Project Implementation Plan

Southwestern Illinois Flood Prevention Initiative

Southwestern
Illinois
Flood Prevention
District Council

July 20, 2011

Table of Contents

List of Figures

List of Tables

I. Introduction

On August 15, 2007 the Federal Emergency Management Agency announced their intention to "de-accredit" the Mississippi River levee systems protecting a 174 square mile area in three Illinois counties known as the American Bottom. The practical effect of this action would be to cripple the area economically and put an enormous financial burden on businesses and residents in this area. The threat of this action by FEMA prompted a chain of events that is without precedent in the area. The end result is a cooperative regional effort to improve flood protection and secure FEMA accreditation for the levee system protecting the American Bottom from flooding.

The American Bottom is an area of incalculable economic value and historical significance. It is home to some 155,000 residents. Businesses in the area employ upwards of 55,000 people. Some of the nation's most prestigious companies have major manufacturing facilities having national significance in the area. The region's leadership recognized that extraordinary measures were necessary to protect this economic asset and the homes and livelihoods of a large portion of the region's population. A new revenue source was created in 2008 and a regional organization was formed to carry out an ambitious plan to maintain a level of flood protection that has been in place for some 70 years. That plan is now taking shape.

The purpose of this report is to outline the basic components of the design, cost estimate, schedule, and financial plan for the project to improve the region's flood protection system. This implementation plan is a work in progress, based on a large volume of data and extensive analysis, but it is necessarily based on certain assumptions about conditions that may be beyond the control of the project designers and area leadership. Future editions of this plan will be issued periodically as the design, construction and financing processes continue to advance. Nonetheless, this report will establish a baseline plan that will be updated in the future as better information becomes available or conditions change.

Having a plan in place, even one that may be subject to adjustment from time to time, is an essential ingredient in helping businesses and citizens prepare for the future, to restore investor confidence in the area, and to assure taxpayers that their money is being spent effectively.

II. Background

A system of 74 miles of mainline levees protects an area called the American Bottom in Southwestern Illinois from flooding by the Mississippi River. The American Bottom is an area of 174 square miles that is home to 156,000 people and 55,000 jobs. The levee system was authorized by Congress and designed and built by the U.S. Army Corps of Engineers to provide protection from a 500-year flood event on the Mississippi River. The American Bottom has not been flooded by the Mississippi River in the 70 years since the flood protection system was initially built, including during the flood of record in 1993, a 300-year event.

Mississippi River flood protection consists of five "federal" levees (see Figure 1), i.e. levees designed and built by the federal government and whose owners participate in the Corps of Engineers Public Law 84-99 emergency assistance program. The construction of the following five (5) levees was authorized in federal law:

- ***Wood River levee***, operated and maintained by the Wood River Drainage and Levee District. Construction was authorized under Section 4 of the Flood Control Act of 1938, Pub. L. 75-761, with subsequent improvement was authorized under Section 1001(20) of the Water Resources Development Act of 2007, Pub. L. 110-114 ("WRDA 2007")

- ***Chain of Rocks canal, levee, and locks***, operated and maintained by the Corps. Construction was authorized under the River & Harbors Act of 1945, Pub. L. 79-114

- ***East St. Louis levee***, operated and maintained by the Metro East Sanitary District. Construction was authorized by the Flood Control Act of 1936, Pub. Law 74-738, as modified by the Flood Control Act of 1965, Pub. L. 89-298, and the Water Resources Development Act of 1976, Pub. L. 94-587. Subsequent improvement was authorized under the Energy and Water Development Appropriations Act of 1988, Pub. L. 100-202

- ***Prairie Du Pont levee***, operated and maintained by the Prairie Du Pont Levee and Sanitary District. Construction was authorized under the Federal Flood Control Act of 1936. Subsequent improvement was authorized under Section 102(8) of the Water Resources Development Act of 2000, Pub. L. 106-541 ("WRDA 2000") and Section 5070 of the WRDA 2007

- **Fish Lake levee**, operated and maintained by the Fish Lake Drainage and Levee District. Construction was authorized by the Flood Control Act of 1954. Subsequent improvement was authorized under Section 102(8) of WRDA 2000 and Section 5070 of WRDA 2007

The Metro-East Sanitary District (formerly the East Side Levee and Sanitary District, originally formed in 1910) is authorized by the Metro-East Sanitary District Act of 1974, 70 ILCS 2905/. The Wood River and Fish Lake districts were authorized by the Illinois Drainage Code, 70 ILCS 605/. The Prairie DuPont district was authorized by the Sanitary District Act of 1907, 70 ILCS 2205/. The levee districts own and have primary responsibility for maintaining the levee systems (with the exception of the Chain of Rocks levee, which is owned and maintained by the Corps of Engineers).

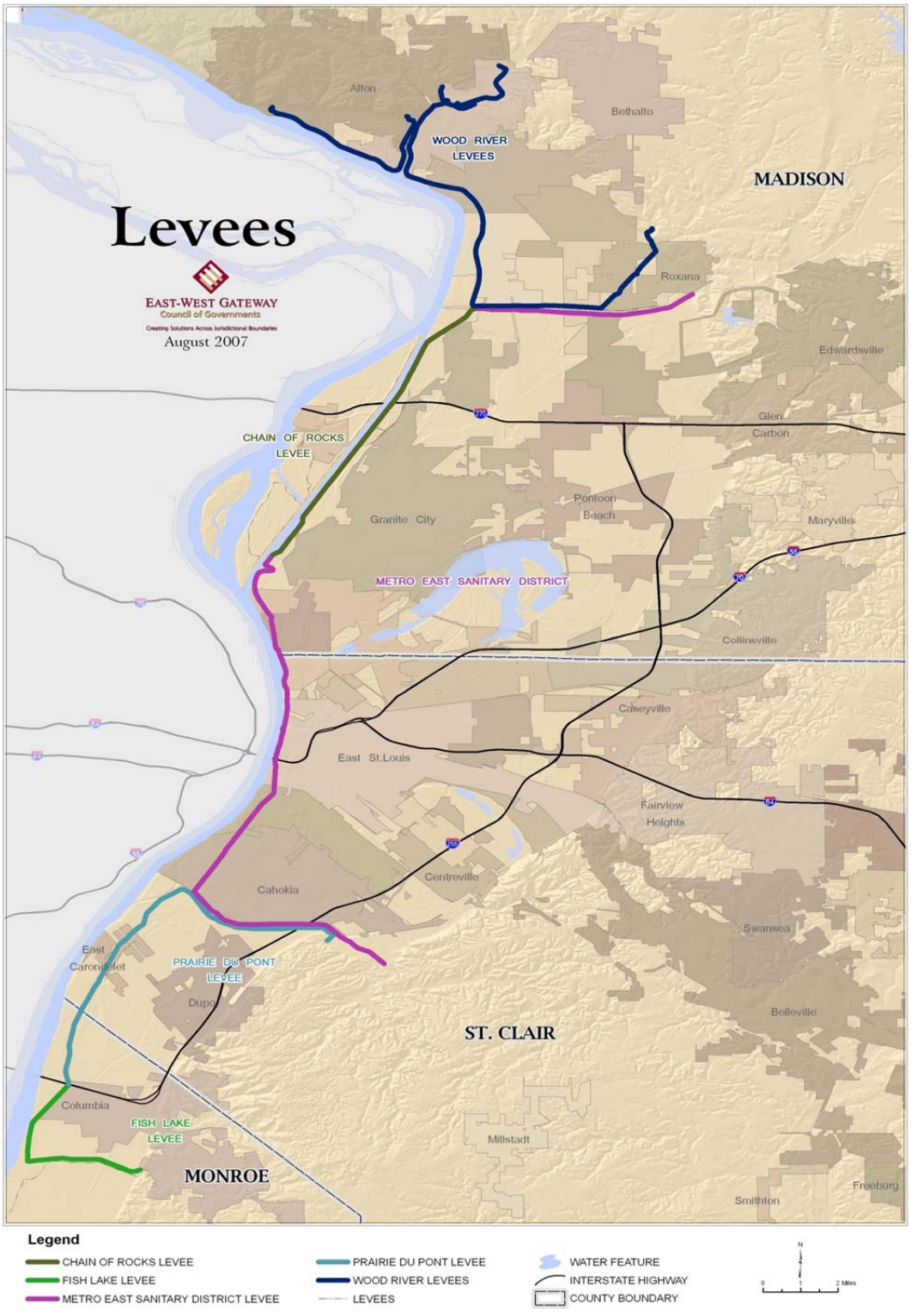


Figure 1 - Levee Systems

The Southwestern Illinois Flood Prevention District Council was formed in 2009 through an Intergovernmental Agreement between the Flood Prevention Districts of Madison, St. Clair and Monroe counties as authorized by the Illinois Flood Prevention District Act of 2008, 70 ILCS 750/. The primary responsibility of the FPD Council is to plan, finance, design and build capital improvements to the levee system. The Council's principal goal is to assure accreditation by FEMA in accordance with criteria described in 44 CFR 65.10 – Mapping of Areas Protected by Levee Systems.

In 2007, the Corps indicated that the agency had "reduced confidence" that the levee system could protect against a flood that has a 1% chance of being equaled or exceeded in any single year (commonly referred to as a 100-year flood or a base flood) without floodfighting. FEMA's announced decision to deaccredit the levee systems in our area, which is the industrial core of the St. Louis region, was based on this assertion by the Corps.

The region's leadership does not agree with the decision by FEMA to deaccredit the levee system. A number of area governments, businesses and citizens have joined to file a lawsuit challenging this decision based, in part, on the lack of any documentation of levee system deficiencies. However, given the significant economic consequences of FEMA's decision, should it stand, area leaders are moving aggressively to make improvements to the levee systems to assure that it will meet all applicable current standards.

While the levee systems in this area were built by the Corps generally in the 1940s and 1950s using design standards in place at the time for 500-year protection, the current "design deficiencies" are measured relative to current engineering standards, so the issue is not a failure of adequate maintenance by local levee districts, or any dramatic change in the condition of the levees, but primarily a change in engineering standards and in the procedures for measuring risk. The levee systems have consistently been determined to be in *acceptable* or *marginally acceptable* condition by annual and more thorough 3-year periodic inspections by the Corps.

According to its own preliminary evaluations and cost estimates the Corps suggests that it could potentially cost $500 million or more in today's dollars to maintain the authorized (500-year) level of flood protection. Further, the schedule to make these investments would essentially be open-ended, because the federal funding is not yet available. Making assumptions consistent with typical levels of federal appropriations, the project would take forty years or more complete. While the federal government could pay as much as 65% of the cost, it could take decades for those funds to be authorized and appropriated, so there would be significant uncertainty about the cost and schedule of the project.

Because of the uncertainty of federal funding and the complexity and time consuming nature of the USACE project development process, levee improvements will be primarily locally funded. The three affected counties have imposed a ¼% sales tax to pay for the restoration of the levee system and formed a new organization, the Southwestern Illinois Flood Prevention District Council to carry out the levee improvement project. The tax has been collected since January 2009 and produces about $11 million annually.

In July, 2009 FEMA issued Preliminary Flood Insurance Rate Maps for the areas protected by the Metro-East levees. Appeals of those maps were submitted by a variety of local governments during the 90-day period provided by law; all of those appeals (some were described as protests by FEMA) were denied in September, 2010.

The FPD Council has been up and running since July, 2009. Since that time, the organization has completed a comprehensive inspection of the levee system, performed an economic analysis of the costs of mandatory flood insurance, provided support to local governments to appeal preliminary flood insurance rate maps, conducted a design competition to determine the most cost-effective approach to assuring compliance with FEMA standards for levee system accreditation, and sold $94 million in bonds to pay for levee improvements. The Council's general goals have been to:

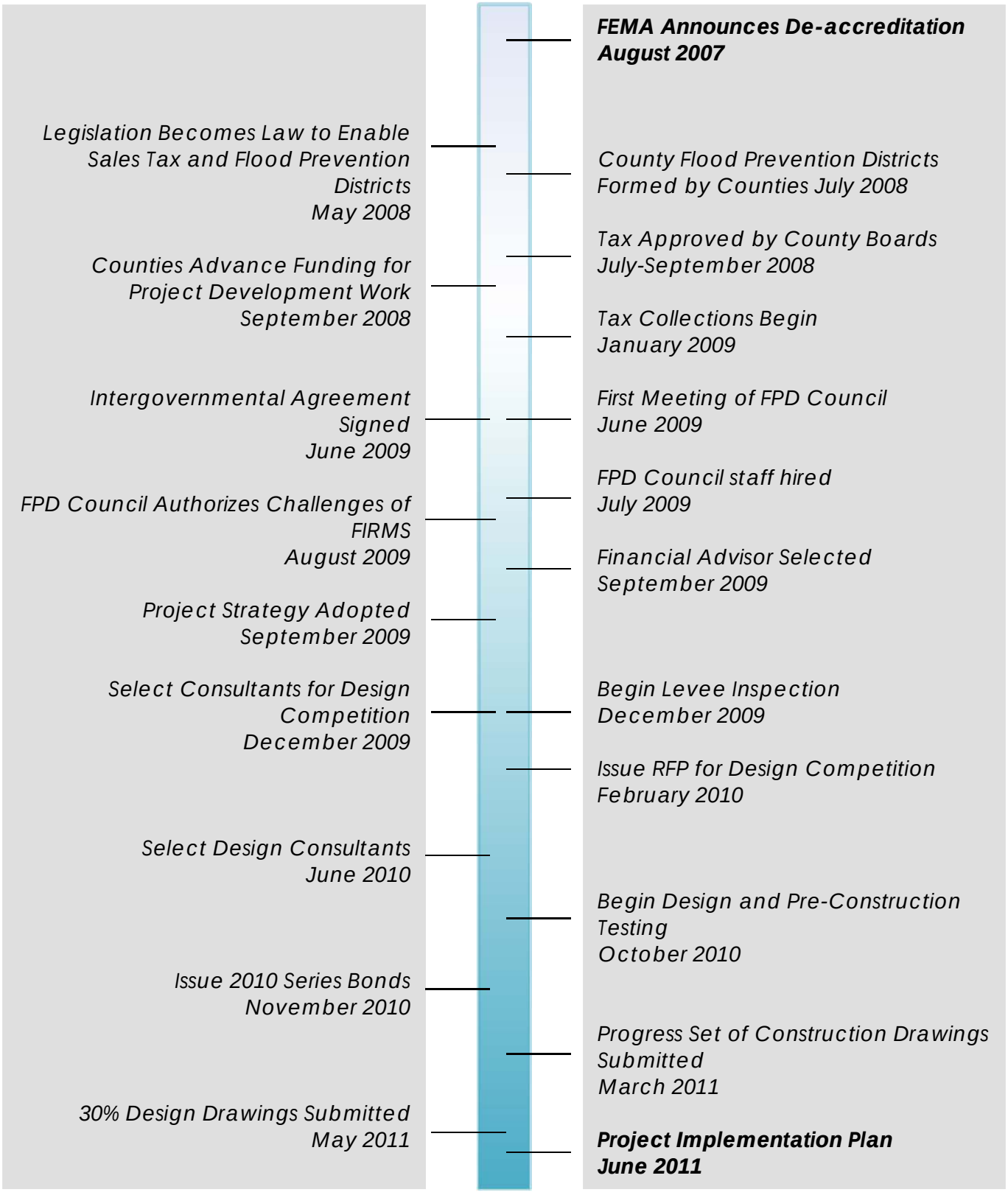
- assure compliance with FEMA accreditation standards with currently available revenue sources in five years or less; and

- minimize economic and financial hardship should the levee systems be de-accredited by FEMA

Notwithstanding the Council's strong disagreements with FEMA's decision to deaccredit the Metro-East levees and the agency's continuing efforts to overturn that decision, every effort is being made to remove all doubt about compliance with FEMA accreditation criteria. In October 2010, the Council engaged a team of engineering consultants led by AMEC Earth & Environmental to design and manage construction of improvements to the levee system. In early May, 2011 the Council received the 30% design and cost estimate submittal from the consulting team. This submittal was the culmination of about 7 months of effort involving substantial subsurface testing and analysis, discussions and review sessions with all affected parties including the levee districts and the Corps of Engineers, a careful review of many design alternatives and a value engineering review.

Three principal elements of the project development process have now come together: the design and cost estimate as part of the 30% design submittal, and the financial plan completed in June 2011. It is now possible to construct a project schedule. Together, these components will comprise an implementation plan for the project.

Figure 2
Project Timeline



III. Preliminary Project Design

The goal of the project design is to achieve improvements to the flood protection system that, once constructed, will fully address the requirements of 44 CFR 65.10, the criteria that determine the eligibility for FEMA to accredit the system and designate the American Bottom as protected from flooding. These FEMA certification criteria address the following elements:

- Freeboard – the levee height above flood level used to compensate for uncertainty of modeling that could lead to flood heights higher than calculated.
- Closures – structures that close gaps in levees or floodwalls typically used to gain access to the river side of those structures.
- Embankment Protection – levee embankments must not be subject to significant erosion during a flood event.
- Embankment and Foundation Stability – seepage either under or through levees must not jeopardize the structural stability of the embankment.
- Settlement – freeboard must not be lost as a result of levee settlement.
- Interior Drainage – drainage provisions for areas behind levee systems must be documented for recognition on flood insurance maps.

Other requirements must be addressed as a part of the accreditation process, such as operating and maintenance plans, but these will be addressed later in the design process.

Based on a thorough levee inspection completed in November 2010, AMEC concluded that the major areas to be addressed by the design would be underseepage and through-seepage. The design process included the following analytical elements (see Appendix A – *30% Design Memorandum and Deliverables* for details):

- Geotechnical Analyses – an investigation of subsurface conditions and materials based on hundreds of borings and other tests and modeling of outcomes in high water events.
- Environmental Assessments – limited investigations to determine the extent of any environmental concerns.
- Natural Resource Assessments (wetlands) - preliminary determination of affected wetland areas.
- Cultural Resource Assessments – an investigation to make a preliminary determination whether the project will affect structures or sites that have historical or cultural significance.
- Interior Drainage Hydraulic and Hydrological (H&H) Analyses – using historic data and modeling to determine peak flows, runoff volumes and water elevations in the areas behind the levee systems
- Civil Engineering Analysis and Design – development of designs to address the conditions identified in the foregoing investigations and analyses.

The preliminary design was submitted to the Council as a two-step process. A “progress set” of construction drawings was submitted in March 2011. This submittal was the subject of numerous reviews by the Corps of Engineers, the affected levee districts, and Council staff. In addition, the Council conducted a value engineering review using an independent group of engineering professionals and Corps staff. AMEC used the input from the various reviews and discussions,

together with additional analysis, to refine the design with the principal goal of improving cost-effectiveness. AMEC then submitted the final set of 30% design drawings, a design memorandum, and cost estimate in May 2011. The preliminary design described in those documents is summarized herein.

The design is driven primarily by the need to control underseepage and through-seepage. While it includes detailed site-specific proposals along the entire length of the levee systems, the overall project design is made up of several principal elements that are repeated throughout the proposal and together account for nearly all of the costs of the project. The selection of underseepage solution was driven by the analysis of site-specific subsurface conditions and made through a decision process illustrated in Figure 3.

