



**COMMISSION  
AGENDA MEMORANDUM**

**Item No.** 8b

**ACTION ITEM**

**Date of Meeting** September 26, 2023

**DATE:** September 15, 2023

**TO:** Stephen P. Metruck, Executive Director

**FROM:** Eileen Francisco, Director, Aviation Project Management  
Sarah Cox, Director, Aviation Environment & Sustainability

**SUBJECT: Industrial Wastewater Treatment Plant (IWTP) Enhancements – CIP# C801234  
30% Design Funding**

**Amount of this request:** \$11,500,000

**Total estimated project cost:** \$250,000,000 - \$350,000,000

**ACTION REQUESTED**

Request Commission authorization for the Executive Director to (1) advertise and execute a project specific contract for Architecture and Engineering (A&E) services, (2) develop a project notebook document and progress the overall design to 30%, (3) utilize port crews for enabling work related to the Industrial Wastewater Treatment Plant (IWTP) project at Seattle-Tacoma International Airport. The amount being requested under this authorization is \$11,500,000.

**EXECUTIVE SUMMARY**

This project will install a pre-treatment system and upgrade the existing systems at the IWTP to ensure compliance with future King County Department of Natural Resources Industrial Waste Discharge permit limits.

The airport's IWTP manages and treats stormwater associated with industrial activities from aircraft fueling and maintenance operations as well as wastewater from other airport related operations such as aircraft deicing. Stormwater runoff with low Biochemical Oxygen Demand (BOD) discharges to the Puget Sound under conditions of National Pollutant Discharge Elimination Systems (NPDES) permit. Stormwater runoff with high BOD discharges to King County South Treatment Plant for secondary treatment under King County Department of Natural Resources Permit No. 7810-05. The primary source of high BOD is aircraft deicer runoff. Effective in 2026, the King County BOD permit limits will be restricted to a level that will require an on-site pre-treatment system at the Seattle–Tacoma International Airport (SEA).

The amount of this request is \$11,500,000 to complete 30% Design and the Project Notebook. The total estimated project cost is currently \$250,000,000 - \$350,000,000. Staff will return to the Commission following the completion of 30% design work; at this time staff will provide an

Meeting Date: September 26, 2023

updated project cost estimate and request authorization for design funding to move forward with the remaining detailed design phase.

**JUSTIFICATION**

Since 2007, the IWTP has discharged industrial wastewater runoff containing aircraft deicers to the King County Wastewater Treatment System. Through each permit cycle, King County has restricted discharges because under sustained heavy deicer loads, the performance of the County’s treatment plant has been disrupted by the Port’s discharges.

Over the past five years, the Port has evaluated technologies and methods to reduce impacts to the King County treatment plant. This evaluation included a comprehensive assessment of deicing source control, storage, and treatment technologies. This assessment resulted in measures to reduce the amount of aircraft deicer applied and implemented operational efficiencies. For example, most of the aircraft deicer applicators switched to an application technology reducing the amount of deicer applied. This source reduction reduces the amount of future storage needed.

Under the terms of the July 2021 Industrial Waste Discharge (IWD) permit, the Port is required to implement infrastructure and operational modifications by 2026 to comply with future discharge limits. The previous BOD mass loading limit of 60,000 lb/day will be reduced to 15,000 lb/day maximum daily and 10,000 lb/day on a monthly average basis as of July 20, 2026, with interim limits imposed in the current permit cycle. The IWTP modifications needed to comply with these reduced limits include significant additions to the system for storage and pretreatment of IWS stormwater containing spent aircraft deicing fluid. The 2021 IWD permit also includes a compliance schedule over the next five years to reflect progress toward implementation of measures to meet reduced 2026 effluent limitations. Given the complexity of the scope, the current project schedule shows a completion date more than 2 years after the IWD permit limits have taken effect. The Port has been in communication with King County Department of Natural Resources regarding this schedule and has received an extension on the 60% and 100% design deliverables only. The Port will continue to collaborate to meet permit limits during construction of the project.

