Stormwater Management Regulation & Implementation Overview

Green/Duwamish Watershed
Stormwater Strategy Workshop
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DEPARTMENT OF
ECOLOGY
State of Washington

- Brief Regulatory Context:
  - Foundation concepts
  - Federal stormwater regulation
  - State stormwater program
- Overview of Permit Requirements:
  - Construction Stormwater
  - Municipal Stormwater
  - Industrial Stormwater

Discharge Permit Foundation

- Federal CWA: National Pollution Discharge Elimination System (NPDES)
- State WPCA: State Waste Discharge
- Permits condition a discharge
- Federal NPDES permitting responsibilities delegated to Ecology
- Additional requirements apply for discharges to impaired water bodies
  - 303(d) list & Water Quality Assessment

Federal Stormwater Regulation

EPA's 1990 Phase I Rule

- Construction Sites
  - 5± acres disturbance
- Large Municipalities
  - 100,000± population as of 1990 census
- Industrial
  - Specified industry types
  - Excluded light industry

EPA's 1999 Phase II Rule

- Construction Sites
  - 1± acres disturbance
- Smaller Municipalities
  - Federal census-based population density
  - ≤1,000 population waiver
- Industrial
  - Included light industry

WA State Stormwater Program Primary Guidance

Stormwater Management Manuals

- Referenced in stormwater permits
- Contain stormwater BMP applicability and design criteria
- Volume II = Construction Stormwater Pollution Prevention
- Volume IV = Source Control BMPs for pollution generating activities
- Volumes I, III and V = Post-Construction Stormwater BMPs
  - Water quality treatment
  - Flow control
- Western WA Hydrologic Model (WWHM)

Types of Stormwater Discharge Permits

Construction Stormwater	Municipal Stormwater	Industrial Stormwater

Construction Stormwater Permits

Construction Stormwater Permits regulate discharges from construction activities.

- One or more acres of “land disturbing activity”
- Less than 1 acre and part of a “common plan of development or sale”
- Significant contributor of pollutants to waters of the state

Construction SWPPP Elements

- Preserve Vegetation/Mark Clearing Limits
- Establish Construction Access
- Control Flow Rates
- Install Sediment Controls
- Stabilize Soils
- Protect Slopes
- Protect Drain Inlets
- Stabilize Channels and Outlets
- Control Pollutants
- Control Dewatering
- Maintain BMPs
- Manage the Project
- Protect Low Impact Development BMPs

Construction Monitoring, Inspections and Reporting

- Weekly monitoring of discharge
  - Benchmarks
    - Turbidity (25 NTU)
    - pH (6.5 – 8.5 su)
- Weekly site inspections (by CESCL)
- Monthly discharge monitoring reports
- Additional requirements for contaminated sites

Types of Stormwater Discharge Permits

Construction Stormwater	**Municipal Stormwater**	Industrial Stormwater

Municipal Stormwater Permits

Municipal Stormwater Permits regulate discharges from municipal separate storm sewer systems (MS4s).

An MS4:

- Includes roadways (curb & gutter), catch basins, ditches, pipes, treatment and detention facilities, etc.
- Is publicly owned or operated
- Collects and/or conveys stormwater
- Is not part of sewage treatment plant or combined sewer system
- Discharges to Waters of the US

MS4 Permit Components

The permits take a programmatic approach to control discharges from MS4s.

Stormwater Management Program (SWMP)

- Monitoring
- Controlling Runoff from New Development
- Operations & Maintenance
- Mapping
- Public Education & Outreach
- Public Involvement
- Illicit Discharges Detection & Elimination
- Source Control (Phase I)
- Structural Controls (Phase I)
- Total Maximum Daily Load (TMDL) actions

Municipal Stormwater Monitoring

- Regional Stormwater Monitoring Program (RSMP)
  - Ambient Status & Trends: creeks & marine nearshore
  - Focused Effectiveness Studies
  - Assessment of illicit discharge incidents
- Pay-in structure based on population
- Opt-out alternatives for self monitoring