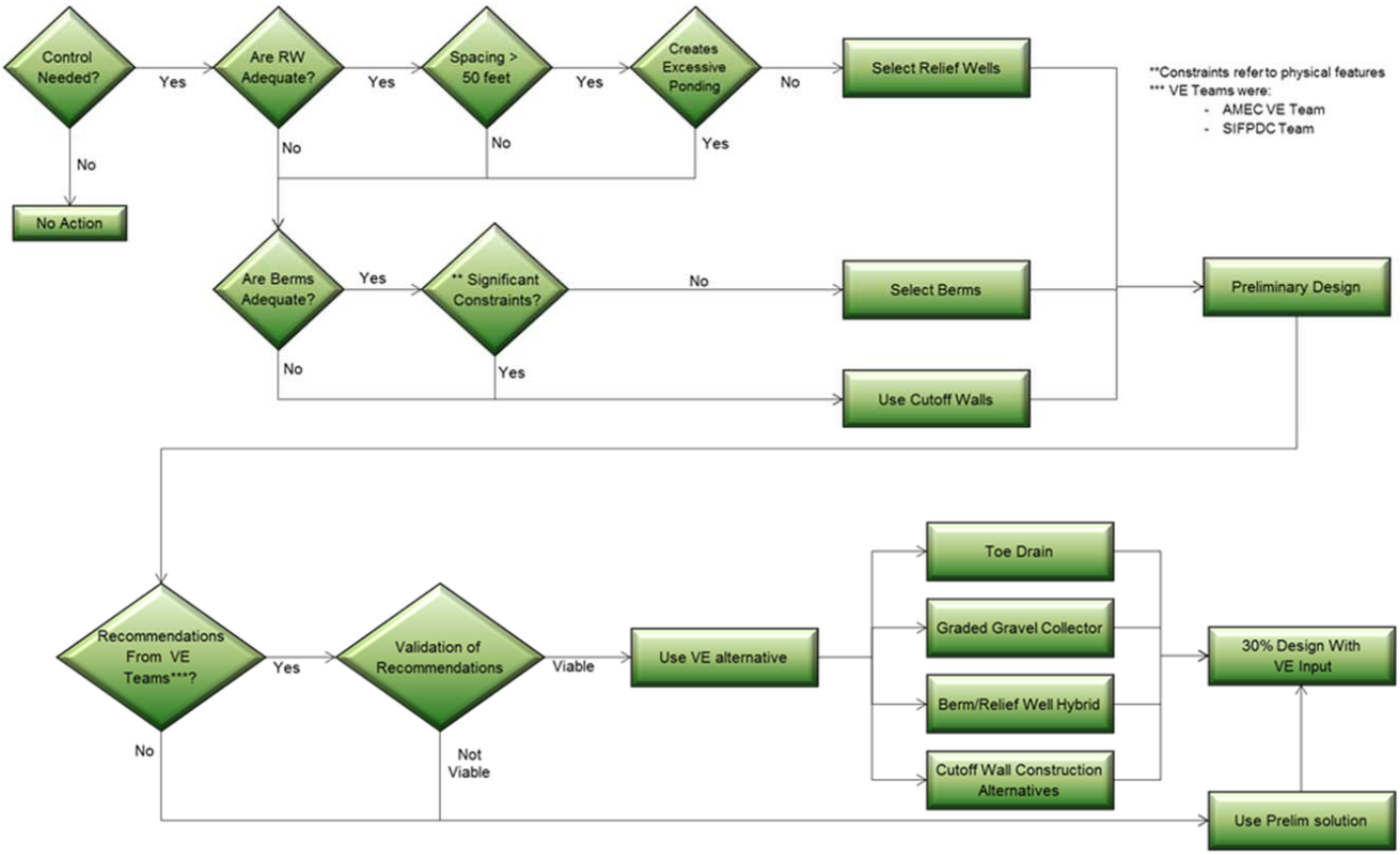


Figure 3
Underseepage Control Decision Process

Source: AMEC Earth & Environmental

These principal design elements are described below, with Figures 4-6 showing the essential design features proposed in each levee district followed by schematic drawings of the design of each of these features in Figures 4-9:

- Seepage Berms – A seepage berm (see Figure 7) is located along the protected side of the levee and constructed of pervious material like sand to provide weighted mass to resist the uplifting seepage forces during periods of high water elevation. With pervious material in the seepage berm, ground water is allowed to seep in a controlled manner from under the levee, thereby lowering the uplift pressure without eroding the levee foundation. Berms are sized to optimally offset the calculated uplift pressure during a high water event. The advantages of berms include low maintenance and relatively low construction cost. Disadvantages are the need for and cost of land to accommodate the berm. In many cases berms are not practical because high-value development adjacent to the levee makes acquiring the needed property impractical or too costly.

- Relief Wells – A relief well (see Figures 8 and 9) is a deep well located on the protected side of the levee, typically ranging in diameter between 8 and 12 inches extending at least halfway through the layer of pervious soil (known as the aquifer) under the levee. The relief well relieves uplift pressure by intercepting and providing a controlled outlet for seepage that would otherwise emerge uncontrolled on the land side of the levee, perhaps carrying soil and eroding the levee's foundation. The diameter and spacing of relief wells are determined based on the site-specific analysis of uplift water pressure during a high-water river event. The principal advantage of relief wells is the limited land area required. The primary disadvantage is the need to accommodate the outflow of the wells, usually by ponding, or by a system to collect discharge water and pump it back into the river. Discharge can take place in a trench or at the surface (D-type wells) or into a buried collection pipe (T-type wells). Relief wells also require periodic maintenance to preserve their efficiency over time. There are many existing relief wells throughout the levee system already. Where feasible, existing wells will be re-used and/or rehabilitated.

- Graded Filters – A trench on the landside toe of the levee (see Figures 13-14) can be used to control the flow of underseepage when it is lined with appropriate layers of pervious material to prevent the movement of soil from under the levee. Similar in concept to a relief well, the graded filter trench is a cost-effective means of providing a controlled outlet for underseepage without eroding the foundation of the levee. Low construction cost, limited maintenance and small land requirements are the principal advantages of this underseepage control measure. The disadvantage is the need to accommodate the water discharged from the trench. In some cases additional pump station capacity is required to effectively dispose of discharge.

- Cutoff Walls – Unlike the previously described measures, cutoff walls (see Figures 10-11) are generally not designed to control underseepage but to virtually eliminate it. A cutoff wall is an impervious wall constructed by excavating a trench through pervious materials under the levee and backfilling with various mixtures of soil and bentonite (a type of clay that expands when wet) slurry, cement and bentonite slurry, or concrete. The cutoff wall can be constructed as deep as bedrock, or can be shallow in cases where there is an impervious clay

layer underlying the aquifer. Cutoff walls must also be extended in length to reduce the likelihood of "end-effects" i.e. underseepage being diverted around the ends of the wall. Because of the high cost, cutoff walls are only used in situations where the uplift pressures are so great that no other less costly control method is practical or where protected landside constraints, like encroaching development, prohibit the use of other seepage control solutions. Advantages of cutoff walls include the lack of any need for maintenance and the absence of any discharge on the land side of the levee. The disadvantages include the extremely high cost, and difficult and sometimes risky construction process.

- Clay Caps – In cases where through-seepage (seepage through the levee embankment during periods of high water) is a potential problem, a layer of impervious clay is placed on the riverside face of the levee (see Figure 10). If there is insufficient room to place the clay on the levee because of encroachment of development, parts of the existing levee are excavated and replaced with clay.

Constructing the principal design elements described above will require related supporting investments to expand or improve pump stations to provide sufficient capacity to dispose of added discharge from relief wells or trenches. Other miscellaneous construction elements will also to implement the overall plan.

The Wood River levee system, shown in Figure 4, is made up of three independent levees: Upper, Lower and the East Fork. The East Fork does not require any improvements. A portion of the Upper Wood River levee in the vicinity of the Mel Price Lock and Dam has deficiencies relating to uncontrolled underseepage that are a direct result of changes in the river elevation caused by Corps construction of the Lock and Dam. The Corps has accepted full responsibility for providing necessary underseepage controls, and in the short term for implementing interim measures to meet FEMA accreditation requirements.

The full range of underseepage controls is proposed in the Wood River system, including berms, relief wells, shallow and deep cutoff walls and graded filters. The most prominent and costly feature of the proposed design is a deep cutoff wall at the "elbow" formed by the intersection of the Mississippi River and Wood River that separates the Upper and Lower Wood River levees. This deep cutoff wall, constructed on the riverside toe of the levee, would extend to bedrock and comprises 633,000 square feet of wall, estimated to cost upwards of $26.3 million. A series of alternatives were closely examined, but a variety of physical and environmental conditions made other options ineffective, impractical, or even more costly. A total of 65 new relief wells are planned along with the placement of 209,000 cubic yards of material for berms. Substantial use of graded filters is planned to reduce the number of more costly underseepage controls. About 28 acres of wetlands will need to be replaced as a result of the project.

The Metro-East Sanitary District maintains the East St. Louis levee, a continuous mainline levee extending from north of Granite City to Dupo on the south with flank levees along drainage canals on the north and south. A portion of the continuous levee along the Chain of Rocks canal is owned and operated by the Corps of Engineers, so no improvements are planned. The Corps has already implemented sufficient improvements on the Chain of Rocks levee to comply with FEMA accreditation requirements.

As in Wood River, the most prominent and costly feature is a deep cutoff wall where the Mississippi River is intersected by Prairie DuPont Creek at the south flank levee. This is an area where development is close to the levee and physical conditions and existing structures leave little opportunity for berms. The cutoff wall would be about 324,000 square feet and cost about $13.5 million. There is are substantial utility relocations (natural gas pipelines) relating to this cutoff wall, which will cost almost $6 million. 60 new relief wells are planned, as well as the rehabilitation of another 42 wells. Nearly 89,000 cubic yards of material will be placed for seepage berms and an additional 184,000 cubic yards for clay caps to address through-seepage issues. There is a chance that hazardous or toxic materials could be encountered while constructing the improvements in the MESD area. Consequently, the design and cost-estimate address that potential. About 58 acres of wetlands will be purchased to compensate for wetland areas affected by levee improvements in the MESD area.

The Prairie DuPont Levee and Sanitary District and Fish Lake Drainage and Levee District are independent districts that together operate and maintain a continuous mainline levee as well as flank levees. Much of the area protected by these levees is relatively undeveloped as compared to MESD and Wood River, which simplifies the designs for underseepage controls by permitting more extensive use of seepage berms. On the other hand, this area is one where the possibility of cultural impacts is more likely, and more study will be necessary before plans can be finalized and permitted.

Improvements proposed for the PdP/FL levee districts are shown in Figure 6 and include seepage berms, relief wells, and clay caps. Seepage berms will involve the placement of some 285,000 cubic yards of material. The preliminary design calls for 156 new relief wells and 33 wells to be rehabilitated. Pump station improvements are contemplated to accommodate additional flow from new relief wells.

Throughout all four levee systems, deteriorated gravity drains will be replaced or lined as needed and those closure structures affected at the 100-year flood elevation will be improved as necessary. Several pump stations will be improved throughout the system to handle increased flows from relief wells, toe drains or graded filters.

The preliminary design described here should be interpreted as a work in progress. Testing and analysis is ongoing to refine the design, particularly to examine more cost-effective improvements to reach the goal of accreditation, and to reduce environmental, economic and cultural impacts.

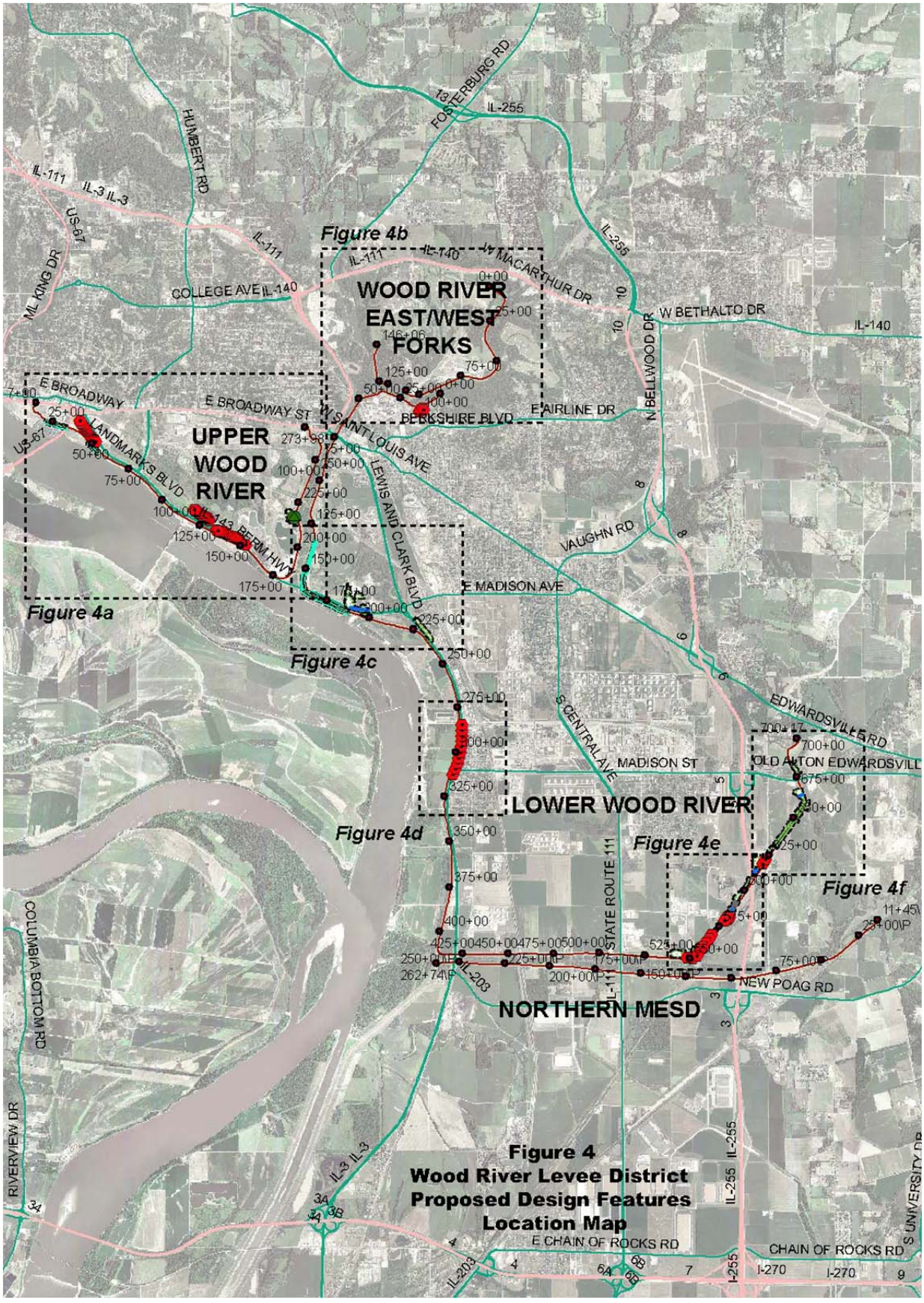


Figure 4b
WOOD RIVER EAST/WEST FORKS
UPPER WOOD RIVER
LOWER WOOD RIVER
NORTHERN MESD
Figure 4a
Figure 4c
Figure 4d
Figure 4e
Figure 4f
E BROADWAY
E BROADWAY ST
W SAINT LOUIS AVE
LANDMARKS BLVD
IL-143 PERM HWY
LEWIS AND CLARK BLVD
E MADISON AVE
VAUGHN RD
COLLEGE AVE IL-140
MACARTHUR DR
E AIRLINE DR
BERKSHIRE BLVD
N BELLWOOD DR
W BETHALTO DR
IL-140
IL-255
FOSTERBURG RD
HUMBERT RD
IL-111
IL-3 IL-3
US-67
ML KING DR
S CENTRAL AVE
MADISON ST
EDWARDSVILLE RD
OLD ALTON EDWARDSVILLE
STATE ROUTE 111
NEW POAG RD
COLUMBIA BOTTOM RD
RIVERVIEW DR
IL-203
E CHAIN OF ROCKS RD
CHAIN OF ROCKS RD
I-270
S UNIVERSITY DR
Figure 4
Wood River Levee District
Proposed Design Features
Location Map

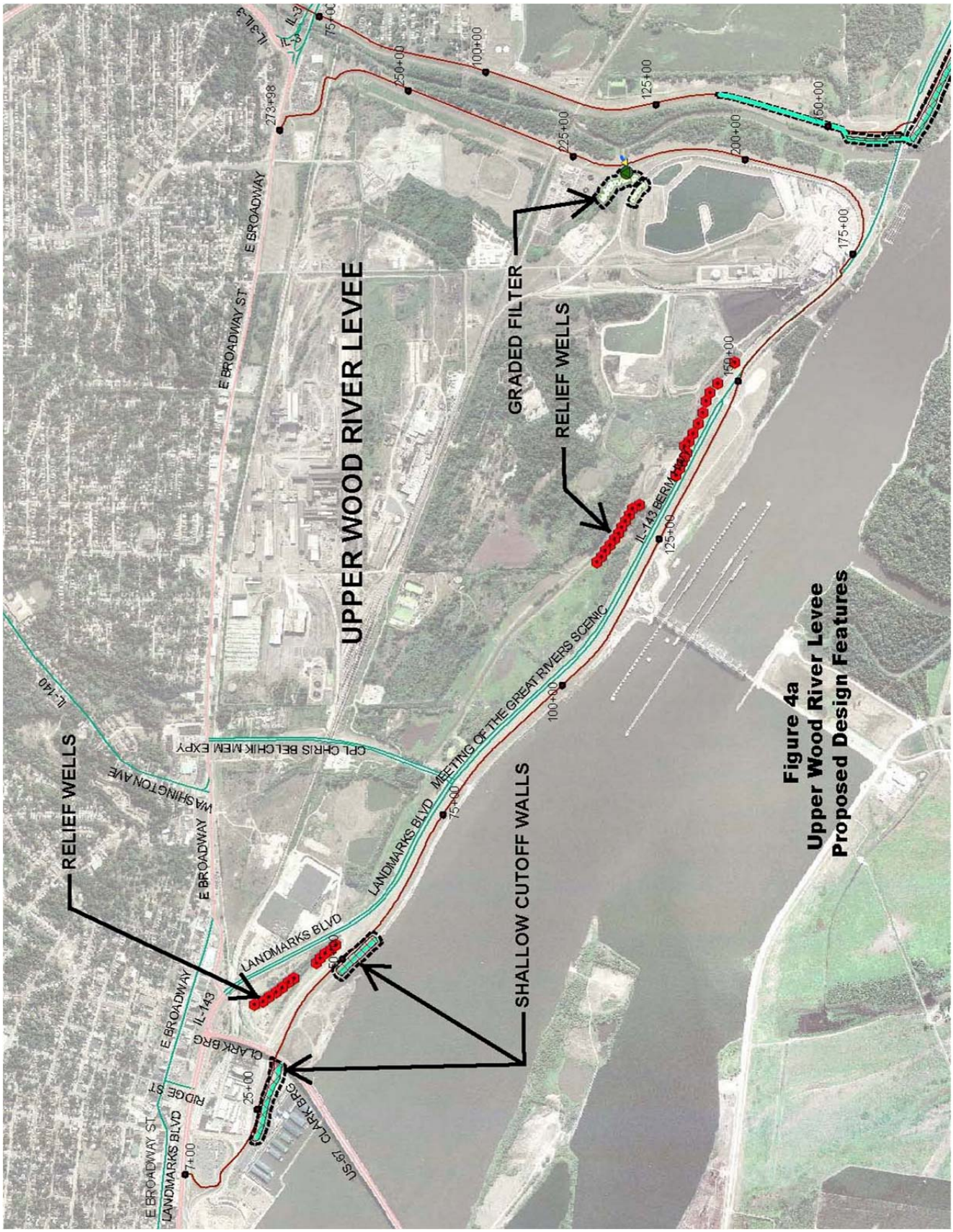


Figure 4a
Upper Wood River Levee
Proposed Design Features

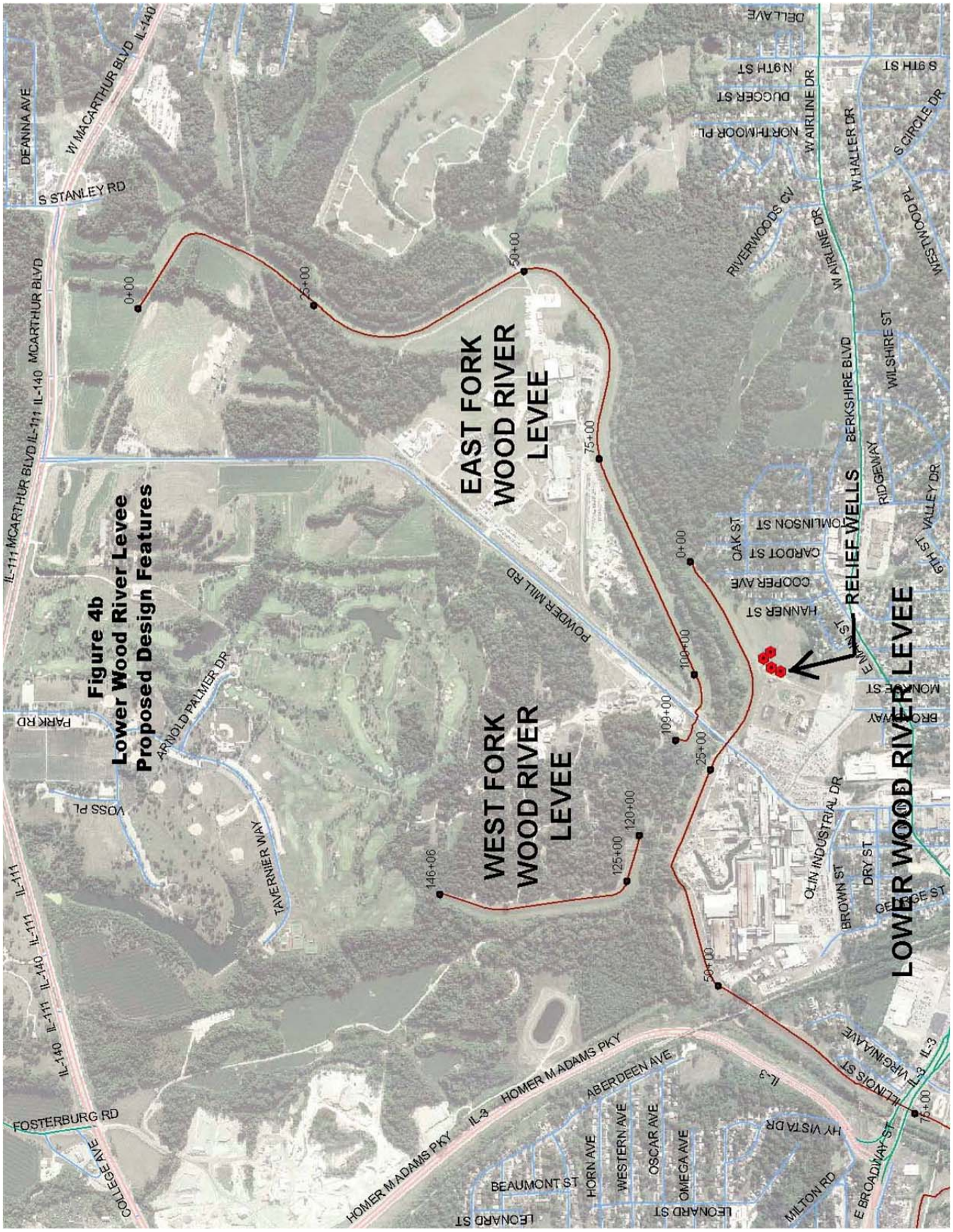


Figure 4b
Lower Wood River Levee
Proposed Design Features
EAST FORK
WOOD RIVER
LEVEE
WEST FORK
WOOD RIVER
LEVEE
LOWER WOOD RIVER LEVEE
RELIEF WELLS
0+00
25+00
50+00
75+00
100+00
109+00
120+00
125+00
146+06
IL-111 MCARTHUR BLVD
IL-140 MCARTHUR BLVD
W MACARTHUR BLVD
S STANLEY RD
DEANNA AVE
POWDER MILL RD
ARNOLD PALMER DR
PARK RD
VOSS PL
TAVERNIER WAY
FOSTERBURG RD
COLLEGE AVE
HOMER M ADAMS PKY
IL-3
ABERDEEN AVE
BEAUMONT ST
HORN AVE
WESTERN AVE
OSCAR AVE
OMEGA AVE
LEONARD ST
MILTON RD
E BROADWAY ST
ILLINOIS ST
VIRGINIA AVE
HY VISTA DR
OLIN INDUSTRIAL DR
BROWN ST
DRY ST
HANNER ST
COOPER AVE
CARDOT ST
OAK ST
COMLINSON ST
E MAIN ST
MONROE ST
BROADWAY
RIDGEWAY
BERKSHIRE BLVD
WILSHIRE ST
6TH ST
VALLEY DR
W AIRLINE DR
RIVERWOODS CV
NORTHMOOR PL
DUCCER ST
N 9TH ST
DELL AVE
W HALLER DR
S CIRCLE DR
S 9TH ST
WESTWOOD PL

