



## King County

# Metropolitan King County Council Transportation, Economy and Environment Committee

### STAFF REPORT

<b>Agenda Item:</b>	15	<b>Name:</b>	Beth Mountsier
<b>Proposed No.:</b>	2016-0016	<b>Date:</b>	February 2, 2016

### SUBJECT

This ordinance would approve the Ship Canal Water Quality Joint Project Agreement and authorize the Executive to enter into the agreement to have Seattle Public Utilities design, construct, own and manage a combined sewer overflow control project for both Seattle and King County wastewater influent in north Seattle.

### SUMMARY

King County entered into a federal consent decree with the Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) on July 3, 2013, which requires control of the County's CSO basins by December 31, 2030. Seattle also entered into a Consent Decree to control its CSO basins by 2030.

After considering separate CSO storage facilities and combinations of shared facilities, the Ship Canal Water Quality (WQ) Project is proposed as a coordinated effort between King County's Department of Natural Resources and Parks (DNRP) and Seattle's Seattle Public Utilities (SPU) to construct a 15-million gallon CSO storage facility to control five of SPU's CSO basins in Ballard and Fremont/Wallingford, and the County's 3rd Avenue West and 11th Avenue Northwest CSO basins. The project would be constructed by tunneling below publicly owned right-of-ways between Ballard and Highway 99.

Subject to the King County Council's and Seattle City Council's<sup>1</sup> approval, DNRP and SPU have tentatively agreed on the terms of a Ship Canal Water Quality Joint Project Agreement (JPA) that provides for the funding of the planning, design, construction, maintenance, operation, repair, replacement, alteration, and improvement of the facility.

The JPA defines King County's role in the execution and management of this project including decision-making and dispute resolution processes during design and construction and after the facility begins operating to control overflows. SPU would pay for portions of the project that solely relate to its delivery of influent to the storage facility. Otherwise, all costs of the joint facility would be split with Seattle paying 65 percent and King County 35 percent of the costs currently estimated to be \$134 million.

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<sup>1</sup> Seattle approved the JPA in December 2015 (Ordinance124966), so long as it is substantially in the form as submitted to the King County Council.

## **BACKGROUND**

### **Combined Sewer Overflows**

Combined sewer overflows are discharges of untreated or partially treated sewage and stormwater released directly into marine waters, lakes and rivers during heavy rainfall, when the sewers have reached their capacity. Although the sewage in CSOs is greatly diluted by stormwater, both CSOs and stormwater may be harmful to public health and aquatic life because they carry chemicals and disease-causing pathogens.

From the late 1800s through the 1940s, engineers designed combined sewers (sewers that carry sewage and stormwater runoff in a single pipe) to convey sewage, horse manure, street and rooftop runoff, and garbage from city streets to the nearest receiving body of water. Starting in the 1950s, most sewer systems were built as separated systems (sewage in one pipe; stormwater in another pipe). In the late 1950s, treating wastewater became the standard. Interceptor pipes were built to transport all wastewater (from either combined or separated systems) to treatment plants.

Combined sewers exist in many parts of older cities, including Seattle. During heavy or long storms, the volume of the stormwater runoff may become too much for the combined sewers to handle. To protect treatment plants and avoid sewer backups into homes, businesses and streets, combined sewers sometimes overflow into Puget Sound, the Duwamish Waterway, Elliott Bay, the Ship Canal and Lake Washington.

Both King County and the City of Seattle manage CSOs within Seattle. King County's WTD manages 38 locations and Seattle Public Utilities manages more than 90. King County also has four CSO treatment plants, one in north Seattle (Carkeek Park CSO Treatment Plant) and one in West Seattle (Alki CSO Treatment Plant), and the relatively new Mercer/Elliott West and Henderson/MLK facilities. The Georgetown treatment facility (to control the Brandon and Michigan CSO basins) is currently being designed.

### **King County's Consent Decree with Ecology and EPA**

Ecology and EPA alleged that the County violated Sections 301 and 402 of the Clean Water Act and the conditions and limitations of the County's National Pollutant Discharge Elimination system (NPDES) permit issued to the County by Ecology. These are violations related to the quality of the effluent released from combined sewer overflow control facilities that act as satellite treatment plants to West Point Treatment Plant. In response, King County, without admitting any liability related to the alleged violations, negotiated a consent decree that the Council approved via adoption of Ordinance 17514 in 2013.