New & Redevelopment Runoff Controls

- 2,000 sf new + replaced hard surfaces or 7,000 sf land disturbance
  - Construction pollution prevention
  - Site planning
  - On-site stormwater management = "Low Impact Development"
- 5,000 sf pollution-generating hard surface
  - Treatment for oil, phosphorus, suspended solids and/or dissolved metals
- 10,000 sf effective impervious surface
  - Flow control to protect creek erosion

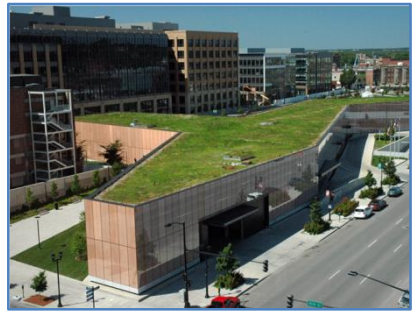
Low Impact Development (LID)

A stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design.

Low Impact Development-Related Code Revisions

Codes to review

- Zoning
- Parking
- Roads
- Clearing/grading
- Bulk and dimensional
- Utilities
- Design
- Subdivisions
- Site planning
- Etc



Minimize impervious surfaces

Minimize loss of vegetation

Reduce stormwater runoff

Watershed-scale Stormwater Planning

- Assess existing hydrologic, biologic and water quality conditions
- Calibrate a continuous runoff model
- Estimate future conditions under full-build out
- Evaluate stormwater management strategies to meet water quality standards
- Prepare an implementation plan

King County: Bear Creek

Snohomish County: Little Bear Creek

Pierce County: Spanaway Creek/Lake

Clark County: Whipple Creek

Operations & Maintenance: Inspections

- Inspect and maintain publicly owned or operated catch basins & stormwater facilities
  - Frequency
  - Timeframe to maintain
  - Alternatives to individual catch basin inspections:
    - Inspections on a circuit basis
    - Full system cleaning

- Inspect and require maintenance of private stormwater facilities
  - Depends on jurisdiction, age of facility and discharge location

Operations & Maintenance: Good Housekeeping

- Perform municipal functions to reduce stormwater impacts
  - Road and utility infrastructure work
  - Public land: pet waste, trash, dust, chemicals
- Site-Specific SWPPPs
  - For heavy equipment maintenance or storage yards & material storage facilities
  - Self-inspection; no monitoring
- Training for O&M employees

