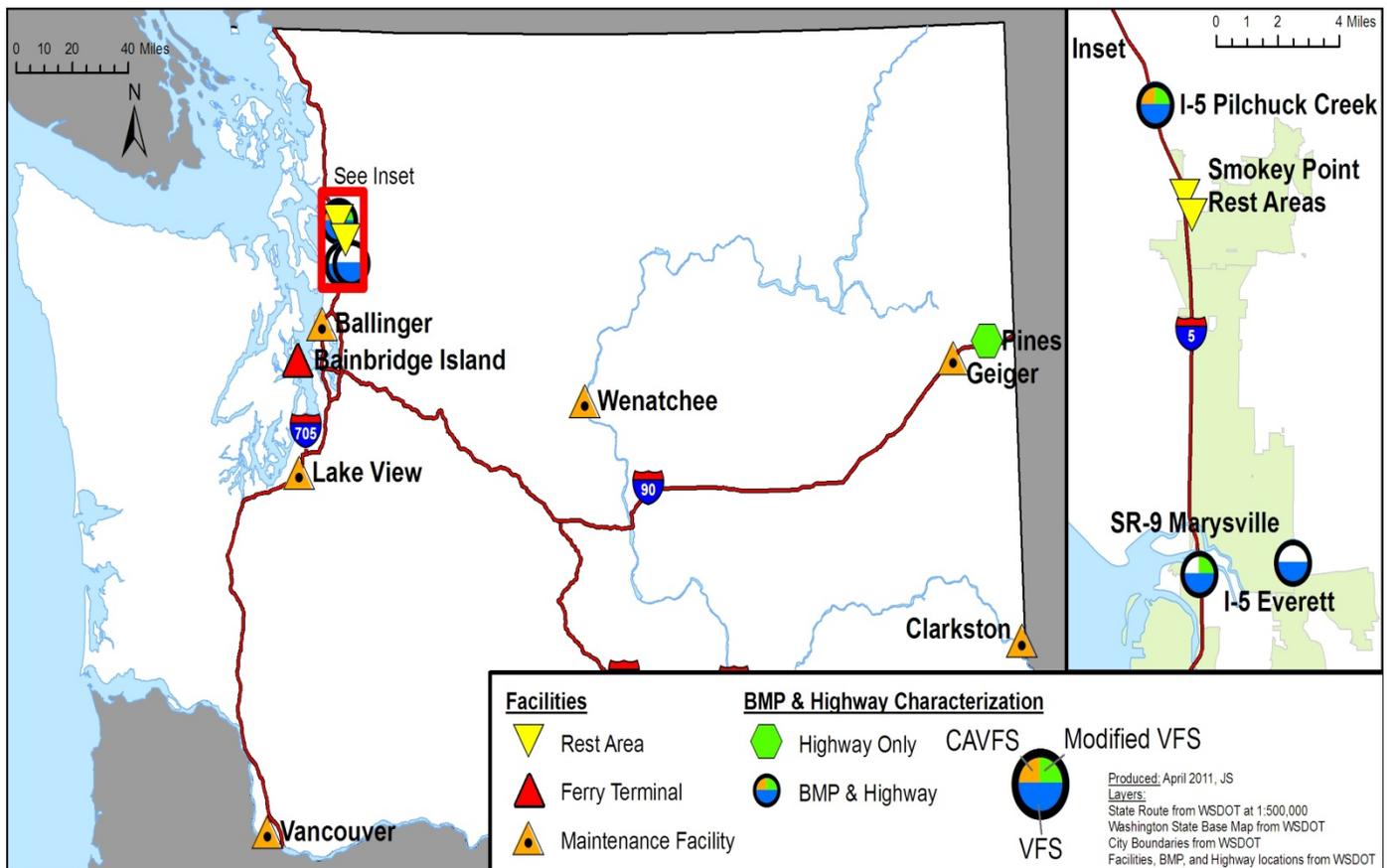


# Current Status and Description of the Stormwater Monitoring Stations

## Stormwater Permit Monitoring Requirements

In February 2009, the Washington State Department of Ecology (Ecology) issued a National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge Municipal Stormwater Permit (permit) (Ecology 2009) to the Washington State Department of Transportation (WSDOT). Under Special Condition S7 of the permit, WSDOT must collect baseline stormwater monitoring data from its highways, rest areas, ferry terminals, and maintenance facilities. In addition, the department must evaluate the effectiveness of stormwater treatment and hydrologic (flow control) best management practices (BMPs).

Under guidance from the permit, WSDOT developed and implemented a monitoring program to collect baseline stormwater discharge information from two rest areas, one ferry terminal, six maintenance facilities, five highways and six best management practices (BMPs) monitoring stations. The figure below displays monitoring station locations and type.



(map of respective stormwater monitoring stations)

## Current Status of Stormwater Monitoring

All stormwater monitoring stations required by the permit are fully functional and collecting real time meteorological and storm event surface runoff data. A description of the specific stations and their monitoring status is listed below.

### Monitoring of WSDOT Highways (5 sites)



(Everett HWY/BMP monitoring stations)



(conveyance system sample collection area)

To comply with the 2009 permit, WSDOT must meet the following requirements.