The consent decree obligates King County to implement the long-term CSO control plan that the Council approved in September 2012 (Ordinance 17413) for future projects per the proposed design criteria/specifications and schedule in the plan, including final completion of all projects in 2030. In addition, the consent decree provides direction for 1) implementation of CSO control projects currently in design 2) improvements in operations of existing CSO treatment plants to meet effluent standards, 3) various

reporting requirements regarding progress towards these goals, post-construction monitoring, etc., 4) dispute resolution procedures, and 5) penalties.

The overall goal of the consent decree and EPA's compliance action is to ensure that combined sewer overflows at King County's outfalls occur on average only once per year based on a rolling 20-year average and that the effluent discharged from CSO control treatment plants meet certain standards.

The consent decree contains some provisions for 'flexibility' with regard to the implementation of King County's long term combined sewer overflow control plan. King County may propose changes to the design specifications for projects, the priority and sequencing of projects and may propose a supplemental 'integrated plan' that includes additional activities or refines the proposed CSO control projects to address other water pollution issues and thereby results in better water quality in the receiving waters where CSOs currently discharge.

### **Consideration of Joint Projects**

King County's long-term CSO control plan as proposed and approved by the Council envisioned the possibility of joint projects with Seattle. Seattle was also interested in shared projects. Additionally both King County's and Seattle's consent decrees required them to coordinate their efforts and future operation of new CSO facilities since each would have impacts upon the other's facilities (and their ability to control overflows) and the West Point Treatment Plant.

With this backdrop, King County and Seattle developed and provisionally agreed to a series of technical memos and plans about cost-sharing, assessment of current and projected flows and exploration of alternatives to control overflows in basins in NW Seattle. Many of these agreements date back to and overlap with the time period when King County's long-term CSO control plan and Consent Decree were being approved.

By April 2014, both SPU and the Wastewater Treatment Division<sup>2</sup> (WTD) had agreed to a "Seattle Public Utilities & King County Wastewater Treatment Division Coordination Plan." Its purpose was to guide each agency in executing both joint and individual CSO projects to efficiently and effectively achieve CSO control to comply with their respective Consent Decrees and other regulatory requirements.

The development of the Ship Canal WQ Project and the Ship Canal WQ JPA is therefore built upon a series of provisional agreements regarding each agency's acceptance of the technical aspects, assumptions and parameters of a shared project addressing:

- existing and future wastewater flows in the basins;
- amounts of combined wastewater and stormwater that would need to be stored;
- conceptual design of a facility to provide the storage;

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<sup>2</sup> WTD is a division of the Department of Natural Resources and Parks. WTD is responsible for constructing, maintaining and operating wastewater facilities, including CSO control facilities. As the preliminary planning got underway WTD was signing off on Technical Memorandums and Plans. In 2015, when the JPA was developed King County and interchangeably DNRP was/is named as the agency entering into the agreement. To confuse matters more, the JPA as transmitted, has a signature block for the Director of DNRP. However PO 2016-0016 authorizes the Executive to enter into the agreement.

- division of potential costs for the project (based on the cost and amount of storage needed by each agency);
- parameters for operation of storage facilities and discharge to the WestPoint Treatment Plant; and
- a potential management structure of a shared project from design through operation.

In 2015 both WTD and SPU concluded that a joint project would be the best means of controlling overflows and would reduce environmental impacts and minimize neighborhood disruptions compared to building separate CSO control facilities in a group of drainage/CSO basins. The agencies proceeded to develop the JPA in 2015 (based on and citing their previous work and provisional agreements) to legally and perpetually bind SPU and the Department of Natural Resources and Parks (DNRP) to execute the project, unless they mutually agreed to terminate the JPA.

The JPA designates Seattle/SPU as the lead agency during design and construction of the project; and upon completion, SPU would be the owner and manager of the facility. The JPA also defines King County's role throughout the project design, construction and future operation of the facility.

### **Project Description**

The Ship Canal WQ Project would provide storage of combined wastewater in a deep storage tunnel constructed between the Ballard and Wallingford CSO areas, on the north side of the Seattle Ship Canal that connects Lake Union and Elliott Bay. The Project would control SPU's Ballard CSO basins (Outfalls 150, 151 and 152), Fremont (Outfall 174) and Wallingford CSO basins (Outfall 147), King County's DNRP 3rd Avenue West Regulator (DSN008), and 11th Avenue NW Regulator (DSN004) by the end of year 2025.

