Seattle Public Utilities

August 6, 2020

TO: Recipients of the Routine Maintenance & Repair of Publicly Owned Drainage System Facilities SEPA DNS/Checklist

FROM: Betty Meyer, SEPA Responsible Official

SUBJECT: Addendum to the Routine Maintenance & Repair of Publicly Owned Drainage System Facilities SEPA DNS/Checklist SEPA Environmental Checklist and Determination of Non-Significance

PURPOSE OF THIS ADDENDUM

In April 2019, Seattle Public Utilities (SPU) prepared a State Environmental Policy Act (SEPA) Environmental Checklist that analyzed environmental impacts of the proposed Routine Maintenance & Repair of Publicly Owned Drainage System Facilities. For efficiency, SPU chose to conduct a system-wide environmental review for three categories of drainage system facilities: open channel drainage system facilities, enclosed drainage system facilities, and drainage system pond facilities. Open channel drainage facilities include ditches and culverts, bioswales, and riparian enhancement projects. Enclosed drainage facilities include piped infrastructure, treatment vaults, diversion structures, trash racks and similar structures. Pond drainage facilities include stormwater detention pond cells, channels or lakes, treatment pond cells or channels, and all hydraulically connected drainage appurtenances such as pipes, engineered wetlands, ditches and culverts, bioswales, riparian enhancements, and structures such as vaults, maintenance holes and diversion structures.

The SEPA Checklist evaluated environmental impacts associated with the types of maintenance and repair activities at each of the facilities in these three categories of drainage system facilities. Work would include one or more of the following eight routine types of maintenance and repair activities:

1. Sediment and Debris Removal
2. Vactoring and Jetting
3. Vegetation Control
4. Anchoring Large Woody Material/Habitat Restoration
5. Beaver Dam Management
6. Mechanical Improvements and Repairs/Replacement
7. Safety Improvements
8. Monitoring Equipment Installation, Repair/Replacement

The Checklist included these five Exhibits describing the facilities and the activities and methods used:

Exhibit A – Drainage System Facility Information Summary Tables
Exhibit B – Drainage System Facility Addresses
Exhibit C – Routine Maintenance & Repair Activities
Exhibit D – Overview Location Maps & Representative Facility Data Sheets
Exhibit E – Routine Maintenance & Repair Methods

As lead agency for SEPA, SPU issued a Determination of Non-Significance (DNS) for the project on April 11, 2019. Since issuance of that DNS, SPU has identified corrections and updates that more accurately depict the activities, methods, and potential environmental impacts at some of the facilities included in that environmental review. SPU has prepared this SEPA Addendum to document these corrections and updates to assess how these affect analyses in the SEPA Environmental Checklist.

As lead agency, SPU has reviewed the findings and concluded the potential additional work does not substantially alter the impact analyses in the SEPA Environmental Checklist and will not result in any significant environmental impacts. This Addendum has been prepared in accordance with the authority provided in Seattle Municipal Code (SMC) 25.05.600 and in accordance with the procedures described in SMC 25.05.625.

UPDATED PROJECT INFORMATION

Attachment A includes an updated Exhibit A with additions underlined and deletions struck through. Exhibits B through E remain unchanged. All other work would be as described in the Routine Maintenance & Repair of Publicly Owned Drainage System Facilities SEPA Environmental Checklist. No additional technical reports have been prepared that directly relate to this proposal.

CHANGES TO ENVIRONMENTAL ELEMENTS

The corrections and updates are mostly focused on the methods used, the volumes of sediment to be removed, and the durations of the work for specific facilities. These changes most notably affect the durations of work at these facilities which in turn would result in additional vehicle trips as personnel and materials are transported to and from work sites.

Environmental Checklist Section B2: Air

The SEPA Environmental Checklist estimated that, each year, completion of the work described in the checklist would produce approximately 411.3 metric tons of greenhouse gas (GHG) emissions (expressed in metric tons of CO_2e). The GHG emissions calculations were included in the Checklist's Exhibit F and are summarized here in Table 1.

Table 1. 2019 Environmental Checklist Summary of Estimated Annual GHG Emissions

Activity/Emission Type	GHG Emissions (pounds of CO_2e)[1]	GHG Emissions (metric tons of CO_2e)[1]
Buildings	0	0
Paving	0	0
Construction Activities (Diesel)	0	0
Construction Activities (Gasoline)	0	0
Long-term Maintenance (Diesel)	587,821	266.6
Long-term Maintenance (Gasoline)	318,999	144.7
Total GHG Emissions	**906,820**	**411.3**

[1] Note: 1 metric ton = 2,204.6 pounds of CO_2e. 1,000 pounds = 0.45 metric tons of CO_2e

SPU estimates the revisions described in this addendum would take approximately 165 additional working days and about 500 additional vehicle round trips (assuming three crew vans or one vactor truck and two crew vans per additional working day) requiring approximately 1,980 gallons of diesel fuel and resulting in generation of an additional 23.8 $MTCO_2e$ of GHG emissions for the period 2019 through approximately 2024. The project's revised annual GHG emissions are estimated to be 416.1 $MTCO_2e$, as summarized in Table 2.

Table 2. Revised Summary of Estimated Annual GHG Emissions

Activity/Emission Type	GHG Emissions (pounds of CO_2e)[1]	GHS Emissions (metric tons of CO_2e)[1]
Buildings	0	0
Paving	0	0
Construction Activities (Diesel)	0	0
Construction Activities (Gasoline)	0	0
Long-term Maintenance (Diesel)	598,317	271.4
Long-term Maintenance (Gasoline)	318,999	144.7
Total GHG Emissions	**917,316**	**416.1**

Environmental Checklist Section B14: Transportation

SPU estimates the revisions described in this addendum would generate an estimated 500 additional vehicular round trips for the period 2019 through 2024 due to workers and materials being transported to and from work sites.

