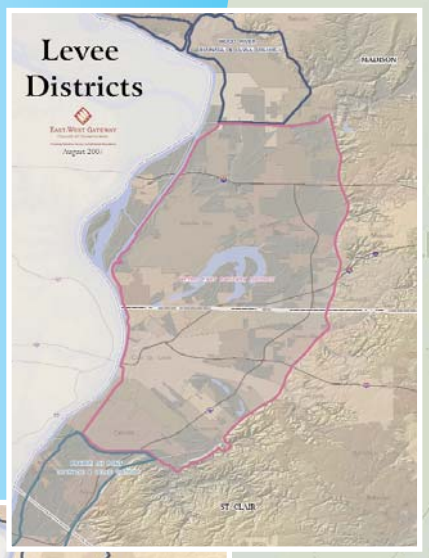

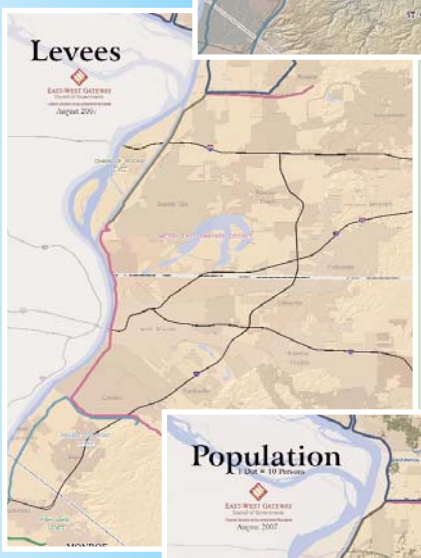

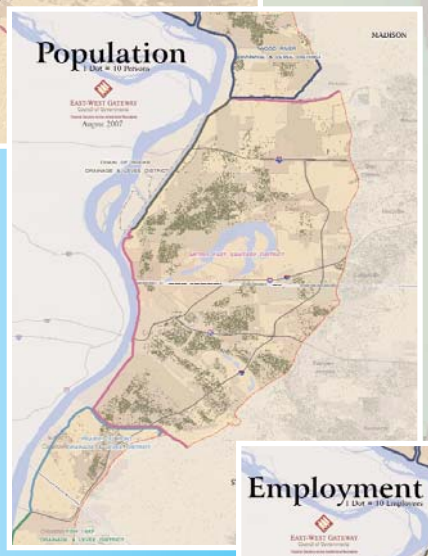

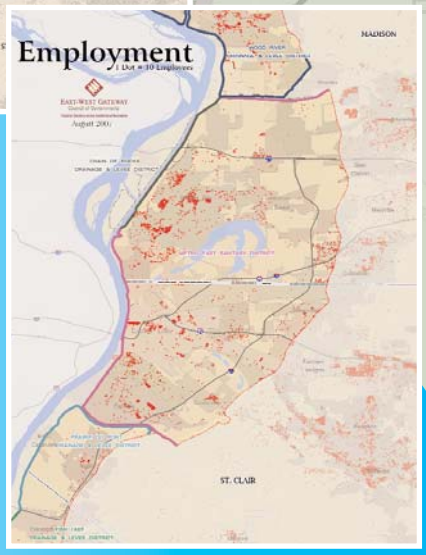

Southwestern Illinois
Flood Prevention Initiative

Status Report & Project Timeline

November, 2007

EAST-WEST GATEWAY
Council of Governments

Creating Solutions Across Jurisdictional Boundaries

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Executive Summary

- Without immediate large scale coordinated effort, nearly all of the American Bottoms will be declared to be a flood hazard area on preliminary FEMA maps as early as March 2008.

- The issue presents substantial public safety and economic consequences for Southwestern Illinois.

  - Flood insurance rates will increase substantially when the preliminary maps become final, currently predicted to occur in early to mid 2009.
  - Uncertainty about risk and development constraints will discourage business investment.

- The total cost to repair the five levee systems in Madison, St. Clair and Monroe counties is estimated to be between $136 and $180 million.

- Local match (of 35%) required for the four locally owned levee systems is estimated to be between $31 and $47 million.

- Because of the historically slow rate of appropriations for federal funding, area leaders should consider raising the entire amount needed to begin repairs as soon as possible, with a goal of completing the entire group of projects in ten years or less.

- A coordinated regional strategy is the most effective way to address the flood control system in Southwestern Illinois because:

  - The five levee systems are inextricably linked hydrologically.
  - Two of the levee systems cross county boundaries and all of them pass through numerous cities and towns.
  - Collaboration among a broad number of varied constituencies will strengthen the effort.
  - The citizens and economy of the entire region of Southwestern Illinois are affected.

- By January 30, 2008, application should be made to FEMA for a "Restoration Zone" status, or AR Zone, for the entire American Bottoms area, because it will preserve lower flood insurance rates for residents and allow a 10-year period to carry out a plan for repair and restoration of the levees.

- Other recommended action steps include creating a leadership task force, developing a ten year plan to restore the levees (including financial and construction components), securing expert assistance in finance and engineering, launching a comprehensive community engagement strategy to reach residents and the business community, and securing funding to carry out the entire planning strategy.

I. Introduction

The 1993 Midwest flood was one of the most damaging natural disasters ever to affect the United States up to that time. Total impact of damages approximated $15 billion, thousands of people were evacuated, fifty people died and hundreds of levees failed. The flood and its path of devastation lasted for several months. The magnitude of this flood event seemed overwhelming. Just twelve years later Hurricane Katrina and storm surges that followed caused more than fifty levee breaches, resulting in catastrophic flooding damage over large portions of southern Mississippi and Louisiana. More than fourteen hundred people died and over 80% of New Orleans was flooded. The losses devastated an entire multistate region and, for a time, adversely affected the whole United States economy.

Katrina has focused great attention on the flood protection systems across the United States. Under the current circumstances, competition for limited federal funding, limited financial capacity of local sponsors and delays in appropriations conspire to compromise public safety and welfare.

Congressman Jerry Costello convened an Illinois Levee Summit on August 15, 2007 onboard the U. S. Army Corps of Engineers Motor Vessel Mississippi for the purpose of providing an overview of the levee systems in the St. Louis region and describing levee deficiencies and flood risks for five levees systems in the Illinois area of the region. Officials representing the Federal Emergency Management Agency (FEMA) Region V explained how the congressionally mandated revision of all flood risk maps for the base level "100-year flood" would affect levee status in Southwestern Illinois. Based on current information provided by the U.S. Army Corps of Engineers (Corps), the five affected levee systems will not meet the minimum criteria for flood protection. These levee systems along the Mississippi River extend from the Wood River Drainage and Levee District in the north, to Prairie Du Pont and Fish Lake Levee Districts in the south. According to reports and studies done by the Corps, all the levees in question exhibit significant underseepage problems that, if left uncorrected, significantly increase the risk of a major flood.

Since the FEMA announcement concerning levee decertification, elected officials in St. Clair, Madison and Monroe counties in Illinois requested that the East-West Gateway Council of Governments follow up on recent discussions and fact-finding meetings to provide an accurate, up-to-date status report that would both define the problem and suggest a process for correcting the levee deficiencies. They indicated that they would like to take a regional approach to address this problem.

The purpose of this report is to present the facts currently known about the levee projects to determine what has to be accomplished to repair the levees to the point that they can be certified by the Corps to protect from a 100-year flood. Expediting the schedule for planning and reconstruction is of paramount importance because the flood risks and rising cost of flood insurance undermine public safety and the economic vitality of large parts of Southwestern Illinois located in Madison, St. Clair and Monroe counties. While the flood risks and map

revisions directly affect the three counties and their respective communities, neighboring communities throughout the St. Louis region are also affected.

The report contains information about the FEMA remapping process and the role of national flood insurance, a status report on all of the projects, including projected costs, funding availability and estimated times for completion, and financial and organizational information about each of the levee districts. The report concludes with recommendations for a series of actions to be completed within the next two months that will begin a measured and urgent process to restore the flood control system in Southwestern Illinois to provide the protection for which they were designed. Actions are also outlined that will provide a measure of economic assurance for the area during the period that full flood protection is being restored. Quick agreement on action steps will facilitate a rapid reconstruction effort.

II. Background

Under Congressional authorization, FEMA is digitizing its flood insurance maps nationwide over approximately a five-year period. As part of the process of producing new maps, FEMA is revising all flood risk maps for base flood levels, a flood with a 1% chance of occurring in any given year – the 100-year flood. Federal regulations require FEMA to ascertain whether flood hazard areas meet standards for adequate protection from catastrophic floods. As part of the mapping process, FEMA has asked the Corps to evaluate and certify levees and other flood control facilities using specific FEMA standards. Under the current schedule for FEMA Region V, maps for the metro east area of the St. Louis region will be completed in March 2008. FEMA will release the maps in draft format and then conduct a series of public meetings. There follows a 90-day appeal period. FEMA will review and respond to the appeals before the maps are finalized. The entire process, from the release of preliminary maps through meetings and appeals to map finalization, should take about a year.

According to FEMA and the Corps, five Illinois levee systems in the St. Louis area are at risk of failing due to structural deficiencies. The levees are: Wood River, Chain of Rocks, Metro East, Prairie Du Pont, and Fish Lake. Most of the American Bottoms, from the Mississippi River east to Bluff Road, which is currently designated as a protected area, is at risk (Figure 1).

After New Orleans, the American Bottoms region represents the second largest concentration of population in the Mississippi Corridor. More than 150,000 residents and 50,000 jobs are in this area (Figures 2 and 3) which has been considered a protected zone, but which may now be reclassified as an area subject to flood risk. While the first concern is public safety and the recognition of increased risk of catastrophic flooding, there are significant economic consequences that will affect the future economic health of Southwestern Illinois.

A. Flood Risk and Insurance

When the FEMA maps are finalized (currently predicted to occur in March 2009), property in flood risk areas will be required to have federal flood insurance to qualify for a mortgage from a federally regulated institution. Flood insurance purchased now (and over the next year before the new maps are officially adopted by FEMA) is significantly less expensive than it will be once the maps are finalized, because the property is still officially behind a protected levee.

Four thousand business establishments face heightened risk due to deficiencies in the levees. According to the 2000 Census, of the 59,107 occupied housing units in the affected area, 38,441 (65%) were owner-occupied and 20,666 were rental units[1]. Forty-three percent of all owner-occupied homes do not have a mortgage. These homes are exempt from the federal mandate to purchase flood insurance, but homeowners will nonetheless benefit from having insurance in case of a disastrous flood. Moreover, these homes could not be sold to a new owner requiring a

[1] A small proportion of these households are already included in special flood hazard areas because of proximity to small stream or tributaries of the Mississippi River that are subject to flooding.

mortgage without the new owner purchasing insurance at a significantly higher rate.[2] FEMA urges all residents living behind levees to purchase insurance whether it is required or not.

Table 1
Demographics of Area Directly Affected

County	*Population*	*Households*	*Jobs*
Madison	78,981	32,055	33,241
St. Clair	77,230	27,020	18,048
Monroe	70	32	250
	15,6281	59,107	51,539

Levee decertification will cause massive costs to individuals and businesses and potentially cripple economic growth and investment in the region. Federally regulated financial institutions will not be able to issue loans to homeowners or businesses that do not carry adequate flood insurance, and communities will need to adopt development ordinances that include strict requirements for building in flood zones. Many homeowners will not be able to afford flood insurance, even at the current favorable rate, putting them at future financial risk. A secondary impact to homeowners and small businesses is a potential decline in property values, since sales of property that require bank financing will be conditioned on the purchase of costly flood insurance.

This potential action will directly affect almost a third of the population of the Illinois portion of the St. Louis area and many critical businesses that are the foundation of the local economy. Inadequate levees threaten to disrupt all who travel on interstate highways 55, 64 and 70 through the American Bottoms. The consequences will be felt not only by areas that could be in jeopardy of flooding, but also by all communities that have a stake in the economic vitality of the region.

[2] When a levee is decertified, FEMA rules allow for a grandfathering of lower insurance rates for those who purchased insurance before decertification; such rates are also available to the purchaser of a home that has been continually insured.

Levees

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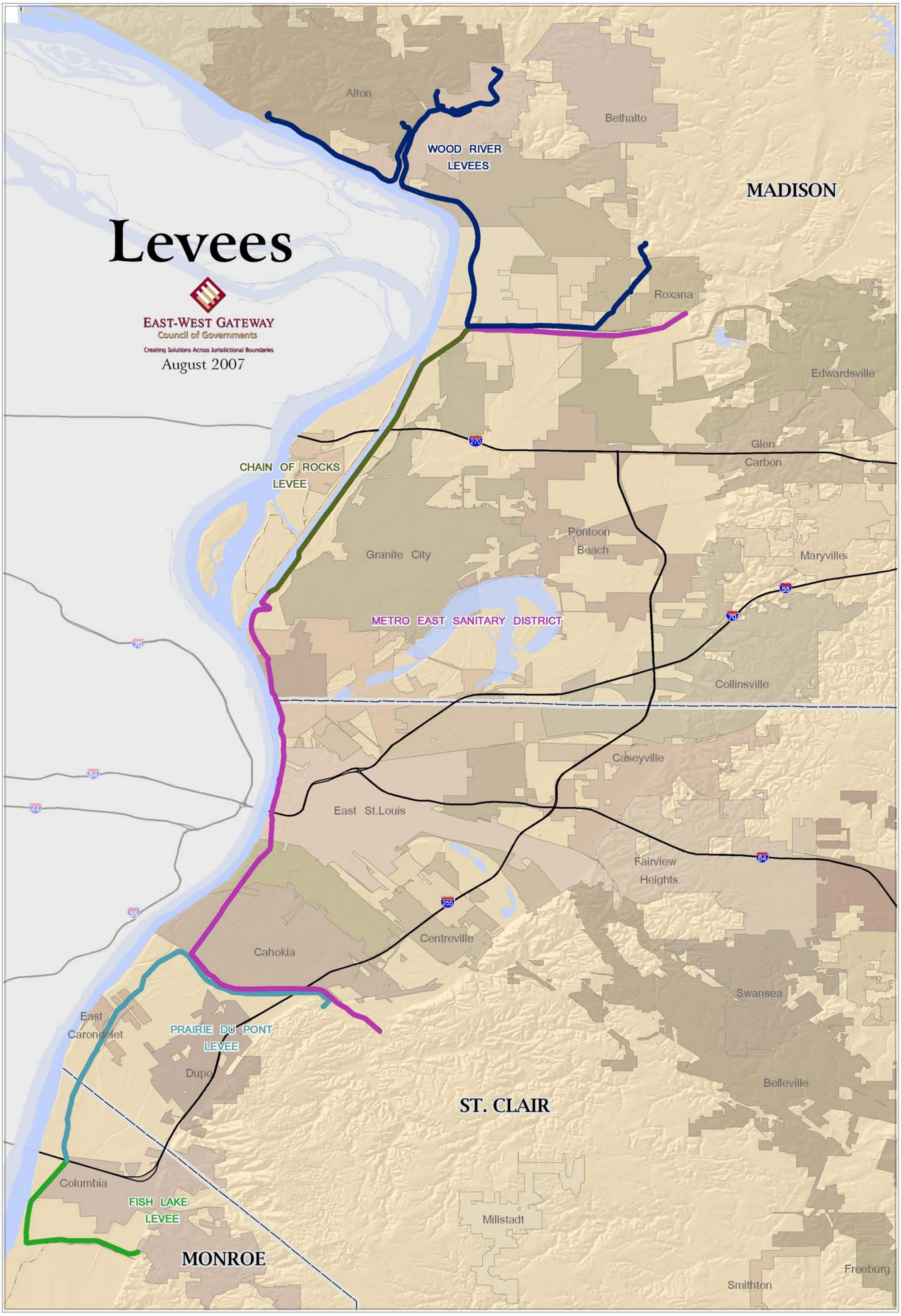
August 2007



