

City of Columbus Wet Weather Management Plan Update

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City of Columbus, Ohio

Division of Sewerage and Drainage



City of Columbus, Ohio

- Population served ~ 1 Million
 - 22 satellite communities
- Two WWTPs
 - Jackson Pike: 80 MGD average, 102 MGD peak
 - Southerly: 100 MGD average, 222 MGD peak
- Consent orders signed
 - Separate sewer system 2002
 - Combined sewer system 2004
 - Both Consent Orders are with the State of Ohio

Wet Weather Management Plan

- Wet Weather Management Plan (2005)
 - 22 volume report
 - Estimated \$2.5 billion dollars on top of current capital program (2005 dollars)
- Addressed entire collection system, both consent orders, and necessary expansions at the WWTPs
- > \$1 billion encumbered so far!!!



Wet Weather Management Plan

■ Interim Plan (Approved & Revised)

- Suite of improvements required for completion by July 1, 2010
- Goal to obtain substantial reduction in overflows from the City's most active CSO: Whittier Street Storm Tanks

■ Full Plan (Conditionally Approved)

- Conditional 40-year schedule
- LTCP done in 20 years
- SSO schedule in 40-years or date sooner

Full WWMP Approval

- Approved the methodology and Level of Control/Level of Service
- Approved nearly all project schedules
- Conditional approval of 40 year schedule for large tunnel projects to address SSOs
 - Resubmit Affordability Analysis in 2014
 - Analyze schedules with completion 5, 10, and 15 years sooner
 - Submit a schedule with a “date sooner” than 2045
- Reevaluate CSO HRT sizing by 2019

Factors Crucial to Approval

- Consent order with the State
- City contended that we are High Burden
- High Level of Control for CSO and SSO
 - CSO – 10-yr LOC in downtown Columbus
 - CSO – Full capture of Typical Year at remainder
 - CSO – 1 new CSO discharge 4 or less per year
 - SSO – 10 year or higher
 - Plant Bypass ~1.4 years
- Big Results in first 10 years
- A “Cadillac Plan”!!

