

Southwestern Illinois Flood  
Prevention District Council

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Annual Report 2012-2013



August 21, 2013





**Southwestern  
Illinois  
Flood Prevention  
District Council**

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August 21, 2013

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Alvin L. Parks Jr.

Hon. Delbert Wittenauer  
Chairman, Monroe County Board of Commissioners  
100 South Main Street  
Waterloo, IL 62298

Sirs:

Les Serman  
Chief Supervisor of  
Construction and the Works

Transmitted herewith is the 2012-2013 Annual Report of the Southwestern Illinois Flood Prevention District Council. The submission of this report is in satisfaction of the requirement of our authorizing statute (70 ILCS 750/).

The Council has adopted two primary goals: to assure accreditation by the Federal Emergency Management Agency of area levee systems and to limit any economic damage to the region during the period during which accreditation is being sought. The Council has made great progress toward achieving both goals. By the end of the year the design of the project will be complete and all required permits will have been obtained. Bids have already been received on two of eight construction packages needed to complete the project, and bids for two more packages are now being solicited. Required real estate, mainly easements, is now being acquired and construction will likely start in late September.

There remain a few uncertainties that could slow down the project or increase costs, but these are manageable. We are also concerned about the timeline for the Corps of Engineers to make necessary improvements to a critical stretch of levee in the Wood River area in the vicinity of the Mel Price Lock and Dam. This is the most serious problem on the entire levee system and our ability to certify the system may be

*a regional partnership to rebuild Mississippi River flood protection*

Hon. Mark Kern  
Hon. Alan Dunstan  
Hon. Delbert Wittenauer  
August 17, 2012  
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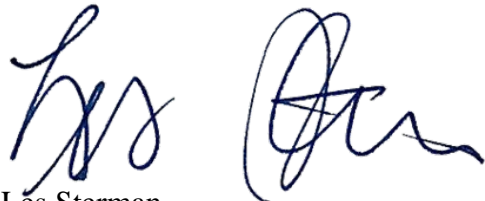
compromised unless the Corps makes significant progress on this project over the next two years.

FEMA is reworking the flood insurance rate mapping process nationwide to address complaints from areas like ours. While we continue to question FEMA's process in coming to conclusions about the adequacy of our levee systems, we will now have more time to make improvements that can assure all concerned that our flood protection system is safe. Continued progress on our part to make levee system improvements, however, is essential or we could face catastrophic economic impacts if we lose accreditation for flood protection.

In summary, I am pleased to report on behalf of our Board of Directors, that we continue to make progress in designing, building and financing a significant improvement to flood protection systems in metro-east. The problem is not yet solved, though. It will take even more effort by our elected leaders, the business community and civic interests, in addition to the continuing work of the Council, our design team, our contractors, and our construction workforce if we are to reach a successful conclusion. In the end however, this project will be an investment in the future prosperity of your counties and the region.

Thank you for supporting our efforts throughout the year.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Les Sterman', written in a cursive style.

Les Sterman  
Chief Supervisor of Construction and the Works

## I. Introduction

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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. Additionally, the area is rich in multimodal transportation assets, that make it well-positioned as a future center of commerce and industry.

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 being implemented.

Acting on a plan to improve flood protection, 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. The unpredictability of the Mississippi River serves as constant reminder that we need to demonstrate real progress in carrying out that plan.

The purpose of this report is to outline the activities of the Southwestern Illinois Flood Prevention District Council in 2012-2013 toward planning and implementing flood protection improvements.



## II. Background

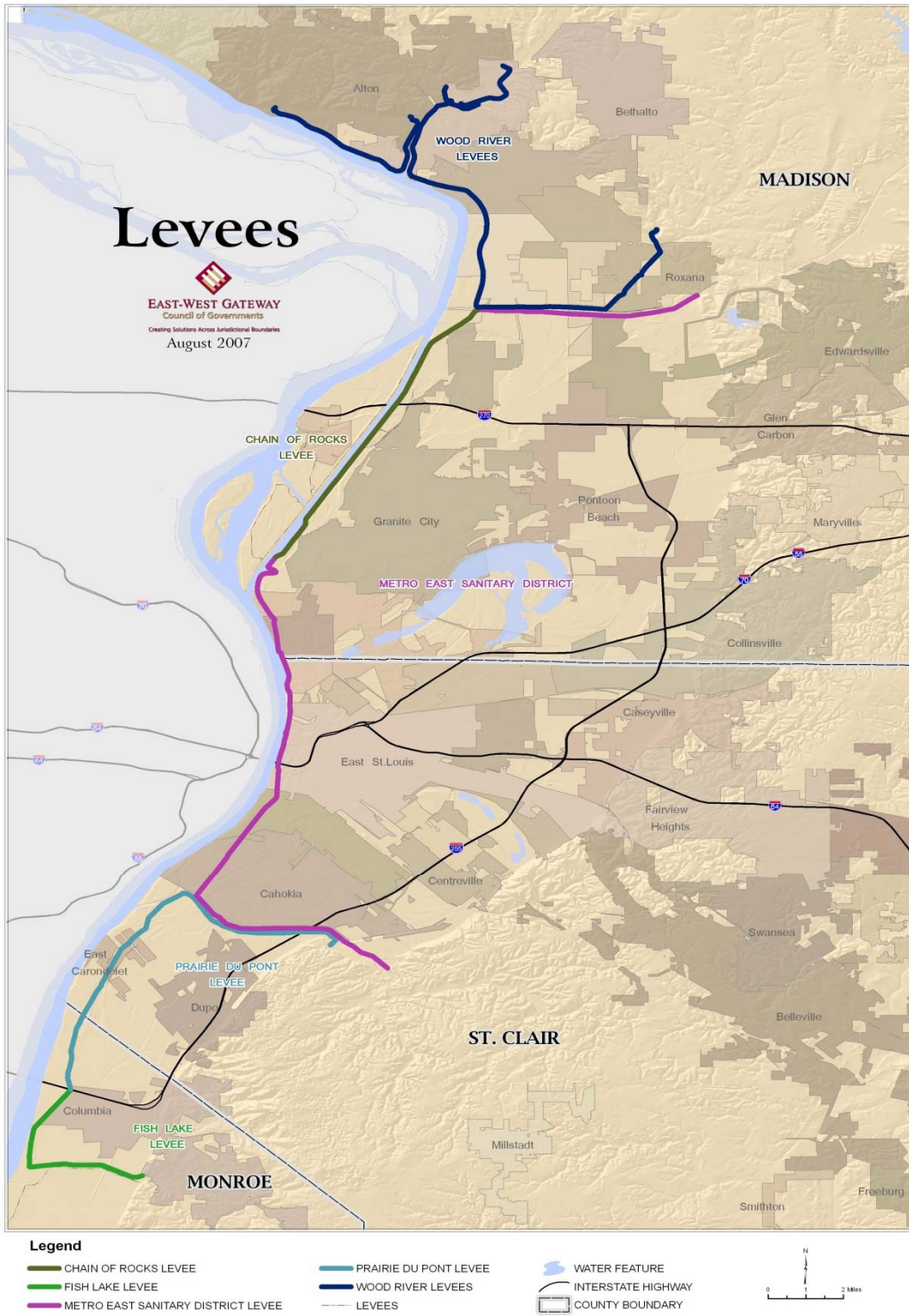
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A system of 85 miles of mainline and wing levees protects an area called the American Bottom in Southwestern Illinois from flooding by the Mississippi River. The American Bottom is an area of 174 square miles that is home to 156,000 people and 55,000 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 flood event on the Mississippi River of 54 feet on the St. Louis gauge. 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, reportedly as much as a 380-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. In July, 2009 FEMA issued preliminary flood insurance rate maps for the area that showed the American Bottom as a flood hazard area with no protection from flooding. Appeals of those maps were submitted by a number of local governments during the 90-day period provided by law; all of those appeals were denied in September, 2010.

