

NOTE: This impact assessment is based on Service Strategy 3 as presented in the Draft RWSP. See Part I of this FEIS for revised strategy descriptions and analysis.

CHAPTER 7

IMPACTS AND MITIGATION MEASURES FOR SERVICE STRATEGY 3

Service Strategy 3 is described in Chapter 3 of this EIS. The major features of SS3 are as follows:

- Create a three-treatment-plant system (comprised of the West Plant, East Plant and new North Plant)
- Leave West Plant capacity at 133 mgd
- Expand East Plant in increments to 172 mgd (2040)
- Construct new third outfall off Duwamish Head (2004)
- Construct new 89 mgd North Plant in increments (2030)
- Construct a conveyance system to carry influent to the North Treatment Plant and an outfall from the North Treatment Plant to Puget Sound (2010)
- Implement CSO program to achieve one event per outfall per year by 2040.
- Implement small-scale I/I reduction program

The important features of Service Strategy 3 are shown in the Figure 3-3.

WATER RESOURCES

Impacts

Treatment plant discharges would increase for SS3 as a direct result of expected population growth in the region. Increased discharges would cause operational impacts on water quality in Puget Sound off West Point, Duwamish Head, and the North Plant outfall. Pollutant loading rates are expected to increase in Puget Sound similarly to those described for SS1 and SS2. However, as described in Chapter 5, differences in flushing rates occur between the West Point, the Duwamish Head, and potential North Plant outfalls based on the depth of the outfalls and their relative locations in Puget Sound. To the extent that SS3 directed effluent away from the Duwamish Head outfall to a more northerly outfall that discharges into the upper water layer, it would be preferable from a water quality perspective to service strategies relying more heavily on treatment at the East Plant (i.e., SS1 and SS4).

West Service Area Treatment and Conveyance

Under this service strategy, no change would occur in the discharge capacity for the West Plant (capacity would remain at 133 mgd). Impacts arising from the operation of

conveyance systems that would serve the West Service area would be similar to those described for each of the other service strategies, except that the parallel Kenmore Interceptor would not be constructed.

East Service Area Treatment and Conveyance

Potential impacts to water resources from the expansion of the East Plant to 172 mgd under SS3 would be similar to those described for SS2.

North Service Area Treatment and Conveyance

Operation of a North Plant with the capacity to treat 89 mgd would result in the discharge of wastewater effluent into Puget Sound from a new outfall off the north King County or south Snohomish County shore. Pollutant loadings would be expected to increase in Puget Sound as described for SS1. However, as described in Chapter 5, differences in flushing rates occur between the West Point, Duwamish Head, and potential North Plant outfalls based on whether they discharge to the upper or lower water layers in Puget Sound.

With discharge to the upper water layer, the North Plant outfall would be in a desirable location for flushing effluent out of Puget Sound because it would discharge to the main channel, where this layer is moving rapidly northward, out of the Sound. The strong currents in this channel would also maximize mixing and dispersion of the effluent. As noted in Chapter 3, the complexity of the flow layering in this area of the Sound will require additional study to determine the best location for the North Plant outfall.

To the extent that SS3 directed effluent away from the Duwamish Head outfall to a more northerly outfall that discharged into the upper water layer, it would be preferable from a water quality perspective to service strategies relying more heavily on treatment at the East Plant (i.e., SS1 and SS4).

CSOs

CSO discharges for SS3 would result in improved water quality over existing conditions. Loading to receiving waters would be reduced for all pollutants of concern, with impacts similar to SS1 and SS2.

CSO outfall sites that would be improved include discharges to the Duwamish River (i.e., Michigan St., Brandon St., and Chelan Avenue), Elliott Bay (i.e., Denny Way, King St./Connecticut St., and Lander St./Hanford #2), the Ship Canal (University/Montlake), and Salmon Bay (i.e., 11th Avenue W. and Ballard).