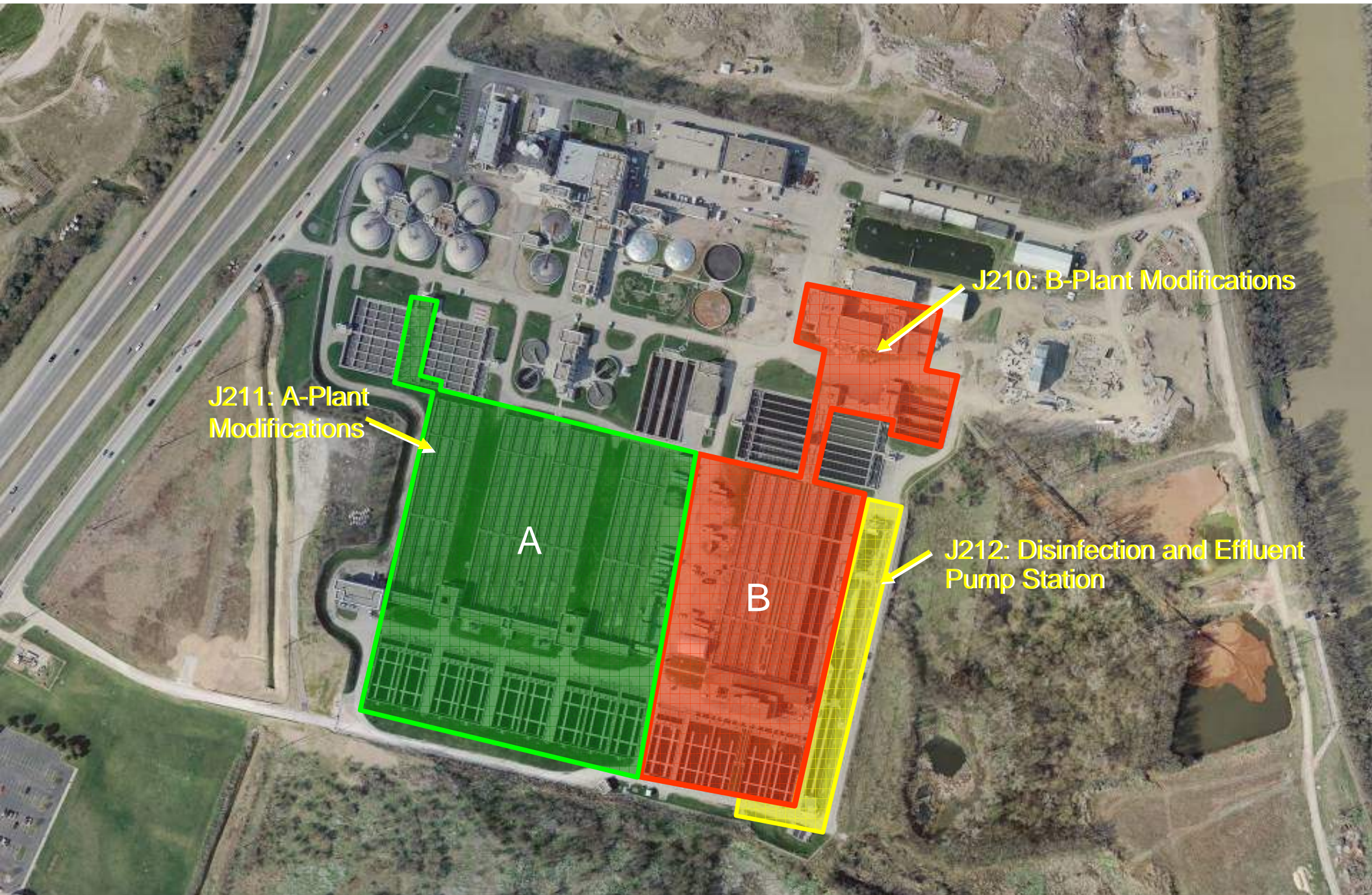
What about Green Infrastructure?

- The Plan does NOT include GI
- Timing of WWMP Submittal
- Environmental Community objected
- Although not a plan feature, City is committed to examine GI on a case by case basis in detailed design of projects
 - Storm water Utility
- High level of control makes GI challenging

What is Columbus Doing Now?

- Completed numerous smaller projects to address local overflows.
- Completed \$270 M in new headworks and a new 14-foot diameter tunnel
- Program Management - \$435 M
- 4.5 mile, 20-foot CSO tunnel
 - Phase 1 \$264.5 M bid, Phase 2 \$75M est.
- Construction contracts alone exceed \$1 Billion for compliance

Jackson Pike Projects



Jackson Pike Projects

- J210 - B Plant Modifications (aeration and final clarifier improvements)
- J211 - A Plant Modifications (aeration and final clarifier improvements)
- J212 - Disinfection Facility and Effluent Pump Station Improvements

CIP 245/J210 - JPWWTP, Headworks Continuation and B – Plant Improvements

SCOPE:

Increase B-Plant hydraulic capacity by rehabilitating 5 secondary clarifiers including various hydraulic improvements, step feed for B-Plant and new aeration diffusers.

Schedule: NTP: 04.15.2008

Substantial Completion: 06.22.2010

Construction Cost (Bid): Kokosing - \$37,128,000.00



CIP 245/J210 - JPWWTP, Headworks Continuation and B – Plant Improvements



B Meter Vault – May 2009



B Meter Vault – April 2010



AFD Building – May 2009



AFD Building – April 2010

CIP 247/J211 - JPWWTP, A-Plant Wet Weather Hydraulic Improvements

Scope:

Hydraulic improvements, step feed and new diffuser for A-Plant aeration.