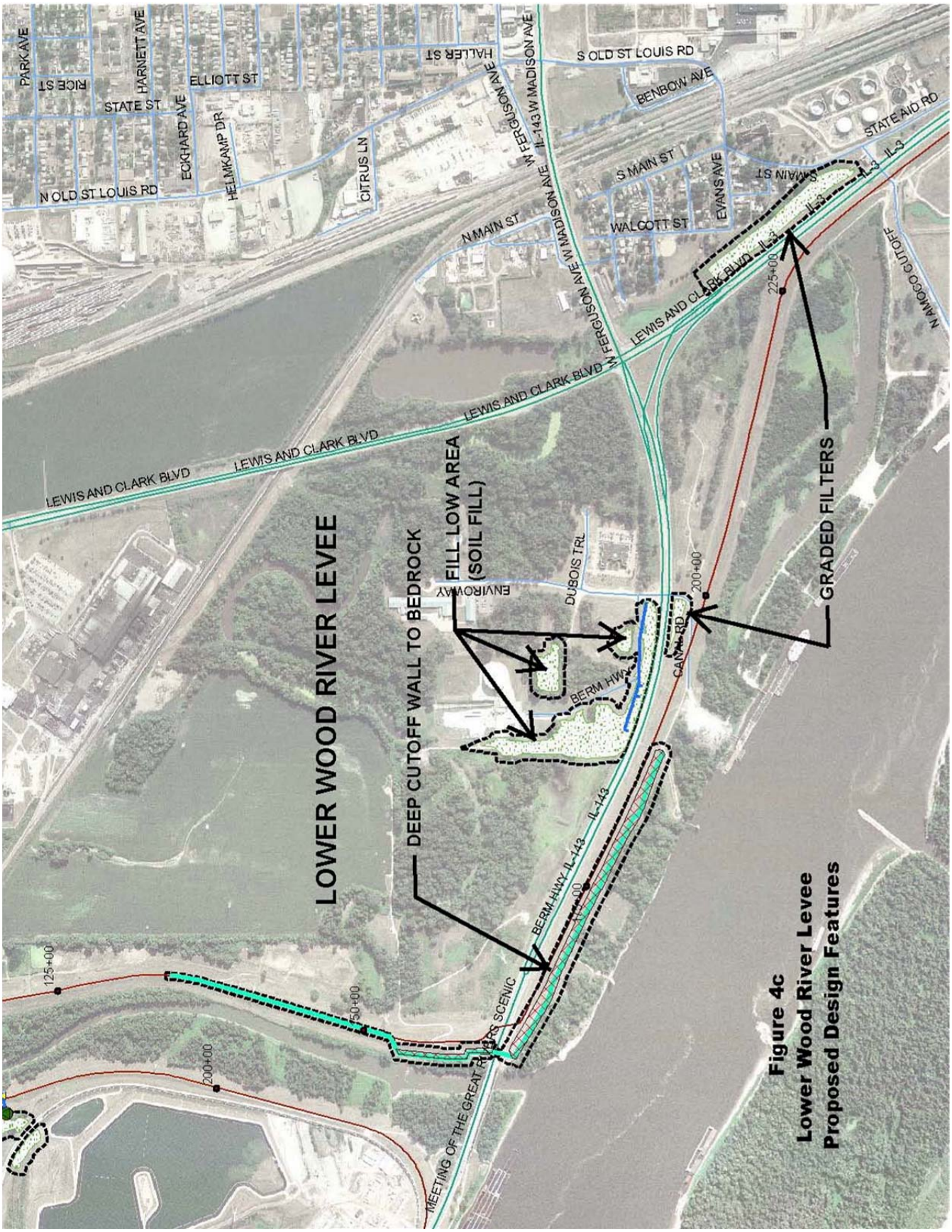


Figure 4c
Lower Wood River Levee
Proposed Design Features

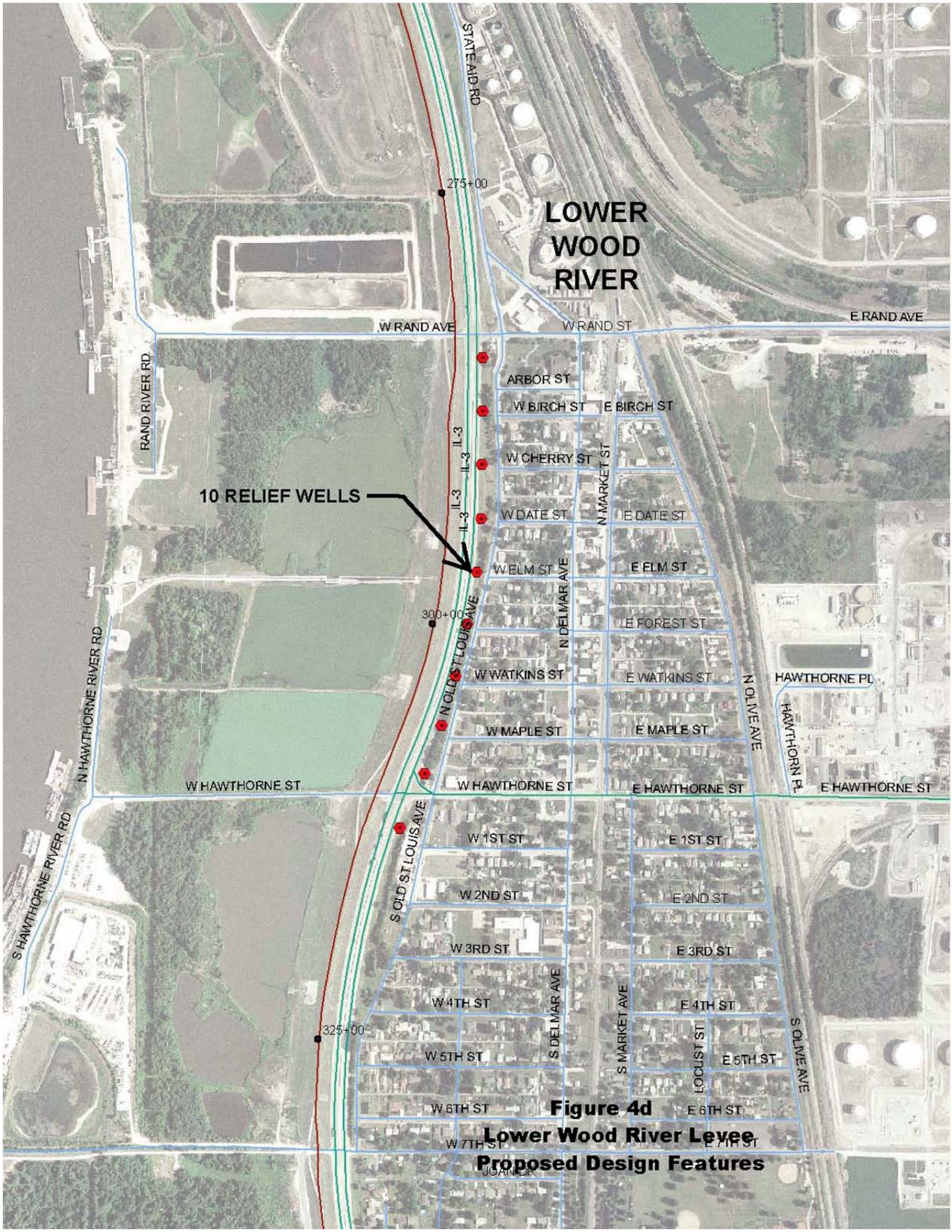
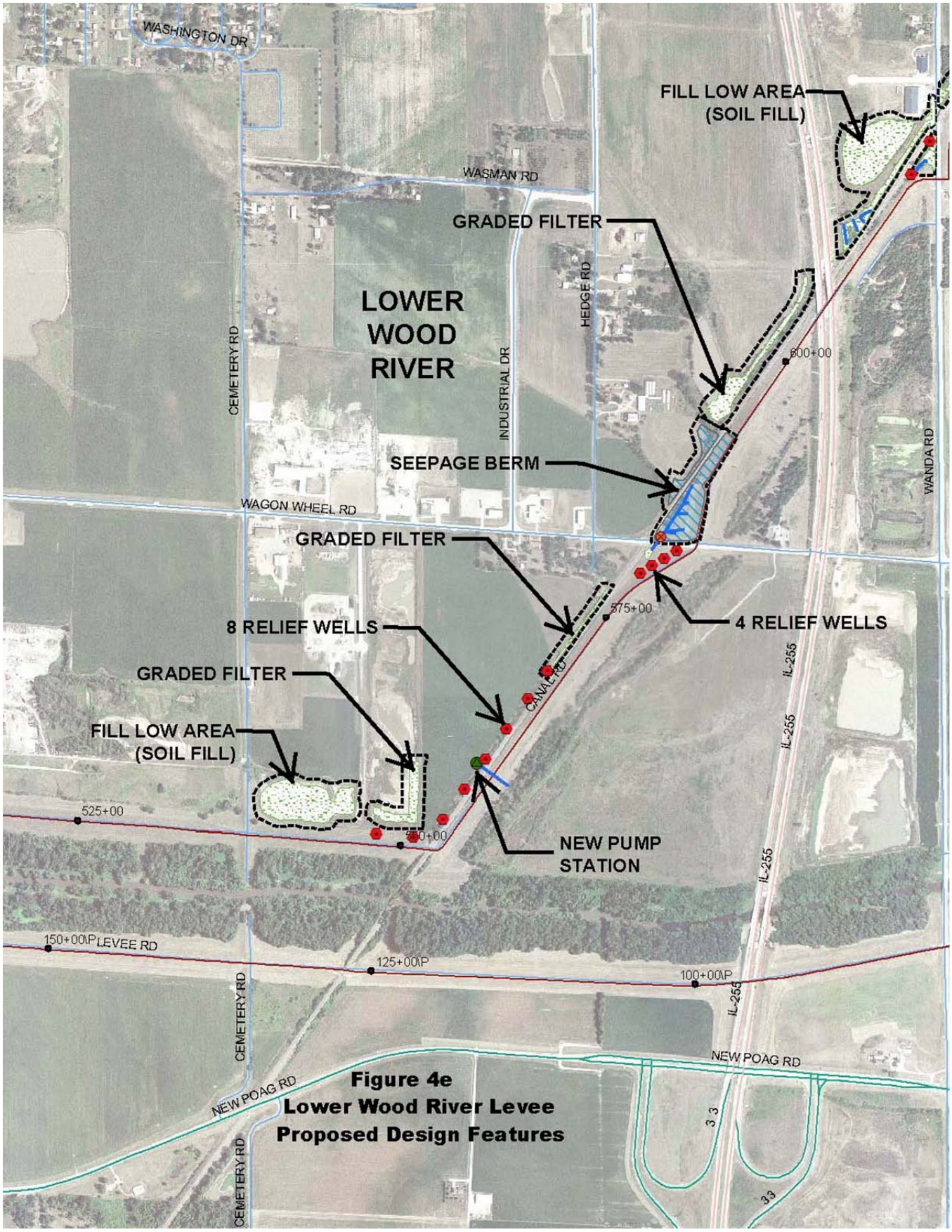


Figure 4d
Lower Wood River Levee
Proposed Design Features


WASHINGTON DR
WASMAN RD
FILL LOW AREA
(SOIL FILL)
GRADED FILTER
LOWER
WOOD
RIVER
HEDGE RD
CEMETERY RD
INDUSTRIAL DR
800+00
WANDA RD
SEEPAGE BERM
WAGON WHEEL RD
GRADED FILTER
575+00
4 RELIEF WELLS
8 RELIEF WELLS
GRADED FILTER
CANAL RD
IL-255
FILL LOW AREA
(SOIL FILL)
525+00
500+00
NEW PUMP
STATION
150+00\P LEVEE RD
125+00\P
100+00\P
CEMETERY RD
NEW POAG RD
NEW POAG RD
CEMETERY RD
Figure 4e
Lower Wood River Levee
Proposed Design Features