While the Port has developed a preliminary design of the pretreatment and storage systems, some elements of the design scope present risks to overall cost and schedule (phasing, controls architecture, storage requirements, seasonal modeling, etc.). Development of a 30% Design package will further develop these elements and provide an accurate cost estimate for long-term decision making. The requested authorization will facilitate this process and keep the project on the approved compliance schedule with King County.

***Diversity in Contracting***

There will be a 15% WMBE aspirational goal associated with this contract.

**DETAILS**

Requested funds will be used to develop:

Meeting Date: September 26, 2023

- 30% Design Package
- Project Notebook
- Updated cost estimate
- Further development of siting and permitting requirements

The 30% Design will develop scope of the pre-treatment system, water storage, and all associated mechanical support systems. The pre-treatment system will need to be integrated into the existing IWTP. The current plan is to procure and execute a project-specific contract for A&E services.

***Scope of Work***

30% Design of the following systems will be included in the scope of the Project Notebook:

- (1) Upgrades to existing IWTP systems (dissolved air flotation systems, pumps, controls, etc.).
- (2) Pre-treatment flow diversion and influent system
- (3) Storage systems to facilitate pre-treatment.
- (4) BOD treatment system (aerated gravel beds, oil-water separators, drainage, etc.).
- (5) Effluent discharge systems.
- (6) Pumps and systems.
- (7) New support systems (controls building, power supply, controls, HVAC).

The Scope of Work will also include a preliminary phasing plan and cost estimate.

***Schedule***

The current project schedule shows an in-use date between Q4 2026 - Q2 2027. The dates shown below are based on conservative assumptions in procurement, permitting, and construction. Options to further compress the schedule will be evaluated during the planning phase to ensure that discharge to the King County STP complies with anticipated 2026 BOD permit levels.

***Activity***

|                                       |                |
|---------------------------------------|----------------|
| Design start                          | 2024 Quarter 3 |
| Commission full design authorization  | 2025 Quarter 2 |
| Commission construction authorization | 2026 Quarter 2 |
| Construction start                    | 2026 Quarter 3 |
| In-use date                           | 2028 Quarter 4 |

***Cost Breakdown***

|              | This Request        | Total Project          |
|--------------|---------------------|------------------------|
| Design       | \$11,500,000        | \$28,000,000           |
| Construction | \$0                 | TBD in 30% Design      |
| <b>Total</b> | <b>\$11,500,000</b> | <b>\$250M - \$350M</b> |

Meeting Date: September 26, 2023

**ALTERNATIVES AND IMPLICATIONS CONSIDERED**

**Alternative 1** – Do not proceed with this project.

Cost Implications: Approximately \$1,500,000 would need to be expensed. BOD levels would exceed permit allowances and likely result in significant fines indefinitely. The Port would not be in compliance with Wastewater Discharge Permit No. 7810-05.

Pros:

- (1) No capital investment required at this time.

Cons:

- (1) Failure to meet King County permit levels for the new permit cycle will leave limited options for managing de-icing runoff at STIA. High BOD wastewater at the IWTP will not be able to discharge to the King County South Treatment Plant.
- (2) In order to comply with reduced limits, the IWTP current storage is not sufficient and could result in overflow of untreated water into adjacent receiving waters.
- (3) High risk of violating King County and NPDES permit requirements. Increased risk of King County restricting or ceasing discharges during high-risk operational periods.

This is not the recommended alternative.

**Alternative 2** – Develop 30% Design to determine approach for implementation of a pre-treatment system at the Industrial Wastewater Treatment Plant (IWTP).

Cost Implications: \$11,500,000

Pros:

- (1) Implementation of a pre-treatment facility on-site at STIA will allow continued discharge to the King County South Treatment Plant.
- (2) King County Department of Natural Resources requires submittal of the Draft Design Documents (60%) by September 30, 2025 and the Final Design Documents (100%) by March 20, 2026. This approach will allow the Port to meet the current permit schedule. Note that while King County has approved these project milestone dates via the Final Engineering Report, management of BOD effluent limits after June 2026 will require further collaboration between the Port and KCIW.
- (3) The 30% Design will allow the long-term design team to develop an overall design philosophy for the final system, reducing uncertainties which could have an impact on project cost and schedule. Comprehensive existing conditions and permit requirements will be evaluated, and an updated project cost estimate will be developed.

