

Lower Duwamish Waterway

Figure 1

Lower Duwamish Study Area

Legend

- | | |
|--------------------|---|
| Streets | Lower Duwamish surface drainage basin |
| Arterials | Combined sewer service area w/in Lower Duwamish |
| State Highway | Diagonal storm drain basin |
| Interstate Freeway | Diagonal combined sewer service area |
| Streams | |
| Culvert | |
| Open Channel | |

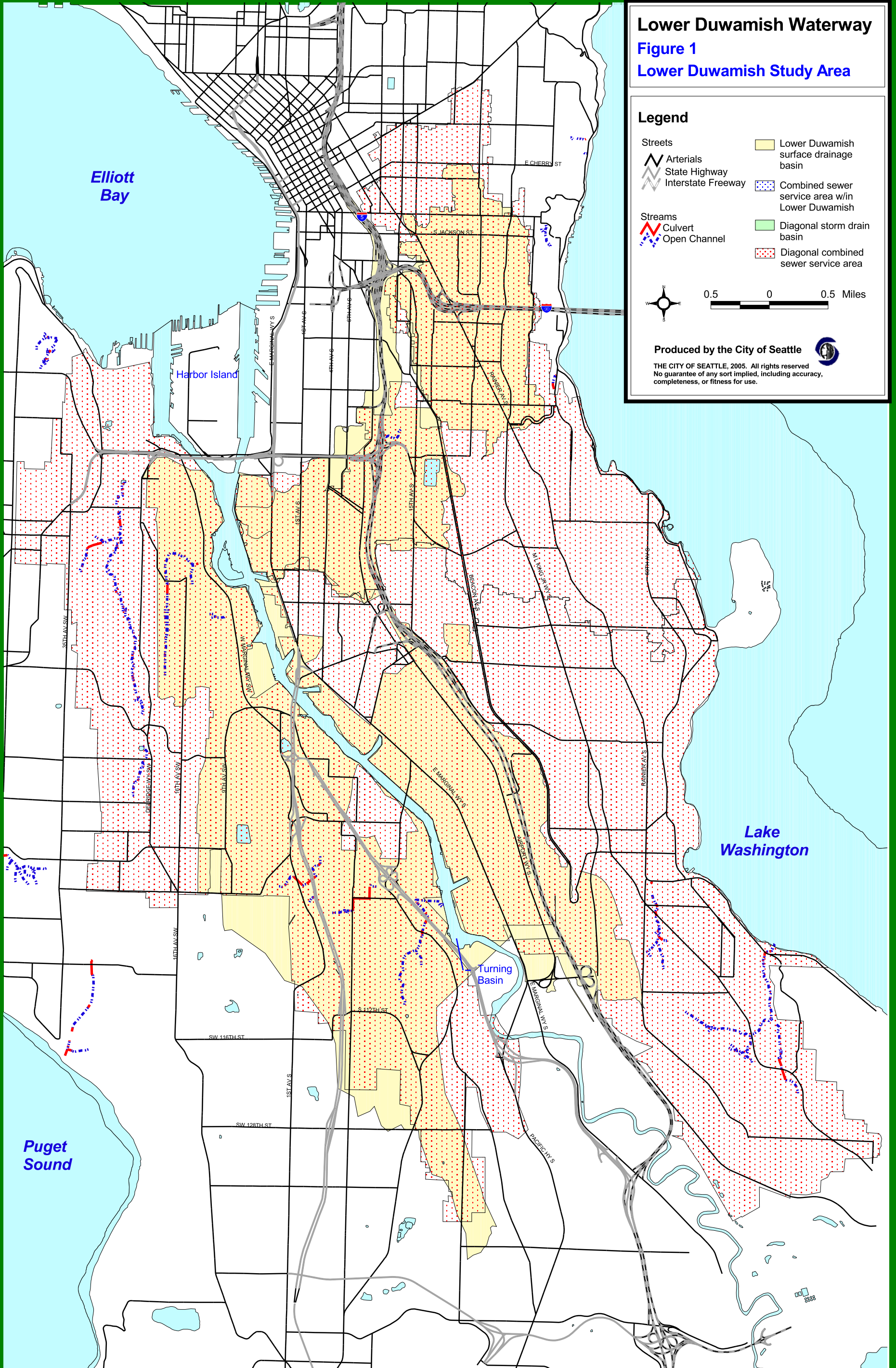


0.5 0 0.5 Miles

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Lower Duwamish Waterway

Figure 2 Outfalls in the Lower Duwamish Waterway

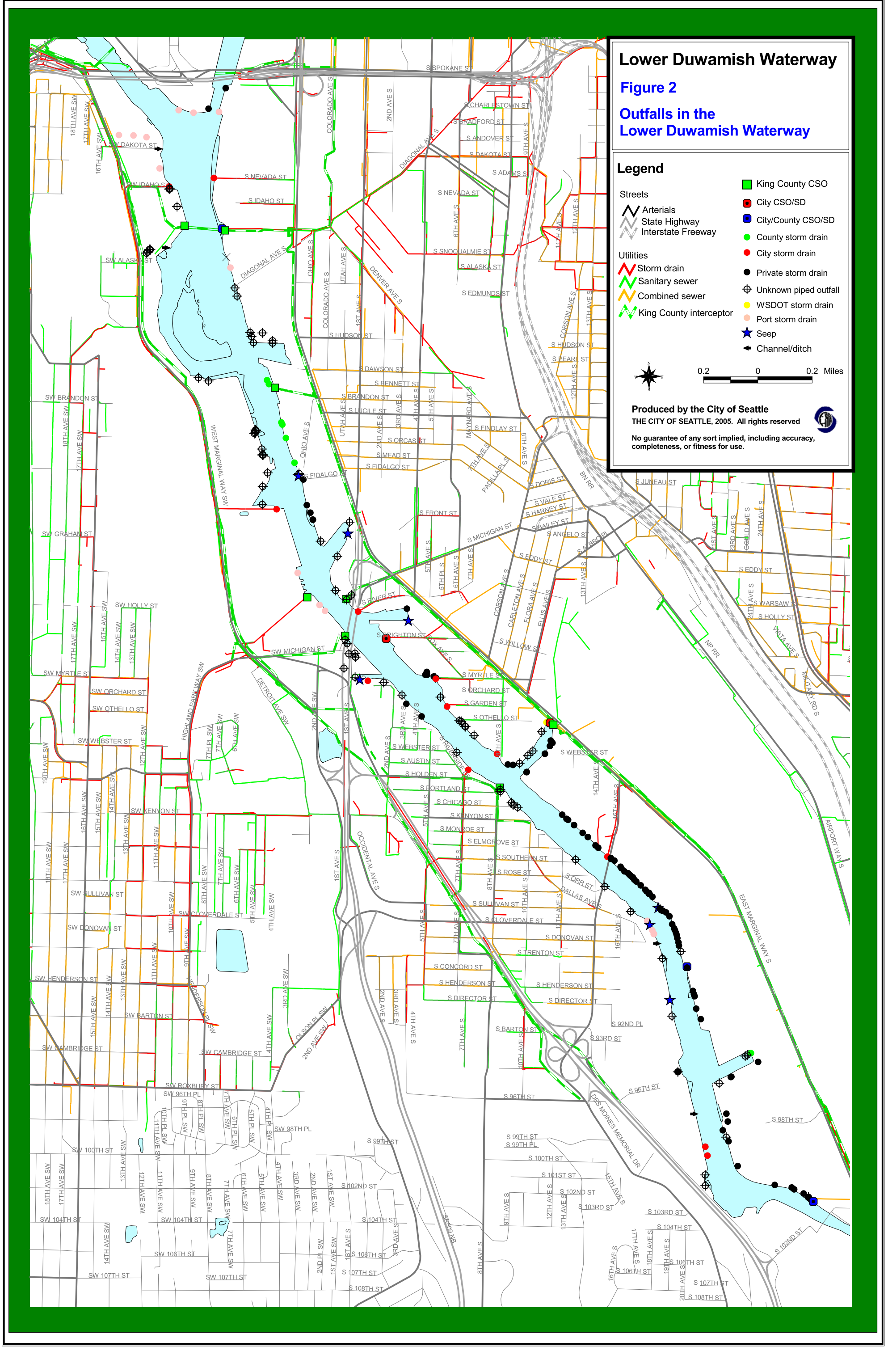
Legend

Streets	King County CSO
Arterials	City CSO/SD
State Highway	City/County CSO/SD
Interstate Freeway	County storm drain
Utilities	City storm drain
Storm drain	Private storm drain
Sanitary sewer	Unknown piped outfall
Combined sewer	WSDOT storm drain
King County interceptor	Port storm drain
	Seep
	Channel/ditch

0.2 0 0.2 Miles

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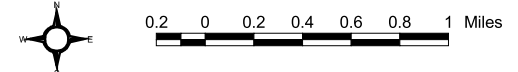
Lower Duwamish Waterway

Figure 3 Businesses Inspected March 2003 - June 2005

Legend

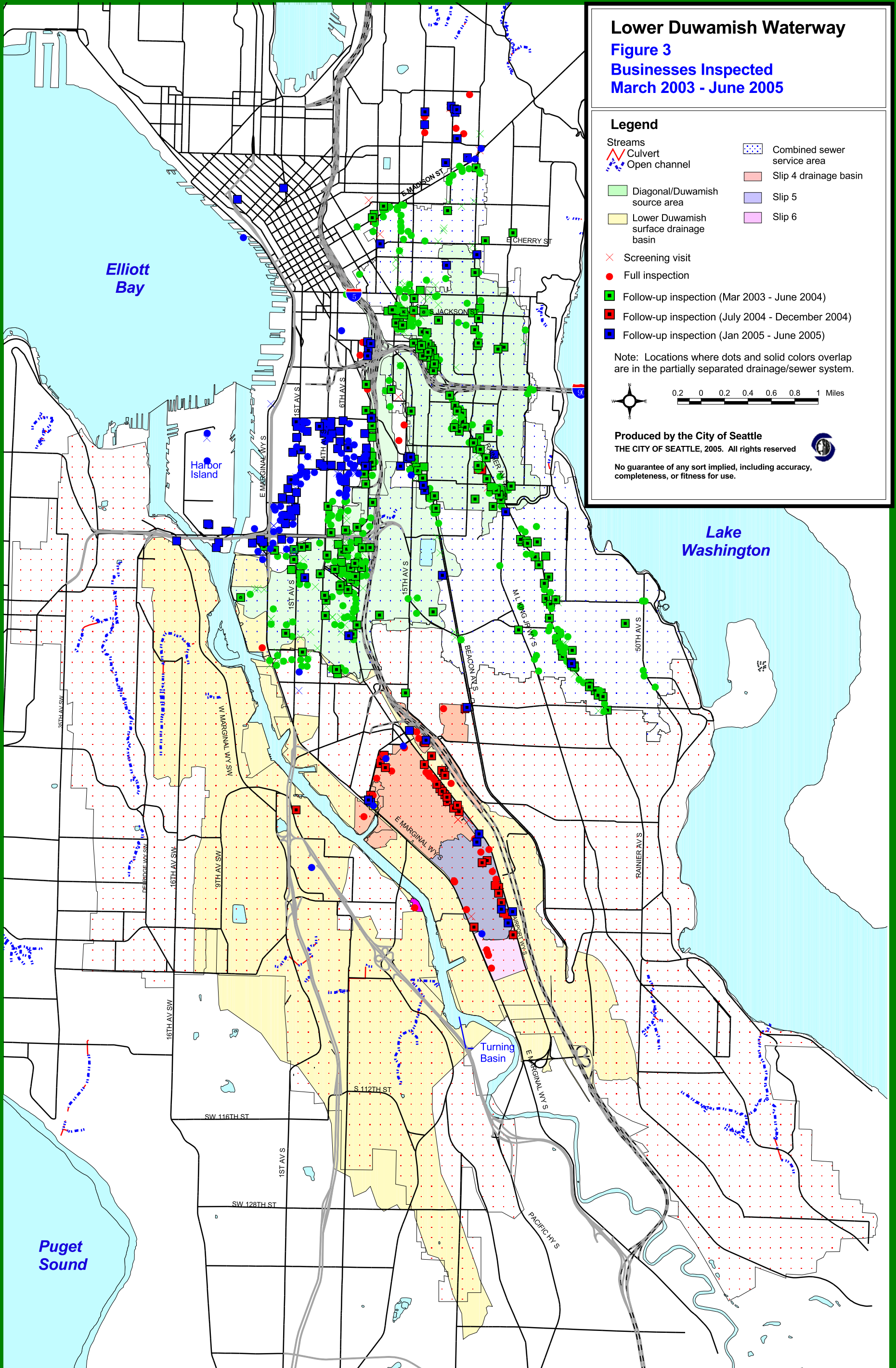
- Streams
- Culvert
- Open channel
- Diagonal/Duwamish source area
- Lower Duwamish surface drainage basin
- Screening visit
- Full inspection
- Follow-up inspection (Mar 2003 - June 2004)
- Follow-up inspection (July 2004 - December 2004)
- Follow-up inspection (Jan 2005 - June 2005)
- Combined sewer service area
- Slip 4 drainage basin
- Slip 5
- Slip 6

Note: Locations where dots and solid colors overlap are in the partially separated drainage/sewer system.



