King County
Department of
Natural Resources and Parks

Restoring the West Point Treatment Plant

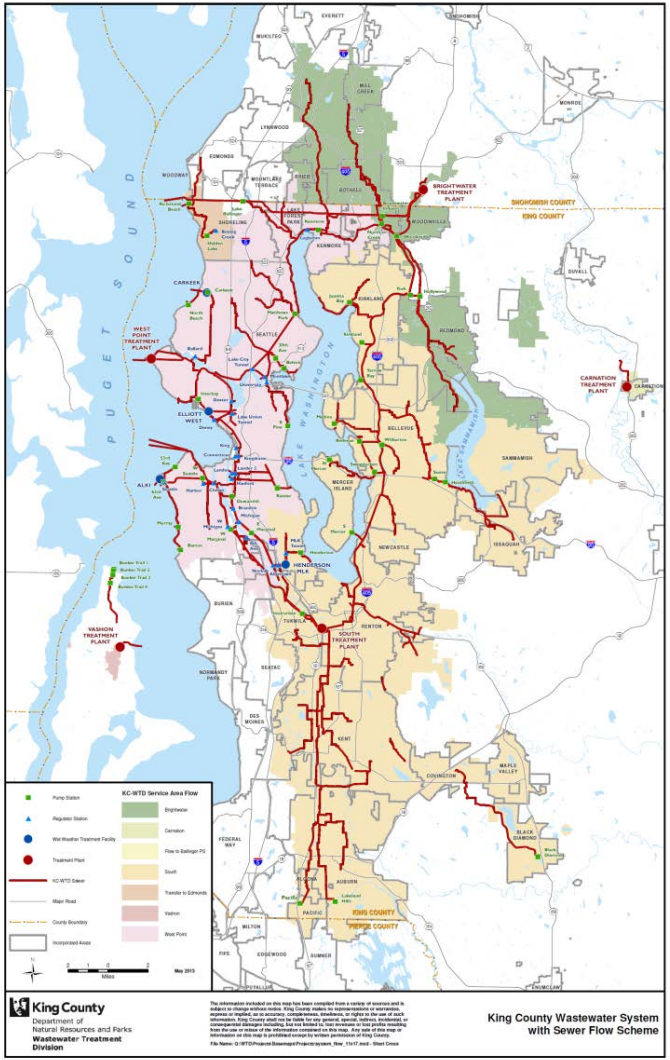
Mark Isaacson, Director
Wastewater Treatment Division
March 22, 2017

Today's Presentation

- Overview of the West Point System & Treatment Plant
- Feb. 9 bypass and immediate response
- Plant restoration & Puget Sound monitoring
- What's next
- Questions & Answers

The West Point System

- Serves about 700,000 people, mainly Seattle and its Northwestern suburbs
- 20 Pump stations
- 23 Regulator stations
- 3 wet weather treatment plants (Alki, Carkeek, Elliott West)

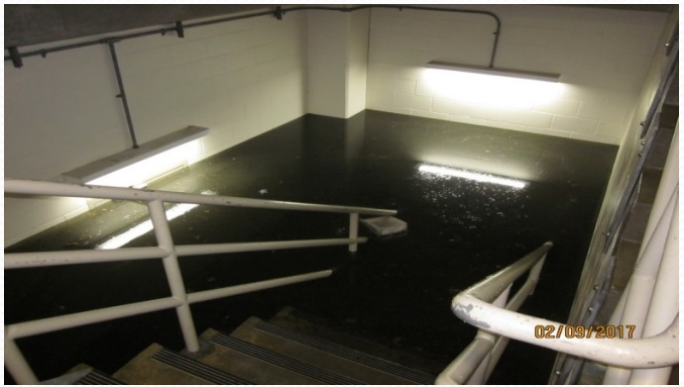


West Point Treatment Plant

- Averages 90 million gallons a day during dry months
- Wet weather design capacity of 440 million gallons a day
- Serves City of Seattle's combined stormwater and sewer system
- 14 years of perfect compliance with its discharge permit

February 9, 2017

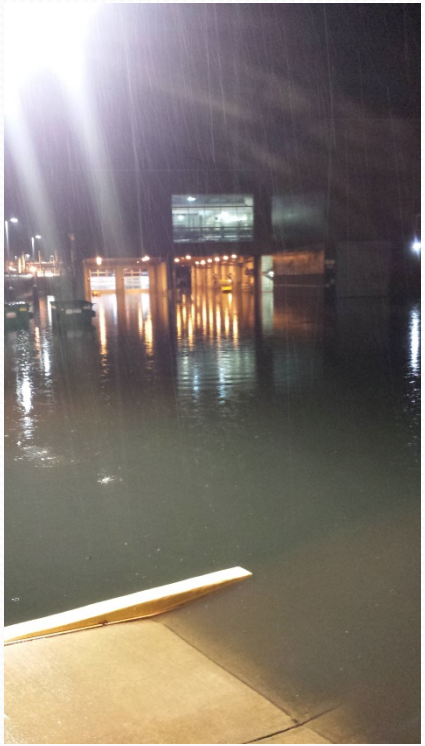
- Severe flooding caused by power and equipment failure led to flooding inside the plant on Feb. 9
- 180 million gallons of stormwater-sewage discharged to Puget Sound
- Damage temporarily reduced plant capacity, treatment level
- Two smaller bypasses occurred on Feb. 15-16