The Ship Canal WQ Project would include the storage tunnel and 'appurtenances,' conveyance facilities to convey SPU and DNRP CSO flows into the tunnel, and a pump station and force main to drain flows from the tunnel. A detailed description of the project (including Figure 1 showing a plan view of the Ship Canal WQ Project location and components) can be found in Exhibit A to the JPA. The following is a summary of the key components of the project:

The storage tunnel and appurtenances would include:

- A minimum 15.24 million gallon (MG) offline<sup>3</sup> storage tunnel. The tunnel is expected to have a 14-foot inside diameter and be approximately 14,000 feet long<sup>4</sup> (2.7 miles).
  - The stored combined sewage in the storage tunnel will flow from the Wallingford CSO Outfalls westward to an effluent pump station located near the Ballard CSO Outfalls 150 and 151.
  - The tunnel route is planned to be generally in street right-of-way along the north side of the Ship Canal.
- Seven diversion structures for diverting influent CSO flow away from existing CSO outfalls to the tunnel.

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<sup>3</sup> "Offline" meaning the storage isn't in a conveyance pipe

<sup>4</sup> These dimensions could be changed during the design phase of the project.

- Four drop structures (each with odor control) to convey influent CSO flow into the storage tunnel.
- A pump station would be located at the West tunnel Portal as defined during the design phase of the project, with a minimum peak capacity of 32 MGD to empty the storage tunnel in approximately 12 hours.

Conveyance facilities would include a:

- Gravity sewer line to convey flows from SPU's diversion structure at Fremont Outfall 174 to the tunnel drop shaft;
- Gravity sewer line to convey flows from DNRPs diversion structure at 3<sup>rd</sup> Ave. W (under the Ship Canal) to the tunnel drop shaft;
- Gravity sewer line to convey flows from DNRPs diversion structure at 11<sup>th</sup> Ave. NW to the tunnel drop shaft; and a
- Force main to convey flows from the tunnel pump station to DNRPs existing Ballard Siphon wet-weather barrel forebay.

SPU would be solely responsible for the design, construction, management and cost of gravity sewer lines to convey flows from SPU's diversion structures at Ballard outfalls 150, 151 and 152, and Wallingford outfall 147 to the tunnel drop shafts.<sup>5</sup>

### **Project Design Assumptions and Parameters**

The control strategy will limit the inflow to the storage tunnel from each outfall basin for each storm event. The minimum control volume for each outfall is:

#### SPU Outfalls

- Fremont (Outfall 174): 1.06 MG
- Wallingford (Outfall 147): 2.15 MG
- Ballard (Outfall 152): 5.38 MG
- Ballard (Outfall 150/151): 0.62 MG

#### DNRP Outfalls

- 3rd Avenue West (DSN008): 4.18 MG
- 11th Avenue Northwest (DSN004): 1.85 MG

Each Party has calculated the control volumes required to meet their independent needs. Although calculation methods vary between the agencies, SPU and DNRP agree that these are the minimum volumes to be controlled and provided for by The Ship Canal WQ Project.

### **Ownership and Operation of the Facility**

SPU would own and operate the storage tunnel and all of the related components listed in the project description above, including all new structures and pipes appended to each existing DNRP outfall pipe and all real estate previously owned or acquired for the project. However, ownership of outfall pipes would remain unchanged. Prior to commissioning of the project, SPU is compelled by the JPA to develop an Operations and Maintenance Plan that must be agreed to by DNRP. The JPA also stipulates a "No Impact Release Rate" to ensure pumping out of the storage facility does not impact the function of the

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<sup>5</sup> These are components and costs of the project are referred to as "excluded" in the JPA

West Point Treatment Plant or cause King County to not meet its regulatory standards for discharges from West Point.