- 1) WSDOT must establish highway monitoring sites at locations with the following annual average daily traffic (AADT).
  - Two highly urbanized western Washington sites ( $\geq 100,000$  AADT)
  - One urbanized western Washington site ( $\leq 100,000$  and  $\geq 30,000$  AADT)
  - One rural western Washington site ( $\leq 30,000$  AADT)
  - One urbanized eastern Washington site ( $\leq 100,000$  and  $\geq 30,000$  AADT)
- 2) WSDOT must collect continuous flow recordings from all storm events (not just sampled events) for one year to establish a rainfall/runoff relationship.
- 3) WSDOT must collect seasonal first flush toxicity samples from three untreated highway runoff monitoring locations once each year. Site locations are based on the following AADTs.
  - One highly urbanized site ( $\geq 100,000$  AADT)
  - One urbanized site ( $\leq 100,000$  and  $\geq 30,000$  AADT)
  - One rural site ( $\leq 30,000$  AADT)
- 4) WSDOT must collect and analyze sediments at highway sampling sites each year. Sediment samples may be collected using in-line sediment traps.

**Current Status:**

All highway monitoring stations are fully operational. Sites are routinely inspected and maintained including: re-programming sample thresholds based on specific storm events, troubleshooting and maintaining site dataloggers and telemetry systems, sediment cleanout from interceptors/conveyance systems, calibration of rain gauges, weirs, leveling devices and stage measuring programs, trimming adjacent vegetation, and performing as needed duties to maintain the function of the stations. Stormwater sampling has been conducted at all highway sites and annual sediment sampling has been conducted at four of the sites.

In addition to the sampling and maintenance routine, current projects include fine tuning and calculating rainfall to runoff estimates, conducting the final sediment sampling event in the Eastern Region, conducting seasonal first flush toxicity sampling at all sites, importing collected sample and telemetric data into the monitoring database, and testing sample collection methods and materials.

## Monitoring of Rest Areas, Maintenance Facilities, and Ferry Terminals (9 sites)



(Bainbridge Island Ferry Terminal)



(Clarkston Maintenance Facility)

WSDOT must collect baseline water quality data for stormwater runoff from transportation facilities at the following locations:

- Two high-use rest areas
- Six maintenance facilities, one in each WSDOT region
- One high-use ferry terminal

For each facility, monitoring locations are established to capture runoff from most of the site and down gradient from major pollutant generating activities. Composite samples must be collected from seven storm events; five in the wet season, one in the dry season, and one representing the seasonal first flush.

### Current Status:

All rest area, maintenance facility and the ferry terminal sites are fully operational. The required wet season samples were obtained at all sites and required dry season samples have been obtained at all western Washington sites. All sites have received scheduled routine maintenance including as-needed programming of dataloggers and telemetry systems; calibration of rain gauges; measurements and downloads of data and maintaining of sample collection areas.

Future projects include obtaining dry season samples at the eastern Washington sites; obtaining the seasonal first flush/toxicity sampling at all sites; training maintenance staff in the use of field data collection software and importing data into monitoring database.

## Monitoring Effectiveness of Best Management Practices (BMPs) (6 sites)



(Pilchuck BMPs/HWYs)



(Pilchuck BMPs/HWYs)

WSDOT must collect influent and effluent samples from at least two treatment BMPs, at no less than two sites per BMP (4 sites). Monitoring must continue until statistical goals are met.

In addition, WSDOT is required to collect continuous rainfall and surface runoff data from one flow reduction BMP that is in use or planned for installation, such as a Low Impact Development (LID) BMP.

Seasonal first flush toxicity sampling is required from three BMP effluent locations. At least one BMP location must be categorized as enhanced treatment for metals. Sampling is required at BMP site locations based on AADT.

- One highly urbanized site ( $\geq 100,000$  AADT)
- One urbanized site ( $\leq 100,000$  and  $\geq 30,000$  AADT)
- One rural site ( $\leq 30,000$  AADT) (one additional site)

The BMPs selected for monitoring include vegetated filter strips, a compost-amended vegetated filter strip with compost tilled into the top layer of the soil, and compost-blanket vegetated filter strips with compost applied as a blanket across the surface of the soil. All three are infiltration-type BMPs that are designed to treat sheet flow runoff through infiltration. Monitoring will evaluate the effectiveness of these three treatment options.

### Current Status:

All BMP monitoring locations are fully operational. Similar to highway sites, all BMP sites are routinely inspected and maintained including: re-programming sample thresholds based on specific storm events; troubleshooting and maintaining site dataloggers and telemetry systems; sediment cleanout from interceptors/conveyance systems; calibration of rain gauges, weir, leveling devices and stage measuring programs; trimming adjacent vegetation, and performing as needed duties to maintain the function of the sites. Stormwater sample events have been conducted at all BMP sites.

Also similar to highway sites, current and future BMP projects include fine tuning and calculating rainfall to runoff estimates, importing collected sample and telemetric data into the monitoring database and testing sample collection methods and materials.