If you have questions about the proposed work, please call or email:

Donna Pacanovsky, Project Manager
Seattle Public Utilities
Drainage and Wastewater
206-615-1705
Donna.Pacanovsky@seattle.gov

Any comments must be submitted via email no later than August 21, 2020 to:

Betty Meyer, SEPA Responsible Official
Seattle Public Utilities
Betty.Meyer@seattle.gov

Signature: Betty Meyer Digitally signed by Betty Meyer Date: 2020.07.29 14:55:09 -07'00' Issue Date: August 6, 2020

Attachment A – Revised Exhibits

Seattle Public Utilities

Citywide Drainage Maintenance Program

Hydraulic Project Approval Application Exhibits

Revised July 10, 2019; revised July 29, 2020

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Exhibit A – Drainage System Facility Information Summary Tables

Exhibit A-1: Open Channel Drainage System Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH1	NE 51st St. @ Matthews Beach	Single Family	47.69382N	122.27217W	Matthews Creek	Thornton Basin - Lake Washington	~~24~~30" reinforced concrete pipe (RCP) outfall to engineered wetland	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Every 3 years	Wildlife, riparian, floodplain, steep slope
TH3	Thornton Creek @ NE 93rd St.	Single Family	47.69587N	122.27543W	Thornton Creek	Thornton Basin - Lake Washington	76" x 84" Concrete Box Culvert	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope, shoreline
TH4	Thornton Creek @ Sand Point Way	Single Family	47.69638N	122.27697W	Thornton Creek	Thornton Basin - Lake Washington	Twin 48" x 72" Concrete Box Culverts	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH5	NE 93rd St. @ Sand Point Way	Single Family	47.69580N	122.27640W	Maple Creek	Thornton Basin - Lake Washington	18" corrugated metal pipe (CMP) Culvert	Sediment and Debris Removal, Jetting Culverts	Vactor/ Excavate/ Hand Work~~Maintenance Activity Duration and Amount Typically Removed~~	Remove accumulated sediment from culvert system and at the outfall/inflow	~~2~~ 10 hours for sediment/debris removal ~~5~~ 25 CY	Every year	Wildlife, riparian, floodplain
TH10	Thornton Creek @ Burke Gilman Trail	Single Family	47.69660N	122.27722W	Thornton Creek	Thornton Basin - Lake Washington	Large Irregular Opening	Sediment and Debris Removal	Vactor/Excavate/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH11	NE 95th St. @ Sand Point Way NE	Single Family	47.69737N	122.27813W	Thornton Creek	Thornton Basin - Lake Washington	Twin 48" x 48" Concrete Box Culverts	Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH17	N & S Branch Thornton Creek Confluence	Single Family	47.70692N	122.29000W	Thornton Creek	Thornton Basin - Lake Washington	Confluence of the N & S branches of Thornton Creek	Anchoring LWM/Habitat Restoration, Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Restore habitat features by anchoring existing woody material and rock. Sediment and debris removal limited to what is required for site restoration.	1 day for LWM anchoring, habitat restore/ sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain
TH18	35th Ave. NE @ S. Fork Thornton Culvert	Single Family	47.70692N	122.29082W	Thornton Creek	Thornton Basin - Lake Washington	81" x 59" Oval CMP Culvert	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH19	30th Ave. NE @ NE 107th St. Thornton Culvert	Single Family	47.70688N	122.29617W	Thornton Creek	Thornton Basin - Lake Washington	98" x 42" Concrete Box Culvert	Sediment and Debris Removal, Jetting Culverts	Vactor/ Excavate/ Hand Work	Remove accumulated sediment in culvert system and at the outfall/inflow	2~~1~~ days for sediment/ debris removal. 50~~25~~ CY	Every year	Wildlife, floodplain
TH21	30th Ave. NE @ NE 110th St.	Single Family	47.70832N	122.29630W	Kramer Creek	Thornton Basin - Lake Washington	18" RCP Culvert	Sediment and Debris Removal, Control Vegetation, Jetting Culverts	Vactor/ Excavate/ Hand Work	Remove accumulated sediment in culvert system and at the outfall/inflow	Full day for sediment/debris removal. 20 CY	Every year	Wildlife, floodplain
TH23	NE 107th St. @ 30th Ave. NE Culvert	Single Family	47.70668N	122.29655W	Thornton Creek	Thornton Basin - Lake Washington	98" x 42" Concrete Box Culvert	Sediment and Debris Removal	Vactor/ Excavate/Hand Work	Remove accumulated sediment at the outfall/inflow	1/2 day for sediment/debris removal 10~~5~~ CY	Demand Work as needed	Wildlife, floodplain
TH24	27th Ave. NE @ NE 105th St.	Single Family	47.70478N	122.29865W	Thornton Creek	Thornton Basin - Lake Washington	81" x 59" CMP Culvert	Anchoring LWM/ Habitat Restoration, Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Restore habitat features by anchoring existing woody material and rock. Sediment and debris removal limited to what is required for site restoration.	1 day for LWM anchoring, habitat rehab/sediment removal. 5 CY	Demand Work as needed	Wildlife, floodplain
TH25	Lake City Fish Ladder	Neighborhood/ Commercial	47.70112N	122.30262W	Thornton Creek	Thornton Basin - Lake Washington	72" x 60" Concrete Box Culvert	Anchoring LWM/Habitat Restoration, Sediment and Debris Removal	Vactor/ Hand Work	Restore habitat features by anchoring existing woody material and rock. Sediment and debris removal limited to what is required for site restoration.	1 day for LWM anchoring, habitat restore/sediment removal. 10 CY	Demand Work as needed	Wildlife, riparian, floodplain
TH29	NE 95th St. @ Lake City Way	Neighborhood/ Commercial	47.69832N	122.30477W	Willow Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Vactoring and Jetting culverts and ditches, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	1/2 day for sediment/debris removal. 10 CY	Every 7 years	Wildlife, riparian, floodplain, wetland, steep slope
TH30	NE 98th St. @ Lake City Way NE	Neighborhood/ Commercial	47.70007N	122.30287W	Willow Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	2 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, wetland, steep slope
TH31	NE 98th St. @ Ravenna Ave. NE	Single Family	47.70003N	122.30152W	Thornton - S Branch Trib E	Thornton Basin - Lake Washington	Trash Rack on 36" Outfall	Sediment and Debris Removal	Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for small woody debris removal. 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, wetland,