The region's leadership did not agree with the decision by FEMA to deaccredit the levee system. A number of area governments, businesses and citizens joined to file a lawsuit challenging this decision based, in part, on the lack of any documentation of levee system deficiencies. In part as a result of that lawsuit and complaints about the mapping process across the country, FEMA agreed to revamp its mapping process and has not yet issued any new flood insurance rate maps from the area.

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 a high level of flood 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 suggested that it could cost hundreds of millions of dollars to restore and maintain the authorized (54 feet flood elevation) level of flood protection. Further, the schedule to make these investments would essentially be open-ended, dependent entirely on the pace of federal appropriations. Making assumptions consistent with typical levels of federal appropriations, the project could take decades to 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. That continued uncertainty would impose very high costs on residents and businesses in the area, and, more importantly, would subject the area to increased flood risk.

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.

### III. FPD Council Activities

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The following describes the work of the Council over its four year existence. Work done this year has brought the Council much closer to meeting its objectives. While some uncertainty remains, the probability of success has significantly increased in the last year.

Over the last couple of years the greatest challenge and source of doubt about the project has been the continued involvement of the Corps of Engineers in granting permission for most of the improvements to the levee system that the Council has proposed. The Corps is an institution that moves very deliberately, is governed by elaborate and extensive guidelines and procedures, most of which apply to federally funded projects but are being applied to our locally funded project. This process caused significant delays in the design process, but most of that is now behind us. By the end of the year all required permits will be in-hand. The focus now will be primarily on construction.

The FPD Council began operations in 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
- Sold \$94 million in bonds to pay for levee improvements.
- Completed the design of levee system improvements that will meet FEMA standards
- Developed a budget to complete the project solely with the proceeds from the FPD sales tax
- Received all required permits from state and federal agencies to proceed with construction
- Solicited bids on four of eight construction packages to complete the project
- Awarded contracts on two construction packages
- Started meaningful construction on the project

The Council's general goals have been to:

- assure compliance with FEMA accreditation standards with currently available revenue sources by end of year 2015; 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 Environment & Infrastructure, Inc. to design and manage construction of improvements to the levee system. Today, after more than two years of design work, multiple levee system inspections, drilling nearly 2000 borings along the entire length of the levee system, and submitting thousands of pages and many gigabytes of electronic files of design documentation to the Corps of Engineers, the Council is on the threshold of major construction. The design is virtually complete, financial plans have been developed and kept

updated, and a current project budget demonstrates convincingly that the Council can afford to build the project using only the funds from the dedicated sales tax. So the essential elements of the project plan have now come together.

The general design features of the project are shown in Appendix I to this report.

The Council has adopted policies that emphasize the use of our local workforce on the construction of the project. It is our policy that all contractors working on the project will use a Project Labor Agreement and comply with Illinois law regarding the use of prevailing wages. The Council is also implementing a minority business and workforce utilization policy. We remain committed to employing local labor and local firms to the maximum extent possible on the project, and to paying fair wages and providing good working conditions for everyone working on the project.

The Council has worked to comply with all relevant environmental laws and regulations. The Illinois Environmental Protection Agency has granted approval for the project under Sec. 401 of the Clean Water Act to certify that the project will not discharging pollutants into any bodies of water. Similarly, the Corps of Engineers has granted conditional approval under Sec. 404 of the Clean Water Act for mitigating the project's impact on wetlands.

We have continued to work closely with our congressional delegation throughout the year to help expedite the project and to advance legislation that would streamline future design approvals and would enable future funding of improvements to the levee system. All of the members continue to be very supportive of the project and are working on our behalf to advance our interests with the Corps, with FEMA, and in Congress.

As it now stands, the FEMA mapping process has been interrupted while the agency implements better methodology for developing maps, especially for those areas protected by de-accredited levees. There is no schedule for producing new preliminary maps, nor is there any suggestion that new maps would differ significantly from those issued two years ago, so the urgency of making levee system improvements is not diminished. However, we do not believe that new maps will be produced or finalized before 2014, and it remains our hope that levee improvements leading to certification will be substantially completed by that time.

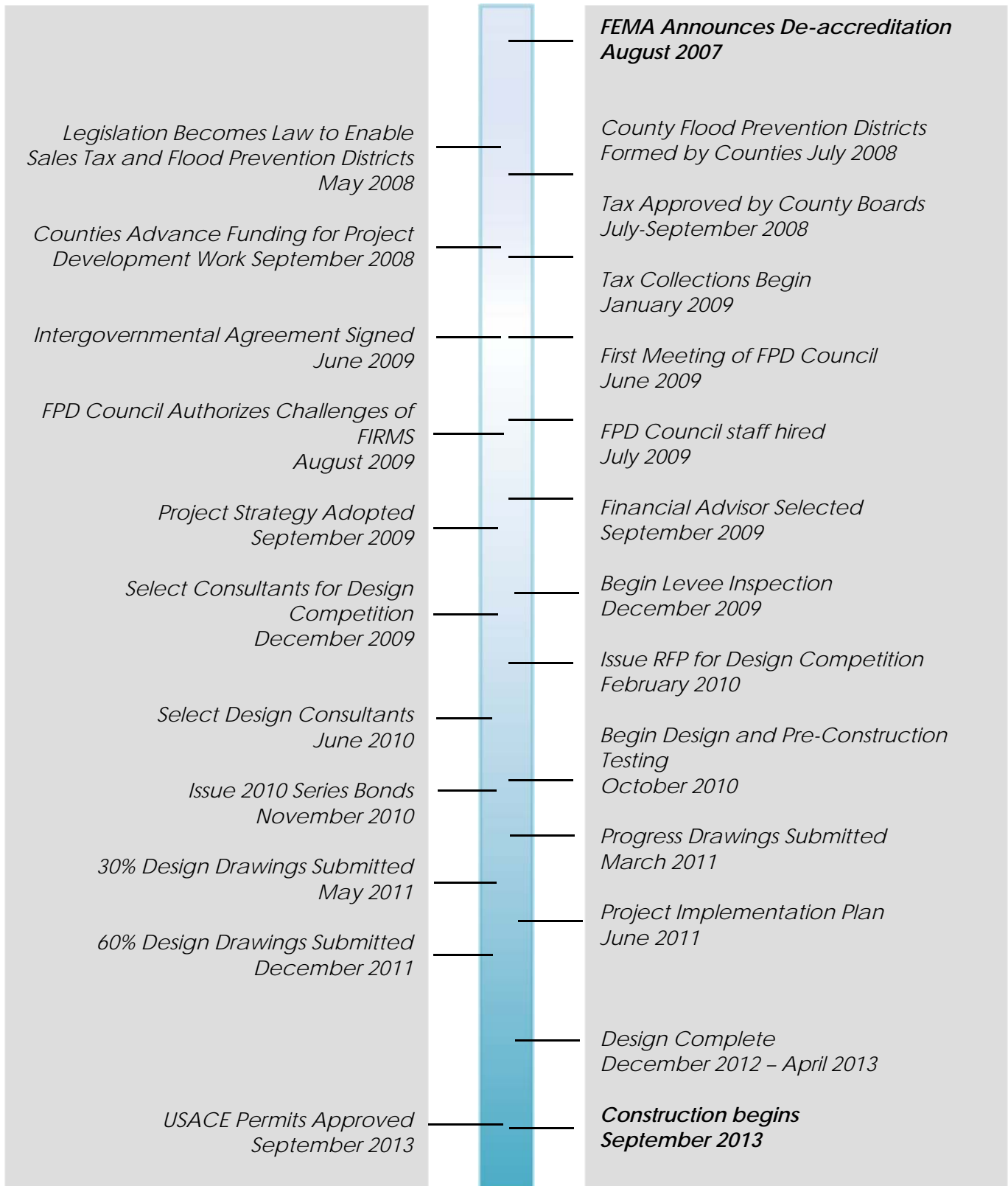
Recently, the Corps of Engineers has indicated a desire to take on portions of the project because of their expectation of significant federal appropriations for the project in 2013 and 2014. The Council will need to pay at least 35% of the cost of any federal work. The Council has provided funds for the Corps to begin design work for at least one major project, a cutoff wall in the Wood River levee district. However, because the Corps' labor policies are inconsistent with those of the Council, we may not agree to provide matching funds for construction of that project. Rather, we would adopt the design now being developed by the Corps and undertake the construction of this project as originally anticipated.