Legend

- CHAIN OF ROCKS LEVEE
- FISH LAKE LEVEE
- METRO EAST SANITARY DISTRICT LEVEE
- PRAIRIE DU PONT LEVEE
- WOOD RIVER LEVEES
- LEVEES
- WATER FEATURE
- INTERSTATE HIGHWAY
- COUNTY BOUNDARY

N

0 1 2 Miles

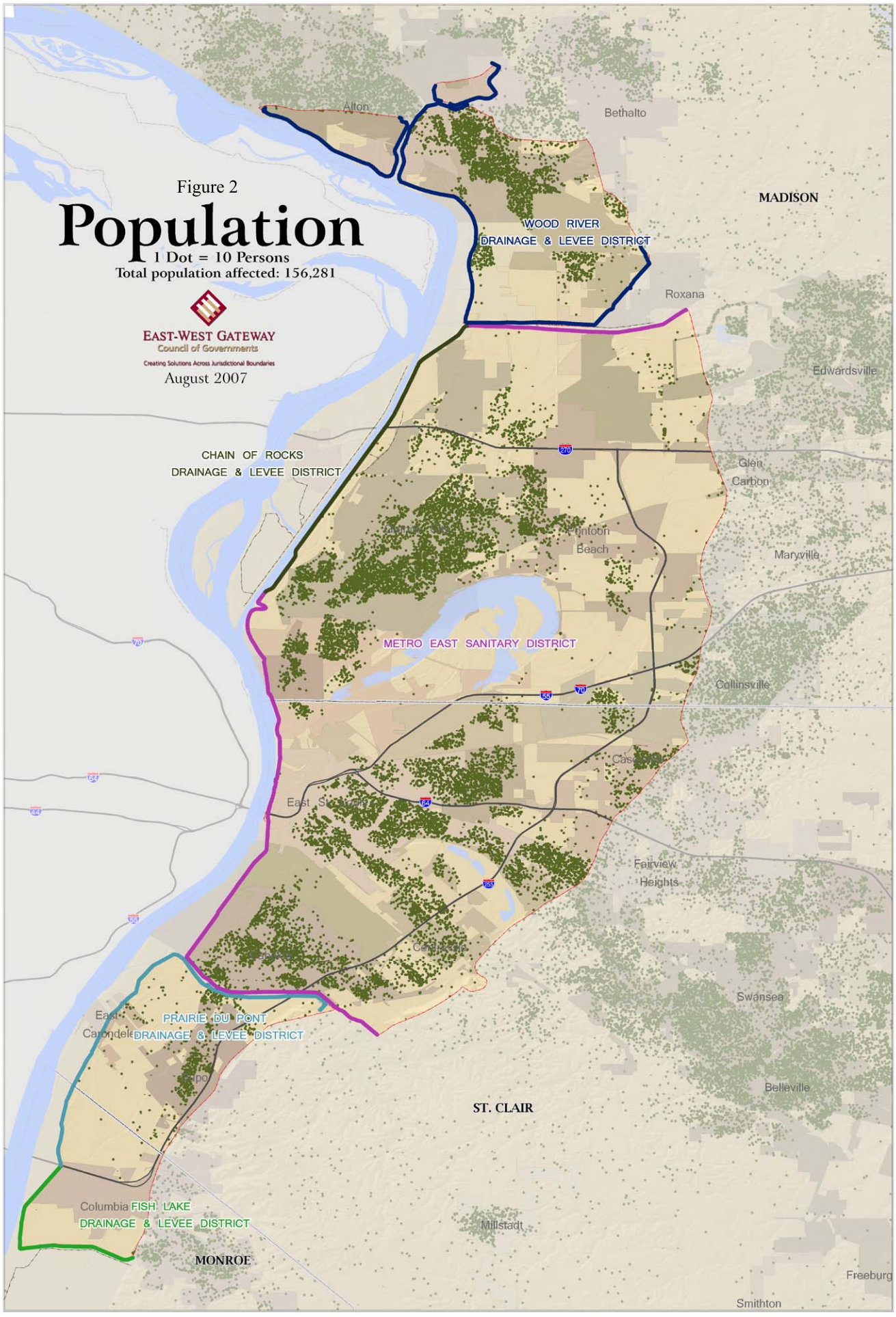


Figure 2
Population
1 Dot = 10 Persons
Total population affected: 156,281
EAST-WEST GATEWAY
Council of Governments
Creating Solutions Across Jurisdictional Boundaries
August 2007
Alton
Bethalto
MADISON
WOOD RIVER
DRAINAGE & LEVEE DISTRICT
Roxana
Edwardsville
CHAIN OF ROCKS
DRAINAGE & LEVEE DISTRICT
Glen
Carbon
Pontoon
Beach
Maryville
METRO EAST SANITARY DISTRICT
Collinsville
Fairview
Heights
Swansea
PRAIRIE DU PONT
DRAINAGE & LEVEE DISTRICT
Belleville
ST. CLAIR
Columbia FISH LAKE
DRAINAGE & LEVEE DISTRICT
Millstadt
MONROE
Freeburg
Smithton
Legend
Chain of Rocks Levee
Fish Lake Levee
Metro East Sanitary District Levee
Prairie Du Pont Levee
Wood River Levees
Levees
Water Features
County Boundary
Levee Protected Area
Interstate Highways
N
0
1
2 Miles

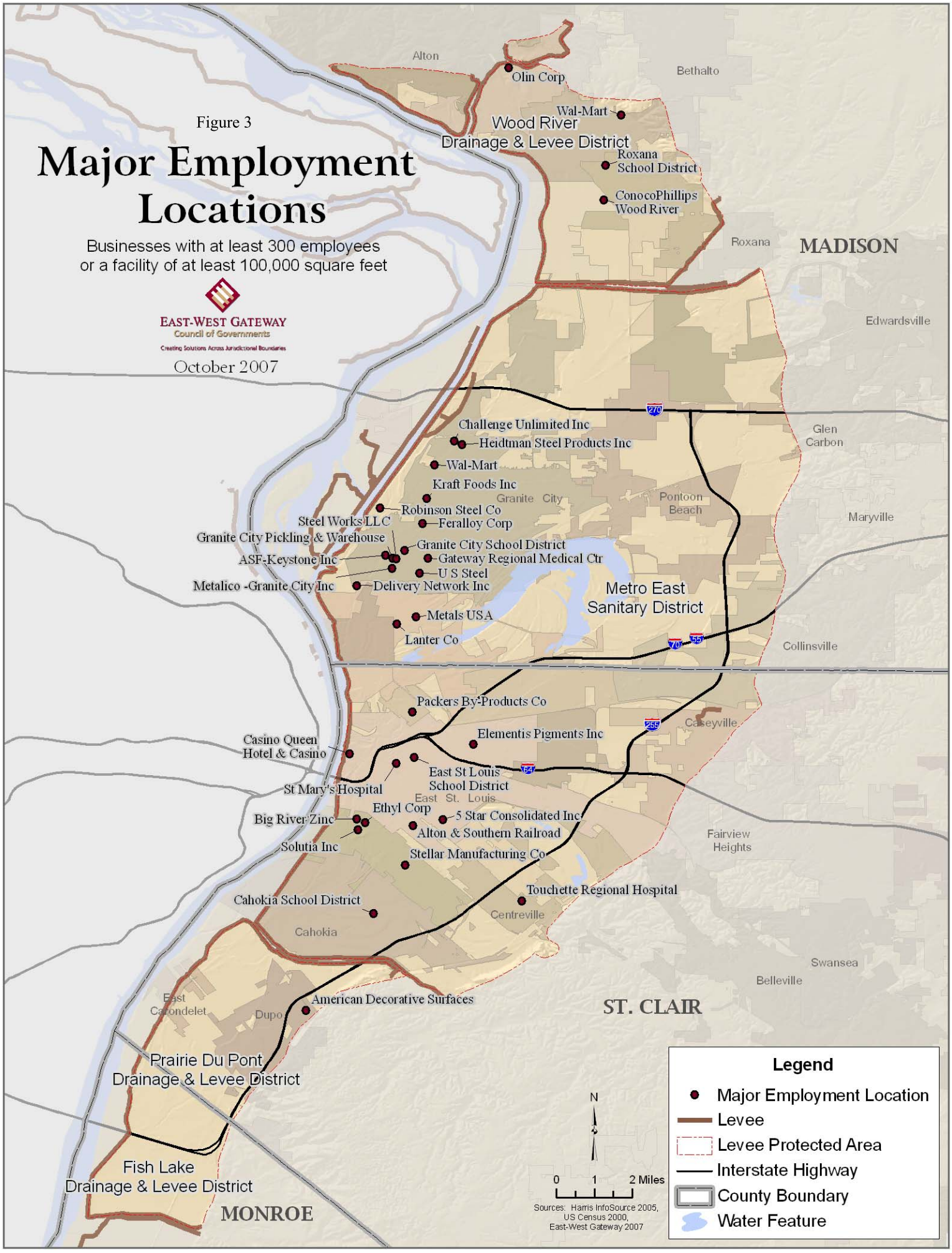
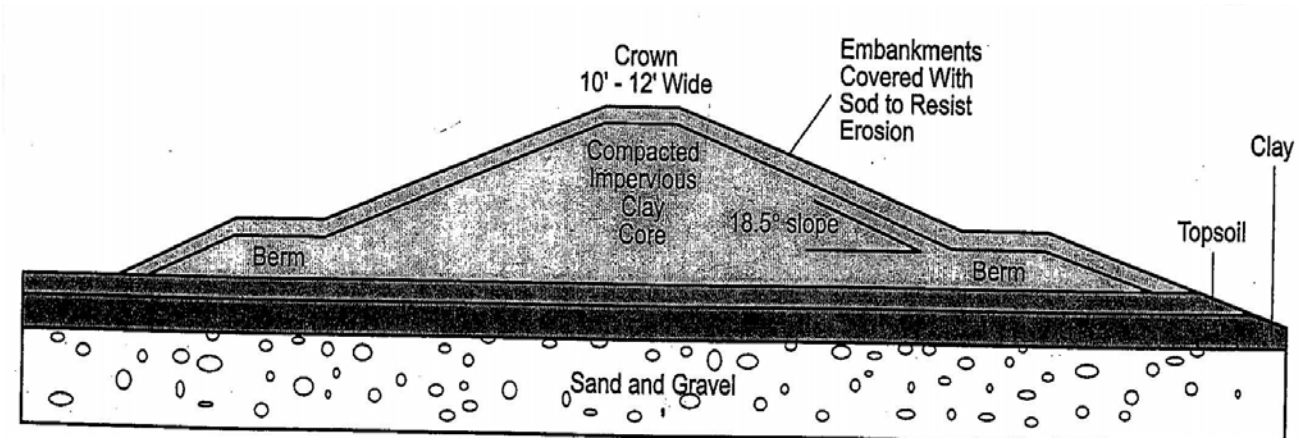


Figure 3
Major Employment Locations
Businesses with at least 300 employees
or a facility of at least 100,000 square feet
EAST-WEST GATEWAY
Council of Governments
Creating Solutions Across Jurisdictional Boundaries
October 2007
Alton
Olin Corp
Bethalto
Wal-Mart
Wood River
Drainage & Levee District
Roxana
School District
ConocoPhillips
Wood River
Roxana
MADISON
Edwardsville
Challenge Unlimited Inc
Heidtman Steel Products Inc
Glen
Carbon
Wal-Mart
Kraft Foods Inc
Granite City
Pontoon
Beach
Robinson Steel Co
Steel Works LLC
Feralloy Corp
Maryville
Granite City Pickling & Warehouse
Granite City School District
ASF-Keystone Inc
Gateway Regional Medical Ctr
U S Steel
Metalico -Granite City Inc
Delivery Network Inc
Metro East
Sanitary District
Metals USA
Lanter Co
Collinsville
Packers By-Products Co
Caseyville
Elementis Pigments Inc
Casino Queen
Hotel & Casino
East St Louis
School District
St Mary's Hospital
East St. Louis
Ethyl Corp
Big River Zinc
5 Star Consolidated Inc
Alton & Southern Railroad
Solutia Inc
Fairview
Heights
Stellar Manufacturing Co
Touchette Regional Hospital
Cahokia School District
Centreville
Cahokia
Swansea
Belleville
East
Cahondelet
Dupo
American Decorative Surfaces
ST. CLAIR
Prairie Du Pont
Drainage & Levee District
Fish Lake
Drainage & Levee District
MONROE
N
0
1
2 Miles
Sources: Harris InfoSource 2005,
US Census 2000,
East-West Gateway 2007
Legend
Major Employment Location
Levee
Levee Protected Area
Interstate Highway
County Boundary
Water Feature

B. The Levee System

The American Bottoms in St. Clair, Madison and Monroe counties, Illinois is a broad floodplain area situated along the easterly bank of the Mississippi River. The whole area which contains approximately 150,000 people and numerous heavy industries and businesses, has a relatively high groundwater level. It is protected from flooding by the Mississippi River by a system of levees which is operated and maintained by four separate locally owned levee districts (Wood River, Metro-East, Prairie Du Pont and Fish Lake) and the Army Corps of Engineers, which maintains the federal levee along the Chain of Rocks Canal.[3]

Man-made levee systems usually consist of earthen embankments and wall structures which are designed and constructed to contain, control, or divert the rising flow of water so as to protect low lying areas from periodic flooding. For stability, an earthen levee is constructed in pyramid fashion so that its bottom width is several times its height. Therefore, constructed levees have a large footprint requiring considerable land area. In urban areas where land is limited, concrete and masonry floodwalls are often used. A long levee system, such as those of Southwestern Illinois, may include a combination of earthen levees and floodwalls. Also, earthen levees are generally constructed with compacted clay materials and an impervious clay base to prevent water infiltration (see Figure 4).



