

Kinnickinnic River Watercourse Rehabilitation Early Out Project Achieving Multiple Design Objectives

Thomas R. Sear, PE, CFM
Short Elliott Hendrickson

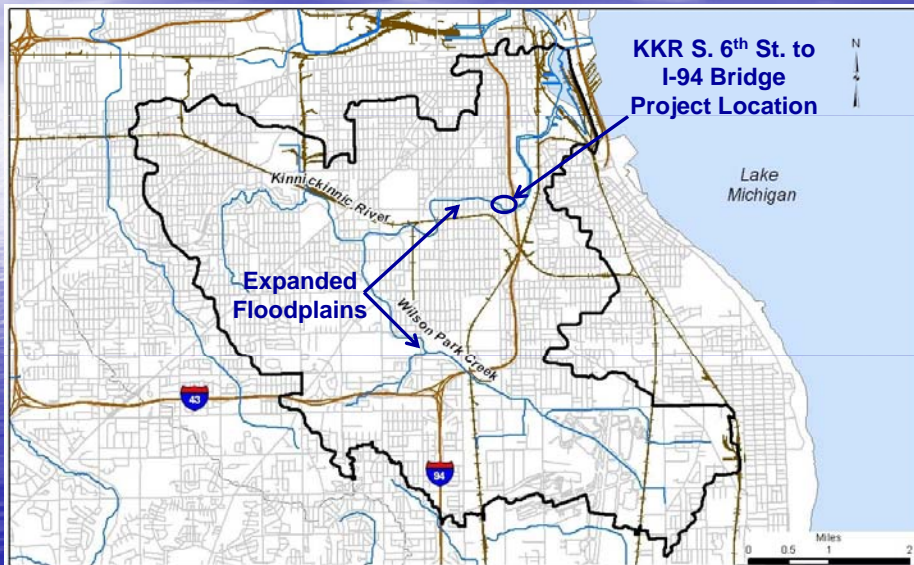


Patrick C. Elliott, PE
Milwaukee Metropolitan Sewerage District



milwaukee metropolitan sewerage district

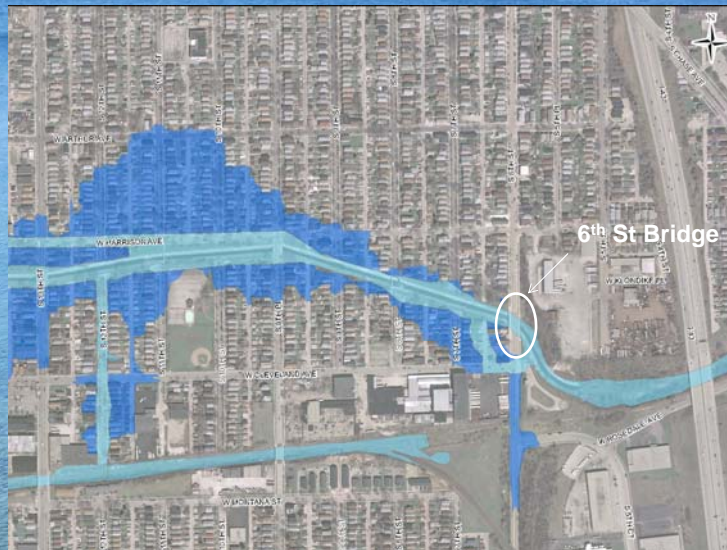
Kinnickinnic River (KKR) Watershed



Kinnickinnic River, "Improved" Channel



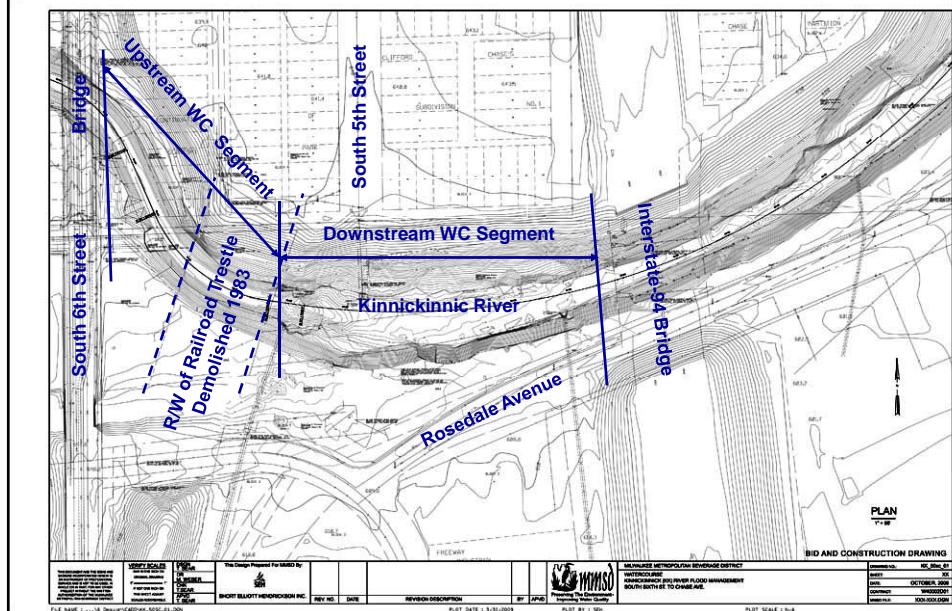
Updated Floodplain (SEWRPC, 2008)