### **Project Costs and Cost Sharing**

SPU and WTD aimed to define a method for sharing capital and operating costs in the joint project that ensures a “win-win” outcome, in which associated risks and rewards are apportioned equitably. The cost sharing methods incorporated into the JPA are based on three principles:

1. Controlling CSO’s through joint multi-basin efforts may be less costly (or otherwise beneficial) than controlling the same CSOs individually;
2. Both SPU and WTD should share in the potential savings of such joint action; and
3. Projects or facilities within SPU or WTD’s independent long term control plan responsibilities that are unaffected by the choice of a joint project should remain the responsibility of that agency.

SPU and WTD agreed to a Joint King County/Seattle CSO Initiative Work Plan Item 4: Cost-sharing Method for Joint Capital Projects, dated March 26, 2012 (Technical Memorandum No. 4) for the purpose of determining each agency's proportionate share of the total cost of The Ship Canal WQ Project. They also agreed to a Technical Memorandum 7, dated January 7, 2013, addressing a compensation methodology (costs and credits) for incremental changes to SPU wastewater flows that directly affect the operation and maintenance costs of DNRP facilities downstream of SPU facilities.

Cost estimates at a Class 4 level (with a range of minus 20 percent to plus 30 percent) were developed and cross-verified for each agencies’ separate, individual projects. They also agreed on a total cost of a shared Ship Canal WQ Project. A proportionate share of the costs was allocated based on the ‘avoided’ costs of what otherwise would have been individual projects divided by the cost of the shared project (excluding costs solely the responsibility of SPU). This methodology arrived at the proposed split of costs with King County paying 35 percent of the shared costs and Seattle paying 65 percent. However King County will be entitled to 40 percent of the shared storage with Seattle using the remaining 60 percent.

The total cost estimate (still Class 4) for the Ship Canal WQ Project is approximately \$423 million. This includes approximately \$41 million in land acquisition costs and conveyance pipes that are solely the responsibility of SPU (referred to as excluded costs). Based on the agreed cost-sharing methodology, the cost for WTD is estimated to be \$134 million and SPU’s to be \$289 million (\$41 million for SPU's sole responsibility + \$248 million for their proportionate share).

The JPA also spells out who will be responsible for fines or other costs related to discharges from outfalls that do not meet the regulatory standards and consent decree requirements.

## **Joint Project Agreement (JPA) – Section Descriptions**

The following major elements are contained in the JPA:

### Recitals (Article II):

- The Ship Canal WQ Project will not be used for any other basins or purpose than those defined in the JPA

### Project Design & Construction (Article IV):

- SPU shall be the lead agency and will be responsible for the planning, design, construction, delivery, operation, maintenance
- SPU will notify DNRP in advance of project milestones
- DNRP and SPU will communicate collaboratively with the Department of Ecology and EPA
- SPU will follow DNRP's Local Public Agency project review process

### Roles & Responsibilities (Article V):

- SPU will lead Project design, construction, commissioning, and operations; DNRP has a defined participation, review and inspection role at each stage of the Project
- Any changes that affect the Project Description (project scope, schedule or budget) will be resolved via the Change Management process

### Project Management (Article VI):

- SPU will develop and implement the Project Management Plan
- Any changes to scope, schedule or budget will be resolved via the Change Management process (Exhibit B)
- Joint public outreach and communications

### Ownership & Use (Article VII):

- SPU will own the Project
- The specific CSOs to be controlled by the Project, and the control volumes to be achieved are contained in this Article

### Operations & Maintenance (Article VIII):

- SPU will develop an O&M Plan in consultation with DNRP
- Content requirements for the O&M Plan are defined in this Article
- The O&M Plan is to be finalized at the end of construction; The Article contains a general schedule for completion in relation to Project design and construction

### Cost Sharing (Article IX):

- The Article contains the 65%/35% cost share split for non-excluded costs; SPU has a right to 60% of the volume, DNRP has a right to 40% of the volume
- Provisions for managing higher costs, allocating excess volumes, and addressing regular and continuous excess use capacity are contained in this Article

### Insurance & Indemnification Articles XI & XII):

- Requires City and County risk managers from to cooperate in the development of an insurance program for design and construction of the Project

- Insurance and Indemnification Requirements developed with the County's Risk Management Office and County's legal counsel in the Civil Division of the PAO

#### Project Description (Exhibit A)

- This Exhibit describes the Project Purpose, Scope, Capital Cost Estimate (including the excluded costs) and a Schedule Summary
- Change to the project scope would need to be negotiated and agreed to by both SPU and DNRP through the "Change Management Process" (see below)