Source: GAO 1993 Flood Study

Figure 4: Cross-Sectional View of an Earthen Levee

Generally, levees are specifically designed and constructed to withstand a certain flood frequency. A ten to a fifty-year levee is usually considered to be an *agricultural* levee designed to protect floodplain in agricultural areas from floods that may occur once every ten or fifty years. These areas will experience flooding during major flood events (e.g., 100-year flood events). *Urban* levees protect floodplains from 100-year floods or higher. The levee system of

[3] With the exception of structures on the Chain of Rocks levee, all of the flood control facilities, including levees, flood walls, floodgates, pump stations, etc., are locally owned and maintained. The Corps has assisted the districts in the overall design, construction and routine inspections.

Southwestern Illinois consists of main stem *urban* levees, which lay along a major river, in this instance the Mississippi River and/or the Chain of Rocks Canal. Other levee structures in the system include *tie back* or *lateral* levees, which extend from the main stem levee to bluff lines (high ground) and are part of the line of protection against backflow during periods of high water (Figure 5). Other key components of a levee system include pumping stations, gravity drains or outlets, street closure gates and relief wells. Gravity drains or outlets are openings built through the base of the levees and are designed to drain and convey floodwaters. These gravity structures permit the outflow of stormwater that comes off the bluffs to the east when the river stage is low. Gravity drains are equipped with closure gates to prevent the river flows from entering the protected area during time of high river stages. Pump stations may be also operated to drain the protected area from interior flooding (Figure 5).

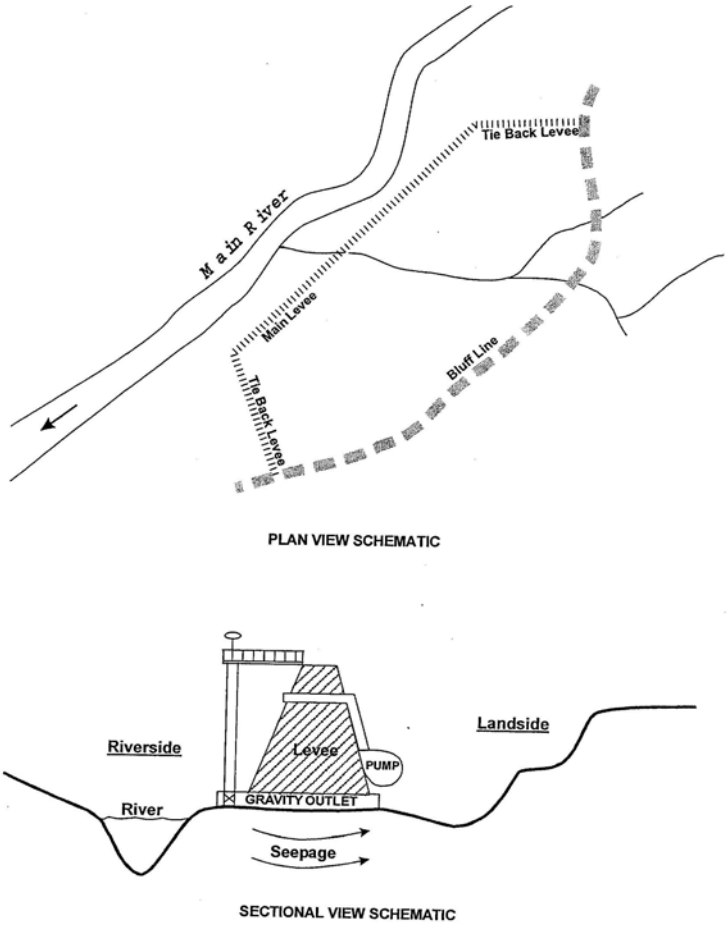


Figure 5: Schematic of Standard Levee System Source: FEMA

The four general ways a levee may fail include: overtopping; piping; saturation; and underseepage (Figure 6). During an extreme flood situation, floodwaters may actually exceed the designed water level of the levee and overtop it. For example, the Metro East levees have a design water level of 52.0 feet. In 1993 floodwaters reached a level of 49.6 feet, which approached but did not reach overtop conditions. Piping, or internal levee erosion, occurs when

floodwaters enter the levee through animal burrows and/or plant and tree root channels. Saturation failure is attributable to a levee that is saturated with floodwaters for an extended period of time. Floodwater permeates and weakens the core of the levee, making it unstable. Underseepage refers to floodwater that travels under the base of the levee via an unstable layer of sand and gravel and weakens the base foundation of the levee from below (Figure 6).

To control for underseepage, relief wells are drilled on the interior side of the levee, and operated during flood events to depress and eliminate seepage under the levee. Another method for eliminating or controlling levee seepage is the construction of pressure berms. These berms are designed as horizontal strips of materials built contiguous to the levee base on the interior sides of the levee for the purpose of providing protection from seepage and resulting levee erosion.

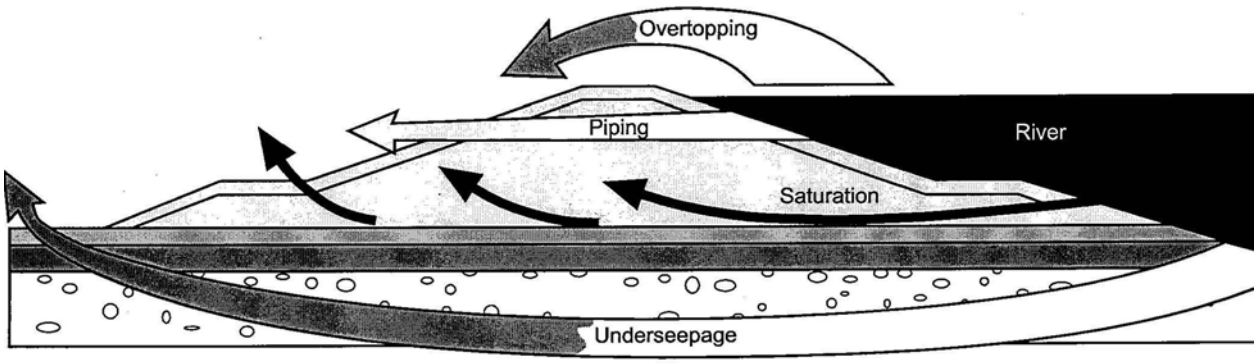


Figure 6: Potential Levee Failure Scenarios Source: FEMA

The size and height of the St. Louis urban levee system has grown over the years to its current configuration to protect from the 500-year flood, a flood that has 0.2 percent chance of occurring in any given year. Major levee improvements were completed with the passage of the Flood Control Act of 1938. Today's urban levee system consists of riverside levees and tie back or wing-levees, canals, conduits, pumping stations, gravity drains and seepage relief wells. The urban levee system has proven effective in protecting the American Bottoms from major flooding events, including the flood of record in 1993 (a 300-year flood) and a 200-year flood in 1995 (Appendix A).

C. Levee and Drainage Districts

Below is a brief description of each the levee districts of concern in this report. The maps show the location of the levees and protected areas.

Wood River Drainage and Levee District

The Wood River Drainage and Levee District is chartered under the 1879 Illinois Levee Law, and dates to 1910. A Board of Commissioners consists of three people appointed by the

Madison County Board to three year staggered terms. The district employs a secretary-treasurer and a superintendent, who hires full time and several part time maintenance workers.

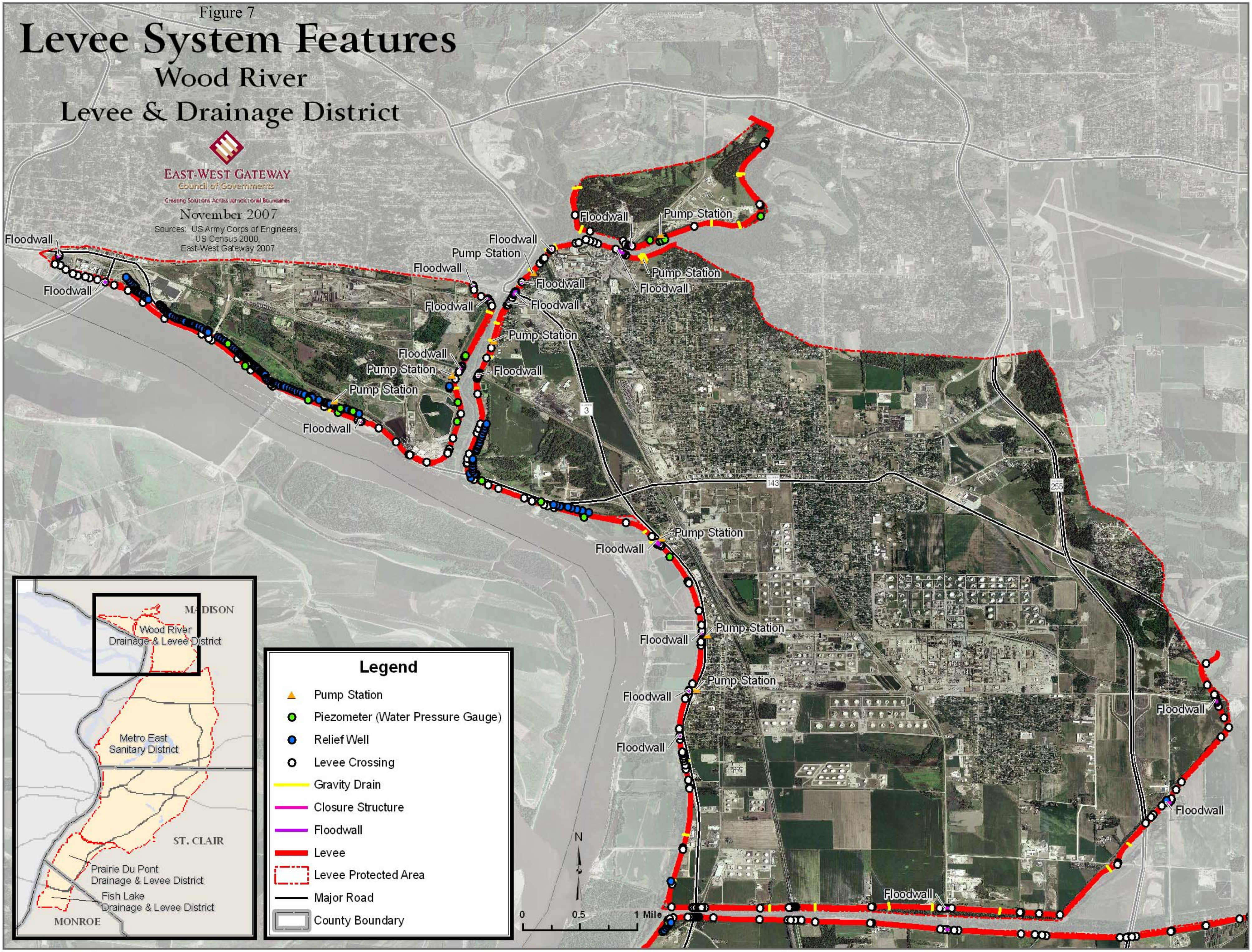
The district, located in Madison County, is just upstream from the city of East St. Louis between river miles 195 and 203 above the Ohio River (Figure 7). The communities of Alton, East Alton, Hartford, Roxana, South Roxana, and Wood River are within the district. The levee district is protected by an urban levee across the Mississippi River from St. Louis and St. Charles counties in Missouri. This system includes approximately 21 miles of main line levee, 164 relief wells, 24 closure structures, 64 gravity drains and 7 pump stations. There are approximately 21 square miles (13,700 acres) of bottomland and 7 square miles (4,700 acres) of hill land within the district. The overtopping level is 52 feet.

The Wood River Drainage and Levee District protects significant industrial development. Work on rehabilitation and reconstruction of the levee, pump stations, and other structures has already begun. The levee district has been working with the Corps in planning and implementing repairs and upgrades, but the notice of potential decertification that came in August 2007 was unexpected. Significant work has already been completed and remaining planned repairs should be sufficient for the levees to be recertified within the next few years. The Wood River District financial statement for the year ending September 30, 2007, reports general revenue of $656,000 from an equalized assessed valuation of property in the district, and expenses of $554,000 for 2006, with a balance on hand of $858,000.

Figure 7

Levee System Features

Wood River Levee & Drainage District



Metro East Sanitary District

The Metro East Sanitary District enabling legislation passed in 1907. A Board of five Commissioners governs the district. Three of the Commissioners are residents of that portion of the district in the county having the greater equalized assessed valuation of the district (currently Madison County), and two are residents of that portion of the district having the lesser valuation (currently St. Clair County). The board hires an executive director and the district employs 57 staff members.

The largest of the four locally maintained districts, the Metro East Sanitary District protects 96.32 square miles (61,645 acres). The district owns 2,776 acres. (See Figures 8 and 9) The district owns approximately 37.5 miles of mainline levee, including north and south flanks; 16,425 feet of floodwall; 52.5 miles of canals; and 14 miles of sanitary sewers in service at the present time.[4] The levee district includes the cities of Collinsville, Edwardsville, Glen Carbon, Granite City, Madison, Pontoon Beach and Venice in Madison County; and Alorton, Brooklyn, Cahokia, Caseyville, Centreville, East St. Louis, Fairmont City, Sauget and Washington Park in St. Clair County. The overtopping level is 54.0 feet at St. Louis.

The district boundaries are fixed by the county court for taxation purposes. General revenue of the district is obtained primarily from two sources – a direct tax in proportion to the assessed valuation of all property within the district, and a replacement tax allocation (for the elimination of personal property tax) from the State of Illinois sales tax revenue. The 2006 annual financial report lists property taxes at $2,033,483; the replacement tax at $1,312,505; and numerous miscellaneous revenue items for total general revenue of $3,678,258.

Administration expenses in 2006 were $2,171,799; general maintenance was $1,554, 935. The 2006 year end fund balance for general revenue was $4,949,854. In addition, the district has a property tax for a Tort Liability Fund that generated $501,000 in 2006. The tort fund had a fund balance of $6,698,104 on December 31, 2006.

[4] Also included are six stormwater pump stations – Cahokia, Venice, Madison, South, North and East St. Louis pump stations. Pumps remove water from behind the levees during interior flooding events, when stormwater water comes into the flood plain from the bluffs to the east.