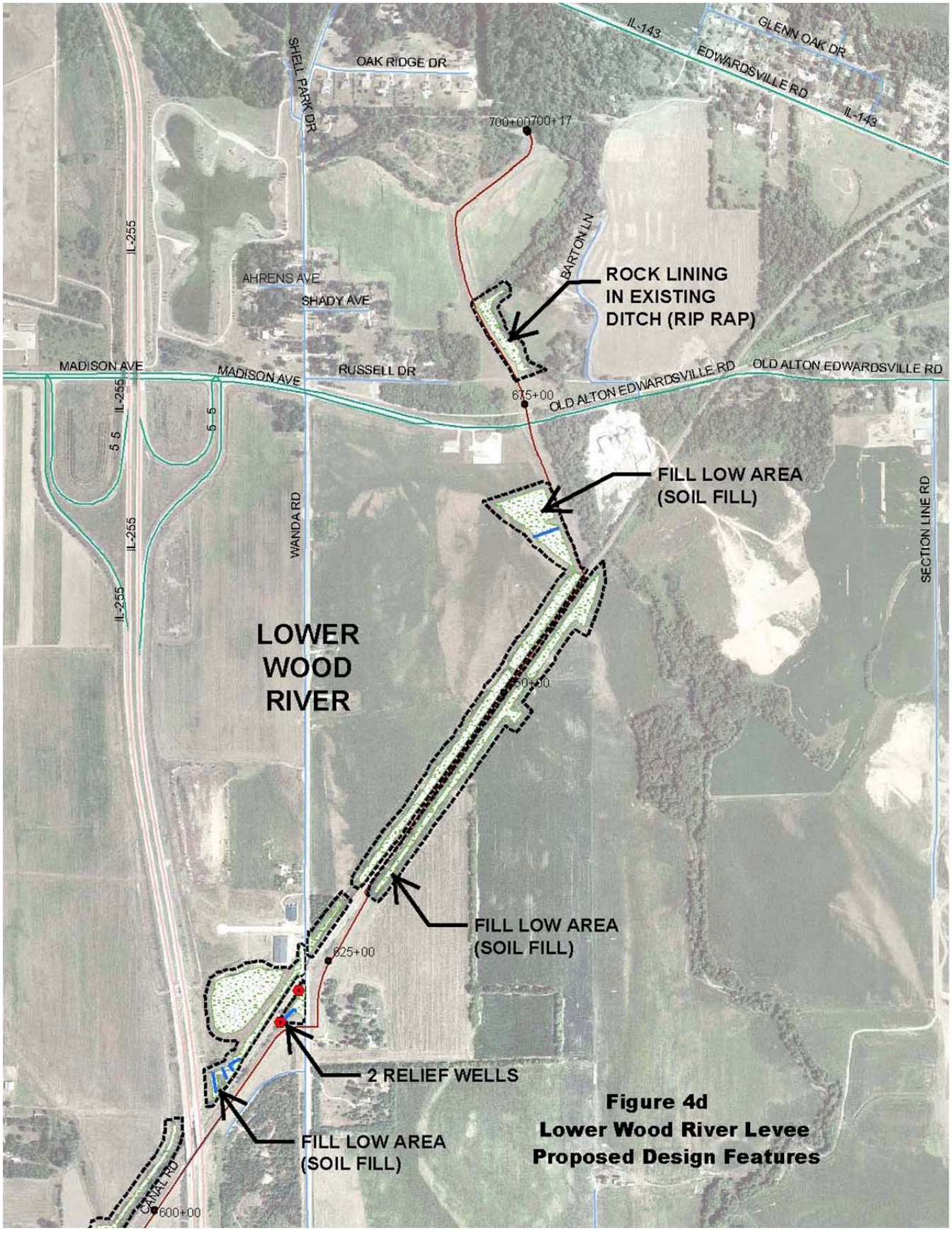


Figure 4d
Lower Wood River Levee
Proposed Design Features

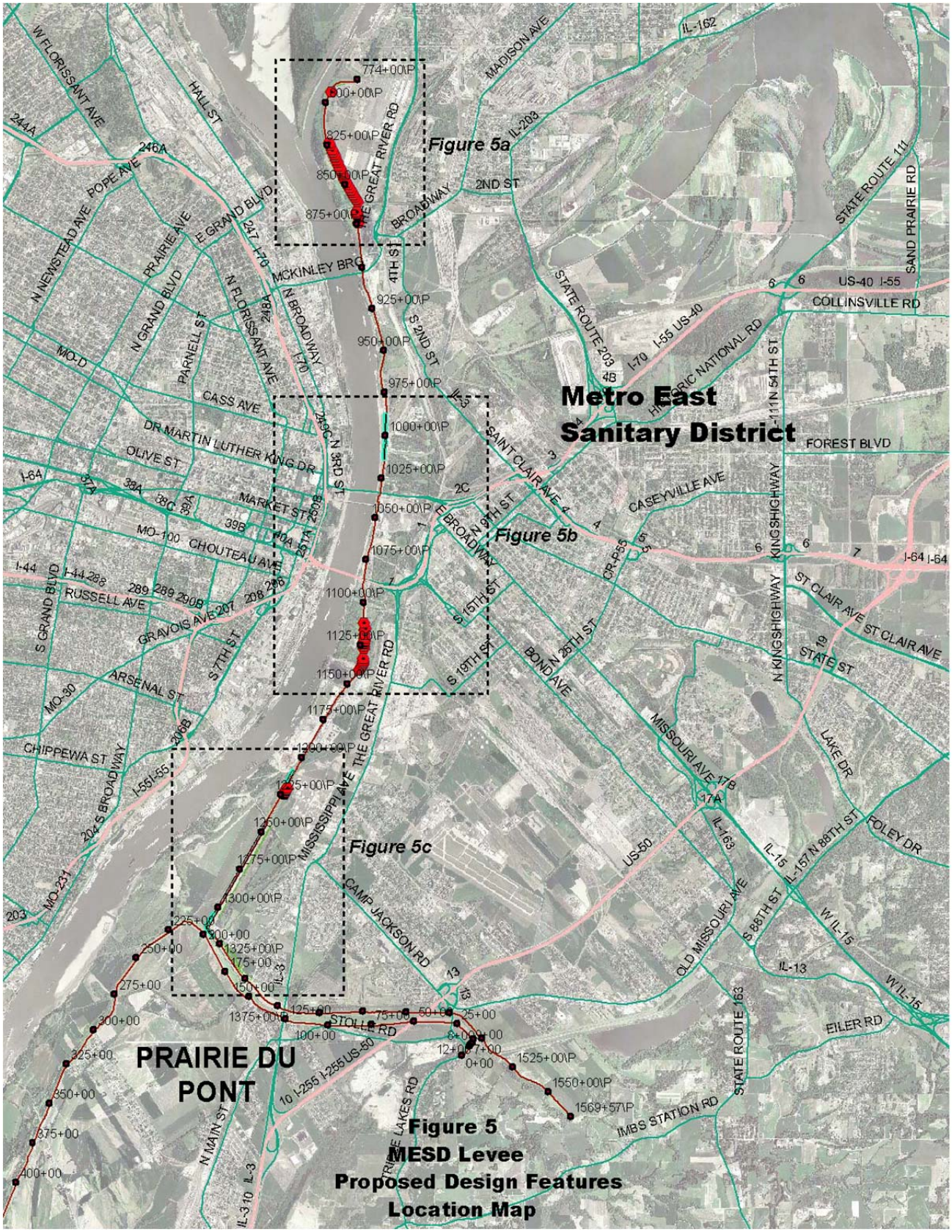
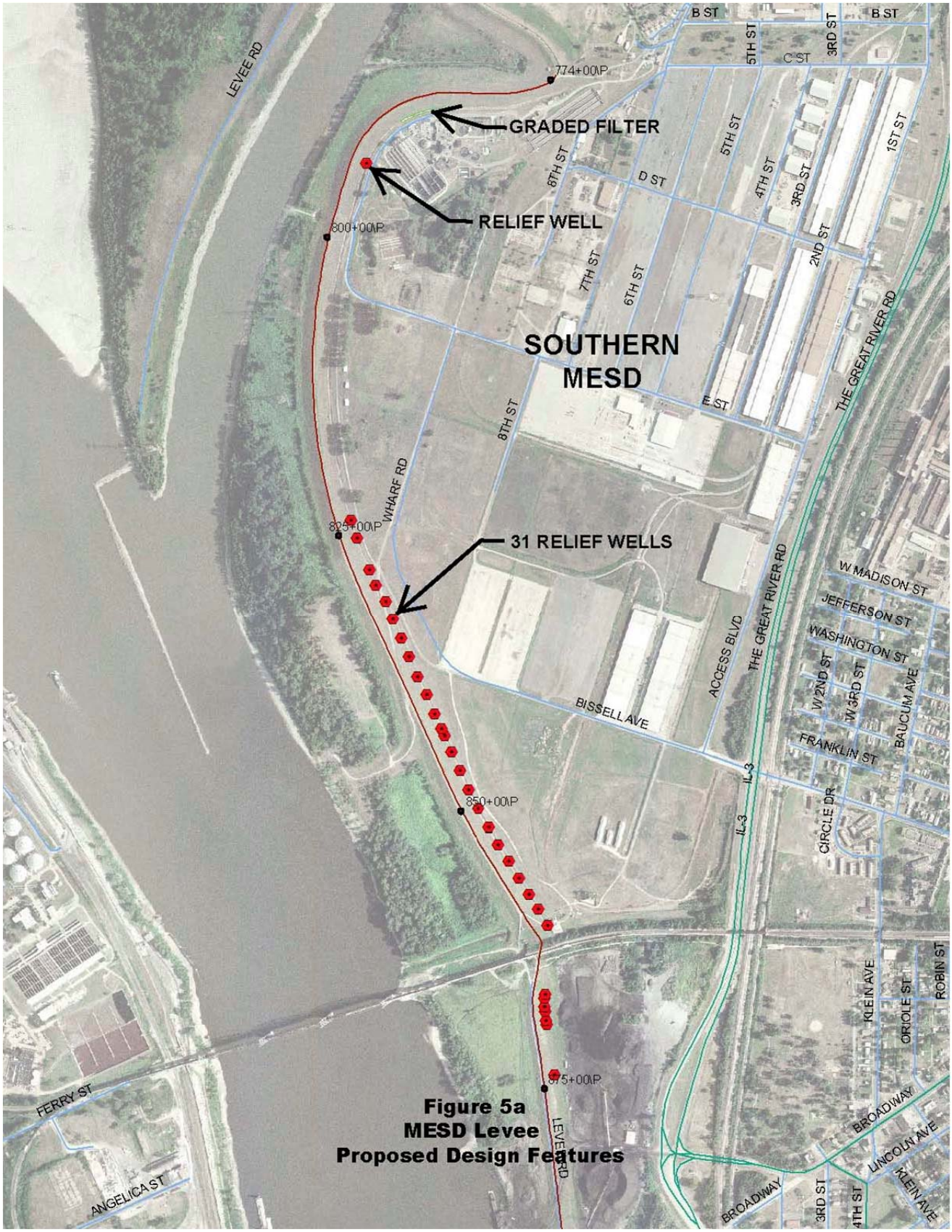


Figure 5
MESD Levee
Proposed Design Features
Location Map


GRADED FILTER
RELIEF WELL
SOUTHERN MESD
31 RELIEF WELLS
774+00\P
800+00\P
825+00\P
850+00\P
875+00\P
LEVEE RD
WHARF RD
8TH ST
7TH ST
6TH ST
5TH ST
4TH ST
3RD ST
2ND ST
1ST ST
B ST
C ST
D ST
E ST
THE GREAT RIVER RD
ACCESS BLVD
W MADISON ST
JEFFERSON ST
WASHINGTON ST
W 2ND ST
W 3RD ST
BAUCUM AVE
FRANKLIN ST
BISSELL AVE
IL-3
CIRCLE DR
KLEIN AVE
ORIOLE ST
ROBIN ST
BROADWAY
LINCOLN AVE
FERRY ST
ANGELICA ST
Figure 5a
MESD Levee
Proposed Design Features

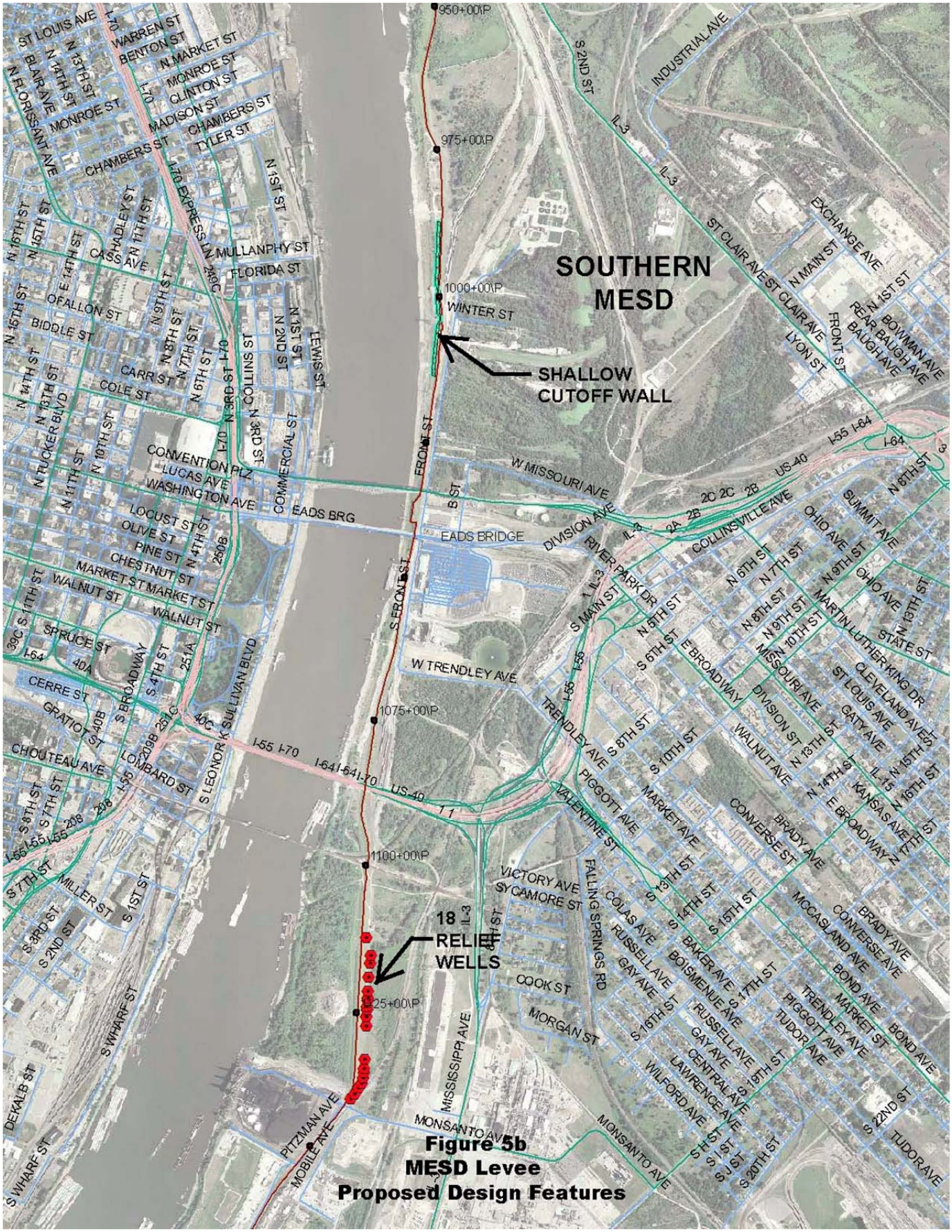


Figure 5b
MESD Levee
Proposed Design Features

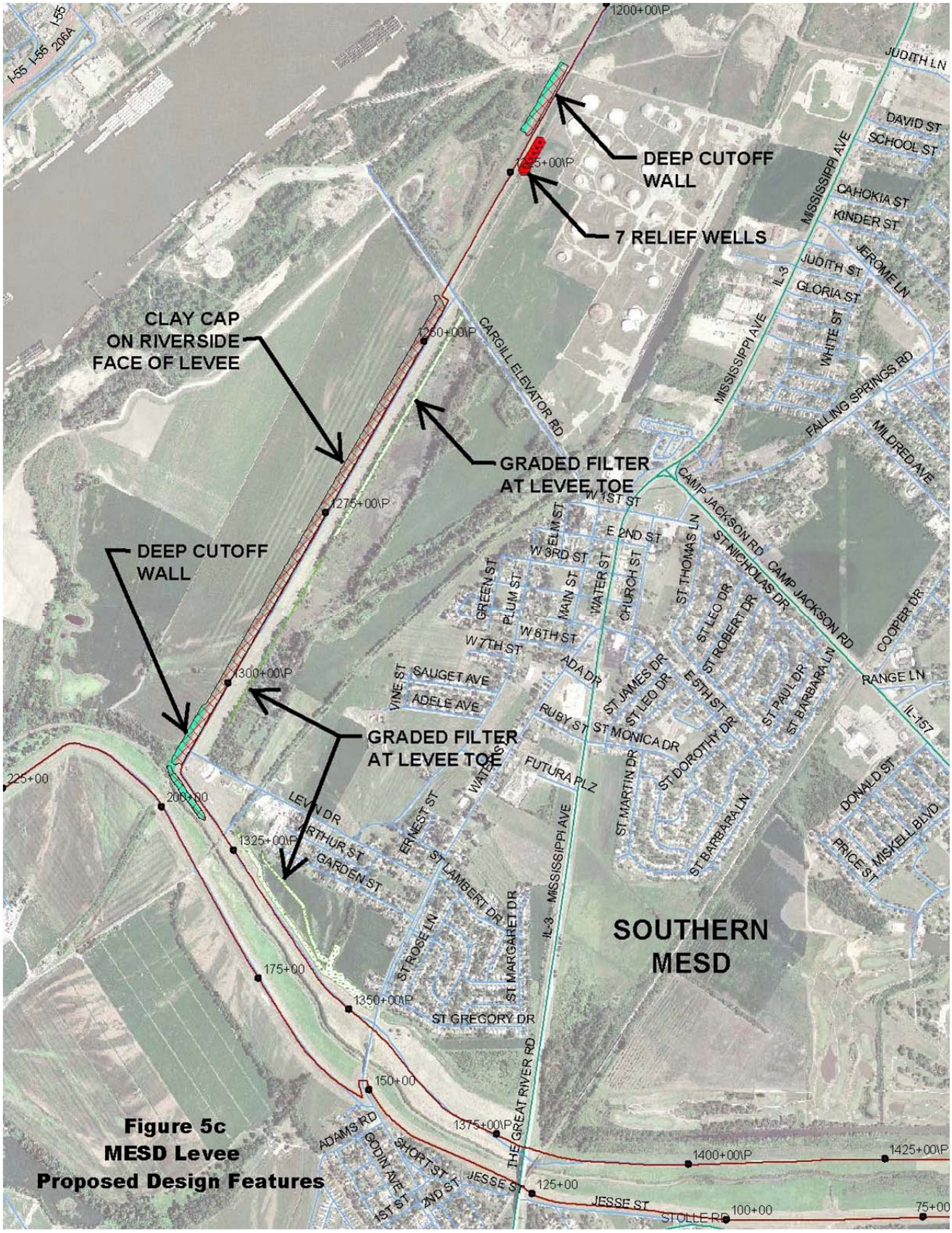
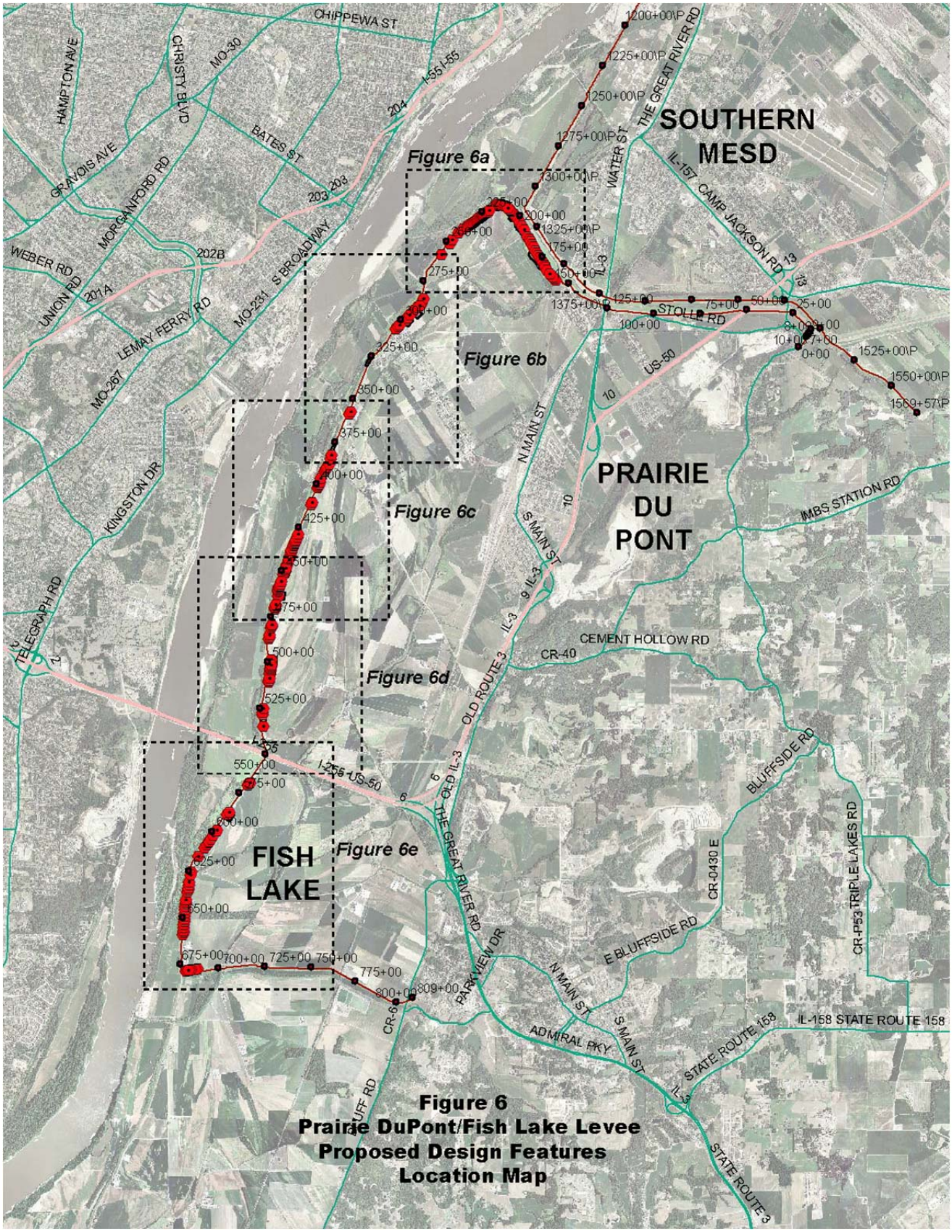


Figure 5c
MESD Levee
Proposed Design Features


SOUTHERN MESD
PRAIRIE DU PONT
FISH LAKE
Figure 6a
Figure 6b
Figure 6c
Figure 6d
Figure 6e
CHIPPEWA ST
HAMPTON AVE
CHRISTY BLVD
MO-30
I-55 I-55
GRAVOIS AVE
BATES ST
MORGANFORD RD
WEBER RD
UNION RD
MO-231
S BROADWAY
LEMAY FERRY RD
MO-267
KINGSTON DR
TELEGRAPH RD
THE GREAT RIVER RD
WATER ST
IL-157
CAMP JACKSON RD
STOLLE RD
US-50
N MAIN ST
S MAIN ST
IL-3
OLD ROUTE 3
CEMENT HOLLOW RD
CR-40
IMBS STATION RD
BLUFFSIDE RD
CR-0430 E
CR-P53 TRIPLE LAKES RD
E BLUFFSIDE RD
PARKVIEW DR
ADMIRAL PKY
STATE ROUTE 158
IL-158 STATE ROUTE 158
STATE ROUTE 3
CR-6
Figure 6
Prairie DuPont/Fish Lake Levee
Proposed Design Features
Location Map