Schedule:

NTP: 04.15.2008

Substantial Completion: 05.25.2010

Construction Cost (Bid):

Kokosing - \$24,640,000.00

Construction Progress:

99% Complete



CIP 253/J212 - JPWWTP, Disinfection Chemical Handling Facility Improvements

Scope:

Project will modify and renovate the existing effluent disinfection facilities including increasing capacity of the Effluent Pump Station.

Schedule:

NTP: 05.20.2008

Substantial Completion: 07.04.2010

Construction Cost (Bid):

Kokosing - \$16,720,000.00

Construction Progress:

93% Complete



Effluent Diversion Structure - May 2009

Effluent Diversion Structure Backfilled - May 2010

CIP 253/J212 - JPWWTP, Disinfection Chemical Handling Facility Improvements

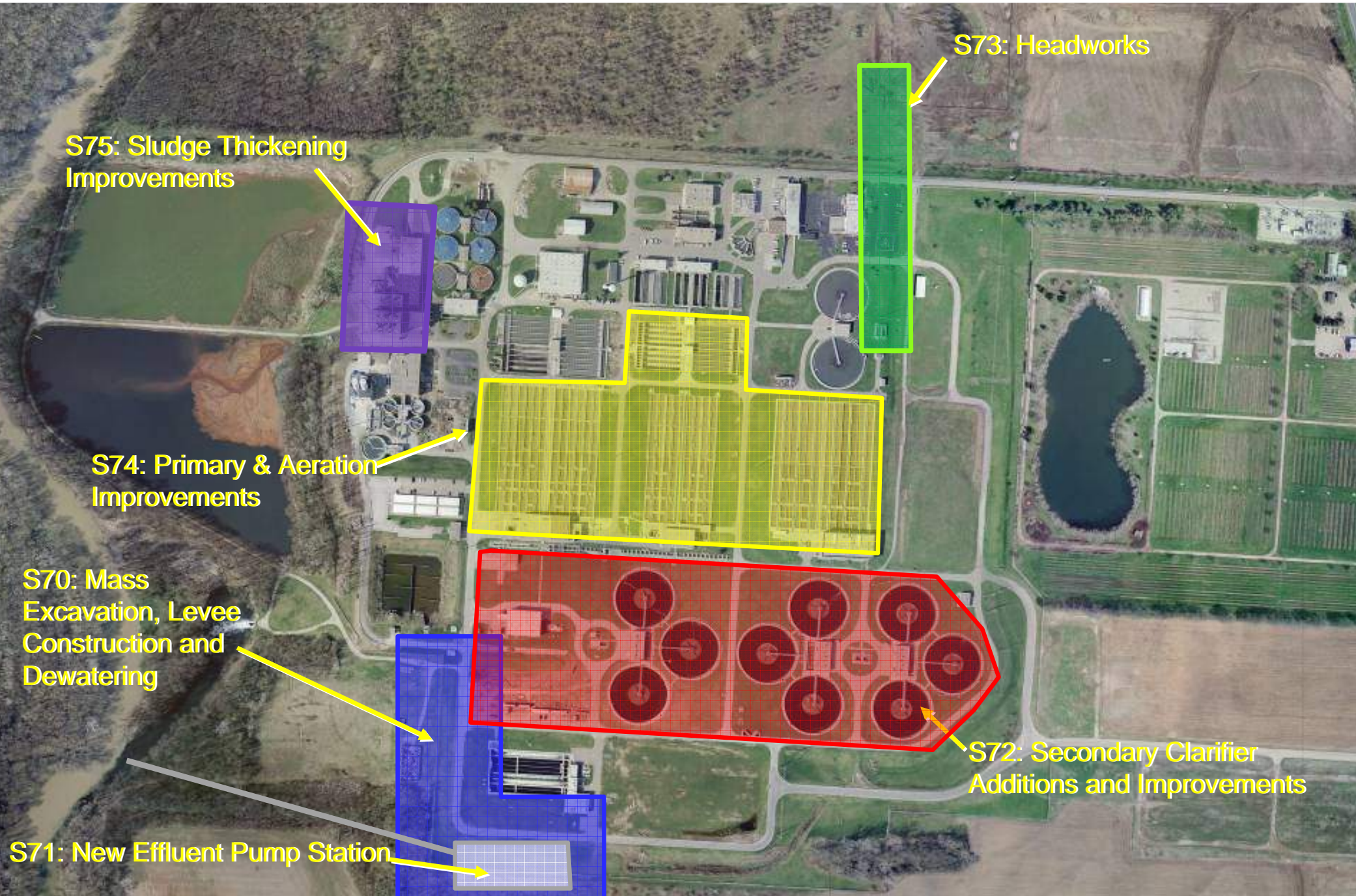


Effluent Pump Station Columns – May 2009



Effluent Pump Station Columns – May 2010

Southerly Projects



Southerly Projects

- S70 – Levee, Mass Excavation and Dewatering
- New Effluent Pump Station and Discharge
- Clarifier Additions and Improvements
- Headworks Part 2
- Primary and Aeration Tank Improvements
- Sludge Thickening Demolition
- Sludge Thickening Improvements

CIP 363.1/S70 – SWWTP, New Effluent Pump Station & Effluent Conduit Levee Construction, Mass Excavation and Dewatering

Scope:

Mass excavation, levee construction and dewatering system preparation for the New Effluent Pump Station.

Schedule: NTP: 07.12.2008

Substantial Completion: 11.30.2007

Construction Cost (Bid): George J. Igel - \$4,377,366.00

Construction Progress: 100% Complete

Levee Around Effluent Conduit – May 2010



Effluent Conduit Backfilled – May 2010