Figure 8

Levee System Features

Metro East Sanitary District (North)

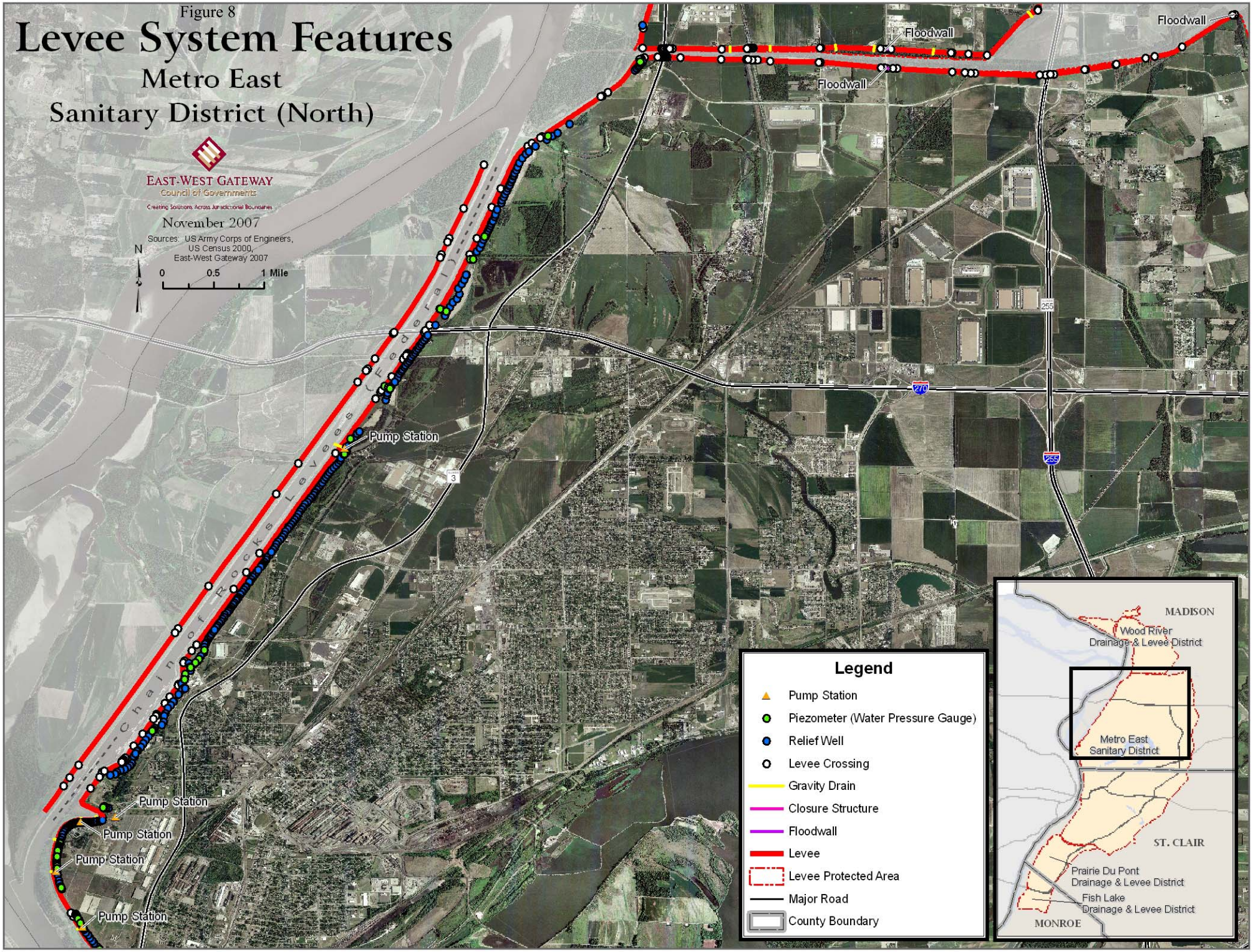
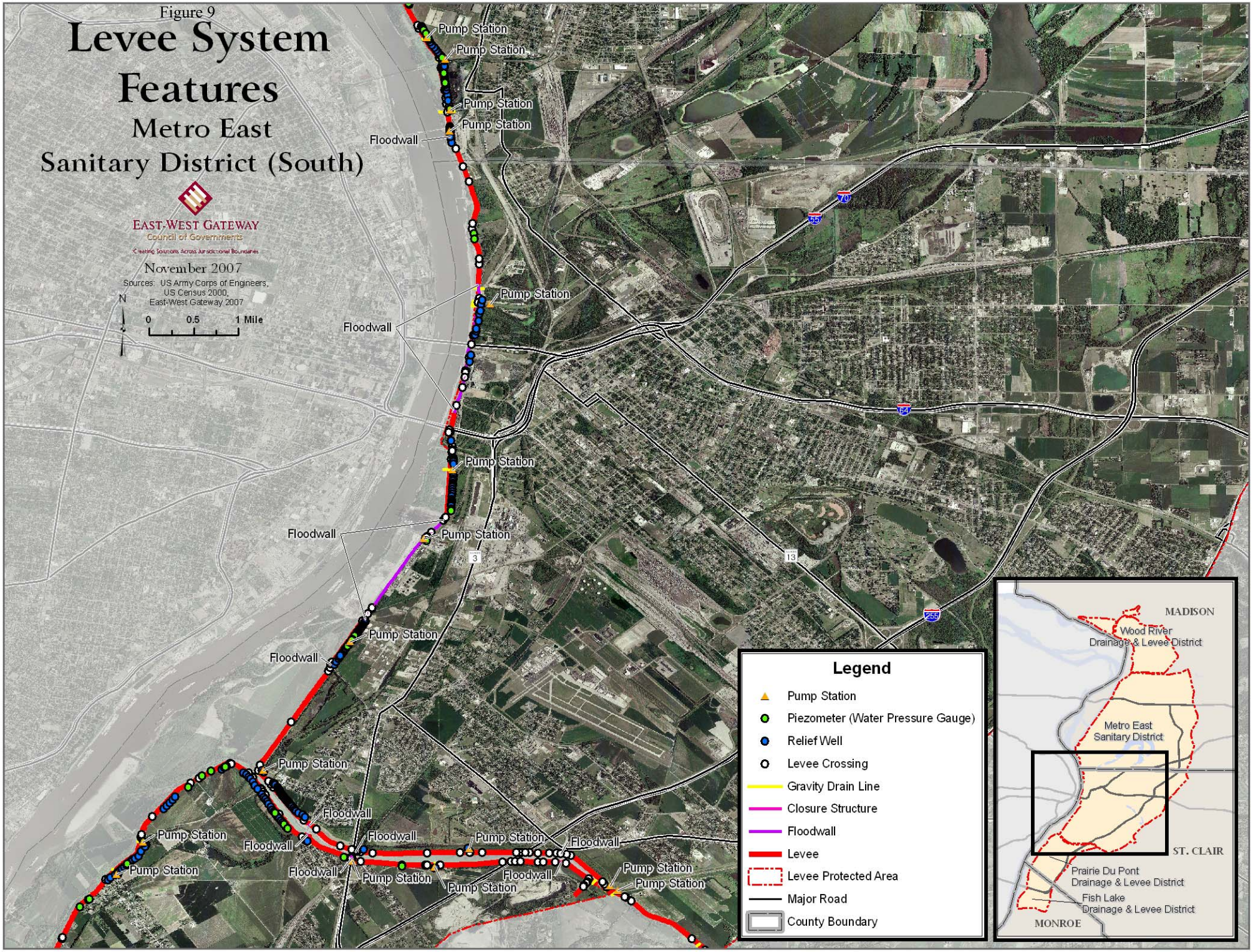


Figure 9

Levee System Features

Metro East Sanitary District (South)



EAST-WEST GATEWAY
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November 2007

Sources: US Army Corps of Engineers, US Census 2000, East-West Gateway 2007

N

0 0.5 1 Mile

Prairie Du Pont Levee and Sanitary District

Prairie Du Pont Levee District is chartered under the Illinois Sanitary District Act of 1907. It has five-member board, elected in a general election and serving four-year terms, with two currently from East Carondelet and one each from Dupo and Columbia. Members are elected from the territory of the district in the two counties. The district has two full time and six part time staff.

The district protects 15 square miles (9,560 acres) and its mainline levees are 10.3 miles in length (Figure 10). Structures include 5 steel gates and 9 gravity drains. Prairie Du Pont Levee protects portions of the communities of Dupo, East Carondelet and Columbia in St. Clair County and a portion of Monroe County. The district can levy property taxes and can issue general obligation bonds. District revenue is approximately $140,000 per year from property taxes. The district has a $60,000 annual bond issue payment and a $2 million bond capacity based on their assessed valuation of which $750,000 is currently being used. The tax rate limit is 0.20 percent of equalized assessed valuation and may be increased by referendum. They also levy a stormwater tax of 0.03 percent. The district may issue general obligation drainage bonds and interest tax, which can be authorized by referendum with no rate limit.

Fish Lake Levee District

The Fish Lake Levee District was established under the 1879 Illinois Levee Law, which was recodified in 1955. The district has three board members elected from the district and from Monroe County and city of Columbia, and two part time staff. Fish Lake District protects 4 square miles (2,440 acres) and has 4.9 miles of mainline levee (Figure 9). It has no gates and currently has 9 gravity drains.

The district can levy three assessments: for annual maintenance; for original construction; and for performance of additional repair work and construction of pumping plants. The Fish Lake District 2007 financial report indicates revenue of $26,000 from assessments.

Figure 10

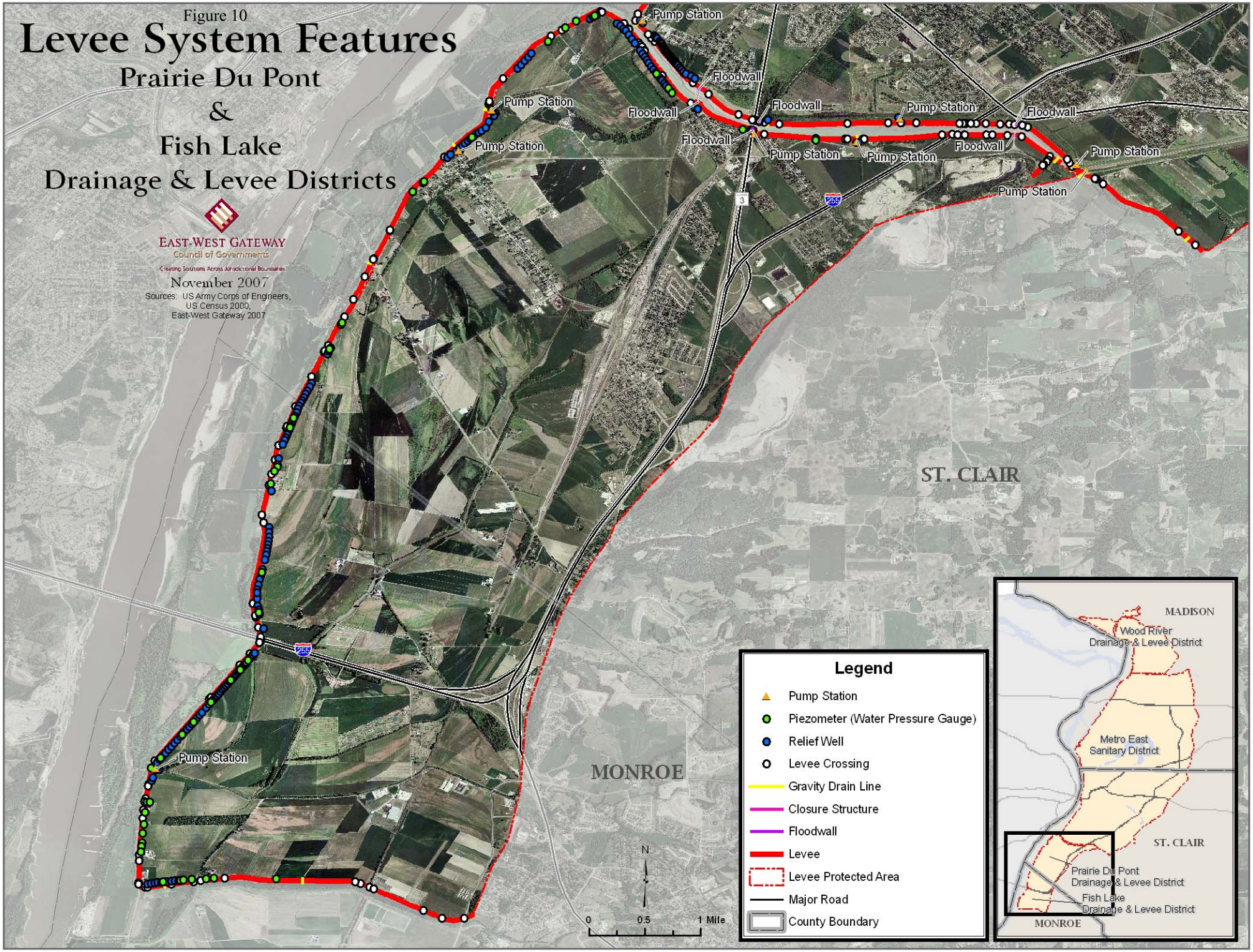
Levee System Features

Prairie Du Pont & Fish Lake Drainage & Levee Districts

EAST-WEST GATEWAY
Council of Governments
Creating Solutions Across Jurisdictional Boundaries

November 2007

Sources: US Army Corps of Engineers, US Census 2000, East-West Gateway 2007



III. Flood Maps and Flood Insurance

Flood maps, known as Flood Insurance Rate Maps (FIRM), show high-risk areas where there is at least a 1% annual chance of flooding (commonly called the 100-year flood). These areas are designated as Special Flood Hazard Areas (SFHA) and flood insurance is required for those property owners that have current mortgages from a federally regulated lender. While there are several different kinds of SFHA designations, all such areas include the letter A in their designation. The maps also show low or moderate risk areas where flood insurance is optional and recommended. Currently much of the American Bottoms is considered to be protected from Mississippi River flooding and not a SFHA. The revised maps will show nearly all of the American Bottoms as an SFHA. When the risk designation officially changes (currently predicted to occur in May 2009), the flood insurance rates will increase.

Under the National Flood Insurance Program (NFIP) property owners may take advantage of lower rates by purchasing insurance before risk designations change. Currently anyone in the area behind the levees who is in a protected zone can receive a lower cost insurance policy. Residents who currently purchase flood insurance, or who purchase flood insurance before the new maps become final will be able to receive lower rates, and the lower rates are transferable to new owners as long as the insurance policy remains continuously in effect.

