Benefits of Sound Planning: How Augusta, Maine's 25-Year Adaptive CSO Abatement Program Netted Positive Results

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Presentation Outline

1. History of Greater Augusta Utility District (GAUD)
2. CSO Planning and Abatement
3. 2015 LTCP Update
4. Systemwide Performance
5. Financing and Implementation
6. Moving Forward with Phase 4 and Beyond

Statehouse, Augusta

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GAUD History

- Created by Special Act of Maine Legislature in 1957 as the Augusta Sewerage District
- Later renamed Augusta Sanitary District; Augusta Water and Sewer Districts; and now Greater Augusta Utility District, or GAUD
- GAUD was formed in 2007 with the formal merging of the Water and Sanitary Districts and addition of the wastewater portion of the Hallowell Water District
- Currently employs a staff of 42 with an annual operating budget of $10.7 million

GAUD WWTP

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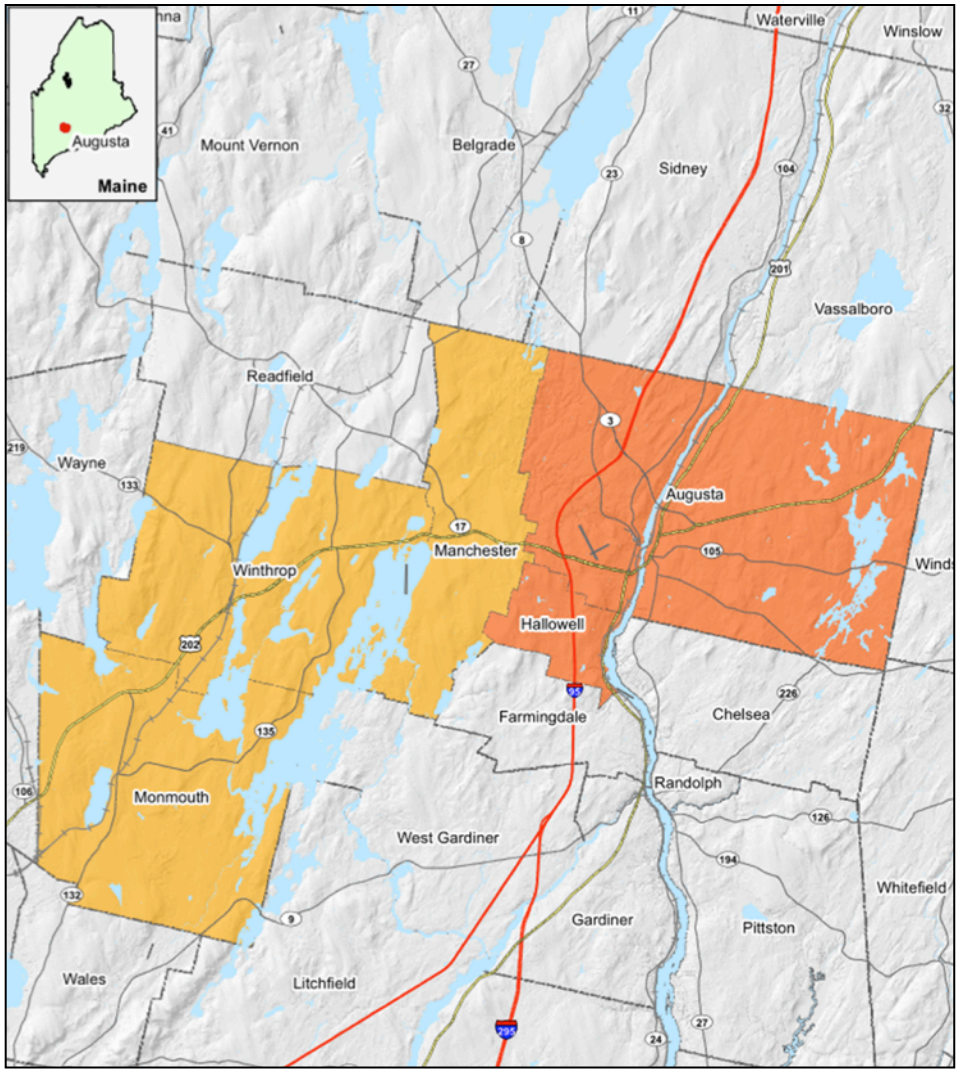
GAUD Services

- Water treatment/distribution services to Augusta and portions of adjacent towns
- Wastewater collection/ treatment services to Augusta and Hallowell (combined 2010 population of 21,417)
- Wastewater treatment services to three western suburbs
- Stormwater services to Augusta
- 8 mgd WWTP with peak wet weather capacity of 36 mgd