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Lower Duwamish Waterway
Figure 4
Source sample locations in
Lower Duwamish Waterway

Legend

- Catch basins in ROW
- Catch basins on private property
- ⊕ Sediment traps
- ▲ King County key manhole (wastewater)
- ⊗ In-line sediment

Basin Boundaries

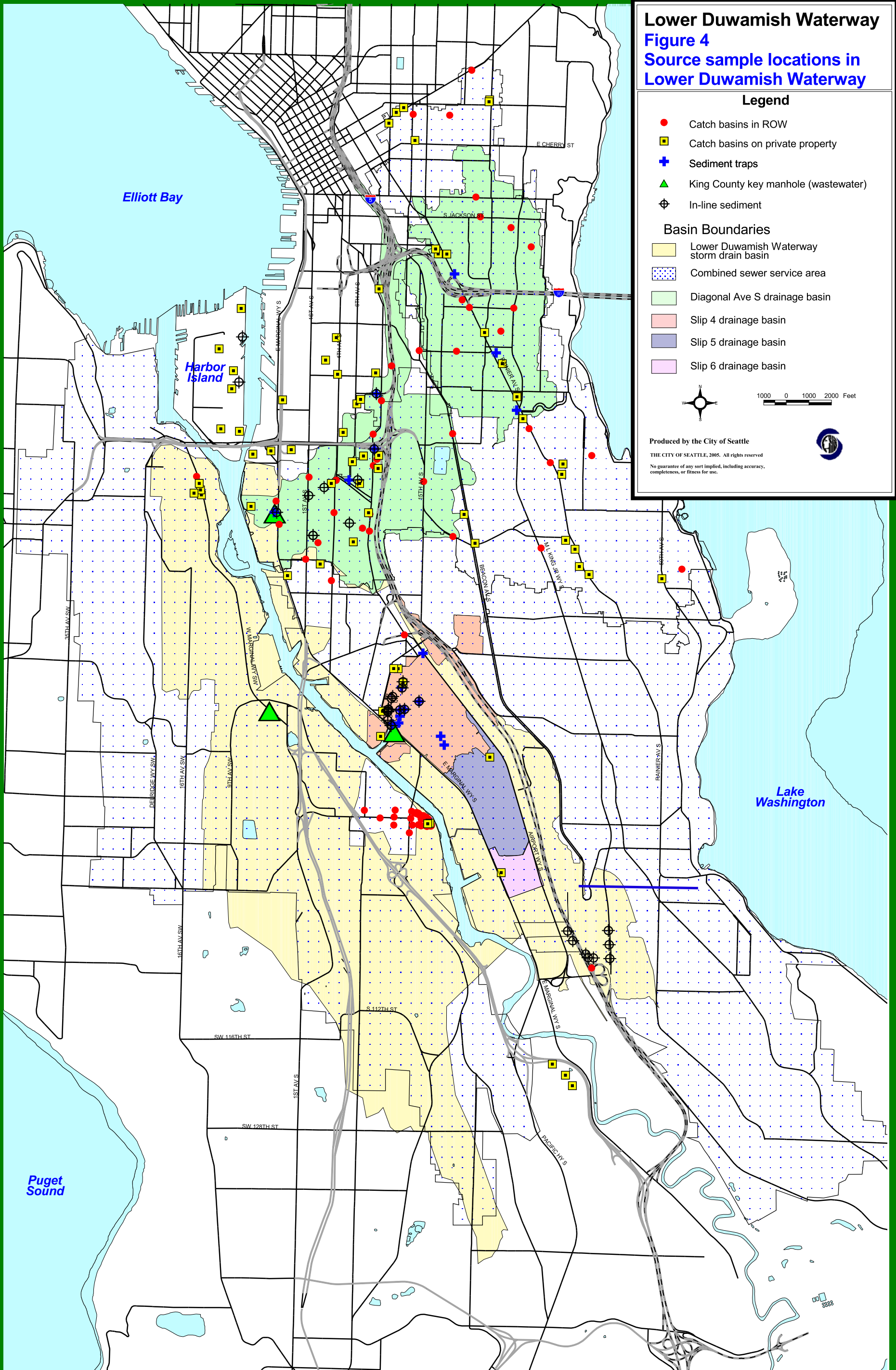
- Lower Duwamish Waterway storm drain basin
- Combined sewer service area
- Diagonal Ave S drainage basin
- Slip 4 drainage basin
- Slip 5 drainage basin
- Slip 6 drainage basin



1000 0 1000 2000 Feet

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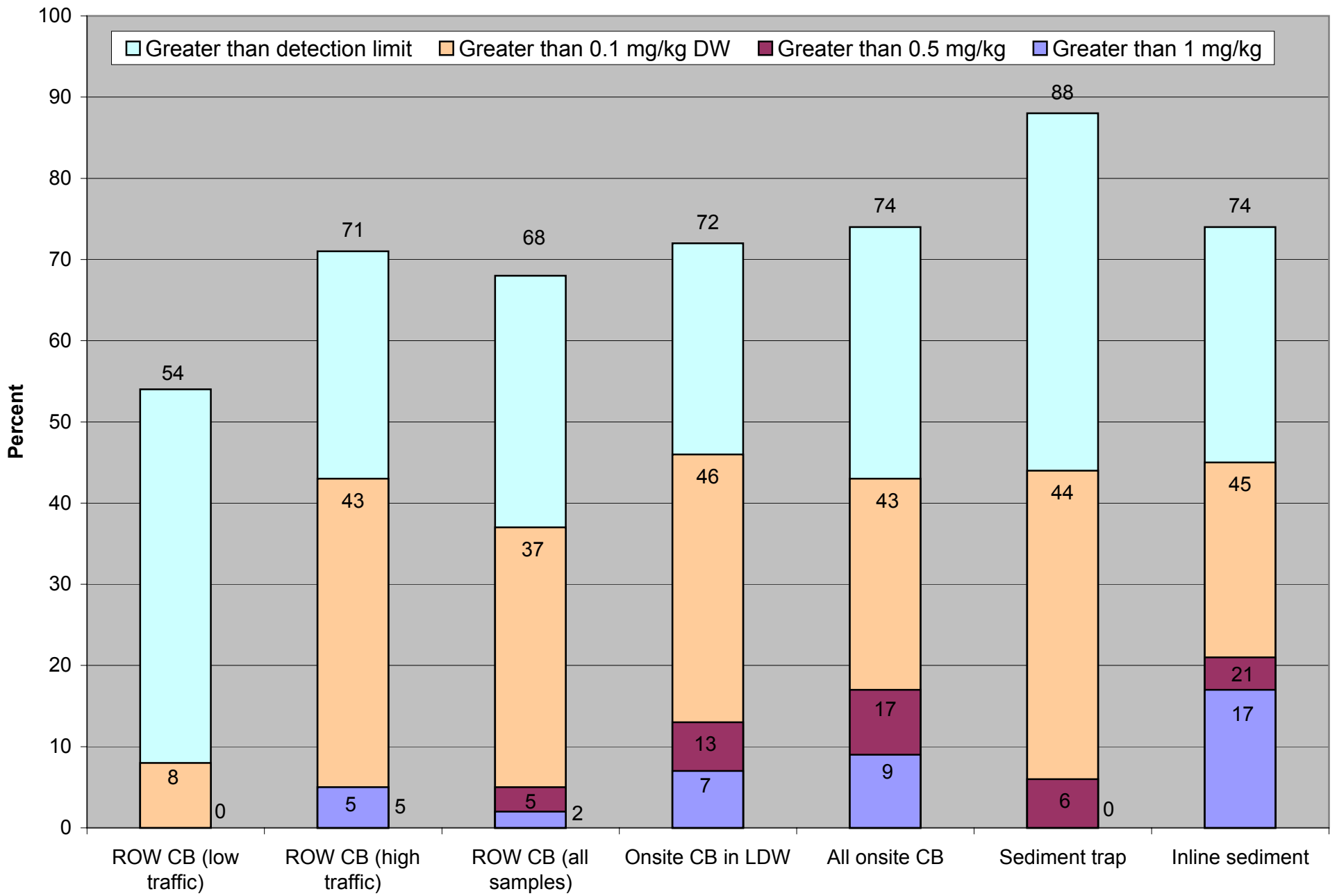


Figure 5. Source sediment PCB comparisons.