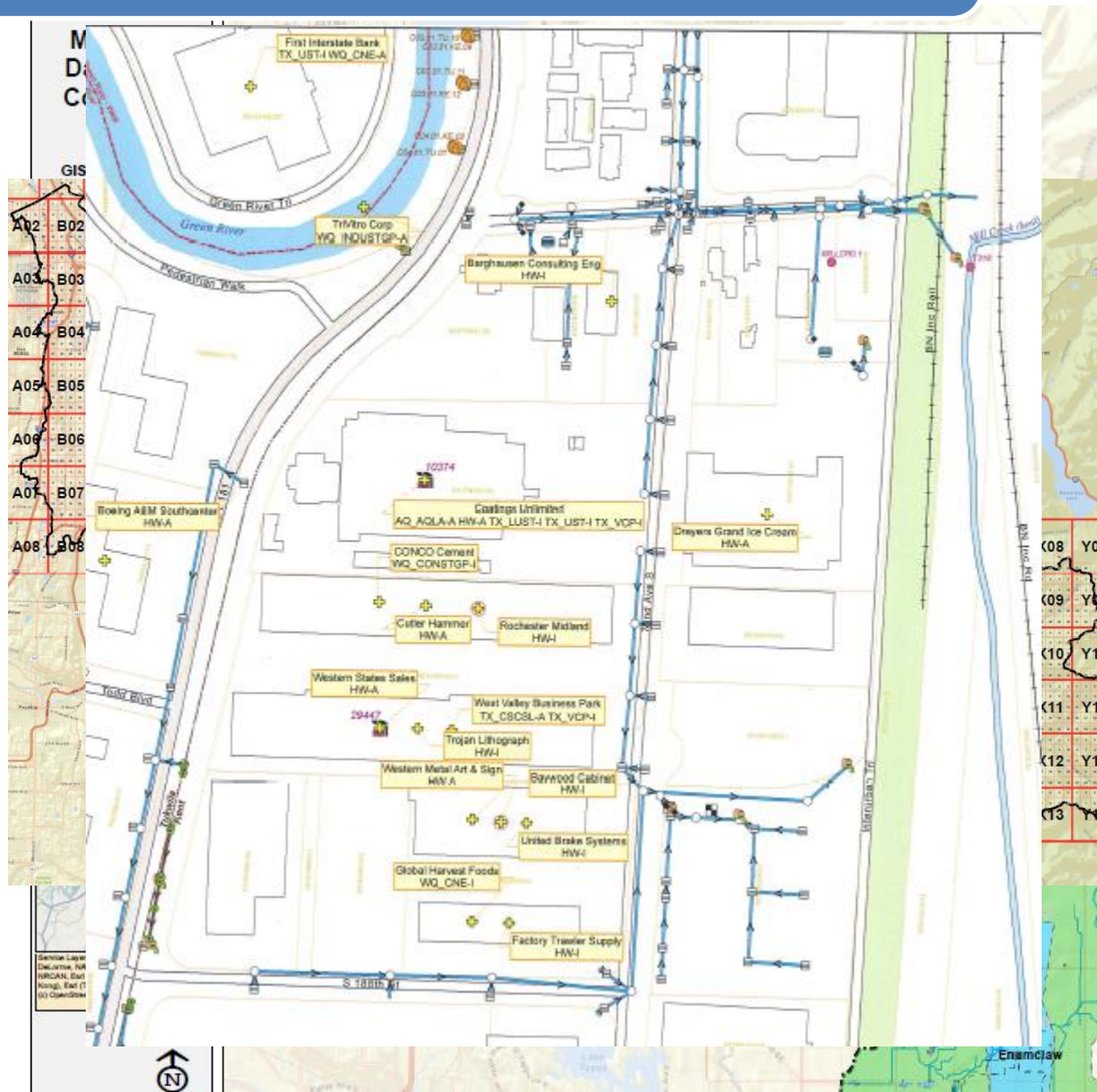
MS4 Mapping

***Green-Duwamish River Watershed: Compendium of Existing Environmental Information*, October 2014**

- Project funded by Ecology's Toxics Cleanup Program
- MS4 Permittees provided existing MS4 maps
- Consultant put the maps together
- GIS files provided back to MS4 Permittees

MS4 maps need routine updates

- New/redevelopment projects
- Existing unknown MS4 components are rediscovered



Stormwater Education & Outreach

- Increase awareness about stormwater pollution problems and solutions
- Change behaviors to prevent pollution
- Many target audiences
- Create stewardship opportunities
- Measure understanding and adoption of behavior

dump SMART
It's Not Just Water

Puget Sound Starts Here.org

Illicit Discharge Detection & Elimination

- Local authority to prohibit non-stormwater discharges & enforce code

Source Control (Phase I Only)

- Local authority to require use of stormwater best management practices & enforce code
- Business inspections at 20%/year rate

Illicit Discharge Detection & Elimination

- **FIND IT**
  - Reporting Hotline
  - Field employees are trained to "see something, say something"
  - Proactive field screening program
- **FIX IT**
  - Characterize the nature & threat
  - Trace the source
  - Use escalating compliance strategy to eliminate it