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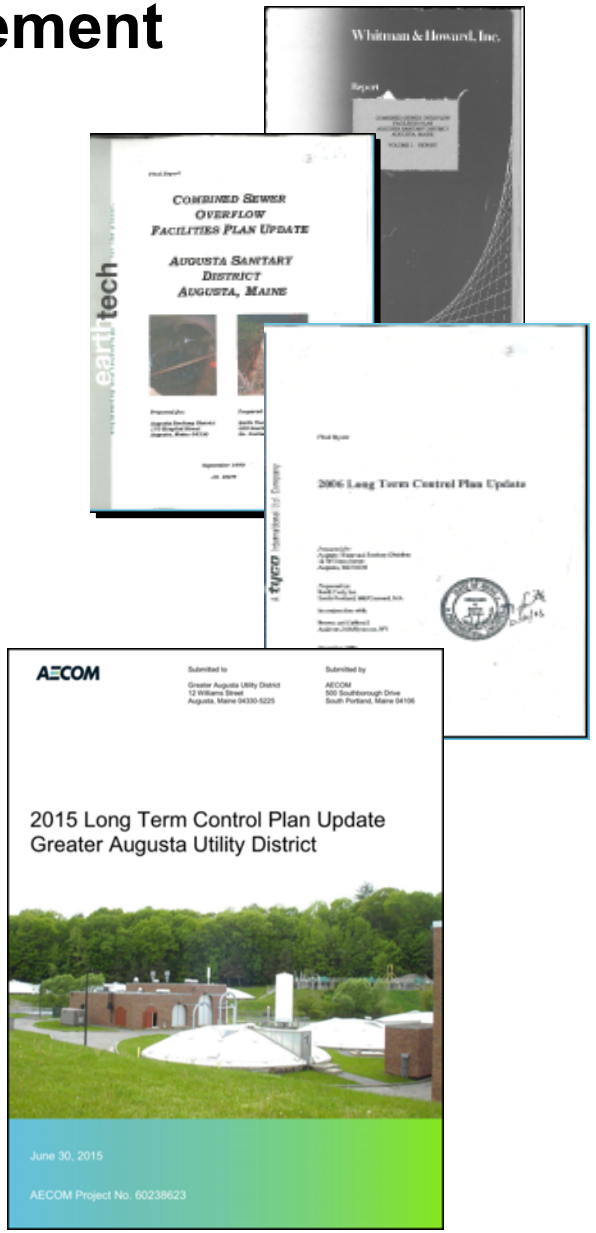
CSO Planning and Abatement

- Comprehensive CSO planning began in late 1980s: initial LTCP completed in 1993
- LTCP was updated in 1999, 2006 and 2015
- Updates allowed GAUD to assess progress and make adjustments for an effective “build-and-measure” process
- An early Administrative Order from EPA expired with the completion of the Phase 1 CSO Abatement Project
- Since that time, the program has been driven by the MEPDES Permit and DEP and EPA CSO guidance documents



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CSO Planning and Abatement (cont.)

- CSOs originally discharged to the Kennebec River and Bond, Kennedy, Noname, Riggs and Whitney Brooks
- There are currently 19 permitted CSOs:
  - Only one remaining CSO is on a tributary: CSO 003 into Kennedy Brook at the WWTP
  - 18 CSOs discharge to the Kennebec River

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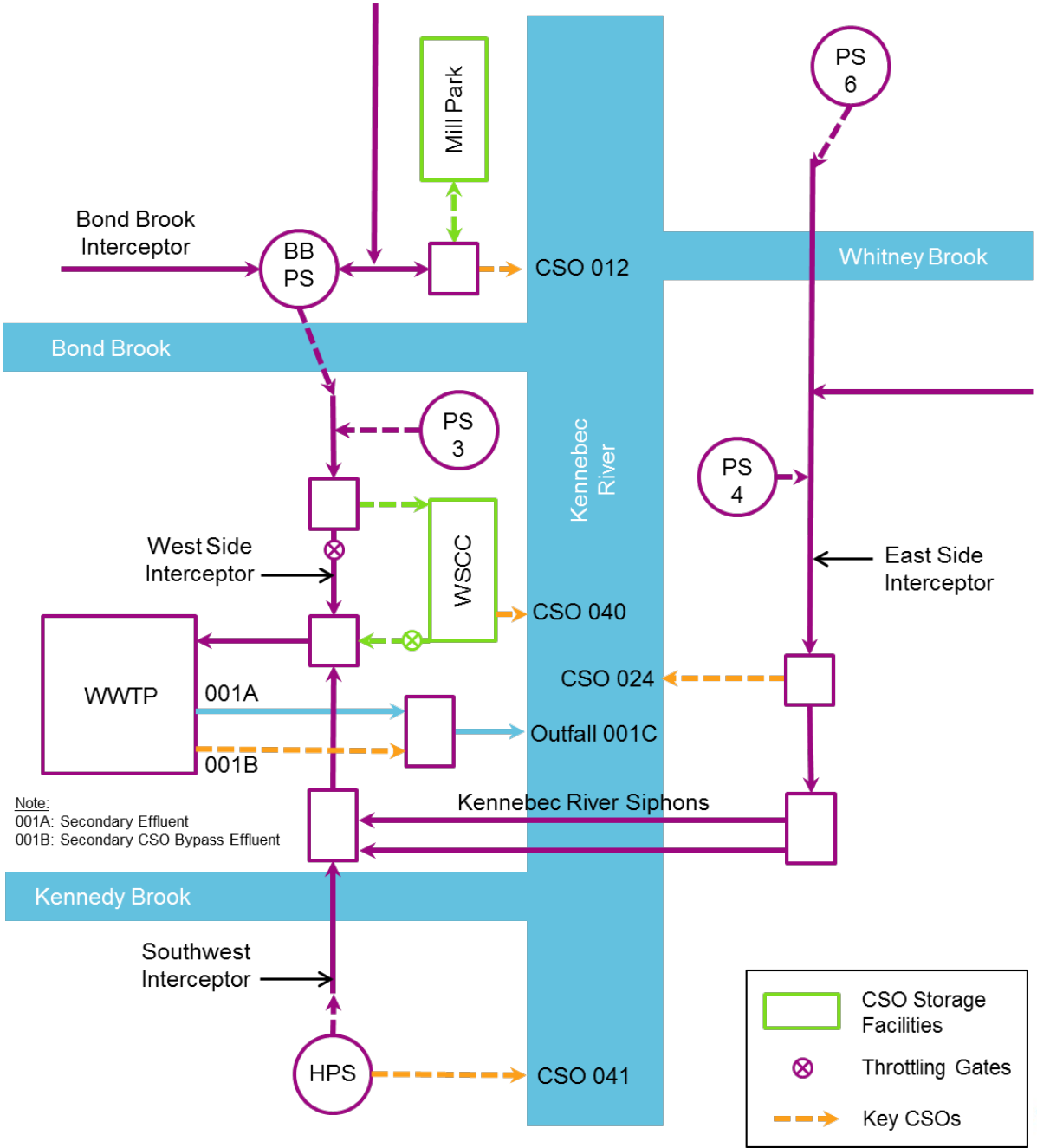
GAUD System Schematic