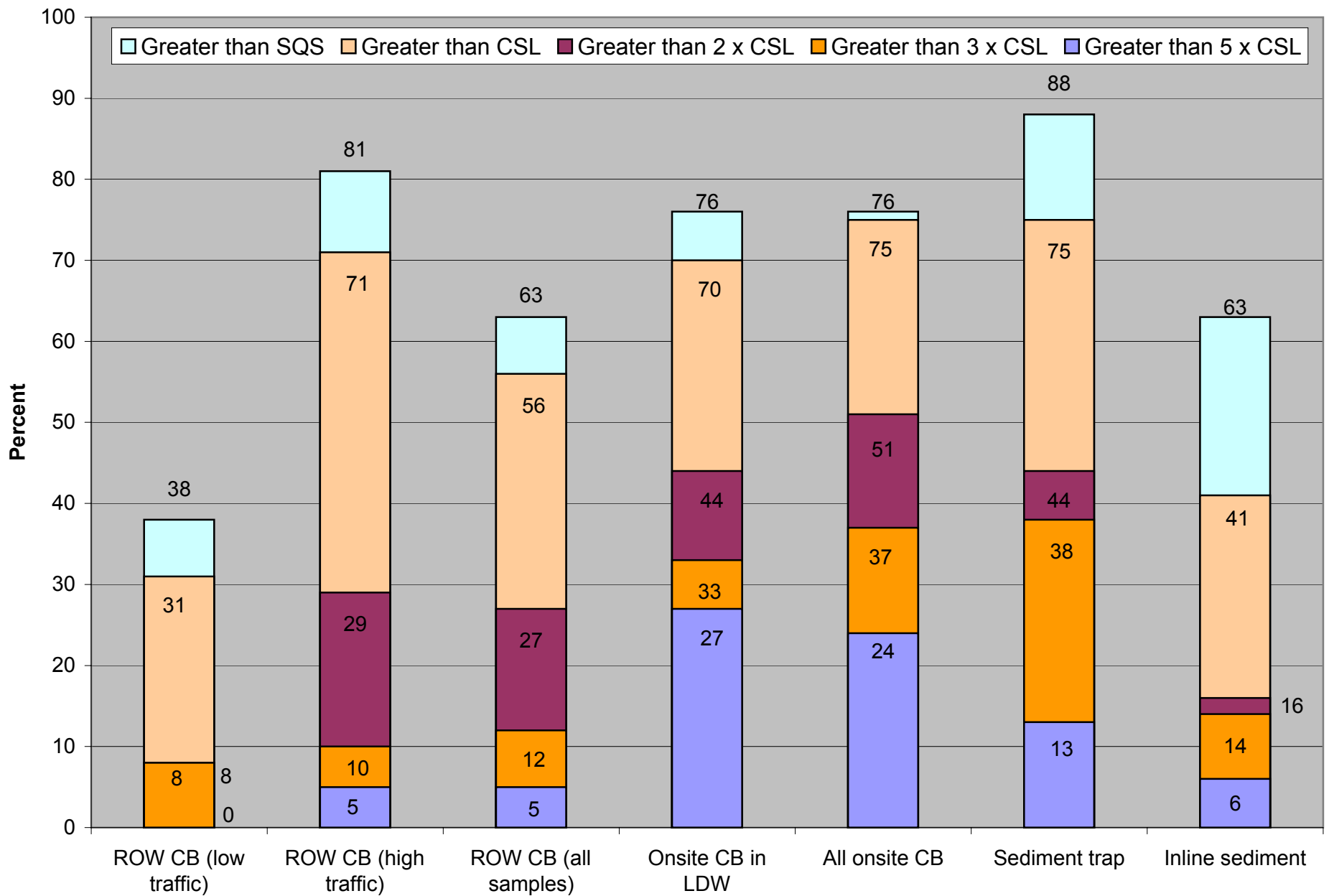
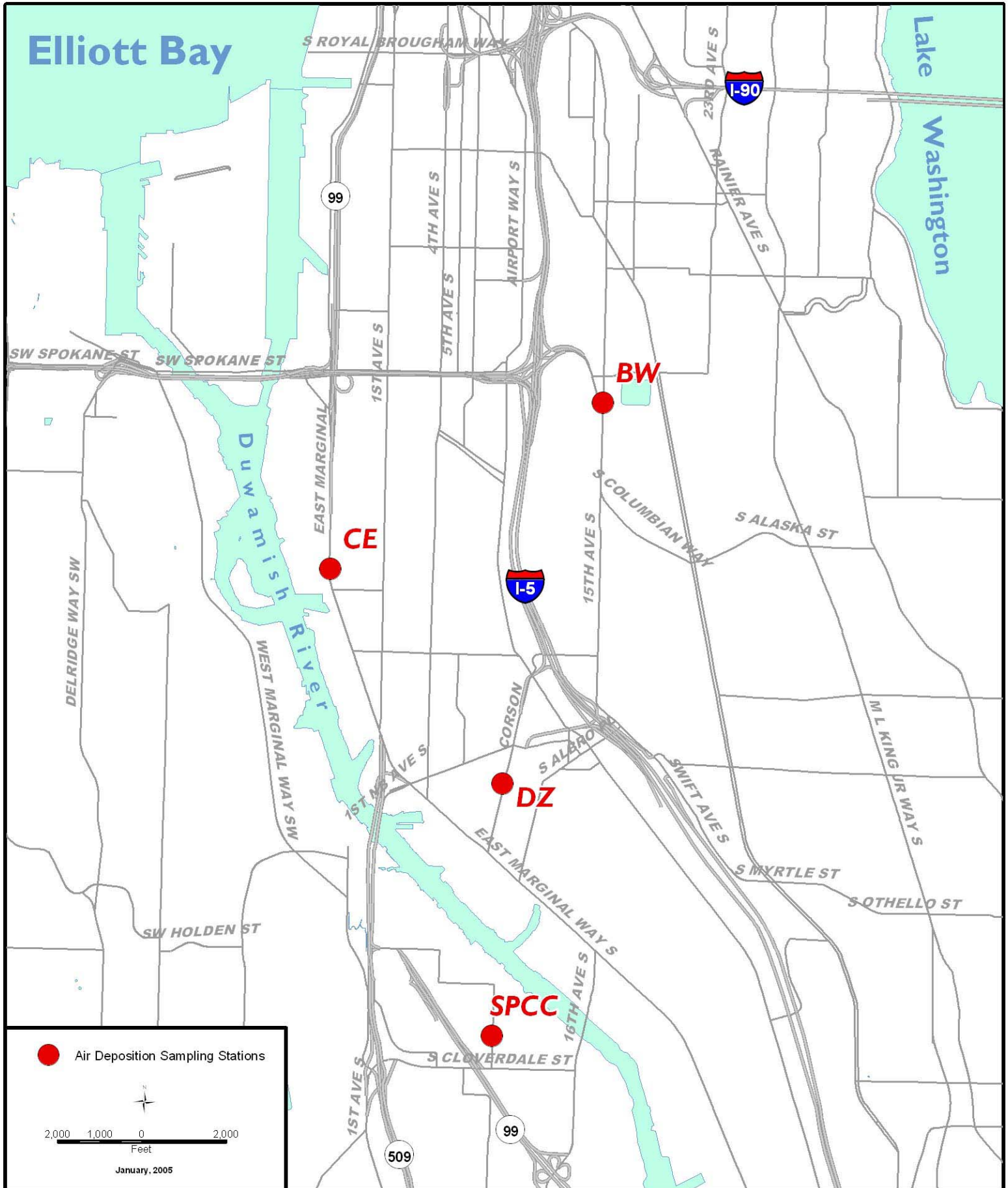


Figure 6. Source sediment BEHP comparisons.



Figure 7. Wet/dry atmospheric deposition sampler



Lower Duwamish Waterway

Figure 9

Diagonal Ave S CSO/SD Drainage Basin Boundary

Legend

Streets

- Arterials
- State Highway
- Interstate Freeway

Streams

- Culvert
- Open Channel

City combined sewer overflow location

County combined sewer overflow location

Diagonal combined sewer service area

Diagonal storm drain basin

Storm drain

County sewer

Note: Locations where dots and solid colors overlap are in the partially separated drainage/sewer system.



0.2 0 0.2 0.4 0.6 0.8 1 Miles

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Lower Duwamish Waterway

Figure 10

Land Use in Diagonal Ave S CSO/SD Service Area

Legend

Streets

- Arterials
- State Highway
- Interstate Freeway

Land Use Types

- Commercial
- Industrial
- Multi-Family
- Open Space
- Schools
- Single Family
- Vacant

- Diagonal Storm Drainage Basin Boundary
- Diagonal Combined Sewer Service Area

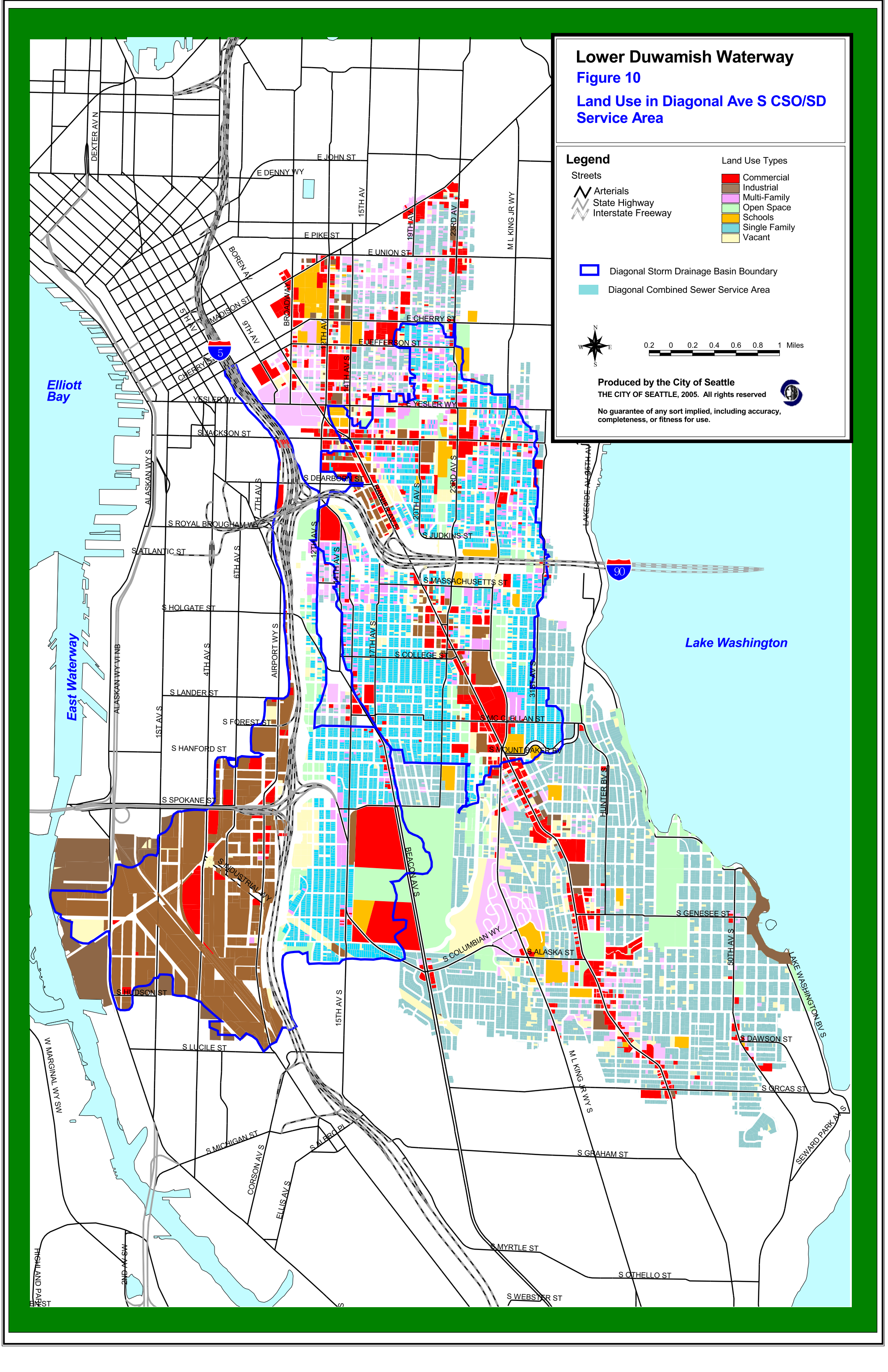


0.2 0 0.2 0.4 0.6 0.8 1 Miles

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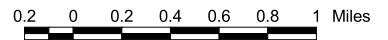
Lower Duwamish Waterway

Figure 11 Business Inspections in the Diagonal Ave S CSO/SD Service Area

Legend

- Streets
 - Arterials
 - State Highway
 - Interstate Freeway
 - Streams
 - Culvert
 - Open Channel
 - Diagonal combined sewer service area
 - Diagonal storm drain basin
- | | |
|-----------------------|------------------------|
| March 2003 - May 2004 | ■ Follow-up inspection |
| | ● Full inspection |
| | × Screening inspection |
| June - December 2004 | ■ Follow-up inspection |
| | ● Full inspection |
| | × Screening inspection |
| January - June 2005 | ■ Follow-up inspection |
| | ● Full inspection |
| | × Screening inspection |

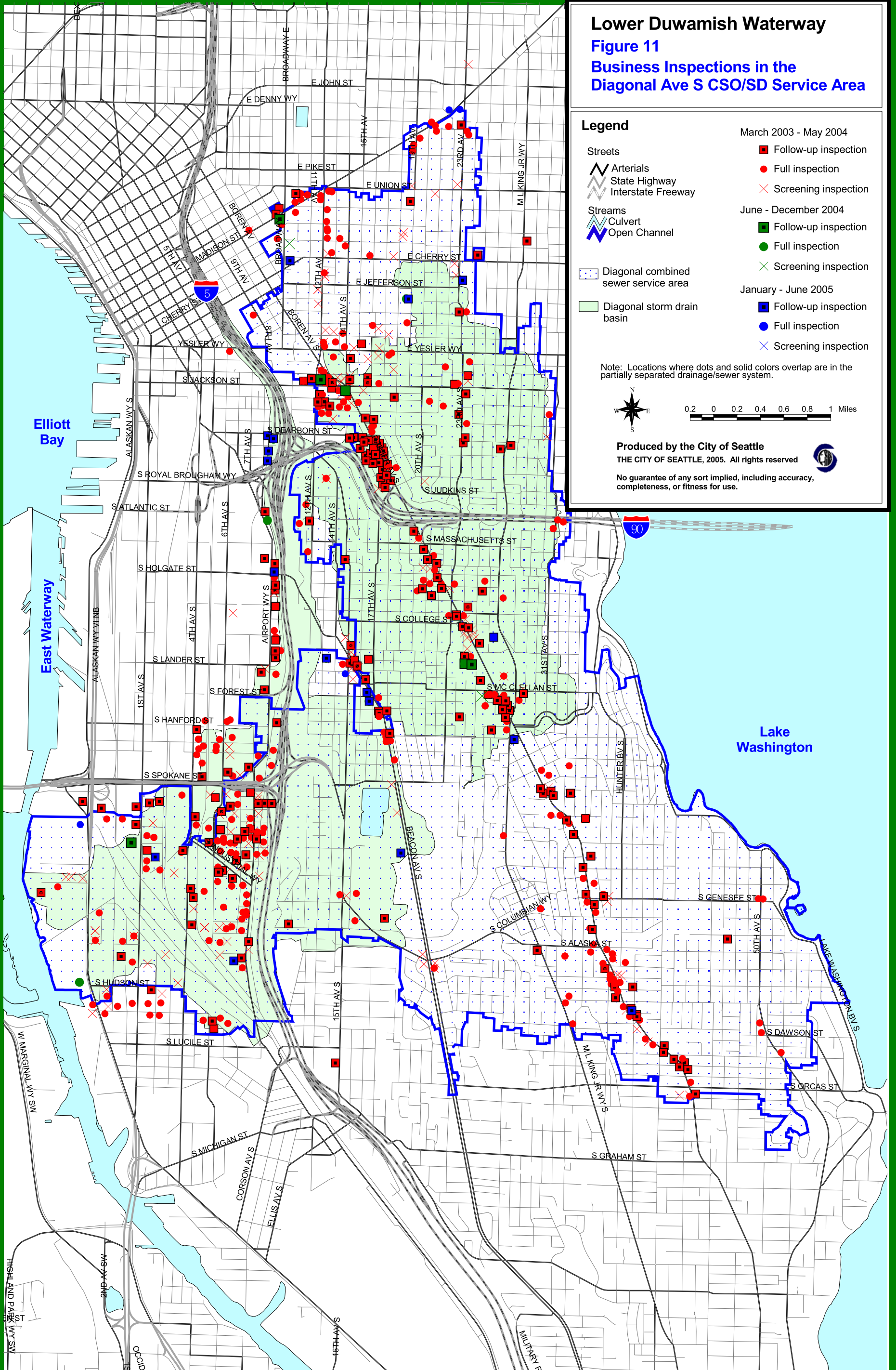
Note: Locations where dots and solid colors overlap are in the partially separated drainage/sewer system.



