CAIRO CONCEPTUAL SITE DESIGN & SCOPING STUDY FOR A PUBLIC PORT TERMINAL

Mississippi River—River Mile 5.7

Prepared for:

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and

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1.0 EXECUTIVE SUMMARY

CDG Engineers (CDG) performed a conceptual site design and scoping study for a public port terminal in Cairo, IL for the City of Cairo and the Cairo Public Utility Company (CPUC). The goal of the study was to gather and review existing site condition information in the study area along the left descending bank of the Mississippi River, between river mile (RM) 5.85 and RM 5.4, and the adjacent site and prepare a conceptual site design and scoping study to support the viability of siting a port / terminal development in the City of Cairo, IL. See Exhibit A – Site Location Map for reference.

After analyzing available information, it was determined that a conceptual river terminal could be located at RM 5.7 without having a likelihood of encountering opposition from the river industry. This location has several desirable attributes including adequate depth, normal to low river velocities, and considerable distance separation from the main navigation traffic.

To provide general capabilities for loading and unloading various commodities, CDG has assumed that a conceptual river terminal structure would be compromised of five mooring cells and four floating deck barges with two dock faces, allowing for both loading and unloading on both sides of the terminal. In addition, adequate space and depth is available for the location of a conceptual downstream anchor fleet capable of accommodating 40-50 barges, between RM 5.5 and RM 5.3. See Exhibits B, C, D, E, F, and G for conceptual river terminal plans for reference.

The City of Cairo currently owns approximately 190 acres of land adjacent to RM 5.7. See Exhibit H – Existing Site Conditions for reference. After analyzing available information, it was determined that conditions are favorable for a conceptual port terminal located adjacent to RM 5.7. The site has several desirable attributes including access to the Canadian National Railroad (CN) main line, prominent location on the Interstate System with I-57, I-55, and I-24 in close proximity, available land with riverfront access sufficient for a major port terminal with storage capabilities, and access to existing utility infrastructure with available capacity and expansion capabilities.

CDG prepared Conceptual Site Layout Exhibits I and J for a port terminal facility located adjacent to RM 5.7. Exhibit I depicts the conceptual port terminal facility with a proposed rail loop and Exhibit J depicts the conceptual port terminal facility with a proposed ladder track. The conceptual port terminal facility is configured for bulk materials and could accept grain commodities such as corn, soy beans, milo, wheat, and rice. The conceptual terminal facility could also accept coal and could be configured to accept gravel, sand, fertilizers, and salt. Additionally, utilizing piping instead of conveyors, liquid commodities such as petrochemicals, refined products, black oils, lube oils, asphalt, or liquid fertilizers could be accommodated. The conceptual site layouts/footprints for grain, coal, and liquid commodity facilities are all shown together on the Site Layout Exhibits for reference and general perspective for comparison purposes. It should be noted that the port terminal facility, as shown, would not likely accommodate grain, coal, and liquids all within the same facility. Unused areas of space were identified as “future industrial areas” for future developments opportunities such as rail car repair/cleaning, auto repair, and other uses related or unrelated to the river operations.

CDG developed order of magnitude cost estimate ranges for the facilities shown on Conceptual Site Layout Exhibits I and J for a port terminal facility. The cost estimate ranges shown below include engineering, overheads, and a 15% contingency:

PORT TERMINAL FACILITIES	COST RANGE
Site Development & Infrastructure	$6 to $8 Million
Rail Facilities	$5 to $7 Million
River Dock Facilities	$8 to $10 Million
Grain Handling Facilities	$30 to $35 Million
Coal Handling Facilities	$20 to $24 Million
Liquids Handling Facilities	$14 to $16 Million

CDG performed a regulatory permit review for the construction of a public port terminal in Cairo, IL and anticipates that permits will likely be required from the U.S. Army Corps of Engineers, Illinois EPA, Illinois DNR/Office of Water Resources, and the City of Cairo/Alexander County.

As future marketing for the port terminal in Cairo, IL evolves, CDG recommends additional study of the existing site conditions. This would include: geotechnical investigations, wetland delineation, cultural/archaeological assessment, threatened/endangered species investigation, outboundary survey, and topographic survey.

2.0 INTRODUCTION

This report examines the viability of locating a port / terminal along the Mississippi River for the City of Cairo and the Cairo Public Utilities Company (CPUC). The City of Cairo and the CPUC desire to develop river access for loading and unloading commodities for the purpose of economic development for the citizens of Cairo, IL.

Background of Cairo:
Cairo is the southernmost city in the state of Illinois, and is located at the confluence of the Mississippi and Ohio Rivers. Cairo has the lowest elevation of any location within the state of Illinois and is the only city in the state surrounded by levees.

With the decline in river trade, Cairo has experienced a marked decline in its economy and population. The population at the 2010 census was 2,831, a significant decline from its peak population of 15,203 in 1920. The City faces many significant socio-economic challenges for the remaining population, including poverty, crime, issues in education, employment and rebuilding its tax base. The community and region are working to stop abandonment of the City, restore its architectural landmarks, and develop heritage tourism focusing on its history and relationship to the Mississippi and Ohio Rivers, to bring new opportunities to the community.

Strategic Location of Cairo:
Cairo is located at a strategic point in the inland river system at the confluence of the Mississippi and Ohio Rivers. Cairo's geographical location has the following advantages:

- No locks/dams from Cairo to export terminals in New Orleans.
- Ice blockage doesn't extend to this point in the Mississippi River.
- Major turn point for upper/lower river boats and a major turn fleet area.
- Located at the lowest point of the upper Mississippi River segment, Cairo offers the lowest barge rates from upriver points to the Gulf and the Gulf to upriver points.
- Prominent location on the Interstate System with I-57, I-55, and I-24 in close proximity.
- Available land area sufficient for a major terminal with storage capabilities.
- Potential to be a great location for transload of commodities from rail to barge with the Canadian National Railroad serving the port area.
- Coal mined in Illinois is utilized for export via barge transportation. Rail access exists to transport coal to the terminal from other U.S. coal mining regions.
- Major grain growing region – corn, soy beans, and some wheat. Much of these crops are transferred into barges at terminals.

The intent of this study effort is for CDG Engineers to develop a conceptual site design and scoping study for a public port terminal facility in Cairo, IL.

3.0 SCOPE OF WORK

CDG Engineers provided the following proposed scope of services to Cairo Public Utilities Company:

- Conduct site visit and meet with officials to discuss details of desired operations, facility locations and designs, and future expansions.
- Acquire existing topographic survey and aerial photography of river bank, levee and interior lands. Acquire available bathymetry for the river bottom at the project site.
- Discuss target cargoes, and develop capacity criteria for commodities to be delivered, stored and transloaded.
- Develop conceptual site layout – rail, roads and terminal facilities.
- Develop concept drawings of unloading, storage and barge loading facilities and equipment.
- Investigate and define parameters of river structures and fleeting with regard to river conditions. Gather information about the historical movement of the river bottom in the area of the proposed new dock facility.
- Develop concept drawings of port facilities and anchor fleets.
- Research and develop a list of regulatory permits that are assessed as being required, and express an opinion as to any difficulties that could be expected to be encountered in regulatory permit acquisition.
- Conduct interim conference calls and meetings with the Client for plan development.
- Prepare order of magnitude project cost estimate.
- Prepare report.
- Present report to CPUC officials.

4.0 DATA ACQUISITION

CDG Engineers acquired and used the following information during development of the conceptual site design and scoping study for a public port terminal facility in Cairo, IL:

LiDAR Digital Terrain Model:

- Illinois State Geological Survey, Illinois Geospatial Data Clearinghouse, 2 Foot Contours, Data Collected Between 2009 and 2011.

Mississippi River Bathymetry:

- USACE Bathymetry, 1987.
- USACE HEC-RAS Data, 2004.
- USACE Bathymetry, 2010.
- Bathymetry from River Soundings, 2013.

Mississippi River Barge Tow Paths:

- Barge Tow Path from 1993 Google Earth Imagery.
- Barge Tow Path from 1998 Google Earth Imagery.
- Barge Tow Path from 2004 Google Earth Imagery.
- Barge Tow Path from 2005 Google Earth Imagery.
- Barge Tow Path from 2009 Google Earth Imagery.
- Barge Tow Path from DPGS Navigation System Output Data from Motor Vessel John H MacMillan (ADM Company), October 19, 2013.

Utility Information:

- Illinois American Water Distribution Systems Maps, Acquired October 1, 2014.

Aerial Photography:

- Illinois State Geological Survey, Illinois Geospatial Data Clearinghouse, Illinois Department of Transportation Orthophotography, 2011 Imagery.

Property Map:

- City of Cairo Proposed Survey, Property Development Boundary Map, Prepared for Cairo Public Utility Company in 2012. See Appendix 1.

Railroad Maps:

- Canadian National Railroad Map, Acquired September 30, 2014. See Appendix 2.
- Shawnee Terminal Railroad Map, Acquired in September, 2014. See Appendix 3.

USGS Quadrangle Maps:

- Cairo Quadrangle, Illinois-Kentucky-Missouri, 7.5 Minute Series (Topographic), Contour Interval 5 Feet, Photorevised 1978. See Appendix 4.

- Wyatt Quadrangle, Missouri-Illinois-Kentucky, 7.5 Minute Series (Topographic), Contour Interval 5 Feet, Photorevised 1978. See Appendix 4.

FEMA Flood Maps:

- FEMA, Flood Insurance Rate Map, Alexander County, IL, Map Number 17003C0215E, Effective Date May 4, 2009. See Appendix 5.
- FEMA, Flood Insurance Rate Map, Alexander County, IL, Map Number 17003C0220E, Effective Date May 4, 2009. See Appendix 5.

- FEMA, Flood Insurance Rate Map, Alexander County, IL, Map Number 17003C0255E, Effective Date May 4, 2009. See Appendix 5.
- FEMA, Flood Insurance Rate Map, Alexander County, IL, Map Number 17003C0260E, Effective Date May 4, 2009. See Appendix 5.

U.S. Fish and Wildlife Service Information:

- National Wetlands Inventory Map, Acquired August 29, 2014. See Appendix 6.
- Threatened and Endangered Species Report, Alexander County, IL, Acquired October 21, 2014. See Appendix 7.

NRCS Soil Resource Report:

- NRCS Soil Resource Report for Cairo, IL, Acquired October 21, 2014. See Appendix 8.

5.0 RIVER CONDITIONS

CDG Engineers reviewed existing river conditions along the left descending bank of the Mississippi River, between river mile (RM) 5.3 to RM 6.7, to verify that river conditions are favorable for a new river terminal.

River Stability:
River meandering in the study area has been stabilized since the late 1960s by a series of bank protection and river training works by the U.S. Army Corps of Engineers (USACE), providing a fixed aerial position of the river and a stable navigation channel. The left descending river bank along the City of Cairo riverfront property, between RM 6.4 and 5.3 (approximately 5,800 linear feet), has been stabilized with rock bank protection (revetment), resulting in no known reports of major bankline erosion over the last 20 years.

Navigation Channel:
During a period from 1993 to 2000, a series of ten bendway weirs were placed in the river, between RM 6.7 and RM 5.8, by the USACE to improve navigation conditions for downbound tows. Prior to construction of these weirs, downbound tows had difficulty navigating through the river bend. Construction of these weirs resulted in improved navigation conditions (normal to low river velocities) allowing downbound tows to navigate closer to the sailing line and farther away from stabilized river bank.

The navigation sailing line (yellow dashed line on Exhibits B and C), is a line established on navigation charts and represents the normal centerline pathway of navigation traffic. This line can be used as a general indication of the pathways of most navigation traffic during normal river conditions. However, high water and low water conditions may cause navigation to slightly deviate from this line.

River Depth:
From the end of the existing weir at RM 5.85 to the short dike located at RM 5.4, favorable depth conditions exist for the proposed river terminal. In the 2013 river sounding bathymetry survey, river bottom depths were approximately 8 feet below the Low Water Reference Plane (LWRP), or

approximately elevation 272± mean sea level (msl). For a fully loaded barge operation requiring a draft of 8 feet, the water surface elevation required above the bottom would be 280± msl. Based on river elevation data at Birds Point Gage (RM 2.0) from January, 1952 to January, 2014, the water surface elevation is at or below elevation 280.25 0.25% of the time. Although extreme conditions could occur as a result of a drought in any given year, depths less than 8 feet at the proposed river terminal would be a rarity. In addition, terminal operations could still be achieved during extreme low water conditions by light-loading the payload barge to a lesser draft. Light-loading of barges in the navigation channel and at terminals and ports is a common practice in the industry during extreme low water conditions.

Historical Movement of the River Bottom:
CDG reviewed and compared historical bathymetry records of the river bottom in the study area from 1987, 2004, 2010, and 2013. The historical records show that the river bottom has been moving upward in the study area along the left descending bank, between RM 5.85 and RM 5.4. CDG does not anticipate this trend continuing in the future and is satisfied that river conditions are favorable for a new river terminal in the study area.