Infiltration/Inflow

Operational impacts of a small-scale I/I program for SS3 would be similar to those identified for SS2.

Mitigation Measures

The measures identified for the mitigation of impacts on water resources are similar to those identified for SS1 and SS2.

Unavoidable Adverse Impacts

Increases in wastewater volumes under any of the service strategies would increase overall pollutant loadings in Puget Sound.

BIOLOGICAL RESOURCES

Impacts

Impacts to biological resources under SS3 would be similar to those under SS2. New outfalls off Duwamish Head and from the new North Plant would introduce effluent to new locations, affecting marine biological resources in the vicinity.

West Service Area Treatment and Conveyance

The West Plant would remain at its existing capacity. No impacts to biological resources would occur.

East Service Area Treatment and Conveyance

Impacts from operation of the expanded East Plant and additional Duwamish Head outfall would be the same as those for SS2.

North Service Area Treatment and Conveyance

Impacts from the proposed new North Treatment Plant outfall would be similar in nature, but slightly greater in magnitude, than for SS2. The new treatment plant would have a greater treatment capacity (89 mgd compared to 65 mgd) and, as a result, discharge-related impacts in the vicinity of the outfall would be slightly greater.

CSOs and Infiltration/Inflow

Impacts would be similar to those for SS1.

Mitigation Measures

Mitigation would be the same as identified for SS2.

Unavoidable Adverse Impacts

Unavoidable adverse impacts would be the same as those identified for SS2.

LAND AND SHORELINE USE

Consistency with Policies and Regulations

Growth Management Act and Local Comprehensive Plans

The consistency of SS3 with the GMA and local comprehensive plans would be similar to that described for SS2.

Shoreline Management Act

For SS3, a number of major facilities are proposed for designated shoreline areas and would require shoreline permits. Impacts would be similar to those described for SS1 except that the West Plant, which is located partially in the shoreline zone, would not be expanded *and the Kenmore Interceptor parallel project, also located partially in the shoreline zone, would not take place.*

Zoning

Zoning issues for SS3 would be similar to those described for SS2 for the East and North Plants. The West Plant would not be expanded under SS3, and the zoning issues raised by the other service strategies would not apply as a result.

The numerous individual pump stations, conveyance lines, and storage facilities proposed under SS3, which are usually classified as utilities, are generally permitted, either outright or by granting a special use, unclassified use, or similar land use permit. Where such a land use permit is required, landscaping or siting requirements and other performance standards are included as permit conditions to ensure compatibility with surrounding land uses.

Direct Land Use Impacts

West Service Area Treatment and Conveyance

Long-term land use impacts in the West Service Area as a result of this service strategy would be minimal.

East Service Area Treatment and Conveyance

The expanded East Plant would be located in a highly urbanized industrial/commercial area, and with continuation of the existing site design features and extension of perimeter buffering, the expanded plant would be compatible with surrounding land uses.

North Service Area Treatment and Conveyance

The compatibility of a new North Plant with nearby land uses would depend on its location. The size of site required to accommodate plant facilities and a buffer would be 35 to 45 acres. Impacts would be similar to those described for SS2.

CSOs and Infiltration/Inflow

Impacts would be the same as those for SS1.

Mitigation Measures

For development of new aboveground wastewater facilities proposed under SS3 (including a new North Plant), the site selection and design processes would include consideration of the nature of nearby land uses and natural environmental features, and place high priority on consistency with local comprehensive plans and compatibility with adjacent land uses. For example, land use consistency and compatibility would also be promoted through inclusion of appropriate design features (odor and noise control, for example) coupled with an appropriate degree of perimeter buffering.

Unavoidable Adverse Impacts

No unavoidable adverse impacts are anticipated.

ENVIRONMENTAL HEALTH

Public Health

Impacts

Proposed CSO control projects and the associated beneficial public health impacts are the same as identified in Chapter 5 under “Impacts Common to All Service Strategies.” CSO control projects under SS3 would essentially achieve the same reductions as SS1, but would include smaller facilities at the University and 3rd Avenue West locations, and projects would be completed slightly earlier. SS3 achieves the one-per-year untreated overflow objective by 2040, 3 years earlier than the other three service strategies.