KKR Stakeholder Meetings

- KKR Technical Stakeholder Group for KKR Mainstem Work: 6th – 27th
 - Neighborhood Plan for 6th – 16th Street
 - Included: City, County, WDNR, SEWRPC, Neighborhood & Business Groups, 16th Street Community Health Center, Local NGOs
- KKR 6th – I94 Bridge:
 - Early Out Projects
 - Response to 2008 Flood Event

KKR FM Project Limits



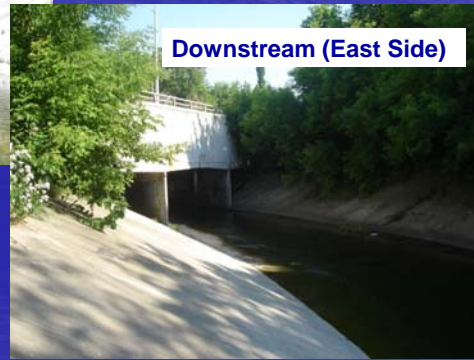
KKR FM Project Limits



KKR FM S. 6th St. to I-94 Bridge Project Area Characteristics

- South 6th Street Bridge
- Upstream Watercourse Segment
 - 500 feet of concrete lined channel
 - Confined cross-Sections
 - Steep northern embankment
 - MMSD CSO Facility on south
- Downstream Watercourse Segment
 - 500 feet of earthen / rock lined channel
 - Eroded north embankment, south of 5th Street
 - South embankment instability

KKR S. 6th Street Bridge Prior to Replacement



Proposed Improvements KKR S. 6th Street Bridge

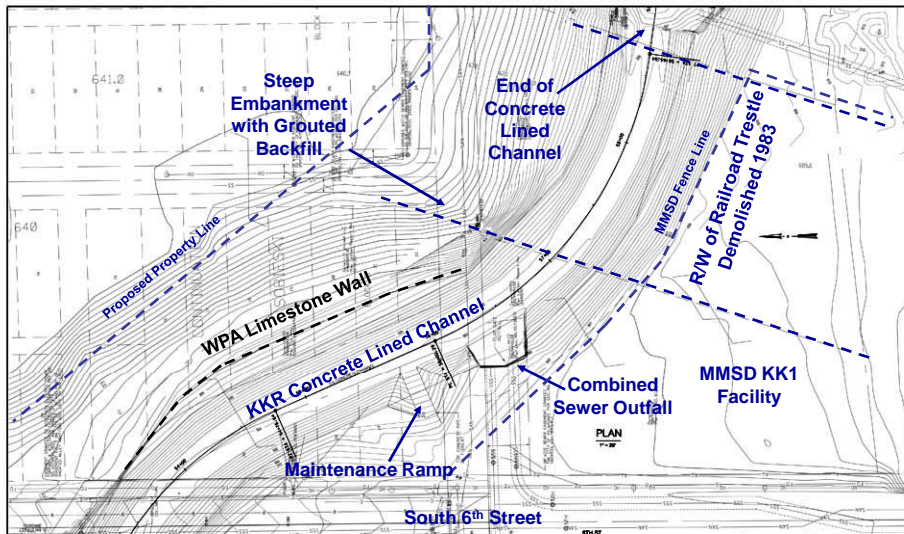
- Design Objectives
 - Significantly reduce upstream WSE's
 - Maintenance / bike path beneath bridge
- Proposed Design Features
 - Clear span concrete girder bridge
 - Functional, durable and attractive bridge
- Implementation
 - Final Design Completed December 2009
 - Construction Completed December 2010
- \$2.5 Million ARRA Grant

KKR S. 6th St. Bridge – December 2010

Upstream (West Side)