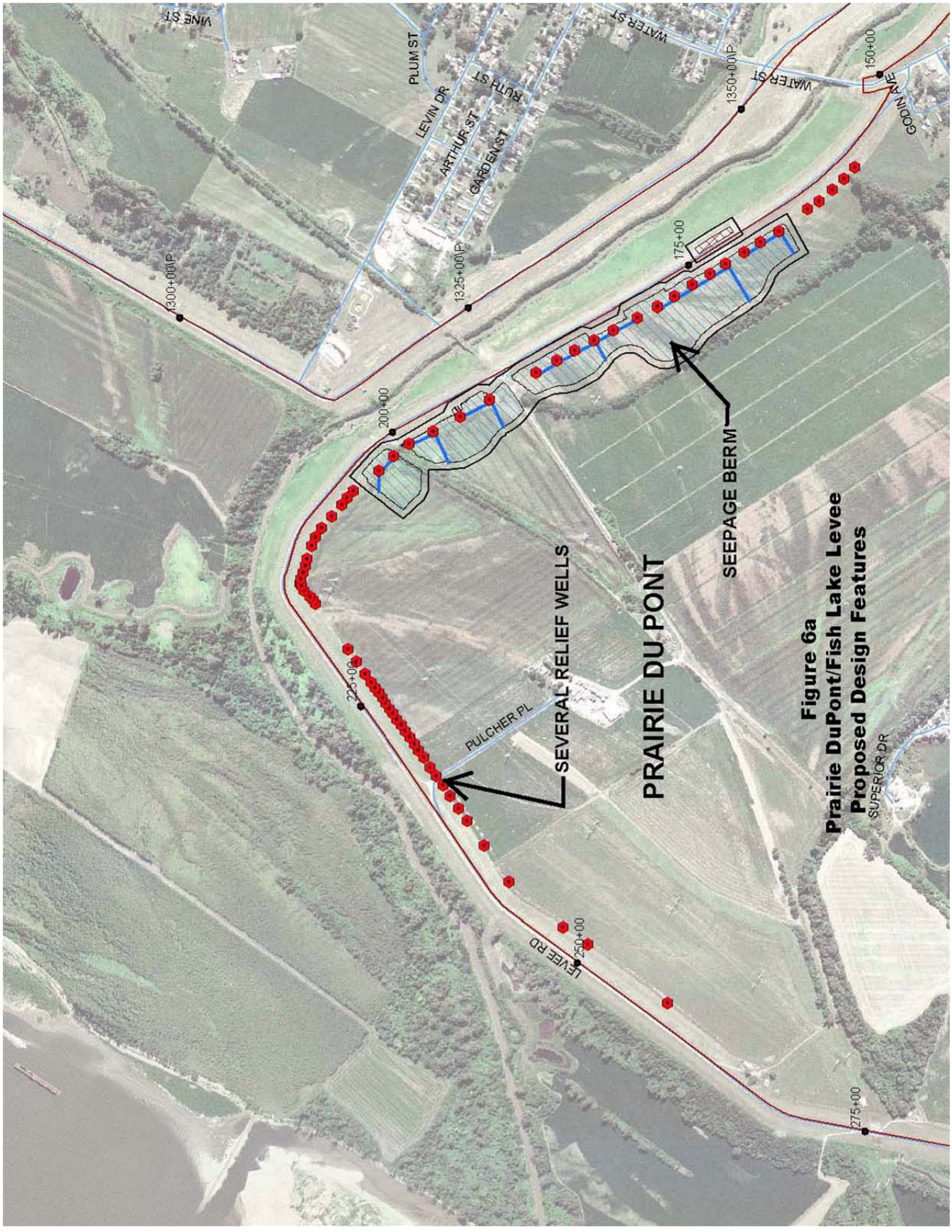


Figure 6a
Prairie DuPont/Fish Lake Levee
Proposed Design Features

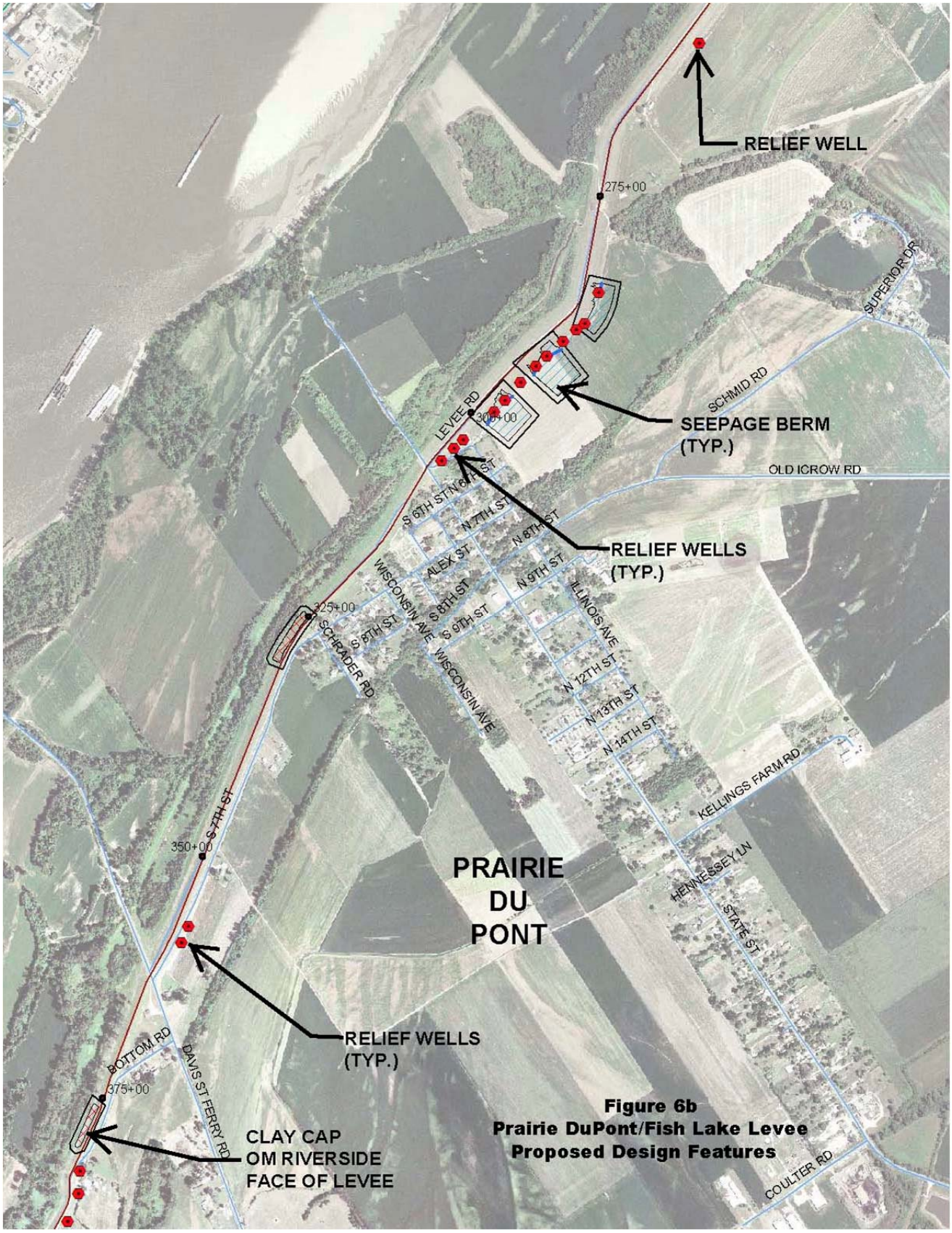


Figure 6b
Prairie DuPont/Fish Lake Levee
Proposed Design Features

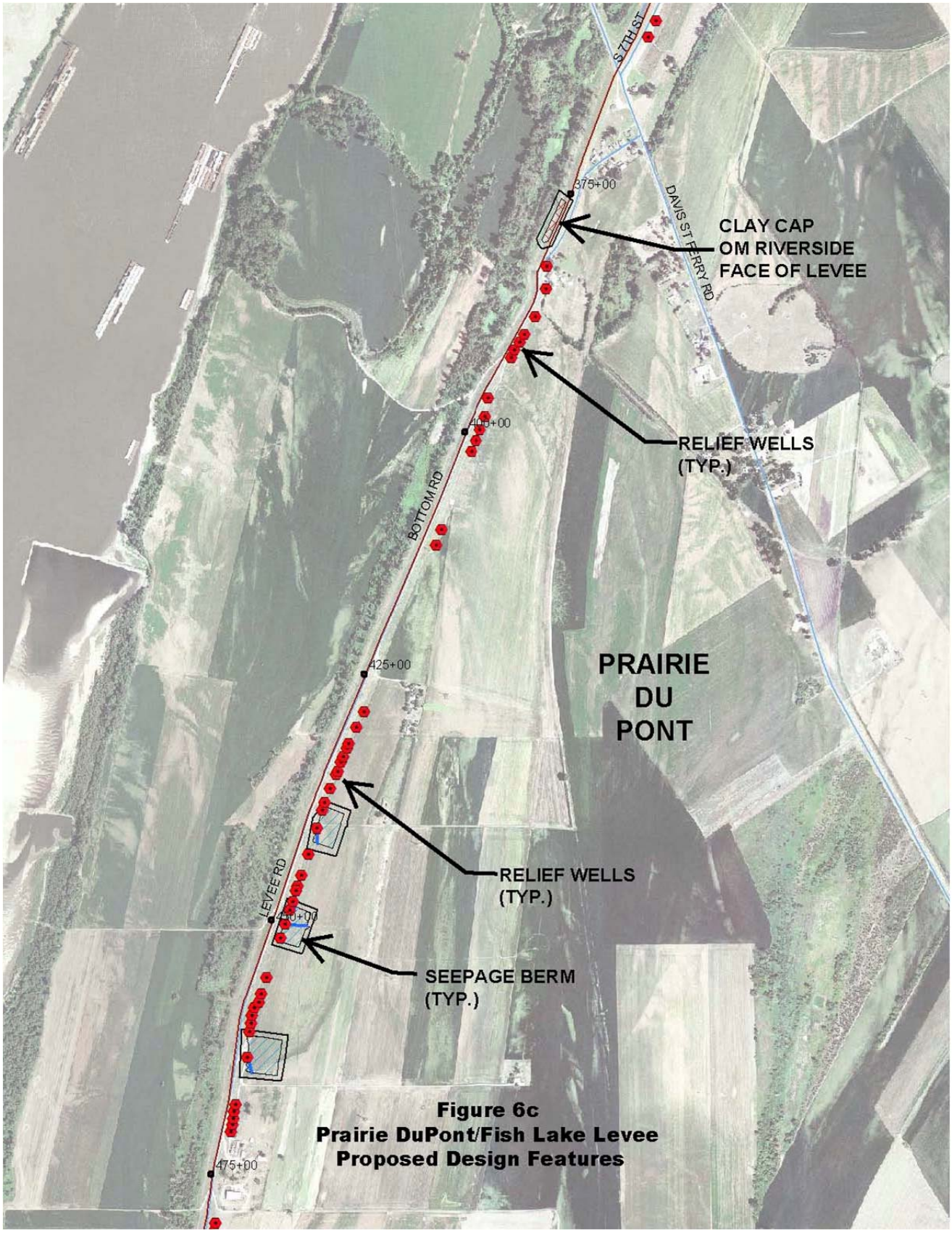


Figure 6c
Prairie DuPont/Fish Lake Levee
Proposed Design Features

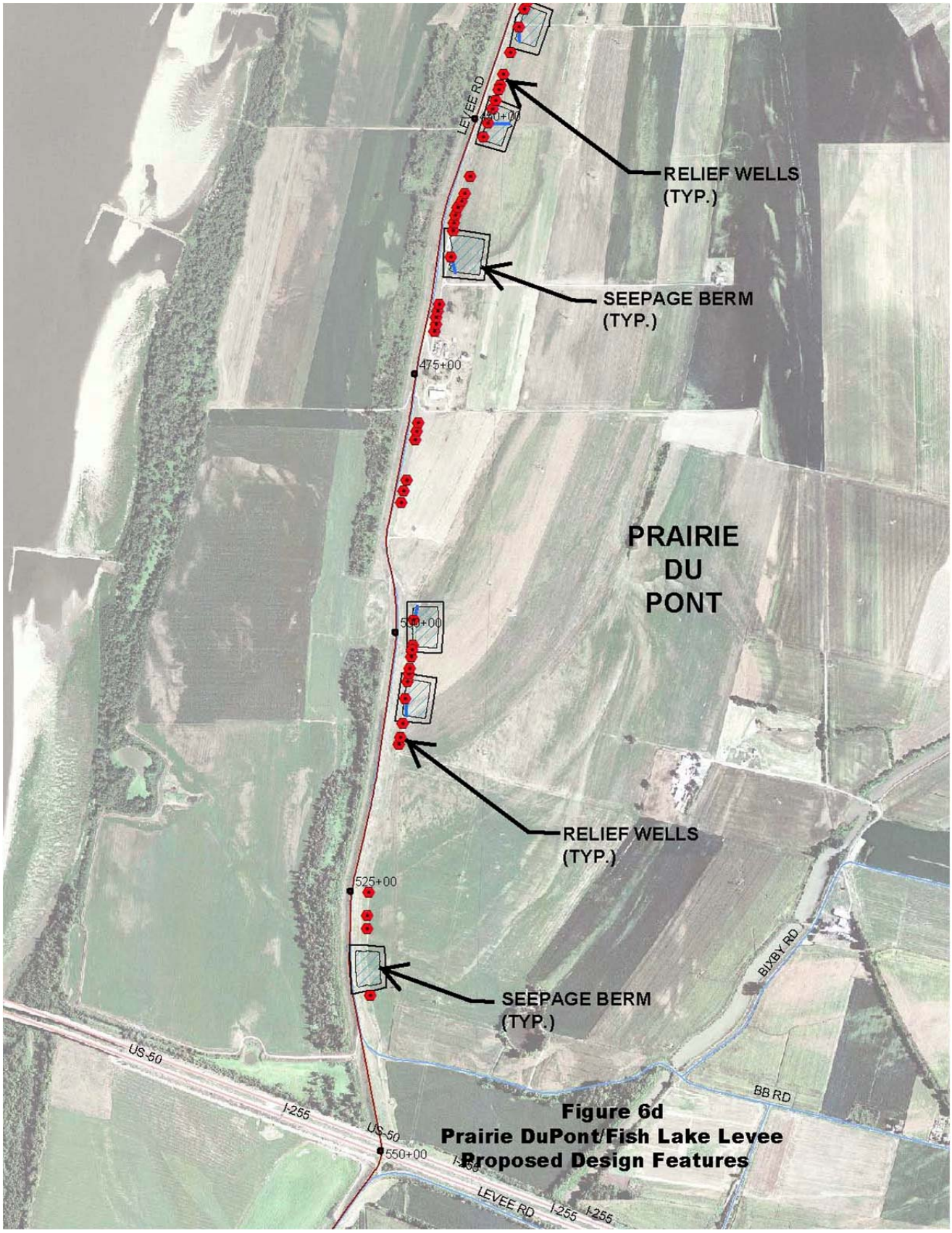


Figure 6d
Prairie DuPont/Fish Lake Levee
Proposed Design Features

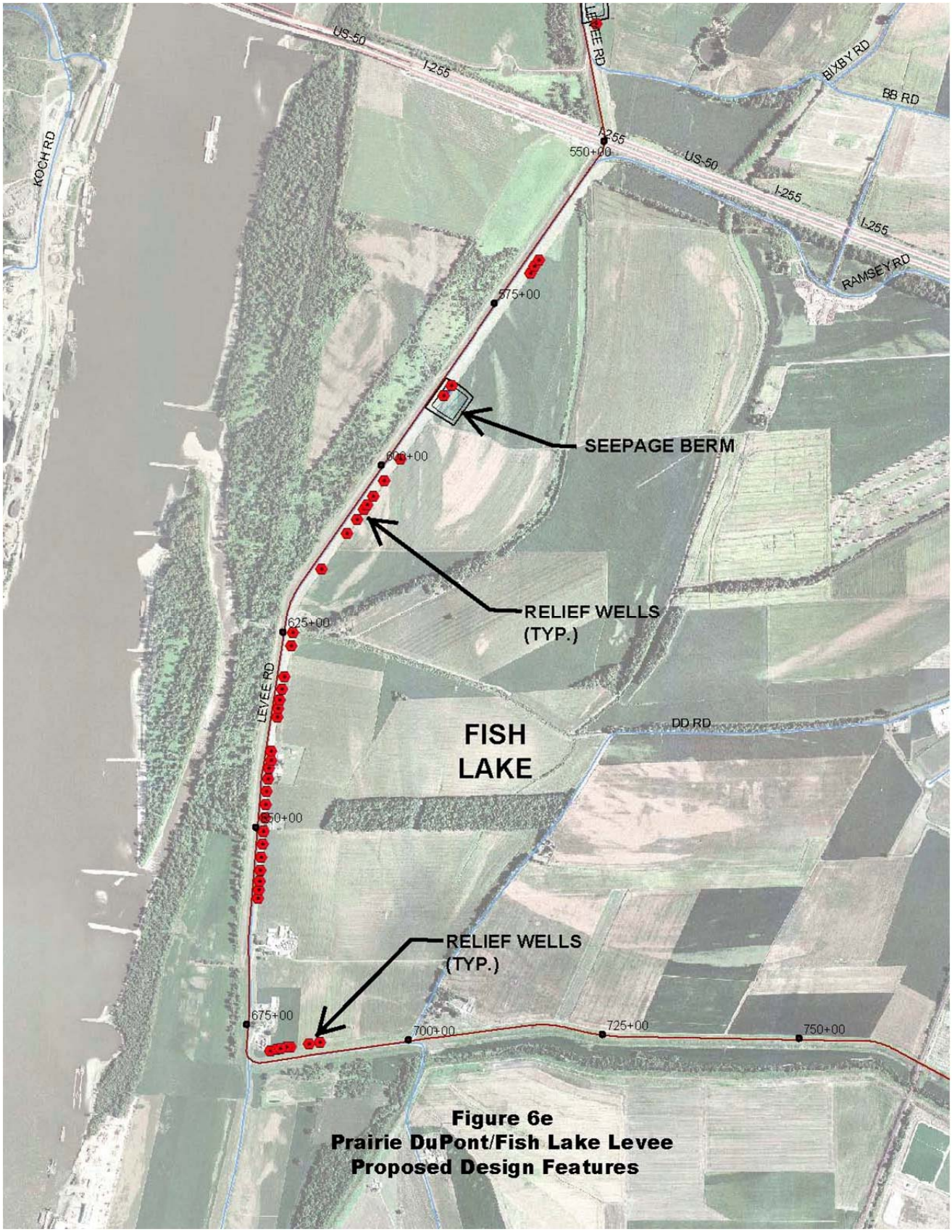


Figure 6e
Prairie DuPont/Fish Lake Levee
Proposed Design Features

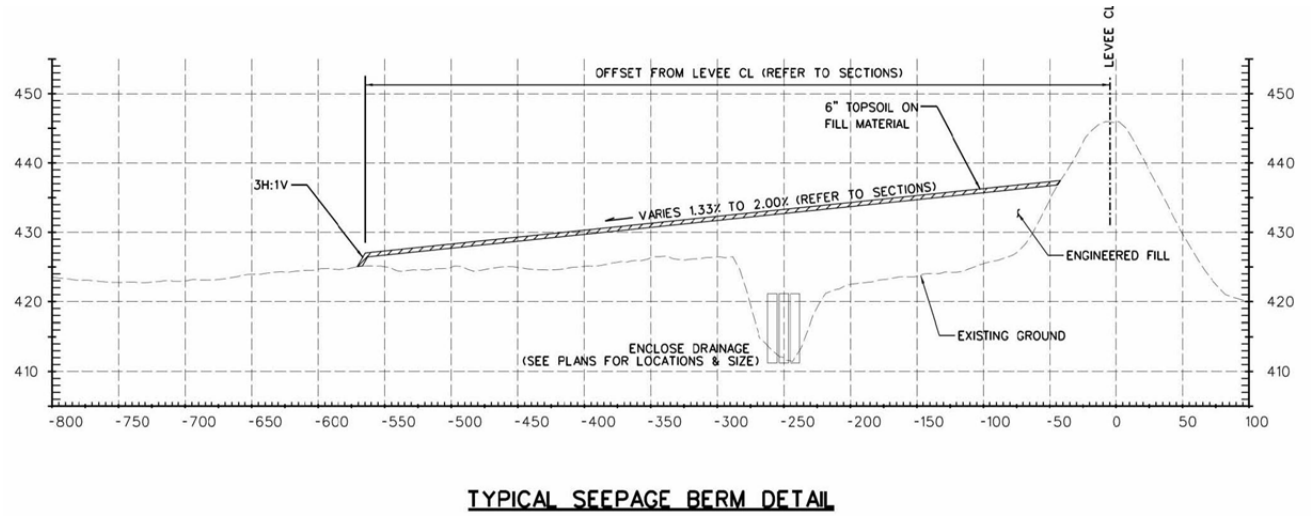


Figure 7

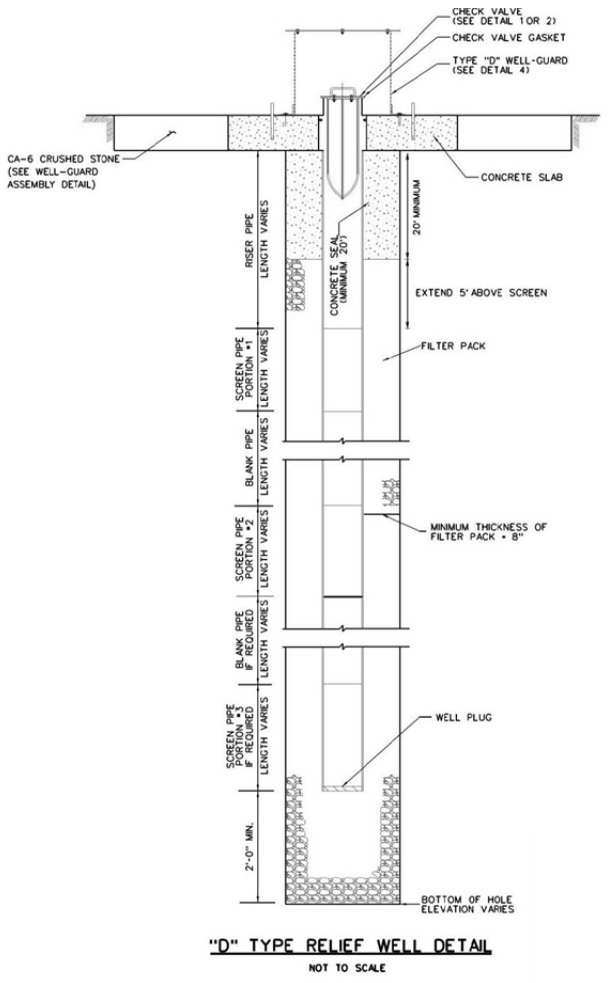


Figure 8

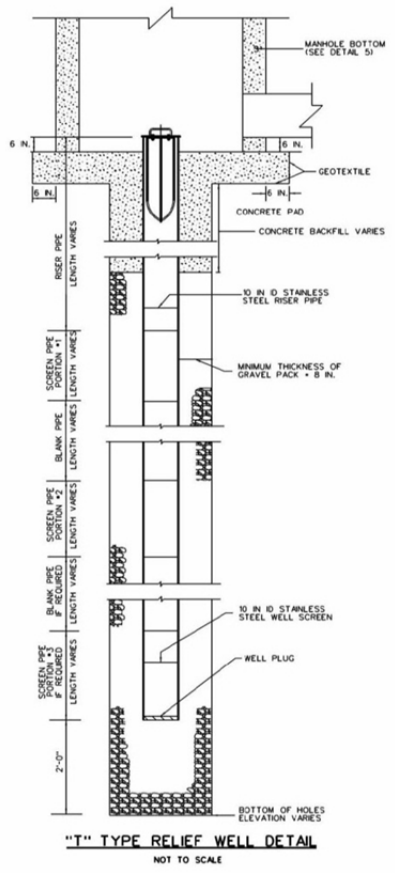
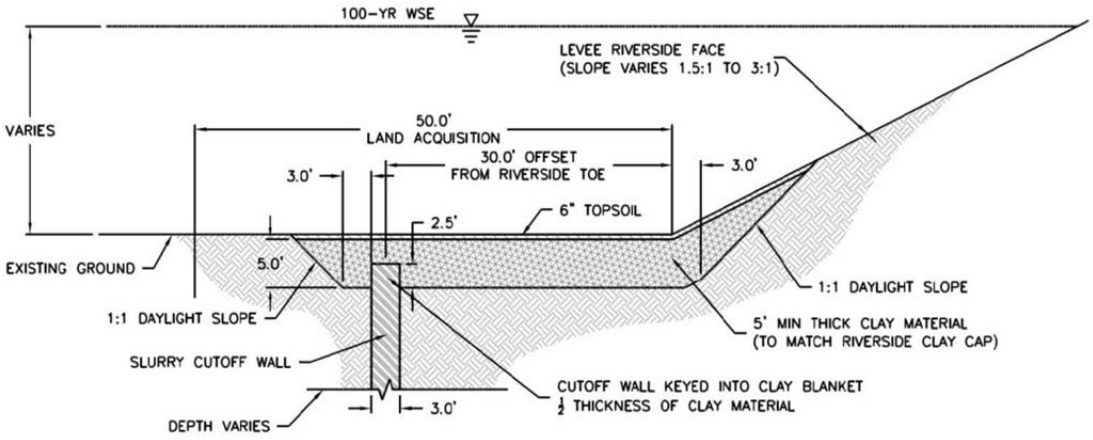
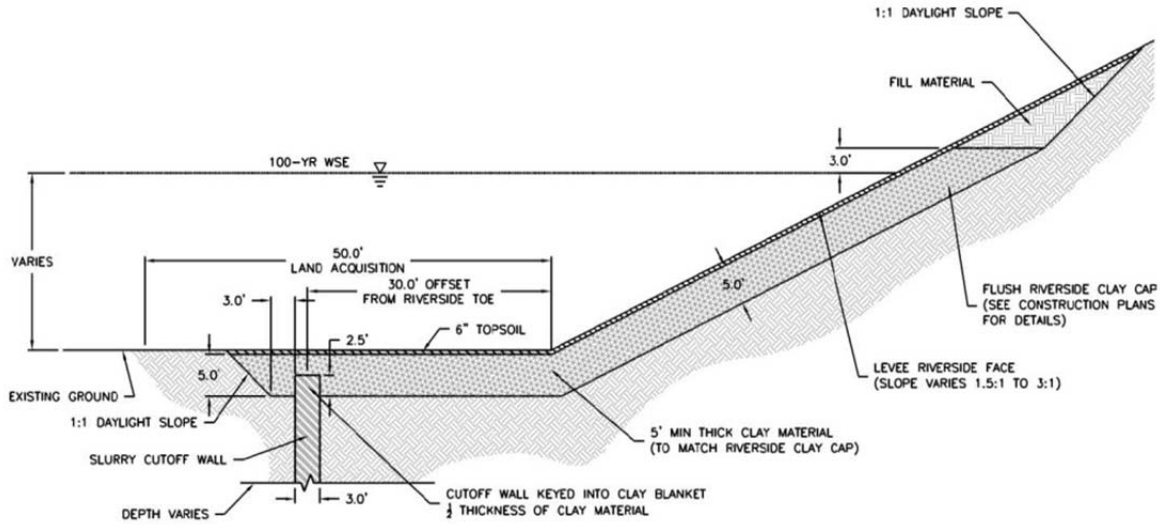


Figure 9



DETAIL 1 - SLURRY CUTOFF WALL WITH FLUSH CLAY BLANKET (NO RIVERSIDE CLAY BLANKET REQUIRED)

Figure 10



DETAIL 3 - SLURRY CUTOFF WALL IN COMBINATION WITH A FLUSH RIVERSIDE CLAY BLANKET

Figure 11

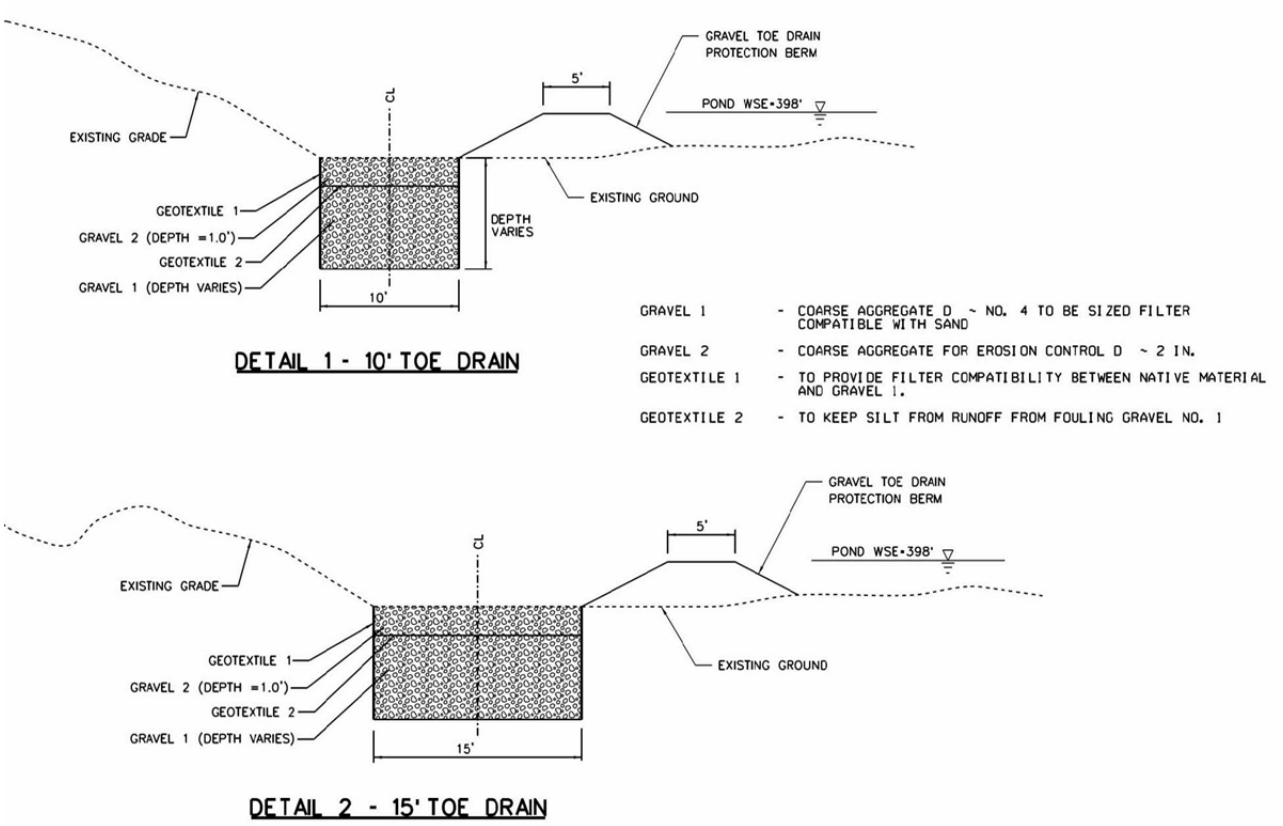


Figure 12
Toe Drain Details

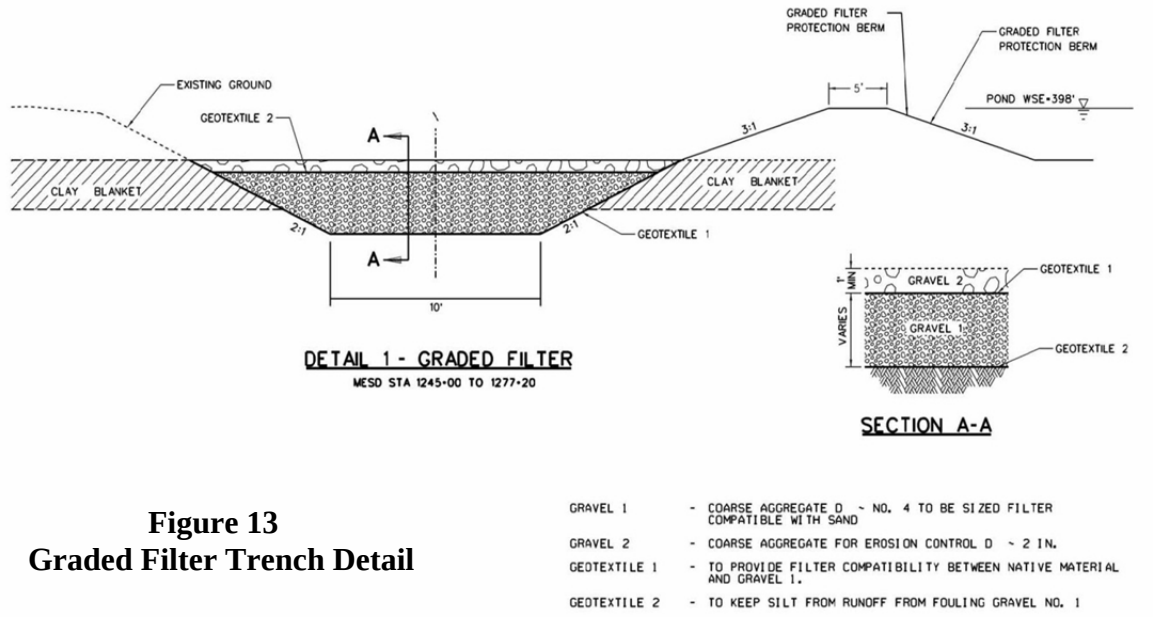


Figure 13
Graded Filter Trench Detail

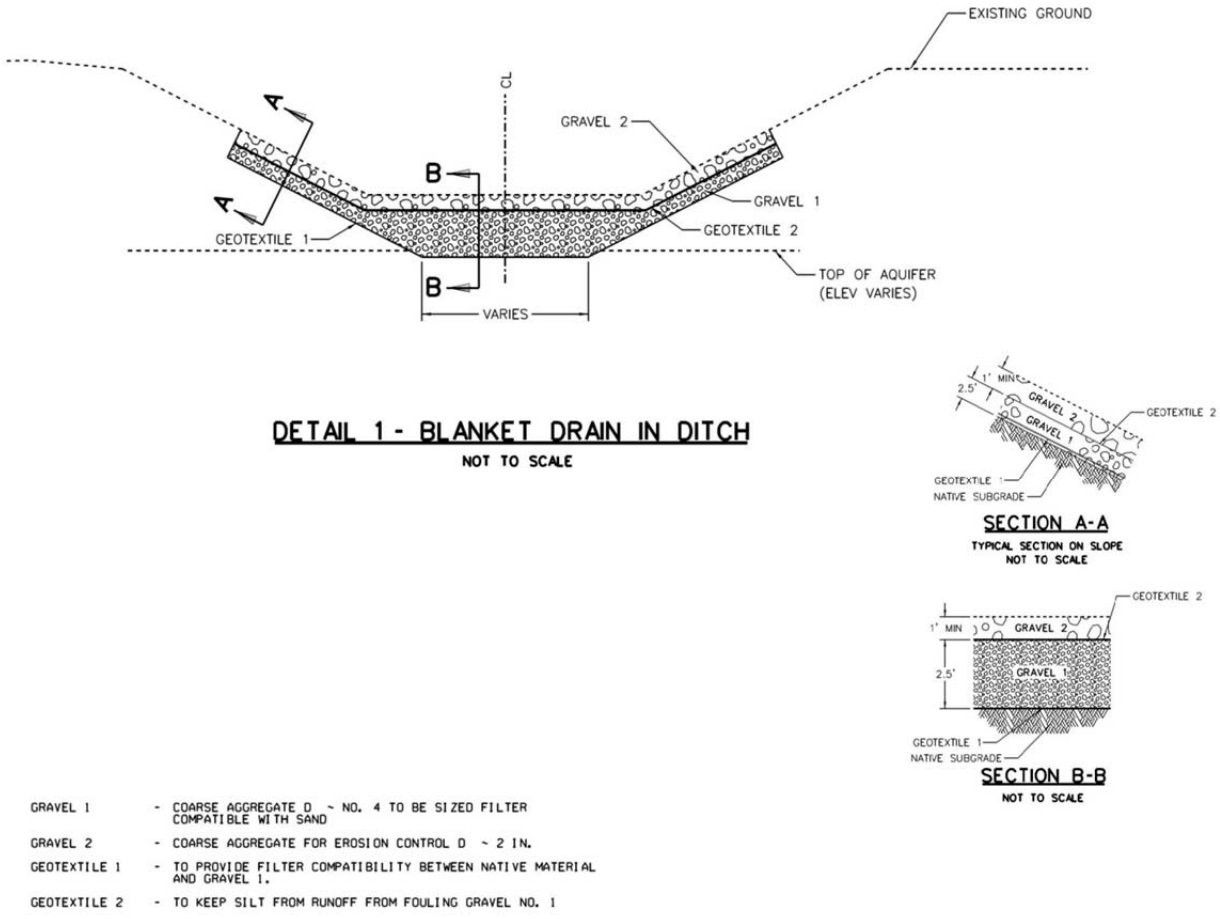


Figure 14
Blanket Drain in Ditch Detail

IV. Cost Estimate

As part of the 30% design submittal AMEC provided a construction cost estimate. At this stage of the design process, there is some uncertainty in the estimate. Construction quantities will change as the design becomes more complete and unit costs will become more predictable as the time of construction approaches. Even with those uncertainties, however, a cost estimate is useful at this stage of project development, both to validate the overall budget for the project and to compare the cost-effectiveness of alternative design solutions. The cost estimate is also essential to support a financing strategy and schedule for the project.

Recognizing the uncertainty of a 30% design cost estimate, a contingency amount is added to the calculated cost of each construction component (see Table 2). The cost of some construction items may be more or less predictable, so AMEC used different contingency amounts to reflect this variability. AMEC also calculated an "escalated" estimate to reflect inflation over a four year construction period. There are schedule risks that could also add costs. Those could include delays caused by natural events such as high water or weather, or delays by state and federal agencies in securing permits.

