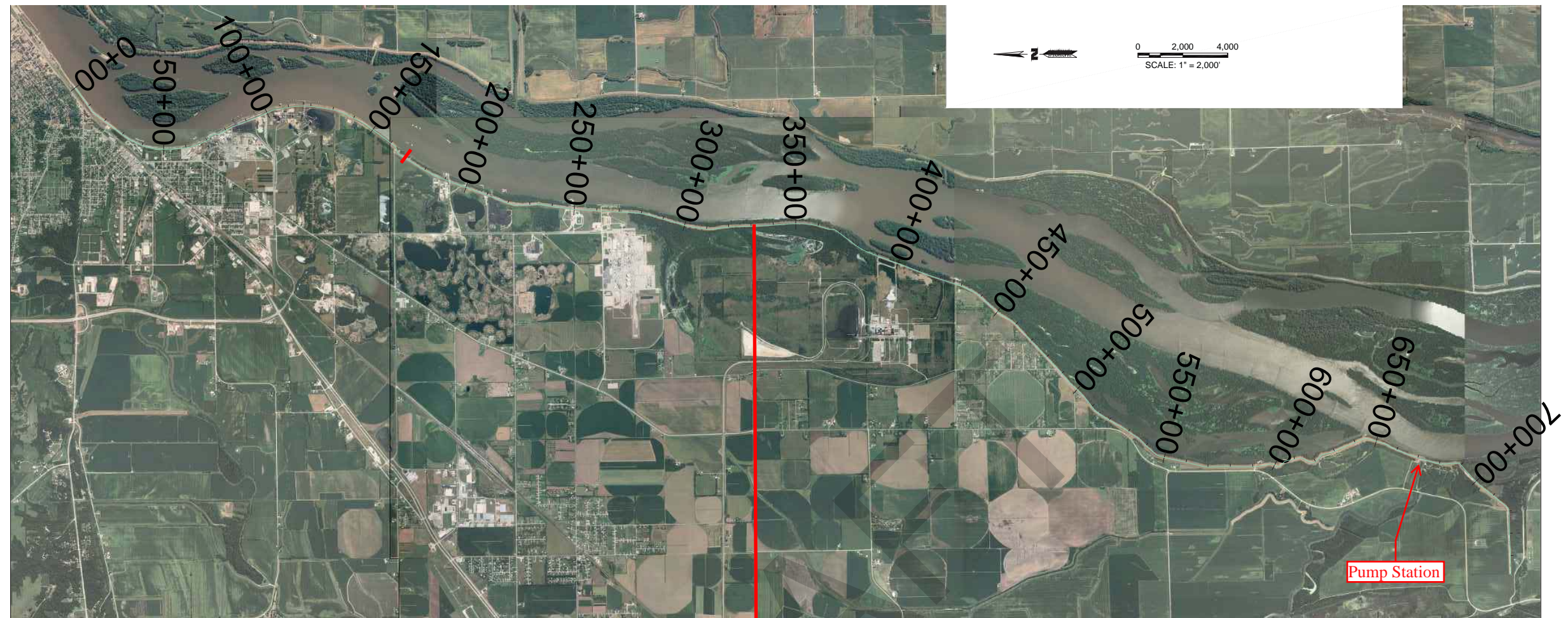
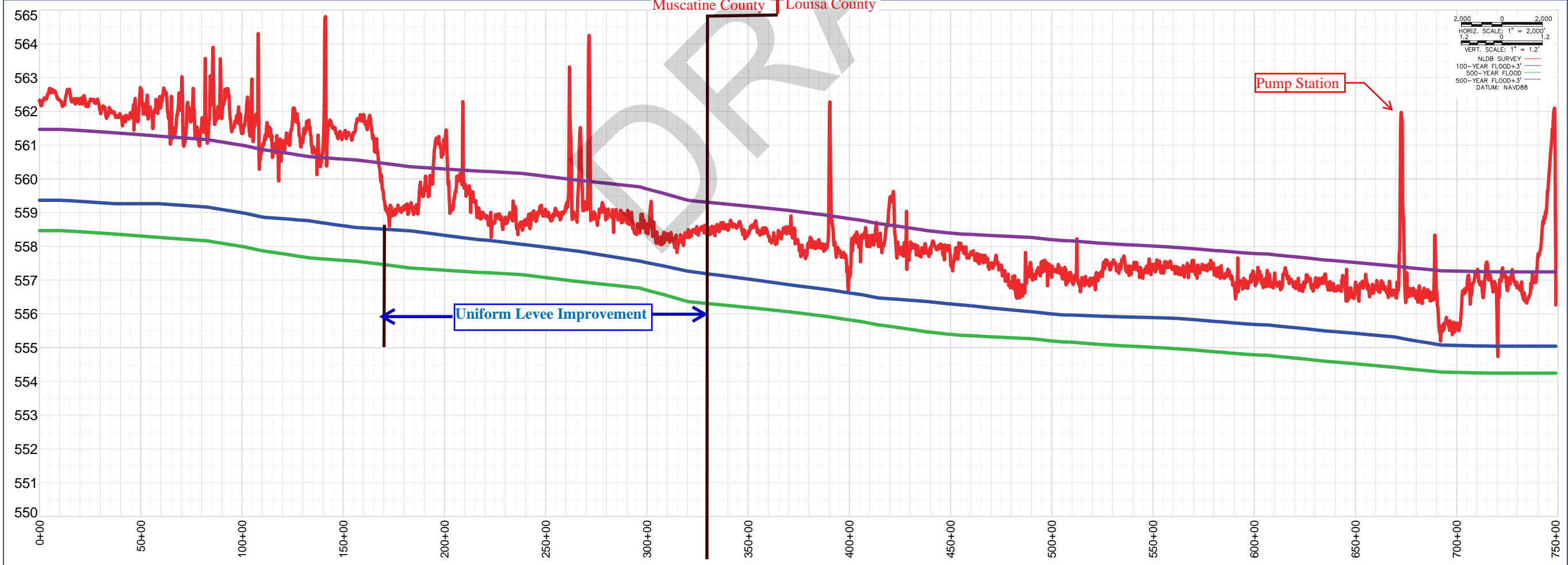
Construction Period – Approximately six (6) months anticipated to be necessary for completion of the entire project. None of the construction has been performed to date.