A. FEMA Mapping Process

FEMA expects to have preliminary flood insurance rate maps for the three counties completed by March or April 2008. A public comment and appeal process will follow and FEMA officials anticipate it will be about one year before the maps become final and all flood insurance and other requirements take effect. Current FEMA operating procedures require maps to become official as they are completed, and although congressional action could change FEMA procedures, there is no guarantee that Congress will change the law or if there is a change, it is unlikely to occur before the preliminary maps are released in early 2008.

FEMA contractors are assembling maps from best available, reliable topographic data. The Illinois Water Survey is contracting with FEMA to do the mapping in Monroe County. PBS&J Corporation is mapping St. Clair County. FMSM Engineers is mapping Madison County.[5]

There are dual flood zones in the American Bottoms because the area is subject to flooding from tributary streams as well as the Mississippi River. Areas subject to interior flooding will remain as currently designated and subject to flood insurance restrictions regardless of what happens with the Mississippi River Levees. The separate Interior Flood Control project may have an impact on some of these areas if and when it is completed.[6]

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[5] Contact information for mapping consultants: Illinois Water Survey -Sally McConkey 217-333-5482; PBSJ – Mike DePue, MdePue@pbsj.com; FMSM – Don Armour, darmour@fmsm.com

[6] The levees under consideration in the report address Mississippi River floodwaters only. Drainage from the bluffs on the east side of the American Bottoms causes flooding on some of the tributaries, and that flooding is addressed in a plan for interior flood control and habitat restoration that was completed by the St. Louis District of the Corps in 2003 and is authorized in the 2008 Water Resources Development Act.

Although the remapping process is occurring nationwide, the Missouri and Illinois portions of the region are on different timetables because they are in different FEMA regions.[7] The proposed changes to flood maps in Illinois may take effect two to three years before new maps will be published in Missouri. To facilitate a more equitable process, on September 25, 2007, Congressman Jerry Costello filed the following proposed amendment to H.R. 3121 relating to the National Flood Insurance Act of 1968:

> *"USE OF MAPS FOR RATES The Director (of FEMA) shall not adjust the chargeable premium rate for flood insurance under this title based on an updated national flood insurance program rate map or require the purchase of flood insurance for a property not subject to such a requirement of purchase prior to the updating of such national flood insurance program rate map until an updated national flood insurance rate map is completed for the entire district of the Corps of Engineers affected by the map, as determined by the district engineer for such district."*

If enacted, the Costello amendment could potentially give the four Illinois levee districts two or three years to raise funds and make necessary repairs of the design deficiencies, but such an extension will still require an extraordinary effort in order to complete design and engineering studies and build the necessary relief wells before the NFIP flood insurance rate maps are finalized.[8]

B. Restoration Zone (AR Zone) Designation

The National Flood Insurance Program requires FEMA to map areas that are not certified to protect against a 100-year flood as Special Flood Hazard Areas, but it also allows FEMA to map areas previously shown as protected by a levee as a "Restoration Zone" (AR Zone). Because the American Bottoms has historically been protected by levees and work has begun to continue to provide that protection, FEMA suggests that an AR designation would provide many short-term benefits. In a letter sent to all affected communities, dated October 5, 2007, FEMA suggested that the levees might meet requirements for AR Zone designation (Appendix B). AR Zone indicates that the increased flood hazard is considered temporary and that restoration of protection is underway. An application to FEMA that is submitted before January 30, 2008 would allow sufficient time for FEMA to make a determination and incorporate the designation in FEMA's preliminary maps.

The application process requires that communities currently designated as protected make a written request to be considered for AR Zone. According to FEMA, "communities" means all of the communities participating in the National Flood Insurance Program. The communities include cities, villages and counties representing the unincorporated areas. In an area such as the American Bottoms where there are many communities, FEMA will accept a joint application as long as it includes a request letter signed by the chief elected official from each of the cities,

[7] Illinois is in Region V, headquartered in Chicago and Missouri is in Region VII, headquartered in Kansas City.

[8] How the mapping schedule in Illinois might be affected by the amendment is difficult to predict with certainty because it depends on progress in other areas.

villages and counties.[9] The request will need to include technical information about how the plan to correct design deficiencies will be implemented over a period not to exceed ten years, if being done in cooperation with a federal agency (or five years if a non-federal project). Each community will also be responsible for adopting a resolution passed by the city or county legislative body – saying they want to apply for the AR Zone designation, that they have not applied before, that they are not in litigation over levees, and that they have a plan to meet requirements for federally supported restoration. The communities must also be certified by the Corps that they are protected against a 33- year flood, a requirement that the Corps has indicated will likely be met, based on a survey currently underway.

For the purpose of determining future development restrictions, the law makes a distinction between "developed" and "undeveloped" areas. A community must adopt a map or legal description designating the developed area, to be submitted with the AR Zone request. As defined in the rule at 44 CFR 59.1(a)-(c) the developed area encompasses the larger urbanized area as well as isolated developed subdivisions beyond the urbanized area. Developed area also recognizes vested land development interests by identifying land that is planned and permitted and where construction is underway. FEMA indicates that while the communities will need to include a map of developed areas in the initial application, the map may be later amended to include any additional areas that are developed (or where construction has begun) during the time before the map becomes official. After FEMA sends the letter of final determination on the AR Zone, the communities will then have time to legally adopt their official map.

C. Benefits of AR Zone

The AR Zone designation helps eligible communities establish levee restoration plans that, when implemented properly, will allow the communities to remove the SFHA designation from the previously protected areas as soon as the levee system is restored. With this AR Zone designation indicating that a restoration plan is in place, developers will be more confident in the long-term success of their investments.

There are other significant benefits. The flood insurance premium rates are lower in SFHAs designated AR Zone than the rates in SFHAs with other flood insurance risk zone designations. Rates in the AR Zone are similar to the rates available to people who have purchased insurance while the area is recognized as protected and grandfathered into the required program. The structure elevation requirements in AR Zone areas are more relaxed than the elevation requirements in other SFHAs[10]. The designation of AR Zone areas also provides a strong incentive for communities to expeditiously restore base flood protection in at-risk areas.

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[9] There are currently three communities in the Metro East that are not part of the NFIP that can be included in the requested application. If they applied on their own, they would not be eligible. However, the remapping process can include these communities in a joint application. Therefore it is considered preferable to consolidate the process, with each of the counties to apply for the AR Zone designation on behalf of all communities. See Appendix B for a list of all elements needed for a request.

[10] In areas designated as AR Zone, the minimum elevation required for all new construction in areas identified as developed is 3 feet above the highest adjacent grade or the AR Zone Base Flood Elevation, whichever is lower. For new construction in AR Zone that is outside areas already designated as developed, the requirement is 3 feet in areas where base flood depth are projected to be less than five feet or the AR Zone Base Flood Elevation for any areas where the projected flood depths exceed 5 feet.

D. Zone A99

As adequate progress is made on any levee reconstruction project, a community may request FEMA to revise the AR Zone designation to A99. Zone A99 designation indicates that for insurance rating purposes, the levee is considered complete. However, NFIP insurance requirements still apply.[11] Adequate progress includes: 100% project funding authorized; 60% appropriated; 50% project cost expended and all critical features as determined by FEMA are under construction and at least 50% completed. The Zone A99 designation is based on the protection from base flood (100-year flood). As soon as FEMA is notified that the project is complete, FEMA can remap the area to delineate a flood-protected zone.

[11] While insurance is still required, it will be offered at the lower rates available in protected zones.

IV. Current Status of Deficient Illinois Levees

Although all of the levees in the American Bottoms held during the 1993 flood, all of them required flood fighting – use of sand bagging around sand boils that occur from underseepage, additional rock brought in to shore up certain areas, etc. According to FEMA rules, the Corps of Engineers was asked to certify that the levees would hold without support of flood fighting. At that juncture, the Corps determined that by its own rules governing levels of safety they could not certify that the levees are capable of providing base flood protection.

The Corps requires that levees exceed minimum design requirements and they measure it by something called a Factor of Safety (FS). Factor of Safety is a calculation of the risk that a failure will occur. Therefore, although an FS of 1.0 means that a structure meets minimum theoretical design requirements the Corps requires a minimum FS of 1.6 to provide a margin of safety, thereby reducing the risk that a structural failure will occur. Tables 2 through 5 on the next few pages specifically show in the far right hand column how seepage deficiencies are rated with the Factor of Safety.

The Corps of Engineers studies to date have all focused on maintaining a 500-year flood protection. However, FEMA requirements for the remapping process require that the levees only need to protect for a base flood, a less stringent requirement. Therefore, the Corps cost estimates and much of the projected work reported here exceed the minimum necessary to meet base flood protection. It is difficult to separate out costs, since much of the project work addresses structural aspects of the levees. Data available at the beginning of this process in September 2007 was therefore based on estimated costs for 500-year protection. The Corps has been providing updated analyses as they develop estimates for protection for base flood levels. Table 6 in Section V provides the most up to date information available.

The federal government requires that all Corps projects have a 35% local match contribution, except for federally owned projects. The Chain of Rocks levee borders the barge canal that is a federal project, so it does not require a local match.

Wood River Drainage and Levee District

The Corps of Engineers divides the Wood River District into three parts, because there are three independent levee systems in the district. Table 2 (on pages 23 and 24) provides a summary of the deficiencies for each of the three sections.

Over the last several months the Corps has worked to define actual costs to improve the levee to base flood protection. The Corps has now determined that to meet the base flood protection, they must build 60 relief wells for underseepage control at a cost of approximately $4 million. Moreover, in order to complete the certification of the levee at the 33-year flood as required for the AR Zone designation, the Corps is looking for other funds internally to complete an assessment of the condition of gravity drains. In the short term, to meet the base flood protection the Corps will work with the levee district to create an operational protocol for use in case of

rising waters. They expect to have the evaluation of the drains and the protocol in place in time to meet the January 30 date for submitting the AR Zone application.

Table 2a
Deficiencies in the Wood River Drainage and Levee District – Upper Levee System

Levee Feature Type	*Cause of Potential Problems*	*Total Number of Features*	*Number of Features Affected by 100-Yr Flood*	*Predicted Performance During a 100-Yr Flood*
Gates	Corrosion of Steel Gates	6	4	No Anticipated Problems Except For Gate Leakage
Seepage	Design	Levee Length 27,430 LF	Levee Length 27,430 LF	Anticipate Seepage Problems 23,270 LF FS* ≥ 1.6 2,880 LF 1.3 ≤ FS < 1.6 1,280 LF FS < 1.3
Drains	Exceeded Design Life	6 3 - 18” CMP 2 - 60” CMP* 1 - 72” CMP	6 3 - 18” CMP 2 - 60” CMP* 1 - 72” CMP	Anticipate Problems w/ CMPs Past Poor Performance 1973 2 – 60” CMPs Failed

CMP= Corrugated Metal Pipe
* Lined With 54” HDPE Pipe

Source: USACE, St. Louis District

Table 2b
Deficiencies in Wood River Drainage and Levee District – Lower Levee System

Levee Feature Type	*Cause of Potential Problems*	*Total Number of Features*	*Number of Features Affected by 100-Yr Flood*	*Predicted Performance During a 100-Yr Flood*
Gates	Corrosion of Steel Gates	17	9	No Anticipated Problems Except For Gate Leakage
Seepage	Design Deficiency	Levee Length 72,020 LF	Levee Length 54,900 LF	Anticipate Seepage Problems 47,970 LF FS ≥ 1.6 1,590 LF 1.3 ≤ FS < 1.6 5,340 LF FS < 1.3
Drains	Exceeded Design Life	27 1 - 18" CMP 6 - 24" CMP 5 - 30" CMP 2 - 36" CMP 4 - 42" CMP 5 - 48" CMP 1 - 60" CMP* 1 - 72" CMP** 2 - 72" CMP	27 1 - 18" CMP 6 - 24" CMP 5 - 30" CMP 2 - 36" CMP 4 - 42" CMP 5 - 48" CMP 1 - 60" CMP* 1 - 72" CMP** 2 - 72" CMP	Anticipate Problems w/ CMPs Past Poor Performance 1993 1 – 60" CMP Failed 2005 1 – 72" CMP Failed (Riverside of Gatewell)

* Lined With 54" HDPE Pipe

Table 2c
Deficiencies in Wood River Drainage and Levee District – East & West Forks

Levee Feature Type	*Cause of Potential Problems*	*Total Number of Features*	*Number of Features Affected by 100-Yr Flood*	*Predicted Performance During a 100-Yr Flood*
Gates	Corrosion of Steel Gates	3	0	No Anticipated Problems Except For Gate Leakage
Seepage		Levee Length 14,570 LF	Levee Length 1,700 LF	No Anticipated Problems 14,570 LF FS ≥ 1.6 0 LF 1.3 ≤ FS < 1.6 0 LF FS < 1.3
Drains	Exceeded Design Life	8 1 - 12" CMP 2 - 24" CMP 3 - 36" CMP 1 - 42" CMP 1 - 48" CMP	8 1 - 12" CMP 2 - 24" CMP 3 - 36" CMP 1 - 42" CMP 1 - 48" CMP	Anticipate Problems w/ CMPs

Source (2b and 2c): USACE, St. Louis District

The Corps estimates a total cost of $33 million to re-establish 500-year protection along the Wood River Levee. The Corps is developing plans for lining the larger pipes (36 inches and larger) and replacing any smaller pipes that are showing signs of failure. Additional relief wells are also needed. Local match required for all reconstruction work will be approximately $11.5 million.

Now that the Water Resources Development Act of 2008 (WRDA) has become law, the Wood River Levee District 500-year levee protection project is authorized. If the 2008 federal budget provides an appropriation for the project ($685,000 is in the House version of the bill), it will enable work to start on the levee repair. The levee district will need $621,000 to meet it 35% obligation and catch up on its share of match from earlier work. Madison County has committed to making a loan to the levee district to cover any shortfall in levee district funds for that initial match, and the county will make that funding available in early 2008. In addition, the levee district is implementing a reassessment in this fiscal year that will take effect by the end of 2008. This reassessment will enable the district to raise close to $1 million per year, and to offer bonds to pay, in advance of federal funding, for reconstruction to protect at the base flood elevation requirements.

In order to begin work under the federal cost share program once federal funds are appropriated, Madison County and the Corps will need to sign a Project Cooperation Agreement (PCA) that details cost sharing arrangements. It is possible to write that agreement so that the county can front load its share of the costs, and receive credit for its local match to federal dollars. However, this may be risky since payback would be contingent on congressional approval of future appropriations. Therefore, the Corps Headquarters and the Assistant Secretary of the Army are reluctant to approve such agreements.[12]

With all money in hand, the Corps estimates a minimum of 18 months to two years to complete the 60 relief wells that should bring certification for base flood protection. (The process requires design of the relief wells, contracting for the work, permits, and then construction.)