CIP 363.2 /S71 - SWWTP, New Effluent Pump Station & Effluent Conduit

Scope:

New Effluent Pump Station and Effluent Discharge Conduit and new flushing water pumping facilities.

Schedule:

NTP: 02.11.2008

Substantial Completion: 10.23.2009

Construction Cost (Bid):

C. J. Mahan - \$48,849,350.00

Construction Progress:

99% Complete



CIP 366/S72 - SWWTP, Secondary Clarifier Additions and Improvements

Scope:

Three new secondary clarifiers and upgrade nine existing clarifiers with improved sludge collection mechanisms.

Schedule:

NTP: 02.11.2008

Substantial Completion: 12.15.2010

Construction Cost (Bid):

Kokosing - \$52,633,900.00

Construction Progress:

93% Complete



CIP 366/S72 - SWWTP, Secondary Clarifier Additions and Improvements



Clarifier SO7 – May 2009



Clarifier SO7 – May 2010



Clarifier SO1 – May 2009



Clarifier SO1 – May 2010

CIP 364/S73 - SWWTP, Headworks – Part 2

Scope:

The project will increase the hydraulic and preliminary treatment capacity of the Headworks by adding Grit Tanks and a new influent flow splitter.

Schedule:

NTP: 02.11.2008

Substantial Completion: 07.30.2010

Construction Cost (Bid):

Kokosing - \$17,988,300.00

Construction Progress:

97% Complete

SGB Elevation 713.00 – May 2009



SGB Elevation 713.00 – May 2010

CIP 364/S73 - SWWTP, Headworks – Part 2

SGB Elevation 713.00 – April 2009



SGB Elevation 713.00 – May 2010

CIP 367/S74 - SWWTP, Primary Clarifier and Aeration Tank Improvements

Scope:

Two new Center Train Aeration Tanks, step feed piping and new diffuser system for all three trains.