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APPENDIX A PROJECT PLANS

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PROJECT: Muscatine Island Levee & Drainage District, IA South Side, 12/10/2013 12:37:40 PM



Full sized plans have been prepared using standard scales. Reduced sized plans may not conform to standard scales. Use graphic scales when making measurements on reduced plans.

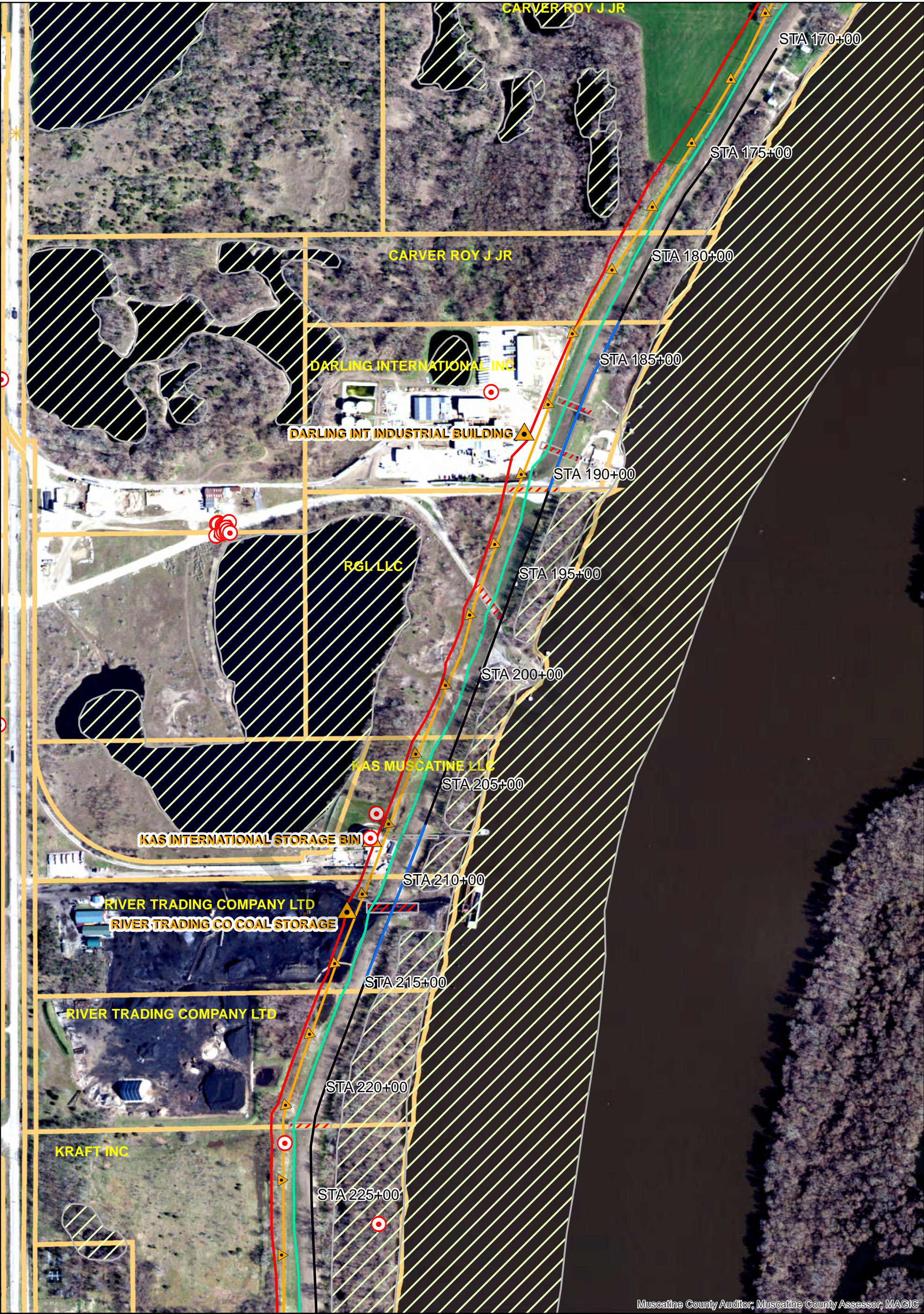
PROJECT NO.
10-2037
DRAWING DATE
12/09/2013
SHEET
1

MUSCATINE ISLAND
LEVEE & DRAINAGE DISTRICT

PLAN AND PROFILE
100-YEAR FLOOD + FREEBOARD
&
500-YEAR FLOOD PROFILES

SCALE	AS SHOWN	DESIGNED	FOR	DATE
BCB	ANP	ANP	ANP	ANP
XXX	XXX	XXX	XXX	XXX
CHECKED	CHECK DATE	CHECK DATE	CHECK DATE	CHECK DATE
FILE NAME	FILE NAME	FILE NAME	FILE NAME	FILE NAME
Exhibit: IA South.dwg	Exhibit: IA South.dwg	Exhibit: IA South.dwg	Exhibit: IA South.dwg	Exhibit: IA South.dwg

KLINGNER & ASSOCIATES, P.C.
Engineers • Architects • Surveyors
1100 North 4th Street, Suite 100, Burlington, IA 52601
PH: 319.252.8803 • FAX: 319.252.8805
WWW.KLINGNER-PA.COM



Levee Improvement Impact

0 200 400
Feet

KLINGNER
& ASSOCIATES, P. C.
Engineers • Architects • Surveyors

Map 4
Prepared By: JAC
Prepared On: 5/12/2020



Legend

- | | |
|----------------------------|--|
| Levee Toe | National Wetland Inventory |
| 100' Construction Easement | Underground Storage Tank |
| Wells | Structure within 100' Construction Easement |
| Parcels | Overhead Utility in Construction Easement |
| Levee Crossing | Possible Raised Earthen Levee or Concrete Wall |
| Possible Flood Wall | |