IDDE: Field Screening

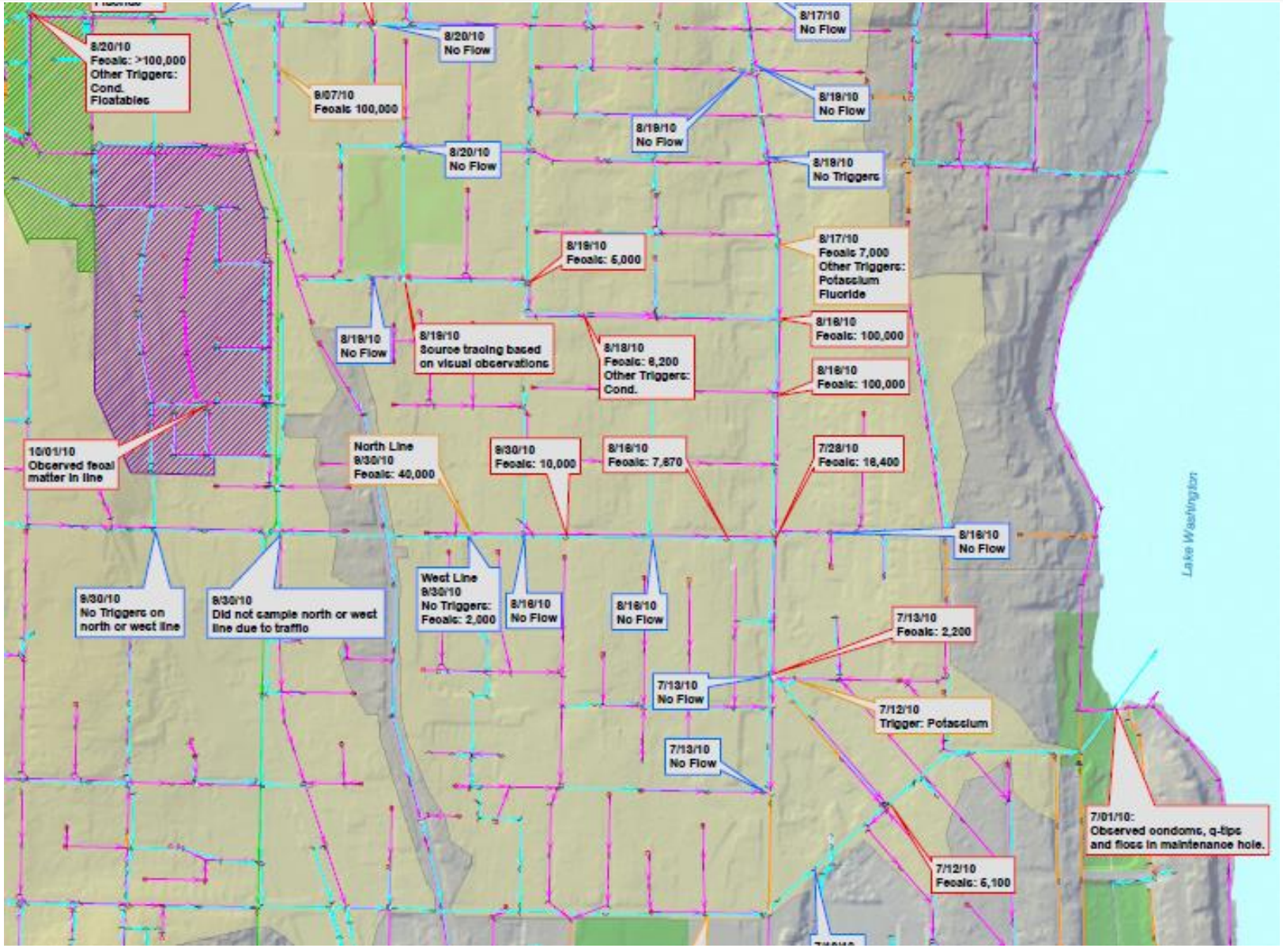
Systematically screen MS4 for illicit discharges & connections

Flexible approaches allowed to meet target of % MS4 screened

Typically screen for sanitary sewage & wash water

Field Screening / Source Tracing Manual: http://www.wastormwatercenter.org/illicit-connection-illicit-discharge/