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH32	Knickerbocker Reach Habitat Improvements	Single Family	47.70058N	122.30593W	Thornton Creek	Thornton Basin - Lake Washington	Creek Restoration with Habitat Features	Anchoring LWM/Habitat Restoration, Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Restore habitat features by anchoring new and existing woody material and rock. Sediment and debris removal are limited to what is necessary to restore the site.	1 day for LWD anchoring, habitat restore/sediment removal. 10 CY	Demand Work as needed	Wildlife, riparian, floodplain, wetland, steep slope
TH33	NE 103rd St. Sewer Main Crossing	Single Family	47.70327N	122.30967W	Thornton Creek	Thornton Basin - Lake Washington	Sewer encased in concrete with adjacent habitat features.	Anchoring LWM/Habitat Restoration, Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Restore habitat features by anchoring new and existing woody debris and rock. Sediment and debris removal are limited to what is necessary to rehabilitate the site	1 day for LWD anchoring, habitat rehab/sediment removal. 10 CY	Demand Work as needed	Wildlife, riparian, floodplain
TH34	NE 105th St. @ 17th Ave. NE	Single Family	47.70485N	122.31132W	Thornton Creek	Thornton Basin - Lake Washington	19' x 6'6" Concrete Box Culvert	Anchoring LWM/Habitat rehabilitation, Sediment and debris removal	Vactor/ Excavate /Hand Work	Restore habitat features by anchoring new and existing woody debris and rock. Sediment and debris removal are limited to what is necessary to rehabilitate the site	1 day for LWD anchoring, habitat rehab/sediment removal. 10 CY	Demand Work as needed	Wildlife, riparian, floodplain
TH35	NE 108th @ 8th Ave. NE (Beaver Lodge Park)	Single Family	47.70558N	122.31977W	Thornton Creek	Thornton Basin - Lake Washington		Sediment and Debris Removal	Vactor/ Hand Work	Remove or manipulate dams for flood control and fish passage	4 hours for sediment and small woody debris removal. 5 CY	Monthly	Wildlife, riparian, floodplain, wetland
TH37	1st Ave. NE @ NE 100th St.	Neighborhood/ Commercial	47.70132N	122.32865W	Thornton Creek	Thornton Basin - Lake Washington	60" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	1/2 day for sediment/debris removal. 5 CY	Demand Work as needed	Peat settlement prone
TH38	1st Ave. NE @ NE 100th St. Ditch	Neighborhood/ Commercial	47.70048N	122.32858W	Thornton Creek	Thornton Basin - Lake Washington	Drainage conveyance ditch.	Sediment and Debris Removal, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	1 day for sediment/debris removal. 20 CY	Every 3 years	Riparian
TH43	North Fork Culvert @ Lake City Way	Neighborhood/ Commercial	47.71490N	122.29810W	Thornton Creek	Thornton Basin - Lake Washington	72" x 60" Concrete Box Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal. 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH44	25th Ave. NE @ Thornton Creek	Single Family	47.71792N	122.30185W	Thornton Creek	Thornton Basin - Lake Washington	50" x 48" Concrete Box Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH45	NE 125th @ Thornton Creek	Single Family	47.71932N	122.30335W	Thornton Creek	Thornton Basin - Lake Washington	52" x 48" Concrete Box Culvert	Sediment and Debris Removal, control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH46	19th Ave. NE @ NE 130th St.	Single Family	47.72295N	122.30857W	Thornton Creek	Thornton Basin - Lake Washington	80" x 56" CMP Culvert	Anchoring LWD/Habitat rehabilitation, Sediment and debris removal	Vactor/ Hand Work	Restore habitat features by anchoring new and existing woody debris and rock. Sediment and debris removal are limited to what is necessary to restore the site	1 day for LWD anchoring, habitat restore/sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain, steep slope
TH50	NE 115th St. @ Littlebrook 918272	Single Family	47.71195N	122.28988W	Littlebrook Creek	Thornton Basin - Lake Washington	36" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
TH51	NE 120th St. @ Littlebrook Creek	Single Family	47.71550N	122.29050W	Littlebrook Creek	Thornton Basin - Lake Washington	30" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
TH52	NE 123rd St. @ Littlebrook Creek	Single Family	47.71732N	122.29057W	Littlebrook Creek	Thornton Basin - Lake Washington	30" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
TH53	35th Ave. NE @ Littlebrook Creek	Single Family	47.71815N	122.29117W	Littlebrook Creek	Thornton Basin - Lake Washington	30" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
PS5	NW 92nd St. @ 28th Ave. NW	Single Family	47.69590N	122.39233W	Unnamed PS07 - Mainstem	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
PS6	28th Ave. NW @ NW Esplanade	Single Family	47.70017N	122.39357W	Unnamed PS07 - Mainstem	Puget Sound	48" RCP Culvert This culvert has not been identified in Utiliview	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
PS7	Marmount Dr. NW @ NW North Beach Dr.	Single Family	47.70080N	122.38995W	Unnamed PS06 - E. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Potential slide, riparian corridors, wetlands, wildlife
PS8	Marmount Dr. NW @ NW North Beach Dr.	Single Family	47.70077N	122.39020W	Unnamed PS06 - W. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Potential slide, riparian corridors, wetlands, wildlife
PS9	NW 96th St. @ 26th Ave. NW	Single Family	47.69862N	122.38962W	Unnamed PS06 - E. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
PS10	26th Ave. NW @ NW 96th St.	Single Family	47.69818N	122.38945W	Unnamed PS06 - E. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
PS11	NW 95th St. @ 26th Ave. NW	Single Family	47.69775N	122.38950W	Unnamed PS06 - E. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
PS12	NW 92nd St. @ 25th Ave. NW	Single Family	47.69650N	122.38850W	Unnamed PS06 - E. Fork	Puget Sound	12" CIP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
PS13	NW Golden Dr. @ 31st Ave. NW	Single Family	47.69833N	122.39608W	Unnamed PS08 - Mainstem	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
PS14	NW 95th St. @ 26th Pl. NW	Single Family	47.69750N	122.39152W	Unnamed PS06 - W. Fork	Puget Sound	24" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
PS15	NW 95th St. @ 28th Ave. NW	Single Family	47.69777N	122.39278W	Unnamed PS07 - Mainstem	Puget Sound	12" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
PS16	View Dr. NW @ 32nd Ave. NW	Single Family	47.69698N	122.39877W	Unnamed PS09 - Mainstem	Puget Sound	12' RCP CULVERT	Sediment and Debris Removal, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
LO1	SW Andover St. @ Longfellow Creek	Manufacturing/ Industrial	47.56807N	122.36630W	Longfellow Creek	Duwamish Drainage Basin	60" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Floodplain, wildlife
LO2	SW Nevada St. @ Longfellow Creek	Multi-Family	47.56502N	122.36752W	Longfellow Creek	Duwamish Drainage Basin	Creek Restoration with Habitat Features	Anchoring LWM/Habitat Restoration, Sediment and debris removal, Control Vegetation	Vactor/ Hand Work	Restore habitat features by anchoring new and existing woody debris and rock. Sediment and debris removal are limited to what is necessary to restore the site	1 day for LWD anchoring, habitat rehab/sediment removal 10 CY	Demand Work as needed	Riparian, wildlife, floodplain, steep slope
LO4	SW Brandon St. @ Longfellow Creek	Single Family	47.55375N	122.36675W	Longfellow Creek	Duwamish Drainage Basin	16' x 72" Arch Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope, wetland
LO7	SW Juneau St. @ Longfellow Creek	Single Family	47.54998N	122.36493W	Longfellow Creek	Duwamish Drainage Basin	78" Concrete Emergency Bypass Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/ inflow	4 hours for sediment and small woody debris removal 5 cubic yards (CY)	Quarterly and before storms	Riparian, wildlife, floodplain, wetland
LO8	24th Ave. SW Mid-Block	Single Family	47.54502N	122.36420W	Longfellow Creek	Duwamish Drainage Basin	60" x 192" Arch Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Floodplain, wildlife
LO9	24th Ave. SW @ 25th Ave. SW	Single Family	47.54447N	122.36438W	Longfellow Creek	Duwamish Drainage Basin	60" x 192" Arch Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Floodplain, wildlife
LO10	SW Willow St. @ Longfellow Creek	Single Family	47.54187N	122.36353W	Longfellow Creek	Duwamish Drainage Basin	50" x 177" Arch Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Floodplain, wildlife
LO12	SW Holden @ Longfellow Creek	Multi-Family	47.53352N	122.36182W	Longfellow Creek	Duwamish Drainage Basin	75" x 112" Arch Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope, wetland