Mitigation Measures

No mitigation measures are required.

Unavoidable Adverse Impacts

No unavoidable adverse impacts are anticipated.

Noise

Impacts

Noise impacts under SS3 would be similar to those for SS2. Operational noise would be the same as existing conditions at the West Plant site with no expansion, while higher

levels of noise could be expected at the North Plant compared to SS2, because of the larger plant size (89 mgd compared to 65 mgd).

Mitigation Measures

Mitigation for noise impacts would be as described for SS1.

Unavoidable Adverse Impacts

No unavoidable adverse impacts are anticipated.

Hazardous Materials

Impacts

Risks associated with the use of chlorine gas and other chemicals at the West and East Treatment plants would be lower compared to SS1, because capacity expansion would be less at the East Plant and would not occur at the West Plant. Impacts associated with the North Plant would be similar to, but slightly greater, than for SS2, because of the larger treatment capacity of the plant.

Mitigation Measures

Mitigation would be as described for SS1.

Unavoidable Adverse Impacts

No unavoidable adverse impacts have been identified.

OTHER ELEMENTS OF THE ENVIRONMENT

Earth Resources

Impacts

New conveyances and CSO facilities under SS3 would contribute minor amounts of additional impervious surface area. Expansion of the East Plant and construction of a new 89-mgd North Plant would result in the following estimated additional impervious surface areas:

- East Plant expansion—32 to 35 acres
- North Plant—25 to 30 acres

Impacts on earth resources from proposed facilities would not be significant. A high-magnitude earthquake could result in structural damage to the East Plant, which is

located in an area subject to liquefaction during seismic activity. Large earthquakes could also result in structural instability at a new North Plant, depending on final site selection.

Benefits to sediment quality from increased CSO control would be the same as for SS1.

Mitigation Measures

Mitigation measures would be similar to those described for SS1.

Unavoidable Adverse Impacts

No unavoidable adverse impacts are anticipated.

Aesthetics

Impacts

Expansion of the East Plant could result in approximately a 50 percent increase in the size of the existing treatment plant. Although the expanded plant would be similar in scale and visual character to the surrounding industrial and office development, its expanded size would make the facility more visible from nearby viewpoints and distant valley residences.

Impacts of a new North Plant would be similar to those described for SS2, although the plant would be slightly larger.

No aesthetic adverse impacts would result from operation of underground facilities (i.e., conveyances and tunnels).

Pump stations would have impacts similar to those described for SS1.

Mitigation Measures

To mitigate adverse visual impacts resulting from an expanded East Plant, the extensive mitigation measures employed at the existing treatment plant should be expanded to include the new structures. These mitigation measures include perimeter berming, perimeter and interior landscaping, and siting of facilities to direct views into the site toward open areas and away from structures. Measures to mitigate adverse visual impacts from a North Plant would be similar to measures described for the East Plant.

For pump stations located at visible sites from nearby properties, landscaping could be provided to obscure the visibility of the facility.

Unavoidable Adverse Impacts

Unavoidable adverse impacts would be similar to those described for SS2.

Recreation

Impacts

Expansion of the East Plant would not result in the loss of any land used for recreation. A location for the a new North Plant that avoided displacing existing recreation facilities would be sought. Consequently, the plant would be unlikely to result in the loss of recreational facilities. Adverse post-construction impacts on recreation resulting from treatment plant expansion or construction would be minimal.

Underground facilities (conveyances and tunnels) would not result in any post-construction adverse impacts on recreation. The Murray Avenue CSO control project could eliminate some recreational space at Lowman Beach Park.

Implementation of the I/I program would not result in any recreation impacts.

Mitigation Measures

No significant adverse impacts to recreation are expected, and no mitigation measures would be necessary.