Chain of Rocks

The Chain of Rocks levee is a 100% federally funded project that is fully authorized and will be completed in approximately five to seven years at current rates of federal appropriations. Authorized at $46,400,000, the project is nearly half complete. There is $4.5 million in the FY 08 Budget, and $22.4 million that remains to be appropriated. This levee provides critical protection to the central region of the Metro East Sanitary District; therefore the certification of

[12] Local Corps officials said that it is theoretically possible to obtain a PCA that commits the Corps to credit local funds expended in advance, if and when appropriations are ever made, without guaranteeing that the appropriation will be made. A commitment can also offer potential for reimbursement of local funds, if the amount spent locally exceeds that total amount necessary for local match, but it likewise does not provide a guarantee. In the case of St. Louis City, an effort to obtain special legislation that would commit the Corps to provide reimbursement of local funds spent before there was a congressional appropriation was unsuccessful in 2007. The Corps and the City are now waiting to see if there is an appropriation, which will enable the city to expend money with confidence that it will be reimbursed. If there is no appropriation (due to continuing resolutions on the federal budget), representatives from the Corps suggest that the City may seek to act on a PCA that does not guarantee credit or reimbursement of expenditures.

the entire district will be contingent on completion of repairs to Chain of Rocks and the Metro East Levee.

Table 3
Deficiencies in Chain of Rocks Canal East Levee

Levee Feature Type	*Cause of Potential Problems*	*Total Number of Features*	*Number of Features Affected by 100-Yr Flood*	*Predicted Performance During a 100-Yr Flood*
Seepage	Design Deficiency	Levee Length 46,500 LF	Levee Length 46,500 LF	No Anticipated Problems when implementing USACE Flood Operating Plan
Drains		1	1	No Anticipated Problems

Source: USACE, St. Louis District

Metro East Sanitary District

The East St. Louis Levee will require an estimated $40 million to restore. The Engineering Design Report, which is 40% complete, will be finished in September 2008, at which time more accurate figures will be available. The initial rehabilitation project for this levee was authorized and has a $2.5 million appropriation. Table 4 below shows the identified deficiencies.

Table 4
Deficiencies in Metro East Sanitary District

Levee Feature Type	*Cause of Potential Problems*	*Total Number of Features*	*Number of Features Affected by 100-Yr Flood*	*Predicted Performance During a 100-Yr Flood*
Gates	Corrosion of Steel Gates	20	015	No Anticipated Problems 2 Closures Closed With Crushed Stone Fill
Seepage	Design Deficiency	Levee Length 105,987 LF	Levee Length 105,987 LF	Anticipate Seepage Problems 69,112 LF FS ≥ 1.6 2,400 LF 1.3 ≤ FS < 1.6 34,475 LF FS < 1.3
Drains	Exceeded Design Life	5 1 - 12” CMP 1 - 18” CMP 1 - 24” CMP 2 - 84” CMP	8 1 - 12” CMP 1 - 18” CMP 1 - 24” CMP 2 - 84” CMP	Anticipate Problems w/unlined CMPs

Source: USACE, St. Louis District

At current rates of appropriation, which the Corps estimates at $4 million per year, this project will take seven years (beginning in 2009) to complete, and require a total of $14 million in local match or $2 million per year over the seven years. Legal authority may determine that the district can use its Liability and Tort Fund revenues to advance its share of the project cost, and thus complete reconstruction to base flood protection. However, since Chain of Rocks and Metro East are a combined levee system, the protection will only be available when both are certified.

Prairie Du Pont and Fish Lake Districts

Although the problems are identified by each district these two levees are treated as one project by the Corps of Engineers as they plan the Design Deficiency Study. The Corps has identified potential problems with the levees as shown in Tables 5a and 5b.

Table 5a
Deficiencies in Prairie Du Pont Levee and Sanitary District

Levee Feature Type	*Cause of Potential Problems*	*Total Number of Features*	*Number of Features Affected by 100-Yr Flood*	*Predicted Performance During a 100-Yr Flood*
Gates	Corrosion of Steel Gates	5	4	No Anticipated Problems - 2 Closures Closed With Crushed Stone Fill
Seepage	Design Deficiency	Levee Length 54,575 LF	Levee Length 54,575 LF	Anticipate Seepage Problems 40,100 LF FS ≥ 1.6 11,475 LF 1.3 ≤ FS < 1.6 3,000 LF FS < 1.3
Drains	Exceeded Design Life	9 1 - 12” CMP 1 - 14” CIP* 1 - 24” CMP 1 - 24” CMP* 1 - 36” CMP 1 - 36” CMP* 1 - 48” CMP* 2 - 60” CMP*	9 1 - 12” CMP 1 - 14” CIP* 1 - 24” CMP 1 - 24” CMP* 1 - 36” CMP 1 - 36” CMP* 1 - 48” CMP* 2 - 60” CMP*	Anticipate Problems w/ unlined CMPs

* Lined With HDPE Pipe

Source: USACE, St. Louis District

Table 5b
Deficiencies in Fish Lake Drainage and Levee District

Levee Feature Type	*Cause of Potential Problems*	*Total Number of Features*	*Number of Features Affected by 100-Yr Flood*	*Predicted Performance During a 100-Yr Flood*
Gates		0	0	No Gates Exist
Seepage	Design Deficiency	Levee Length 25,613 LF	Levee Length 25,613 LF	Anticipate Seepage Problems 5,384 LF FS ≥ 1.6 6,029 LF 1.3 ≤ FS < 1.6 14,200 LF FS < 1.3
Drains	Exceeded Design Life	9 1 - 18" CMP 1 - 30" CMP 3 - 84" CMP	9 1 - 18" CMP 1 - 30" CMP 3 - 84" CMP	Anticipate Problems w/unlined CMPs

Source: USACE, St. Louis District

The Corps estimates $2 million is needed for the Design Deficiency Study, of which $700,000 will be required as local match. Since the two districts combined bring in only $165,000 annually, there is concern about meeting the local match even for this initial reconnaissance. The Prairie Du Pont District reports that it has already committed to put up $250,000 of necessary match toward the proposed Corps study and has an agreement from St. Clair County to cover the rest. They are hoping to secure a portion from Monroe County and the Fish Lake District.

Reconstruction costs are not known at this time, but the Corps has given an unofficial estimate of $20-25 million. The length of levee that has been identified as potentially deficient is approximately the same as the Chain of Rocks levee, and that project cost is $46 million; therefore, a worst case estimate could reach $52 million with inflation factored in over a ten year period. Conservatively then, the local match required is in the range of $7 million to $18.2 million.

Levee district officials in Fish Lake and Prairie Du Pont have stated that they intend to ask the Corps of Engineers to re-consider the decertification of the levees in that area. Citing the fact that the levees effectively withstood the 1993 and 1995 floods and that since that time the levees have had significant updates to pumps and gates, district officials do not believe that the levees should be decertified without more research. Their recommendation is that the levees be provisionally certified[13] pending the results of the Design Deficiency Study proposed by the Corps of Engineers. The levee officials say they support the importance of the Design Deficiency Study, but argue that without the study there is no sound basis for decertification now.

[13] The PAL – Provisionally Accredited Levee – procedure was established primarily to assist levee owners, the community, or local project sponsors by providing additional time to gather full documentation on a levee that is eventually expected to be accredited. Such provisional accreditation will rely on close cooperation with the Corps of Engineers.

V. Project Costs and Schedule

The total cost to address all design deficiencies and reconstruction in the five levees that comprise the Southwestern Illinois levee system presented in this report will be somewhere between $136 and $180 million in year of expenditure dollars.[14] Since the Corps has not completed necessary studies, particularly in the Prairie Du Pont and Fish Lake Districts, this is a very preliminary estimate, but it is a good indication of the scale of funding required to restore the flood protection system in the region.

Ultimately these expenditures will bring the levees up to the 500-year base level of protection. To date, federal project authorizations total $78.5 million and $28.1 million has been appropriated. It is important to realize at this stage that not all levees will be eligible for certification at the same time. However, given a proactive strategy and disciplined schedule to correct the deficiencies it is reasonable that each levee in the system can be certified within the 10 year time period allowed by the AR Zone classification.

As noted above, progress in necessary studies and repair activities for each district varies widely in terms of congressional authorization, rates of federal appropriation and capacity for local sponsorship.

Below in Table 6 is a summary of the current status of each of the five levees, and a visual image of the levees and financial requirements is shown in Figure 11.

In order to pay for construction work, the Corps depends on authorizing legislation for each individual project, and a subsequent series of annual budget appropriations leading to completion of the project. The slow pace of appropriations could significantly delay project completion. The Corps adheres to a specific protocol and sequence of project phases to ensure orderly progress of engineering design and construction leading to completion of the project as shown in Table 7.

[14] The term "year of expenditure" means that the projected costs have been adjusted upward to include annual inflation in construction costs.

Table 6
Summary of Estimated Project Costs and Status of Funding

	Levee District					Total
	Wood River	*Metro East*	*Chain of Rocks*	*Fish Lake*	*Prairie Du Pont*	
Repair and Reconstruction Cost	$29.6	Est. $40-$52	$46.6	Unknown, see PDP	Unknown; estimate $20 to $52	$136 to $180[1]
Federal Funds Authorized/Appropriated	$29.6/ $1.6	$2.5 / $2.5	$46.4 / $24	0	0	$78.5 / $28.1
Remaining Federal Funds to be Authorized/Appropriated	0/ $28	Est. $26 / $26	0 / $22.4	See PDP	$20 to 52/ TBD	$46 -78 / $96 - 128
Local Matching Funds Required / Spent	$9.9 / $0.4	$14 / 0	0	See PDP	$7 to $17.5 / 0	$31 to $47
Estimated Time to Complete	3 to 7 years	10 years	5 to 7 years	10 years	10 years	10 years

Note: All dollar amounts in $ millions. When different time or cost estimates have been provided by sources for this report, the longer time period and higher cost estimate is shown.

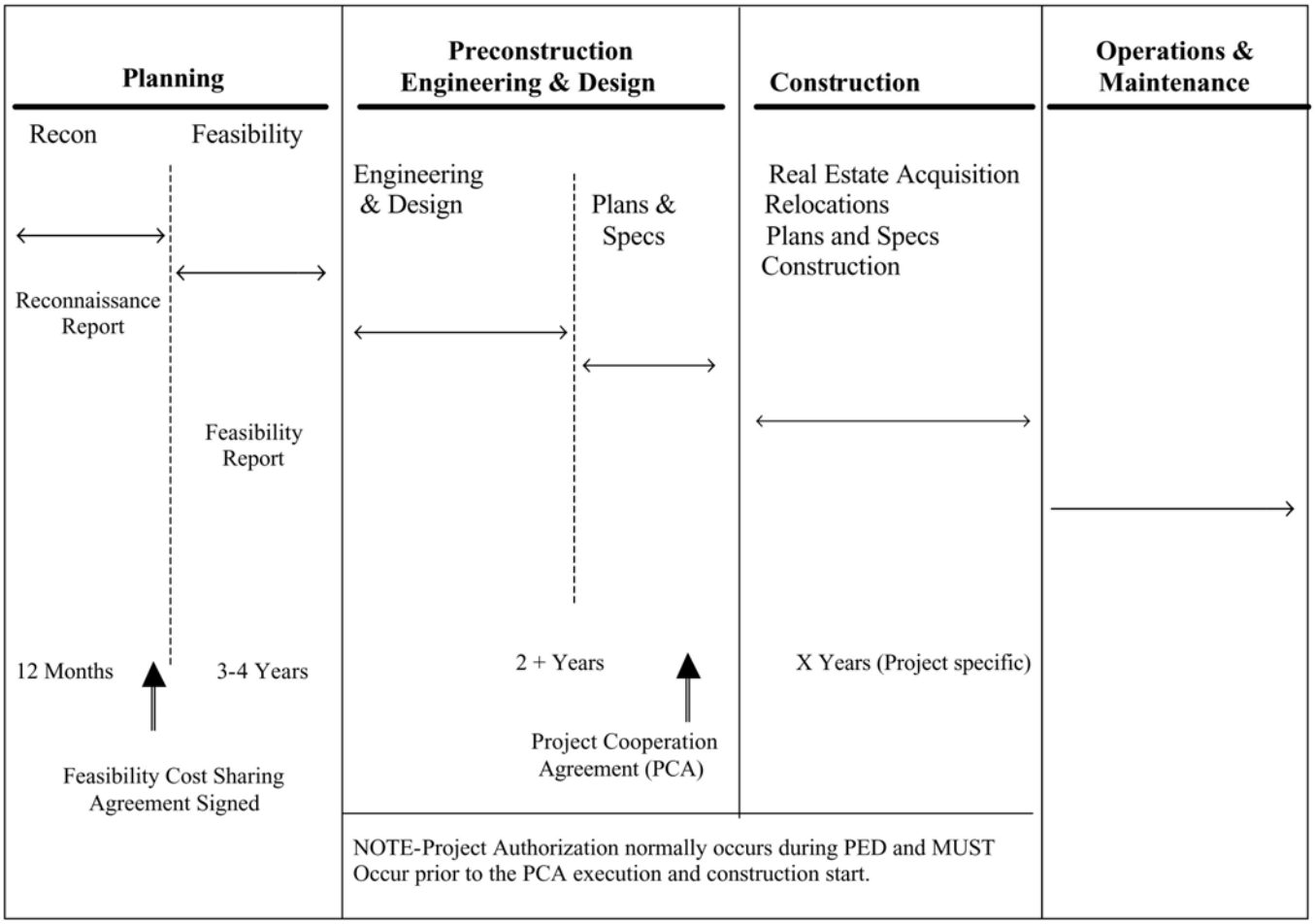
[1] Costs shown are in year of expenditure dollars, adjusted for inflation.