6.0 RECOMMENDED RIVER TERMINAL LOCATION

River conditions are favorable for a new river terminal located along the left descending bank of the Mississippi River, between RM 5.85 and RM 5.4. Specifically, CDG recommends siting a conceptual loading and off-loading terminal centered at RM 5.7. This location has several desirable attributes including adequate depth, normal to low river velocities, and adequate distance separation from the main navigation traffic. Exhibits B and C show the recommended river terminal location and configuration and downstream anchor fleeting area along the left descending bank of the river, with the tow transits and the navigation sailing line overlaid for reference.

The river structures at this terminal are presently assumed to be comprised of the following general features:

- Five evenly spaced mooring cells for anchoring and mooring.
- Four floating deck barges moored to the cells for loading and off-loading of commodities.

Exhibits D and E show the conceptual river terminal dock plan and elevation and Exhibit F depicts conceptual 3D views of the river terminal dock for reference. The conceptual river terminal is shown with two dock faces, allowing for both loading and unloading of barges on both sides of the terminal. Exhibit G shows the conceptual dual side loadout concept for reference.

The outside line of the deck barges comprising the dock face is presently located at approximately 125 feet from the Low Water Reference Plans (“LWRP”). With the location shown on the present drawings, cargo barges have approximately 8 feet of river below the LWRP, which represents an extremely low and rarely occurring river condition. The distance from the sailing line is judged to be adequate to avoid affecting or impeding river traffic at the present location. It is also judged that tows could transit in and out of the terminal location with adequate clearance for the main traffic area.

In addition to the terminal location, there is adequate depth and safe distances away from the sailing line for the location of fleeting, capable of accommodating 40-50 barges, between RM 5.5 to RM 5.3. The fleets would utilize anchors and would be moved to and from the left descending bank of the river dependent upon changing river stages.

7.0 TARGET CARGOES

CDG Engineers envisions a port terminal capable of handling a variety of bulk commodities including grains, coal, liquids, etc. See summary below of a list of target cargoes.

Grains:
Cairo is ideally located in a major grain growing region with substantial local grain merchandizing opportunities for the following grain commodities. Much of these crops are transferred into barges at port terminals.

- Corn
- Soy Beans
- Milo
- Wheat
- Rice

Coal:
Coal mined in Illinois is utilized for export via barge transportation. Rail access exists to transport coal form Illinois and from other U.S. coal mining regions along the existing Canadian National Railroad to a port terminal facility in Cairo.

Liquids:
A port terminal in Cairo could be configured to accept the following liquid commodities. These products could be transloaded to/from barges at the port terminal.

- Petrochemicals
- Refined Chemicals
- Black Oils
- Lube Oils
- Asphalt
- Liquid Fertilizers

Additionally, a port terminal in Cairo could be configured to accept gravel, sand, dry fertilizers, and salt. As future marketing for a port terminal in Cairo evolves, other bulk commodities could also be considered.

8.0 EXISTING SITE CONDITIONS

The following is a summary of the existing site conditions for the proposed port terminal site. This information was collected and reviewed to verify that existing site conditions are favorable for a new port terminal.

Existing Rail Facilities:
Historically, the site was serviced by the Gulf, Mobile and Ohio Railroad, which merged with Illinois Central Railroad (IC) to form the Illinois Central Gulf Railroad (ICG). Later reverting back to simply IC, the railroad was purchased by the Canadian National Railway Company (CN) in 1988. These rail lines, now owned by CN, which formerly serviced the site, appear to have been abandoned.

Today, rail service in and out of the City of Cairo appears to be limited to Canadian National Railway Company (CN). Multiple railroad service providers (e.g. UP, BNSF, NS) have "trackage rights" in the area allowing them to haul through Cairo. However, following discussions with representatives from these railroad companies, it was determined that these rights do not allow for pickup or delivery to/from Cairo facilities.

The Shawnee Terminal Railway Company (STR, a wholly-owned subsidiary of Pioneer Railcorp) also operates approximately 2.5 miles of track in the Cairo area. Following discussions with representatives from STR, it was determined that these lines have not been used for five to six years. Cursory inspections of these rails indicate a need for major rehabilitation, if not replacement.

Existing Roadways:
Historically, the site was accessible from 21st Street, 22nd Street, and 28th Street. The existing roadbeds for 21st Street and 28th Street are still in place and accessible. The existing roadbed for 22nd Street appears to have been abandoned west of the Park Avenue. Following a cursory review, it was noted that 28th Street is a marked access route to Cairo's Historic Park District.

Existing Utilities:

- Water: Current Illinois American Water Distribution System Maps show an existing 6" water main on both 21st Street and 28th Street. The current condition of these existing water facilities is unknown.

- Electric: An existing electric substation is located near the intersection of 28th Street and the existing STR track. The existing substation has plenty of available capacity with 100 primary amps at 12.47 kV (3 phase).

- Sewer: An existing sewer line runs along 21st Street. The current condition of this existing sewer line in unknown.

- Gas: No known existing gas lines service the site. The closest known existing gas line is an existing 4" residential line (35 psi) that runs along Park Avenue adjacent to the site. However, this existing residential gas line would not be sufficient to handle a large client.

Site Drainage:
In general, the site drains to an existing pump house located just east of the existing levee near RM 5.5, from which point surface water runoff is pumped to the Mississippi River.

Potential Existing Wetland Areas:
The U.S. Fish and Wildlife Service National Wetlands Inventory Map indicates that parts of the site may possibly be covered with wetlands. These areas are "potential" wetlands. A wetland delineation is required to definitively determine if wetlands truly exist.

Existing Floodplain Areas:
The FEMA Flood Insurance Rate Maps of the site indicate that parts of the site are Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood (Zone AE). The base flood elevation within these areas is elevation 312 mean seal level (msl).

Existing Soils:
The Natural Resources Conservation Service (NRCS) Soil Resource Report for the site indicates that the majority of the site consists of silty clay loam soil.

9.0 CONCEPTUAL PORT TERMINAL SITE LAYOUT

CDG Engineers developed two conceptual port terminal site layout configurations adjacent to RM 5.7. See Exhibits I and J for reference. Exhibit I depicts the conceptual port terminal facility with a proposed rail loop and Exhibit J depicts the conceptual port terminal facility with a proposed ladder track. These Exhibits also depict a rail connection to the Canadian National Railroad (CN) main line track, truck access routes, and conceptual site layouts/footprints for grain, coal, and liquid commodity facilities. The conceptual site layouts/footprints for grain, coal, and liquid commodity facilities are all shown together on the site layout Exhibits for reference and general perspective for comparison purposes. It should be noted that the port terminal facility, as shown, would not likely accommodate grain, coal, and liquids all within the same facility. If coal is selected as the primary transloading commodity, then grain facilities would not likely be practical within the same facility, and vice versa.

Rail Access:
Railway service for the proposed port terminal site could be accomplished in several different ways.

- The trains (locomotives) going through the transloading facility could be CN owned and operated.

- The Shawnee Terminal Railway Company (STR) could service the site, before changing to CN haulage on the northern end of the site.

- The rails within the site could be privately owned and operated, before changing to CN haulage on the northern end of the site.

Any development utilizing rail access will involve the construction of new trackage. This construction is typically carried out by the developer, following specific railroad standards. In rare instances, with large volumes or additional client potential, a railroad company may construct and own the track itself. This study assumes private construction and ownership, either by the developer or a short line railway company such as STR.

The most likely new railway alignment would begin approximately 1.5 miles north of the proposed facility, at a new connection to the existing CN mainline track. New trackage would then run through a southerly curve to a new connection to the existing STR track. The rail alignment would then run along the existing STR track, if STR ran the service or if the right-of-way was purchased by the developer or another short line railroad company. New trackage would then run south and west to the new terminal facility, where no tracks currently exist. Continuing beyond the transloading area, two railway alignment options were developed. The first option would be to loop the track back to the existing STR alignment (See Exhibit I). This type of loop arrangement allows for an easier, smoother flow of rail cars. The drawback to a loop arrangement is that a long train stopped in the loop could block access to portions of the site. The second option would be to have a series of parallel side tracks within the site, a ladder track arrangement, to maintain access to the site at all times (See Exhibit J).

Truck Access:

The City of Cairo is accessible from both the north and the south by Route 51, which within Cairo is named Sycamore Street (north half of City) and Washington Avenue (South half of City). Following a review of multiple truck access route options, the preferred truck access route, between the proposed port terminal and Route 51, was identified as the connection of Center Street to 21st Street. This route is preferred because it provides direct access to the proposed port terminal site, utilizes existing roadbeds, and reduces travel distance. This route also minimizes impacts to residential neighborhoods and other Cairo assets (historic, religious, cultural, educational and recreational) to the maximum extent possible.

Terminal Facilities Layout:

The conceptual port terminal site layouts contain the following significant features:

- The terminal facility is configured for bulk materials and could accept the following grain commodities: corn, soy beans, milo, wheat, and rice. The terminal facility could accept coal and also be configured to accept gravel, sand, fertilizers, and salt. Additionally, utilizing piping instead of conveyors, liquid commodities such as petrochemicals, refined products, black oils, lube oils, asphalt, or liquid fertilizers could be accommodated.

- Paved concrete roadways are proposed because they provide a smooth, durable, and relatively dust free option for heavy truck routing. The trucks would travel in a northerly direction from 21st Street between the levee and the proposed rail alignment to a truck turnaround area on the north end of the loading/load out area. A truck scale/probe station would be located between the street and the loading/load out area.

- 3 independent truck dump pits long enough to dump an entire truck without moving. One truck pit with a split scale to accommodate truck loading.

- Grain storage tanks: 2 x 250k bushel; 2 x 125k bushel; 4 x 50,000 bushel for total storage capacity of 950k bushels. An optional ground pod storage expansion would provide additional storage capacity of approximately 900k bushels.

- Coal ground storage area (radial stacker and underground reclaim) with 20k ton storage capacity.

- Liquid storage tanks: 4 x 100,000 barrel tanks with a 400k barrel storage capacity.

- Office building with space for manager's office, bookkeeper room, grade room, and lab.

- Control room near the truck/rail dump.

- Barge loading control room located on the river tower.

- Barge loading and unloading conveyance.

- Truck loading and unloading conveyance.

- Rail loading and unloading conveyance.

Utilities:
Records indicate existing water, sewer, gas, and electric facilities are all available within close proximity of the site. All utilities would need to be extended to service the port terminal facility.

10.0 COST ESTIMATE

CDG Engineers developed order of magnitude cost estimate ranges for the facilities shown on the conceptual site layout Exhibits I and J. The conceptual site layouts/footprints for gain, coal, and liquid commodity facilities are all shown together on the site layout Exhibits for reference and general perspective for comparison purposes. It should be noted that the port terminal facility, as shown, would not likely accommodate grain, coal, and liquids all within the within the same facility. If coal is selected as the primary transloading commodity, then grain facilities would not likely be practical within the same facility, and vice versa.

The cost estimate ranges shown below include engineering, overheads, and a 15% contingency.

Site Development & Infrastructure: **Cost Range: $6 to $8 Million**
Site development includes clearing/grubbing, earthwork, concrete truck routes, concrete access roads, office parking lot, site drainage, and truck scales and probe facilities. Site infrastructure includes an office building, shop/maintenance building, and other miscellaneous support facilities. Costs were also included for geotechnical investigations on the land side and the river side of the levee as well as surveying.

Costs for extending the existing utilities to service the port terminal site are not included in the cost estimate range for site development & infrastructure. Records indicate existing water, sewer, gas, and electric facilities are all available within close proximity of the site.

Rail Facilities: **Cost Range: $5 to $7 Million**

Any development utilizing rail access will involve the construction of new rail facilities. This construction is typically carried out by the developer, following specific railroad standards. Rail facilities include new track, ties, ballast, and sub-ballast from the proposed port terminal site to the proposed CN rail connection, located approximately 1.5 miles north of the proposed site. Costs were also included for new rail turnouts and crossings.

River Dock Facilities: **Cost Range: $8 to $10 Million**

The river dock facilities include five evenly spaced mooring cells, four floating deck barges moored to the cells, a loadout structure, and a barge haul system.

Grain Handling Facilities: **Cost Range: $30 to $35 Million**

The grain handling facilities include 3 truck dumps, rail dump, receiving/transfer system, 8 storage tanks (2 x 250k bushel, 2 x 125k bushel, 4 x 50k bushel) with a total storage capacity of 950k bushels, reclaim/transfer system, barge loadout system, and miscellaneous ancillaries.

Grain receiving/unloading from barges is not included in the cost estimate range for grain handling facilities.

Coal Handling Facilities: **Cost Range: $20 to $24 Million**

The coal handling facilities include rail dump, receiving/transfer system, reclaim stacker, coal pile ground storage with a total storage capacity of 20k tons, reclaim/transfer system, barge loadout system, and miscellaneous ancillaries.

Coal receiving/unloading from barges is not included in the cost estimate range for coal handling facilities.

Liquids Handling Facilities: **Cost Range: $14 to $16 Million**

The liquids handling facilities include river barge to storage transfer system, truck to storage transfer system, 4 storage tanks (4 x 100,000 barrel) with a total storage capacity of 400k barrels, storage to river barge transfer system, and miscellaneous ancillaries.