Muscatine County Auditor, Muscatine County Assessor, MAGIC

0 200 400
Feet

Levee Improvement Impact

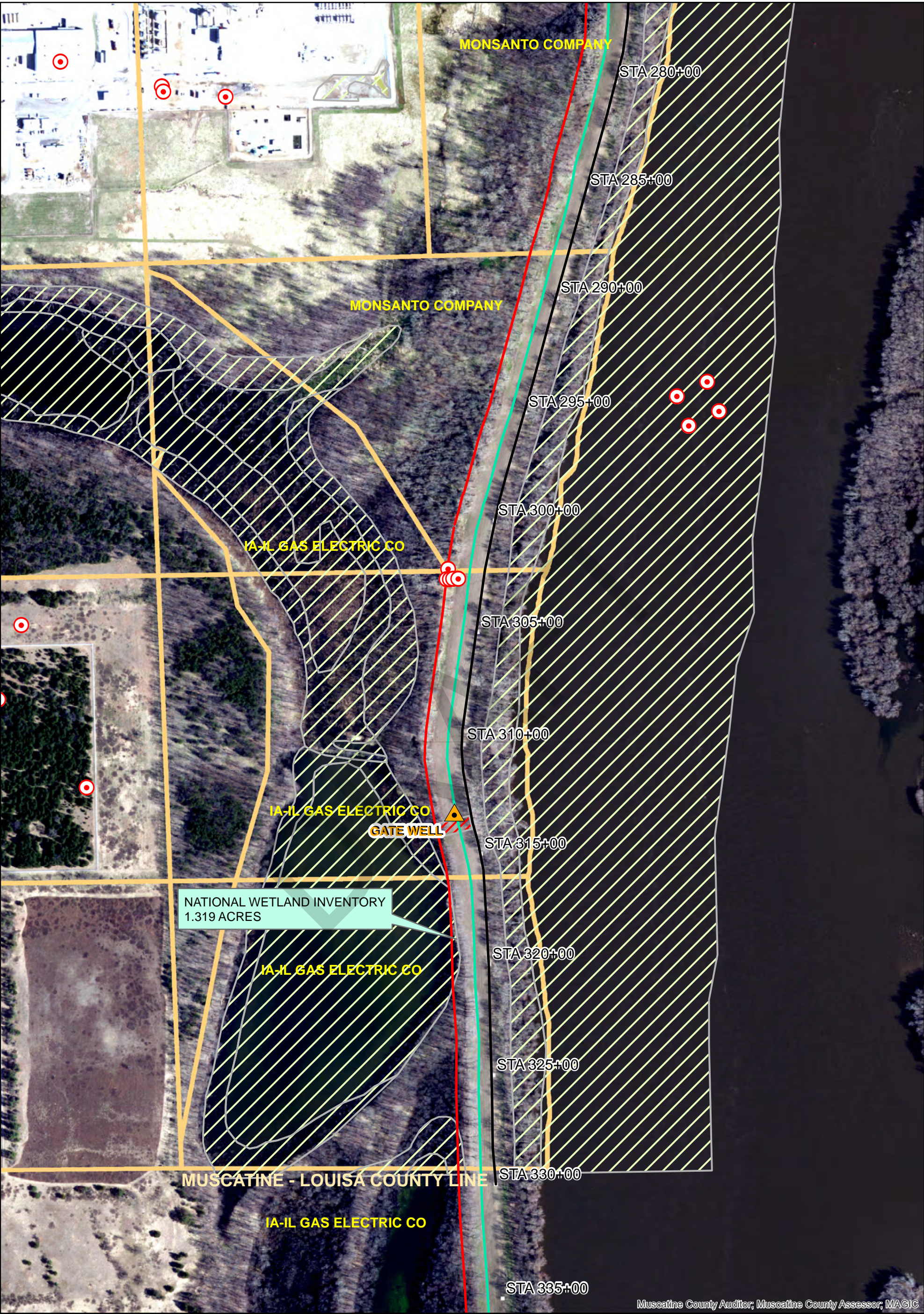
KLINGNER
& ASSOCIATES, P. C.
Engineers • Architects • Surveyors

Map 5
Prepared By: JAC
Prepared On: 5/12/2020



Legend

- | | |
|----------------------------|--|
| Levee Toe | National Wetland Inventory |
| 100' Construction Easement | Underground Storage Tank |
| Wells | Structure within 100' Construction Easement |
| Parcels | Overhead Utility in Construction Easement |
| Levee Crossing | Possible Raised Earthen Levee or Concrete Wall |
| Possible Flood Wall | |



Muscatine County Auditor, Muscatine County Assessor, MAGIC

0 200 400
Feet

Levee Improvement Impact

KLINGNER
& ASSOCIATES, P. C.
Engineers • Architects • Surveyors

Map 6
Prepared By: JAC
Prepared On: 5/12/2020



Legend

	Levee Toe		National Wetland Inventory
	100' Construction Easement		Underground Storage Tank
	Wells		Structure within 100' Construction Easement
	Parcels		Overhead Utility in Construction Easement
	Levee Crossing		Possible Raised Earthen Levee or Concrete Wall
	Possible Flood Wall		