Table 7
Fiscal Capacity of Levee Districts

	Levee District					Total
	Wood River	*Metro East*	*Chain of Rocks*	*Fish Lake*	*Prairie Du Pont*	
Annual Revenue	$656,584	$3,678,258 [2]	NA	$26,000	$426,291	$4,787,133
Annual Operating Expenses	$554,378	$3,261,626	NA	$5,000	$394,827	$4,215,831
Funds Potentially Available for Capital Expenditures	$1,279,750	$4,262,360	NA		$659,349 cash & equivalent	$6,201,459
Local Matching Funds Needed	$4,101,200	$14,000,000	none	- - - $750,000 - - -		$18,851,200
Revenue Source(s)	Property tax EAV [1]	Assessed valuation direct tax/Illinois sales tax	Federal Appropriations	Maintenance assessment / Construction assessment & additional repair	EAV property tax /stormwater tax	

[1] Equalized Assessed Valuation
[2] Tort liability fund potential: add $6,698,104

Table 8
Corps of Engineers Levee Project Phases



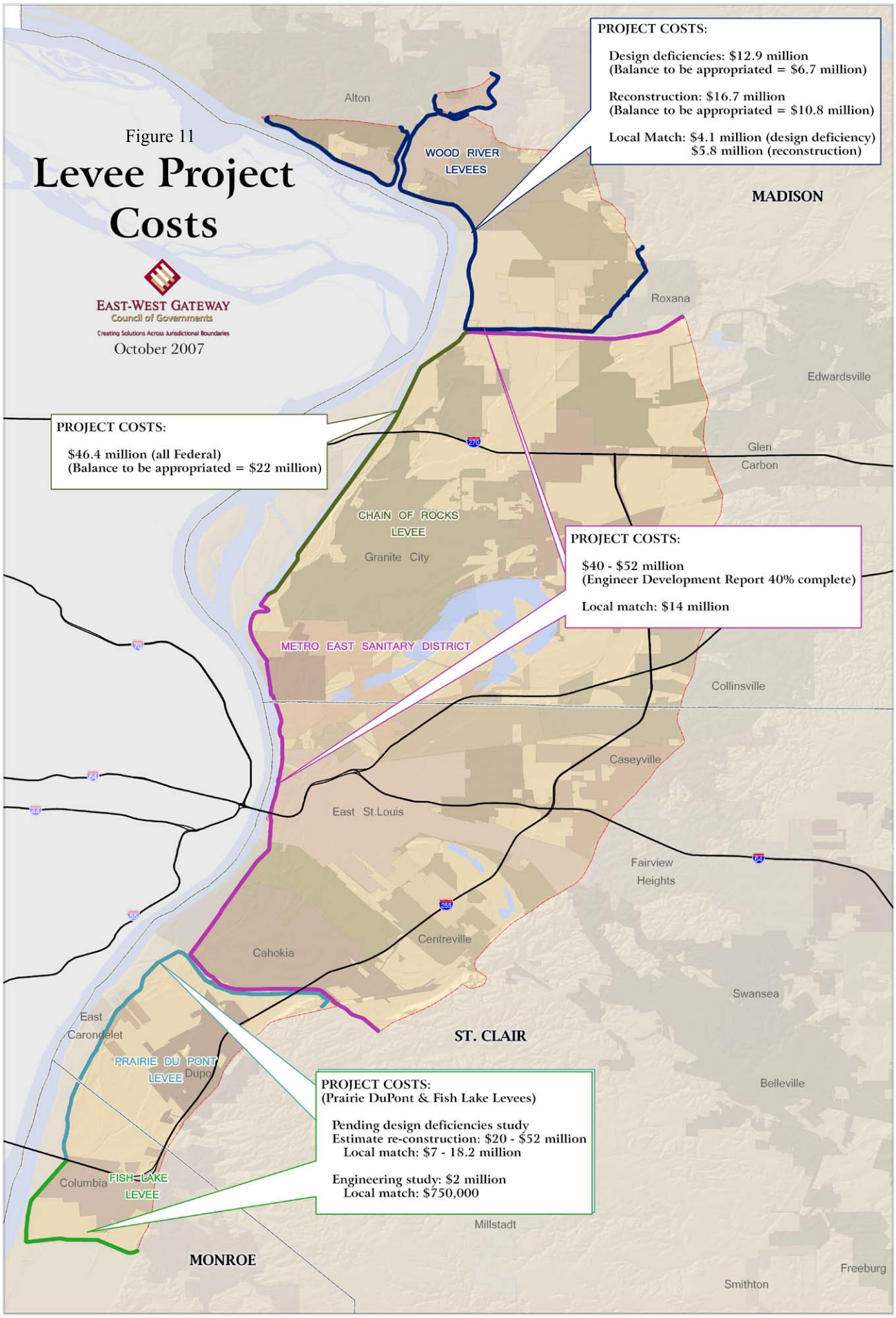


Figure 11
Levee Project Costs
EAST-WEST GATEWAY
Council of Governments
Creating Solutions Across Jurisdictional Boundaries
October 2007
PROJECT COSTS:
Design deficiencies: $12.9 million
(Balance to be appropriated = $6.7 million)
Reconstruction: $16.7 million
(Balance to be appropriated = $10.8 million)
Local Match: $4.1 million (design deficiency)
$5.8 million (reconstruction)
PROJECT COSTS:
$46.4 million (all Federal)
(Balance to be appropriated = $22 million)
PROJECT COSTS:
$40 - $52 million
(Engineer Development Report 40% complete)
Local match: $14 million
PROJECT COSTS:
(Prairie DuPont & Fish Lake Levees)
Pending design deficiencies study
Estimate re-construction: $20 - $52 million
Local match: $7 - 18.2 million
Engineering study: $2 million
Local match: $750,000
Alton
WOOD RIVER LEVEES
MADISON
Roxana
Edwardsville
Glen Carbon
CHAIN OF ROCKS LEVEE
Granite City
METRO EAST SANITARY DISTRICT
Collinsville
Caseyville
East St.Louis
Fairview Heights
Centreville
Cahokia
Swansea
East Carondelet
PRAIRIE DU PONT LEVEE
ST. CLAIR
Belleville
Columbia
FISH LAKE LEVEE
Millstadt
MONROE
Freeburg
Smithton
Legend
CHAIN OF ROCKS LEVEE
FISH LAKE LEVEE
METRO EAST SANITARY DISTRICT LEVEE
PRAIRIE DU PONT LEVEE
WOOD RIVER LEVEES
LEVEES
WATER FEATURE
INTERSTATE HIGHWAY
COUNTY BOUNDARY
LEVEE PROTECTED AREA
N
0
1
2 Miles

A normal Reconnaissance Report, the first order of business for the Corps, leading to a Feasibility Report, takes about twelve months to complete. A Feasibility Report can take three to four years. The next project phase is Preconstruction Engineering & Design, which can take two years or more to complete and includes the Engineering and Design Study. Typically each of these processes is funded separately and requires a separate Project Cooperation Agreement (PCA) signed between the Corps and the levee district(s). Before a PCA can be signed, Congress must authorize the project and at least some funds must be appropriated. The Construction Phase, which includes any real estate acquisition and plans and specifications for construction can also take two years or more.

The Corps has indicated they have a well-defined administrative system to assure expeditious letting of contracts for construction and re-construction work. The final project phase is the Certification Study conducted by the Corps and funded by Inspection of Completed Works (ICW) federal funds. Operations and Maintenance falls on the shoulders of the local sponsors and levee districts, with periodic inspections done by the Corps. As Table 7 indicates, following this typical process can easily require twenty years, and ten years for a project from start to finish is exceptional.

There have been circumstances where local sponsors have exceeded the local cost share in order to expedite a certified levee project. Congress cannot, however, guarantee that the local sponsor will be reimbursed or credited in such a case. As part of a PCA, credits can be granted and the non-federal sponsor can accelerate a project. However, special care must be taken to draft appropriate language in the PCA to facilitate the potential for subsequent credit or reimbursement from the federal government.

VI. Next Steps – A Path to Rebuilding

A coordinated regional strategy will be the most effective way to address the repair and restoration of the flood control system in Southwestern Illinois. There are four levee districts that are individually responsible for maintaining flood control facilities, along with the Chain of Rocks Canal levee maintained by the Corps. The future of the five facilities are inextricably linked. Failure of any one will have regional consequences. We are therefore recommending that the leadership of the counties and levee districts adopt an overall regional strategy. That strategy might include the following next steps, all of which should be substantially accomplished by the end of January 2008:

A. Creation of a Leadership Task Force

The three affected counties should consider establishing a task force that can provide leadership in devising a strategy for action that includes development of a plan for repair and restoration of the levees that will most quickly secure FEMA protected zone status. The task force should have members from the public and private sectors and include representation by the affected levee districts.

The task force can be staffed by a public agency such as East-West Gateway Council of Governments or by private consultants. The group can provide a regular source of advice and feedback in the development and implementation of a plan and provide a source of local influence in obtaining support from other political entities.

B. Immediate Application for "AR Zone" Protected Status

In the absence of an immediate response, the decertification of levees will result in large areas being designated as special flood hazard areas when preliminary flood insurance rate maps are released in early 2008. This is the same designation that would be used if there were no levees at all in place and the area was completely unprotected from flooding. While those maps will not become final until approximately May 2009, the uncertainty and doubt created by the unprotected designation will have a chilling effect on plans and prospects for economic growth. The AR Zone is a transitional designation that recognizes that the area has been adequately protected from flooding in the past and is now in a transitional process to restore that protection. The AR Zone designation confirms there is a plan to restore the levees and also provides significant relief in the insurance rates and requirements for new development. Further, it will signal that there is a plan in place that will fully restore adequate flood protection within ten years.

FEMA has indicated that a joint application representing all communities involved in the National Flood Insurance Program will be an effective means of applying for the AR Zone. There are a number of specific steps required to qualify for AR Zone status. Those steps must be completed by the end of January 2008 to be assured that the preliminary maps will reflect the transitional status of the area. Completing the requirements will require an immediate mobilization of efforts to develop a financing plan and implementation plan. It will also require the agreement of every incorporated

area to comply with the terms of AR status. For a complete list of all of the steps to qualify for AR designation**,** see Appendix B.

C. Development of a Ten-Year Plan to Restore the Flood Protection System

The progress of each of the levee districts and the Corps in determining and repairing flood control facilities is uneven. The most advanced in the process is the Wood River Levee District, which has most or all of the needed federal funding now authorized although only partially appropriated. By contrast, the Fish Lake and Prairie Du Pont districts have very little funding in place and no planning and design work has been done. None of the districts, however, has made sufficient progress to avoid decertification and flood zone designation in the final flood insurance maps to be issued in May 2009. It appears that all are considering a plan to secure necessary funds to meet the local required match on the federal projects. Identifying the source of matching funds is needed to meet federal certification requirements. What is not so clear is whether the counties might have funds to move forward with the work without waiting for the slow process of the federal government funding.

To qualify for the beneficial AR Zone status, the community will have ten years to restore the flood control system. A ten-year plan would include financial, design and construction elements. While a ten-year plan can include use of federal funding to pay for 65% of the costs, at the current pace of appropriations (especially considering that much of the needed work is not yet authorized by Congress) ten years is an optimistic scenario for completion of all the work necessary to restore the levees. Any plan must therefore consider options for state and local funding that can speed the process of reconstruction, as well as options for speeding the planning, design and construction work should the Corps not be able to meet the ambitious schedule. FEMA has already indicated that an AR Zone application should use the full ten years allotted in describing the plan for completing the reconstruction, and notes that a more rapid completion will enable an earlier re-certification of the levees.

D. Secure Expert Assistance in Financing and Engineering

Given the substantial legal, financial, design and construction issues that will need to be addressed by local leadership, it will be useful to retain independent experts to advise on these subjects. While federal officials will continue to support local efforts at levee repair, the local leadership should have the benefit of independent advice on complex financial and engineering questions to be able, for example, to challenge the flood insurance maps or to work with the Corps to reduce the costs of needed repairs.

E. Community Engagement

Citizens and businesses will need to be fully aware of the risks of living in the flood plain, even when it is protected by levees. Further, the public and the business community will need to be partners in the adopted strategy of levee restoration.

If the counties agree to pursue a designation of AR Zone for the short term, then the community engagement process will also be important in obtaining the necessary resolutions in all of the affected cities and in building support for any necessary local funding to pay for the work that needs to be done to restore the levees as quickly as possible.

The community engagement effort should strongly emphasize the need for property owners to purchase flood insurance at favorable rates prior to the final maps being published in 2009. If this opportunity is lost, financial consequences on those property owners will be magnified considerably.

F. Secure Funding for Immediate Activities

Funding will be immediately required to maintain the current pace of local planning efforts to secure the AR Zone status, develop the ten-year strategy and plan for levee restoration, to form and staff the task force, and to retain appropriate expert assistance to support good decision-making by area leadership.

East-West Gateway may have approximately $200,000 available from the new comprehensive planning program for regional planning commissions that was recently authorized by the Illinois legislature to support staff efforts. Additional funds may be necessary to retain outside experts when needed.

It is critically important, given the substantial public safety and economic consequences involved, that the efforts to restore the flood control system in Southwestern Illinois move forward with energy and urgency. This will require a high degree of cooperation between local, state and federal authorities, and the full participation of the private sector. If the above steps can be substantially accomplished by the end of January 2008, that will send a signal to the federal government, the public and area businesses, that the regional leadership is engaged and focused on this important problem.

Appendix A: River Stages
Mississippi River Flood Stage Impacts

River Gauge Height	Impacts
54.0	The Metro East St. Louis and Fish Lake levees which protect 71,000 acres are overtopped.
52.0	St. Louis floodwall is overtopped.
50.6	This the 500-year frequency level.
49.6	This is the RECORD FLOOD LEVEL that was reached on August 1, 1993.
49.0	Hartford IL Public Water supply is threatened.
48.0	The Harrisonville and Prairie Du Pont Levees protect 37,360 acres.
47.9	This level is expected to be met or exceeded on average once every 200 year.
47.7	The Columbia levee protects 14,000 acres.
46.1	This river level is expected to be exceeded once in every 100 years.
44.1	This river level is expected to be exceeded once in every 50 years.
44.1	Chouteau Island Pump Station begins to flood. Power to the Chouteau Island Pump Station disconnected.
43.2	This flood level was reached on April 28, 1973.
42.0	Riverview Boulevard in City of St. Louis becomes flooded.
42.0	This level is expected to be met or exceeded on average once every 25 years.
41.1	This level is expected to be met or exceeded on average once every 20 years.
40.0	Major flooding begins. At this level the Chouteau Island levee, protecting 2,400 acres is overtopped.
38.5	This river level is expected to be exceeded once in every 10 years.

River Gauge Height	Impacts
36.0	Railroad tracks become flooded.
35.8	This level is expected to be met or exceeded on average once every five years.
35.0	Moderate flooding begins.
33.0	Floodwall at Prairie Street in the City of St. Louis is closed.
31.0	Water begins entering the downtown parking garage.
30.0	Floodwall at Laclede's Landing in City of St. Louis is closed. Also this level is expected to be met or exceeded on average once every two years.
26.0	At 26 feet, several levees protect 2,000 acres.
18.5	Levee parking begins to be inundated.