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Highlights of 1993 Long Term Control Plan

- Established four planning subareas: WWTP Bypass, West Side, East Side and Bond Brook
- CSO and ambient monitoring/ characterization the combined collection system
- Developed hydrologic/ hydraulic model (SWMM)
- Recommended a four-phase, multi-year abatement program
- Abatement of the CSO Bypass was recommended for Phase 1: High Flow Management Facilities at the WWTP

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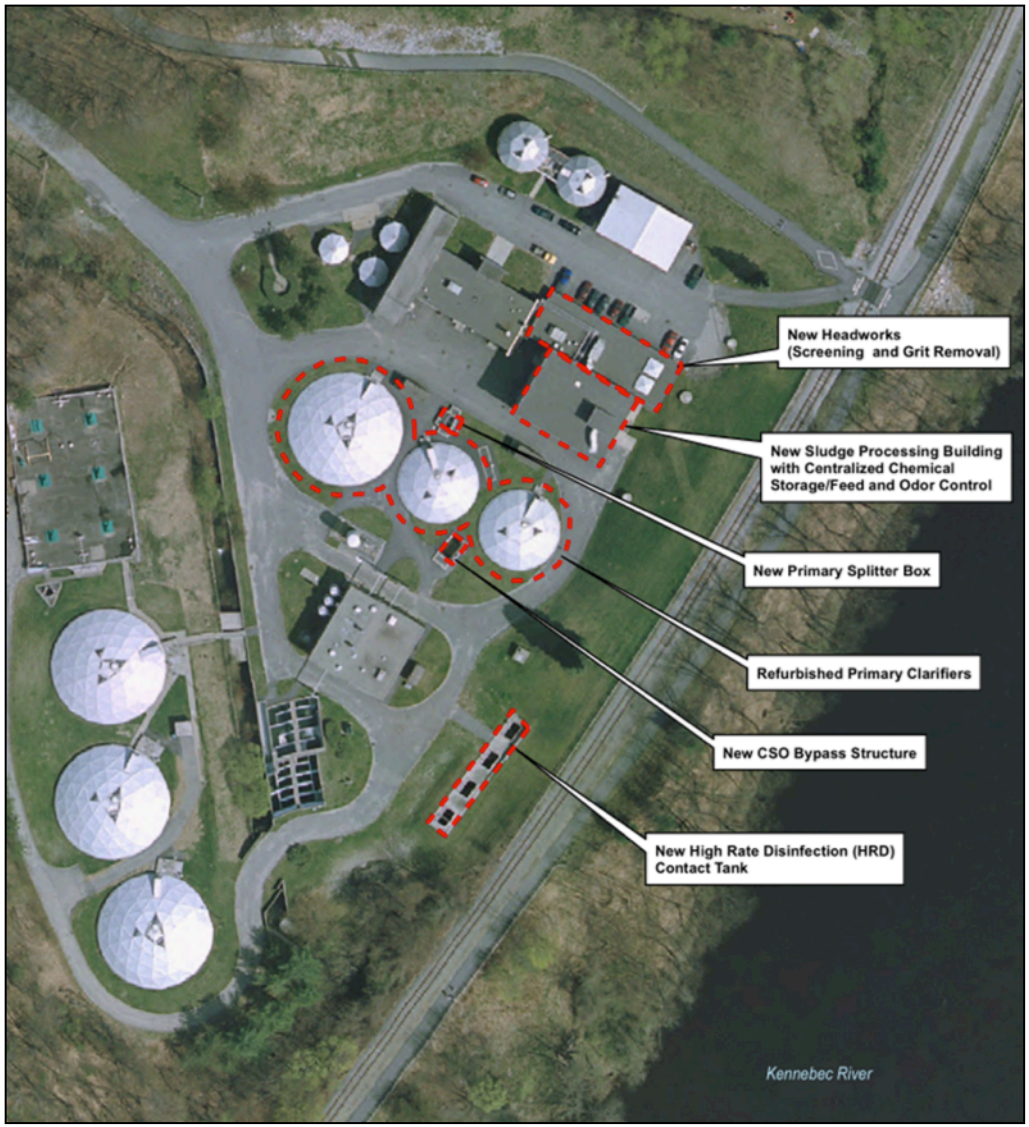
Phase 1 High Flow Management Facilities



- 36 mgd Peak Flow Through Preliminary and Primary Treatment
- High Rate (Seasonal) Disinfection
- Related Improvements: *Refurbished 1960s-era Headworks and Admin. Building and 1980s-era Solids Handling, Chemical Storage/Fee and Odor Control Facilities*

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Highlights of the 1999 LTCP Update