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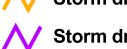






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Lower Duwamish Waterway

Figure 12
Diagonal CSO/SD
sediment trap locations

Legend

- Streets
-  Arterials
 -  Streets
 -  State Highway
 -  Interstate Freeway
 -  Storm drain trib to ST 2
 -  Storm drain trib to ST 3
 -  Storm drain trib to ST 5
 -  Storm drain trib to ST 6
 -  Storm drain trib to ST 7
 -  Diagonal Ave S CSO/SD storm drain basin

 Sediment trap

 SPU storm drain mainline

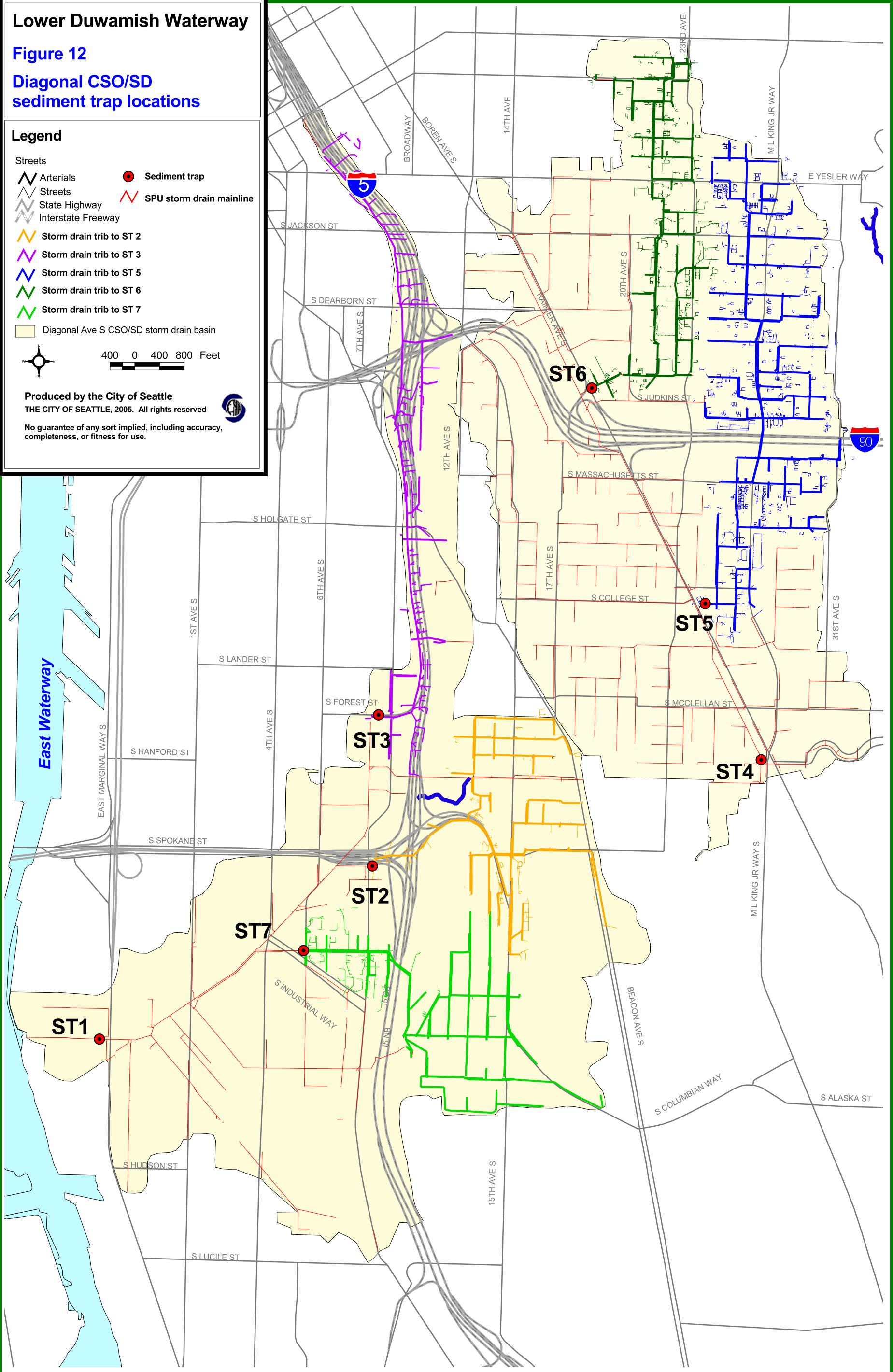


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Lower Duwamish Waterway

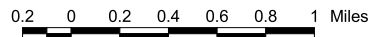
Figure 13

Catch Basin Samples Collected in Diagonal Ave S CSO/SD Service Area

Legend

- Streets
 - Arterials
 - State Highway
 - Interstate Freeway
- Diagonal combined sewer service area
- Diagonal storm drain Basin
- Onsite catch basin June-04 reporting period
- Right-of-way catch basin June-04 reporting period
- Onsite catch basin Jan-05 reporting period
- Right-of-way catch basin Jan-05 reporting period
- Onsite catch basin June-05 reporting period
- Right-of-way catch basin June-05 reporting period

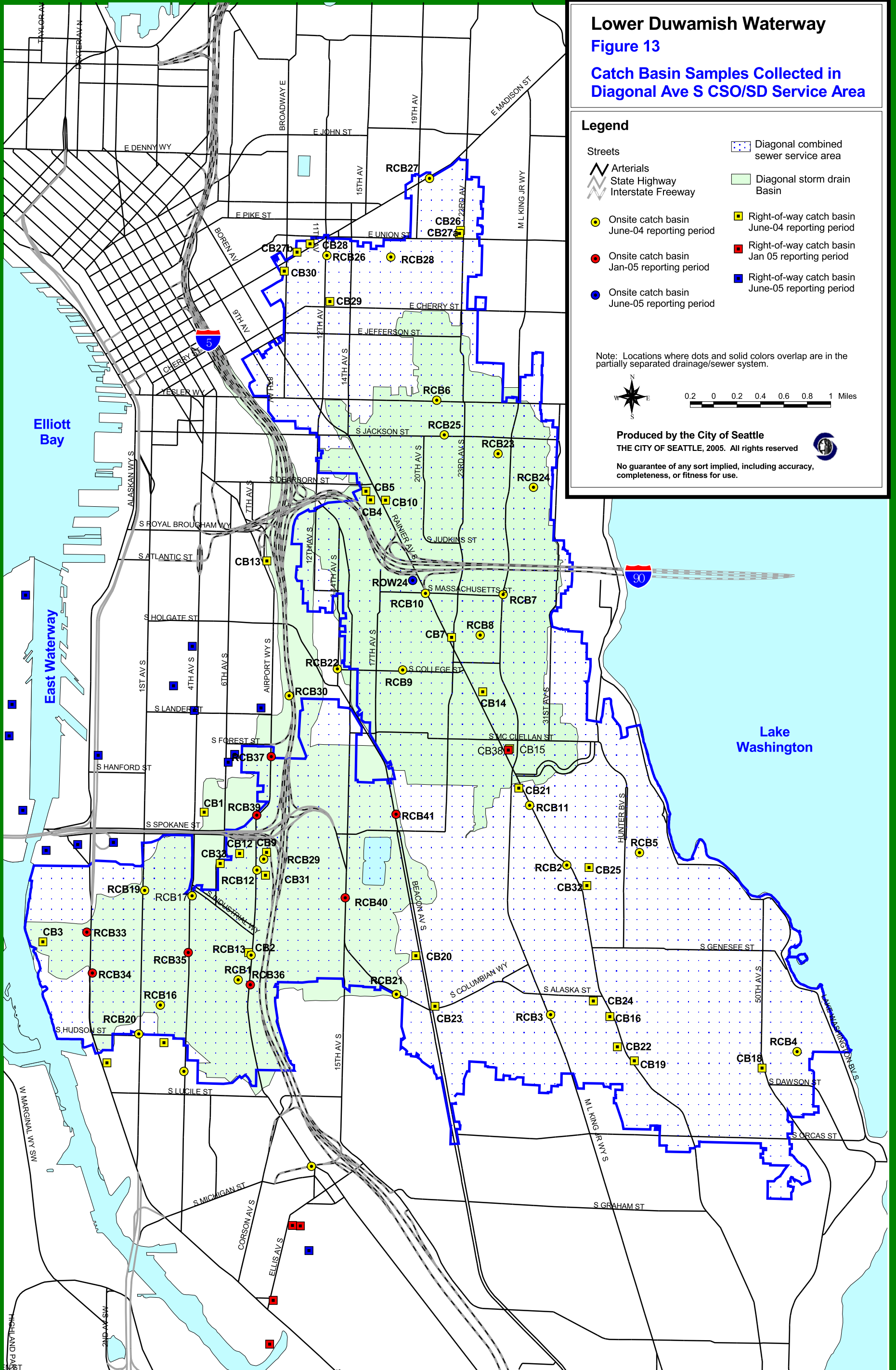
Note: Locations where dots and solid colors overlap are in the partially separated drainage/sewer system.