#### Change Management (Exhibit B)

- Addresses potential risks to the project by utilizing senior level management from each agency as a Project Review and Change Management Committee (PRCMC) to provide oversight, support and direction should issues arise affecting project scope, schedule and/or budget.
- PRCMC decisions intended to be made by consensus – and otherwise relies on Paragraph 12 of the "One Team Decision Making Guidelines" (Exhibit C)
- SPU leadership will convene meetings with a "Direction and Action Log" maintained and shared for each meeting in addition to meeting minutes.
- Includes direction for PRCMC involvement in Consultant Contract Amendments and Construction Contract Changes

#### One Team Decision Making Guidelines (Exhibit C)

- Outlines the goals of a Project Team during phases of the project with regard to decision making, team member interactions, responsibilities and what to do if a team member disagrees with the decisions of the team or Team Lead.
- Paragraph 12 calls for the Team Lead to make a project decision in the absence of consensus.

#### List of Potential Causes for Capital Cost Increases (Exhibit D)

- Assigns financial responsibility for potential capital cost increases to the Lead Agency (SPU) or Partner Agency (DNRP) or where the cost increase would be shared.

#### DNRP-WTD Invoice Format (Exhibit E)

- Titled to be the 'invoice format' – but is actually intended to provide the format for reporting of SPU costs (to accompany monthly invoices) ranging from staffing to mitigation.

### **ANALYSIS**

Council staff and legal analysis of the proposed project and JPA is still ongoing.

In addition to PO 2016-0016 approving the Ship Canal Water Quality Joint Project Agreement, the Executive also transmitted PO 2016-0017 approving a supplemental appropriation for the Ship Canal WQ Project for approximately \$14.2 million. This appropriation is requested to cover the DNRP's portion of the costs for the preliminary



analysis and design work, including costs from the years 2014 – 2015 and anticipated costs in 2016.

Though this is a separate decision of the Council, it should be noted that a supplemental appropriation and any first allocation of funding to a capital project is required by KCC 4A.130.010 to undergo an annual mandatory phased appropriation determination<sup>6</sup> if it exceeds \$10 million. Capital project are required to receive an annual risk assessment score using a risk assessment scoring instrument developed by the Capital Projects Oversight Program in the Auditor's Office. For capital project supplemental appropriation requests, the Executive is required by KCC 4A.130.020 to transmit a risk assessment score, with the request. Within a reasonable time, the Joint Advisory Group (JAG) in consultation with the Capital Projects Oversight Program shall consider the project's risk assessment score and determine if the project is to be a mandatory phased appropriation project. At this time, the project risk assessment has not been received and the Oversight Program staff have not been briefed on the project yet.

The remainder of this analysis section of this staff report provides a preliminary assessment of how the Ship Canal WQ Project would meet the Consent Decree terms and King County's long term CSO control plan and how it compares to estimated costs for separate projects. Finally this section briefly summarizes policy considerations regarding the project and agreement.

### **Compliance with Consent Decree and Long-term CSO Control Plan**

The Consent Decree contemplated potential joint projects between King County and Seattle. King County's long-term CSO control plan recommended the 3rd Ave W (DSN 008) CSO project be a joint Seattle-County storage tank on the north side of the Ship Canal. It was scheduled for completion in 2023 and proposed to hold up to 7.23 MG of peak CSO storage with the County's portion of the project estimated to be \$50.3 million (in 2010 dollars and at a Class 5 cost estimate<sup>7</sup>). But as a fall back, the plan recommended an independent storage tank near Seattle Pacific University at an estimated cost of \$56.4 million.

The 11<sup>th</sup> Ave NW (DSN 004) was proposed to be controlled by reducing some flows through green stormwater infrastructure (GSI) in the basin and additional conveyance capacity to move flows to the Ballard Siphon more swiftly at an estimated cost of \$23.7 million. Because of the GSI component project wasn't scheduled to be completed until 2030.

DNRP has already begun discussions and would be seeking approval from EPA and Ecology to approve a modified schedule for completion of the 3<sup>rd</sup> Ave W. CSO control project and a change in the project description for the 11<sup>th</sup> Ave. NW CSO and 3<sup>rd</sup> Ave W. CSO control projects consistent with the Ship Canal WQ Project schedule and description. It is premature to formally request approval of the project changes until the Council has approved the project and the JPA. It is noted here as a potential (though

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<sup>6</sup> The Council developed this code provision to determine which projects had significant risks, requiring monitoring of the project through design and construction, with requirements for written documentation and reviews as the project progressed through 'phases' prior to Council authorization of appropriation for the next phase.