- CSO monitoring/revised SWMM
- Focused on West Side Subarea
- Reevaluated the abatement alternatives from the 1993 LTCP
- Offline storage was recommended for Phase 2: West Side Consolidation Conduit (WSCC)

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Phase 2 West Side Consolidation Conduit (WSCC)

- 3,655 LF of 10 ft. by 6 ft. Box Culverts
- 1.64 MG Storage Volume
- Gravity in/throttled gravity drain to WWTP
- Internal Automated Flushers
- Throttled Discharge to WWTP
- Coordinated alignment with Kennebec River Rail Trail

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Highlights of 2006 LTCP Update

- CSO monitoring/revised SWMM
- Optimized the Phase 1 (HFMF) and Phase 2 (WSCC) hydraulic interface
- Reevaluated the abatement alternatives from the 1999 LTCP
- Focused on the Bond Brook and East Side Subarea/switched abatement priorities from previous LTCPs
- Offline storage was recommended for Phase 3: Mill Park Storage Facility for the Bond Brook Subarea
- Satellite treatment was recommended for the East Side Subarea as the Phase 4 placeholder

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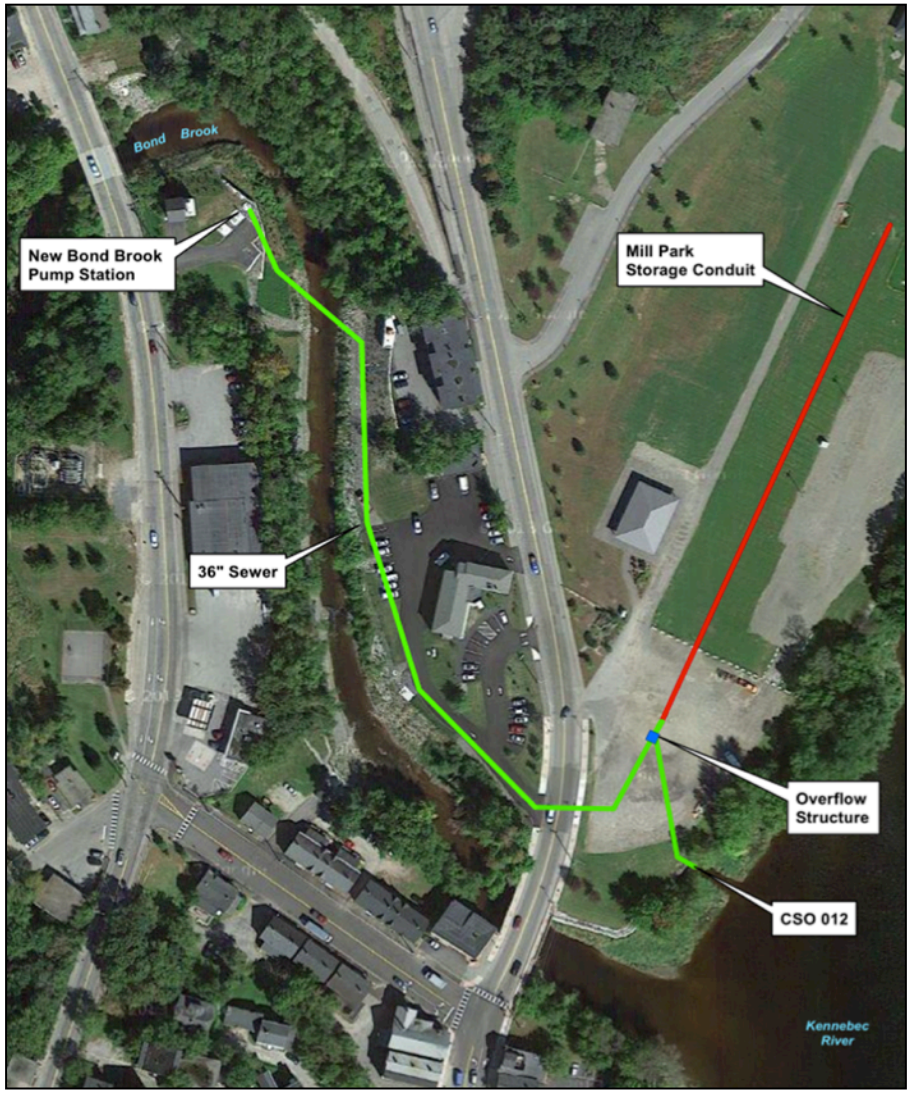
Phase 3 Mill Park Storage Facility



- 670 LF of “double barrel” 10 ft. by 10 ft. box culverts
- 1.0 MG Storage Volume
- Gravity in/gravity drain to new Bond Brook pump station
- Manual flusher gates
- Throttling gate on the West Interceptor to optimize operation of Phase 1 and 2 facilities
- Related Improvements: *Consolidated two 1960s-era PSs into single flood-protected PS and new interceptor along Bond Brook*

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Highlights of 2015 LTCP Update

- Focused on the East Side Subarea
- Coordinated with parallel LTCP for the Hallowell system
- CSO monitoring/revised SWMM
- Reevaluated the abatement alternatives from the 2006 LTCP
- CSOs divided into two groups:
  - North Branch CSOs – small volume
  - South Branch CSOs - large volume
- Also included a systemwide performance evaluation of Phases 1, 2 and 3

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Highlights of 2015 LTCP Update (cont.)