11.0 REGULATORY PERMITS

The following is a summary of the anticipated regulatory permits that will likely be required for the construction of a public port terminal in Cairo, IL. See summary table of anticipated regulatory permits, located at the end of this section, for reference.

- U.S. Army Corps of Engineers (USACE) Section 10/404 Permit: If a river facility is contemplated, then it will be necessary to construct new port facilities. This will require a Section 10 Permit and possibly a 404 Permit. If it is determined that wetlands are, in fact, within the site and will be disturbed, remediation must be addressed. Typically, river ports can be developed with a simple Section 10 and a 404 Permit. If wetlands need to be mitigated, then an individual USACE Permit may be necessary. A Section 10 Permit typically requires 2 months to acquire following initial submittal. No submittal fee is anticipated for a Section 10 Permit. An individual 404 Permit typically requires 9-12 months to acquire following initial submittal. No submittal fee is anticipated for a 404 Permit submittal. The 404 Permit is made concurrent with the Illinois EPA 401 Water Certification submittal. CDG recommends that if this project is deemed feasible, a pre-application permit meeting be held with the USACE to discuss different possibilities.

- U.S. Army Corps of Engineers (USACE) 408 Permit: The USACE regulates construction activities within 500' of the toe of slope of existing levees. Construction inside this 500' limit requires a 408 Permit from the USACE and a letter from the Levee Board. It is CDG's understanding that the USACE is currently working to expand the 500' limit to 1500'. A 408 Permit typically requires 6 months to acquire following initial submittal. No submittal fee is anticipated for a 408 Permit submittal.

- Illinois EPA 401 Water Certification: If the USACE issues a 404 Permit, then a corresponding Illinois EPA 401 Clean Water Certification will also need to be issued. An Illinois EPA 401 Clean Water Certification submittal is made concurrent with the USACE 404 Permit submittal. An Illinois EPA 401 Clean Water Certification typically requires 9-12 months to acquire following initial submittal. A $2,000 fee is anticipated for an Illinois 401 Clean Water Certification submittal.

- Illinois Department of Natural Resources/Office of Water Resources Floodway Permit: The State of Illinois regulates construction within floodways. Construction within a floodway requires performing a "no-rise" analysis and obtaining a Floodway Permit. A Floodway Permit typically requires 6-9 months to acquire following initial submittal. A $5,000 fee is anticipated for a Floodway Permit submittal, excluding floodway compensatory mitigation costs. It is a requirement to compensate for the floodway volume lost to the Mississippi River. This is typically referred to as floodway compensatory mitigation. Typical mitigation is provided by removing an equal volume of earth from a parcel of property that lies within the floodway. The borrow is then removed (taken out of) from the floodway. The borrow pit is then deed restricted to prevent future filling of the site. Subject to availability and Illinois DNR approval, it may be possible to buy floodway compensatory storage credits from an Illinois DNR approved source.

- City of Cairo/Alexander County Floodplain Development Permit: A Floodplain Development Permit and "No-Rise" Certificate may be required from the City and/or Alexander County. This would likely be a minor permit to obtain once the State of Illinois issues a Floodway Permit from the

Department of Natural Resources. A Floodplain Development Permit typically requires 1 month to acquire following initial submittal. No submittal fee is anticipated for a Floodplain Development Permit.

- Illinois EPA NPDES Permit for Stormwater Control: A General NPDES Permit for Stormwater Discharges from Construction Site Activities is required for any construction site that will result in the disturbance of soil of one or more acres total land area. Disturbance of soil includes clearing, grading, and excavation activities of 1 acre or more. Construction activities less than 1 acre must also obtain coverage if they are part of a larger common plan of development. A Construction Site Permit must remain active until the site has been completely stabilized. "Stabilized" means that all soil disturbing activities at the site have been completed and a uniform perennial vegetative cover has been established on all unpaved areas; or equivalent permanent stabilization measures have been employed. A General NPDES Permit typically requires 1 week to acquire following initial submittal. A $750 fee is anticipated for a General NPDES Permit for land disturbance of 5 or more acres.

- City of Cairo Building Permit: A City of Cairo Building Permit will be required. A City of Cairo Building Permit typically requires 1 month to acquire following initial submittal. The anticipated fee schedule for a City of Cairo Building Permit is $5 for the first $1,000 in construction cost and then $1 for every $1,000 in construction cost thereafter.

- Air Permitting: Not addressed in this report.

- Cultural Resources: The proposed port terminal site lies along the Mississippi River and has been disturbed over a number of years and the potential for cultural resources such as Native American Indian artifacts is most likely low. It is possible to perform a cursory review of potential cultural resources by contacting the Illinois State Historical Preservation Office (SHPO). This contact would be recorded as a record of investigation. A SHPO cursory review of potential cultural resources typically requires 2 months following initial inquiry. No submittal fee is anticipated for a SHPO cursory review of potential cultural resources.

- Endangered Species: An investigation of possible endangered species along the riparian corridor and the adjacent Mississippi River was not conducted. It is possible to perform a cursory review of potential endangered species utilizing the Illinois Department of Natural Resources Ecological Compliance Assessment Tool (EcoCAT). This contact would be recorded as a record of investigation. An EcoCAT cursory review typically requires 1 week following initial submittal. A $500 fee is anticipated for an EcoCAT cursory review submittal.

See summary table of anticipated regulatory permits, next page, for reference.

Regulatory Permits – Summary Table:

The following table is a summary of the anticipated regulatory permits that will likely be required for the construction of a public port terminal in Cairo, IL.

ANTICIPATED PERMIT REQUIREMENTS	REVIEWING AGENCY	ANTICIPATED ACQUISITION TIME*	ANTICIPATED SUBMITTAL FEES**
CONSTRUCTION PERMITS			
Section 10 Permit	U.S. Army Corps of Engineers	2 Months	No Submittal Fee
Individual Section 404 Permit	U.S. Army Corps of Engineers	9-12 Months	No Submittal
408 Permit	U.S. Army Corps of Engineers	6 Months	No Submittal Fee
401 Water Certification	Illinois Environmental Protection Agency	9-12 Months	$2,000
Floodway Permit	Illinois Department of Natural Resources / Office of Water Resources	6-9 Months	$5,000
Floodplain Development Permit	City of Cairo / Alexander County	1 Month	No Submittal Fee
NPDES Permit for Stormwater Control	Illinois Environmental Protection Agency	1 Week	$750***
Building Permit	City of Cairo	1 Month	$5 for First $1,000 in Construction Cost. Then, $1 for every $1,000 thereafter.
OTHER ENVIRONMENTAL REGULATIONS			
Cultural Resources Cursory Review	Illinois State Historical Preservation Office	2 Months	No Submittal Fee
Endangered Species Cursory Review (EcoCAT)	Illinois Department of Natural Resources	1 Week	$500

*Anticipated acquisition time following initial submittal.
**Does not include fees for engineering services / preparation of submittal documents.
***Assumes land disturbance of 5 or more acres.

12.0 CONCLUSIONS

After analyzing available information, it was determined that a conceptual river terminal could be located at RM 5.7. This location has several desirable attributes including adequate depth, normal to low river velocities, and considerable distance separation from the main navigation traffic. CDG has assumed that a conceptual river terminal structure would be compromised of five mooring cells and four floating deck barges with two dock faces, allowing for both loading and unloading on both sides of the terminal. In addition, adequate space and depth is available for the location of a conceptual downstream anchor fleet capable of accommodating 40-50 barges, between RM 5.5 and RM 5.3.

After analyzing available information, it was determined that conditions are favorable for a conceptual port terminal located adjacent to RM 5.7. The site has several desirable attributes including access to the Canadian National Railroad (CN) main line, prominent location on the Interstate System with I-57, I-55, and I-24 in close proximity, available land with riverfront access sufficient for a major port terminal with storage capabilities, and access to existing utility infrastructure with available capacity and expansion capabilities.

CDG envisions a Cairo port terminal capable of handling a variety of commodities. The port terminal in turn has the potential to support additional public and private facilities adjacent to or nearby that can utilize the capabilities of the port terminal. The conceptual port terminal facility is configured for bulk materials and could accept grain commodities such as corn, soy beans, milo, wheat, and rice. The conceptual terminal facility could also accept coal and could be configured to accept gravel, sand, fertilizers, and salt. Additionally, utilizing piping instead of conveyors, liquid commodities such as petrochemicals, refined products, black oils, lube oils, asphalt, or liquid fertilizers could be accommodated.

CDG developed order of magnitude cost estimate ranges for the facilities shown on Conceptual Site Layout Exhibits I and J for a port terminal facility. The cost estimate ranges shown below include engineering, overheads, and a 15% contingency:

PORT TERMINAL FACILITIES	COST RANGE
Site Development & Infrastructure	$6 to $8 Million
Rail Facilities	$5 to $7 Million
River Dock Facilities	$8 to $10 Million
Grain Handling Facilities	$30 to $35 Million
Coal Handling Facilities	$20 to $24 Million
Liquids Handling Facilities	$14 to $16 Million

CDG performed a regulatory permit review for the construction of a public port terminal in Cairo, IL and anticipates that permits will likely be required from the U.S. Army Corps of Engineers, Illinois EPA, Illinois DNR/Office of Water Resources, and the City of Cairo/Alexander County.

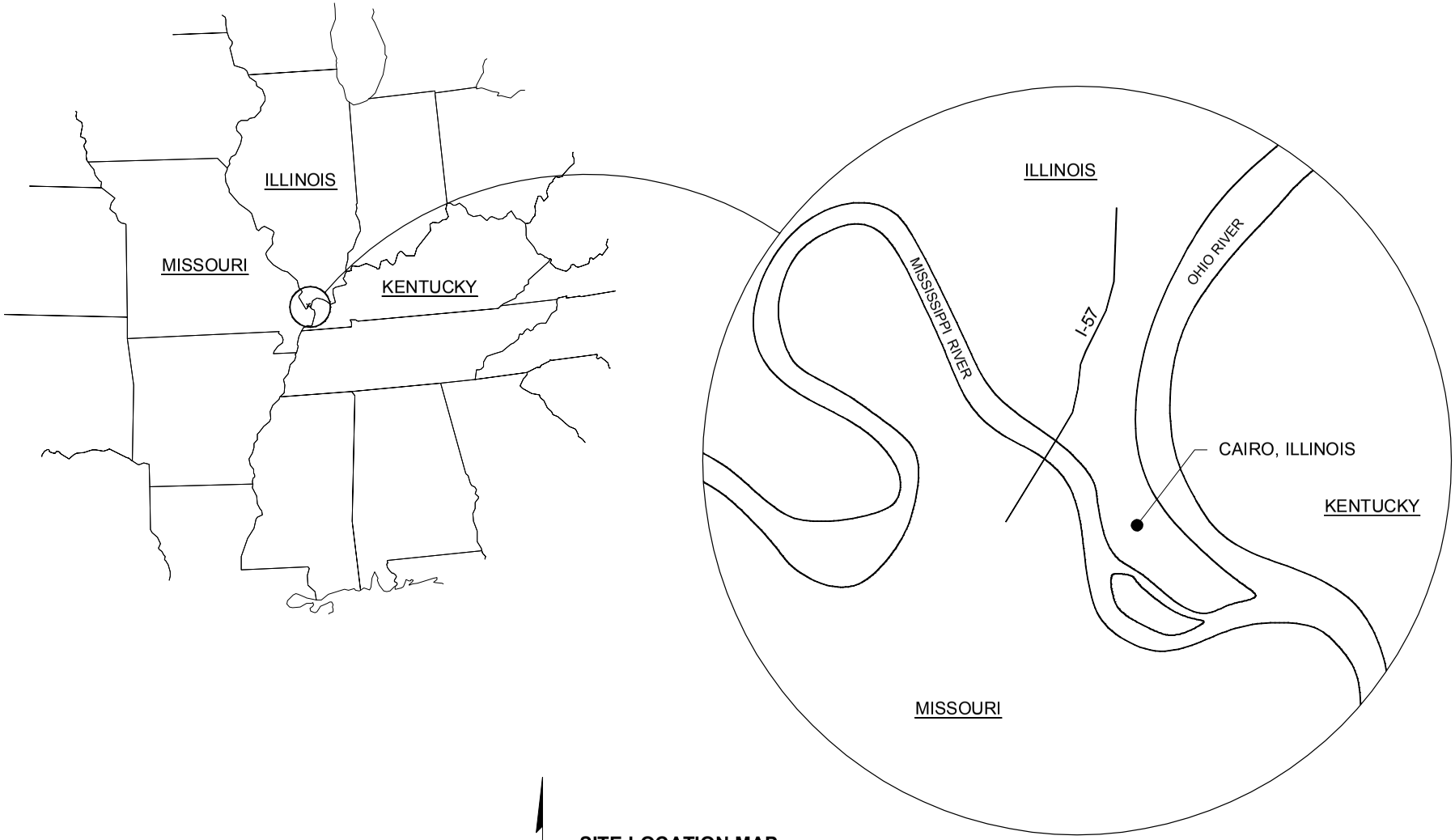
13.0 RECOMMENDATIONS

As future marketing for the port terminal in Cairo, IL evolves, CDG recommends additional study of the existing site conditions. This would include:

- Geotechnical Investigations.
- Wetland Delineation.
- Cultural/Archaeological Assessment.
- Threatened/Endangered Species Investigation.
- Outboundary and Topographic Survey.