Source: National Weather Service http://www.weather.gov/ahps/forecasts.php

Appendix B: FEMA Notification Letter and AR Zone Submittal Requirements

DEACCREDITATION NOTIFICATION LETTER

[Mr./Ms.] (Full Name of Community official)
(Title of Community Official)
(Address)
(City, State Abbreviation, and Zip Code)

Dear **[Mr./Ms.] (Last Name of Community Official)**:

This letter is in regard to the levees shown on the effective Flood Insurance Rate Maps (FIRMs) and in the effective Flood Insurance Study (FIS) reports for communities in Madison, St. Clair and Monroe Counties in Illinois. As you may know, the Department of Homeland Security, Federal Emergency Management Agency (FEMA), is in the process of producing new flood risk maps for the nation and, as part of that effort, countywide FIS reports and Digital Flood Insurance Rate Maps (DFIRM) will be issued for Madison, St. Clair, and Monroe Counties.

As part of FEMA's effort to produce the DFIRM, it was determined that the flood hazard information presented on the effective FIRM and in the effective FIS report is based, in some areas, on flood protection provided by at least one of five levee systems in the Metro East area that include the following:

Wood River Drainage & Levee District
Chain of Rocks Levee
Metro East Sanitary District
Prairie Du Pont Levee & Sanitary District
Fish Lake Drainage & Levee District

Based on the information available and on the mapping standards of the National Flood Insurance Program (NFIP) at the time the FIS was performed, FEMA accredited these levee with providing protection from the flood that has a 1-percent-chance of being equaled or exceeded in any given year. The 1-percent-annual-chance flood also is referred to as the base flood.

Recently, FEMA was informed by the U.S. Army Corps of Engineers (USACE) that they have determined the levees identified above do not meet the requirements set forth in the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10), entitled "Mapping of Areas Protected by Levee Systems". Since the levees and levee systems identified above do not meet the requirements set forth in 44 CFR 65.10, they will be de-accredited and therefore will not be shown on the future DFIRM as providing protection from the base flood.

You were invited to a meeting hosted by the East West Gateway Council of Governments and Congressman Jerry Costello that was held on August 29, 2007 to discuss the status of the levees and FEMA's de-accreditation process. The area landward of the levee will be mapped as a Special Flood Hazard Area (SFHA) on the DFIRM when it is prepared. Therefore, federally regulated lenders will require the purchase of flood insurance on loans secured by structures located in the de-accredited area when the DFIRM becomes effective. In addition, continued participation in the NFIP will require your community to adopt and enforce local floodplain management regulations in these areas. It is highly recommended that you consider this risk in your local emergency management plans, including creating evacuation plans for this area.

Please note, there is a provision in the NFIP regulations that may be used in unique situations to allow

FEMA to map the areas previously shown as being protected by the levee (accredited) as a "Restoration" Zone (Zone AR). Initial information provided to us by the USACE indicates that these levees *may* meet the requirements for Zone AR designation. In order to be considered, the Chief Elected Official must provide a written request to FEMA for the restoration zone designation. There are specific submittal requirements that must be included with the request. Attached are several documents that may help you decide if you want to pursue the Zone AR designation. In order to be considered for a Zone AR designation when the preliminary map is distributed, your official request package must be received by this office by January 30, 2008.

FEMA will issue Preliminary Maps when the de-accredited mapping is completed. At that time, FEMA will conduct a Flood Risk Information Open House and will meet with local officials and the public regarding the revised maps. Following this meeting, a 90-day Appeal/Protest Period will be held. When all Appeals/Protests are resolved, FEMA will issue the Letter of Final Determination. Final DFIRMs will be distributed that will become effective 6 months after the date of the Letter of Final Determination.

We encourage you to inform property owners behind the levee of this change. FEMA has produced a variety of outreach materials which can be used to educate and inform the public about the risks associated with levees and how they can better protect themselves against those risks. These materials are located online at: http://www.fema.gov/plan/prevent/fhm/lv_intro.shtm.

If you need additional information or assistance, please contact Ms. Terry Reuss Fell, Chief of the Floodplain Management & Insurance Branch, by email at www.terry.fell@dhs.gov or by phone at 312-408-5587.

Sincerely,

Mr. Norbert F. Schwartz, Director
Mitigation Division
FEMA Region V

Enclosures:

44 CFR Section 65.10: "Mapping of Areas Protected by Levee Systems
Submittal Requirements for Restoration Zone (Zone AR) – (2 pages)
Flood Control Restoration Zone Requirements (4 pages)
AR Zone 44 CFR Section 65.14, part 60.3(f), and definition of "developed area"

cc: **Levee Owners**
(Community Floodplain Administrator)
Paul Osman, IL DNR/ NFIP State Coordinator
Mr. Les Sterman, EW Gateway Council of Governments
Colonel Lewis Setliff, USACE, St. Louis District
Senator Richard Durbin
Senator Barack Obama
Congressman Jerry Costello
Congressman John Shimkus

Submittal Requirements for Restoration Zone (Zone AR)

Restoration Zone (Zone AR) is a Special Food Hazard Area zone designation that may be used in areas where a Federal flood control system, such as a levee, that was certified as providing "base flood" or "100-year" flood protection has been shown to no longer provide that level of protection. A Federal agency, such as USACE, will notify FEMA and the communities of de-certification of the levee. The Zone AR designation on the community's Flood Insurance Rate Map indicates that the increased flood hazard is considered temporary until the flood protection system can again provide base flood protection. 44 Code of Federal Regulation (44 CFR) Section 65.14 of the National Flood Insurance Program (NFIP) regulations describes the procedures to follow and the types of information FEMA requires to designate an area as Zone AR. Based on FEMA's current regulations, the following are the eligibility and submittal requirements that need to be met and approved in order for FEMA to implement the Zone AR designation.

A community may be eligible to apply for this zone designation if FEMA determines that it is engaged in the process of restoring a flood protection system that was:

- Constructed using Federal funds;
- Recognized as providing base flood protection on the community's effective FIRM; and
- Decertified by a Federal agency responsible for flood protection design or construction.

The limitation of using this zone designation is that a community may have a flood control restoration zone designation only once while restoring a flood protection system. This limitation does not preclude future flood control restoration zone designations should a fully restored, certified, and accredited system become decertified for a second or subsequent time.

A community that receives Federal funds for the purpose of designing or constructing, or both, the restoration project must complete restoration not to exceed a maximum of 10 years from the date of submittal of the community's application for designation of a flood control restoration zone.

A community that does not receive Federal funds for the purpose of constructing the restoration project must complete restoration within a specified period, not to exceed a maximum of 5 years from the date of submittal of the community's application for designation of a flood control restoration zone.

The following list provides the application and submittal requirements for designation of a flood control restoration zone.

- The community must submit a written request, from the community CEO, to FEMA requesting the restoration zone designation.
- The request from the community CEO must include a legislative action by the community requesting the designation.

- At a minimum, the request from a community that receives Federal funds for the purpose of designing, constructing, or both, the restoration project must include:
  a. A statement whether, to the best of the knowledge of the community CEO, the flood protection system is currently the subject matter of litigation before any Federal, State, or local court or administrative agency, and if so, the purpose of that litigation;
  b. A statement whether the community has previously requested a determination with respect to the same subject matter from FEMA, and if so, a statement that details the disposition of such previous request;
  c. A statement from the community and certification by a Federal agency responsible for flood protection design or construction (e.g., USACE) that the existing flood control system shown on the effective FIRM was originally built using Federal funds; that it no longer provides base flood protection; and that it continues to provide protection from at least a 3-percent-annual-chance flood (33-year flood);
  d. An official map of the community or legal description, with supporting documentation, that the community will adopt as part of its floodplain management measures, which designates developed areas as defined in 44 CFR Section 59.1 of the NFIP regulations and as further defined in 44 CFR Paragraph 60.3(f) of the NFIP regulations;
  e. A restoration plan to return the system to a level of base flood protection. At a minimum, this plan must:
     - List all important project elements, such as acquisition of permits, approvals, and contracts and construction schedules of planned features;
     - Identify anticipated start and completion dates for each element, as well as significant milestones and dates; and
     - Identify the date on which "as built" drawings and certification for the completed restoration project will be submitted. This date must provide for a restoration period not to exceed the maximum allowable restoration period (10-years using Federal funds or 5-years using non-Federal funds) for the flood protection system.
  f. A statement identifying the local project sponsor responsible for restoration of the flood protection system;
  g. A copy of a study, performed by a Federal agency responsible for flood protection design or construction in consultation with the local project sponsor, which demonstrates a Federal interest in restoration of the system and which deems that the flood protection system is restorable to a level of base flood protection; and
  h. A joint statement from the Federal agency responsible for flood protection design or construction involved in restoration of the flood protection system and the local project sponsor certifying that the design and construction of the flood control system involves Federal funds, and that the restoration of the flood protection system will provide base flood protection.

Please Note: There is no requirement of having funds appropriated for Federally funded restoration projects. For non-Federally funded projects, all funding for the completion of the restoration project must be appropriated before a Zone AR designation can be approved.

Appendix C

FEMA Progress of Mapping Activities Nationwide

Click on the link above to access the 4 FEMA Maps - File size is about 8 mg.

Appendix D
Glossary

American Bottoms	Floodplain of the Mississippi River in southwestern Illinois which extends from Alton south to the Kaskaskia River.
ASA/OMB	Assistance Secretary of the Army (Civil Works) and Office of Management and Budget. Establishes national goals, funding ceiling, guidance, ensures policy compliance, measures performance.
BFE	Base Flood Elevation The elevation of a flood having a 1-percent chance of being equaled or exceeded in any given year.
Base Flood	The flood that has a 1 percent chance of being equaled or exceeded in any given year. Synonymous with 100-Year Flood.
Berms	Horizontal strips or shelves of material built contiguous to the base of either side of levee embankments for the purpose of providing protection from underseepage and erosion, thereby increasing the stability of the embankment or reducing seepage. Berms can be located on either side of levees, depending upon their purpose.
CMP	Corrugated metal pipe, part of gravity drain system. Can be unlined or lined with HDPE plastic pipe. Part of levee system.
CG	New start construction funds or Construction, general.
Closure Devices	Any movable and essentially watertight barrier, used in flood periods to close an opening in a levee, securing but not increasing the levee design level of protection.
Community	Any state or area or political subdivision thereof that has the authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. (County, city, town, village, etc.)
D & LD	Drainage and levee district
Design Deficiency	Defined as a project that does not or never has adequately achieved its purpose, has major structural oversights, or creates problems that could have been foreseen.
EDR	Engineering (and design) documentation report.

Factor of Safety (FS)	Factor of Safety (FS) is a calculation of the risk that a failure will occur. A factor of safety of 1.0 means that a structure meets minimum theoretical design requirements. The Corps requires that levees exceed minimum design requirements and have a FS of at least 1.6.
FEMA	Federal Emergency Management Agency Oversees the administration of the National Flood Insurance Program
FIRM	Flood Insurance Rate Map Insurance and floodplain management map produced by FEMA that identified area subject to flooding during a 1-percent flood event.
Flood	A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters or (2) the unusual and rapid accumulation or runoff of surface waters from any source.
Floodplain	A land area that is susceptible to being inundated by water from any source.
Floodplain Management	The operation of a program of corrective and preventative measures for reducing flood damage, including, but not limited to, emergency preparedness plans, flood control works and floodplain management regulations.
Floodwalls	Concrete walls constructed adjacent to streams for the purpose of preventing flooding of property on the landside of the wall; normally constructed in lieu of or to supplement levees where the land required for levee construction is more expensive or not available.
Gravity Outlets	Culverts, conduits, or other similar conveyance openings through the line-of-protection that permit discharge of interior floodwaters through the line-of-protection by gravity when the exterior stages are relatively low. Gravity outlets are equipped with gates to prevent river flows from entering the protected area during time of high exterior stages.
L & SD	Levee and sewer district
LERRDs	Land, easements, right-of-ways, relocations and dredged materials disposal areas.
Levee	A man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control or divert the flow of water so as to provide protection in flood plain areas from temporary flooding.
Levee Breach	A levee that is ruptured, broken or overtopped.

Levee Decertification	An official action by FEMA where accreditation is removed. The levee or levee system does not meet the standards in 44 CFR 65.10 and does not provide sufficient risk reduction against a base flood.
Levee System	Flood protection systems that includes all components that are interconnected and necessary to insure flood and storm damage reduction for the associated floodplain - levee/floodwall sections, closure structures, pumping stations, culverts, interior drainage works and system operation and maintenance. Such interconnected systems are constructed and operated in accordance with sound engineering practice.
Lines-of-Protection	Locations of levees or walls that prevent floodwaters from entering an area.
Main and Tributary Levees	Levees that lie along a main stream and its tributaries, respectively.
MVD	Mississippi Valley Division of U.S. Army Corps of Engineers St. Louis District part of this Division.
PCA	Project Cooperation Agreement Agreement between Corps and non-Federal Project Sponsor defining obligations of in construction, maintenance and cost sharing of project. Delineates funding commitments. After PCA is signed, construction can begin.
P&S	Design process and submittal requirements.
Piezometer	A small diameter water well used to measure the hydraulic head of groundwater in aquifers. Similarly, it may also be a standpipe, tube, vibrating wire piezometer or manometer used to measure the pressure of a fluid at a specific location in a column.
Pressure Conduits	Closed conduits designed to convey interior flows through the line-of-protection under internal pressure. The inlet to a pressure conduit that discharges interior flows by force of gravity must be at a higher elevation than the river stage against which it functions. Some pressure conduits may serve as discharge conduits from pumping stations.
Protected Zone	The floodplain behind a certified 100-year levee.
Provisionally Accredited Levee (PAL)	A FEMA procedure which assists the levee owners, the community or local project sponsors by providing additional time to gather full documentation on levees or levee systems that is close to or expected to receive FEMA accreditation.

Pumping Stations	Pumps located at or near the line-of-protection to discharge interior flows over or through the levees or floodwalls (or through pressure lines) when free outflow through gravity outlets is prevented by high exterior stages.
RCP	Reinforced concrete pipe, part of gravity drain system. Part of levee system.
Reconstruction	Defined as the project where the original constructed project continues to deliver the full benefits intended by Congress at the time of authorization. A reconstruction project does not change or expand the function or purpose of the project.
Stop Logs	Logs, planks, cut timber, steel, or concrete beams fitting into end guides between walls or piers to close openings in levees, floodwalls, dams, or other hydraulic structures. The stop logs are usually handled or placed one at a time. Part of levee system.
Street Gates	Closure gates used during flood periods to close roadway openings through levees or floodwalls.
Tie Back Levees	Levees that extend from the main levees along rivers, lakes, or coasts to bluff lines (high ground) and are part of the line-of-protection.
USACE	United States Army Corps of Engineers
WRDA	Water Resources Development Act Authorization bill that deems a project eligible for future funding.