- Recommendations:
  - System rehabilitation/separation was recommended for the smaller North Branch CSOs as Phase 4A
  - Offline storage recommended for the larger South Branch CSOs in proposed East Side Consolidation Conduit (ESCC) as Phase 4B

Proposed East Side Consolidation Conduit (ESCC)

- Begins at CSO 024, the East Side Interceptor Relief: largest East Side CSO
- Gravity in/throttled gravity drain to PS 4
- Bending weir to optimize storage
- Singe automated flusher
- Related Improvements: *PS 4 (built in 1963) will be replaced*

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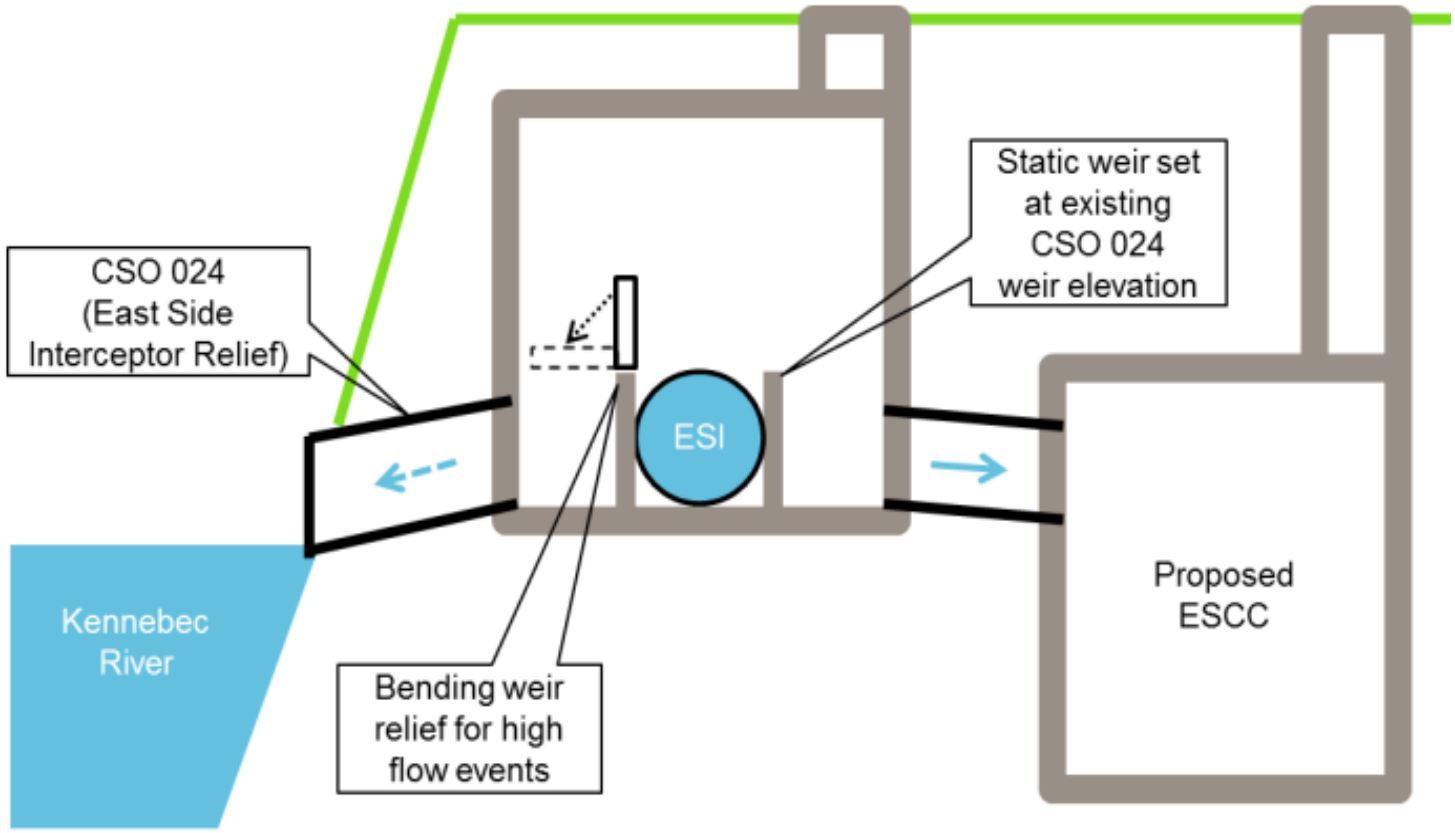
Proposed ESCC Diversion Structure