<sup>7</sup> Class 5 estimates have a variance ranging from minus 50% to plus 100%

unlikely risk) that EPA and Ecology will need to approve the changed project scopes and schedules.

### **Cost Comparisons**

As noted above, the total Class 5 cost estimate for CSO projects for 3<sup>rd</sup> Ave W. and 11<sup>th</sup> Ave NW was approximately \$74 million (in 2010 dollars). Those cost estimates were based on long-range planning concepts for the projects in the 1999 Regional Wastewater Services Plan. Adjusting for inflation and typical project cost increases that estimate would be almost \$86 million (with a range of \$43 million to \$171 million).

By comparison, the current estimate of \$134 million for King County's portion of the costs in the Ship Canal WQ Project actually reflects a range (at a Class 4 cost estimate ranging from minus 20 percent to plus 30 percent) of \$107 million to \$174 million.

Council staff has not analyzed all the components of the cost estimates or assessed the accuracy of the estimates. Staff has provided the comparison of the separate projects to a shared project to note that the cost estimates are relatively similar. Executive staff have verbally noted that the shared project may cost about the same or slightly less than two separate projects. But rather than cost, the primary driver for the shared project is the opportunity to consolidate several complex projects under the coordinated leadership of a single entity while reducing environmental and community impacts.

There are different risks and benefits between controlling costs during the design phase for multiple complex projects compared to one larger complex project (see below).

### **Environmental and Community Impacts**

Council staff has not done a detailed examination of the impacts of separate projects versus a joint project but logically it is assumed that one project versus seven lessen the impact on the immediate environment and the broader communities that would be affected by these projects.

Construction of one storage tunnel will involve the deployment of a single tunnel boring machine with portals constructed at either end. This single project could be expected to reduce traffic disruptions and other neighborhood impacts compared to tunneling or construction of storage is needed at seven different sites. The joint project as proposed would also require a reduced number of necessary property acquisitions, which would lower the impact on commercial businesses and residences.

### **Control over scope, schedule and budget**

The JPA calls for Seattle to assume the project lead for design and construction of the project. King County's DNRP leadership would have an ongoing and defined role in decision-making, especially where it concerns any proposal to amend the scope or address issues affecting schedule and budget. However the day to day project management responsibilities would fall primarily to SPU staff. The JPA and attached Exhibits address decision-making and anticipated cost assignments where costs might escalate due to one party or the other not meeting deadlines or project conditions that cannot be known at this time. These same unknowns would likely exist for individual projects.

King County is required to complete the control of its CSOs under the terms of the consent decree. However, if the Council approves the Ship Canal WQ Project JPA through Proposed Ordinance 2016-0016 and the supplemental appropriation proposed through Proposed Ordinance 2016-0017 and allows the Executive to enter into the JPA, the County will be able to satisfy the consent decree obligations through the Ship Canal WQ Project. The JPA, if signed by both City and County would continue in perpetuity, unless both parties mutually agree to terminate it.

This aspect of the project reflects potentially the most risk and benefit. As noted above, though not quantified, there are potentially significant benefits to a coordinated single project in a dense, urban neighborhood, compared to multiple complex projects in this setting. However, there is also risk in assigning the project to Seattle and SPU to lead. Though DNRP will have a role in decision-making affecting the scope, schedule and cost of the project, it ultimately will be the Seattle's project to deliver on time and on budget.

Mitigating the risks for project scope alterations, etc. is outlined throughout the JPA but it is a policy decision whether what is outlined provides sufficient security and confidence for the project funders.

As noted above, staff and legal analysis is ongoing.

## **ATTACHMENTS**

1. Proposed Ordinance 2016-0016 (and its attachments)
2. Transmittal Letter , dated December 29, 2015
3. Fiscal Note

## **INVITED**

- Sharman Herrin, Governmental Relations Director, Wastewater Treatment Division
- Mark Buscher, Capital Project Manager and CSO Program Lead, Wastewater Treatment Division