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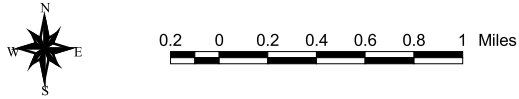
Lower Duwamish Waterway

Figure 14

Diagonal Ave S CSO/SD Cleaning Project

Legend

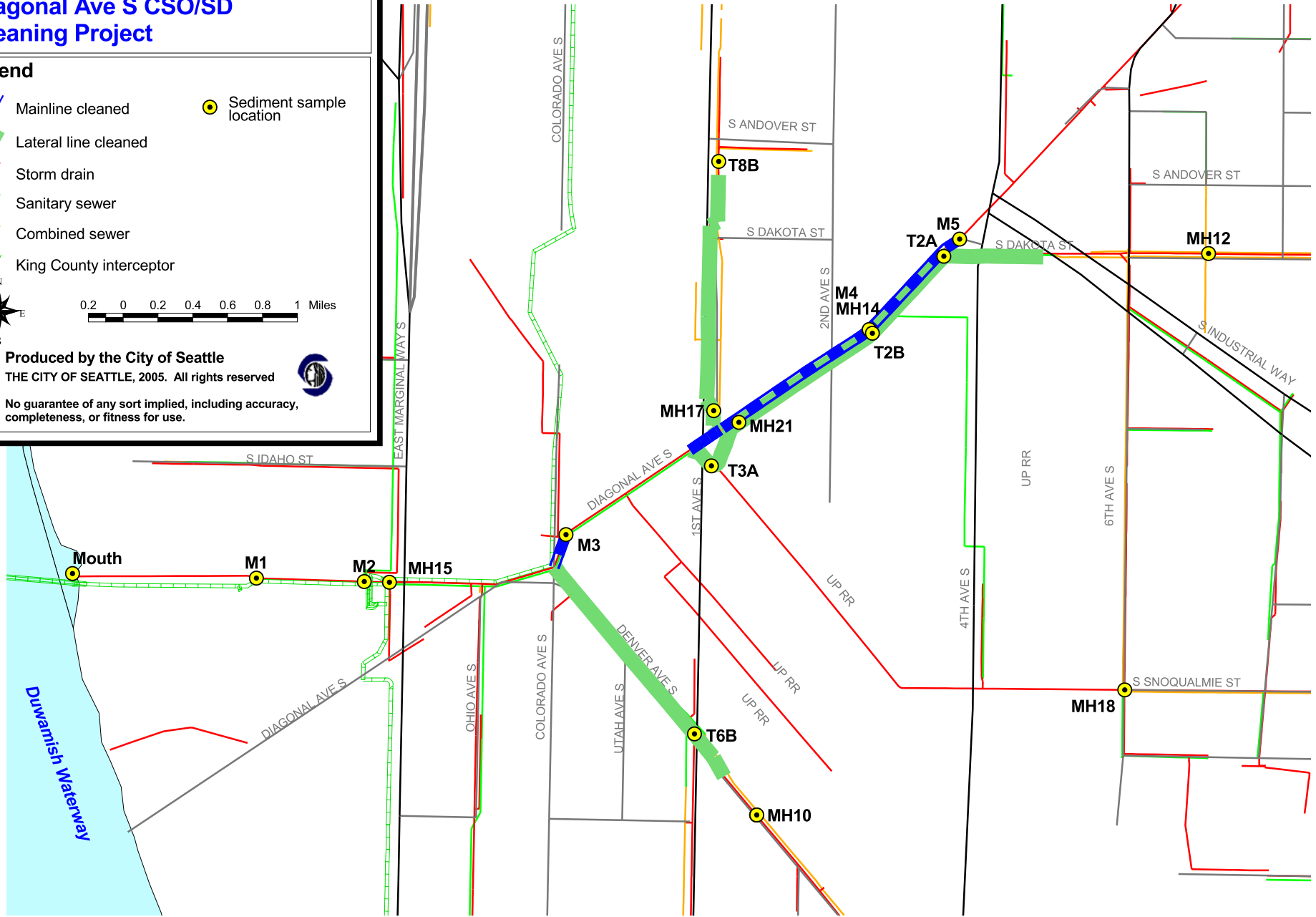
-  Mainline cleaned
-  Lateral line cleaned
-  Storm drain
-  Sanitary sewer
-  Combined sewer
-  King County interceptor
-  Sediment sample location



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Lower Duwamish Waterway

Figure 15

Areas draining to Slip 4

Legend

- Storm drain
- Sanitary sewer
- Combined sewer
- King County interceptor
- King County CSO
- City CSO/SD
- City/County CSO/SD
- County storm drain
- City storm drain
- Private storm drain
- Unknown piped outfall
- WSDOT storm drain
- Port storm drain
- Seep
- Channel/ditch
- Direct discharge
- Georgetown flume
- I-5 SD
- Slip 4 SD (King County Airport drain)
- Slip 4 CSO/SD

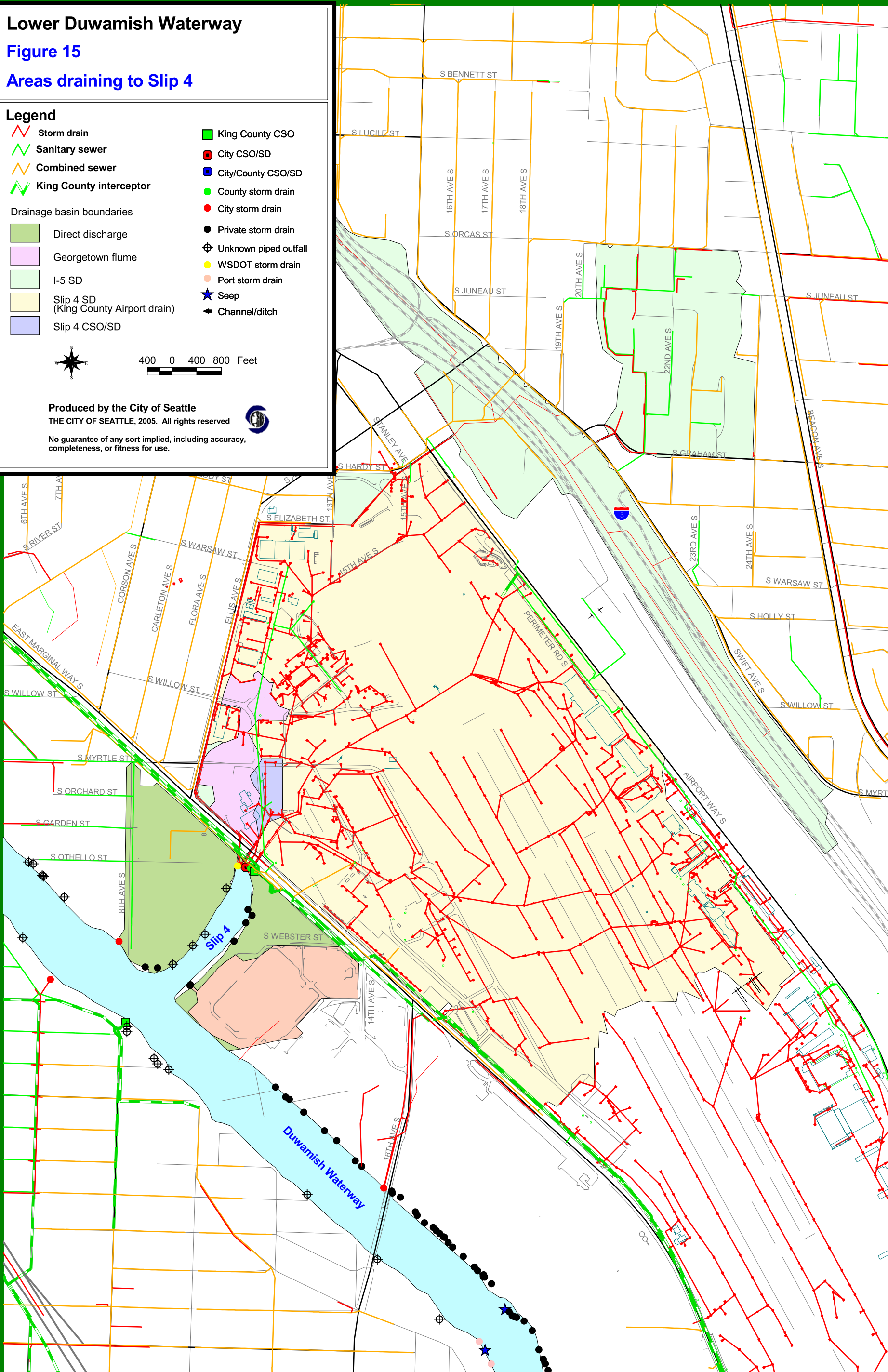


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







Lower Duwamish Waterway

Figure 16

Businesses inspected in Slip 4 June 2004 - June 2005

Legend

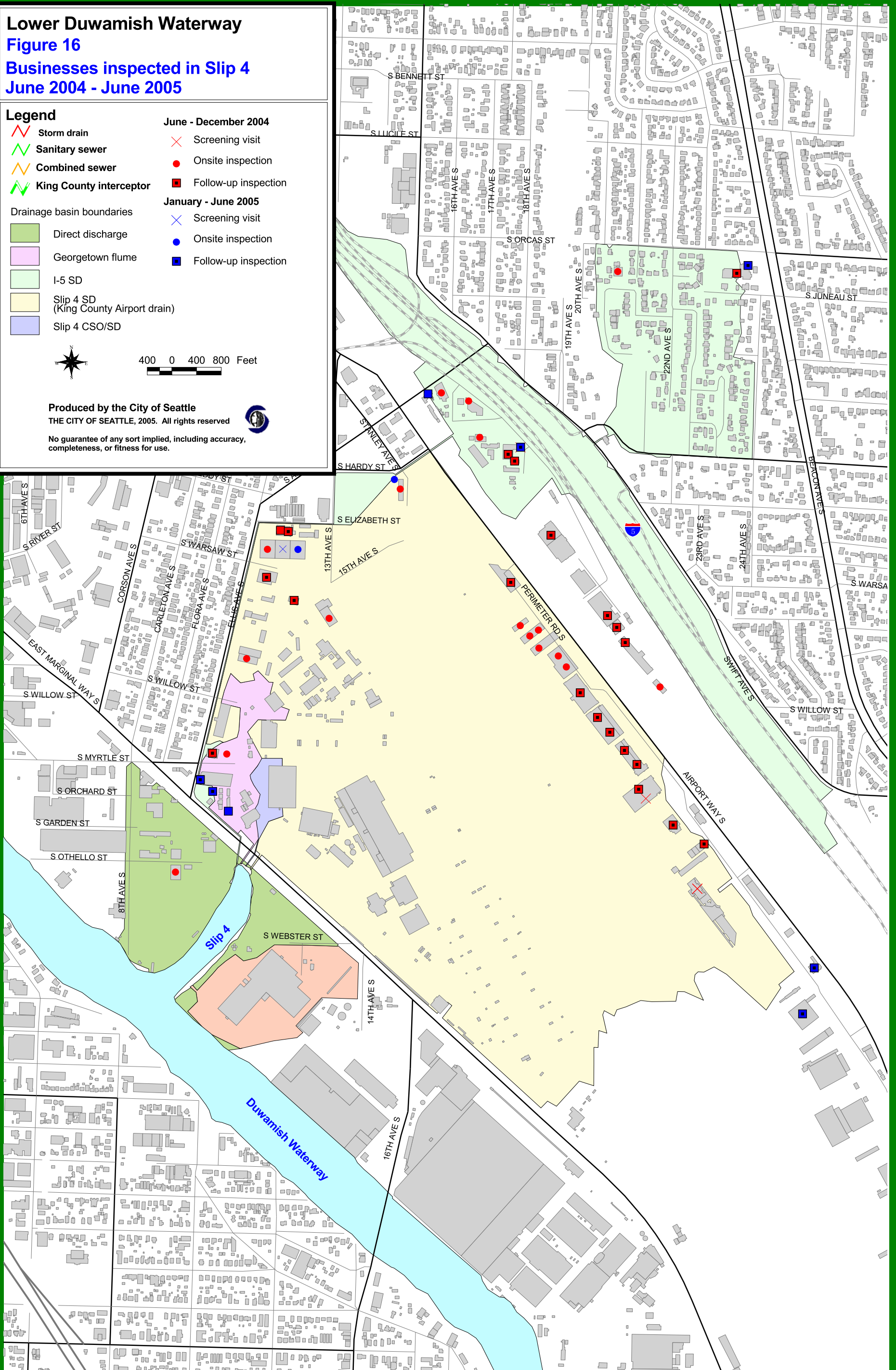
 Storm drain	June - December 2004
 Sanitary sewer	 Screening visit
 Combined sewer	 Onsite inspection
 King County interceptor	 Follow-up inspection
Drainage basin boundaries	January - June 2005
 Direct discharge	 Screening visit
 Georgetown flume	 Onsite inspection
 I-5 SD	 Follow-up inspection
 Slip 4 SD (King County Airport drain)	
 Slip 4 CSO/SD	



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Lower Duwamish Waterway






Figure 17

Slip 4 Source Sediment Samples

Legend

-  Storm drain
-  Sanitary sewer
-  Combined sewer
-  King County interceptor
-  Georgetown flume sample
-  Storm drain sample
-  Sediment trap

Drainage basin boundaries

-  Direct discharge
-  Georgetown flume
-  I-5 SD
-  Slip 4 SD (King County Airport drain)
-  Slip 4 CSO/SD