In addition to actual construction costs, there are other project expenditures that are included in the overall cost estimate for the project. Professional services for program management, design and construction management have been estimated, along with the cost of issuance for subsequent Council debt, and the operating costs for the Council. Cost totals include amounts for design and pre-construction testing that have been previously expended from the Council's bond issue proceeds in order to preserve consistency with financial capacity estimates discussed later in this report.

Construction cost estimates are provided in summary herein (see Tables 1-2); the detailed construction cost estimate is included as Appendix B to this report.

Table 1
Project Cost Estimate Summary

	Levee System			
Type of Improvement	***Wood River***	***MESD***	***PdP/FL***	***Total***
Berms	$7,422,000	$6,650,000	$6,864,000	$20,936,000
Relief Wells	4,387,000	7,540,000	8,038,000	19,965,000
Cutoff Walls	31,328,000	27,038,000	0	58,366,000
Clay Caps	0	5,598,000	513,000	6,111,000
Civil Works	9,033,000	12,872,000	2,197,000	24,102,000
Construction Testing				5,688,000
Subtotal- Construction	$52,170,000	$59,698,000	$17,612,000	$135,168,000
Program Mgmt.				2,200,000
Design				7,799,000
Construction Mgmt.				5,183,000
Certification				325,000
Subtotal-Prof. Services				$15,507,000
Total Project Costs				$150,675,000

Notes:

1. *All costs are in year of expenditure dollars and include contingency amounts (see Table 2 for details); totals include previously expended amounts for design and construction.*
2. *Operations/Administration (Council staffing, project management oversight consultant and Corps of Engineers liaison) estimated at $3,186,000 during the period of construction is not included in this total, but is deducted from sales tax prior to payment of interest and principal on Series 2010 bonds .*