EXHIBITS

A. Site Location Map
B. Barge Tow Paths
C. Conceptual Terminal Plan
D. River Plan at Dock
E. River Dock Elevation
F. 3D Dock Views
G. Dual Side Loadout Concepts
H. Existing Site Conditions
I. Conceptual Rail Loop Site Layout
J. Conceptual Ladder Track Site Layout



SITE LOCATION MAP
NOT TO SCALE

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CITY OF CAIRO, IL & CAIRO PUBLIC UTILITY COMPANY
CONCEPTUAL SITE DESIGN & SCOPING STUDY
EXHIBITS
SITE LOCATION MAP

CDG PROJECT NO.
13088

DRAWING NO.
EXHIBIT A

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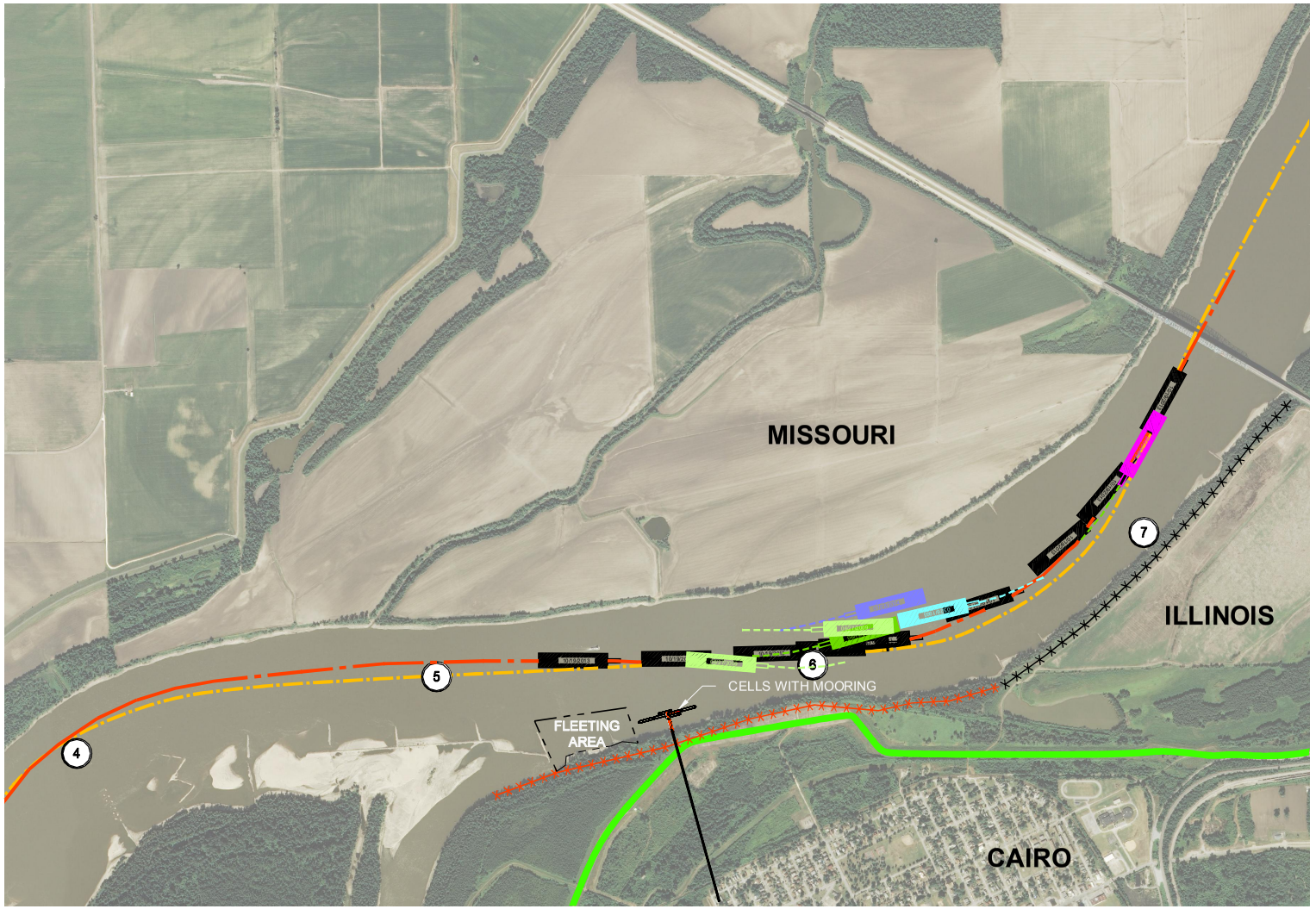

LEGEND:

- Navigation Sailing Line
- Bendway Weirs
- Dikes and Bank Protection
- 3 River Mile
- Cairo Riverfront Property
- Private Property
- Levee
- A - 1993 Barge from Google Earth imagery
- B - 1998 Barge from Google Earth imagery
- C - 2004 Barge from Google Earth imagery
- D - 2005 Barge from Google Earth imagery
- E,F - 2009 Barge from Google Earth imagery
- G - Barge tow path October 2013

Source of Photo: USDA-FSA Aerial Photography Field Office

Date of Photo: July 27, 2012

Birds Point Gage 27.98

BARGE TOW PATHS

SCALE: 1" = 1600'

N

800' 0' 1600' 3200'

SCALE IN FEET

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EXHIBITS
BARGE TOW PATHS

CDG PROJECT NO.
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DRAWING NO.
EXHIBIT B

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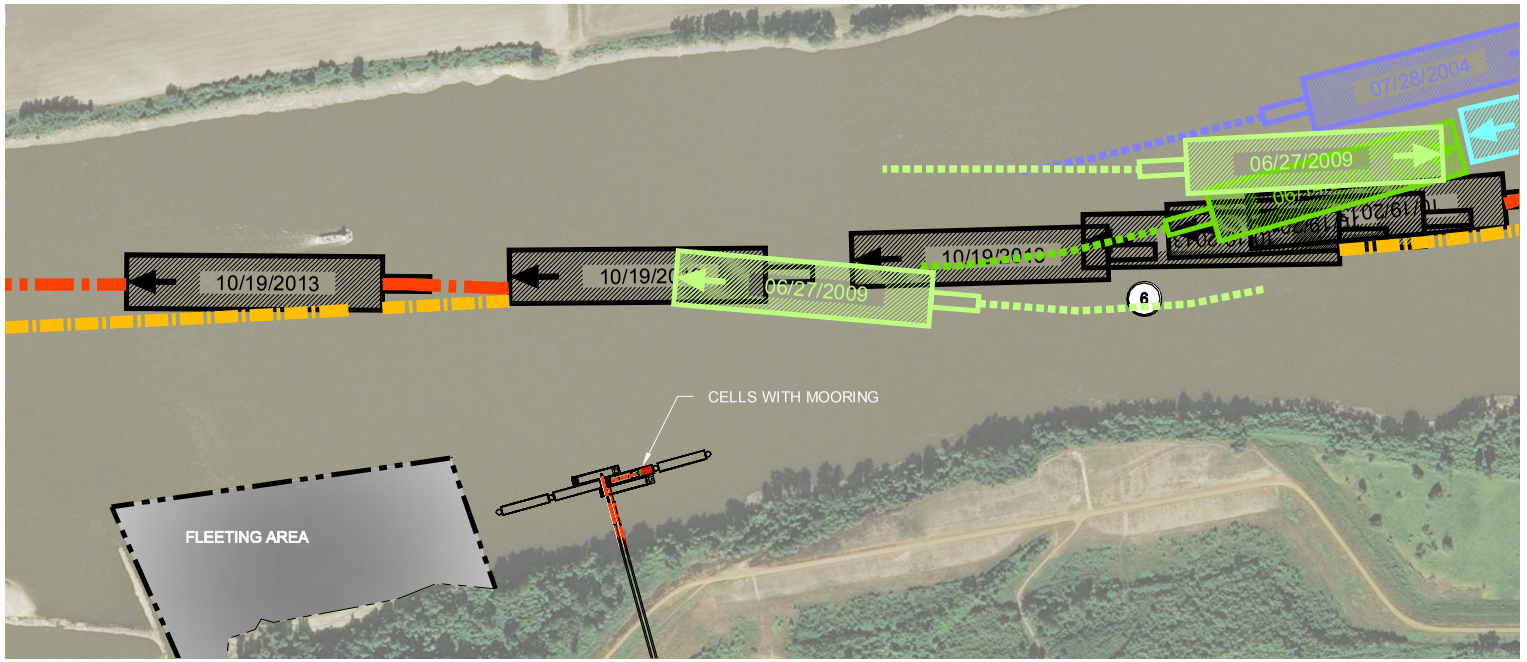


CONCEPTUAL TERMINAL PLAN

SCALE: 1" = 500'

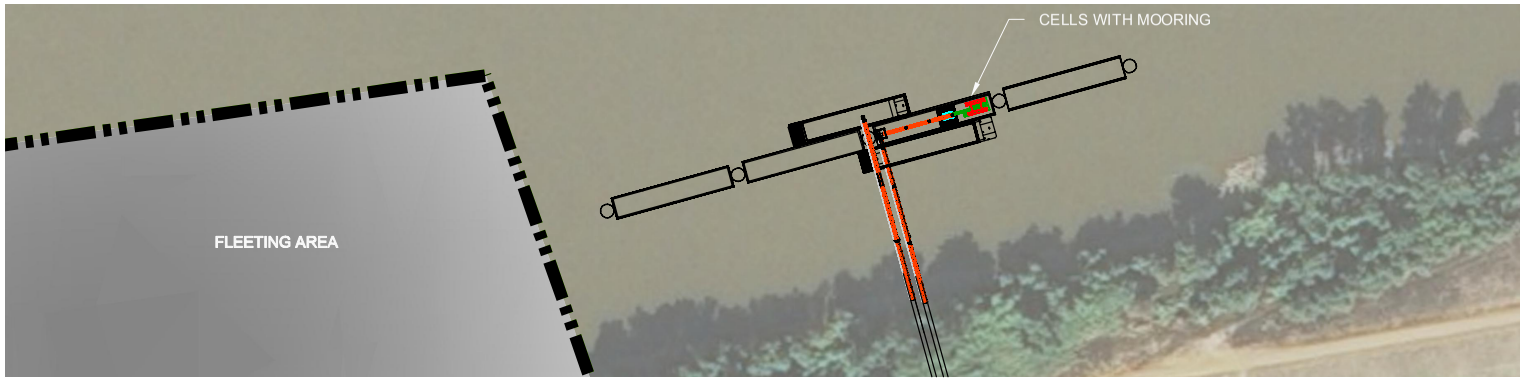
N

250' 0' 500' 1000'

SCALE IN FEET

LEGEND:

- Navigation Sailing Line
- Bendway Weirs
- Dikes and Bank Protection
- 3 River Mile
- Levee
- A - 1993 Barge from Google Earth imagery
- B - 1998 Barge from Google Earth imagery
- C - 2004 Barge from Google Earth imagery
- D - 2005 Barge from Google Earth imagery
- E,F - 2009 Barge from Google Earth imagery
- G - Barge tow path October 2013



Source of Photo: USDA-FSA Aerial Photography Field Office

Date of Photo: July 27, 2012

Birds Point Gage 27.98

CONCEPTUAL TERMINAL PLAN

SCALE: 1" = 200'

N

100' 0' 200' 400'

SCALE IN FEET

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EXHIBITS
CONCEPTUAL TERMINAL PLAN