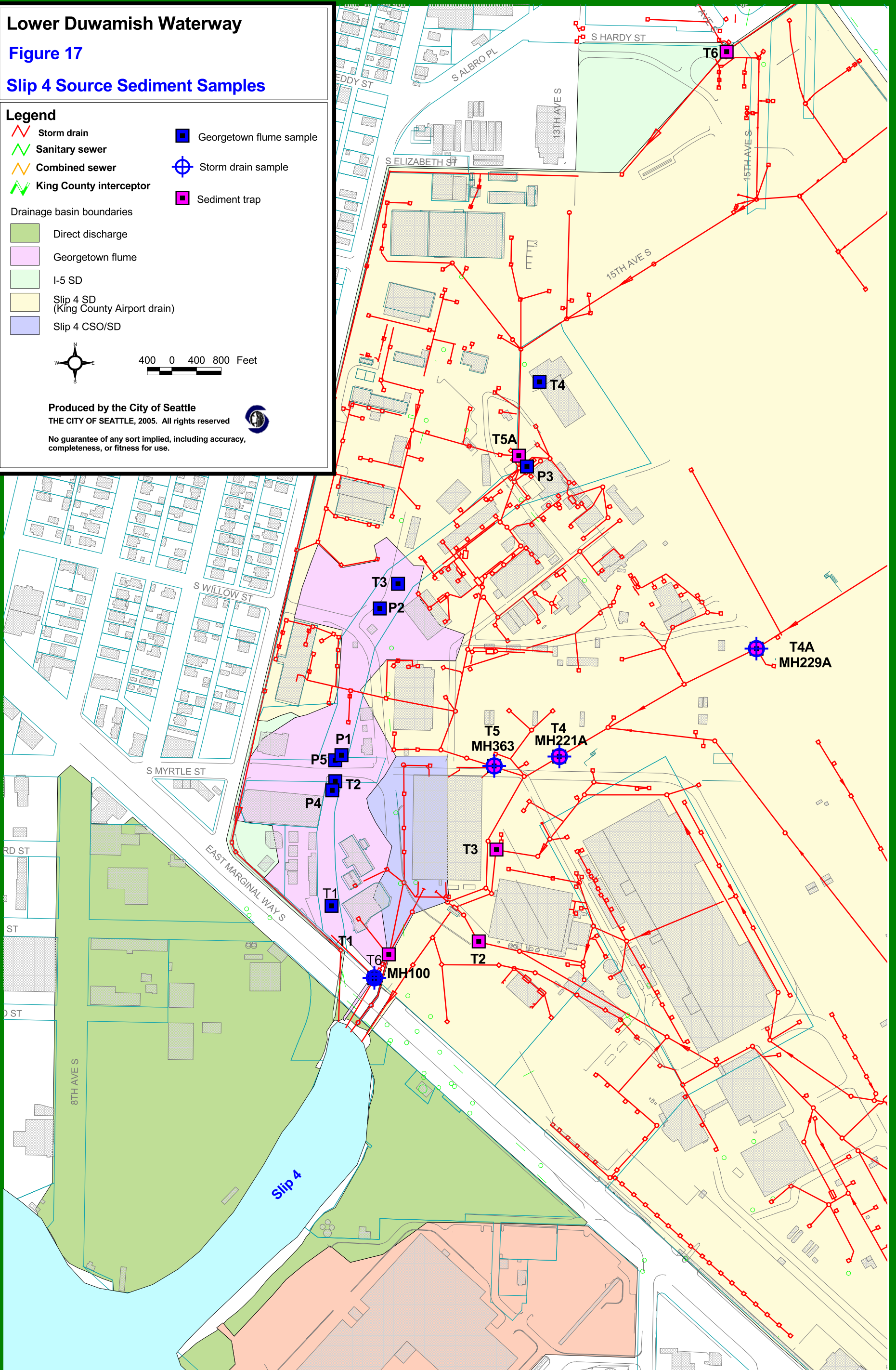


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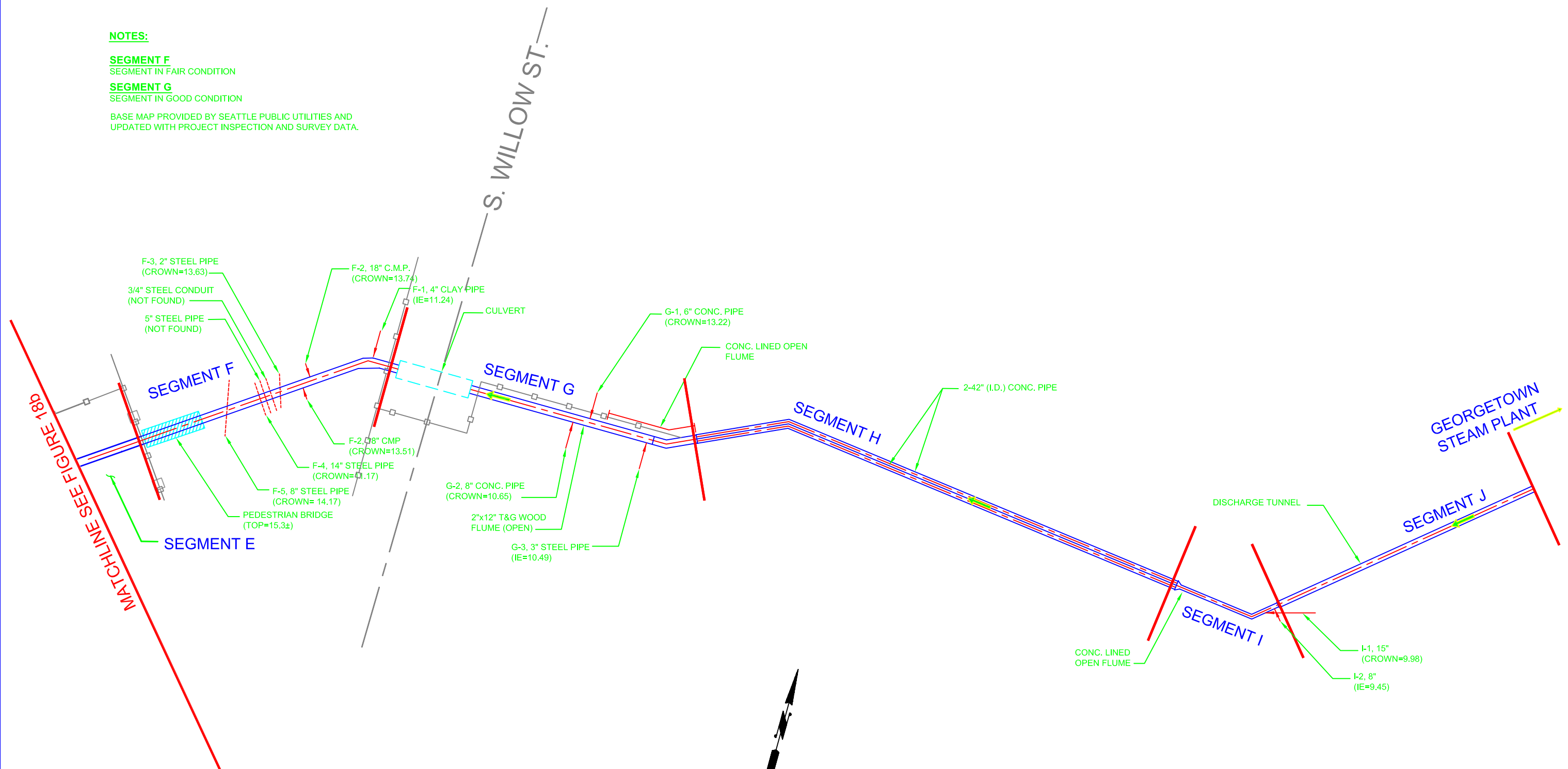


NOTES:

SEGMENT F
SEGMENT IN FAIR CONDITION

SEGMENT G
SEGMENT IN GOOD CONDITION

BASE MAP PROVIDED BY SEATTLE PUBLIC UTILITIES AND
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MATCHLINE SEE FIGURE 18b

LEGEND	
	EXISTING FENCE
	DIRECTION OF FLOW

DATUM
NAVD 88, CITY OF SEATTLE

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No.	REVISION	BY	APP'D	DATE

HERRERA
ENVIRONMENTAL
CONSULTANTS
2200 Sixth Avenue
Suite 1100
Seattle, Washington
98121-1820
206-441-9080
206-441-9108 FAX
<http://www.herrerainc.com>

DESIGNED:	CHECKED:
DRAWN:	SCALE:
TDP	RECOMMENDED:
APPROVED:	CONTRACT NO: 01-01948-200

GEORGETOWN STEAM PLANT

UPPER GEORGETOWN FLUME

DATE:	AUGUST 2005
FILE NO.:	423484/200
DRAWING NO.:	FIG 18a
SHEET NO.:	1 OF 2

NOTES:

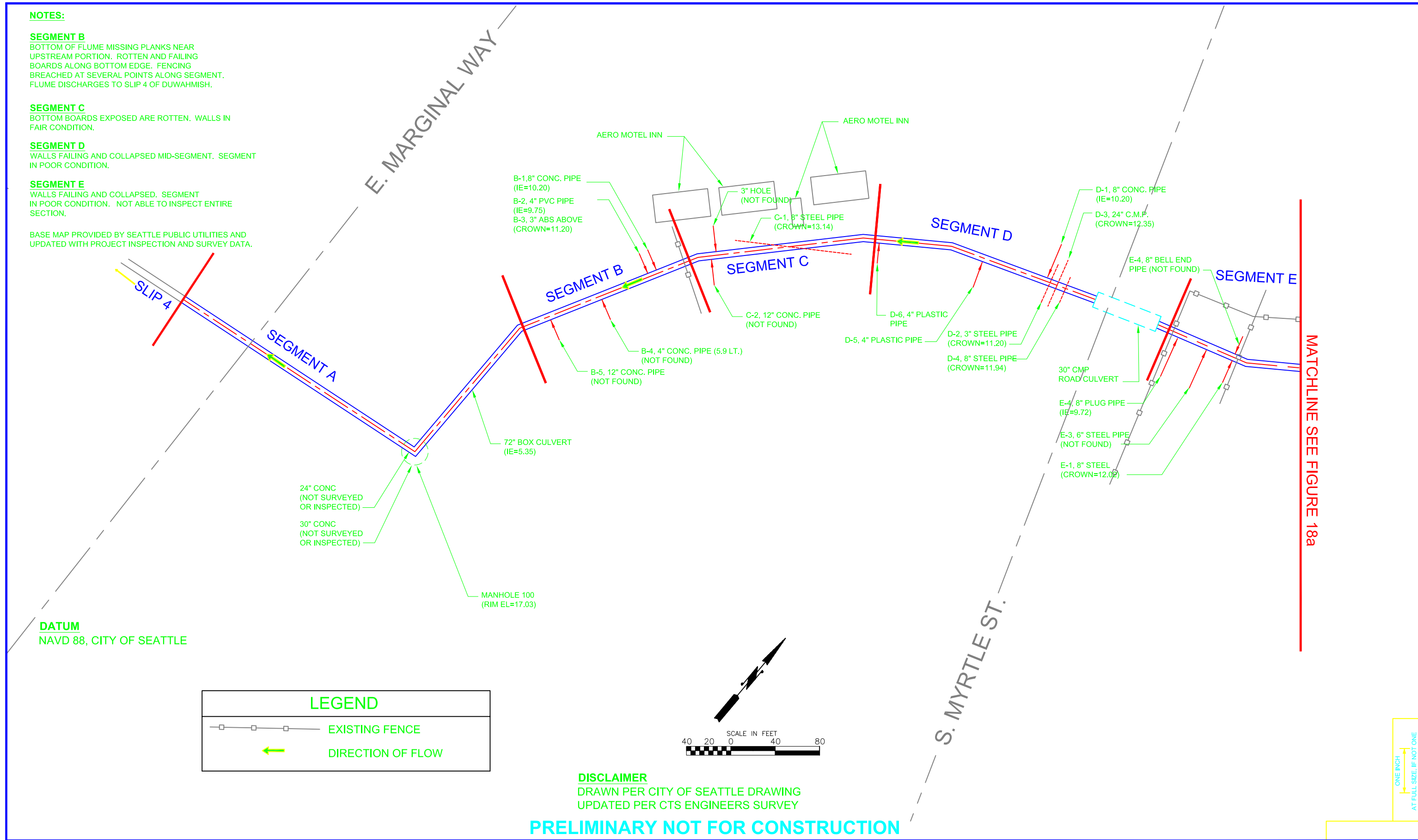
SEGMENT B
 BOTTOM OF FLUME MISSING PLANKS NEAR
 UPSTREAM PORTION. ROTTEN AND FAILING
 BOARDS ALONG BOTTOM EDGE. FENCING
 BREACHED AT SEVERAL POINTS ALONG SEGMENT.
 FLUME DISCHARGES TO SLIP 4 OF DUWAHMISH.

