

Joint King County/Seattle Initiatives Item 7

Incremental Costs and Credits Associated with Combined Sewer Overflow Return Flows and Other Seattle Flow-Changing Initiatives

Overview

This outline identifies the major components that form the basis for estimates of the incremental or decremental cost of increased or decreased flows delivered to the West Point Treatment Plant (WP) or South Treatment Plant (SP) due to Seattle CSO initiatives, including returns from Combined Sewer Overflow (CSO) control facilities, installation of Green Stormwater Infrastructure, flow separation, and other captured CSO flow. The components below focus on the costs associated with operations of intervening pump stations, tunnel facilities and major treatment plants. The specific examples accompanying this memo include 1) the Elliott West CSO facility flows going to WP and 2) the Henderson CSO facilities going to SP, however the approach should be applicable in other cases as well. The approach and principles stated in this memo, while specifically addressing CSO control return flows, can be adapted to the more general topic of incremental increases in flows to the system with recognition and adaptation of the special characteristics of the particular application.

The principles that should guide the determination of charges for increased flows associated with CSO facilities and installations are that they be:

- Rational and reasonable – the charge makes sense to the component agencies and the public
- Economically efficient – the charges lead to appropriate investment decisions.
- Effective in recovering costs associated with the activity
- Based on available data to the degree possible. This may involve some loss of ultimate precision but should support the greater goals of being:
 - a. Replicable – easy to get up-to-date data (on an annual basis)
 - b. Verifiable – assumptions and calculations can be checked and refined
- Transferrable – a similar approach would be used for any component agency and any facility with due recognition of the relevant special characteristics of the specific application.
- Consistent in that calculating the value of (decremental) credits will be consistent with the methods of calculating incremental costs.

Charges for Seattle project return flows and credits for Seattle reduced flows from other initiatives will include costs associated with: 1) the operations of the relevant facilities tributary to the Treatment Plant (TP) accepting the flows (if any), such as pump stations and other special facilities, e.g. the Henderson Tunnel Facilities; and 2) the flow-related and solids-related costs associated with incremental changes in flows at the treatment plant.

For TP charges/credits, changes in flows to the treatment plant will be charged/credited on a rate per million gallons comprised of three components. The first reflects expenses associated with flow conveyance, including the number of pump stations between source and treatment plant; secondly, flow processing; and finally, the third element reflects costs associated with solids processing. The expenses associated with solids will recognize the characteristic solids content of return CSO flows. As the solids content of CSO flows may vary significantly over time the use of a moving five year average of return flow characteristics may provide stability to the charge.

To provide perspective on the magnitude of costs discussed in this memo, estimates of the individual components of the charges are provided by example calculations for Elliott West CSO facilities and WP (based on 2012 adopted budget data) and Henderson CSO Facilities and SP (based on 2011 actuals). It is assumed billings or credits will be based on the actual costs and data from the previous year, unless otherwise noted or specified. Data updates will occur on a 5 year cycle or in light of process or facility changes that have a material effect on the processing cost with subsequent charges adjusted accordingly.

A. Pump Station Costs

Incremental operations costs for pump stations will be based on the number of pump stations between the source of the increased flow and the TP, applied as a per million gallon charge reflecting the 5 year average of operating costs of the pump stations. The resulting per-million gallons charge is then multiplied by the number of intervening pump stations. This “per million gallons per pump station” charge will be comprised of:

1. Increased energy costs – electricity costs attributed to specific pump stations between the source of the increased flow and the treatment plant. Costs are based on the 5 year average of pumping electricity costs per million gallons of the pump stations in the combined segment of the system for flows going to WP and for the specific pump stations in line with flows going to SP.
2. Increased operations cost – non-energy operating costs attributed to specific pump stations between the source of the increased flow and the treatment plant. Costs are based on the 5 year average of the flow-based incremental non-energy operating cost per million gallons of pump stations in the sample.

B. Henderson Tunnel Facilities Costs

Incremental operations costs for Henderson-MLK Treatment Tunnel: flow to the Henderson-MLK Treatment Tunnel is expected to impact the existing O&M by requiring the treatment tunnel to operate more frequently and for a longer duration, filling it more rapidly, increasing the number of flow peaks, and reducing treatment effectiveness. Incremental increases in O&M costs will be incurred for keeping the tunnel ready to perform, equipment, chemicals, and cleaning the tunnel after treatment to maintain compliance in the existing tunnel.

1. The parties agree that SPU will pay DNRP, annually, a share of the actual O&M costs incurred by DNRP, based on SPU's estimated average proportional share of flows to the Henderson/MLK Treatment Tunnel, which the parties agree is 13.3%.
2. The costs of increased O&M at the Henderson/MLK Treatment Tunnel shall be:
 - Increased energy, water and chemical costs
 - Increased operations cost – electrical and mechanical maintenance.

B. West Point Flow Related Costs

1. Increased WP flow processing costs. Charges for increased flows to WP from a CSO control facility (as measured by CSO returned flows) will reflect the annual costs for power and chemicals specific to flow treatment (including sodium hypochlorite, sodium bisulfate, caustic soda and others as may be relevant). The per-million gallon charge for these expenses is equal to the annual total divided by total inflow volumes to the plant.
2. Increased Local Hazardous Waste fees. WTD is charged a fee per million gallons of inflow to its plants by (KC?) Public Health for the local hazardous waste program. This fee will be applied to the increased CSO return flows.
3. West Division overtime labor costs during peak flows. Increased labor costs for additional staffing and overtime during peak flow periods. Use a ratio of returned CSO gallons during peak flow periods to total WP gallons during peak flow periods. Include benefits and WP labor overhead. Excludes CSO gallons released from storage during non-peak periods.