KKR Upstream Watercourse Segment



PROJECT TITLE KKR Upstream Watercourse Segment		DESIGNER BICOTT BLAUGHT RENOVATION INC.		DATE 9/30/2009		SCALE 1" = 20'	
CLIENT METRO		PROJECT NO. 09-001		DATE 9/30/2009		SCALE 1" = 20'	
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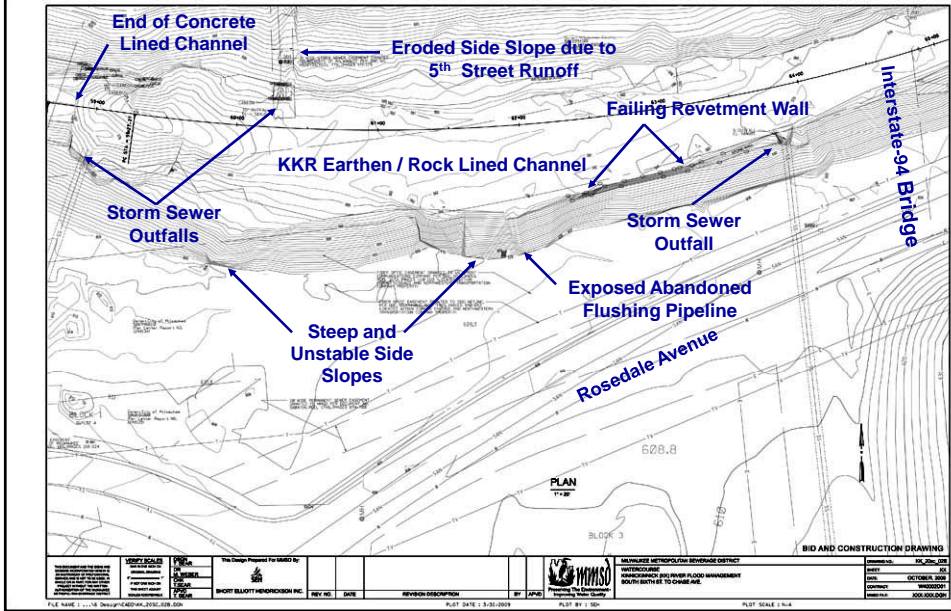
KKR Downstream of South 6th Street Bridge
June 7, 1961



KKR Upstream Watercourse Segment



KKR Downstream Watercourse Segment



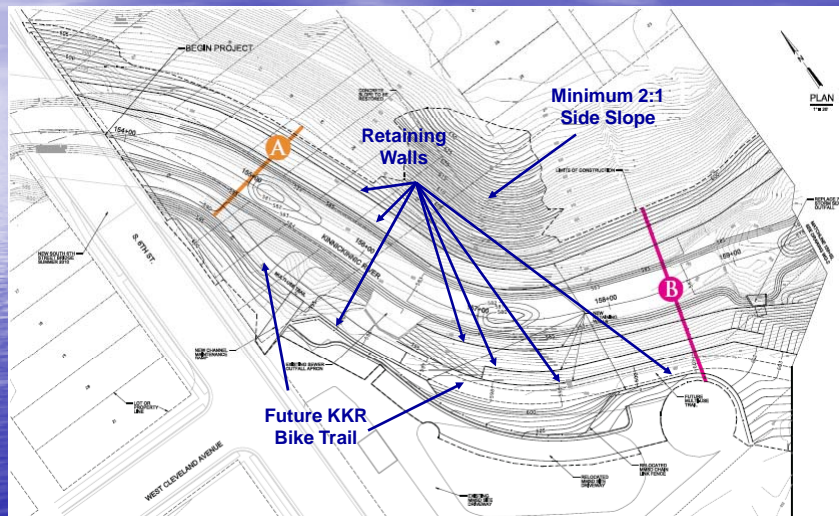
KKR Downstream Watercourse Segment



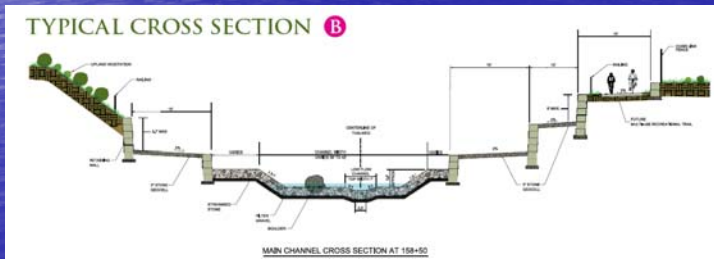
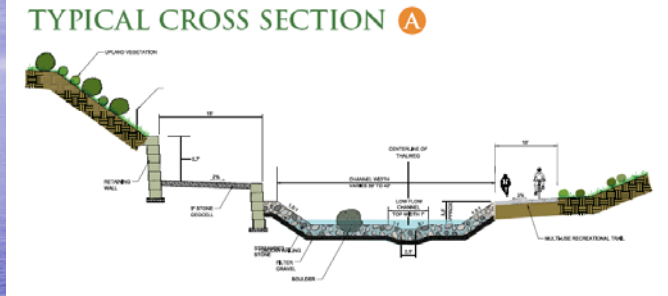
KKR Watercourse Improvements

