St. Joseph Water Protection

Regulated by Missouri Department of Natural Resources, U.S. EPA

- Combined & Separate Sewer Systems
- Water Protection Facility
- Long Term Control Plan - 2008
Water Protection Facilities Plan

- Comprehensive study of St. Joseph’s entire sanitary and combined sewer system
- Refined Long Term Control Plan
- Determined improvements needed
- Addresses regulatory requirements, system reliability, and city growth
- Includes Blacksnake Creek Project
**Phase IA:**
- 9 Projects
- 60% Capture
- $152.1M
- 20 Years

**Phase IB:**
- Water Quality Study
- Evaluate IA Effectiveness
- Adapt Phase II
- ~$2M
- 2 Years
Facilities Plan Overview

Phase 1A

- Nine projects over 20 years have separate completion deadlines
- Projects 1-5 separate stormflow from combined sewer
- Most cost effective
- Blacksnake Creek project

- Projects 6-9 optimize wet weather treatment at water protection facility
- Increase capacity from a peak 54 mgd to 108 mgd
# Phase IA CSO Control Implementation Schedule

<table>
<thead>
<tr>
<th>No.</th>
<th>Project Description</th>
<th>2009</th>
<th>2014</th>
<th>2019</th>
<th>2024</th>
<th>2029</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CSO Control Facilities Plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Roy’s Branch Sewer Separation – Phase II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Wet Weather Disinfection &amp; Effluent Pump Station Structures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Whitehead Creek Stormwater Separation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Blacksnake Creek Stormwater Separation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Wet Weather Screening and Grit Removal Improvements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Whitehead Pump Station Improvements and Diversion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>High Rate Treatment Facility and Back-up Power</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Wet Weather Disinfection &amp; Effluent Pump Equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- JAN 2009: Land Acquisition
- JAN 2014: Land Acquisition
- JAN 2019: Land Acquisition
Negotiated CSO Control Compliance Schedule

**FIRST 20 YEARS: (PHASE 1A)**
- 9 projects (including Blacksnake Creek Stormwater Separation)
- $152.1 million (2007 dollars)
- Goal: 60% of diluted, untreated sewage captured by improvements - not sent to waterways

**YEARS 21 - 22: (PHASE 1B)**
- Water quality study to evaluate effectiveness of first 20 years
- $2 million (2007 dollars)
- Important before moving into Phase 2

**YEARS 23+: (PHASE 2)**
- Deep tunnel (NOT part of Blacksnake Creek Stormwater Separation)
- $310 million (2007 dollars)
- Goal: 85% of diluted, untreated sewage captured by improvements - not sent to waterways
Facilities Plan Overview

Phase 1B
• Water quality study - evaluates Phase 1A for any adaptations
• Two-year duration

Phase 2
• 23 years out – open ended deadline of 100 years
• Creates storage of combined sewage
• Uses enhanced wet weather treatment capacity to store water following rain event
BLACKSNAKE PROJECT PURPOSE
Address Water Quality + Public Health Issue

- Billions of gallons of sewage spills into river each year at 14 locations
- Federal and state mandates to reduce combined sewer overflows
- Blacksnake Project requires compliance by 2019
BLACKSNAKE CREEK PROJECT GOALS
Meets regulations, water quality + public health

Meet regulatory requirements

Reducing the amount of combined sewer overflows improves water quality and public health

Redirect stormwater from the Blacksnake Creek watershed to the Missouri River

Transporting creek water directly to the river is less expensive than building treatment facilities
PROJECT GOALS
Reduce treatment costs

Eliminate the cost of treating up to 2 million gallons per day of dry weather creek water at the treatment facility

Saving Operation & Maintenance treatment costs
Technology & Alignment Alternatives

Screened Out

- Treatment facility at outfall
- Storage facility at outfall
- Replacement of existing combined sewer
- Open channel for entire alignment
- Lake at entrance

Alignments

- Multiple evaluated
- Alignment Selected
ROUTE
Stormwater Culvert

• 7-ft. by 6-ft. box culvert to carry stormwater flow
Tunnel Connects Stormwater Conveyance to Roy’s Branch
Tunnel From Second Harvest Along Highland Avenue
Improved Roy’s Branch Stream

- Tunnel connects to open channel downstream
- Sends stormwater to Missouri River
- Improves stream by Remington Nature Center
COORDINATE – ROAD IMPROVEMENTS
Funded by Capital Improvement Sales Tax

• Eliminate 6-way intersection at Karnes Road
• Connect Krug Park to existing trail
• Use dirt from construction of stormwater separation to build Northwest Parkway
COST

Sewer Rate Funded
State Revolving Loan Fund

Prelim Engring $ 4.25 M
CSO Separation $ 56.45* M
Rehab Blacksnake Sewer & Screening $ 2.31 M

$ 63,010,000 Total Cost

* Includes estimated SRF loan closing cost
# PROJECT SCHEDULE

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Design</td>
<td>Underway</td>
</tr>
<tr>
<td>Finalize Real Estate Purchases/Easements</td>
<td>Fall 2016 – Spring 2017</td>
</tr>
<tr>
<td>Advertise Project for Bids</td>
<td>Winter-Summer 2017</td>
</tr>
<tr>
<td>Award of Bid</td>
<td>Spring-Fall 2017</td>
</tr>
<tr>
<td>Notice to Proceed – Start Construction</td>
<td>Summer-Winter 2017</td>
</tr>
<tr>
<td>Complete Construction</td>
<td>Summer 2019</td>
</tr>
</tbody>
</table>
QUESTIONS & ANSWERS

City of St. Joseph, Missouri