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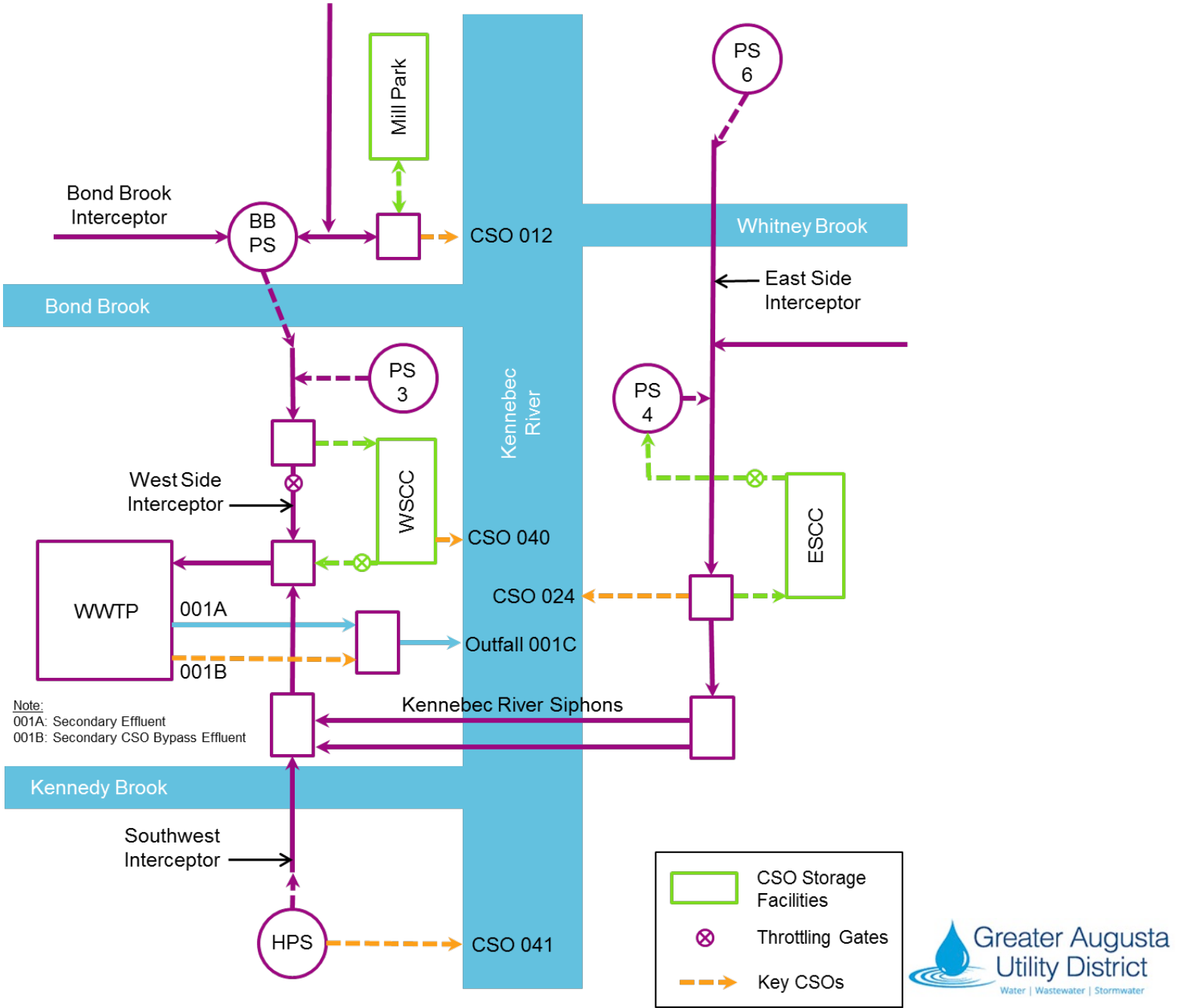
GAUD System Schematic with Proposed ESCC



Systemwide Performance

- Significant progress has been made in reducing CSO discharges to the Augusta-area waterways:
  - 81% reductions in activations per inch of rain: 12 to 2
  - 88% reduction in annual discharge volume: 58 MG to 6.6 MG
- Completion of the Phase 4 East Side project will further improve performance
- Abatement efforts will continue for smaller, miscellaneous CSOs through rehabilitation/separation of aging infrastructure

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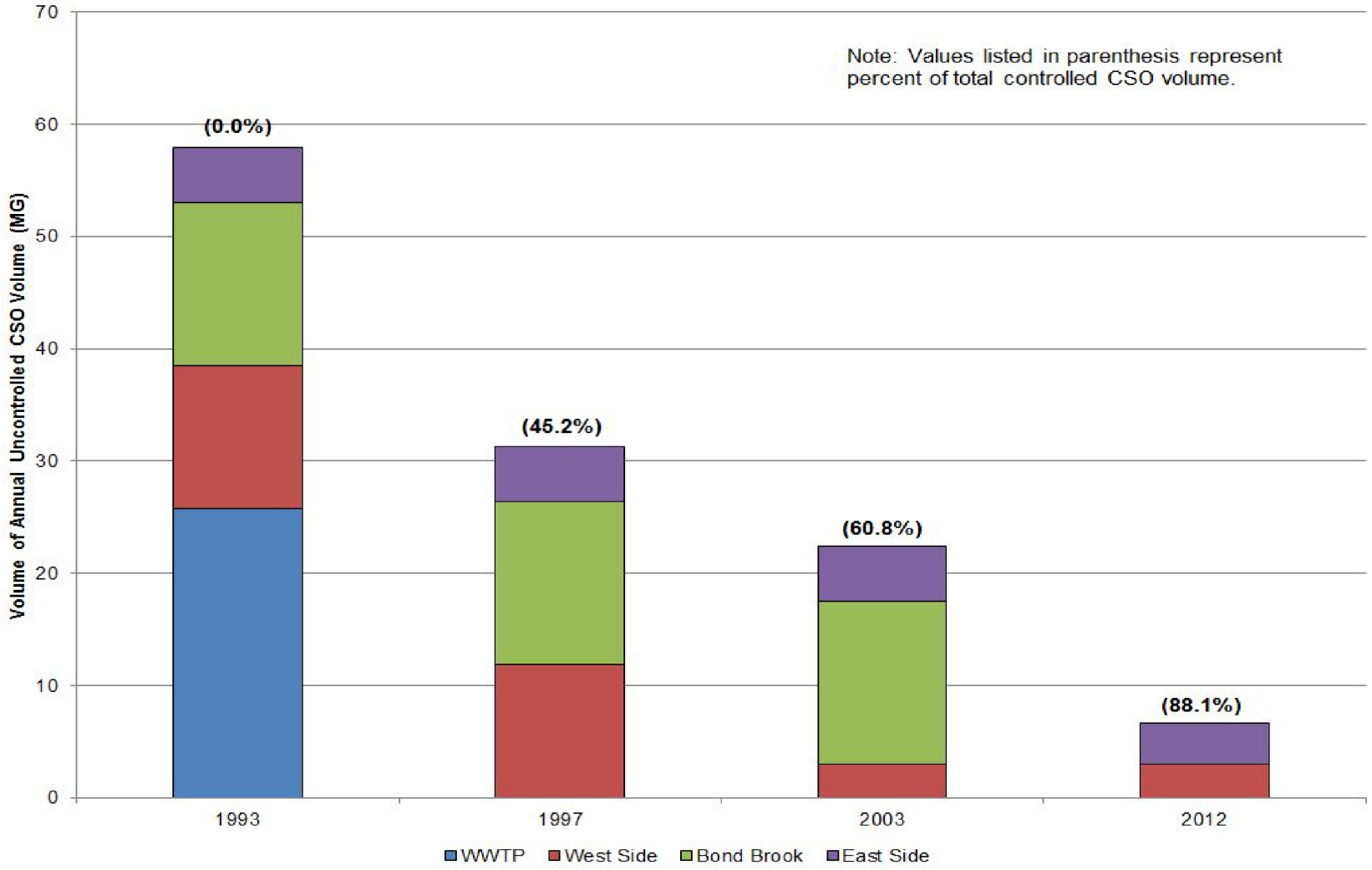
Volumetric Reduction/Treatment of CSO Discharges in MGY 1993 to Present