APPENDIX E

PHOTOGRAPHS

DRAFT



Description	Typical view on levee	1
Date	05/27/2010	



Description	Typical view on levee	2
Date	05/27/2010	

 <div>05/27/2010</div>		
Description	Typical view on levee	3
Date	05/27/2010	

APPENDIX F

FLOOD INSURANCE RATE MAPS

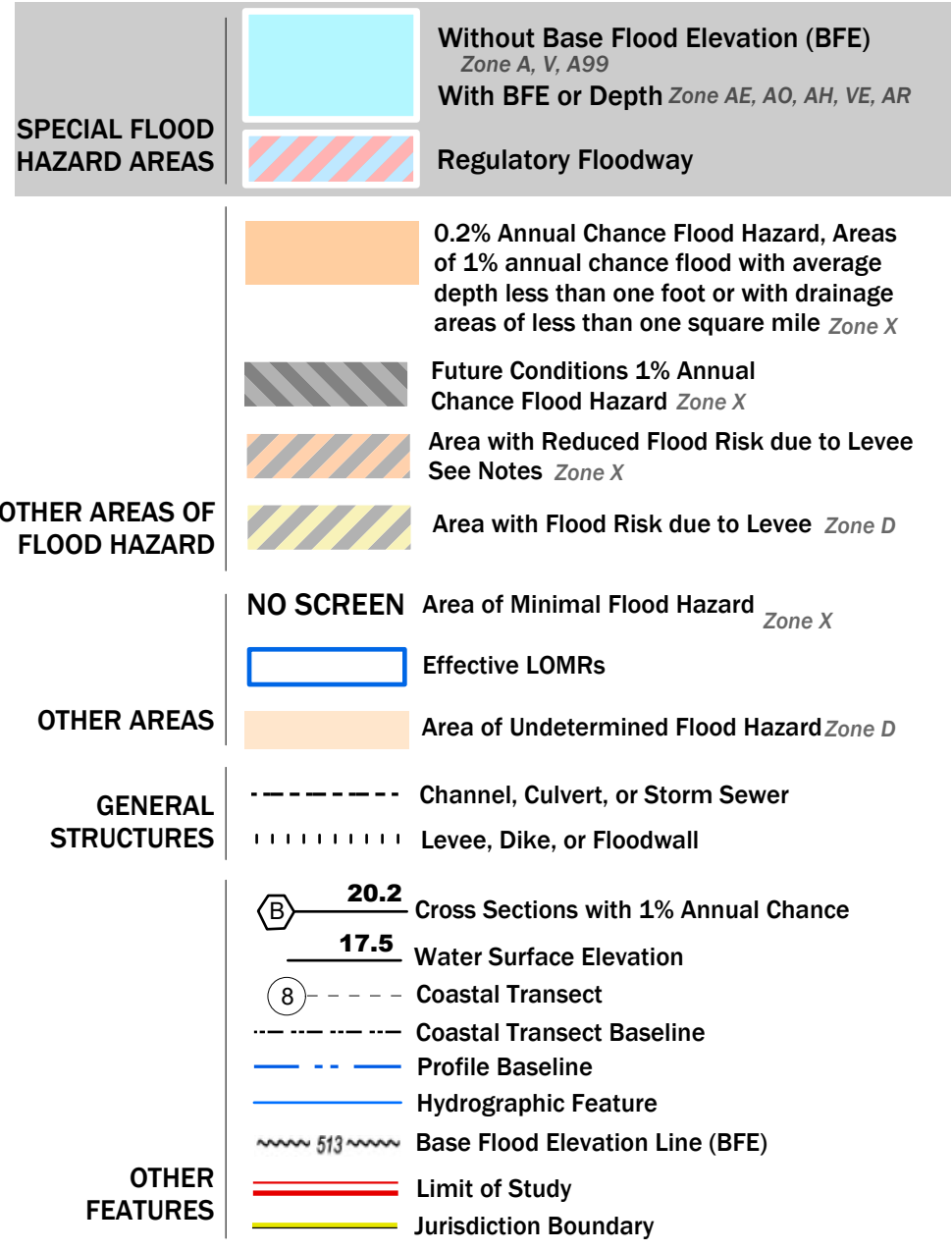
DRAFT



USGS The National Map: Orthoimagery, Data refreshed April 2020

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT



NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-6267) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

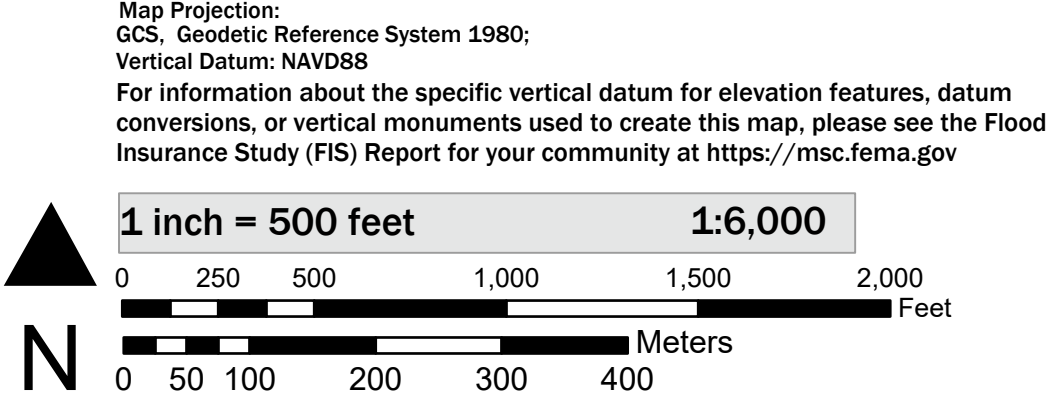
Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 6/29/2020 1:23 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118418>

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

ACCREDITED LEVEE SYSTEM: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit <http://www.fema.gov/national-flood-insurance-program>.