The Council believes that levee certification documentation will be submitted in 2015. However, the Corps is responsible for providing certification information to our design team for two levee segments, the Chain of Rocks levee, and a segment in the vicinity of the Mel Price Lock and Dam. The Corps will not submit certification documentation to FEMA, but will instead provide it to the

Council. Whether the Council's engineers can then certify those segments remains an unresolved question. The Mel Price segment is the biggest and most urgent concern, as described above. One solution to this problem is for the Corps to expedite construction of the Mel Price project by redirecting all available federal appropriations for area levee systems to pay for construction of the project, currently estimated to cost about \$40 million.

In summary, there have been a number of breakthrough developments on the levee improvement project in the last year. The level of uncertainty has diminished. The Council remains committed to working within budget and time limitations, but with the continued support of the area's leadership and cooperation from the Corps of Engineers, we will be able to meet any remaining challenges to completion of the project.

**Figure 2**  
**Project Timeline**



## IV. Financing and Budget

Table 1 is a financial summary of the Council’s activities through September 30, 2012.

Revenue from a dedicated sales tax was used to support the Council’s ongoing design and construction activities. While sales tax revenue showed substantial growth in 2009, 2010 and 2011 coming out of the recession, growth was slowed in 2012 and revenues have declined somewhat in 2013 (see Figure 3). This trend is important, because it will affect the Council’s ability to finance future expenditures on the project.

The Council issued bonds in the amount of \$94,195,000 in November 2010. After setting aside funds for a debt service reserve and costs of issuance, around \$87 million is available to fund construction of the project. Future bond issues are expected in 2014 and 2015 to complete the financing of the project. The financing plan adopted by the Council is anticipated to produce \$150 million or more to pay for the project and potential future levee system improvements. That plan assumes that all receipts from the FPD sales tax in all three counties will be solely devoted to the project. At this point in the design process, the project is expected to consume all available revenues, including the amounts remaining in the county FPD sales tax accounts.

**Figure 3**  
**Flood Prevention District Sales Tax Trends 2009-2011**

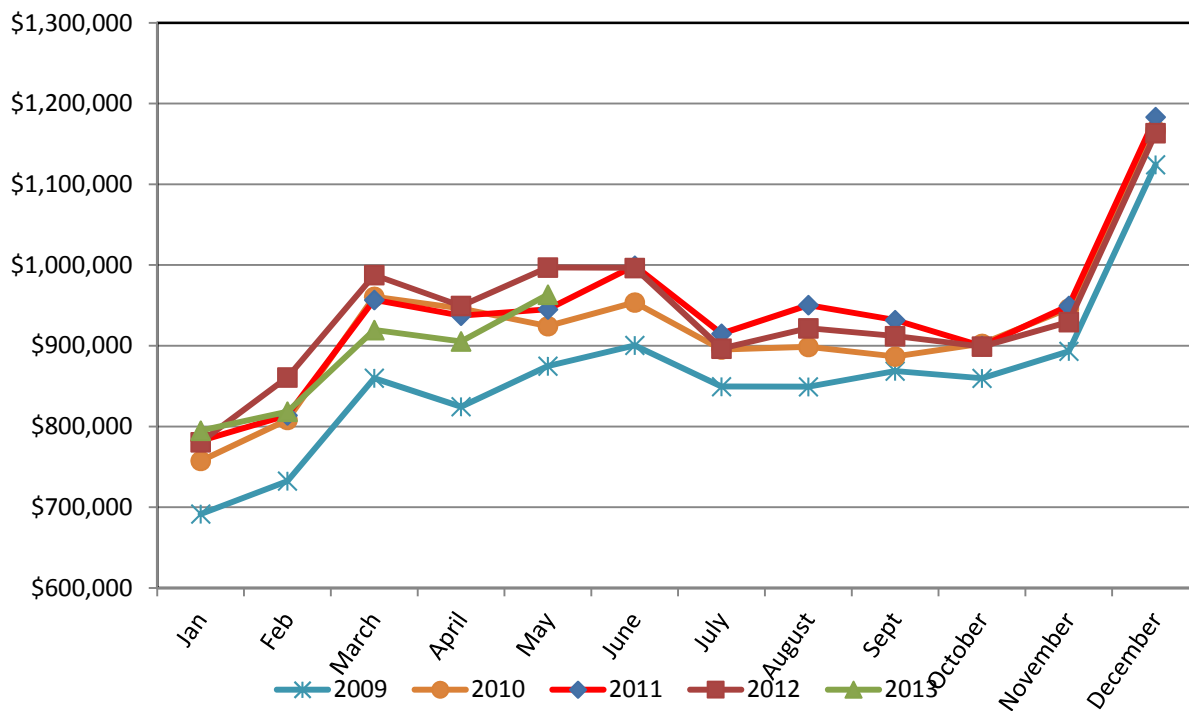


Table 1

***Southwestern Illinois Flood Protection District Council  
Audited Statement of Revenues, Expenditures, and  
Changes in Fund Balances – Governmental Fund  
For the Year Ended September 30, 2012***

<b>Resources:</b>	
Flood Prevention Tax	\$11,354,784
Less: Return to Counties	(5,233,194)
Interest Income	830,276
<b>Total Resources</b>	<b>\$6,951,866</b>
<b>Expenditures:</b>	
Design and Construction	\$4,345,573
Professional Services	167,141
Debt Service:	
Principal	2,455,000
Interest	4,646,540
General and Administrative	232,414
<b>Total Expenditures</b>	<b>\$10,936,528</b>
Net Change in Fund Balance	(\$3,984,662)
Fund Balances:	
Beginning of the Year	90,259,144
Prior Period Adjustment	(766,094)
End of Year	\$85,508,388

Table 2 summarizes estimated project costs. Tables 3, 4, and 5 illustrate the fiscal capacity of the Council using only the proceeds of the FPD sales tax revenues, and based on conservative assumptions. This information illustrates that *the Council is well-positioned to meet our goals of achieving FEMA certification by 2015 with the revenue available from the dedicated FPD sales tax.* This positive conclusion results largely from two factors: a concerted effort throughout the design process to reduce costs, and a delay of over a year from the original construction schedule as it was originally conceived in 2010. Some uncertainty remains, of course, such as schedule interruptions for weather or property acquisition, but the risks to successful completion of the project are diminishing.