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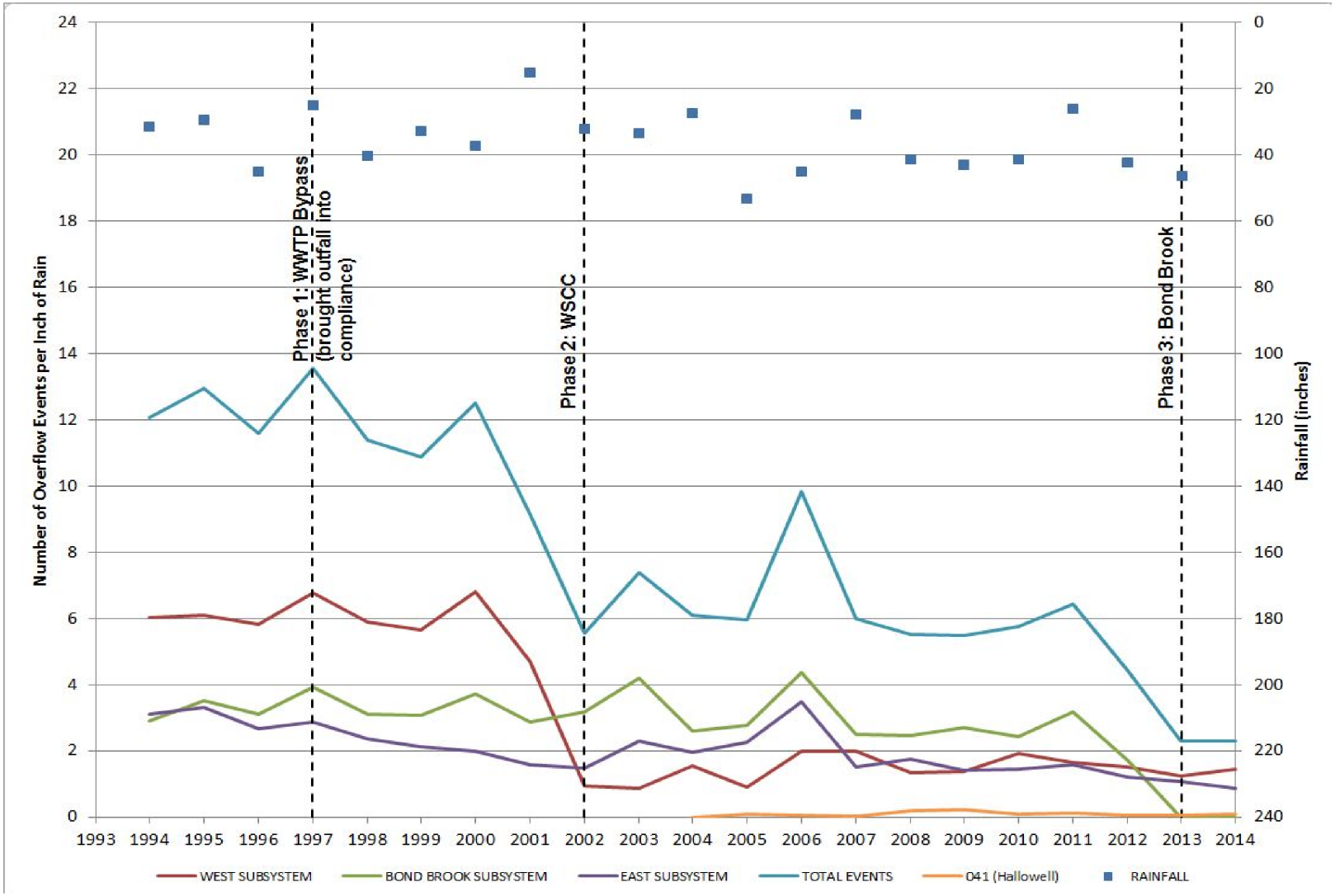
CSO Activations per Inch of Rain
1994 to Present