IDDE: Field Screening & Source Tracing



Advanced Source Tracing Programs

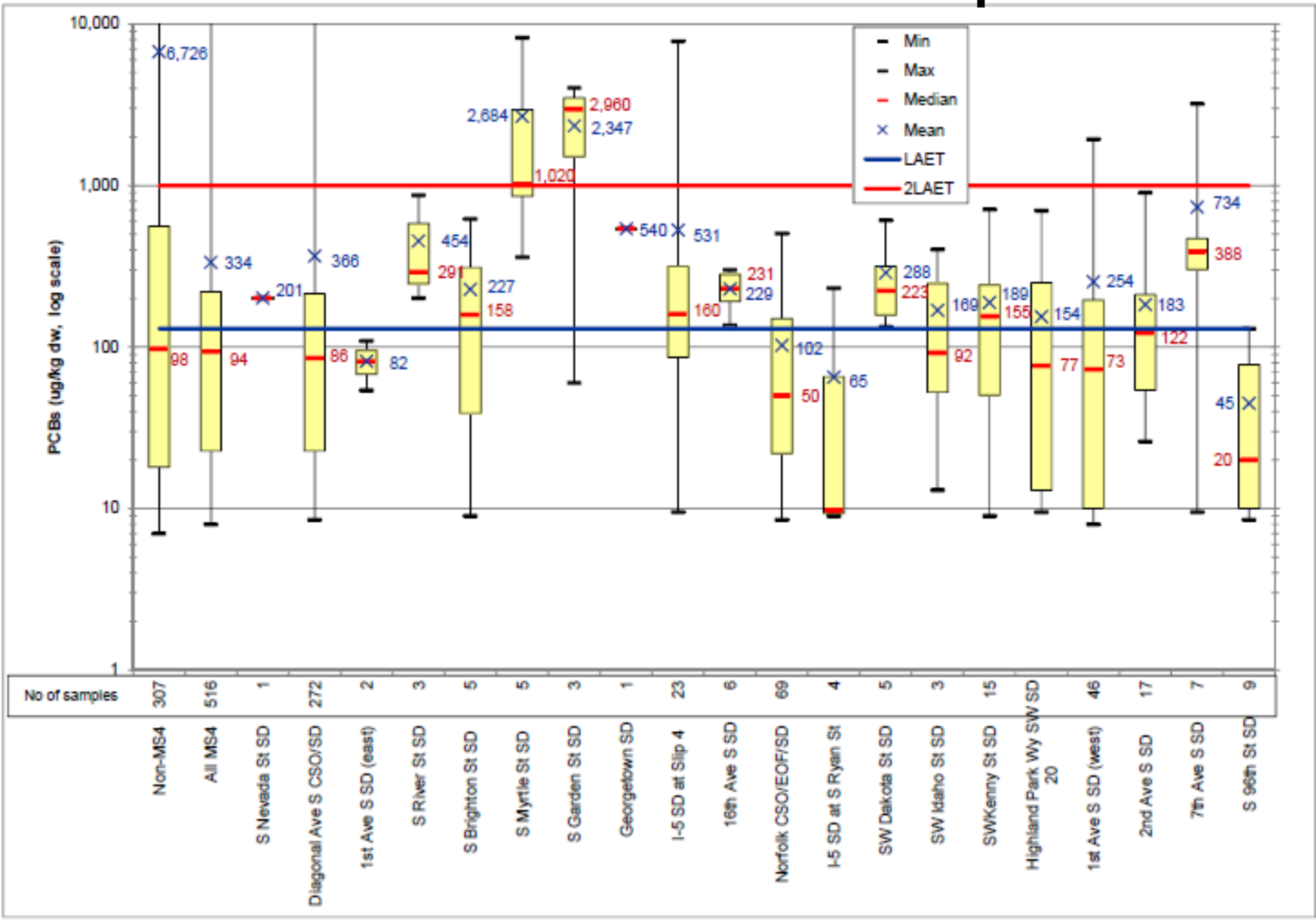
City of Seattle

- In-system source tracing:
  - Storm drain solids grab sampling & analysis
  - Storm drain sediment trap monitoring
- Business inspections
- Line cleaning & resample

City of Tacoma

- Long-term ambient surface sediment monitoring
- Long-term stormwater discharge monitoring
- In-system source tracing
- Business inspections
- Line cleaning & resample

Duwamish Area Storm Solids Samples: PCBs



Structural Controls (Phase I Only)

Address impacts not adequately controlled by the SWMP.

Project-specific Planning

- New stormwater facilities
- Stormwater retrofits
- Property acquisition for water quality or flow benefit
- $25K+ maintenance
- Optional projects include
  - Riparian habitat acquisition
  - Forest and riparian buffer restoration
  - Floodplain reconnection
  - Other actions not required

Types of Stormwater Discharge Permits

Construction Stormwater	Municipal Stormwater	**Industrial Stormwater**

Industrial Stormwater Permits

Industrial Stormwater Permits regulate discharges associated with industrial activities.