Table 2  
**Estimated Project Expenditures 7.1.2013 – 12.31.2015**

	Calendar Year			TOTAL
	2013	2014	2015	
<b>Construction</b>				
<i>Bid Package #1</i>	\$0	\$0	\$0	\$0
<i>Bid Package #2a</i>	\$493,353	\$328,902	\$0	\$822,255
<i>Bid Package #2b</i>	\$2,765,200	\$4,147,800	\$0	\$6,913,000
<i>Bid Package #3</i>	\$1,686,500	\$13,492,000	\$1,686,500	\$16,865,000
<i>Bid Package #4</i>	\$476,300	\$3,810,400	\$476,300	\$4,763,000
<i>Bid Package #5</i>	\$1,740,800	\$13,926,400	\$1,740,800	\$17,408,000
<i>Bid Package #6</i>	\$2,828,568	\$9,899,989	\$1,414,284	\$14,142,841
<i>Bid Package #7a/7b</i>	\$0	\$20,000,000	\$3,104,000	\$23,104,000
<i>Pre-Const. Testing</i>	\$1,546,185	\$0	\$0	\$1,546,185
<i>Const. Mgmt.</i>	\$1,536,055	\$2,816,101	\$768,028	\$5,120,184
<i>Property Acquisition</i>	\$4,000,000	\$0	\$0	\$4,000,000
<i>Wetland Mitigation</i>	\$1,000,000	\$500,000	\$0	\$1,500,000
<i>HazMat Mitigation</i>	\$100,000	\$1,800,000	\$100,000	\$2,000,000
<i>Repair &amp; Cost Share to LD</i>	\$1,000,000	\$700,000	\$300,000	\$2,000,000
<b>TOTAL CONSTRUCTION</b>	<b>\$19,172,961</b>	<b>\$71,421,592</b>	<b>\$9,589,912</b>	<b>\$100,184,465</b>
<b>Design</b>				
<i>Program Mgmt.</i>	\$320,000	\$405,000	\$302,660	\$1,027,660
<i>30% Design</i>	\$0	\$0	\$0	\$0
<i>60% Design</i>	\$0	\$0	\$0	\$0
<i>100% Design</i>	\$451,899	\$50,000	\$0	\$501,899
<i>408 Review</i>	\$181,747	\$0	\$0	\$181,747
<i>Certification</i>	\$15,000	\$130,000	\$180,000	\$325,000
<b>TOTAL DESIGN</b>	<b>\$968,646</b>	<b>\$585,000</b>	<b>\$482,660</b>	<b>\$2,036,306</b>
<b>Operations &amp; Financing</b>				
<i>General &amp; Administrative</i>	\$88,000	\$300,000	\$300,000	\$688,000
<i>Debt Service</i>	\$2,273,671	\$7,076,792	\$7,101,242	\$16,451,705
<i>Interest Rate Subsidy</i>	(\$455,070)	(\$910,140)	(\$910,140)	(\$2,275,350)
<i>Professional Services</i>	\$369,000	\$259,000	\$85,000	\$713,000
<i>Legal</i>	\$120,000	\$60,000	\$36,000	\$216,000
<i>Legislative</i>	\$108,000	\$108,000	\$108,000	\$324,000
<i>Financial Advisor</i>	\$10,000	\$20,000	\$10,000	\$40,000
<i>Appraisal &amp; Prop. Acq.</i>	\$100,000	\$10,000	\$0	\$110,000
<i>Diversity Program Mgr.</i>	\$120,000	\$150,000	\$20,000	\$290,000
<i>Other</i>	\$10,000	\$10,000	\$10,000	\$30,000
<b>TOTAL OPERATIONS</b>	<b>\$2,275,601</b>	<b>\$6,725,652</b>	<b>\$6,576,102</b>	<b>\$15,577,355</b>
<b>TOTAL EXPENSES</b>	<b>\$22,516,208</b>	<b>\$78,831,244</b>	<b>\$16,747,674</b>	<b>\$118,095,126</b>
Cumulative Expenses	\$22,516,208	\$101,347,452	\$118,095,126	

Table 3  
*Estimated Revenue 7.1.2015 – 12.31.2015*

<b>Fund Sources</b>	Calendar Year			<b>TOTAL</b>
	2013	2014	2015	
Sales Tax Revenue	\$5,679,000	\$11,237,000	\$11,237,000	\$28,153,000
Interest Income	\$480,000	\$300,000	\$100,000	\$880,000
County FPD Tax Balance	\$14,000,000			\$14,000,000
Bond Funds Balance (6.1.2013)	\$73,188,725			\$73,188,725
<b>TOTAL FUNDS</b>	\$93,347,725	\$11,537,000	\$11,337,000	\$116,221,725
Cumulative Sources	\$93,347,725	\$104,884,725	\$116,221,725	

Table 4  
*Excess Revenue vs. Expenditure by Calendar Year*

Year	Amount
2013	\$70,831,517
2014	\$3,537,273
2015	\$-1,873,401

Table 5  
*Subordinate Lien Capacity  
Bond Proceeds for Construction*

Interest Rate	Sales Tax Growth Rate			
	0%	1%	2%	3%
4%	57,340,972	58,958,246	60,577,760	62,199,515
5%	50,347,886	51,803,116	53,260,586	54,720,295
6%	45,004,849	46,316,656	47,630,703	48,946,990
7%	40,617,897	41,823,011	43,030,365	44,239,959

Assumptions:

1. Issuance in 2014
2. 25 year final maturity
3. Fully funded debt service reserve fund
4. 1% cost of issuance
5. 1.10x gross debt service coverage

Source: Raymond James, July 9, 2013

## V. Conclusions, Issues and Next Steps

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Much progress has been made in the four 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 great sense of urgency, commitment, and cooperation in conceiving major improvements to the flood protection system. That process reached an important milestone this year with the completion of the design process and the imminent start of construction. There remain some uncertainties and there are yet a few obstacles to be overcome, but those are becoming much fewer. The design is done, costs are reasonably well known, and financing is largely in place. The Council has adopted some definitive goals and is now has a clear path to achieving them.

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 safely in balance. However, design changes driven by field conditions, delays for weather, or unknowns that might be encountered such as hazardous materials, could drive costs higher, 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.*

There are a number of critical next steps for the project:

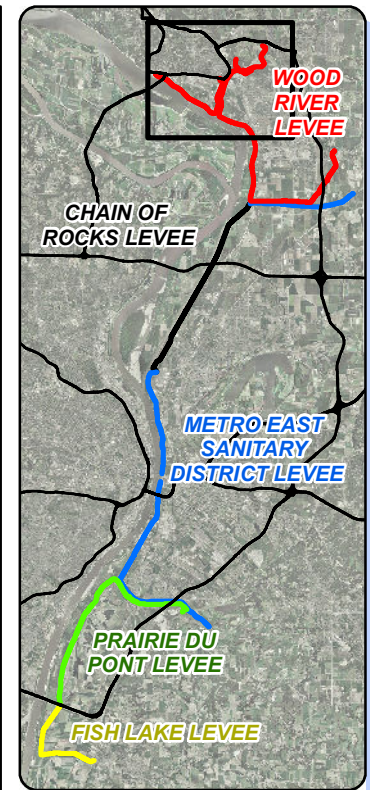
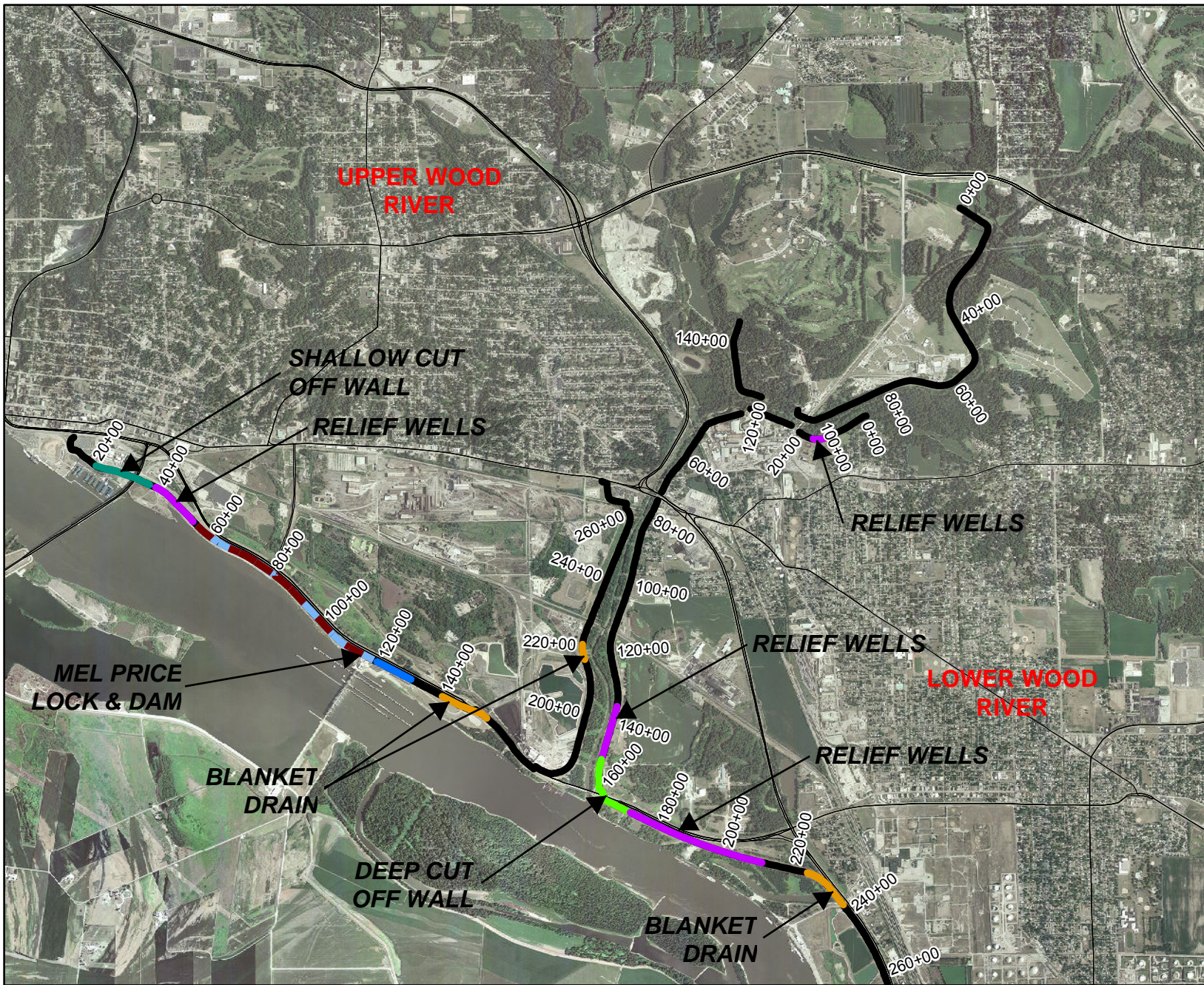
- Complete all property acquisition required to begin construction.
- Resolve any remaining design or constructability issues.
- Award bids for all construction packages to complete the project.
- Expedite the construction process prior to deadline for certification to be done by the end of 2015.
- Complete the USACE design of the Wood River cutoff wall project and reach a decision on whether the USACE or the Council will build the project.
- Resolve how certification of Corps owned or controlled segments of the levee system can be accomplished.
- Work with levee districts to provide for sufficient funding for ongoing maintenance of improvements.