SEGMENT C
 BOTTOM BOARDS EXPOSED ARE ROTTEN. WALLS IN
 FAIR CONDITION.

SEGMENT D
 WALLS FAILING AND COLLAPSED MID-SEGMENT. SEGMENT
 IN POOR CONDITION.

SEGMENT E
 WALLS FAILING AND COLLAPSED. SEGMENT
 IN POOR CONDITION. NOT ABLE TO INSPECT ENTIRE
 SECTION.

BASE MAP PROVIDED BY SEATTLE PUBLIC UTILITIES AND
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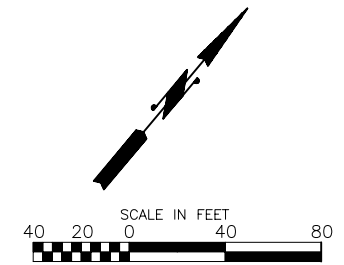


DATUM
 NAVD 88, CITY OF SEATTLE

LEGEND

—□—□—□— EXISTING FENCE

← DIRECTION OF FLOW



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 Xref Filename: I

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DESIGNED:	CHECKED:
DRAWN:	SCALE:
SLH/TDP	
RECOMMENDED:	
APPROVED:	CONTRACT NO: 01-01948-200

GEORGETOWN STEAM PLANT

LOWER GEORGETOWN FLUME

DATE:	AUGUST 2005
FILE NO:	423484/200
DRAWING NO:	FIG 18b
SHEET NO:	2 OF 2

ONE INCH
 AT FULL SIZE, IF NOT ONE
 INCH SCALE ACCORDINGLY

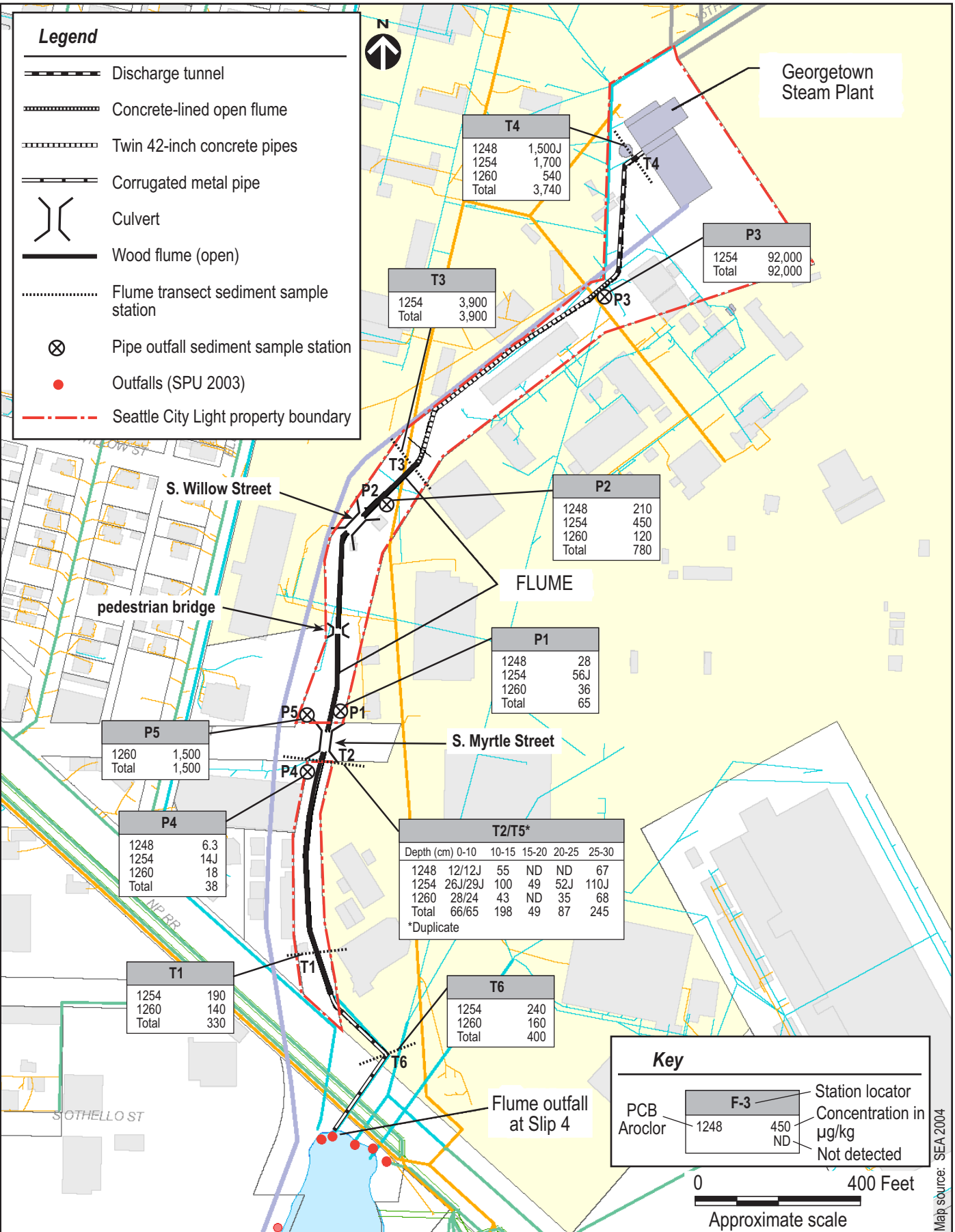


Figure 19. Georgetown flume sediment sample location and PCB results.

Lower Duwamish Waterway

Figure 20

Businesses inspected in Slip 5 and Slip 6

Legend

June - December 2004

January - June 2005

✗ Screening visit

✗ Screening visit

● Onsite inspection

● Onsite inspection

■ Follow-up inspection

■ Follow-up inspection

↗ Storm drain

↗ Sanitary sewer

↗ Combined sewer

↗ King County interceptor

Drainage basin boundaries

King County Airport storm drain (Slip 5)

King County Airport storm drain (Slip 6)

Waterfront discharges



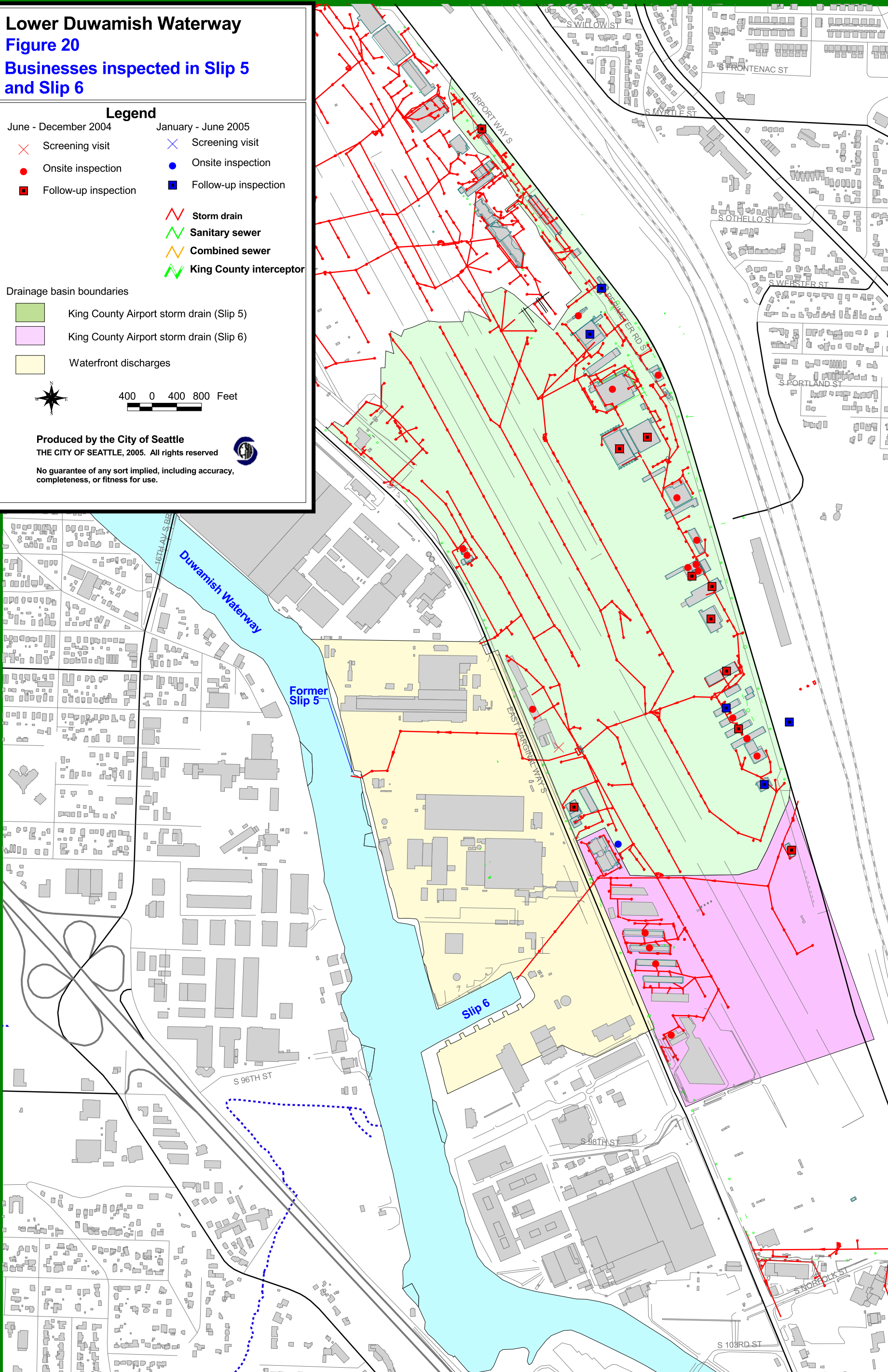
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Lower Duwamish Waterway
Figure 21
T117 Drainage Area