Unavoidable Adverse Impacts

No unavoidable adverse impacts are anticipated.

Cultural Resources

No cultural resource impacts would result from operation of SS3. Construction impacts are discussed in Chapter 11.

Air Quality

Impacts

Because VOCs are regulated as precursors to ozone, which is a regional pollutant, their impacts are not localized with respect to treatment facilities. For a full discussion of VOCs, please refer to Chapter 5.

Odor impacts would be similar to those for SS2, although odor-generating potential would be slightly higher at the North Plant given its larger capacity. West Point would remain unchanged from existing conditions.

Mitigation Measures

Mitigation would be as described for SS1.

Unavoidable Adverse Impacts

Unavoidable adverse impacts would be as described for SS1.

Transportation

Operational impacts under SS3 are generally similar to SS2. Under this service strategy, the West Plant would not be expanded, eliminating any significant increases to treatment plant traffic through Discovery Park. Expansion of a North Plant to 89 mgd (versus 65 mgd under SS2) would generate slightly increased numbers of employee and truck trips. Fewer trips would be generated by the proposed expansion of the East Plant to 172 mgd (versus 235 mgd). Biosolids truck trips to and from North Plant are projected to average up to approximately 8 per day. Operational trips are shown in Table 7-1.

Depending upon the site selected for a new North Plant, roads to the site might require improvements in order to accommodate plant traffic.

Mitigation Measures

Mitigation would be as identified for SS1.

Unavoidable Adverse Impacts

Unavoidable adverse impacts would be similar to impacts identified for SS1.

NOTE: Table EP1-3, Chapter EP-1, provides operational trips for revised Service Strategy 3 (the Executive's Preferred Plan).

**Table 7-1
Operational Trips (1)
Service Strategy 3**

Vehicle Type	Facility						
	West Plant	East Plant			North Plant		
	Existing, (133 mgd)	Existing, (115 mgd)	(154 mgd)	(172 mgd)	(35 mgd)	(55 mgd)	(89 mgd)
Septage Trucks	-----	60/day	85/day	90/day	NA	NA	NA
Screen/Grit Trucks	12/week	8/week	11/week	12/week	2/week	4/week	6/week
Process Chemicals	40-50/month	0-10/month	0-14/month	0-15/month	NA	NA	NA
County Trucks and Cars	8/day	60/day	85/day	90/day	NA	NA	NA
<u>Employees</u>							
Shift Crew	80/day	70/day	100/day	105/day	20/day	35/day	55/day
All Others (Mon. - Fri.)	160/day	200/day	280/day	300/day	60/day	100/day	155/day
Visitors	50/month	NA ⁽³⁾	NA	NA	NA	NA	NA
Biosolids Trucks ⁽²⁾ (7 days a week)	14/day (7 loads)	Maximum of (13 loads)	14/day (7 loads)	15/day (7.5 loads)	3/day (1.5 loads)	5/day (2.5 loads)	8/day ()
<u>Chlorine</u>							
Railroad Cars	-----	7/year	10/year	11/year	-----	-----	-----

Notes: (1) Trips are one-way; figures are rounded. "One-way" is defined as a single direction trip to a single destination.
(2) Biosolids truck trips are one-way. Final conditions to the Shoreline Substantial Development Permit to upgrade to secondary treatment at West Point state that "the number of loaded sludge trucks shall not exceed 13 per day on average over a year period (January through December)." Thirteen truck loads per day equals 26 one-way truck trips as defined in Note (1).
(3) Data not available.

Public Services, Utilities, and Energy

Impacts

The additional electrical energy required to operate treatment plants in the year 2030 is estimated at 35.6 million kWh per year. The amount of energy produced to offset this demand has not been estimated.

Mitigation Measures

Mitigation would be as described for SS1.

Unavoidable Adverse Impacts

Treatment of higher wastewater volumes would result in increased energy usage.