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Financing and Implementation

- To date, GAUD has spent $43M (2015 dollars) on CSO abatement including the completion of three of the four phases outlined in the 1993 LTCP
- With the addition of Phase 4, and later miscellaneous CSO abatement, this will rise to $55M
- This equates to roughly $1.03 per gallon of controlled overflow volume
- Scheduling and financing of Phase 4 (broken into two parts: 4A and 4B) will coincide with the retiring of two earlier CSO bonds for rate stability

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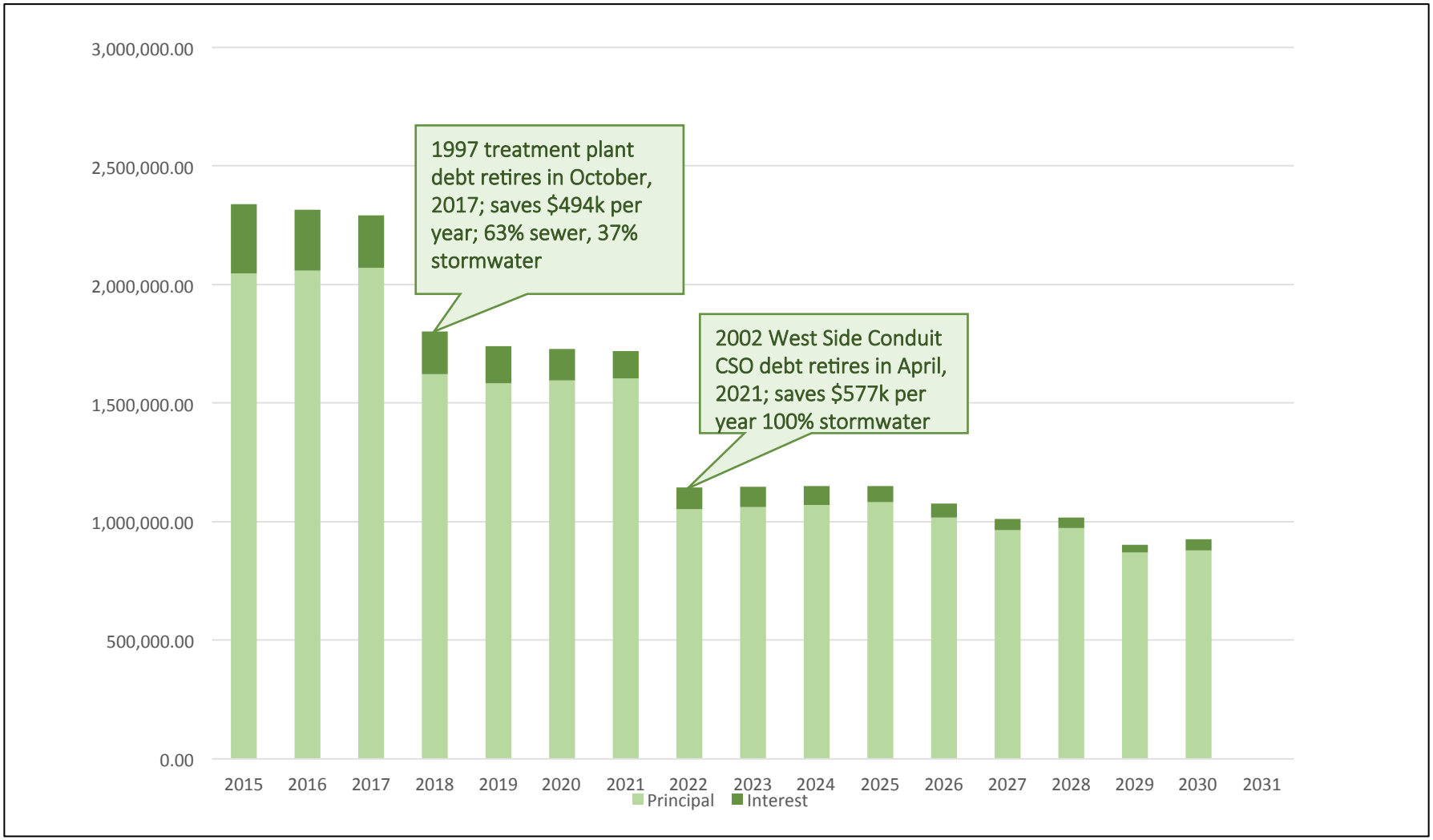
Schedule of Sanitary Debt



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Innovative Revenue Sources

- GAUD has used innovative revenue streams from its conception to finance the operation, and later the abatement of, its CSO system
- Original rate structure from the 1960s included catch basin charges including both “combined” and “separate” rates
- In the mid-1990s, GAUD became the first New England community to institute an impervious area-based stormwater charge to offset CSO abatement costs

Moving Forward with Phase 4 and Beyond

- 2015 LTCP Update was submitted to DEP on June 30 per the MEPDES Permit
- Implementation of Phase 4:
  - 4A for the smaller North Branch CSOs: 2016-2019
  - 4B for the larger South Branch CSOs: 2018-2021
- Continued rehabilitation/separation of aging wastewater infrastructure through piggybacking on development and/or related street/highway projects with a long-term goal of zero CSO discharges
- Future LTCP updates to continually monitor and assess progress

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Questions?

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