- Design Objectives
 - Stone lined channel with riffles and pools
 - Maintain stable side slopes / hydraulic capacity
 - Native vegetation plantings
- Upstream Watercourse
 - Tiered retaining walls
 - 15 ft. wide maintenance / bike path
- Downstream Watercourse
 - 2:1 to 4:1 native vegetated side slopes
 - Reuse of limestone blocks

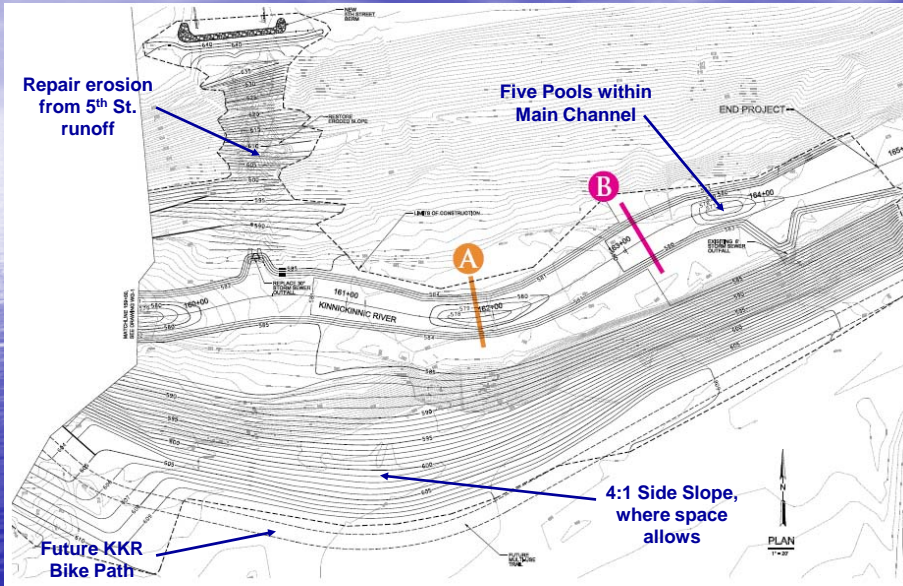
Upstream KKR Improvements



Upstream KKR Cross-Sections

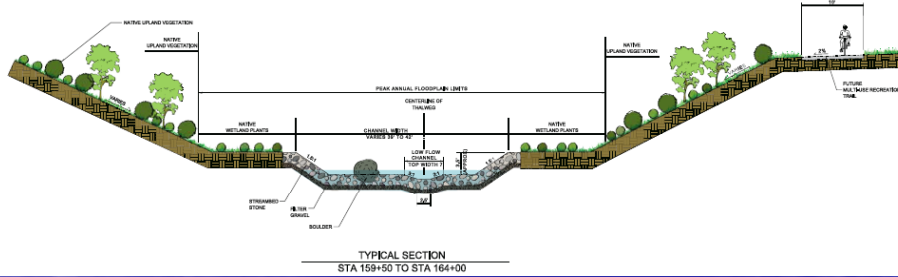


Downstream KKR Improvements



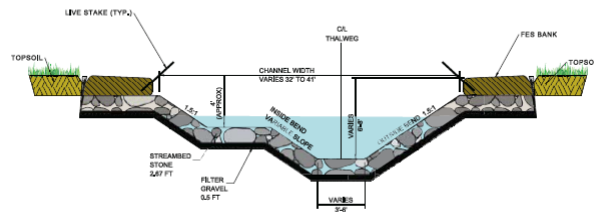
KKR Downstream Cross-Section

TYPICAL DOWNSTREAM CROSS SECTION

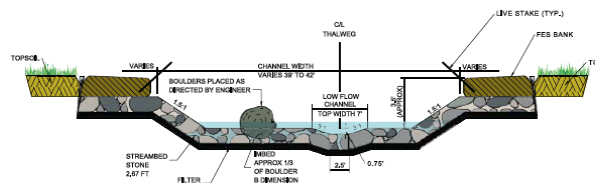


KKR Main Channel Cross-Sections

MAIN CHANNEL CROSS SECTION AT POOL (A)



MAIN CHANNEL CROSS SECTION AT RIFFLE (B)