Schedule:

NTP: 03.25.2008

Substantial Completion: 06.17.2010

Construction Cost (Bid):

Kenmore Construction - \$53,196,098.45

Construction Progress:

89% Complete



05/20/2009

West Train Tanks A04, A05, A06 in Service

CIP 367/S74 - SWWTP, Primary Clarifier and Aeration Tank Improvements



Tank A07 – May 2009

Tank A07 – May 2010



CIP 367/S74 - SWWTP, Primary Clarifier and Aeration Tank Improvements



Tank A12 Bottom Slabs-on-Grade



Tank A12 – May 2010

CIP 359 – SWWTP, Sludge Thickening Improvements & Additional Renovations

Contract S75: Incinerator Building North & Selective Demolition

Scope:

Asbestos abatement and building demolition necessary to facilitate Thickening Improvements under contract S76.

Schedule:

NTP: 07.28.2008

Substantial Completion: 01.18.2010

Construction Cost (Bid):

Precision Environmental - \$3,507,750.00

Construction Progress:

99% Complete



CIP 359/S76 – SWWTP, Sludge Thickening Improvements & Additional Renovations



Centrifuge Feed Wells – May 2010

Overall Program Management

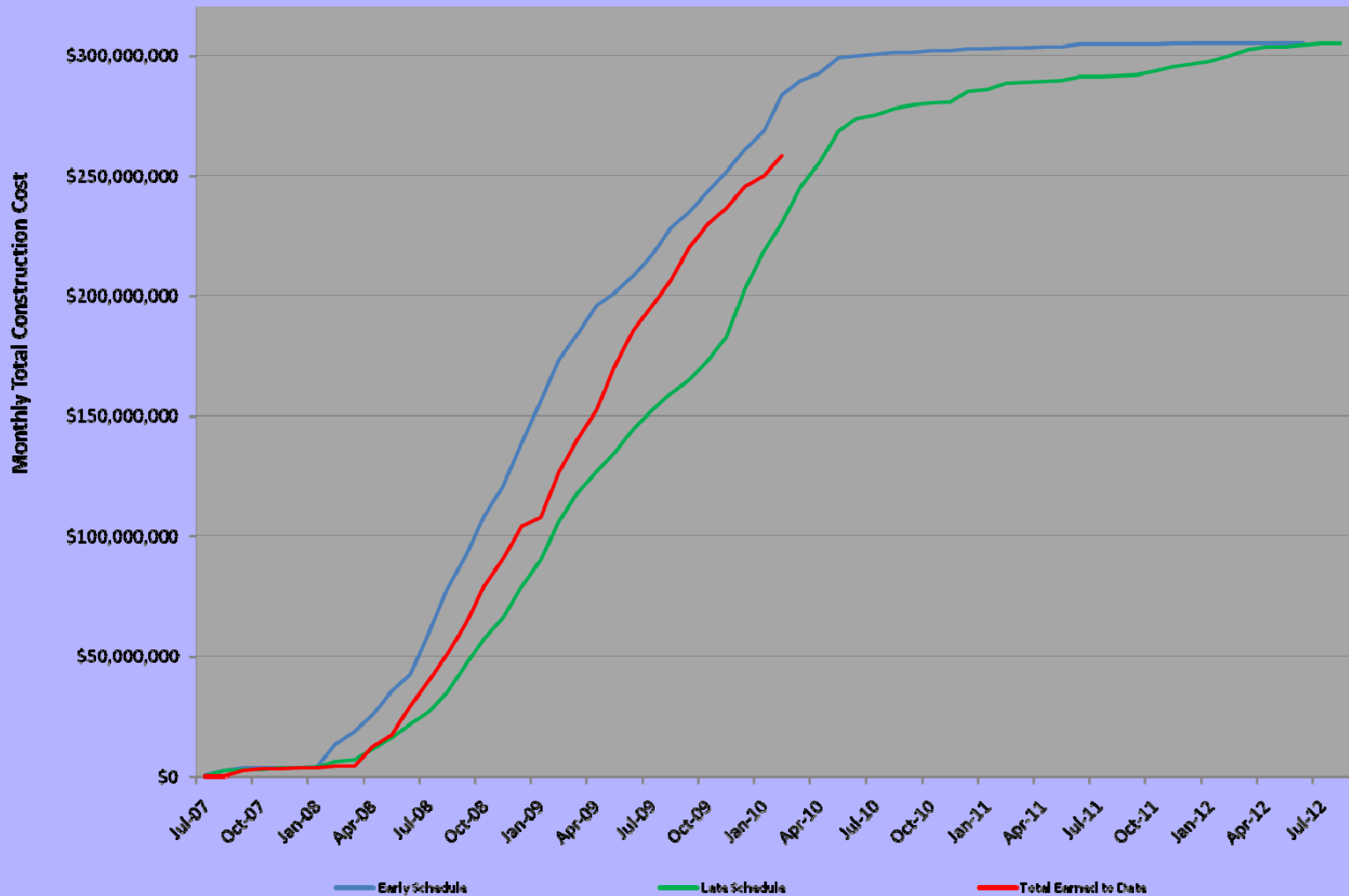
Contract	Project	Contract Amount	Change Order Amount to Date
S70	SWWTP - Levee Construction Mass Excavation and Dewatering	\$4,377,366.00	\$254,355.98
S71	SWWTP -New Effluent Pump Station and Effluent Conduit	\$48,849,350.00	\$1,336,229.00
S72	SWWTP - Secondary Clarifier Additions and Improvements	\$52,633,900.00	\$3,318,562.00
S73	SWWTP - Headworks, Part 2	\$17,988,300.00	\$816,515.05
S74	SWWTP - Primary Clarifier and Aeration Tank Improvements	\$53,196,098.00	\$2,863,700.00
S75	SWWTP - Incinerator Building North and Selective Demolition	\$3,507,750.00	\$262,909.00
S76	SWWTP - Sludge Thickening Improvements and Additional Renovations	\$63,200,500.00	\$257,034.00
J209	JPWWTP - Skimmings Concentrator System Improvements	\$5,547,500.00	\$817,174.00
J210	JPWWTP - Headworks Continuation and B-Plant Improvements	\$37,128,000.00	\$1,915,653.00
J211	JPWWTP - A Plant Wet Weather Hydraulic Improvements	\$24,640,000.00	\$1,081,146.00
J212	JPWWTP - Disinfection Chemical Handling Facility Improvements	\$16,720,000.00	\$203,605.00
	Totals	\$327,788,764.00	\$13,126,883.03
	Change Order Percentage of Total Contract Amounts		4.00%