Note: Initial analysis indicates the labor amounts are not material and therefore have not been included the calculation.

4. WP facilities maintenance operating costs. Increased labor costs attributed to maintenance of WP liquid facilities. Use a ratio of returned CSO gallons to annual WP gallons. Include benefits and WP labor overhead.

Note: In the example, maintenance work is not allocated between liquids and solids and is presented as an aggregate.

C. West Point Solids Processing Costs

1. Increased plant solids operating costs. Increased solids to WP from CSOs (based on 5 year moving average of TSS) increase the annual costs for chemicals (dewatering polymer and thickening polymer) specific to solids treatment and grit hauling & disposal. The per-million gallon charge is based on the total costs for these expenses divided by total plant

inflow volumes. The charge is then adjusted by the 5-year moving average of CSO TSS relative to total inflow TSS to be applied against the CSO return flows

2. Increased biosolids haul & application operating costs. Increased solids to WP from CSOs (adjusted for TSS) increase the annual costs for hauling & application of biosolids. Excluding fixed cost components, the total haul and application cost from WP was determined. The per-million gallon charge is equal to the total costs for these expenses divided by total plant inflow volumes, which is then applied to the CSO adjusted return flows.
3. WP facilities maintenance operating costs - Increased labor costs attributed to maintenance of WP solids handling facilities. In light of data source limitations, maintenance work is not allocated between liquids and solids and is presented as an aggregate.

D. South Plant Flow Related Costs

1. Increased SP flow processing costs. Charges for increased flows to SP will reflect the annual costs for power and chemicals specific to flow treatment (including sodium hypochlorite, sodium bisulfate, caustic soda and others as may be relevant). The per-million gallon charge for these expenses is equal to the annual total divided by total inflow volumes to the plant.
2. Increased Local Hazardous Waste fees. WTD is charged a fee per million gallons of inflow to its plants by Seattle and King County Public Health for the local hazardous waste program. This fee will be applied to the increased CSO return flows.
3. East Division overtime labor costs during peak flows. Increased labor costs for additional staffing and overtime during peak flow periods. Use a ratio of returned CSO gallons during peak flow periods to total WP gallons during peak flow periods. Include benefits and WP labor overhead. Excludes CSO gallons released from storage during non-peak periods.

Note: Initial analysis indicates the labor amounts are not material and therefore have not been included the calculation.

4. SP facilities maintenance operating costs. Increased labor costs attributed to maintenance of SP liquid facilities. Use a ratio of returned gallons to annual SP gallons. Include benefits and SP labor overhead.

Note: In the example, maintenance work is not allocated between liquids and solids and is presented as an aggregate.

E. South Plant Solids Processing Costs

1. Increased plant solids operating costs. Increased solids to SP from CSOs (based on 5 year moving average of TSS) increase the annual costs for chemicals (dewatering polymer and thickening polymer) specific to solids treatment and grit hauling & disposal. The per-million gallon charge is based on the total costs for these expenses divided by total plant inflow volumes. The charge is then adjusted by the 5-year moving average of CSO TSS relative to total inflow TSS to be applied against the CSO return flows
2. Increased biosolids haul & application operating costs. Increased solids to SP from CSOs (adjusted for TSS) increase the annual costs for hauling & application of biosolids. Excluding fixed cost components, the total haul and application cost from SP was determined. The per-million gallon charge is equal to the total costs for these expenses divided by total plant inflow volumes, which is then applied to the CSO adjusted return flows.
3. SP facilities maintenance operating costs - Increased labor costs attributed to maintenance of SP solids handling facilities. In light of data source limitations, maintenance work is not allocated between liquids and solids and is presented as an aggregate.

F. Determination of Flow Quantities to Which Charges and Credits Will Apply

1. For any independent Seattle CSO storage facility, the measured release flows returned to the County's conveyance system will form the basis for return flow incremental cost calculation unless by mutual agreement an average is specified.
2. For any independent Seattle direct transfer of flow, the measured release flows returned to the County's conveyance system will form the basis for incremental cost calculation unless by mutual agreement an average is specified.
3. For a jointly developed County/City CSO facility, all operating costs associated with that CSO facility will be shared based on the cost share calculation developed for that facility, according to the methodology selected by King County and Seattle. Return flow share assignments, on the other hand, will be based on the respective design control volumes for each agency in their basins tributary to the joint CSO facility.
4. For Green Stormwater Infrastructure installations in CSO basins that are owned and maintained by Seattle, modeled reductions in influent flows to a TP will form the basis for decremental flow credit calculation. These calculations will rely on the methodology underlying the estimates contained in the *December 2013 SPU-WTD Joint Program*

*Management Technical Memorandum on Green Stormwater Infrastructure
Modeling Methods.*

G. Billing and Further Considerations

1. Billing frequency will be annual, after year-end results are known (approximately second quarter).
2. Calculation will be based on most recent year of full data, e.g. charges covering 2013 would be first billed June 2014 and based on 2013 year-end data unless otherwise specified.
3. Verification of assumptions, reconciliations and incorporation of changed conditions into subsequent charges.

H. Attachments

1. The attached excel workbook (Attachment 1) provides an example of the estimate for incremental costs associated with the increased return flows from the Elliott West CSO facility and West Point, including:
 - a. A summary sheet indicating the major components of the charge and estimated contribution to the total charge. References to the detailed spreadsheets are included.
 - b. Detailed sheets that provide additional data on the source of the cost element
2. The attached excel workbook provides an example of the estimate for incremental costs associated with the increased flows from the Henderson Facilities and South Plant, including:
 - a. A summary sheet indicating the major components of the charge and estimated contribution to the total charge. References to the detailed spreadsheets are included.
 - b. Detailed sheets that provide additional data on the source of the cost element