February 9, 2017

Flooded galleries

February 9, 2017



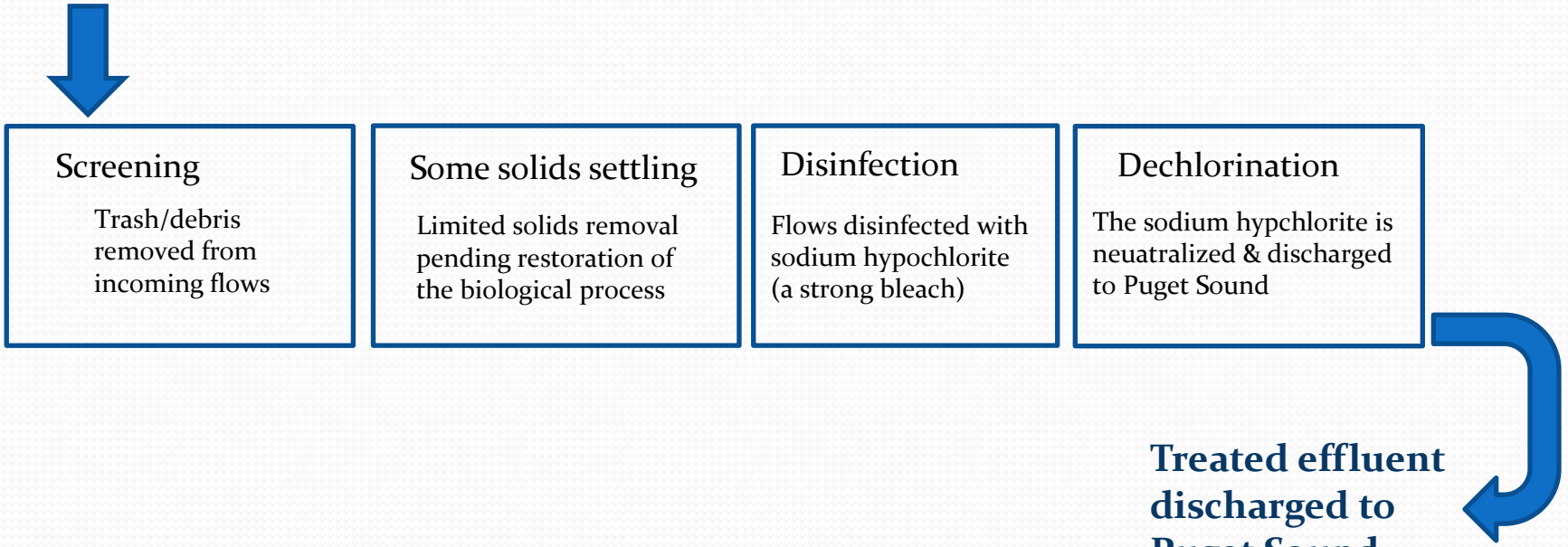
Immediate Response

- Mobilized crews and equipment for 24/7 response
- Protecting employee safety paramount
- Diverted flows to other facilities
- Posted beaches and monitored water quality to protect public
- Implemented a plan to use primary plants and avoid future bypasses

Flashlight shows water line

Current Treatment – Limited Primary

Untreated influent enters the plant



Restoration Makes Progress

- Plant dewatering and cleanup is complete.
- Repairing and replacing pumps, motors and electrical equipment; repairing building damage.
- Priorities are restoring the boiler heat and restarting the secondary biological treatment process by April 30

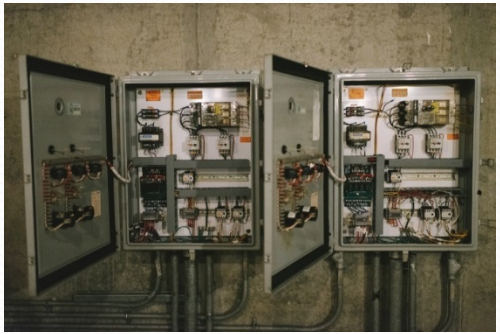
Damage & Repairs Ongoing

Type of Equipment Damaged	Equipment Count
12 x 12-foot tunnels	1 Mile
Electric Motors	149
Pumps	127
Electrical Motor Control Centers Buckets	200
Electrical Panels	125
Electrical Transformers	25
Local Electrical Control Stations	125
Light Fixtures	>2000
Outlets and Switches	>1200
Instruments	>125
Solenoids	>200
Equipment Control Systems	3