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EXHIBIT C

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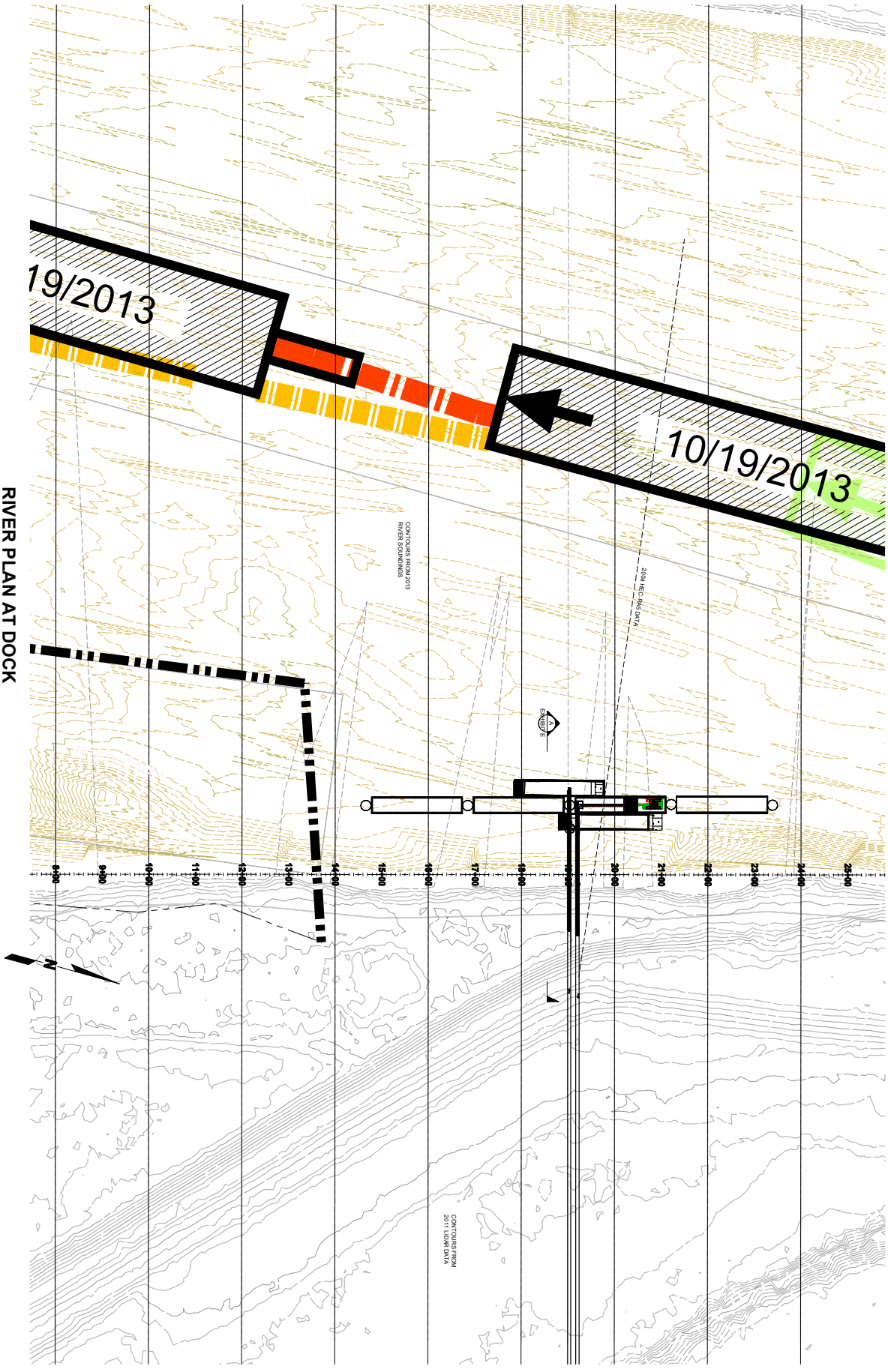
RIVER PLAN AT DOCK

SCALE: 1" = 200'



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EXHIBITS
RIVER PLAN AT DOCK

CITY OF CAIRO, ILLINOIS & CAIRO PUBLIC UTILITY COMPANY

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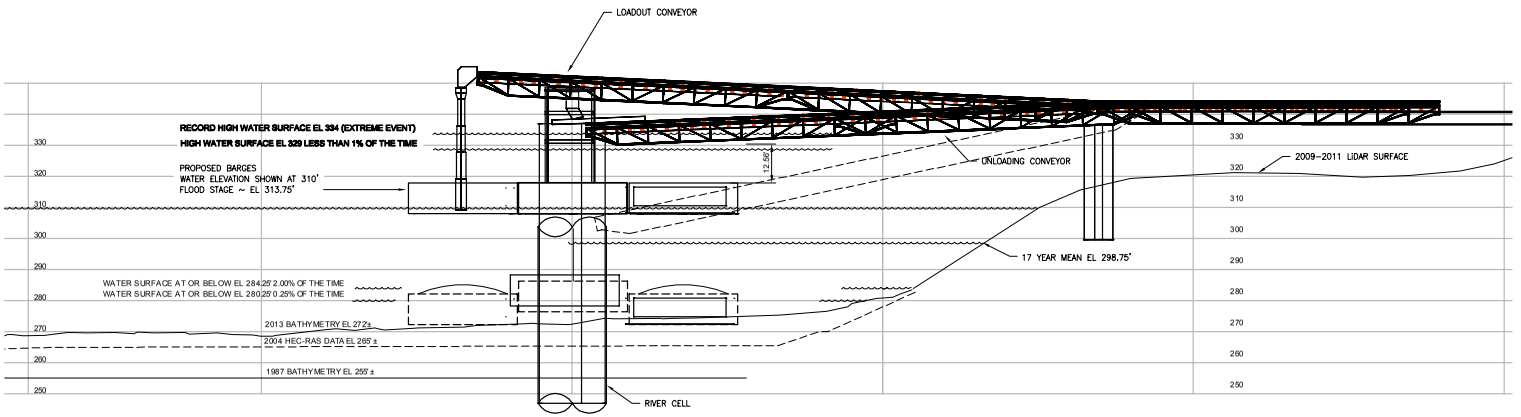

RIVER DOCK ELEVATION

SCALE: 1" = 40'

A
EXHIBIT D

20' 0' 40' 80'
SCALE IN FEET

BIRDS POINT RIVER ELEVATION DATA FROM JAN 1952 TO JAN 2014						
GAGE		WATER STAGE		GAGE	DAYS OCCURRED	% OCCURRENCE
10	>=	WS	<	11	755	3.43
9	>=	WS	<	10	729	3.31
8	>=	WS	<	9	559	2.54
7	>=	WS	<	8	438	1.99
6	>=	WS	<	7	321	1.46
5	>=	WS	<	6	264	1.20
4	>=	WS	<	5	164	0.75
3	>=	WS	<	4	56	0.25
2	>=	WS	<	3	38	0.17
1	>=	WS	<	2	1	0.00

GENERAL NOTES:

1. RIVER ELEVATIONS BASED ON BIRDS POINT GAGE AT RIVER MILE 2.0.
2. RIVER ELEVATIONS AT CAIRO DOCK (RIVER MILE 5.5) = BIRDS POINT ELEVATIONS +1.75' (6" ELEVATION ADDED PER UP STREAM RIVER MILE).
3. BIRDS POINT GAGE 0 = 274.5'
4. 2% OF THE TIME THE RIVER IS BELOW GAGE 8 = 282.5 AT BIRDS POINT = 284.25' AT CAIRO LOADING DOCK.
5. 0.25% OF THE TIME THE RIVER IS BELOW GAGE 4 = 278.5' AT BIRDS POINT = 280.25 AT CAIRO LOADING DOCK.
6. RECORD HIGH RIVER ELEVATION IS 334'.
7. RIVER HAS REACHED 329' LESS THAN 1% OF THE TIME.

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RIVER DOCK ELEVATION

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DRAWING NO.
EXHIBIT E

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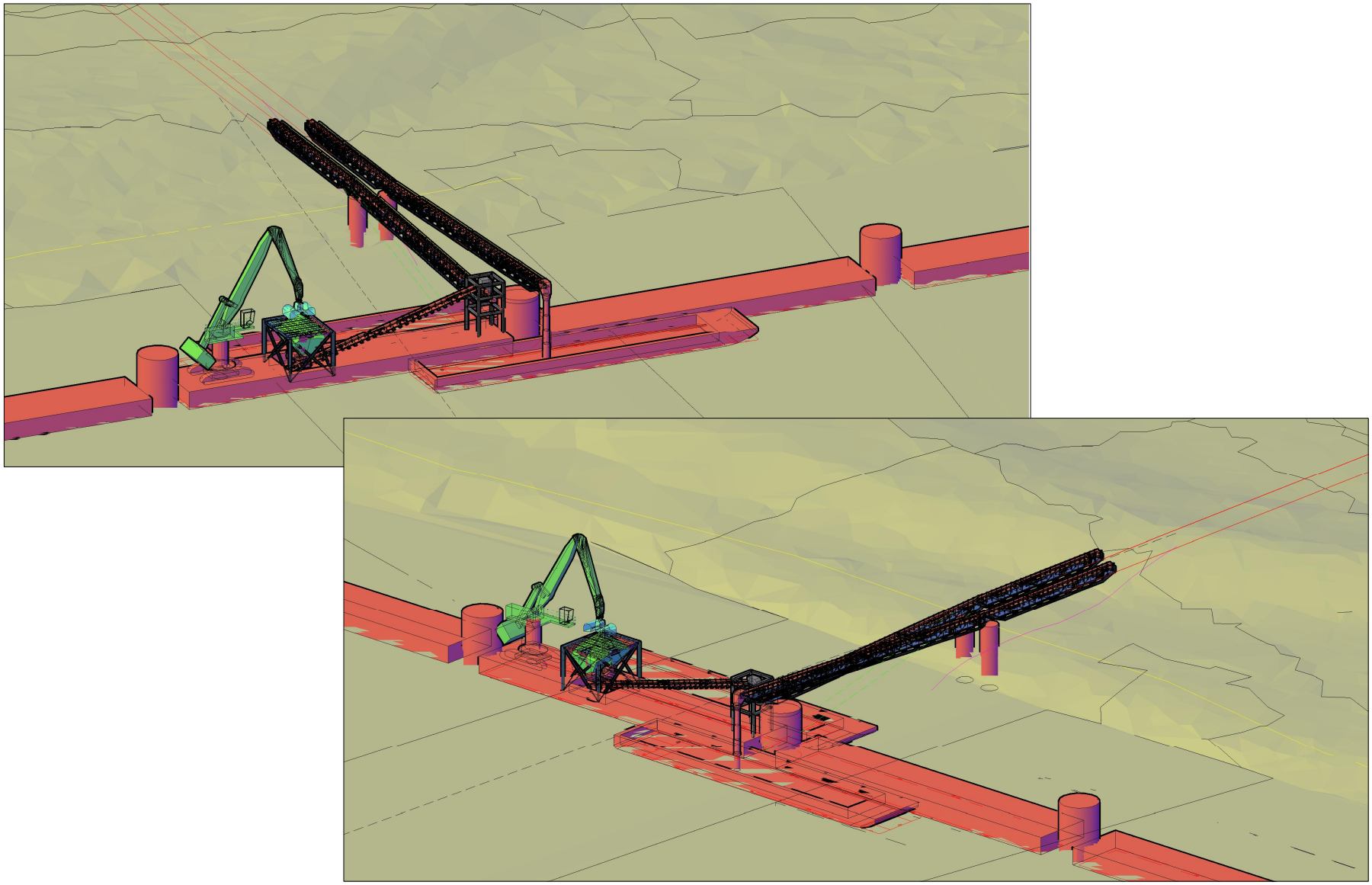

3D DOCK VIEWS

NOT TO SCALE

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EXHIBITS
3D DOCK VIEWS

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DRAWING NO.
EXHIBIT F

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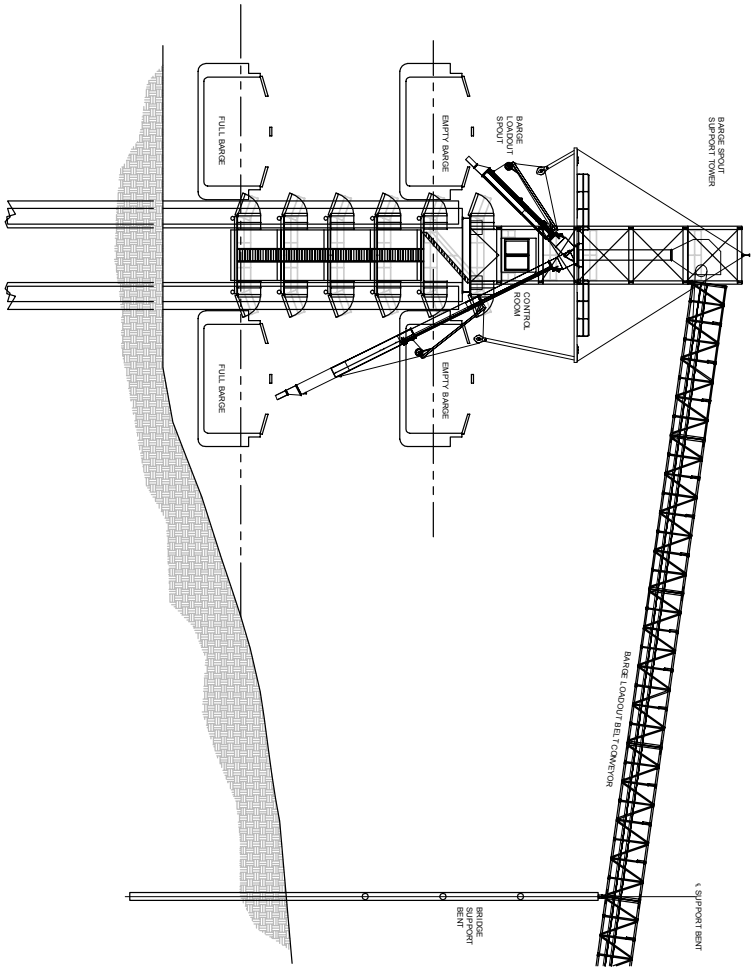
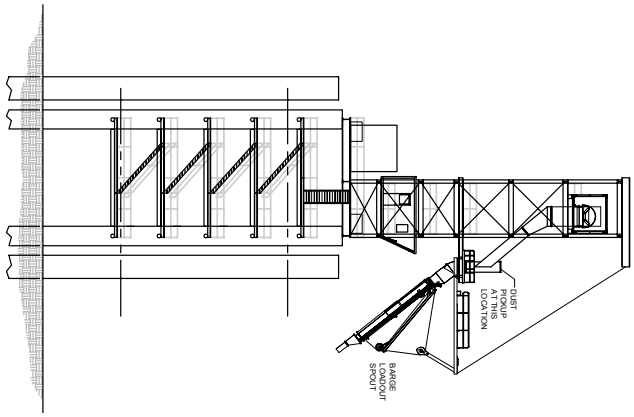
DUAL SIDE LOADOUT CONCEPT

NOT TO SCALE





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CITY OF CAIRO, IL & CAIRO PUBLIC UTILITY COMPANY
CONCEPTUAL SITE DESIGN & SCOPING STUDY
EXHIBITS
DUAL SIDE LOADOUT CONCEPT

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EXISTING SITE CONDITIONS
SCALE: 1" = 800'

THE UNDERGROUND UTILITIES SHOWN HEREIN WERE PLOTTED FROM AVAILABLE INFORMATION AND DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NONEXISTENCE, SIZE, TYPE, NUMBER, OR LOCATION OF THESE OR OTHER UTILITIES. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, AND SHALL LOCATE THE UTILITIES IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION, OR CONSTRUCTION IMPROVEMENTS.