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
SP1	31st Ave. SW @ SW 104th St.	Single Family	47.51005N	122.37130W	Seola Pond	Puget Sound Drainage Basin	18" HDPE Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/ inflow	1 day for sediment/debris removal 10 CY	Every 3 years	None
DU1	2nd Ave. SW @ W. Marginal Way	Manufacturing/ Industrial	47.53637N	122.33730W	Tidal Ditch	Duwamish Drainage Basin	48" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/ inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wetland, pond
DU2	S. Norfolk St. Treatment Swale	Manufacturing/ Industrial	47.50998N	122.28253W	Engineered Swale	Duwamish Drainage Basin	60" RCP Mainline	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/ inflow	2~~1~~ days for sediment/debris removal 40~~10~~ CY	Demand Work as needed	Wetland
MC1	S. Cloverdale @ Grattan Pl. S.	Single Family	47.52332N	122.26437W	Mapes Creek	Lake Washington Drainage Basin	24" RCP Culvert Outfall	Sediment and Debris Removal	Vactor/Hand Work	Remove or manipulate dams for flood control and fish passage	4 hours for sediment and small woody debris removal 5 CY	Demand Work as needed	Riparian, steep slope

Notes

1) WDFW Site # is a unique identification for each facility used by SPU for permitting documents, the first two initials are an abbreviation for waterbody or drainage basin the facility is in (e.g. TH49 is in Thornton Basin, LO11 is on Longfellow Creek).
2) The presence of the New Zealand Mud Snail (NZMS) is confirmed in the Thornton, Mapes, Longfellow, and Piper drainage basins. SPU will follow WDFW and internal guidelines for equipment decontamination and management of dredged/excavated materials that may be contain NZMS.

Exhibit A-2: Enclosed Drainage System Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH2	49th Ave. NE @ NE 51st St.	Single Family	47.69448N	122.27312W	Thornton Mainstem Trib A	Thornton Basin - Lake Washington	12" and 24" RCP culverts	Vactoring and Jetting culverts and ditches, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 5 CY	Every 5 years	Wildlife, riparian, floodplain, shoreline
TH6	NE 92nd St. @ Sand Point Way	Single Family	47.69545N	122.27623W	Maple Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	~~4 hours~~1 day for sediment/debris removal 15~~5~~ CY	Every 5 years	Wildlife, floodplain
TH7	Matthews Ave. NE @ Sand Point Way	Single Family	47.69563N	122.27743W	Maple Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 5 CY	Every 5 years	Wildlife, floodplain
TH8	Matthews Ave. NE Mid Block	Single Family	47.69518N	122.27742W	Thornton Mainstem Trib B (Maple Creek)	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 2 CY	Every 5 years	Wildlife, floodplain
TH9	Matthew Ave. NE South Block	Single Family	47.69447N	122.27695W	Thornton Mainstem Trib A	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 5 CY	Every 5 years	Wildlife, riparian, floodplain
TH12	NE 96th St. @ 39th Ave. NE 905457	Single Family	47.69828N	122.28692W	Mock Creek	Thornton Basin - Lake Washington	18" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate / Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Quarterly and before storms	Wildlife, riparian, floodplain
TH20	30th Ave. NE @ NE 107th St. Kramer Culvert	Single Family	47.70693N	122.29618W	Kramer Creek	Thornton Basin - Lake Washington	36" CMP Culvert	Sediment and Debris Removal, Jetting Culverts	Vactor/Excavate/ Hand Work	Remove accumulated sediment from culvert system and at the outfall/inflow	~~1/2~~1 day for sediment/debris removal 25~~5~~ CY	Every year	Wildlife, floodplain
TH22	31st Ave. NE @ NE 110th St.	Single Family	47.70838N	122.29398W	Unnamed Tributary	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Every 3 years	Wildlife, floodplain
TH26	NE 100th St. @ Ravenna Ave. NE	Single Family	47.70110N	122.30098W	Willow Creek	Thornton Basin - Lake Washington	18" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	1/2 day for sediment/debris removal 5 CY	Demand Work as needed	Wildlife, riparian, floodplain