Recovery efforts

Pressure washing a digester

Underground gallery



Twin Equipment Control Panels – Cleaned, inspected, and ready for repair/replacement

Gravity Belt Thickener Feed Pumps - Ready for replacement motors

Pumps for Biosolids being repaired

The Secondary Treatment Process

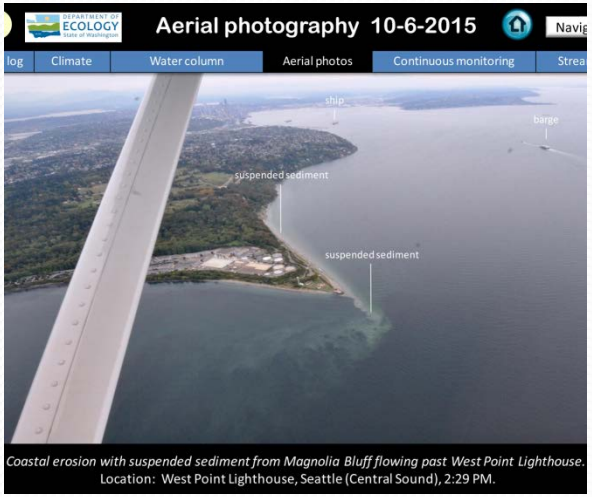
- A delicate combination of infrastructure and biology
- Experts are being called in to help us restore this system, which will take time to complete
- Treatment capacity and pollutant removal levels are temporarily limited

© 2011 Ellen Sollod, *Collection and Transformation* (detail). Photo courtesy of the artist. From the King County Public Art Collection.

Coastal sediment off West Point

- Seattle Times photo from 3/12 story – Not bypass-related
  - No seagulls
  - Low bacteria count from lab samples
  - Several hours after bypass stopped
  - Sediment plumes off West Point are normal

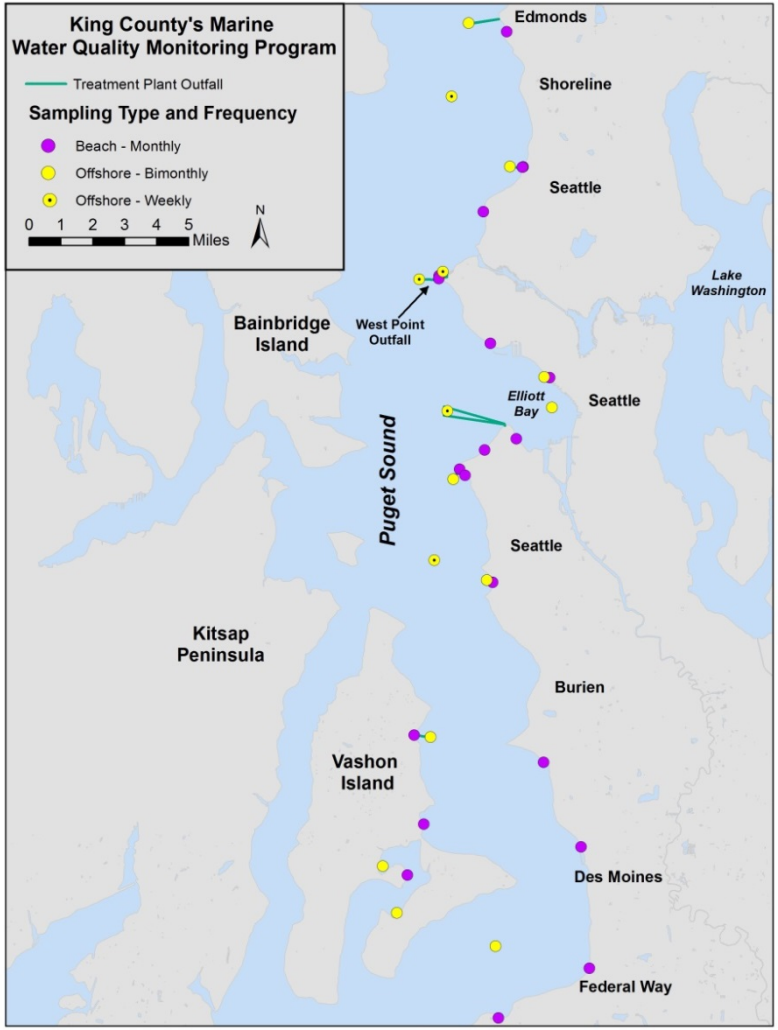
Suspended fine sediments lining all beaches around Discovery Park.
Location: Seattle (Central Sound), 2:42 PM.