Table 2
Detailed Summary of Construction Costs

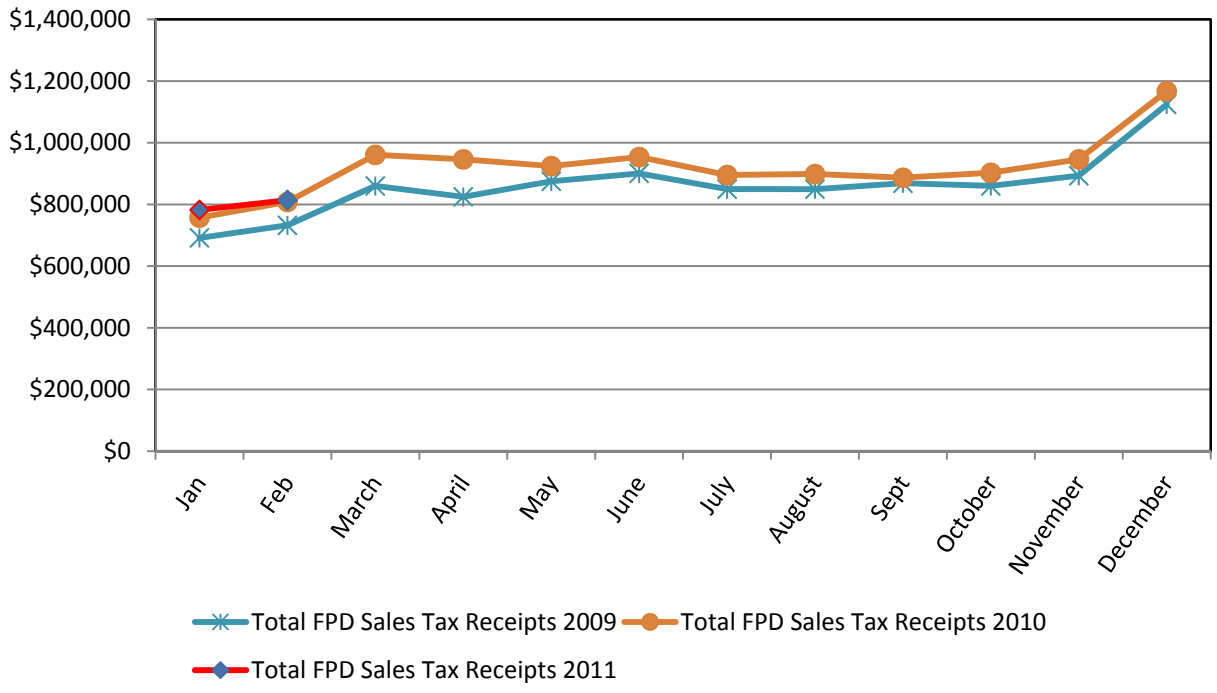
DETAILED SUMMARY - WOOD RIVER, MESD, PdP & FISH LAKE						
Item #	Cost Item	Unit	Unit Cost	Contingency	Quantity	Total
1	Clay Cap/Clay Blanket Material - Haul On & Placement	CY	$ 12	20%	268,311	$ 3,863,678
2	Clear & Grub - Light Vegetation	AC	$ 6,000	20%	185	$ 1,332,072
3	Clear & Grub - Wooded	AC	$ 21,625	20%	70	$ 1,816,500
4	Cutoff Wall - Deep	SF	$ 32	30%	957,418	$ 39,828,589
5	Cutoff Wall - Hazardous Waste Premium	SF	$ 28	20%	45,453	$ 1,527,221
6	Cutoff Wall - Shallow	SF	$ 12	30%	158,600	$ 2,474,160
7	Cutoff Wall - Special Waste Premium	SF	$ 11	20%	181,813	$ 2,399,932
8	Dewatering	LF	$ 51	20%	11,455	$ 701,046
9	Drainage - Enclosed - 30" Pipe	LF	$ 96	20%	569	$ 65,549
10	Drainage - Inlet Structure	EA	$ 2,200	20%	1	$ 2,640
11	Drainage - Surface - Shallow Ditch	LF	$ 141	20%	7,200	$ 1,218,240
12	Excavation	CY	$ 11	20%	191,485	$ 2,527,603
13	Gravel Filter - D50=#4 Material - Haul On & Placement	CY	$ 24	20%	47,161	$ 1,358,237
14	Gravel Filter - D50=2" Material - Haul On & Placement	CY	$ 29	20%	70,017	$ 2,436,592
15	Gravel Filter - Geotextile - Material & Installation	SY	$ 2	20%	709,631	$ 1,703,114
16	Gravel Filter - Sand Material - Haul On & Placement	CY	$ 12	20%	29,590	$ 426,096
17	Haul Off of Excess Material	CY	$ 6	20%	187,835	$ 1,352,413
18	Mobilization (% varies)	LS	$ 1,492,890		1	$ 1,492,890
19	Pump Station - WR - New - 220+00 UWR	EA	$ 605,500	20%	1	$ 726,600
20	Pump Station - WR - New - 560+00 LWR	EA	$ 699,500	20%	1	$ 839,400
21	Pump Station - MESD - Improve Existing - Phillips Reach	EA	$ 849,500	20%	1	$ 1,019,400
22	Pump Station - PdP - Improve Existing - PdP West	EA	$ 849,500	20%	1	$ 1,019,400
23	Pump Station - Various Improvements	EA	$ 600,000	20%	4	$ 2,880,000
24	Pvmt - Curb & Gutter - Remove & Replace	LF	$ 42	20%	1,247	$ 62,849
25	Pvmt - Improved Roadway	LF	$ 122	20%	3,522	$ 515,621
26	Pvmt - Roads & Trails - Remove & Replace	SY	$ 50	20%	8,388	$ 503,280
27	Pvmt - Road Repair	LF	$ 44	20%	15,840	$ 836,352
28	Relief Well - Existing - Abandon	EA	$ 2,000	20%	42	$ 100,800
29	Relief Well - Existing - Convert to Type "T"	EA	$ 6,000	20%	76	$ 547,200
30	Relief Well - Existing - Hazardous Waste Premium	EA	$ 48,700	20%	6	$ 350,640
31	Relief Well - Existing - Rehabilitate	EA	$ 12,000	20%	78	$ 1,123,200
32	Relief Well - Existing - Special Waste Premium	EA	$ 12,700	20%	24	$ 365,760
33	Relief Well - Lateral Pipe (8-Inch)	LF	$ 40	20%	3,588	$ 172,224
34	Relief Well - Manifold Manhole	EA	$ 3,000	20%	29	$ 104,400
35	Relief Well - Manifold Pipe (12-Inch)	LF	$ 50	20%	3,548	$ 212,880
36	Relief Well - Manifold Pipe (18-Inch)	LF	$ 64	20%	3,591	$ 275,789
37	Relief Well - New - Hazardous Waste Premium	EA	$ 61,950	20%	11	$ 817,740
38	Relief Well - New - Special Waste Premium	EA	$ 16,575	20%	51	$ 1,014,390
39	Relief Well - New Type "D"	EA	$ 32,500	20%	215	$ 8,385,000
40	Relief Well - New Type "T"	EA	$ 40,000	20%	67	$ 3,216,000
41	RipRap Bank Protection	CY	$ 120	20%	6,252	$ 900,288
42	ROW Acquisition - Agricultural	AC	$ 6,500	20%	135	$ 1,053,000
43	ROW Acquisition - Commercial	AC	$ 30,000	20%	9	$ 324,000
44	ROW Acquisition - Governmental	AC	$ 25,000	20%	12	$ 360,000
45	ROW Acquisition - Industrial	AC	$ 30,000	20%	68	$ 2,448,000
46	ROW Acquisition - Residential	AC	$ 18,000	20%	1	$ 21,600
47	ROW Acquisition - Vacant/Undeveloped	AC	$ 23,000	20%	79	$ 2,180,400
48	Seeding	AC	$ 1,650	20%	180	$ 356,420
49	Seepage Berm Material - Haul On and Placement (Hauled)	CY	$ 12	20%	583,346	$ 8,400,183
50	Slip-Line - 12-Inch Pipe	LF	$ 110	20%	175	$ 23,100
51	Slip-Line - 15-Inch Pipe	LF	$ 115	20%	60	$ 8,280
52	Slip-Line - 18-Inch Pipe	LF	$ 121	20%	2,340	$ 339,768
53	Slip-Line - 24-Inch Pipe	LF	$ 132	20%	2,870	$ 454,608
54	Slip-Line - 27-Inch Pipe	LF	$ 138	20%	960	$ 158,976
55	Slip-Line - 36-Inch Pipe	LF	$ 167	20%	835	$ 167,334
56	Slip-Line - 42-Inch Pipe	LF	$ 201	20%	580	$ 139,896
57	Slip-Line - 48-Inch Pipe	LF	$ 220	20%	3,190	$ 842,160
58	Utility Relocation - High Tension Power (Raise)	EA	$ 300,000	20%	5	$ 1,800,000
59	Utility Relocation - Natural Gas Pipeline	LF	$ 500	20%	12,190	$ 7,314,000
60	Utility Relocation - Power Pole / Light Pole	EA	$ 10,000	20%	42	$ 504,000
61	Utility Relocation - Shield OE Power	LF	$ 50	20%	4,048	$ 242,880
62	Utility Relocation - Underground Communication	LF	$ 100	20%	8,300	$ 996,000
63	Utility Relocation - Underground Communications Pedestal	EA	$ 10,000	20%	2	$ 24,000
64	Utility Relocation - Various Buried Facilities	LF	$ 250	20%	3,805	$ 1,141,500
65	Wetland Mitigation	AC	$ 25,000	20%	112	$ 3,360,000
66	Construction Estimate					$ 125,175,000
67	Construction Estimate Escalated to Mid-Point of 4 Yrs @ 3.44%					$ 129,480,000

V. Financial Plan

The goal of the financial plan is to produce the maximum fiscal capacity for the Council to pay for levee system improvements. There are several existing revenue sources available, or potentially available, for this purpose. The principal source of revenue is the ¼% sales tax authorized in 2008 by state statute (70 ILCS 750/) for this purpose. This tax has been collected since January 1, 2009 and is now yielding about $11 million annually (see Figure 15). Far smaller revenues are potentially available from the levee districts themselves, each of which has taxing or assessment authority and borrowing capacity under existing law. While the Corps of Engineers will not provide direct funding to the project, they may well have the fiscal capacity to build parts of the project, thereby reducing the Council's costs.

The challenge is to leverage all existing revenue sources to optimize the proceeds available for construction. In 2009, the Council retained financial advisors, Scott-Balice Strategies and ButcherMark Financial Advisors to assemble a financial plan and to structure the Council's bond issues. An initial financial plan was produced in 2010 prior to the Council's first bond issue and that plan has now been updated to reflect current market conditions, the project schedule and cost estimate.

Figure 15
Flood Prevention District Sales Tax Trends 2009-2011



The 2010 financial plan called for the Council to issue several series of sales tax revenue bonds in combination with expenditures of any excess sales tax receipts that might accumulate after payments of interest and principal on the bonds. This plan was approved by the Council and the first series of bonds was issued in November 2010 for a par amount of $94,195,000. Of that total, only $87.4

million is available to pay project costs after setting aside the remainder in a debt service reserve fund. This was a successful bond issue largely because of a favorable interest rate environment and some beneficial tax subsidies offered by the federal government as part of the American Recovery and Reinvestment Act of 2009. The Council issued Build America Bonds, Economic Recovery Zone Bonds and tax exempt bonds. Neither Build America Bond or Economic Recovery Zone Bond programs have been reauthorized so those favorable programs are no longer available for future issues.

The financial plan developed in 2010 was designed to maximize proceeds by delaying additional borrowing to correspond to the cash needs of the project, thereby reducing interest payments and taking advantage of future increases in sales tax receipts. The 2010 plan envisioned bond issues in 2012 and 2014 to complete the financing of the project. Projections made in the plan suggested that the Council could raise $166.5 using a combination of borrowing and excess sales tax funds. The Plan assumed that all flood prevention district sales tax funds collected by the three counties would be used solely to pay for the project and not used for other purposes allowable in the authorizing legislation.

At the Council's request, ButcherMark has now updated the 2010 financial plan. The 2011 plan reflects the new project cost estimate, a revised spending schedule, the loss of the favorable federal tax benefit programs, the latest sales tax receipts, and current and projected interest rate conditions. This plan now calls for small bond issues in 2013 and 2015, with a greater reliance on the use of excess sales tax receipts to pay current expenses ("pay-go").

The following assumptions (summarized in Table 3) have been built into the forecast models used in the 2011 Financial Plan Update to determine the capacity of flood prevention district sales tax revenues to meet the financial needs of the project:

1. Sales Tax Revenues – Sales tax receipts increased from 2009 into 2010. The plan uses the total calendar year deposits from 2010 ($11.047 million) as its starting point for revenue projections into the future. The model builds in a modest growth rate in those sales taxes of 3% per year over the life of the debt. Sales tax revenues are the major source of revenues for leveraging debt to pay for levee reconstruction. Prudent management and rating agency criteria only allow financial plans to leverage growth in these taxes by looking backward at the actual documented growth pattern. A sensitivity analysis (see Table 4) addresses the impact should sales tax revenues fall short of current projections.

2. Operating Expenditures – These are the funds that are budgeted to operate the Council during the planning, design, construction and post construction periods of the project. The operating budget is assumed to grow at a modest 3% per year. No sensitivity analysis was done for this assumption because this is an item that is under the control of the Council and not subject to market variability.

3. Financing Assumptions – The current schedule to spend the $87.4 million from the initial bond issue shows those monies being fully drawn down during the first quarter of 2013. The plan recommends that construction costs from April 2013 to April 2015 be paid from surplus moneys in the three county flood prevention district sales tax funds, estimated to be approximately $17.3 million

during that time, supplemented by a subordinated[1] Council bond transaction in the first quarter of 2013 in the net amount of $21.9 million. The plan also recommends that interest earned through April 2015 on the Construction Fund and the Debt Service Reserve Fund held by the bond Trustee be used to pay project costs during this period. The estimate of surplus in the three county Sales Tax Funds is based upon a calculation made of the amounts that will flow out of the Bond Indenture from the 2010 bond transaction (i.e. funds that are not required to pay interest or principal on the bonds or Council operating costs) as excess to the counties and assumes that those monies are modestly invested by the counties and that they are not spent for any purpose other than levee reconstruction. To facilitate the orderly payment of expense the plan provides that in the future excess moneys should not flow out of the Indenture to the County Sales Tax Funds, but rather they should be retained and protected under the Bond Indenture by being placed in the Project Fund, invested and then be spent as pay as you go for levee reconstruction in accordance with the approved financial plan of the Council. This would be a credit enhancement (those monies would be available in the event of a default), simplify accounting and management of those moneys and guarantee that they would be spent on the levee reconstruction costs in accordance with the Council approved plan.

The financial plan recommends that the Council plan for a final (second) subordinated bond transaction in early 2015, that is projected to raise approximately $20.9 million in net additional bond proceeds to pay for construction costs.

Financial market conditions and project needs will change over time, which could affect the timing and amount of additional borrowing. Consequently, the two subordinated bond transactions now projected for 2013 and 2015 will most likely be sized differently as the Council approaches those dates.

4. Coverage and Rating of Subordinated Debt – The most important determinant of the net proceeds from a sales tax bond will be the coverage level selected by the issuer to achieve a "A" subordinated rating from the ratings agencies to present a strong credit to bond investors. The coverage level is the amount of revenue forecast to be received annually by the issuer in excess of the annual debt service amounts (principal and interest on the bonds). The relevant gauge of coverage is the additional bonds test (ABT), the ratio between the previous year's sales tax revenues and the maximum annual debt service on all bonds. This margin of safety or comfort is a variable in the plan and directly affects the rating on the bonds. For planning purposes ButcherMark recommends that the coverage requirement be established at the lowest possible net coverage ratio to achieve a single "A" rating, approximately 1.25, and also achieve a reasonable cost of capital in the market. This excess coverage will also be needed to provide funds to the Council to pay operating costs during construction and post-construction until the bonds are paid off. The sensitivity analysis shows the impact of varying the net coverage ratio on the leveraging capacity of the sales taxes.

[1] The initial Council bond issue of November, 2010 was a "senior" issue and legally first in line for repayment. Bonds issued that are subordinate are repaid from revenues left over after senior bonds are repaid. Senior bonds usually have higher coverages (more protection for bondholders) than subordinated bonds and, therefore, are rated higher than subordinated bonds. Issuers use subordinated bonds to maximize their leveraging capacity, because subordinated bonds require less coverage (see discussion below).

5. Market Interest Rates – ButcherMark based its estimated yields on tax exempt market interest rates derived from the Municipal Market Monitor Index published for June 7, 2011. To produce a conservative yield estimate, ButcherMark began with the current MMD interest rate and added:

- the spread between the November 2010 actual and MMD rates for a similar maturity
- the spread between the A-index and the AA-index (future issues will target the single A rating rather than AA)
- 0.5% (50 basis points).

For example, the total spread for a current interest bond maturing in 2029 (16 years after the anticipated issue date of 2013) would be 5.75% (3.50% (MMD for year 16 on June 7, 2011) plus 0.95% (the spread to MMD in the 2010 bond issue) plus 0.8% (A-index minus AA-index) plus 0.5%). The sensitivity analysis shown in Table 4 measures the impact from varying this assumption.

6. Reserve Fund – A debt service reserve fund is normally required by the rating agencies and the market to ensure that there are sufficient funds in place to meet timely principal and interest payments to bondholders. These reserve funds stay in place for the life of the debt, are normally sized at the maximum annual debt service obligation on the issued bonds, are conservatively invested and readily available and usually pay for the last debt service obligation of the bonds at the end of the maturity.

Table 3
Key Financing Assumptions

Assumption	2010	2013	2014
Tax Revenues	$11,047,000	$11,719,810	$12,071,404
Net Coverage	1.75x	1.25x	1.25x
Gross Coverage	1.5x	1.1x	1.1x
Rating	AA-/Aa3	A(est.)	A(est.)
Spread to Market (June 7, 2011)		0.50%	0.50%
2010 & Future Rev Growth		3%	3%

Surplus Fund Balance 11/23/2010 (Est.)	$1,500,000
Annual Administrative Expenditures	$600,000
Ann. Exp Growth	3.00%
Construction Fund Earnings	0.87%
Surplus Earnings	0.50%
Reserve Earnings	2.32%
Fixed Costs per Issuance	$100,000
Per bond costs of issuance	$7
Minimum Surplus Fund Balance	$25,000
Reserve Percentage	100%

Table 4
Sensitivity to Financing Assumptions
Maximum Additional Leveraging of Sales Tax Revenue Post-2010 Bond Issue
($millions)

	Spread to Current Rates		
Net Coverage	***+50 bp***	***0***	***-50 bp***
1.40x	54.7	56.2	57.6
1.25x	63.1	65.0	67.0
1.10x	67.1	69.3	71.7

	Reserve Requirement, as Pct. of Maximum "Reasonably Required"		
Tax Rev. Growth	***100%***	***50%***	***0%***
2%	58.1	59.8	61.7
3%	63.1	65.11	67.1
4%	68.0	70.2	72.5

Table 5
Summary of Financial Capacity Analysis
FPD Sales Tax

Source of Funds	**Amount**	
2010 Net Proceeds	$87,409,570	
2013 Net Proceeds	21,917,669	
2015 Net Proceeds	20,937,672	
Construction Fund Earnings	2,018,753	(10/15/2015)
Reserve Fund Earnings	1,000,543	(10/15/2015)
Surplus Draws	17,266,292	
MESD & WRDD Net Proceeds	0	
Total Other than 2010 Net Proceeds	**63,140,929**	
Total Capital Improvement Fund Draws	**150,550,498**	
Maximum Semiannual Draw after 4/15/2013	14,218,211	

In structuring subordinated debt within an Indenture it is not uncommon to be able to reduce the amount of the reasonably required reserves, sometimes to zero, and still obtain very high ratings. The financial plan conservatively includes a reserve fund on subordinated debt sized at the maximum

annual debt service on the respective bonds in 2013 and 2015. The sensitivity analysis also shows the impact on the Council's fiscal capacity by reducing this requirement.

While the goal of the Council is to pay for the project solely with receipts from the FPD sales tax, there are other potential sources of funding that may be needed should costs rise unexpectedly, sales taxes not grow to meet current assumptions, or the project schedule be delayed because of events not controlled by the Council (e.g. high water, weather, delays in state and federal permitting). The financial plan therefore considers other sources of funding to supplement sales tax receipts if necessary.

The Metro-East Sanitary District has the statutory authority to generate revenues to carry out their purposes and issue debt. The law sets a maximum tax rate and an overall maximum debt limit for the District. MESD has historically provided flood protection to many properties that were not included within District boundaries, and therefore not paying taxes to the District. Illinois legislation approved in 2010 and effective in 2011 (70 ILCS 2905 Sec. 2-11) provided for such areas to be annexed by the District. The increment of taxes paid by these annexed areas could be used to support the project. Current estimates suggest that the assessed value of annexed properties would be about $208 million. Applying existing tax rates results in estimated addition annual revenue to MESD of about $649,000.

As a Sanitary District, MESD has a maximum statutory debt limit of 5.75% of its assessed valuation. Against its 2008 assessed valuation of approximately $730 million MESD had a debt capacity of almost $42 million. As of its 2008's audited financials, MESD had no outstanding debt.

Based on the following assumptions MESD could generate approximately $3.4 million through borrowing:

- 20 year term
- 2 times annual debt service coverage
- 7% average interest rate

With the approval of MESD, these funds could be used to help pay for the project.

The Wood River Levee and Drainage District has the statutory authority (70 ILCS 605/) to levy assessments on all properties within the district and to issue drainage and levee improvement bonds to finance capital projects necessary to carry out their public purpose.

The District has previously obtained judicial approval to increase assessments to generate an additional $450,000 annually, of which approximately $350,000 is estimated to be incremental revenue that could be used to support the debt service obligations of a bond issue for levee reconstruction. As a drainage district WRDD has no statutory debt limit. Wood River currently has issued bonds for levee work and has outstanding debt of $436,491.

ButcherMark has made an estimate of the leveraging capacity of the incremental WRDD revenue of $350,000 and determined that, using the assumptions below, WRDD could raise an additional $1.9 million.

- 20 year term
- 2 times annual debt service coverage
- 7% average interest rate
- Estimated bond size: $1,870,000

With the approval of the Board of the Wood River district, these funds could be used to support the project.

The Corps of Engineers is now authorized to spend federal funds on portions of the project and should be fully authorized to spend for eligible projects on the entire levee system by federal fiscal year 2013. However, the availability of funds is determined annually by the federal budgeting process. The outcome of that process is uncertain in the best of times. Given the stresses on the federal budget and the reluctance of Congress to earmark funds, the federal funding environment is even more difficult and unpredictable.

Once a federal project is authorized, the Corps of Engineers can undertake design and construction with the agreement of a local sponsor to provide a share of the cost and meet a number of other conditions. Typically, the federal share of project costs is 65%, but it can be greater. Certain costs, such as land acquisition or treatment and disposal of toxic and hazardous waste must be paid by the local sponsor.

While it would not be prudent for the Council to incorporate an unknown or unpredictable funding source into the financial plan, the expectation by the Corps is that over the next five year period there will be some federal appropriations for elements of the project that are coincident with the Corps projects in the American Bottom. Based on discussions with the Corps, it is reasonable to expect a minimum of $20 million in appropriations for projects in MESD and Wood River over the next few years. If the Council and the Corps can agree on directing these funds toward high priority elements of the project, it could effectively reduce the Council's costs. However, the Council would still be responsible for the local-cost share and other costs that are not eligible for federal funding.

Table 6 summarizes the latest estimates of fiscal capacity of the Council and others to pay for the project. The total estimate of fiscal capacity potentially available to the project is nearly $176 million. However, achieving this total will require reliance on other agencies to contribute to the project, either by building components of the project or providing cash to the Council. *The Council's strong preference is to build the project solely with revenues provided through the FPD sales tax.*

While the added fiscal capacity provided by third-parties will be useful as a backstop source of funding if the sales tax unexpectedly proves inadequate, the levee districts can make good use of the excess funds they will collect for maintenance and ongoing capital improvements that will be needed in the future. Further, reliance on parties over which the Council has no control, such as the federal government, diminishes confidence in the Council's ability to effectively manage the project to meet critical cost and schedule goals.

Table 6
Estimated Fiscal Capacity Including "Backstop" Funding

Organization	Amount
FPD Council	$150,550,498
Metro-East Sanitary District	3,470,000
Wood River Levee and Drainage District	$1,870,000
Corps of Engineers	$20,000,000
Total	**$175,890,498**

At this point, the financial plan concludes that with prudent decision-making by the Council and the counties, with continuing efforts to control costs, and barring unforeseen developments in the financial markets, FPD sales tax receipts should be sufficient to pay for construction of the project and ongoing Council operations.