- Manufacturing
- Warehousing
- Processing
- Waste Disposal/Recycling
- Transportation – if vehicle maintenance activity, equipment cleaning operations, or airport de-icing

Industrial Stormwater General Permit (ISGP) Components

Mandatory BMPs:

Vacuum sweep paved surfaces once per quarter.

Keep dumpsters covered when not in use.

Inspect and maintain catch basins.

- Stormwater Pollution Prevention Plan
- Inspections
- Sampling
- Benchmarks & Effluent Limits
- Discharges to Impaired Waters
- Corrective Actions

Industrial Stormwater Sampling

- Sample Timing
  - One sample per quarter
  - Sample "1st Fall Flush" after October 1st
  - Sample within 12 hrs of discharge
- Sample Locations
  - All discharge points unless "substantially identical"
- Compare to Benchmark Values

ISGP Benchmark Values

Parameter	Benchmark
Turbidity (NTU)	**25**
pH (SU)	**5.0 – 9.0**
Oil Sheen	**No Visible Oil Sheen**
Zinc (µg/L)	**117**
Copper (µg/L)	**West WA: 14** **East WA: 32**

ISGP Corrective Actions

- Level 1 – Operational Source Control BMPs
  - Each time benchmark exceeded
- Level 2 – Structural Source Control BMPs
  - Benchmark exceeded 2 Quarters/Year
- Level 3 – Treatment BMPs
  - Benchmark exceeded 3 Quarters/Year

Level 3 Treatment Examples:

Catch basin inserts

Stormfilters

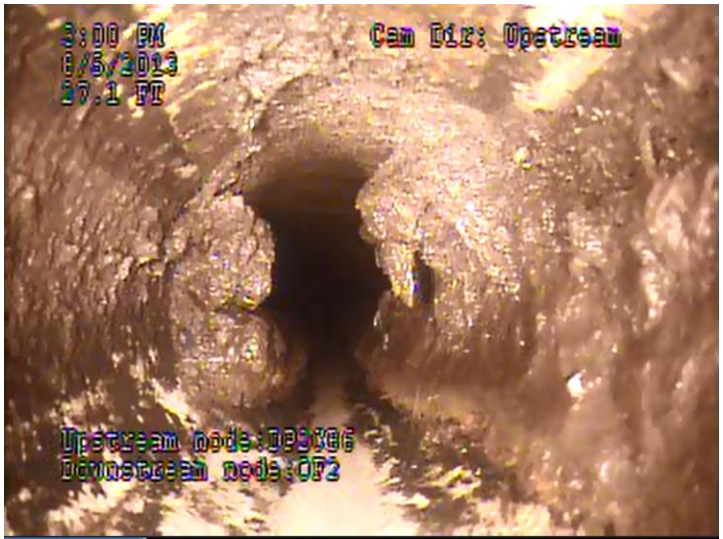
Chitosan Enhanced Sand Filtration

Discharges to Impaired Waters

Parameter	Units	Effluent Limitation	
		Fresh Water	Marine
Turbidity	NTUs	25	25
pH	S U	Fresh water criteria	7.0 – 8.5
Fecal Coliform	# colonies/ 100 mL	BMPs/Report	BMPs/Report
Sediment (TSS)	mg/L	30	30
Mercury	ug/L	2.1	1.8
Pentachlorophenol	ug/L	9.0	Site-Specific
Phosphorus, Ammonia, Copper, Lead, Zinc	TBD	Site-Specific	Site-Specific

ISGP Discharges to Sediment Cleanup Sites

- Sample catch basin solids
  - Metals, PAH, PCB, NWTPH-Dx, etc
  - One time, prior to Oct 1, 2016
- Clean storm drain lines
  - One time prior to Oct 1, 2016



Stormwater Management Actions Wrap-Up

- Implement programmatic controls
- Use site-specific BMPs
- Maintain existing infrastructure
- Build new state-of-the-art infrastructure
- Monitor and assess outcomes
- Make changes to improve over time

THANK YOU