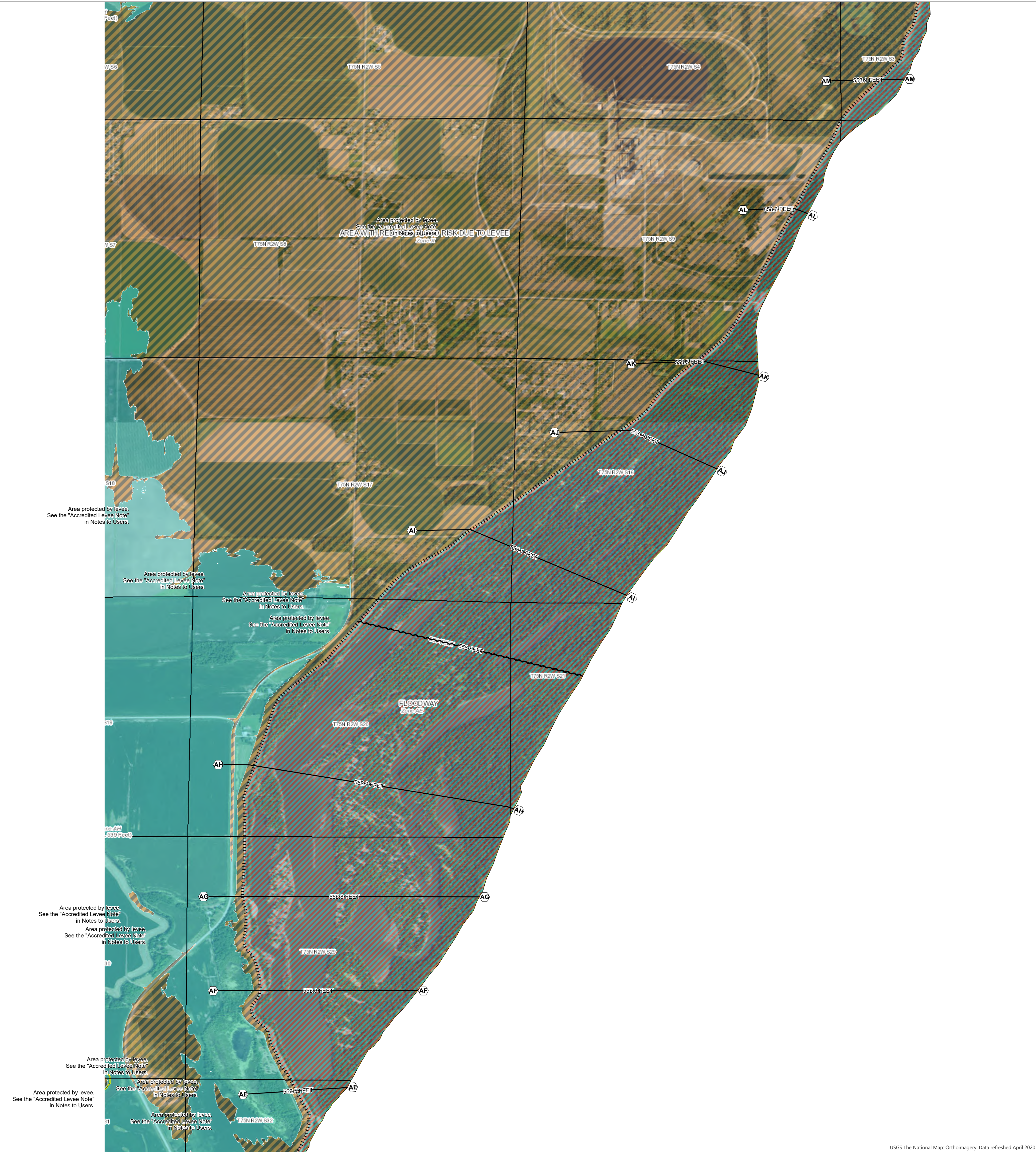
SCALE



NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

MUSCATINE COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 325 OF 325

Panel Contains:		
COMMUNITY	NUMBER	PANEL
ROCK ISLAND COUNTY	170582	0325
MUSCATINE COUNTY	190836	0325
LOUISA COUNTY	190193	0325



USGS The National Map: Orthoimagery, Data refreshed April 2020

91°4'6.22"W 41°15'26.1"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

Without Base Flood Elevation (BFE)
Zone A, V, A99

With BFE or Depth Zone AE, AO, AH, VE, AR

Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X

Future Conditions 1% Annual Chance Flood Hazard Zone X

Area with Reduced Flood Risk due to Levee See Notes Zone X

Area with Flood Risk due to Levee Zone D

OTHER AREAS

NO SCREEN Area of Minimal Flood Hazard Zone X

Effective LOMRs

Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES

Channel, Culvert, or Storm Sewer

Levee, Dike, or Floodwall

Cross Sections with 1% Annual Chance

Water Surface Elevation

Coastal Transect

Coastal Transect Baseline

Profile Baseline

Hydrographic Feature

Base Flood Elevation Line (BFE)

OTHER FEATURES

Limit of Study

Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-6627) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

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Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **6/29/2020 1:37 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118418>

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

ACCREDITED LEVEE SYSTEM: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit <http://www.fema.gov/national-flood-insurance-program>.

SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD88

For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at <https://msc.fema.gov>

1 inch = 1,000 feet

1:12,000

0 500 1,000 2,000 3,000 4,000 Feet

0 105 210 420 630 840 Meters



NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

LOUISA COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 150 OF 375

Panel Contains:		
COMMUNITY	NUMBER	PANEL
MUSCATINE COUNTY	190836	0150
FRUITLAND,	190212	0150
CITY OF		
LOUISA COUNTY	190193	0150
KLUM LAKE	195T	0150
WILDLIFE		
MANAGEMENT AREA		

APPENDIX G

USFWS IPAC REPORT

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United States Department of the Interior



FISH AND WILDLIFE SERVICE
Illinois-Iowa Ecological Services Field Office
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
Phone: (309) 757-5800 Fax: (309) 757-5807

In Reply Refer To:

June 29, 2020

Consultation Code: 03E18000-2020-SLI-2015

Event Code: 03E18000-2020-E-04782

Project Name: Muscatine County Uniform Levee Improvements

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Service if they determine their project "may affect" listed species or critical habitat.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally. You may verify the list by visiting the ECOS-IPaC website <http://ecos.fws.gov/ipac/> at regular intervals during project planning and implementation and completing the same process you used to receive the attached list. As an alternative, you may contact this Ecological Services Field Office for updates.

Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website at - <http://www.fws.gov/midwest/endangered/section7/s7process/index.html>. This website contains step-by-step instructions which will help you

determine if your project will have an adverse effect on listed species and will help lead you through the Section 7 process.

For all wind energy projects, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project or may be affected by your proposed project.

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.) and Migratory Bird Treaty Act (16 U.S.C. 703 et seq), as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at <http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html> to help you determine if you can avoid impacting eagles or if a permit may be necessary.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Illinois-Iowa Ecological Services Field Office

Illinois & Iowa Ecological Services Field Office

1511 47th Ave

Moline, IL 61265-7022

(309) 757-5800

DRAFT

Project Summary

Consultation Code: 03E18000-2020-SLI-2015

Event Code: 03E18000-2020-E-04782

Project Name: Muscatine County Uniform Levee Improvements

Project Type: STREAM / WATERBODY / CANALS / LEVEES / DIKES

Project Description: The Project is located along an existing mainstream Mississippi River levee in Muscatine in southeast Iowa (Muscatine County). The goal of the District's currently proposed project is to provide a more uniform flood protection for the Muscatine Island area and improve the reliability of the existing flood protection system. The Project is located along an existing mainstream Mississippi River levee in Muscatine in southeast Iowa (Muscatine County). The Project activities will be confined to the crown and landside of the existing levee approximately from Station 170+00 to 330+00 . Some areas along this levee stretch are located in close proximity to existing commercial/industrial facilities; these areas may necessitate the erection of a flood wall where earthen berms cannot be adequately extended and/or the right-of-way cannot be extended without demolition of existing structures. Much of the landside levee has additional rights-of-way where seepage berms have been constructed at the toe of the slope. The earthen fill will be placed upon the existing seepage berms wherever possible; however, some rights-of-way may need to be obtained to extend seepage berms further inland. All construction will be conducted on the landside of the levee outside the regulated floodway. Timing is to be determined, based upon funding.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/41.35493291702957N91.07248266722604W>