The Council's primary goal remains -- to achieve certification of the Metro-East levee system by FEMA in 2015.



**Appendix**  
**Proposed Levee System Improvements**

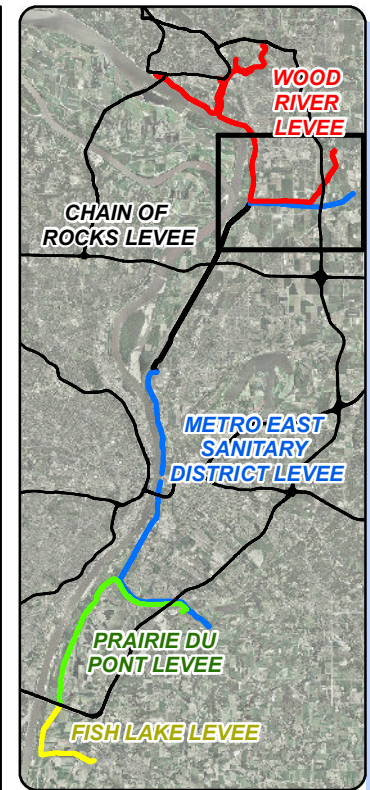
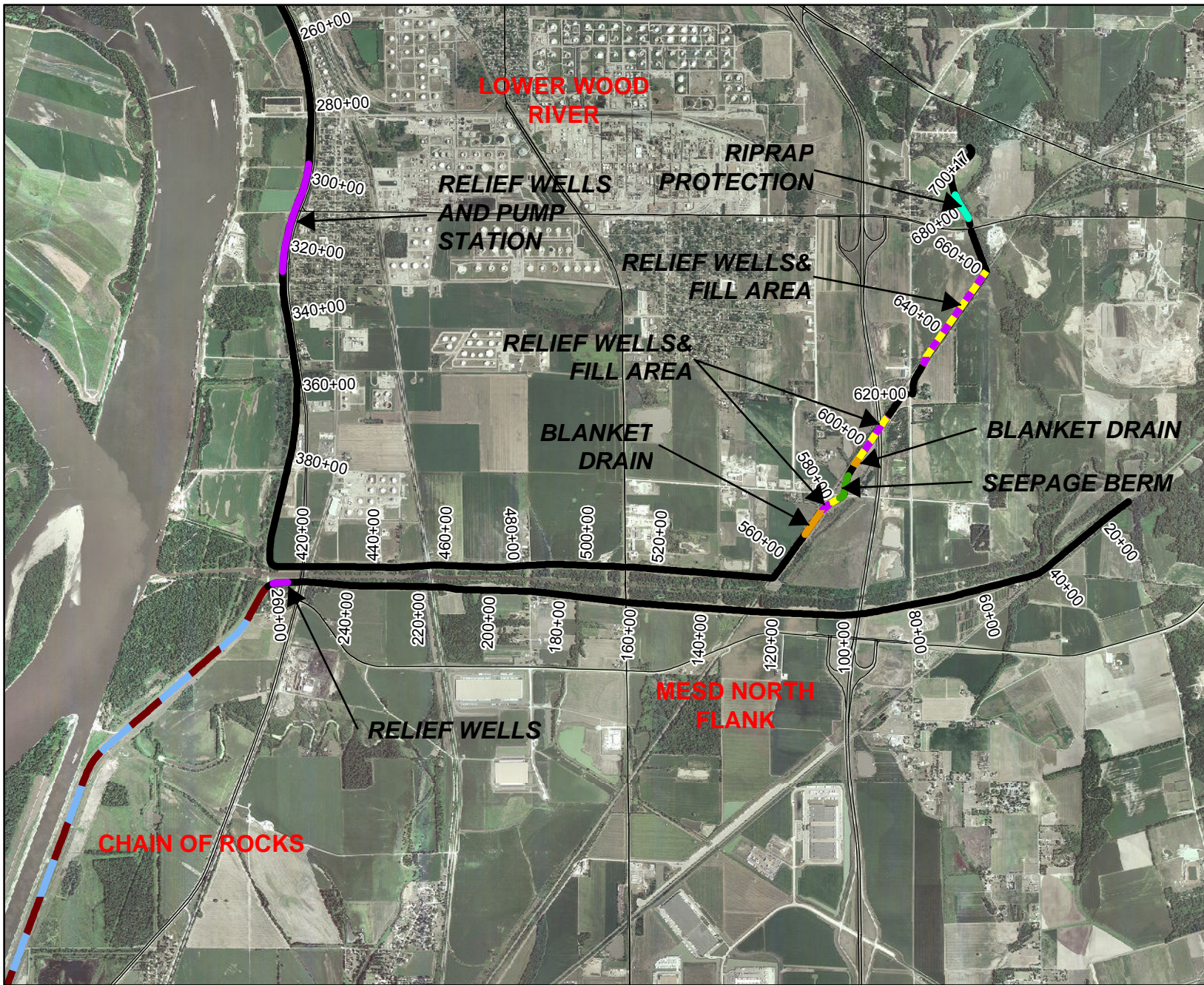




**Legend**

100% Improvements

Layer	Description
Green	SEEPAGE BERM
Red	SEEPAGE BERM & CLAY CAP
Yellow	BLANKET DRAIN
Orange	BLANKET DRAIN & FILL AREA
Red	CLAY CAP
Light Green	DEEP CUT OFF WALL
Dark Green	SHALLOW CUT OFF WALL
Blue	MEL PRICE
Light Blue	PIEZOMETERS
Cyan	RIPRAP PROTECTION
Purple	RELIEF WELLS
Pink	RELIEF WELLS AND CLAY CAP
Light Purple	RELIEF WELLS AND FILL
Light Blue/Purple	RELIEF WELLS AND COLLECTION PIPES
Light Blue/Purple/Red	RELIEF WELLS, PIPES, AND SEEPAGE BERM
Light Blue/Purple/Red/Orange	RELIEF WELLS, PIPES, AND CLAY CAP
Light Blue/Purple/Red/Orange/Blue	RELIEF WELLS, PIPES, AND FILL