Legend

Outfalls

- Port storm drain
- ◄ Seep
- ★ Channel/ditch
- ▭ T117 drainage basin

Utilities

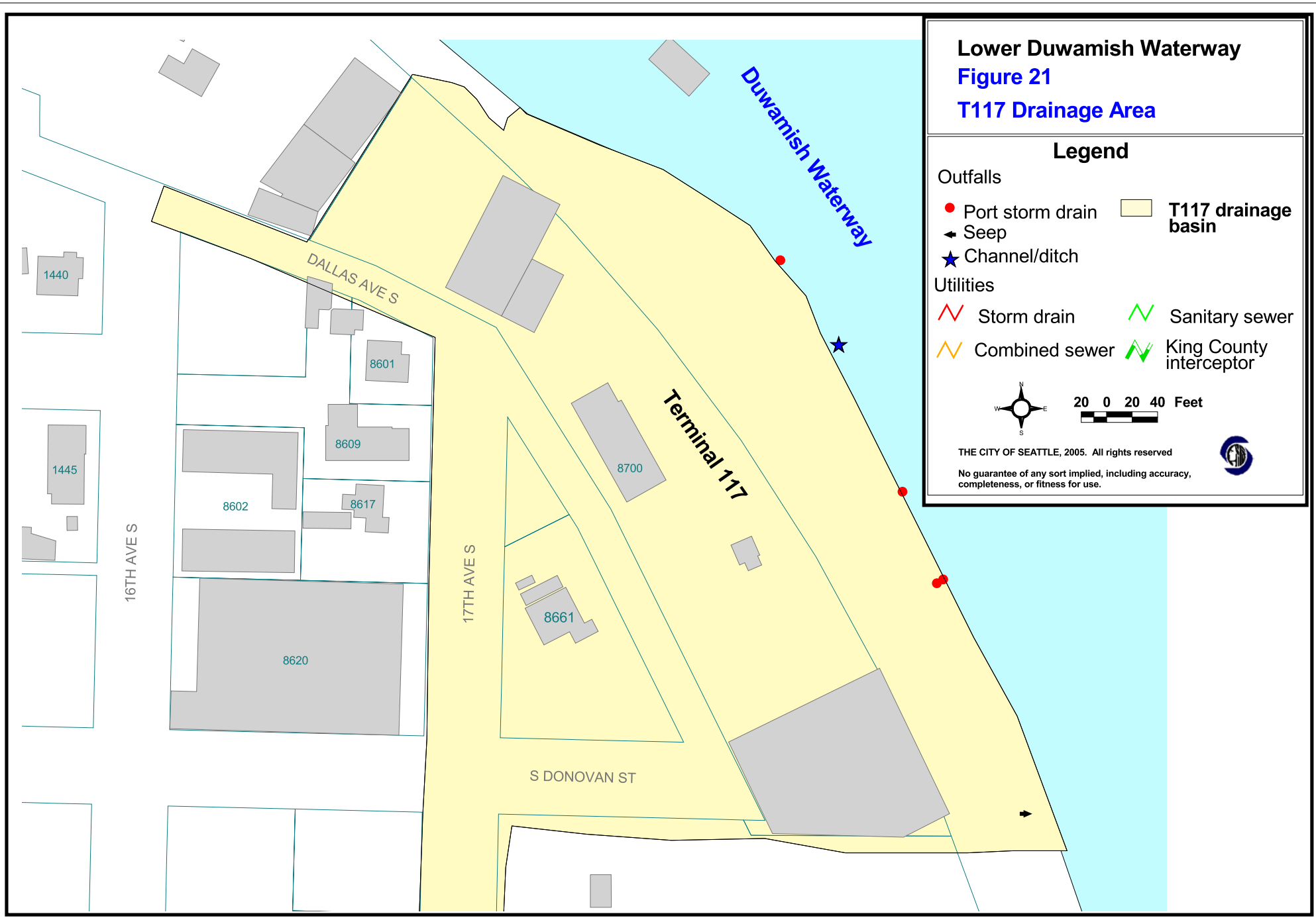
- ∨ Storm drain
- ∨ Sanitary sewer
- ∨ Combined sewer
- ∨ King County interceptor



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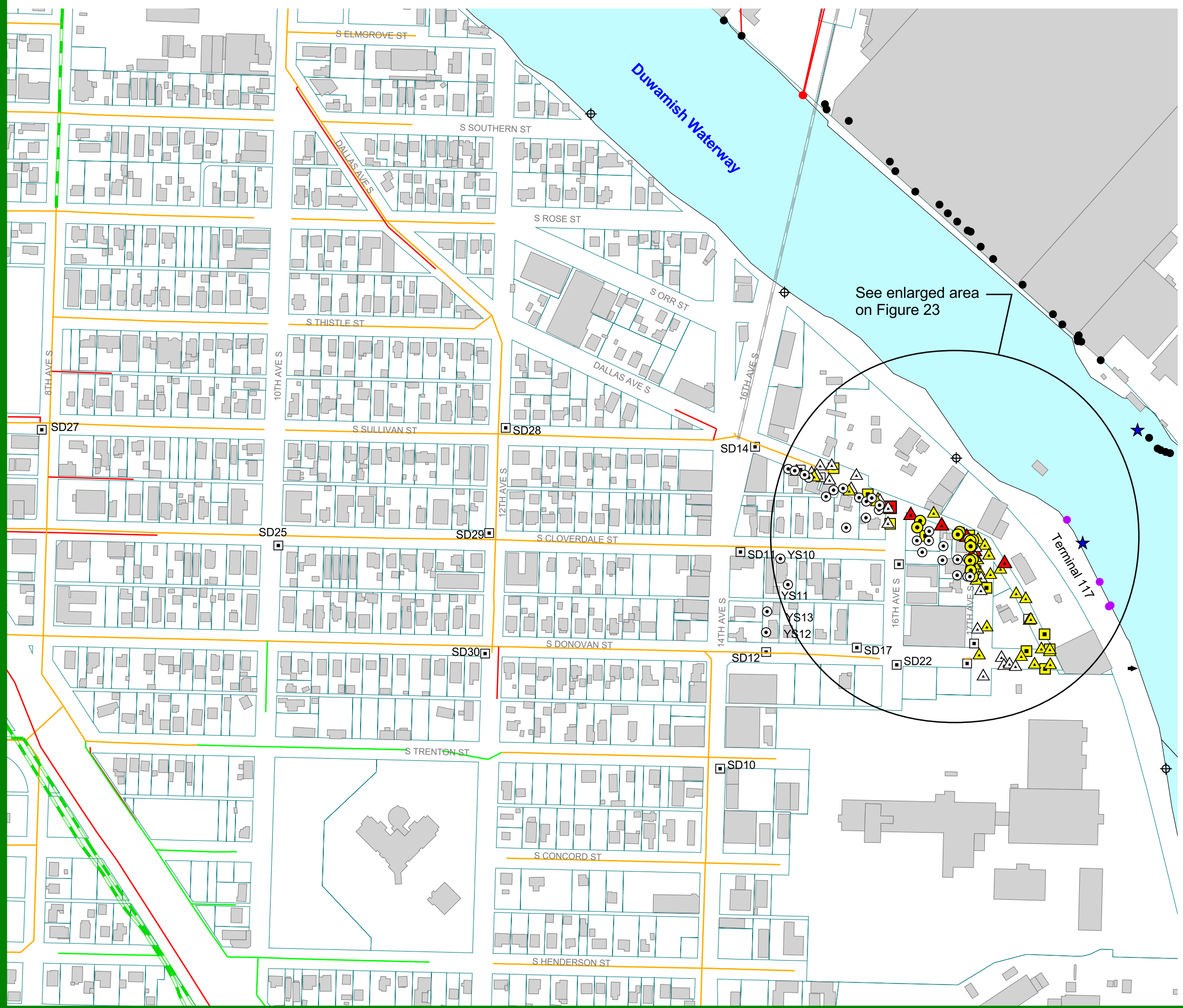
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Lower Duwamish Waterway

Figure 22

Sediment Sample Locations in Vicinity of T117 Early Action Site



Legend

PCBs in Right-of-Way Soil

- Below Cleanup Level
- Above Cleanup Level
- Greater than 50 ppm

PCBs in Roadway Dirt

- Below Cleanup Level
- Above Cleanup Level

PCBs in Yard Soil

- Below Cleanup Level
- Above Cleanup Level
- Greater than 50 ppm

Property boundary

Building

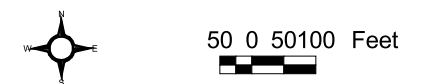
Utilities

- Storm drain
- Sanitary sewer
- Combined sewer
- King County interceptor

Outfalls

- City storm drain
- Private storm drain
- Unknown piped outfall
- Port storm drain
- Seep
- Channel/ditch

PCBs = Polychlorinated Biphenyl
State Cleanup Level = 1 ppm PCBs



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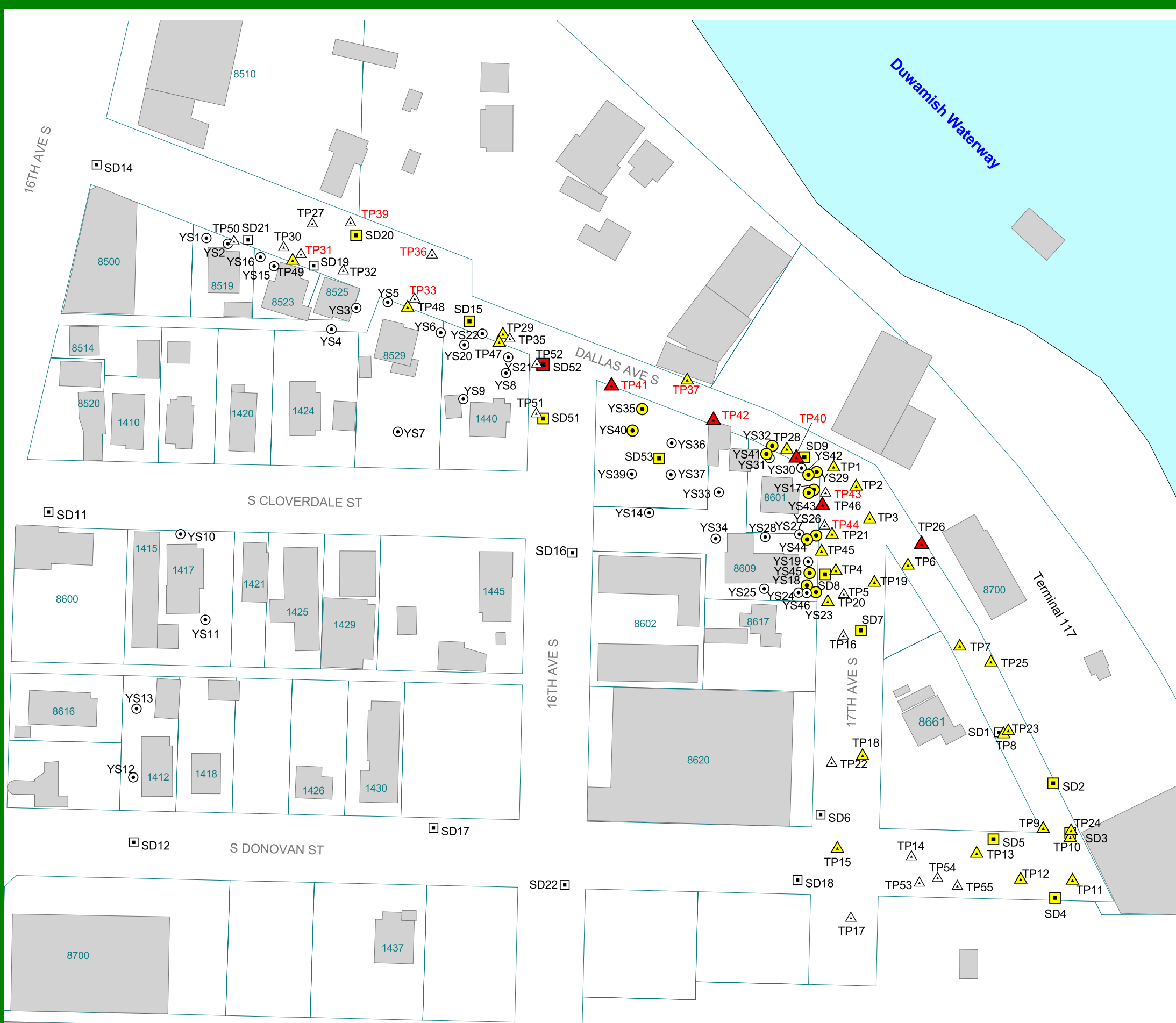


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Lower Duwamish Waterway

Figure 23

Dallas Ave S and Vicinity Street and Yard Sample Locations



Legend

PCBs in Right-of-Way Soil

- △ Below Cleanup Level
- △ Above Cleanup Level
- △ Greater than 50 ppm

PCBs in Roadway Dirt

- Below Cleanup Level
- Above Cleanup Level

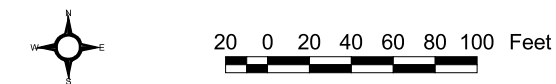
PCBs in Yard Soil

- Below Cleanup Level
- Above Cleanup Level
- Greater than 50 ppm

- Property boundary
- Building

PCBs = Polychlorinated Biphenyl
State Cleanup Level = 1 ppm PCBs

Note: Sample numbers shown in red indicate samples collected from base of excavation following interim cleanup.








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Lower Duwamish Waterway
Figure 24
Dallas Ave S Interim Cleanup

Legend

-  Grade, pave, install temporary drainage
-  Remove contaminated soil/replace with clean gravel
-  Minor grading/paving to correct drainage problem
-  Remove contaminated soil/replace with sod
-  Property boundary













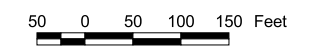
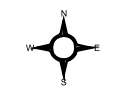
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Lower Duwamish Waterway
Figure 25
Sediment sampling locations
in Norfolk-MLK Way drainage system

Legend

- Streets
-  Arterials
 -  State Highway
 -  Interstate Freeway
 -  Parcel boundary
 -  Building
 -  Sediment sampling location
-  Storm drain
 -  Sanitary sewer
 -  County interceptor
 -  Pipe cleaned in 2005



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