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CONCEPTUAL SITE DESIGN & SCOPING STUDY
EXHIBITS
EXISTING SITE CONDITIONS

CDG PROJECT NO.
13088

DRAWING NO.
EXHIBIT H

CONCEPTUAL RAIL LOOP SITE LAYOUT
SCALE: 1" = 800'

THE UNDERGROUND UTILITIES SHOWN HEREIN WERE PLOTTED FROM AVAILABLE INFORMATION AND DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NONEXISTENCE, SIZE, TYPE, NUMBER, OR LOCATION OF THESE OR OTHER UTILITIES. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, AND SHALL LOCATE THE UTILITIES IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION, OR CONSTRUCTION IMPROVEMENTS.

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CONCEPTUAL SITE DESIGN & SCOPING STUDY
EXHIBITS
CONCEPTUAL RAIL LOOP SITE LAYOUT

CDG PROJECT NO.
13088

DRAWING NO.
EXHIBIT I

CONCEPTUAL LADDER TRACK SITE LAYOUT
SCALE: 1" = 800'

THE UNDERGROUND UTILITIES SHOWN HEREIN WERE PLOTTED FROM AVAILABLE INFORMATION AND DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NONEXISTENCE, SIZE, TYPE, NUMBER, OR LOCATION OF THESE OR OTHER UTILITIES. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, AND SHALL LOCATE THE UTILITIES IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION, OR CONSTRUCTION IMPROVEMENTS.

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CONCEPTUAL SITE DESIGN & SCOPING STUDY
EXHIBITS
CONCEPTUAL LADDER TRACK SITE LAYOUT

CDG PROJECT NO.
13088

DRAWING NO.
EXHIBIT J

APPENDICES

1. City of Cairo Proposed Survey
2. Canadian National Railroad Map
3. Shawnee Terminal Railroad Map
4. USGS Quadrangle Maps
5. FEMA Flood Insurance Rate Maps
6. U.S. Fish and Wildlife Service National Wetlands Inventory Map
7. U.S. Fish and Wildlife Service Threatened and Endangered Species Report (Alexander County, IL)
8. NRCS Soil Resource Report

APPENDIX 1

City of Cairo Proposed Survey

PROPOSED SURVEY

PART OF THE CITY OF CAIRO, ILLINOIS,. PROPERTY

PART OF THE S 1/2 OF SECTION 14, SEC'PTION 23,SECTION 25 AND SECTION 26 OF T 17 S, R 1 W OF THE 3RD P.M., ALEXANDER COUNTY, ILLINOIS

Requested By: GLENN KLETT CITY OF CAIRO

Drafted by:	V. SHOCKLEY
Date:	11/12/2012
Reviewed by:	
Scale:	1"=400'
Job Number:	2012-380
Sheet:	1 OF 1

Drawing Status
■ Preliminary Drawing
☐ Final Drawing

This Professional Service Conforms To The Current Illinois Minimum Standards of Practice Applicable To Boundary Surveys.

Revisions

#	Date	Note

PROPOSED SURVEY

PART OF THE CITY OF CAIRO, ILLINOIS,. PROPERTY

PART OF THE S 1/2 OF SECTION 14, SEC'PTION 23,SECTION 25 AND SECTION 26 OF T 17 S, R 1 W OF THE 3RD P.M., ALEXANDER COUNTY, ILLINOIS

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Shawnee Survey & Consulting, Inc.
Surveyors & Engineers
P.O. Box 125
104 South 4th Street
Vienna, IL 62995
Tel: 618-658-6065
Fax: 618-658-9190
E-Mail: surveys@ss-ci.com
Website: www.ss-ci.com

BEARINGS REFERENCED TO ILLINOIS STATE PLANE COORDINATE SYSTEM WEST ZONE, NAD 83

N W E S

APPENDIX 2

Canadian National Railroad Map

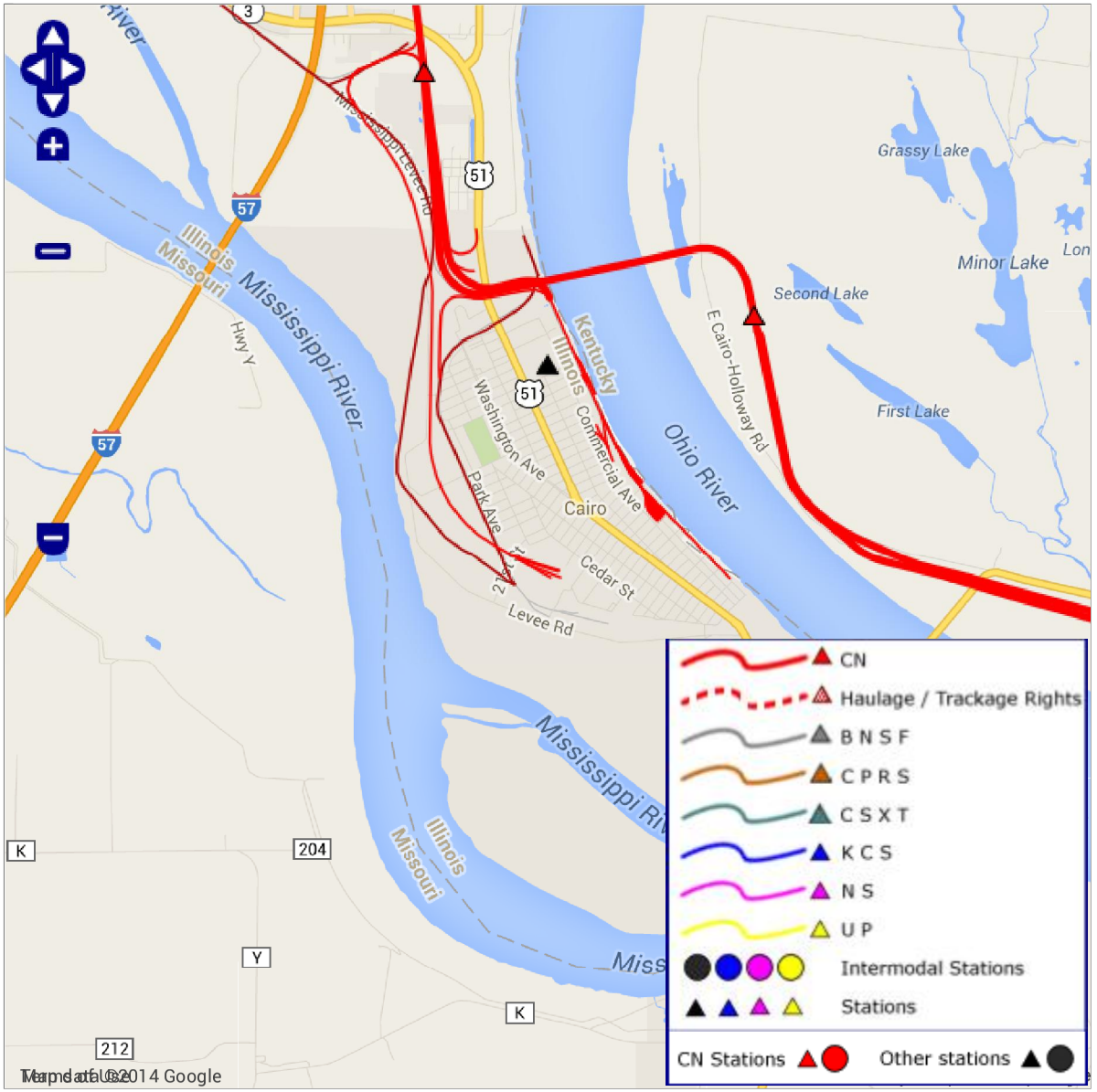
Network Map

Search by station

Select a station...

Search

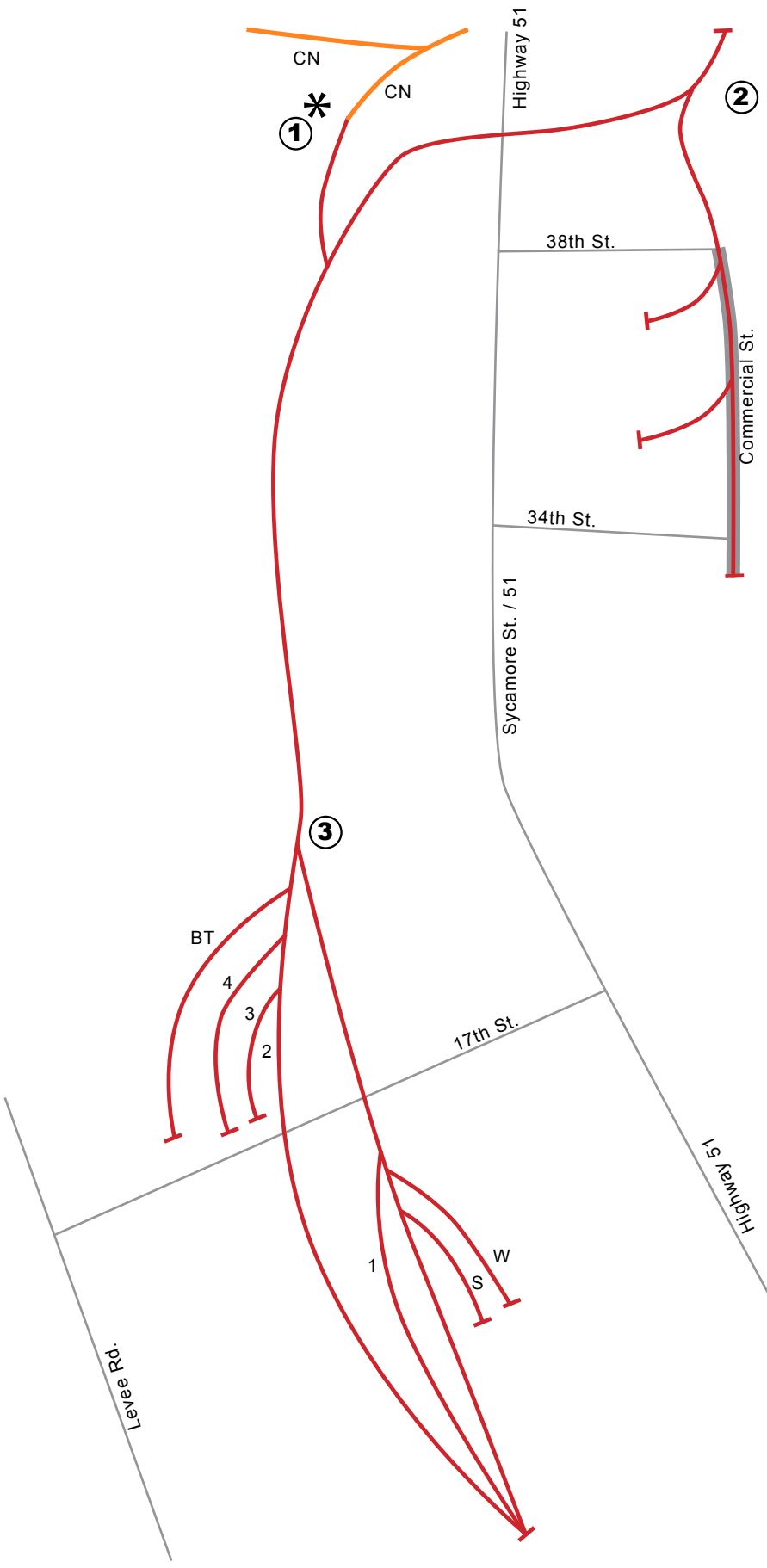
Search Results:



APPENDIX 3

Shawnee Terminal Railroad Map

Shawnee Terminal Railway Co. (STR)