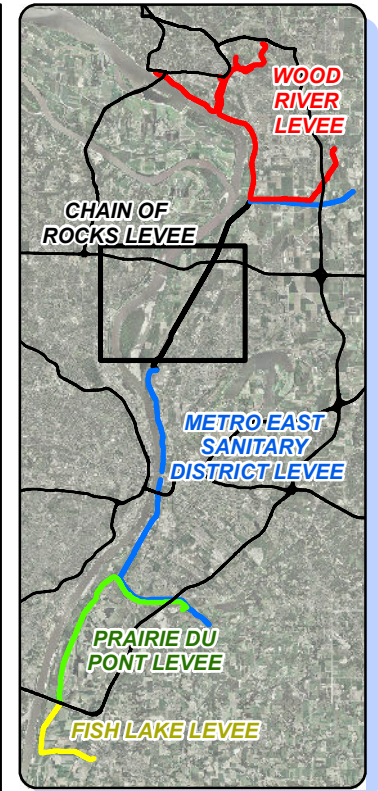
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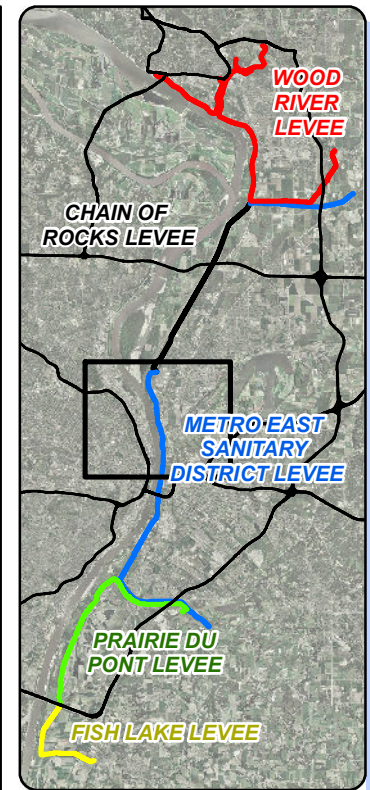
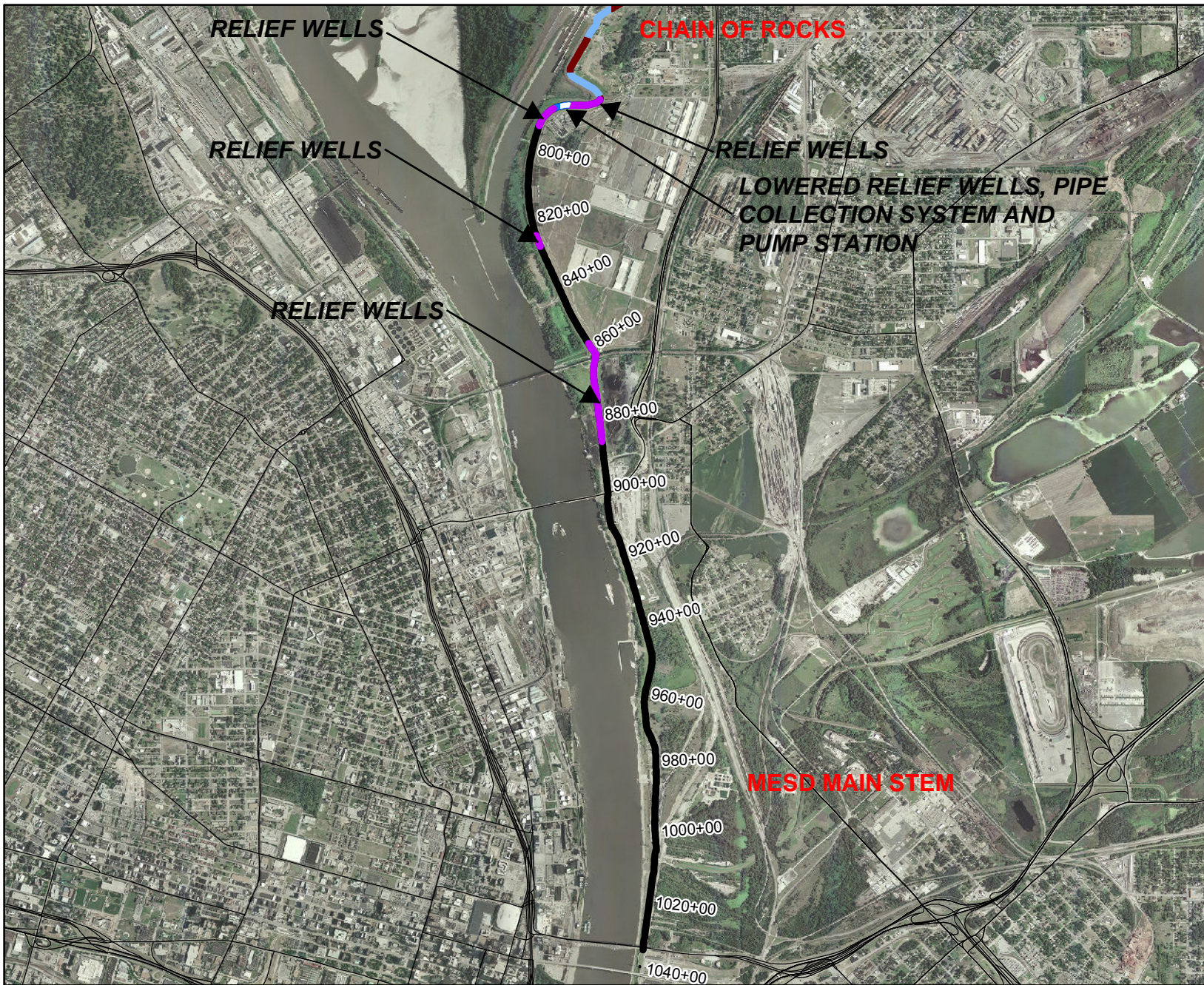
100% Improvements

Layer

- SEEPAGE BERM
- SEEPAGE BERM & CLAY CAP
- BLANKET DRAIN
- BLANKET DRAIN & FILL AREA
- CLAY CAP
- DEEP CUT OFF WALL
- SHALLOW CUT OFF WALL
- MEL PRICE
- PIEZOMETERS
- RIPRAP PROTECTION
- RELIEF WELLS
- RELIEF WELLS AND CLAY CAP
- RELIEF WELLS AND FILL
- RELIEF WELLS AND COLLECTION PIPES
- RELIEF WELLS, PIPES, AND SEEPAGE BERM
- RELIEF WELLS, PIPES, AND CLAY CAP
- RELIEF WELLS, PIPES, AND FILL