PPM OVERALL PROGRAM MONTHLY CONSTRUCTION COST

Contracts S70, S71, S72, S73, S75, S76, J209, J210 & J211

April 2010

PPM Overall Program Monthly Construction Cost
Contracts S70, S71, S72, S73, S74, S75, S76, J209, J210, J211 & J212



Looking Ahead

- Modeling enhancements
 - Continuous calibration and simulation
 - Operations optimization (automation of collection system and evaluating RTC)
 - Refining I&I forecasting (undeveloped & existing service areas)
- Re-evaluate sizing of major projects using revised model
- Update all cost estimates and refine project scopes
 - Feeds into affordability analysis
 - Provide a clearer path for future City staff

Looking Ahead

- Update Affordability Analysis
 - Include contract communities in effort directly
 - Forecast actual rates customers will incur
 - Include Replacement Planning results from Asset Management program
 - Sewer Assets Replacement Value > \$20 Billion
- Solids Handling – Solids Treatment and Utilization Master Plan
 - OSU Center for Resilience
 - Asset Management

Summary Points

■ Program Management

- Team of consultants combined with City staff has resulted in successful process
- Design effort completed in 6 months
- Partnership with contractors has led to better problem resolution
- All team members are focused on achieving the July 1, 2010 compliance date

Summary Points

- Five years since submitting plan
 - Rates have increased >70% and it continues
 - Debt Service is over 60% of annual budget and climbing
 - Ohio EPA has been cooperative with modifications
 - City has maintained high bond rating
- City will continue to optimize planned facilities (right size, asset management, green infrastructure)

Thank you

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