VI. Project Schedule

A preliminary project schedule is shown in Figure 16. There are two critical goals that need to be addressed by the schedule:

- complete the project by 2015
- pay for the project with funds available during the period of construction

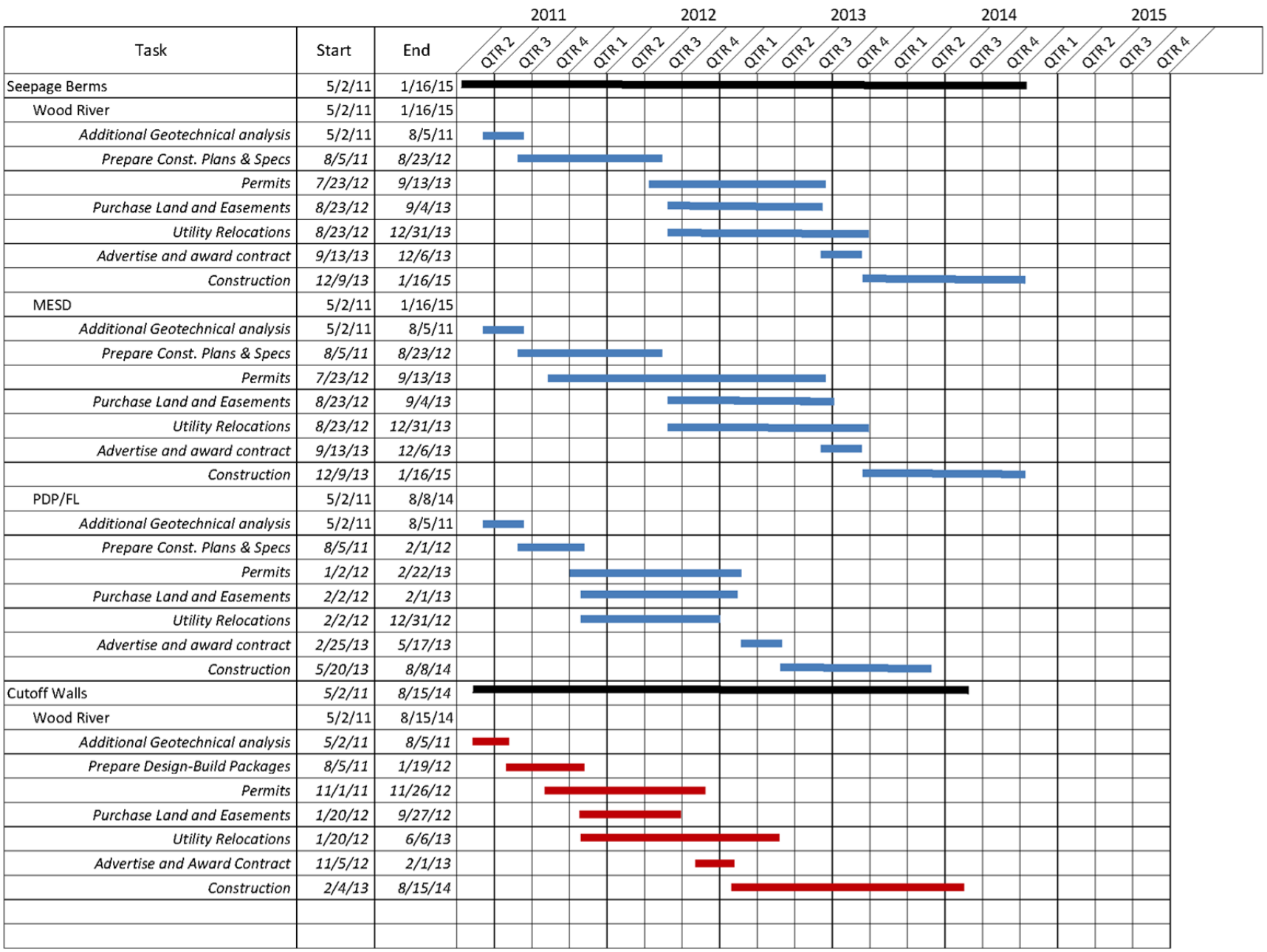
The schedule must allow sufficient time for design and construction, including such time-consuming tasks as obtaining necessary permits for construction, and acquiring needed land and easements. However, the schedule may also be constrained by limitations of funding, so the design and construction process must be aligned with the financing process for the schedule to be met. Also, the schedule should anticipate potential delays by building in some additional time that may be required due to unplanned events like high water or unfavorable weather.

The schedule is based on somewhat independent contracting and construction processes for each major type of improvement, since each requires its own set of skills and equipment. In addition, the plan anticipates that cutoff walls will be built through a *design-build* contracting process. Design-build is a method of project delivery wherein the design and construction of a project are contracted by a single contractor. This system is used to minimize the project risks for the owner and to reduce the delivery schedule by overlapping the design phase and construction phase of a project. In the case of cutoff walls, the construction process is specialized and often difficult, and experienced contractors will have better capability to design the walls using their deeper understanding of the unique construction processes and specialized equipment required for this work.

The schedule for building other design features reflects the traditional design-bid-build project delivery process.

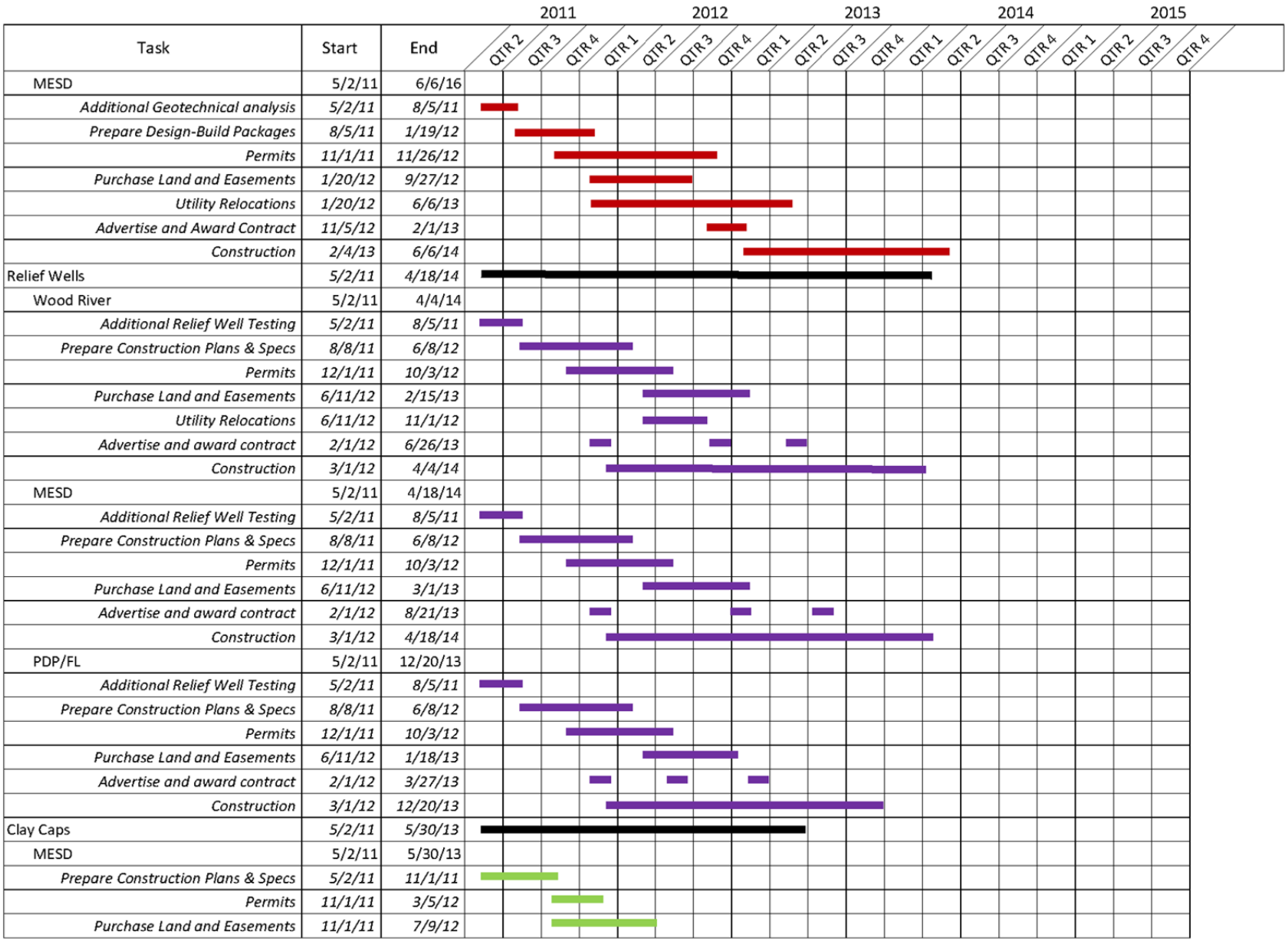
The preliminary schedule optimally provides for construction to be substantially complete by the end of 2014, with the submittal of certification documentation to occur in 2015. This schedule was used to produce an estimate of draws on the construction fund in order to align the financing program with construction needs.

Figure 16a
Draft Project Schedule



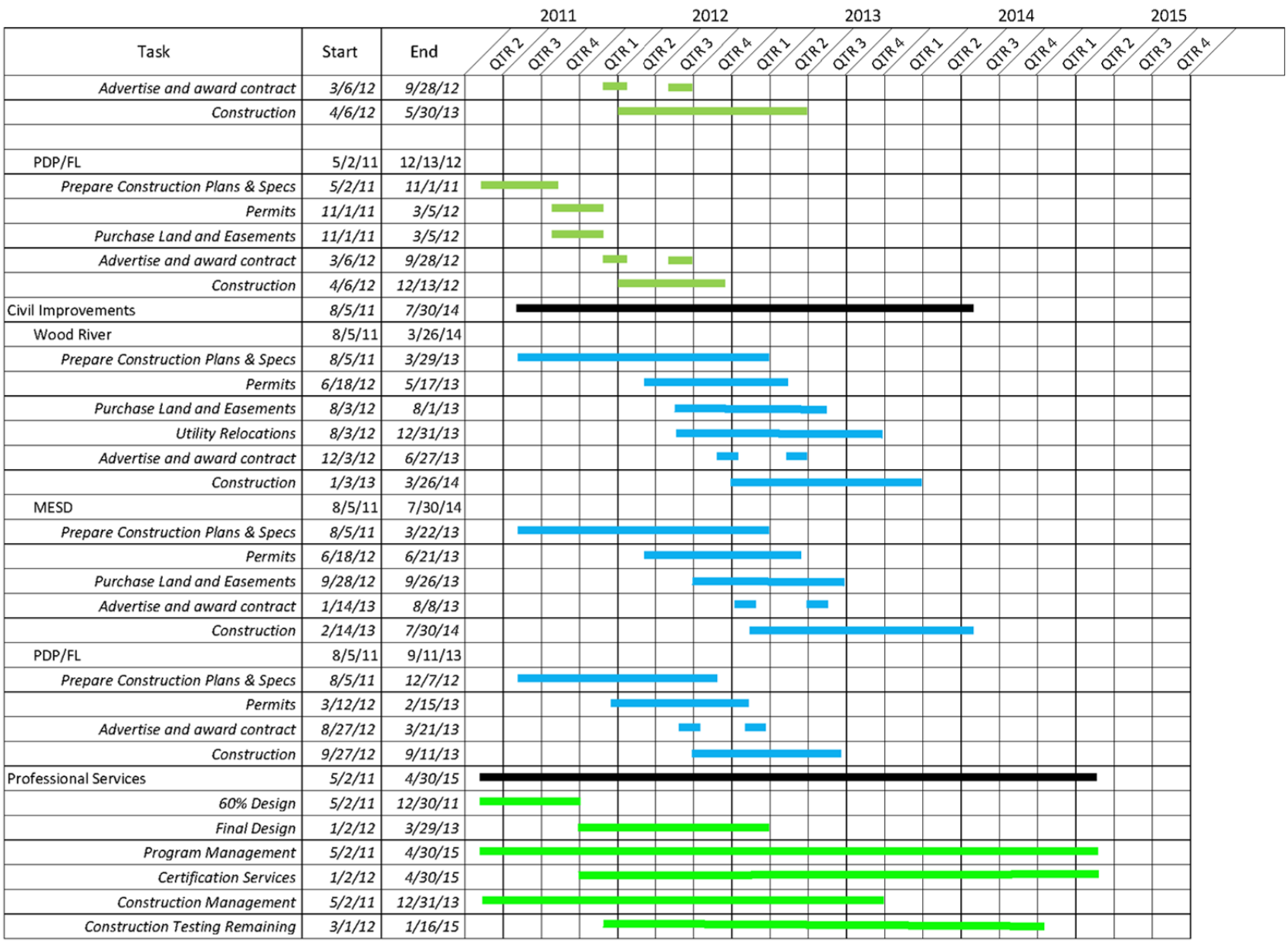
Task	Start	End
Seepage Berms	5/2/11	1/16/15
Wood River	5/2/11	1/16/15
Additional Geotechnical analysis	5/2/11	8/5/11
Prepare Const. Plans & Specs	8/5/11	8/23/12
Permits	7/23/12	9/13/13
Purchase Land and Easements	8/23/12	9/4/13
Utility Relocations	8/23/12	12/31/13
Advertise and award contract	9/13/13	12/6/13
Construction	12/9/13	1/16/15
MESD	5/2/11	1/16/15
Additional Geotechnical analysis	5/2/11	8/5/11
Prepare Const. Plans & Specs	8/5/11	8/23/12
Permits	7/23/12	9/13/13
Purchase Land and Easements	8/23/12	9/4/13
Utility Relocations	8/23/12	12/31/13
Advertise and award contract	9/13/13	12/6/13
Construction	12/9/13	1/16/15
PDP/FL	5/2/11	8/8/14
Additional Geotechnical analysis	5/2/11	8/5/11
Prepare Const. Plans & Specs	8/5/11	2/1/12
Permits	1/2/12	2/22/13
Purchase Land and Easements	2/2/12	2/1/13
Utility Relocations	2/2/12	12/31/12
Advertise and award contract	2/25/13	5/17/13
Construction	5/20/13	8/8/14
Cutoff Walls	5/2/11	8/15/14
Wood River	5/2/11	8/15/14
Additional Geotechnical analysis	5/2/11	8/5/11
Prepare Design-Build Packages	8/5/11	1/19/12
Permits	11/1/11	11/26/12
Purchase Land and Easements	1/20/12	9/27/12
Utility Relocations	1/20/12	6/6/13
Advertise and Award Contract	11/5/12	2/1/13
Construction	2/4/13	8/15/14

Figure 16b
Draft Project Schedule



Task	Start	End
MESD	5/2/11	6/6/16
Additional Geotechnical analysis	*5/2/11*	*8/5/11*
Prepare Design-Build Packages	*8/5/11*	*1/19/12*
Permits	*11/1/11*	*11/26/12*
Purchase Land and Easements	*1/20/12*	*9/27/12*
Utility Relocations	*1/20/12*	*6/6/13*
Advertise and Award Contract	*11/5/12*	*2/1/13*
Construction	*2/4/13*	*6/6/14*
Relief Wells	*5/2/11*	*4/18/14*
Wood River	5/2/11	4/4/14
Additional Relief Well Testing	*5/2/11*	*8/5/11*
Prepare Construction Plans & Specs	*8/8/11*	*6/8/12*
Permits	*12/1/11*	*10/3/12*
Purchase Land and Easements	*6/11/12*	*2/15/13*
Utility Relocations	*6/11/12*	*11/1/12*
Advertise and award contract	*2/1/12*	*6/26/13*
Construction	*3/1/12*	*4/4/14*
MESD	5/2/11	4/18/14
Additional Relief Well Testing	*5/2/11*	*8/5/11*
Prepare Construction Plans & Specs	*8/8/11*	*6/8/12*
Permits	*12/1/11*	*10/3/12*
Purchase Land and Easements	*6/11/12*	*3/1/13*
Advertise and award contract	*2/1/12*	*8/21/13*
Construction	*3/1/12*	*4/18/14*
PDP/FL	5/2/11	12/20/13
Additional Relief Well Testing	*5/2/11*	*8/5/11*
Prepare Construction Plans & Specs	*8/8/11*	*6/8/12*
Permits	*12/1/11*	*10/3/12*
Purchase Land and Easements	*6/11/12*	*1/18/13*
Advertise and award contract	*2/1/12*	*3/27/13*
Construction	*3/1/12*	*12/20/13*
Clay Caps	*5/2/11*	*5/30/13*
MESD	5/2/11	5/30/13
Prepare Construction Plans & Specs	*5/2/11*	*11/1/11*
Permits	*11/1/11*	*3/5/12*
Purchase Land and Easements	*11/1/11*	*7/9/12*

Figure 16c
Draft Project Schedule



Task	Start	End
Advertise and award contract	*3/6/12*	*9/28/12*
Construction	*4/6/12*	*5/30/13*
PDP/FL	5/2/11	12/13/12
Prepare Construction Plans & Specs	*5/2/11*	*11/1/11*
Permits	*11/1/11*	*3/5/12*
Purchase Land and Easements	*11/1/11*	*3/5/12*
Advertise and award contract	*3/6/12*	*9/28/12*
Construction	*4/6/12*	*12/13/12*
Civil Improvements	*8/5/11*	*7/30/14*
Wood River	8/5/11	3/26/14
Prepare Construction Plans & Specs	*8/5/11*	*3/29/13*
Permits	*6/18/12*	*5/17/13*
Purchase Land and Easements	*8/3/12*	*8/1/13*
Utility Relocations	*8/3/12*	*12/31/13*
Advertise and award contract	*12/3/12*	*6/27/13*
Construction	*1/3/13*	*3/26/14*
MESD	8/5/11	7/30/14
Prepare Construction Plans & Specs	*8/5/11*	*3/22/13*
Permits	*6/18/12*	*6/21/13*
Purchase Land and Easements	*9/28/12*	*9/26/13*
Advertise and award contract	*1/14/13*	*8/8/13*
Construction	*2/14/13*	*7/30/14*
PDP/FL	8/5/11	9/11/13
Prepare Construction Plans & Specs	*8/5/11*	*12/7/12*
Permits	*3/12/12*	*2/15/13*
Advertise and award contract	*8/27/12*	*3/21/13*
Construction	*9/27/12*	*9/11/13*
Professional Services	*5/2/11*	*4/30/15*
60% Design	*5/2/11*	*12/30/11*
Final Design	*1/2/12*	*3/29/13*
Program Management	*5/2/11*	*4/30/15*
Certification Services	*1/2/12*	*4/30/15*
Construction Management	*5/2/11*	*12/31/13*
Construction Testing Remaining	*3/1/12*	*1/16/15*

VII. Conclusion and Recommendation

Much progress has been made in the nearly two years that the Council has been in existence toward the regional goal of maintaining a high level of flood protection for the American Bottom. Doing so is a regional priority and the Council has acted with a sense of urgency in conceiving major improvements to the flood protection system. That process has now reached an important milestone. A preliminary design is done, costs have been estimated, and financing put in place. The Council has adopted some definitive goals and is now in a position to set forth how those goals will be achieved. Accordingly, this report is something of a guide to the completion of the project.

Recognizing that the Plan will be a work in progress, at least until the design is fully completed, adoption by the Council will be a commitment to essential design, schedule and financing elements of the project. This commitment will be a reassurance to the community in planning for the future.

With regard to the critical question of the Council's capability to finance the project, the current cost estimate and financial capacity (the amount that can be raised from the FPD sales tax) are almost precisely in balance at $150.6 million. While the analysis is sufficient to conclude that the project is fiscally feasible from existing resources, there are many variables that will affect both cost and revenue over the next five years, so the Council must continue to make every effort to reduce costs, avoid delays, and maximize potential revenues. *For this project every penny will indeed count.*

In addition to adopting the plan there are a number of critical next steps for the project:

- Continue the design process with a goal of reducing costs and any negative impacts of construction.
- Work with regulatory agencies to expedite the project permitting process.
- Refine the project schedule and better align it with the sequence of financing.
- Seek agreement from counties that all FPD sales taxes will be devoted to the project.
- See assurances from the USACE that federal funds will be directed to assist in a timely manner to focus on elements of the Council's project.
- Work with levee districts to provide for sufficient funding for ongoing maintenance of improvements and to identify capital funding to "backstop" the sales tax for funding the project.

In September, 2009 the Council adopted a process for analyzing the problem and conceiving solutions. That process has been successfully executed and is now virtually complete. With the conclusion of the project planning strategy, it is now time to take the next step by adopting a plan to bring the project to a successful conclusion – implementing flood protection improvements and achieving FEMA accreditation of area levee systems.

The Plan described in this report can accomplish that goal, with cautious optimism that it can be achieved by 2015 and lift the cloud of uncertainty that has enveloped the area since 2007.