Counties: Louisa, IA | Muscatine, IA

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Endangered Species Act Species

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Reptiles

NAME	STATUS
Eastern Massasauga (=rattlesnake) <i>Sistrurus catenatus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2202	Threatened

Clams

NAME	STATUS
Higgins Eye (pearly mussel) <i>Lampsilis higginsii</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5428	Endangered
Sheepnose Mussel <i>Plethobasus cyphus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6903	Endangered
Spectaclecase (mussel) <i>Cumberlandia monodonta</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7867	Endangered

Flowering Plants

NAME	STATUS
Prairie Bush-clover <i>Lespedeza leptostachya</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4458	Threatened
Western Prairie Fringed Orchid <i>Platanthera praeclara</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1669	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

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Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER FORESTED/SHRUB WETLAND

- [PFO1Ah](#)

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APPENDIX H

IOWA T&E SPECIES LIST

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Listed Species In a County

[<< Back To Query Page](#)MUSCATINE County, IA**Summary by Species Report**

Total Unique Listed Species In This County: 139

County	Common Name	Scientific Name	Class	State Status	Federal Status	Link To Species Profile
MUSCATINE	Central Newt	Notophthalmus viridescens	AMPHIBIANS	T		PDF
MUSCATINE	Bald Eagle	Haliaeetus leucocephalus	BIRDS	S		PDF
MUSCATINE	Barn Owl	Tyto alba	BIRDS	E		PDF
MUSCATINE	King Rail	Rallus elegans	BIRDS	E		PDF
MUSCATINE	Red-shouldered Hawk	Buteo lineatus	BIRDS	E		PDF
MUSCATINE	Blacknose Shiner	Notropis heterolepis	FISH	T		PDF
MUSCATINE	Bluntnose Darter	Etheostoma chlorosoma	FISH	E		PDF
MUSCATINE	Chestnut Lamprey	Ichthyomyzon castaneus	FISH	T		PDF
MUSCATINE	Freckled Madtom	Noturus nocturnus	FISH	E		PDF
MUSCATINE	Grass Pickerel	Esox americanus	FISH	T		PDF
MUSCATINE	Lake Sturgeon	Acipenser fulvescens	FISH	E		PDF
MUSCATINE	Pirate Perch	Aphredoderus sayanus	FISH	S		PDF
MUSCATINE	Pugnose Minnow	Opsopoeodus emiliae	FISH	S		PDF
MUSCATINE	Weed Shiner	Notropis texanus	FISH	E		PDF
MUSCATINE	Western Sand Darter	Ammocrypta clara	FISH	T		PDF
MUSCATINE	Butterfly	Ellipsaria lineolata	FRESHWATER MUSSELS	T		
MUSCATINE	Creeper	Strophitus undulatus	FRESHWATER MUSSELS	T		
MUSCATINE	Higgin's-eye Pearly Mussel	Lampsilis higginsii	FRESHWATER MUSSELS	E	E	
MUSCATINE	Pistolgrip	Tritogonia verrucosa	FRESHWATER MUSSELS	E		
MUSCATINE	Purple Wartyback	Cyclonaias tuberculata	FRESHWATER MUSSELS	T		
MUSCATINE	Round Pigtoe	Pleurobema sintoxia	FRESHWATER MUSSELS	E		
MUSCATINE	Sheepnose	Plethobasus cyphus	FRESHWATER MUSSELS	E	E	
MUSCATINE	Spectaclecase	Cumberlandia monodonta	FRESHWATER MUSSELS	E	E	
MUSCATINE	Yellow Sandshell	Lampsilis teres	FRESHWATER MUSSELS	E		
MUSCATINE	Baltimore	Euphydryas phaeton	INSECTS	T		
MUSCATINE	Byssus Skipper	Problema byssus	INSECTS	T		
MUSCATINE	Dion Skipper	Euphyes dion	INSECTS	S		
MUSCATINE	Pipevine Swallowtail	Battus philenor	INSECTS	S		
MUSCATINE	Regal Fritillary	Speyeria idalia	INSECTS	S		
MUSCATINE	Zebra Swallowtail	Eurytides marcellus	INSECTS	S		
MUSCATINE	Northern Long-eared Bat	Myotis septentrionalis	MAMMALS		T	
MUSCATINE	Plains Pocket Mouse	Perognathus flavescens	MAMMALS	E		PDF
MUSCATINE	Southern Bog	Synaptomys cooperi	MAMMALS	T		PDF