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH27	NE 86th St @ Ravenna Ave. NE	Single Family	47.69118N	122.30237W	Willow Creek	Thornton Basin - Lake Washington	18" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/Hand Work	Remove accumulated sediment from the culvert/ditch system	1/2 day for sediment/debris removal 10 CY	Every 3 years	Wildlife, riparian, floodplain, wetland
TH28	NE 89th St. @ Ravenna Ave.	Multi-Family	47.69302N	122.30353W	Willow Creek	Thornton Basin - Lake Washington	18" RCP Culvert.	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	1/2 day for sediment/debris removal 10 CY	Every 3 years	Wildlife, riparian, floodplain, wetland
TH41	35th Ave. NE @ NE 115th St.	Single Family	47.71197N	122.29068W	Thornton Creek	Thornton Basin - Lake Washington	81" x 59" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain
TH42	33rd Ave. NE @ NE 117th St.	Single Family	47.71278N	122.29188W	Thornton Creek	Thornton Basin - Lake Washington	72" x 54" Concrete Box Culvert, 48" Concrete Box Culvert, 24" CIP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain
TH47	15th Ave. NE @ NE 130th Pl.	Multi-Family	47.72510N	122.31297W	Thornton Creek	Thornton Basin - Lake Washington	72" Concrete Box Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain, steep slope
TH48	10th Ave. NE @ Thornton Creek	Single Family	47.72337N	122.31812W	Thornton Creek	Thornton Basin - Lake Washington	2 - 36" RCP Culverts	Vactoring and Jetting culverts and ditches, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH55	33rd Ave. NE @ NE 127th St. 969068	Neighborhood/Commercial	47.72118N	122.29257W	Littlebrook Creek	Thornton Basin - Lake Washington	48" RCP Culvert with Sediment Vault	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Every 2 years	Riparian, flood prone, steep slope
TH56	NE Northgate Way @ Victory Creek	Single Family	47.70873N	122.31520W	Victory Creek	Thornton Basin - Lake Washington	36" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
TH57	Ravenna Av. NE @ Lake City Way NE 972327	Multi-Family	47.69567N	122.30548W	Willow Creek	Thornton Basin - Lake Washington	36" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH58	NE 97th St. @ 20th Ave. NE	Single Family	47.69940N	122.30702W	Beckler Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH59	2407 NE 98th St.	Single Family	47.70023N	122.30478W	Beckler Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH60	NE 117th St @ 12th Ave NE 905081	Single Family	47.71401N	122.31616W	Victory Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH61	NE 120th St @ 12th Ave NE	Single Family	47.71582N	122.3166W	Victory Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH62	NE 115th @ 12th Ave NE 905087	Single Family	47.71213N	122.31549W	Victory Creek	Thornton Basin - Lake Washington	2 - 12" RCP Culverts	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH63	Pinehurst Way NE @ Victory Creek	Single Family	47.71199N	122.31543W	Victory Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH64	NE 114th St @ 12th Ave NE 905116	Single Family	47.71097N	122.3155W	Victory Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH65	NE 113th St @ 12th Ave NE 905119	Single Family	47.71066N	122.3156W	Victory Creek	Thornton Basin - Lake Washington	30" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 4 CY	Demand Work as needed	Riparian
TH66	NE 95th St @ 27th Ave NE	Single Family	47.69745N	122.29958W	Willow Creek Tributary E	Thornton Basin - Lake Washington	18" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian, steep slope
TH 67	NE 94th St @ 27th Ave NE 771901	Single Family	47.69655N	122.29869W	Willow Creek Tributary D	Thornton Basin - Lake Washington	12" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH 68	NE 96th @ 35th Ave NE 904413	Single Family	47.69818N	122.29048W	Mock Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian, wildlife, steep slope
TH 69	NE 93rd St @ 45th Ave NE 975177	Single Family	47.69576N	122.27996W	Maple Creek	Thornton Basin - Lake Washington	2 - 24" RCP Culverts	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian, steep slope
LU2	Licton Springs @ Woodlawn Ave. N.	Single Family	47.69743N	122.33872W	Licton Springs	Lake Union	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, floodplain
PS2	NW Culbertson Dr @ Sherwood Rd. NW	Single Family	47.73188N	122.37050W	Unnamed PS01 - S. Fork	Puget Sound	18" CMP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand work as needed	Riparian, steep slope
PS3	7th Ave. NW @ Holman Rd NW	Multi-Family	47.70063N	122.36517W	Pipers Creek	Puget Sound	30" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
PS4	8th Ave. NW @ Holman Rd. NW	Multi-Family	47.69987N	122.36563W	Pipers Creek	Puget Sound	60" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
LO5	26th Av. SW @ Longfellow Creek	Single Family	47.55130N	122.36557W	Longfellow Creek	Duwamish Drainage Basin	Twin 36" RCP Culverts	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	1 day for sediment/debris removal 10 CY	Every 5 years	Riparian, wildlife, floodplain, steep slope, wetland
TA1	Rainier Ave. S. @ Taylor Creek	Neighborhood/Commercial	47.51123N	122.24782W	Taylor Creek	Lake Washington Drainage Basin	48" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain
TA2	68th Ave. S. @ Taylor Creek	Single Family	47.50938N	122.24810W	Taylor Creek	Lake Washington Drainage Basin	168" x 72" Box Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain
TA3	SE Holyoke Way @ Taylor Creek	Single Family	47.50860N	122.24797W	Taylor Creek	Lake Washington Drainage Basin	168" x 72" Box Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
FA1	Fauntleroy Way SW @ Fauntleroy Creek 943242	Single Family	47.52273N	122.39277W	Fauntleroy Creek	Puget Sound Drainage Basin	36" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope
FA2	45th Av. SW @ Fauntleroy Creek 918243	Multi-Family	47.52140N	122.39022W	Fauntleroy Creek	Puget Sound Drainage Basin	36" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope
FA3	California Way SW @ Fauntleroy Creek 918244	Single Family	47.52348N	122.38757W	Fauntleroy Creek	Puget Sound Drainage Basin	36" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope
SC1	SW Tieg Pl. @ Schmitz Creek	Single Family	47.57780N	122.40528W	Schmitz Creek	Puget Sound Drainage Basin	Stormwater Treatment Vault	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment from the treatment structure.	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope
PC1	SW Puget Way @ Puget Creek	Single Family	47.55790N	122.35357W	Puget Creek	Duwamish Drainage Basin	46" CMP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope
PC2	SW Dawson @ 19th Ave SW 968515	Single Family	47.55572N	122.35822W	Puget Creek	Duwamish Drainage Basin	24" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 3 CY	Demand Work as needed	Riparian, wildlife,
PC3	SW Brandon @ 19th Ave SW 968514	Single Family	47.55367N	122.35816W	Puget Creek	Duwamish Drainage Basin	18" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 3 CY	Demand Work as needed	Riparian, wildlife, wetland
MC2	Sturtevant Ave S @ S. Roxbury St.	Single Family	47.51682N	122.26782W	Mapes Creek	Lake Washington Drainage Basin	18" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
MC3	Sturtevent Ave S. @ Renton Ave S.	Single Family	47.51568N	122.26789W	Mapes Creek	Lake Washington Drainage Basin	24" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
YC1	NE 65th St @ 39th Ave NE 904418	Single Family	47.67577N	122.28643W	Yessler Creek	Lake Washington Drainage Basin	27" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Duration & Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
YC2	NE 62nd St @ 40th Ave NE	Single Family	47.67396N	122.28453W	Yessler Creek	Lake Washington Drainage Basin	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian
YC3	NE 60th St. @ 40th Ave NE	Single Family	47.67211N	122.28455W	Yessler Creek	Lake Washington Drainage Basin	15" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian

Notes

1) WDFW Site # is a unique identification for each facility used by SPU for permitting documents. The first two initials are an abbreviation for the waterbody or drainage basin where the facility is located (e.g. TH49 is in Thornton Basin, LO11 is on Longfellow Creek.)
2) Types of Pipe: CMP - Corrugated Metal Pipe, RCP - Reinforced Concrete Pipe, HDPE - High Density Polyethylene.
3) The presence of the New Zealand Mud Snail (NZMS) is confirmed in the Thornton, Mapes, Longfellow, and Piper drainage basins. SPU will follow WDFW and internal guidelines for equipment decontamination and management of dredged/excavated materials that may be contain NZMS.