Cons:

- (1) Capital investment of \$11,500,000 is required to develop 30% Design (current total project estimate is \$250M - \$350M).

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

Meeting Date: September 26, 2023

**FINANCIAL IMPLICATIONS**

Following a third-party cost estimate, as part of the 30% Design, the project will update the revised estimate for total project cost.

| <i>Cost Estimate/Authorization Summary</i>   | Capital       | Expense | Total                            |
|--|---------------|---------|----------------------------------|
| <b>COST ESTIMATE</b>                         |               |         |                                  |
| Original estimate                            | \$127,000,000 | \$0     | \$127,000,000                    |
| Transfer from IWTP Controls                  | \$10,600,000  | \$0     | \$10,600,000                     |
| Current Budget Estimate                      | \$137,600,000 | \$0     | \$137,600,000                    |
| Revised Estimate Range                       | TBD           | \$0     | \$250,000,000 -<br>\$350,000,000 |
| <b>AUTHORIZATION</b>                         |               |         |                                  |
| Previous authorizations                      | \$2,135,000   | \$0     | \$2,135,000                      |
| Current request for authorization            | \$11,500,000  | \$0     | \$11,500,000                     |
| Total authorizations, including this request | \$13,635,000  | \$0     | \$13,635,000                     |
| Remaining amount to be authorized            | TBD           | \$0     | TBD                              |

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

This project, CIP C801234 was included in the 2023-2027 capital budget and plan of finance with a budget of \$127,000,000. The capital increase of \$10,600,000 was transferred from the Aeronautical Allowance<sup>1</sup> CIP C800753 resulting in no net change to the Airport capital budget. Note that the initial cost of C801234 was set at \$100,000,000 for a new pretreatment system; this value was set before the system scale required to meet the King County permit limits was understood. This was combined with \$37,600,000 from projects C801123 and C801122, which were intended to upgrade mechanical and controls systems at the existing IWTP. The current budget of \$137,600,000 does not account for the overall complexity of a project of this magnitude.

The cost is estimated to be within a range of \$250 - \$350 million. This cost is based on estimates developed from the preliminary design, and the wide range is a result of large uncertainty in the capability of the existing storage capacity of the system to meet pretreatment requirements. These uncertainties will be evaluated in the 30% Design to allow for final decision-making by project stakeholders. The funding sources would include the Airport Development Fund and revenue bonds. Most of the project costs would be recovered through airlines rates. The Majority-In-Interest ballot would be submitted to the airlines for approval in late 2024, once the 30% Design and cost estimate has been developed.

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<sup>1</sup> The Aeronautical Allowance is included in the Capital Improvement Plan to ensure funding capacity for unspecified projects, cost increases for existing projects, new initiatives, and unforeseen needs. This ensures funding capacity for unanticipated spending within the dollar amount of the Allowance CIP.

Meeting Date: September 26, 2023

***Financial Analysis and Summary***

|   |  |
|---|--|
| Project cost for analysis                               | \$250,000,000 - \$350,000,000  |
| Business Unit (BU)                                      | Industrial Waste System  |
| Effect on business performance (NOI after depreciation) | NOI after depreciation will increase due to inclusion of capital (and operating) costs in airline rate base. |
| IRR/NPV (if relevant)                                   | N/A  |
| CPE Impact  | \$0.57 - \$0.87 in 2029  |

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

Aviation Operations and Maintenance have reviewed the preliminary design of the system, and meetings have been held with leadership from each group to discuss expected additional costs of ownership. The preliminary design documentation includes a summary of expected additional operators needed to support the system, as well as additional maintenance and spare part requirements. A full evaluation of the future expenses will be provided with the completed Project Notebook.

**ADDITIONAL BACKGROUND**

N/A

**ATTACHMENTS TO THIS REQUEST**

- (1) Presentation

**PREVIOUS COMMISSION ACTIONS OR BRIEFINGS**

December 14, 2021 (Item 8I) – The Commission authorized execution of a contract for Architecture and Engineering (A&E) services to complete planning and preliminary design for the Industrial Wastewater Treatment Plant (IWTP) Program (CIP C801234). The amount of this request was \$2,000,000.