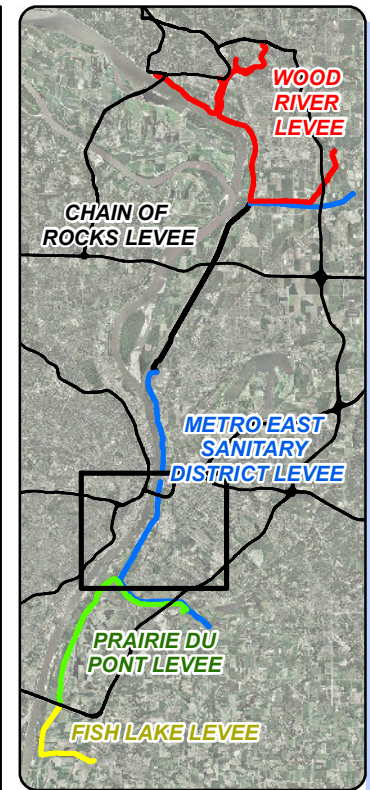
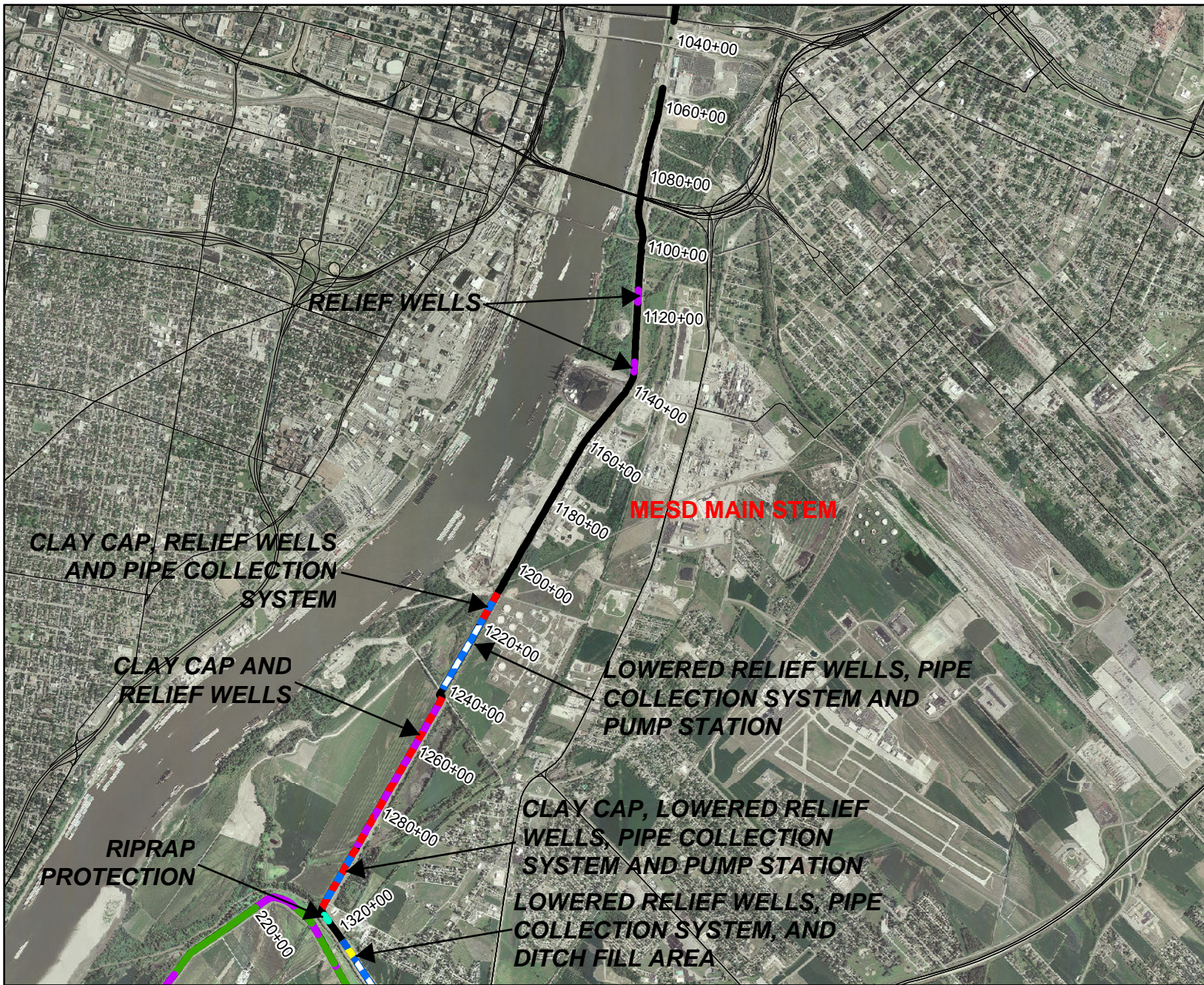


**Legend**

**100% Improvements**

**Layer**

- SEEPAGE BERM
- SEEPAGE BERM & CLAP CAP
- BLANKET DRAIN
- BLANKET DRAIN & FILL AREA
- CLAY CAP
- DEEP CUT OFF WALL
- SHALLOW CUT OF WALL
- MEL PRICE
- PIEZOMETERS
- WRAP PROTECTION
- RELIEF WELLS
- RELIEF WELLS AND CLAY CAP
- RELIEF WELLS AND FILL
- RELIEF WELLS AND COLLECTION PIPES
- RELIEF WELLS, PIPES, AND SEEPAGE BERM
- RELIEF WELLS, PIPES, AND CLAY CAP
- RELIEF WELLS, PIPES, AND FILL

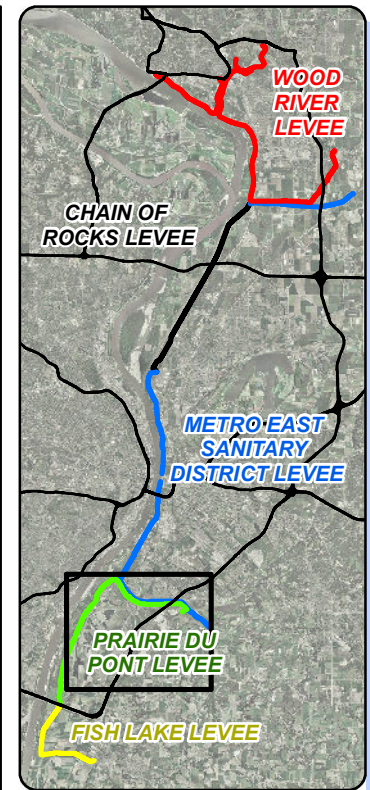
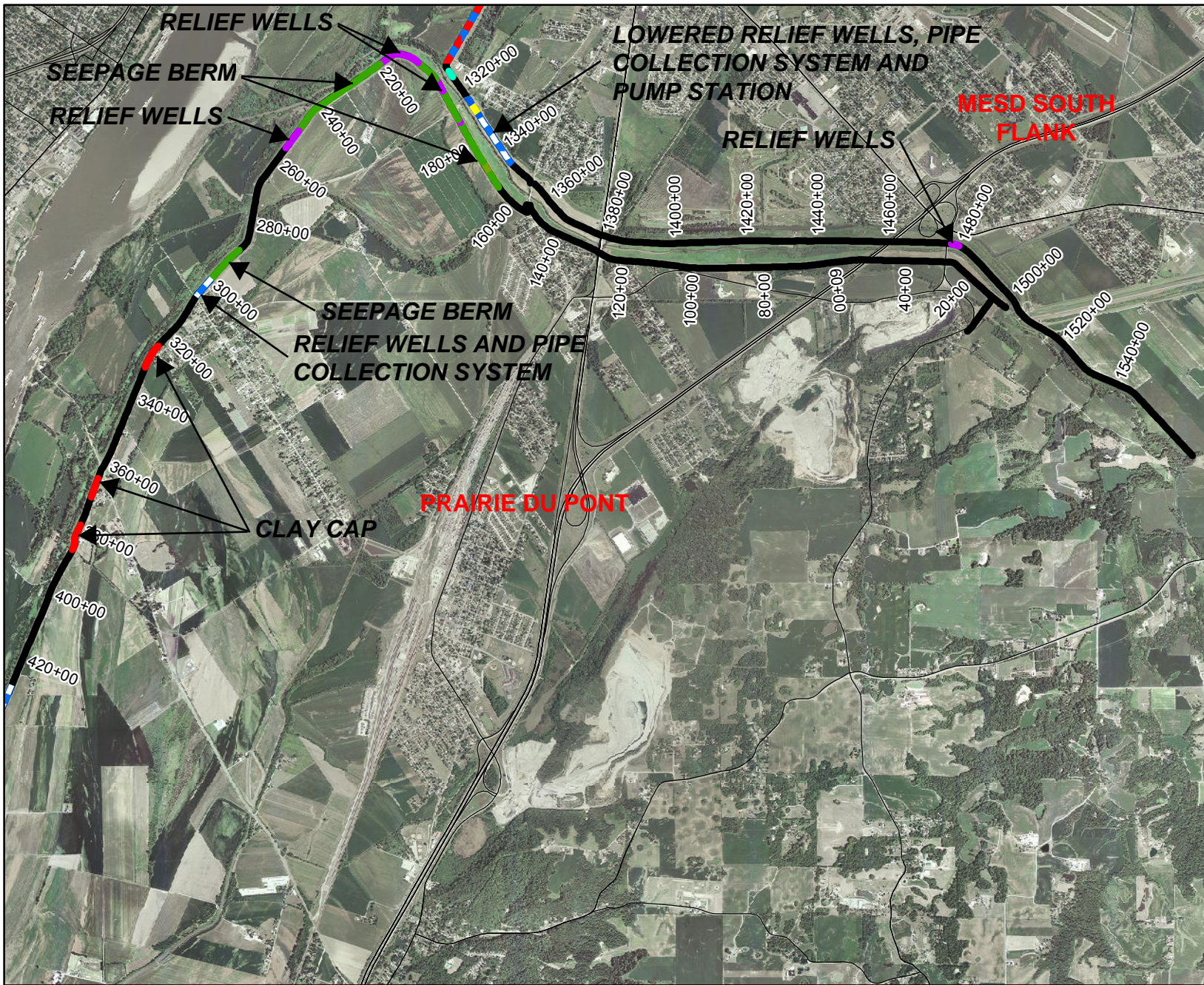