Lemming					
MUSCATINE	Bent Milk-vetch	Astragalus distortus	PLANTS (DICOTS)	S	PDF
MUSCATINE	Bigroot Prickly-pear	Opuntia macrorhiza	PLANTS (DICOTS)	E	
MUSCATINE	Black Huckleberry	Gaylussacia baccata	PLANTS (DICOTS)	T	PDF
MUSCATINE	Buckbean	Menyanthes trifoliata	PLANTS (DICOTS)	T	PDF
MUSCATINE	Cleft Phlox	Phlox bifida	PLANTS (DICOTS)	S	
MUSCATINE	Cliff Conobea	Leucospora multifida	PLANTS (DICOTS)	E	
MUSCATINE	Creeping Bush-clover	Lespedeza repens	PLANTS (DICOTS)	S	
MUSCATINE	Crossleaf Milkwort	Polygala cruciata	PLANTS (DICOTS)	E	
MUSCATINE	Curved-pod Corydalis	Corydalis curvisiliqua ssp grandibracteata	PLANTS (DICOTS)	E	
MUSCATINE	Cutleaf Water-milfoil	Myriophyllum pinnatum	PLANTS (DICOTS)	S	
MUSCATINE	Dwarf Dandelion	Krigia virginica	PLANTS (DICOTS)	E	PDF
MUSCATINE	Earleaf Foxglove	Tomianthera auriculata	PLANTS (DICOTS)	S	
MUSCATINE	Eastern Jointweed	Polygonella articulata	PLANTS (DICOTS)	E	
MUSCATINE	Flax-leaved Aster	Aster linariifolius	PLANTS (DICOTS)	T	
MUSCATINE	Forked Aster	Aster furcatus	PLANTS (DICOTS)	T	PDF
MUSCATINE	Globe Mallow	Malvastrum hispidum	PLANTS (DICOTS)	S	
MUSCATINE	Golden Corydalis	Corydalis aurea	PLANTS (DICOTS)	T	PDF
MUSCATINE	Hill's Thistle	Cirsium hillii	PLANTS (DICOTS)	S	
MUSCATINE	Humped Bladderwort	Utricularia gibba	PLANTS (DICOTS)	S	
MUSCATINE	James Cristatella	Polanisia jamesii	PLANTS (DICOTS)	E	
MUSCATINE	Kitten Tails	Besseyia bullii	PLANTS (DICOTS)	T	PDF
MUSCATINE	Lake Cress	Armoracia aquatica	PLANTS (DICOTS)	S	
MUSCATINE	Lance-leaved Violet	Viola lanceolata	PLANTS (DICOTS)	S	
MUSCATINE	Large-leaf White Violet	Viola incognita	PLANTS (DICOTS)	E	
MUSCATINE	Low Hairy Ground-cherry	Physalis pubescens	PLANTS (DICOTS)	S	
MUSCATINE	Marsh Mermaid-weed	Proserpinaca palustris	PLANTS (DICOTS)	S	
MUSCATINE	Meadow Beauty	Rhexia virginica	PLANTS (DICOTS)	T	
MUSCATINE	Missouri Lambsquarters	Chenopodium missouriensis	PLANTS (DICOTS)	S	
MUSCATINE	Orange Grass St. John's Wort	Hypericum gentianoides	PLANTS (DICOTS)	E	
MUSCATINE	Pale False Foxglove	Agalinis skinneriana	PLANTS (DICOTS)	E	
MUSCATINE	Pickering Morning-glory	Stylisma pickeringii	PLANTS (DICOTS)	E	
MUSCATINE	Pink Milkwort	Polygala incarnata	PLANTS (DICOTS)	T	
MUSCATINE	Poppy Mallow	Callirhoe triangulata	PLANTS (DICOTS)	E	
MUSCATINE	Purple Angelica	Angelica atropurpurea	PLANTS (DICOTS)	S	
MUSCATINE	Queen-of-the-prairie	Filipendula rubra	PLANTS (DICOTS)	T	
MUSCATINE	Ragwort	Senecio pseudoreus	PLANTS (DICOTS)	S	
MUSCATINE	Rose Turtlehead	Chelone obliqua	PLANTS (DICOTS)	S	
MUSCATINE	Rough Buttonweed	Diodia teres	PLANTS (DICOTS)	S	
MUSCATINE	Roundleaf Goldenrod	Solidago patula	PLANTS (DICOTS)	E	
MUSCATINE	Roundstem Foxglove	Agalinis gattingeri	PLANTS (DICOTS)	T	
MUSCATINE	Sand Cherry	Prunus pumila	PLANTS (DICOTS)	S	
MUSCATINE	Sand Pigweed	Amaranthus arenicola	PLANTS (DICOTS)	S	
MUSCATINE	Schreber's Aster	Aster schreberi	PLANTS (DICOTS)	E	

MUSCATINE	Slender Copperleaf	Acalypha gracilens	PLANTS (DICOTS)	S			
MUSCATINE	Small Morning Glory	Ipomoea lacunosa	PLANTS (DICOTS)	S			
MUSCATINE	Spring Avens	Geum vernum	PLANTS (DICOTS)	S			
MUSCATINE	Sweet Indian Plantain	Cacalia suaveolens	PLANTS (DICOTS)	T			
MUSCATINE	Toothcup	Rotala ramosior	PLANTS (DICOTS)	S			
MUSCATINE	Violet	Viola macloskeyi	PLANTS (DICOTS)	S			
MUSCATINE	Virginia Snakeroot	Aristolochia serpentaria	PLANTS (DICOTS)	T			
MUSCATINE	Water Shield	Brasenia schreberi	PLANTS (DICOTS)	S			
MUSCATINE	Water Starwort	Callitriche heterophylla	PLANTS (DICOTS)	S			
MUSCATINE	Waxyfruit Hawthorn	Crataegus pruinosa	PLANTS (DICOTS)	S			
MUSCATINE	Winged Monkey Flower	Mimulus alatus	PLANTS (DICOTS)	T			
MUSCATINE	Wooly Milkweed	Asclepias lanuginosa	PLANTS (DICOTS)	T			
MUSCATINE	Yellow Monkey Flower	Mimulus glabratus	PLANTS (DICOTS)	T			
MUSCATINE	Blue Mud-plantain	Heteranthera limosa	PLANTS (MONOCOTS)	S			
MUSCATINE	Bulrush	Scirpus pedicellatus	PLANTS (MONOCOTS)	S			
MUSCATINE	Bur-reed	Sparganium angrocladum	PLANTS (MONOCOTS)	S			
MUSCATINE	Clandestine Dropseed	Sporobolus clandestinus	PLANTS (MONOCOTS)	S			
MUSCATINE	Deep Green Sedge	Carex tonsa	PLANTS (MONOCOTS)	S			
MUSCATINE	Drooping Bluegrass	Poa languida	PLANTS (MONOCOTS)	S			
MUSCATINE	Eastern Prairie Fringed Orchid	Platanthera leucophaea	PLANTS (MONOCOTS)	E	T		PDF
MUSCATINE	False Hop Sedge	Carex lupuliformis	PLANTS (MONOCOTS)	S			
MUSCATINE	Glomerate Sedge	Carex aggregata	PLANTS (MONOCOTS)	S			
MUSCATINE	Grass Pink	Calopogon tuberosus	PLANTS (MONOCOTS)	S			
MUSCATINE	Grassleaf Rush	Juncus marginatus	PLANTS (MONOCOTS)	S			
MUSCATINE	Great Plains Ladies'-tresses	Spiranthes magnicamporum	PLANTS (MONOCOTS)	S			PDF
MUSCATINE	Green Adder's Mouth	Malaxis unifolia	PLANTS (MONOCOTS)	S			
MUSCATINE	Hall Bulrush	Scirpus hallii	PLANTS (MONOCOTS)	S			
MUSCATINE	Large-leaf Pondweed	Potamogeton amplifolius	PLANTS (MONOCOTS)	S			PDF
MUSCATINE	Nuttall Pondweed	Potamogeton epihydrus	PLANTS (MONOCOTS)	S			
MUSCATINE	Oval Ladies'-tresses	Spiranthes ovalis	PLANTS (MONOCOTS)	T			
MUSCATINE	Pale Green Orchid	Platanthera flava	PLANTS (MONOCOTS)	E			
MUSCATINE	Purple Fringed Orchid	Platanthera psycodes	PLANTS (MONOCOTS)	T			
MUSCATINE	Purple Spike Rush	Eleocharis atropurpurea	PLANTS (MONOCOTS)	S			
MUSCATINE	Sand Bluestem	Andropogon hallii	PLANTS (MONOCOTS)	S			
MUSCATINE	Sedge	Carex gracilescens	PLANTS (MONOCOTS)	S			
MUSCATINE	Shallow Sedge	Carex lurida	PLANTS (MONOCOTS)	S			
MUSCATINE	Showy Lady's Slipper	Cypripedium reginae	PLANTS (MONOCOTS)	T			