Coastal erosion with suspended sediment from Magnolia Bluff flowing past West Point Lighthouse.
Location: West Point Lighthouse, Seattle (Central Sound), 2:29 PM.

Monitoring Puget Sound

- Marine monitoring plan during West Point restoration
- Additional offshore location and increased sample frequency
- Marine offshore monitoring (fecal bacteria, dissolved oxygen, nutrients, chlorophyll)
- Beach monitoring (fecal bacteria, nutrients)
- Bi-weekly reporting



Monitoring Puget Sound

- **West Point monitoring of wastewater discharge**
  - Routine Effluent Monitoring - daily/weekly samples for required influent/effluent parameters (solids, chlorine, biochemical oxygen demand, nutrients, toxicity bioassay)
  - Additional Effluent Analysis – trace metals and organic compounds
  - Sediment Characterization – outfall and reference sites
- **Discharge effects characterization** (data analysis)
  - Analysis of the short-term and long-term discharge water quality
  - Analysis of outfall mixing zone water quality
  - Sediment and benthic organism data analysis

Regular updates online

West Point restoration

Response to February 9 storm incident

March 13, 2017 update:

News release: Statement on the King County Council's motion for expert review of the West Point Treatment Plant Incident, March 13, 2017

Visit our new marine monitoring page to learn about our plan to monitor water quality while West Point Treatment Plant is being restored to full secondary treatment. You can find our monitoring plan, frequently asked questions, and contact information for questions and concerns. We will post monitoring data and summaries every two weeks, with the first report published by March 17.

Visit the Incident Response page for current updates on restoration progress at West Point.

Access this page at www.kingcounty.gov/wtd

Regular updates online

West Point marine water quality monitoring

More information | Monitoring update | Sampling map |

King County Wastewater Treatment Division's mission is built around protecting our region's waters. For decades, WTD has provided high quality treatment at our regional treatment plants. As part of our commitment to water quality, King County has conducted decades of water quality monitoring in the central Puget Sound basin where our treatment plant outfalls are located.

We take our commitment to environmental stewardship very seriously. On Feb. 9, an incident caused a loss of full performance of the West Point Treatment Plant. We are working to restore full operations at the plant. At this time, the plant is providing limited primary treatment. We recognize that substandard treatment or any untreated emergency bypasses do not meet the stringent requirements of our permits, and we are working around the clock to restore secondary treatment.

Access this page at www.kingcounty.gov/wtd

What's Next

- Secondary treatment online – April 30
- Scientists will study the data and compare to baselines
- Marine monitoring data will be regularly updated and posted online
- Council Independent Review – Evaluate Action
  - Before, during, after

Questions

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Protecting Puget Sound

- Marine Monitoring Plan (online) - example detail

Marine Offshore Monitoring Program Parameters & Sampling Frequency

			Bacteria		Laboratory analysis								Field sampling (CTD)							Field	Phyto
Station	Location	Number of Depths Sampled	Enterococcus	Fecal Coliform	Ammonia Nitrogen	Nitrite + Nitrate Nitrogen	Total Nitrogen	Orthophosphorus	Silica	Chlorophyll-a	Phaeophytin	Total Suspended Solids	Fluoresence (chlorophyll)	Density	Dissolved Oxygen	Light Intensity (PAR)	Salinity	Sample Temperature	Transmissivity	Secchi Transparency	Abundance & biovolume
JSUR01	Brightwater outfall	7	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
KSBP01	Pt. Jefferson	7	✪	✪	✪	✪	✪	✪	✪	●	●	●	✪	✪	✪	✪	✪	✪	✪	●	●
CK200P	Carkeek CSO outfall	5	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	
KSSK02	West Point TP outfall	5	✪	✪	✪	✪	✪	✪	✪	●	●	●	✪	✪	✪	✪	✪	✪	✪	●	●
LTBC43	Elliott West outfall	2	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	
LTED04	Elliott Bay	6	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
LSEP01	South Plant outfall	7	✪	✪	✪	✪	✪	✪	✪	●	●	●	✪	✪	✪	✪	✪	✪	✪	●	●
LSKQ06	Alki CSO outfall	4	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●
LSNT01	off Fauntleroy	7	✪	✪	✪	✪	✪	✪	✪	●	●	●	✪	✪	✪	✪	✪	✪	✪	●	●
LSVV01	Fauntleroy	2	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	
MSJN02	Vashon outfall	5	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●
NSEX01	East Passage	7	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
EBO *	emergency bypass outfall	2	✪	✪	✪	✪	✪	✪	✪	✪	✪	✪	✪	✪	✪	✪	✪	✪	✪	●	

● Sampled biweekly as part of ongoing marine monitoring program
✪ Sampled weekly

* indicates new sampling location at West Point emergency bypass outfall
note: the two Quartermaster Harbor stations are not included

Findings –High & High-High Float Switch Failures

Primary Sedimentation Tanks High and High-High Float Switches