



**COMMISSION  
AGENDA MEMORANDUM**

**Item No.** 4g

**ACTION ITEM**

**Date of Meeting** June 27, 2017

**DATE:** May 5, 2017

**TO:** Dave Soike, Interim Executive Director

**FROM:** Jeffrey Brown, Director Aviation Facilities and Capital Programs  
Wayne Grotheer, Director Aviation Project Management Group

**SUBJECT:** Industrial Wastewater System Glycol Management Improvements (CIP #C800655)

**Amount of this request:** \$1,092,000

**Total estimated project cost:** \$1,142,000

**ACTION REQUESTED**

Request Commission authorization for the Executive Director to (1) prepare design and construction bid documents for the Industrial Wastewater System (IWS) Glycol Management Improvements project at Seattle-Tacoma International Airport; (2) use Port crews and small works contracts to purchase and install all necessary equipment and devices; (3) advertise and award a construction contract. The amount of this request is \$1,092,000 for a total estimated project cost of \$1,142,000.

**EXECUTIVE SUMMARY**

The purpose of this project is to reduce the amount of wastewater sent to sewage treatment plants. This project will install two Total Organic Carbon (TOC) analyzers into the existing Industrial Wastewater System (IWS) conveyance system serving the ramp areas on the south half of the Airport. TOC analyzers measure the Total Organic Carbon of wastewater and that data is correlated to Biochemical Oxygen Demand (BOD) of wastewater. High BOD in airport wastewater systems is largely the result of Glycol used during deicing activities of aircraft.

These new TOC analyzers will provide data that the Port of Seattle Industrial Wastewater Treatment Plant (IWTP) operators will use to manage wastewater treatment and reduce the amount of wastewater sent to Valley View Sewer District sanitary sewers and King County South Wastewater Treatment Plant. These TOC analyzers are desk top sized computer devices that connect to the wastewater sampling stations.

**JUSTIFICATION**

Since 2006, the IWTP has discharged three times as much wastewater for treatment through Valley View Sewer District sanitary sewers and King County South Wastewater Treatment Plant as the design engineer originally predicted. The Port has agreements with Valley View Sewer

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District and King County South Wastewater Treatment Plant for the originally estimated 36 million gallons of wastewater treatment discharge per year. The Port has averaged over 125 million gallons of wastewater treatment discharge per year since 2007. The Port has on average paid fees of \$1,250,000 per year to Valley View Sewer District and King County South Wastewater Treatment Plant. Installing these new TOC analyzers will enable the IWTP to segregate and discharge only the wastewater that requires treatment to Valley View Sewer District sanitary sewers and to the King County South Wastewater Treatment Plant and thus reduce the fees paid by the Port of Seattle for wastewater treatment. This project will help the Port of Seattle meet the new King County Discharge permit restrictions and keep alignment with our commitment to the All Known, Available and Reasonable methods of Treatment (AKART) initiative. The size and scope of work for this project are an ideal fit for the Port Construction Services (PCS) group. Requesting the design and construction authorization simultaneously allows PCS to procure the TOC analyzers concurrent with the design and take advantage of the dry season and preplan the construction in 2018.

**DETAILS**

Sea-Tac utilizes three primary lagoons for wastewater segregation.

- Lagoon #1: A mix of high and low BOD water due to operational limitations resulting from a lack of IWTP influent TOC meters. This project corrects this condition.
- Lagoon #2: Provides storage for high BOD (dirty) water that must be discharged to King County for treatment.
- Lagoon #3: Provides storage for low BOD (clean) water that is permitted for discharge to the Puget Sound.

Since the IWTP does not currently have influent TOC meters the BOD level of the incoming wastewater is unknown and as such must be sent to Lagoon #1 for measurement, processing, and storage. Existing TOC meters at the discharge outlets of lagoon #1 provide IWTP operators with the information they need to determine the BOD content of the wastewater. This operating scenario is inefficient because all incoming wastewater is mixed in lagoon #1 and does not provide effective segregation of high and low BOD influent. High BOD wastewater is often diluted and low BOD wastewater can be contaminated.

This project will reduce the volume of wastewater sent to Valley View Sewer District sanitary sewers and to the King County South Wastewater Treatment Plant by segregating the wastewater prior to storage in Lagoon No. 1 and thus reduce the fees paid by the Port of Seattle for wastewater treatment and improve the operation of the IWTP.