2011 Watercourse Construction



KKR S. 6th St. Bridge and Watercourse

December 2011



Pre-Improvement



KKR Watercourse - Upstream Segment

December 2011



Pre-Improvement



KKR Watercourse - Transition Segment

December 2011



Pre-Improvement

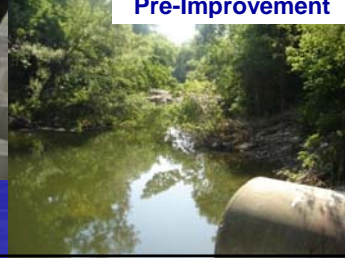


KKR Watercourse - Transition Segment

December 2011



Pre-Improvement



KKR Watercourse - Downstream Segment

December 2011



Pre-Improvement



KKR Watercourse - December 2011



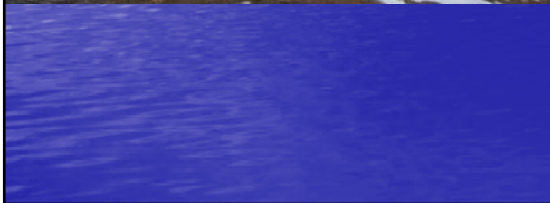
KKR Watercourse - December 2011



KKR Watercourse - January 2012

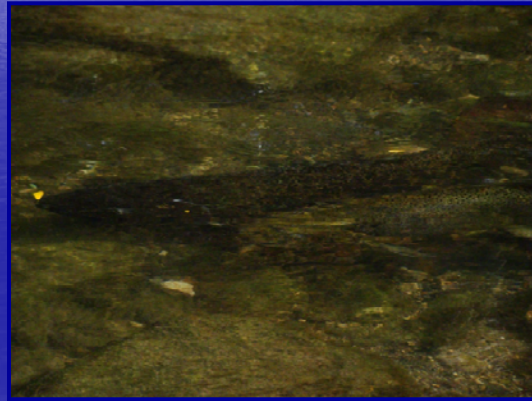


KKR Watercourse - January 2012

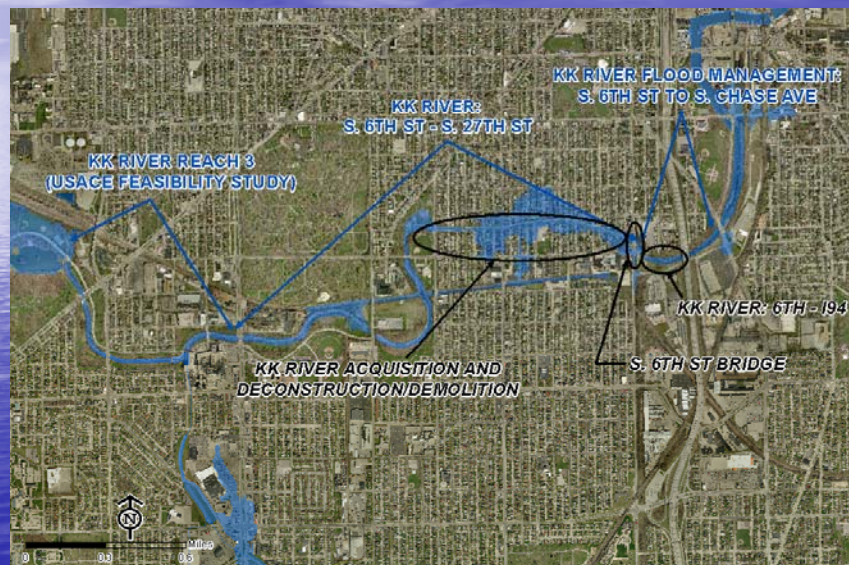


KKR Watercourse Rehabilitation Improvements Schedule

- Construction Start – September 2010
- Construction Completion – May 2012
- \$1.5 Million Great Lakes Restoration Initiative Grant



KK River Mainstem Projects



KKR Watercourse Rehabilitation Improvements Schedule

- S. 6th Street – S. 27th Street
 - Neighborhood Plan Completed 2010
 - Preliminary Engineering Completed 2011
 - Home Acquisition/Deconstruction Ongoing
 - 83 Structure Acquisitions (Voluntary)
 - 37 Structures Acquired To Date
 - 25 Structures Deconstructed To Date
 - Design & Construction Pending Funding
- S. 27th Street to Jackson Park
 - USACE Feasibility Study Ongoing (Sept 2012)

Kinnickinnic River S. 6th Street to I-94 SEH Project Team Members

- Dale Miller,
Mainstream
Restoration
- Rose Chmielewski,
Ecological Services of
Milwaukee
- Doug Bath, Gestra
Engineering