**Legend**

100% Improvements

Layer

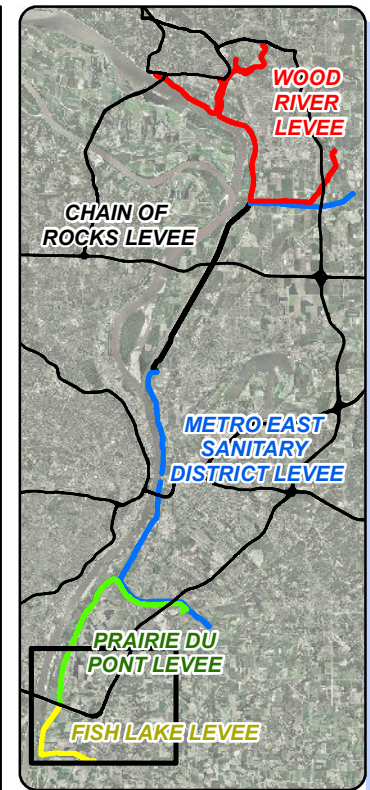
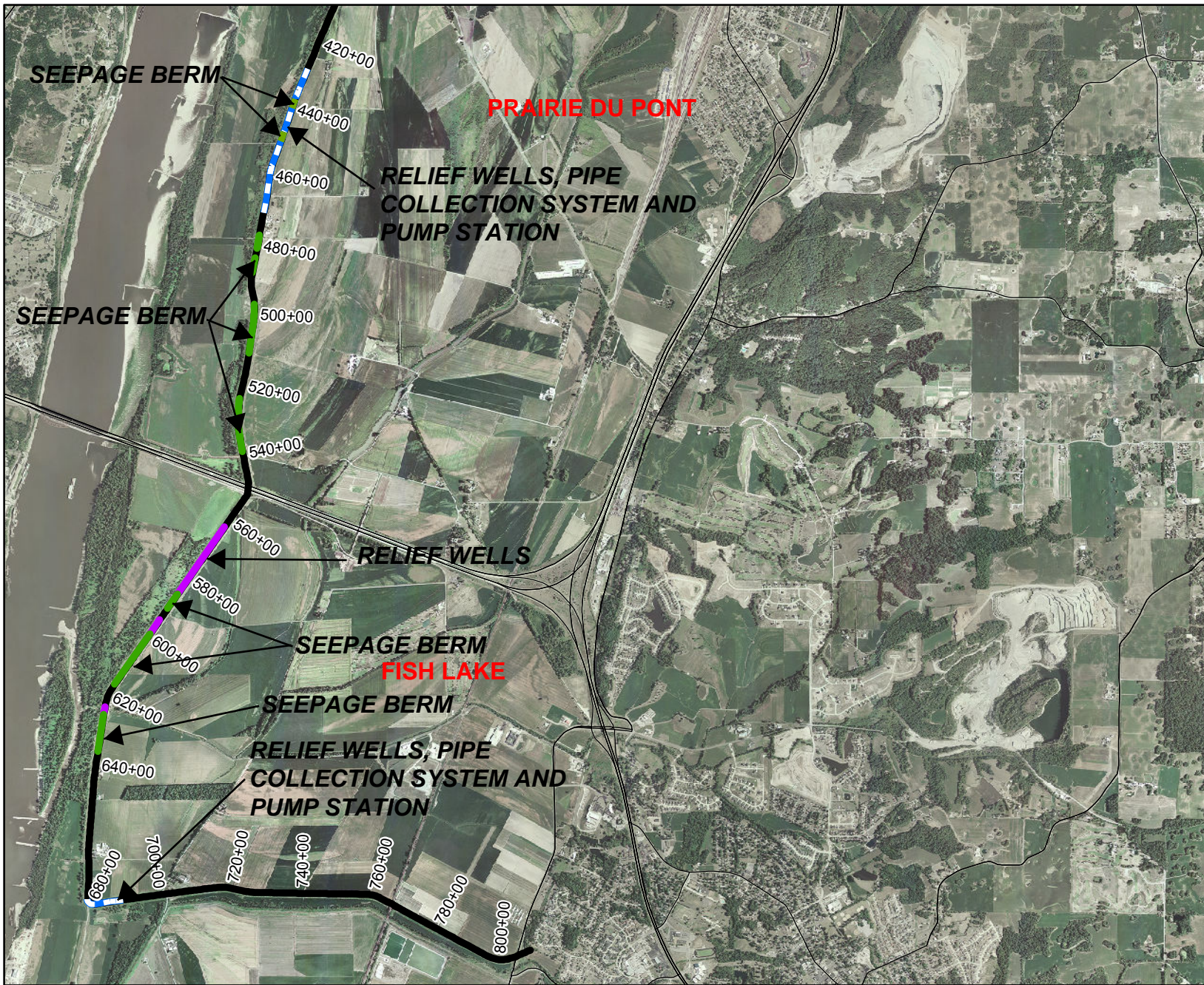
- SEEPAGE BERM
- SEEPAGE BERM & CLAY CAP
- BLANKET DRAIN
- BLANKET DRAIN & FILL AREA
- CLAY CAP
- DEEP CUT OFF WALL
- SHALLOW CUT OFF WALL
- MEL PRICE
- PIEZOMETERS
- RIPRAP PROTECTION
- RELIEF WELLS
- RELIEF WELLS AND CLAY CAP
- RELIEF WELLS AND FILL
- RELIEF WELLS AND COLLECTION PIPES
- RELIEF WELLS, PIPES, AND SEEPAGE BERM
- RELIEF WELLS, PIPES, AND CLAY CAP
- RELIEF WELLS, PIPES, AND FILL



**Legend**

**100% Improvements Layer**

- SEEPAGE BERM
- SEEPAGE BERM & CLAY CAP
- BLANKET DRAIN
- BLANKET DRAIN & FILL AREA
- CLAY CAP
- DEEP CUT OFF WALL
- SHALLOW CUT OFF WALL
- MIL PRICE
- PIEZOMETERS
- RIPRAP PROTECTION
- RELIEF WELLS
- RELIEF WELLS AND CLAY CAP
- RELIEF WELLS AND FILL
- RELIEF WELLS AND COLLECTION PIPES
- RELIEF WELLS, PIPES, AND SEEPAGE BERM
- RELIEF WELLS, PIPES, AND CLAY CAP
- RELIEF WELLS, PIPES, AND FILL



**Legend**

**100% Improvements Layer**

- SEEPAGE BERM
- SEEPAGE BERM & CLAY CAP
- BLANKET DRAIN
- BLANKET DRAIN & FILL AREA
- CLAY CAP
- DEEP CUT OFF WALL
- SHALLOW CUT OF WALL
- MEL PRICE
- PIEZOMETERS
- WRAP PROTECTION
- RELIEF WELLS
- RELIEF WELLS AND CLAY CAP
- RELIEF WELLS AND FILL
- RELIEF WELLS AND COLLECTION PIPES
- RELIEF WELLS, PIPES, AND SEEPAGE BERM
- RELIEF WELLS, PIPES, AND CLAY CAP
- RELIEF WELLS, PIPES, AND FILL