MUSCATINE	Slender Crabgrass	Digitaria filiformis	PLANTS (MONOCOTS)	S	
MUSCATINE	Slender Dayflower	Commelina erecta	PLANTS (MONOCOTS)	T	
MUSCATINE	Slender Fimbry	Fimbristylis autumnalis	PLANTS (MONOCOTS)	S	
MUSCATINE	Slender Ladies'-tresses	Spiranthes lacera	PLANTS (MONOCOTS)	T	
MUSCATINE	Slender Sedge	Carex tenera	PLANTS (MONOCOTS)	S	
MUSCATINE	Small Green Woodland Orchid	Platanthera clavellata	PLANTS (MONOCOTS)	S	
MUSCATINE	Small White Lady's Slipper	Cypripedium candidum	PLANTS (MONOCOTS)	S	
MUSCATINE	Soft Rush	Juncus effusus	PLANTS (MONOCOTS)	S	
MUSCATINE	Tall Cotton Grass	Eriophorum angustifolium	PLANTS (MONOCOTS)	S	
MUSCATINE	Yellow-eyed Grass	Xyris torta	PLANTS (MONOCOTS)	E	
MUSCATINE	Cinnamon Fern	Osmunda cinnamomea	PLANTS (PTERIDOPHYTES)	E	
MUSCATINE	Crowfoot Clubmoss	Lycopodium digitatum	PLANTS (PTERIDOPHYTES)	S	
MUSCATINE	Ledge Spikemoss	Selaginella rupestris	PLANTS (PTERIDOPHYTES)	S	
MUSCATINE	Long Beechfern	Thelypteris phegopteris	PLANTS (PTERIDOPHYTES)	E	
MUSCATINE	Meadow Spikemoss	Selaginella eclipses	PLANTS (PTERIDOPHYTES)	E	
MUSCATINE	Northern Adder's-tongue	Ophioglossum pusillum	PLANTS (PTERIDOPHYTES)	S	
MUSCATINE	Royal Fern	Osmunda regalis	PLANTS (PTERIDOPHYTES)	T	
MUSCATINE	Blanding's Turtle	Emydoidea blandingii	REPTILES	T	PDF
MUSCATINE	Bullsnake	Pituophis catenifer sayi	REPTILES	S	PDF
MUSCATINE	Common Musk Turtle	Sternotherus odoratus	REPTILES	T	PDF
MUSCATINE	Copperbelly Water Snake	Nerodia erythrogaster neglecta	REPTILES	E	PDF
MUSCATINE	Diamondback Water Snake	Nerodia rhombifer	REPTILES	T	PDF
MUSCATINE	Eastern Massasauga	Sistrurus catenatus	REPTILES	E	T PDF
MUSCATINE	Ornate Box Turtle	Terrapene ornata	REPTILES	T	PDF
MUSCATINE	Smooth Green Snake	Liochlorophis vernalis	REPTILES	S	PDF
MUSCATINE	Yellow Mud Turtle	Kinosternon flavescens	REPTILES	E	PDF

APPENDIX I

MUSCATINE, IA ZONING MAP

DRAFT



Zoning Distirct

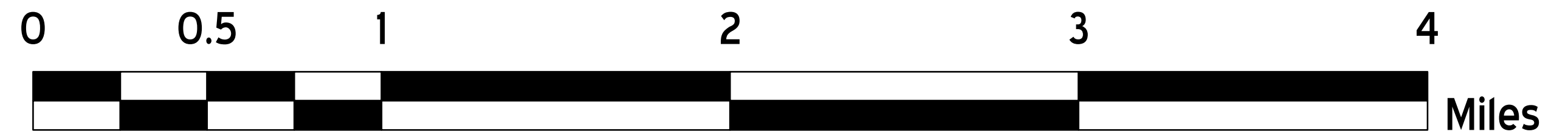
- AG-Agricultural
- A-P-Airport
- C-1 Neighborhood & General Commercial
- C-2 Central Commercial
- C-3 Planned Commercial
- M-1 Light Industrial
- M-2 General Industrial

- R-1 Single-Family Residence
- R-2 Single-Family Residence
- R-3 Single-Family Residence
- R-4 Two-Family Residence
- R-5 Multi-Family Residence
- R-6 Multi-Family Residence
- R-L Large Scale Residence
- S-1 Special Development

- S-2 Institutional Office
- S-3 Mixed Use
- R-3(A) Clinics Allowed as Conditional Use
- FP Floodplain
- FC Flood Channel (Floodway)
- Corporate Limit



Zoning District Map



Date Source: Muscatine Area Geographic Information Consortium, FEMA, & City of Muscatine
Prepared by: Andrew Fangman, City Planner
Date: February 21, 2013