1* **Cairo, IL - CN Interchange**

2 **Cairo North** (MP 256.4)
 # car spots: 35

3 **17th St. Yard** (MP 259.4)
- BT
 # car spots: 14

- 4
 # car spots: 12

- 3
 # car spots: 3

- 2
 # car spots: 28

- 1
 # car spots: 30

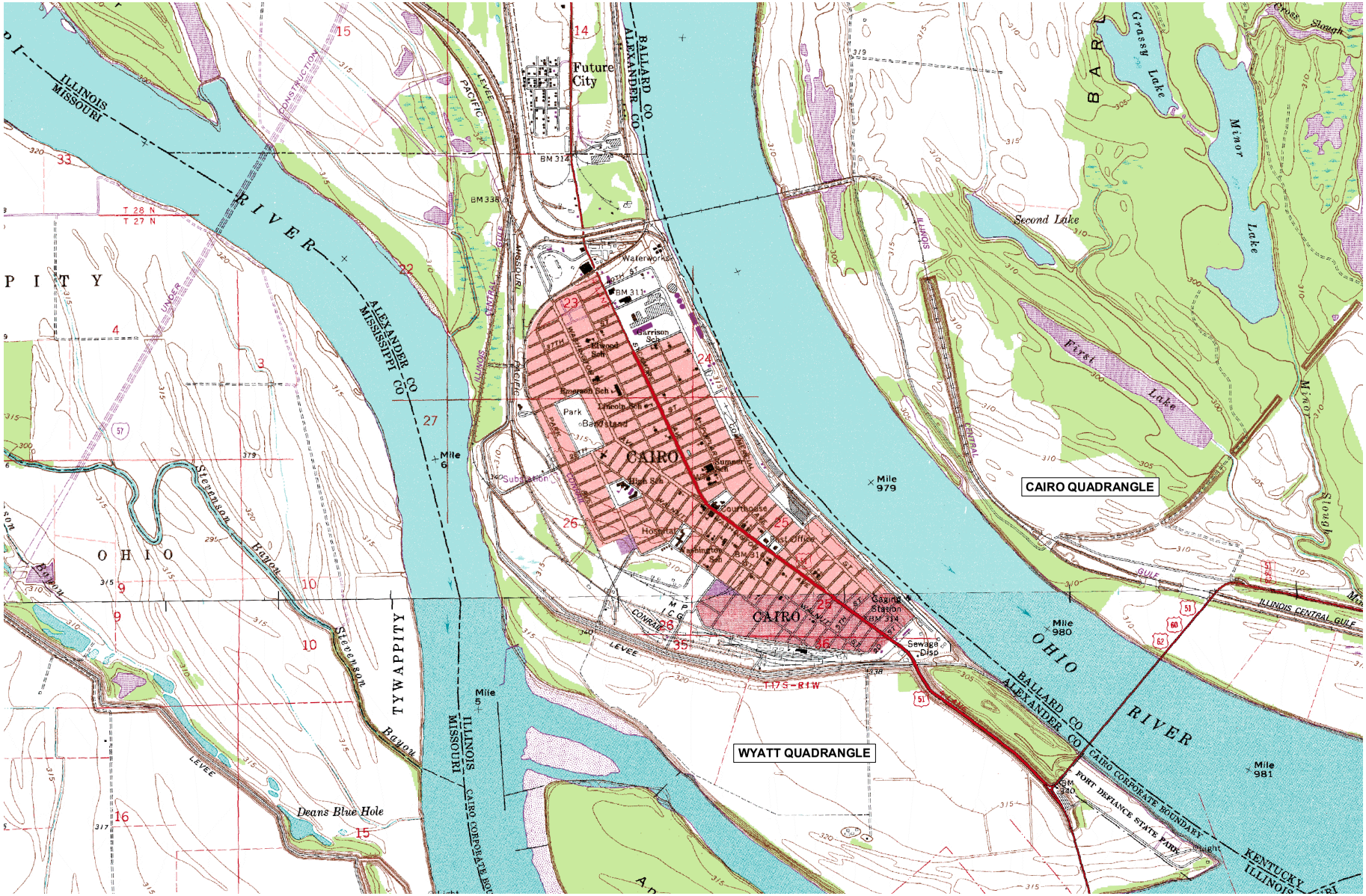
- S
 # car spots: 10

- W
 # car spots: 12

property available and warehouse space for lease

APPENDIX 4

USGS Quadrangle Maps


CAIRO QUADRANGLE
WYATT QUADRANGLE
CAIRO
Future City
Waterworks
Garrison Sch
Elwood Sch
Emerson Sch
Lincoln Sch
Park
Band Stand
High Sch
Courthouse
Post Office
Hospital
Washington Sch
Gaging Station
Sewage Disp
Substation
Second Lake
Grassy Lake
Minor Lake
First Lake
Cross Slough
Slough
ILLINOIS
MISSOURI
ALEXANDER CO
MISSISSIPPI CO
BALLARD CO
ALEXANDER CO
OHIO
RIVER
TYWAPPITY
Stevenson Bayou
Deans Blue Hole
LEVEE
PACIFIC
ILLINOIS CENTRAL GULF
CONRAIL
CAIRO CORPORATE BOUNDARY
FORT DEFIANCE STATE PARK
KENTUCKY
ILLINOIS
Mile 6
Mile 5
Mile 979
Mile 980
Mile 981
T 28 N
T 27 N
T 17 S - R 1 W

APPENDIX 5

FEMA Flood Insurance Rate Maps

FIRM

FLOOD INSURANCE RATE MAP

ALEXANDER COUNTY, ILLINOIS

AND INCORPORATED AREAS

EFFECTIVE DATE
MAY 4, 2009

Federal Emergency Management Agency

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4989000 N — 1000-meter Universal Transverse Mercator grid values, zone 16
- 1565000 FT — 5000-foot grid tick: Illinois State Plane West Coordinate System, 3801 zone (FIPSZONE 1202) Transverse Mercator
- DX5510 X — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

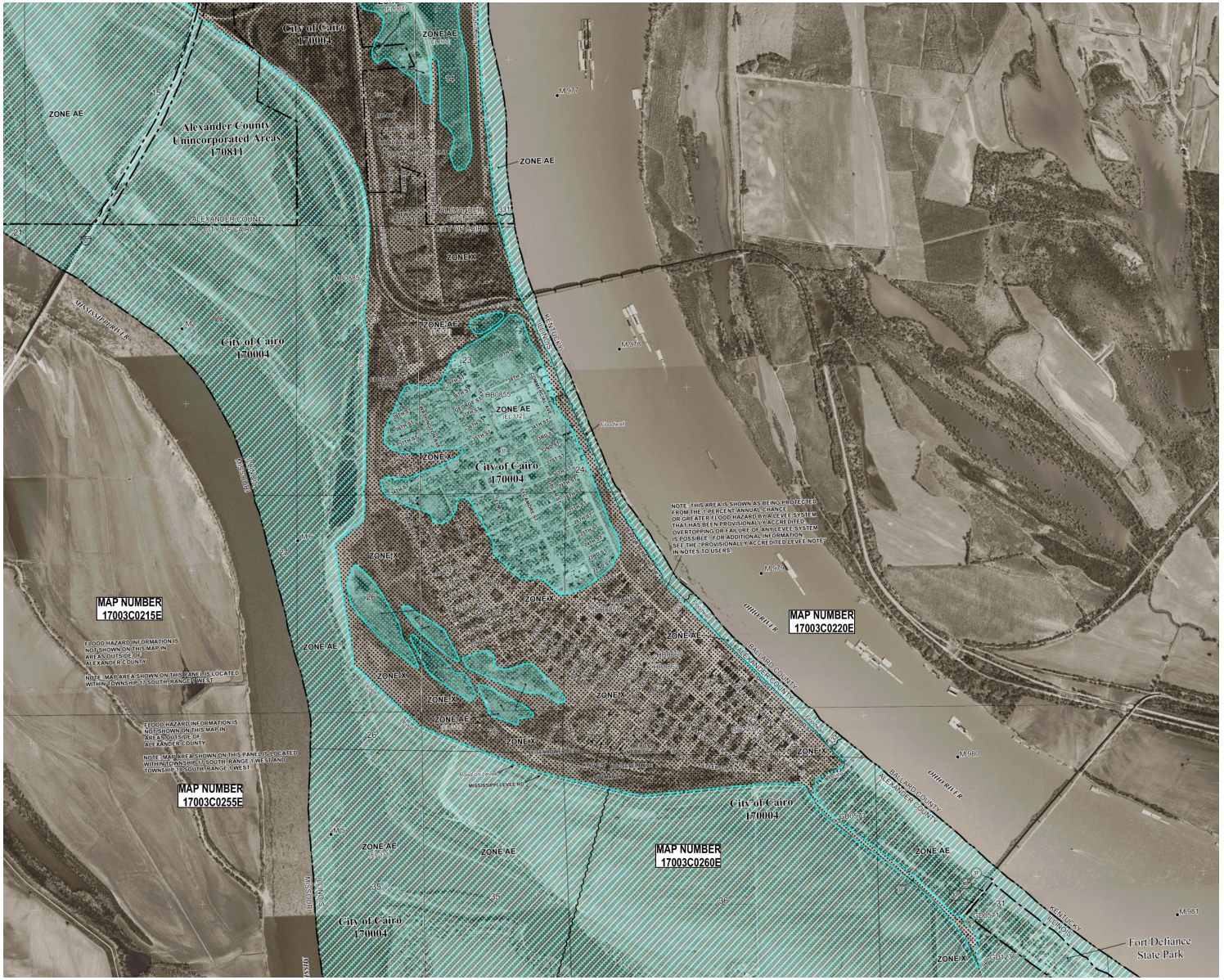
MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MAY 4, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in 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.



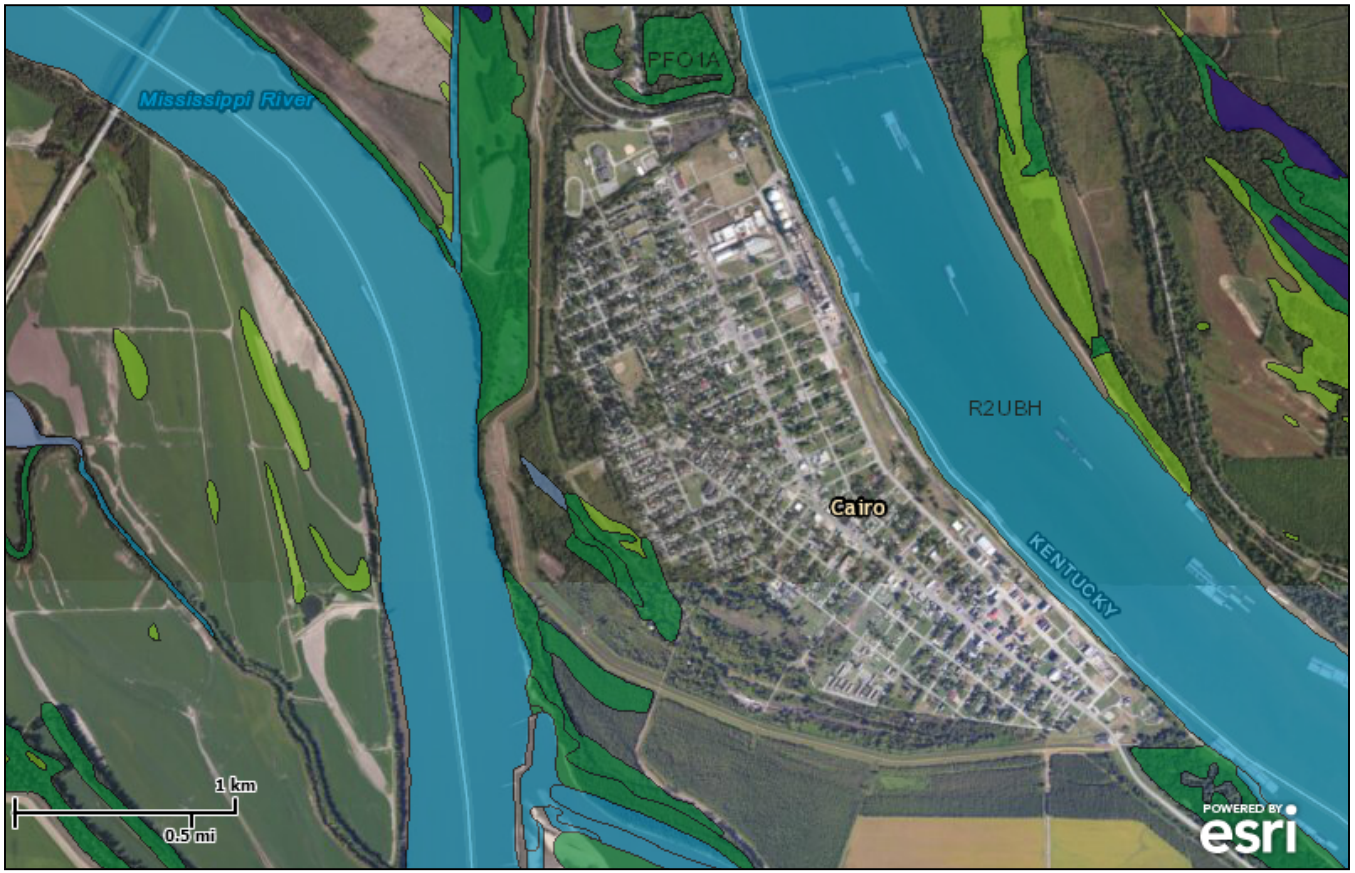
APPENDIX 6

U.S. Fish and Wildlife Service National Wetlands Inventory Map

U.S. Fish and Wildlife Service
National Wetlands Inventory

Cairo, IL

Aug 29, 2014



Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

User Remarks:

APPENDIX 7

U.S. Fish and Wildlife Service Threatened and Endangered Species Report (Alexander County, IL)

U.S. Fish & Wildlife Service

Environmental Conservation Online System
Conserving the Nature of America

Species By County Report:

The following report contains Species that are known to or are believed to occur in Alexander County, IL. Species with range unrefined past the state level are now excluded from this report. If you are looking for the Section 7 range (for Section 7 Consultations), please visit the IPaC application.