TOC analyzers measure the Total Organic Carbon of wastewater and that data is correlated to Biochemical Oxygen Demand (BOD) of wastewater water. Per the Port of Seattle National Pollution Discharge Elimination System (NPDES) permit, wastewater with a High BOD must be discharged to a Wasterwater Treatment Facility. Wastewater with a Low BOD can be discharged directly to Puget Sound. Installing these two new TOC analyzers will not reduce the

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volume of wastewater to 36 million gallons per year, but these TOC analyzers will ensure that only high BOD wastewater is discharged to Valley View Sewer District sanitary sewers and to the King County South Wastewater Treatment Plant.

**Scope of Work**

Develop a design, procure equipment, construct and install two TOC analyzers in locations that enable the IWTP operators to segregate the low and high BOD wastewaters and more efficiently and effectively operate the IWTP.

**Small Business**

In support of the scope of work, portions of this project will utilize PCS small works contracts which enable small business participation.

**Schedule**

Commission design and construction authorization	2 <sup>nd</sup> Quarter 2017
Design start	3 <sup>rd</sup> Quarter 2017
Construction start	4 <sup>th</sup> Quarter 2017
In-use date	2 <sup>nd</sup> Quarter 2018

**Cost Breakdown**

	This Request	Total Project
Design	\$407,000	\$407,000
Construction	\$735,000	\$735,000
Total	\$1,142,000	\$1,142,000

**ALTERNATIVES AND IMPLICATIONS CONSIDERED**

**Alternative 1 – Maintain current conditions**

Cost Implications: \$0

Pros:

- (1) No capital costs required

Cons:

- (1) The IWTP will continue to mix low and high BOD wastewater and discharge that wastewater to a treatment facility at an average cost of \$1,250,000 per year.
- (2) Does not prepare the Port of Seattle for the new King County Discharge permit restrictions and does not keep alignment with the All Known Available Reasonable methods of Treatment (AKART) initiative.

This is not the recommended alternative.

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**Alternative 2 – Install two new TOC analyzers**

Cost Implications: \$1,142,000

Pros:

- (1) The SEATAC IWTP will be able to segregate Low and High BOD wastewater and discharge only the wastewater that requires treatment to Valley View Sewer District sanitary sewers and to the King County South Wastewater Treatment Plant and thus reduce the fees paid by the Port of Seattle for wastewater treatment. We conservatively estimate a 10% reduction in fees.
- (2) Installing these new TOC analyzers will ensure that the Port of Seattle remains in compliance with the National Pollution Discharge Elimination System (NPDES) permit.
- (3) The project will help the Port of Seattle meet the new King County Discharge permit restrictions and keep alignment with the All Known Available Reasonable methods of Treatment (AKART) initiative.

Cons:

- (1) Requires a capital investment of \$1,142,000

***This is the recommended alternative.***

**FINANCIAL IMPLICATIONS**

***Cost Estimate/Authorization Summary***

	Capital	Expense	Total
<b>COST ESTIMATE</b>			
Original estimate	\$900,000	\$0	\$900,000
Revised estimate	\$1,142,000	\$0	\$1,142,000
<b>AUTHORIZATION</b>			
Previous authorizations	\$50,000	\$0	\$50,000
Current request for authorization	\$1,092,000	\$0	\$1,092,000
Total authorizations, including this request	\$1,142,000	\$0	\$1,142,000
Remaining amount to be authorized	\$0	\$0	\$0

***Annual Budget Status and Source of Funds***

This project CIP #C800655 was included in the 2017 capital budget and plan of finance with a budget of \$850,000. The budget increase will be transferred from the Aeronautical Allowance CIP (C800753), resulting in no net change to the airport capital budget. The funding source will be the Airport Development Fund.

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***Financial Analysis and Summary***

Project cost for analysis	\$1,142,000
Business Unit (BU)	Utilities, Industrial Waste Water cost recovery
Effect on business performance (NOI after depreciation)	NOI after depreciation will increase
IRR/NPV (if relevant)	N/A
CPE Impact	\$.03 in 2019

***Future Revenues and Expenses (Total cost of ownership)***

Long term operating costs will be minimized by incorporating newer more energy-efficient equipment and components that meet the Port’s mechanical and electrical design standards for operational cost and optimum energy utilization. Maintainability will be improved by installation of equipment with useful life spans of 20-30 years.

**ATTACHMENTS TO THIS REQUEST**

- (1) Diagram of proposed of TOC analyzer layout and sample station locations.
- (2) IWTP Lagoon overview.

**PREVIOUS COMMISSION ACTIONS OR BRIEFINGS**

None