Date: October 21, 2014

County: Alexander County, IL

Group	Name	Population	Status	Lead Office
Birds	Least Tern (Sterna Antillarum)	Interior Pop.	Endangered	Mississippi Ecological Services Field Office
Clams	Rabbitsfoot (Quadrula Cylindrica Cylindrica)		Threatened	Arkansas Ecological Services Field Office
	Sheepnose Mussel (Plethobasus cyphyus)		Endangered	Rock Island Ecological Services Field Office
Fishes	Pallid Sturgeon (Scaphirhynchus Albus)	Entire	Endangered	Northern Rockies Fish and Wildlife Conservation Office
Mammals	Indiana Bat (Myotis Sodalis)	Entire	Endangered	Bloomington Ecological Services Field Office
	Gray Bat (Myotis Grisescens)	Entire	Endangered	Columbia Ecological Services Field Office
	Northern Long-Eared Bat (Myotis Septentrionalis)		Proposed Endangered	Twin Cities Ecological Services Field Office

Source:

http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=17003

APPENDIX 8

NRCS Soil Resource Report

United States Department of Agriculture

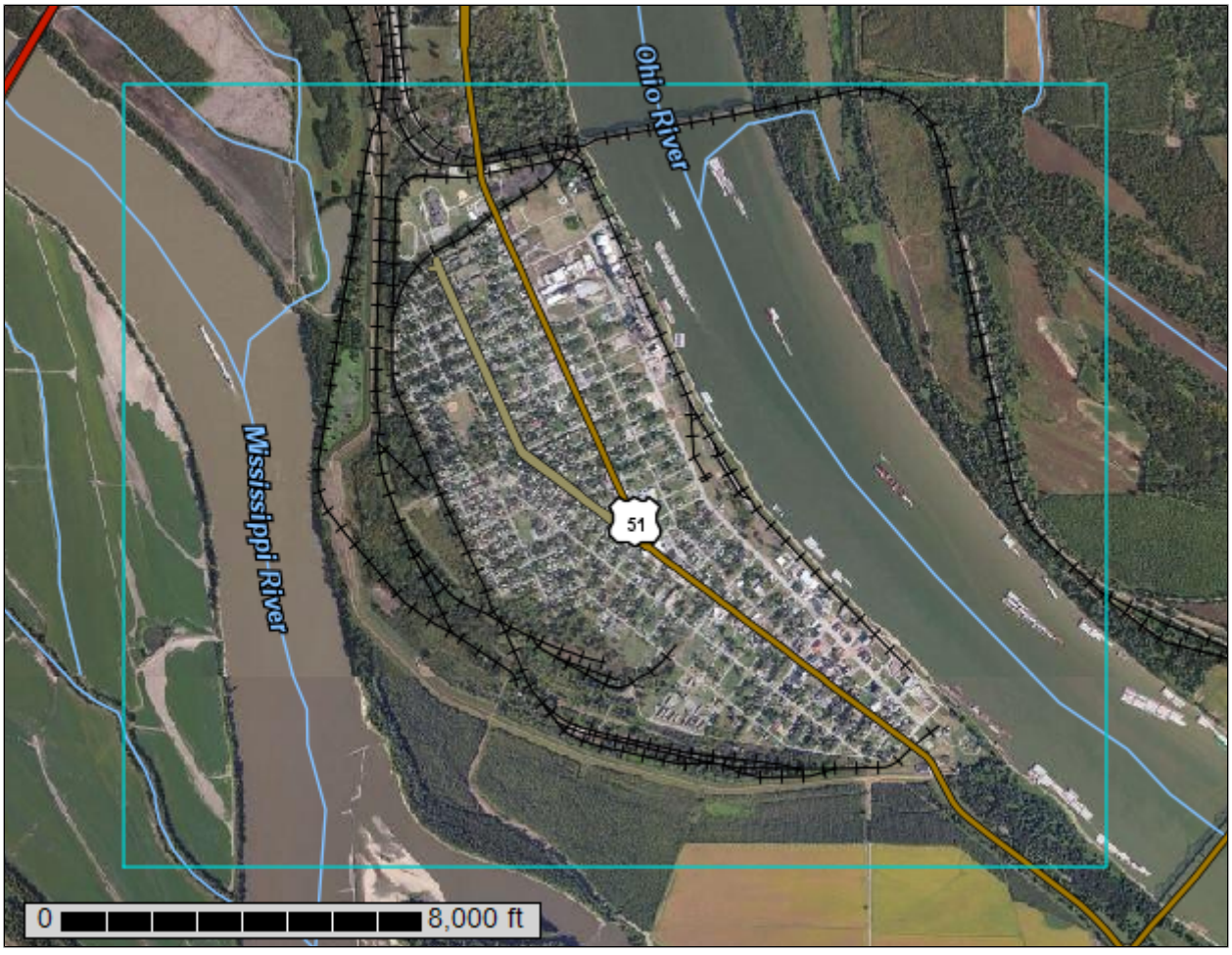
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Alexander County, Illinois, Ballard and McCracken Counties, Kentucky, and Mississippi County, Missouri

Cairo, IL



October 21, 2014

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

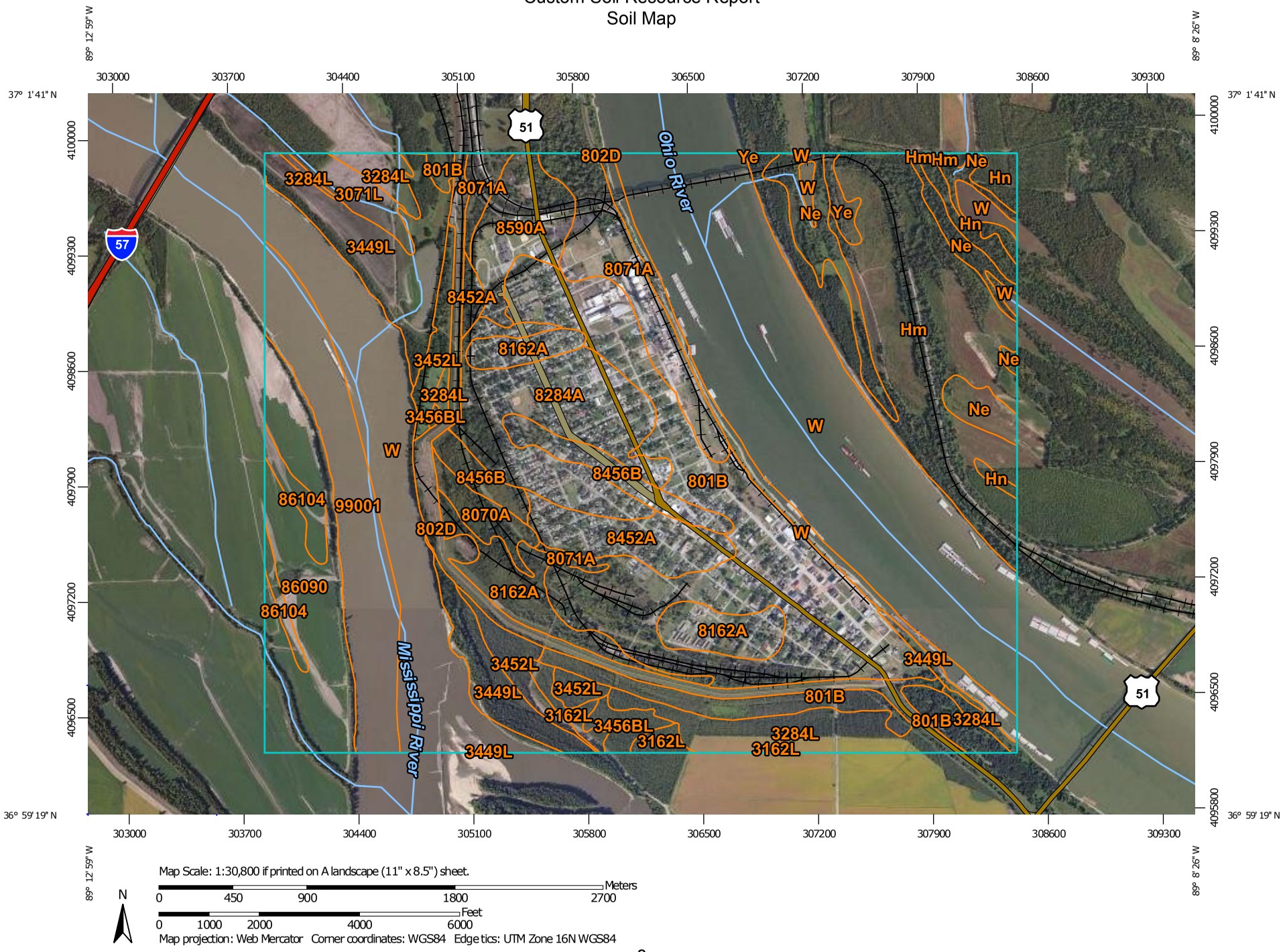
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alexander County, Illinois
Survey Area Data: Version 11, Sep 13, 2014

Soil Survey Area: Ballard and McCracken Counties, Kentucky
Survey Area Data: Version 9, Sep 17, 2014

Soil Survey Area: Mississippi County, Missouri
Survey Area Data: Version 12, Aug 5, 2014

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 13, 2011—Oct 9, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Alexander County, Illinois (IL003)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
801B	Orthents, silty, undulating	560.6	13.6%
802D	Orthents, loamy, hilly	118.9	2.9%
3071L	Darwin silty clay, 0 to 2 percent slopes, frequently flooded, long duration	35.8	0.9%
3162L	Gorham silty clay loam, 0 to 3 percent slopes, frequently flooded, long duration	28.9	0.7%
3284L	Tice silty clay loam, 0 to 2 percent slopes, frequently flooded, long duration	135.3	3.3%
3449L	Armiesburg-Sarpy complex, 0 to 2 percent slopes, frequently flooded, long duration	203.4	4.9%
3452L	Riley silty clay loam, 0 to 2 percent slopes, frequently flooded, long duration	76.2	1.8%
3456BL	Ware loam, 1 to 6 percent slopes, frequently flooded, long duration	23.8	0.6%
8070A	Beaucoup silty clay loam, 0 to 2 percent slopes, occasionally flooded	34.0	0.8%
8071A	Darwin silty clay, 0 to 2 percent slopes, occasionally flooded	146.3	3.5%
8162A	Gorham silty clay loam, 0 to 2 percent slopes, occasionally flooded	153.8	3.7%
8284A	Tice silty clay loam, 0 to 2 percent slopes, occasionally flooded	214.9	5.2%
8452A	Riley silty clay loam, 0 to 2 percent slopes, occasionally flooded	93.2	2.3%
8456B	Ware loam, 1 to 6 percent slopes, occasionally flooded	75.1	1.8%
8590A	Cairo silty clay, 0 to 2 percent slopes, occasionally flooded	89.7	2.2%
W	Water	377.9	9.1%
Subtotals for Soil Survey Area		**2,367.7**	**57.3%**
Totals for Area of Interest		**4,133.5**	**100.0%**

Ballard and McCracken Counties, Kentucky (KY602)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Hm	Huntington-Combs complex, 0 to 2 percent slopes, frequently flooded	409.5	9.9%
Hn	Huntington and Nolin silty clay loams, 0 to 2 percent slopes, frequently flooded	41.2	1.0%
Ne	Newark-Lindside complex, 0 to 2 percent slopes, frequently flooded	130.4	3.2%
W	Water	701.9	17.0%
Ye	Yeager fine sandy loam, 0 to 4 percent slopes, frequently flooded	14.3	0.3%
Subtotals for Soil Survey Area		**1,297.3**	**31.4%**
Totals for Area of Interest		**4,133.5**	**100.0%**

Mississippi County, Missouri (MO133)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
86090	Commerce silty clay loam, 0 to 1 percent slopes, frequently flooded	222.9	5.4%
86104	Sharkey silty clay loam, 0 to 1 percent slopes, frequently flooded	34.9	0.8%
99001	Water	210.7	5.1%
Subtotals for Soil Survey Area		**468.5**	**11.3%**
Totals for Area of Interest		**4,133.5**	**100.0%**