Exhibit A-3: Pond Drainage System Facilities

Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods*	Limits of Work	Estimated Maintenance Activity Duration and Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
Highland Park Basin	Major Institutions	47.540450 N	122.344280 W	Unknown Tributary	Duwamish	Stormwater detention: Infall - concrete headwall to 30" culvert and 18" bypass pipe w/ slide gate; concrete basin; overflow maintenance hole w/ trash rack to 24" CMP outlet pipe	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc.	Heavy equipment, vactor, jetting, and hand work. If needed, bypass and dewater structure using pumps.	Remove sediment/debris and thin noxious vegetation. Repair erosion damage to road, parking area, and berm separating settling basin from the road.	Sediment ~~–~~ 1~~3~~ Week~~3 Days~~, 60 CY; Vegetation - 1 Day; Debris - 1 Day; Road/Parking Area/Berm - 3 Days, 20 CY crushed rock	Sediment – As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work - As needed; Road/Parking Area/Berm – As frequently as annually	Wetlands, known slide, potential slide, wildlife habitat
Norfolk Pond	Industrial/ commercial	47.510584 N	122.284773 W	None	Duwamish	Stormwater detention & treatment: Twin WSDOT culvert outfalls; two Pond Cells with high flow bypass pipe, culvert connection pipe and access ramp; one wetland cell with low flow outlet pipe.	Sediment and debris removal. Control vegetation. Access road maintenance. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Dewater pond cells with pumps. Access road maintenance work may require addition of quarry spall/gravels and compaction of surface.	Thin obstructing and noxious vegetation around perimeter of pond and around twin WSDOT culvert outfalls. Vegetation maintenance in Wetland Cell. Sediment removal from pond cells 1 and 2 and pipes.	Sediment - 4 Weeks, 700 CY.; Vegetation - 1 Day; Access Road - 1 Day; Debris - 1 Day	Sediment – As frequently as annually; Vegetation – As frequently as monthly; Access Road – As frequently as annually; Debris – As needed; Demand work - As needed	Wetlands, wildlife habitat, liquefaction area
Jackson Park Ponds	Single Family (on Golf course)	47.728583 N	122.322082 W	Thornton Creek	Thornton Basin - Lake Washington	Stormwater detention & seasonal irrigation storage for golf course: Pond 1 with infall, fish passage, fish weir, and outfall with fish screen; Pond 2 with infall and outfall; Pond 3 with infall with trash rack and outfall.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, valves, debris racks, weirs, fish screen, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Use of pumps and temporary water-tight structure to isolate and dewater the ponds. Fish protection measures include fish screens, catch and release downstream and/or return to Pond 1.	Sediment and debris removal from ponds and pipes. Thin obstructing and noxious vegetation around ponds and fish return channel. Maintenance/repair of fish screen and aerators.	Sediment - 6 weeks, 3000 CY.; Vegetation - 1 ~~Day~~Week; Fish Screen/aerators - 1 ~~Day~~Week; Debris - ~~1~~3 Days	Sediment – As frequently as annually; Vegetation – As frequently as monthly; Fish screen/aerators – as frequently as annually; Debris – As needed; Demand work – As needed	Wetland, riparian corridor, flood prone

Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods*	Limits of Work	Estimated Maintenance Activity Duration and Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
Jackson Park Ponds-Diversion Structure & Forebay (WDFW Site #TH49)	Single Family (on Golf course)	47.72942N	122.32303W	Thornton Creek	Thornton Basin - Lake Washington	Forebay; and concrete Diversion Structure with trash rack, 36-inch outlet, diversion weir, and creek weir.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Use of pumps and temporary water-tight structures to isolate the forebay and diversion structure from the creek. Fish protection measures include fish screens, catch and release downstream.	Remove sediment and debris from forebay and structures. Thin obstructing and noxious vegetation around forebay, diversion structure, and 36-inch outlet pipe.	Sediment - 1 ~~Day~~Week, ~~20~~30 CY.; Vegetation - 1 ~~Day~~Week; Debris - ~~1~~3 Days	Sediment – As frequently as bi-annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Wetland, riparian corridor, flood prone
Jackson Park Ponds-Maintenance Holes & Flow Control Structures	Single Family (on Golf course)	47.72748N	122.32070W	Thornton Creek	Thornton Basin - Lake Washington	Three concrete maintenance holes; three flow control structures each with two gates and one weir; and associated piping.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Jetting pipes. Saw cutting concrete for access improvements.	Sediment and debris removal inside of structures and pipes. Thin obstructing and noxious vegetation around structures and pipes. Mechanical repair/replacement for access improvements at flow control structures.	Sediment - 4 Weeks, 30 CY.; Vegetation - ~~1~~3 Days; Debris - ~~1~~3 Days	Sediment– As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Wetland, riparian corridor, flood prone
North Seattle College (NSC) Stormwater Structures & Outfalls	Major Institutions	47.70162N	122.33377W	Thornton Creek	Thornton Basin - Lake Washington	72” x 54” concrete box culvert, 48” concrete box culvert, 24” CIP culvert	Sediment and Debris Removal	Heavy equipment, vactor, jetting, and hand work. If needed, bypass and dewater structure using pumps.	Remove accumulated sediment at the outfall/inflow	Sediment/Debris – ~~4 hours~~ 1 Week, 10 CY	Quarterly and before storms	Peat settlement prong area category 2
Thornton Creek Water Quality Channel	Neighborhood/ commercial	47.70182N	122.32424W	Thornton Creek	Thornton Basin - Lake Washington	Stormwater detention & treatment: Biofiltration system consisting of upper waterfall; splash pool; lower waterfall; Cell 1; Cell 2 with notch weir; Cell 3 with log spreader; and outlet cell.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Bypass flows using the diversion structure. Dewater cells using pumps. Fish protection measures will be implemented as needed and may include fish screens, catch and release downstream.	Thin obstructing and noxious vegetation around cells. Sediment and debris removal around upper waterfall, in splash pool, around lower waterfall, in Cells 1,2,3, and outlet cell.	Sediment - 6 Weeks, ~~500~~800 CY.; Vegetation - ~~1~~2 ~~Day~~Weeks; Debris - 1 ~~Day~~Week	Sediment - As frequently as annually; Vegetation – As frequently as daily; Debris – As needed; Demand work – As needed	Peat settlement prone area category 2

Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods*	Limits of Work	Estimated Maintenance Activity Duration and Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
Thornton Creek Water Quality Channel-Diversion Structure (WDFW Site #TH36)	Neighborhood/ commercial	47.70177N	122.32403W	Thornton Creek	Thornton Basin - Lake Washington	Concrete Diversion Structure with weir, gate, 60-inch by 36-inch (5' x 3") box culvert outlet, and trash rack. Can be used to bypass the pond cells for routine maintenance.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. If needed, bypass and dewater structure using pumps.	Remove sediment in diversion structure and box culvert. Remove debris from trash rack. Thin obstructing and noxious vegetation around structures and outlet.	Sediment - ~~2~~3 Weeks, ~~10~~50 CY.; Vegetation - ~~1~~3 Days; Debris - ~~1~~3 Days	Sediment – As frequently as annually; Vegetation – As frequently as daily; Debris – As needed; Demand work – As needed	Peat settlement prone area category 2
Thornton Creek Water Quality Channel-Outlet Structure	Neighborhood/ commercial	47.70296N	122.32337W	Thornton Creek	Thornton Basin - Lake Washington	Concrete Structure with 72-inch by 36-inch (6' x 3") box culvert outlet, and trash rack.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. If needed, bypass and dewater structure using pumps.	Remove sediment in diversion structure and box culvert. Remove debris from trash rack. Thin obstructing and noxious vegetation around structures and outlet.	Sediment - 2 Weeks, ~~10~~30 CY.; Vegetation - 1 ~~Day~~Week; Debris - ~~1~~3 Days	Sediment - As frequently as annually; Vegetation – As frequently as daily; Debris – As needed; Demand work – As needed	Peat settlement prone area category 2
Thornton Creek Water Quality Channel-Inlet Structure	Neighborhood/ commercial	47.70296N	122.32337W	Thornton Creek	Thornton Basin - Lake Washington	Concrete Structure with 24-inch inlet pipe, and 72-inch by 18-inch (6' x 18") box culvert outlet, and trash rack.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work.	Remove sediment in diversion structure and inlet and outlet. Thin obstructing and noxious vegetation around structures and outlet.	Sediment - ~~1~~ ~~Day~~1 Week, ~~10~~30 CY.; Vegetation - 1 ~~Day~~Week; Debris - ~~1~~3 Days	Sediment - As frequently as annually; Vegetation – As frequently as daily; Debris – As needed; Demand work – As needed	Peat settlement prone area category 2

Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods*	Limits of Work	Estimated Maintenance Activity Duration and Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
Littles Creek Pond	Single Family (on Golf course)	47.73286N	122.31870W	Littles Creek	Thornton Basin - Lake Washington	Stormwater detention: Overflow channel with weir and berm; Pond with 12-inch outfall and concrete headwall.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Dewater pond using pumps. Fish protection measures will be implemented as needed and may include fish screens, catch and release downstream.	Remove sediment and debris in pond, channel and around outflow structures. Thin obstructing and noxious vegetation around berm, channel, pond and 12-inch outfall pipe.	Sediment - 4 weeks, 500 CY.; Vegetation - 1 ~~Day~~Week; Debris - ~~1~~3 Days	Sediment – As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work as needed	Wetland, riparian corridor, liquefaction
NSC Stormwater Structures & Outfalls	Major Institutions	47.70162N	122.33377W	Thornton Creek	Thornton Basin - Lake Washington	Concrete diversion structure with weir wall, weir plate and gate; 24-inch outfall with sluice gate and headwall; 36-inch outfall; 12-inch outfall and associated maintenance holes; and oil water separator	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacement as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work.	Sediment and debris removal in diversion structure, oil water separator, and at outfalls. Thin obstructing and noxious vegetation around outfalls.	Sediment - ~~1~~2 Weeks, ~~10~~50 CY.; Vegetation - 1 ~~Day~~Week; Debris - ~~1~~3 Days	Sediment - As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Peat settlement prone area category 2, wetland
Webster Pond (WDFW Site #LO11)	Multi Family	47.53510N	122.36190W	Longfellow Creek	Duwamish	Stormwater detention: Diversion structure with gate and 12-inch bypass pipe; concrete lined settling basin; outlet structure with trash rack, gate, and 24-inch outlet pipe; overflow maintenance hole with debris cage; overflow structure with weir, trash rack and 60-inch outfall pipe; grass lined overflow spillway; detention area; and gravel access road.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacement as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Access road maintenance work may require addition of quarry spall/gravels and compaction of surface. Bypass stream flows and isolate pond area using existing diversion structure and/or water tight structure. Fish protection measures will be implemented as needed and may include fish screens, catch and release downstream	Sediment and debris removal in settling basin, detention area, around and inside of pond structures and pipes. Maintain access road. Thin obstructing and noxious vegetation around structures, along maintenance road and on perimeter slopes.	Sediment - ~~2~~3 Weeks, ~~1~~200 CY.; Vegetation - ~~1~~2 ~~Day~~Weeks; Debris - 1 ~~Day~~Week	Sediment - As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Flood prone, wetlands, riparian corridor

Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods*	Limits of Work	Estimated Maintenance Activity Duration and Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
Genesee Pond: Inlet Culvert (WDFW Site #LO3)	Single Family	47.56449N	122.36722W	Longfellow Creek	Duwamish	Inlet structure with concrete headwall, debris rack, riprap and 48-inch discharge pipe.	Sediment and Debris Removal, Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Temporary water tight structure and pumps to isolate inlet and bypass creek for sediment removal. Fish protection measures as needed may include fish screens, catch and release downstream.	Remove accumulated sediment and debris at culvert inflow and trash rack. Jet clean culvert. Vegetation thinning at culvert inflow	Sediment - ~~3~~1 ~~Days~~Week, 25 CY.; Vegetation - ~~1~~3 Days; Debris - 1 Day	Sediment - As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Steep slope, riparian corridors, wetlands, flood prone, wildlife, liquefaction
Genesee Pond: Outlet Structure	Single Family	47.56500N	122.36746W	Longfellow Creek	Duwamish	Concrete open-top outlet structure with metal safety railing, 6-inch weir outlet, two outlet ports and one 12-inch low flow outlet port.	Sediment and Debris Removal, Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Temporary water tight structure and pumps to isolate and bypass flow for sediment removal. Fish protection measures as needed may include fish screens, catch and release downstream. Construct temporary access road if needed.	Remove accumulated sediment and debris around outlet structure and inside of structure. Vegetation thinning around outlet structure and for construction of temporary access road if needed.	Sediment - ~~1~~2 Weeks, ~~5~~70 CY.; Vegetation - 1 ~~Day~~Week; Debris - ~~1~~3 Days	Sediment - As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Steep slope, riparian corridors, wetlands, flood prone, wildlife, liquefaction
Olson Pond	Single Family	47.52252N	122.33502W	Unnamed creek	Duwamish	Stormwater Detention: Pond- Pond outlet maintenance hole with 18-inch grated outlet, 24-inch grated outlet, and 30-inch outlet culvert; one 18-inch outfall to pond; and Ecology Block/rock overflow spillway.	Sediment and Debris Removal, Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Construct temporary access road if needed.	Sediment removal to be done during dry season. Remove accumulated sediment and debris at outlet pipes and pond area. Thin vegetation around maintenance hole and on access road. Thin obstructing vegetation around retaining wall and spillway. May require removal of up to 5 mature trees to be replaced with similar native species at min. 1:1.	Sediment - ~~2~~1 Weeks, 100 CY.; Vegetation - 1 Day; Debris - 1 Day	Sediment - As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Wetland. Wildlife Habitat.
Becker's Pond	Utility/ Public (Carkeek Park)	47.71095N	122.36531W	Pipers Creek (Tributary H)	Pipers	Historically a private impoundment: Tributary H to Pipers Creek, no longer an impoundment	Debris Removal, Control Vegetation.	Hand Work.	Remove debris and thin noxious vegetation	Debris - 1 ~~Day~~Week, 1 CY.; Vegetation - ~~1~~2 ~~Day~~Weeks	Debris – As needed; Vegetation – As frequently as annually; Demand work – as needed	Wetland, Wildlife Habitat, Riparian Corridor, Steep Slopes, Slide area

Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods*	Limits of Work	Estimated Maintenance Activity Duration and Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
Outfall to Bitter Lake (WDFW Site #LU1)	Single Family	47.72845N	122.35477W	Bitter Lake	Lake Union	Outfall structure-Concrete headwall with 48-inch outfall pipe. Discharges stormwater to Bitter Lake.	Sediment and Debris Removal, Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Isolate in pond work area with silt fence or equivalent. Fish protection measures as needed may include fish screens, catch and release.	Remove accumulated sediment and debris around outfall. Thin obstructing and noxious vegetation as needed.	Sediment - 3~~21~~ Weeks, 35 CY.; Debris - 1 Day; Vegetation - 1 Day	Sediment - As frequently as annually; Debris – As needed; Vegetation – As frequently as annually	Riparian corridor, wildlife
Green Lake – Densmore Outfall	Single Family	47.68485N	122.33793W	Green Lake	Densmore	Grated-top concrete vault structure with 48-inch inlet pipe.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Dewater structure with pumps. Fish protection measures as needed may include fish screens, catch and release.	Remove accumulated sediment and debris around outfall.	Sediment –~~–~~ 2 Weeks~~2 Days~~, 10 CY.; Debris - 1 Day	Sediment - As frequently as annually; Debris – As needed; Demand work – As needed	Wildlife, wetlands, riparian corridor
Outfall to Haller Lake	Single Family	47.72080N	122.33423W	Haller Lake	Densmore	Outfall structure 18-inch pipe outfall and Outfall Protection Pad	Sediment and Debris Removal, Control Vegetation, Outfall protection pad enhancement. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Isolate in pond work area with silt fence or equivalent. Fish protection measures as needed may include fish screens, catch and release.	Remove accumulated sediment and debris around outfall. Thin obstructing and noxious vegetation as needed. Construct access road and temporary removal of guard rail.	Sediment –~~–~~ 3 Weeks~~2 Days~~, 50~~25~~ CY.; Vegetation - 1 Day; Debris - 1 Day; Outfall protection pad – 1 day	Sediment - As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed	Riparian corridor

Notes

1) Most of the pond and outfall facilities in Table A-3 have not previously been assigned a WDFW Site #. If a WDFW Site # has previously been assigned to a pond or outfall facility, it is noted in parenthesis after the site name.
2) All construction to follow City of Seattle's Construction Stormwater and Erosion Control Plan guidelines and BMP's.
3) The presence of the New Zealand Mud Snail (NZMS) is confirmed in the Thornton, Mapes, Longfellow, and Piper drainage basins. SPU will follow WDFW and internal guidelines for equipment decontamination and management of dredged/excavated materials that may be contain NZMS.

Exhibit B – Drainage System Facility Addresses

Exhibit B-1: Open Channel Drainage System Facility Addresses

WDFW Site #	Site Name	Street Address
TH1	NE 51st St. @ Matthews Beach	5101 NE 90th Pl.
TH3	Thornton Creek @ NE 93rd St.	4819 NE 93rd St.
TH4	Thornton Creek @ Sand Point Way	East of Matthews Ave. NE @ Sand Point Way NE
TH5	NE 93rd St. @ Sand Point Way	NE 93rd St. @ Sand Point Way NE
TH10	Thornton Creek @ Burke Gilman Trail	9251 Matthews Ave. NE
TH11	NE 95th St. @ Sand Point Way NE	NE 95th St. @ Sand Point Way
TH17	N & S Branch Thornton Creek Confluence	10706 35th Ave. NE
TH18	35th Ave. NE @ S. Fork Thornton Culvert	10708 35th Ave. NE
TH19	30th Ave. NE @ NE 107th St. Thornton Culvert	10703 30th Ave. NE
TH21	30th Ave. NE @ NE 110th St.	30th Ave. NE @ NE 110th St.
TH23	NE 107th St. @ 30th Ave. NE Culvert	2839 NE 107th St.
TH24	27th Ave. NE @ NE 105th St.	2710 NE 105th St.
TH25	Lake City Fish Ladder	9800 Lake City Way NE
TH29	NE 95th St. @ Lake City Way	9500 Lake City Way NE
TH30	NE 98th St. @ Lake City Way NE	2351 NE 98th St.
TH31	NE 98th St. @ Ravenna Ave. NE	9750 Ravenna Ave. NE
TH32	Knickerbocker Reach Habitats	1919 NE 100th St.
TH33	NE 103rd St. Sewer Main Crossing	10312 17th Ave. NE
TH34	NE 105th St. @ 17th Ave. NE	10423 17th Ave. NE
TH35	NE 108th @ 8th Ave. NE (Beaver Lodge Park)	800 NE 106th St.
TH37	1st Ave. NE @ NE 100th St.	10001 1st Ave. NE
TH38	1st Ave. NE @ NE 100th St. Ditch	9580 1st Ave. NE
TH43	North Fork Culvert @ Lake City Way	11701 Lake City Way NE
TH44	25th Ave. NE @ Thornton Creek	12321 25th Ave. NE
TH45	NE 125th @ Thornton Creek	12507 24th Ave. NE
TH46	19th Ave. NE @ NE 130th St.	1903 NE 130th Pl.

WDFW Site #	Site Name	Street Address
TH50	NE 115th St. @ Littlebrook	3516 NE 115th St.
TH51	NE 120th St. @ Littlebrook Creek	3516 NE 120th St.
TH52	NE 123rd St. @ Littlebrook Creek	3518 NE 123rd St.
TH53	35th Ave. NE @ Littlebrook Creek	12329 35th Ave. NE
PS5	NW 92nd St. @ 28th Ave. NW	9115 27th Ave. NW
PS6	28th Ave. NW @ NW Esplanade	2803 NW Esplanade
PS7	Marmount Dr. NW @ NW North Beach Dr.	9810 Marmount Dr. NW
PS8	Marmount Dr. NW @ NW North Beach Dr.	2605 North Beach Drive
PS9	NW 96th St. @ 26th Ave. NW	9519 26th Ave. NW
PS10	26th Ave. NW @ NW 96th St.	2518 NW 95th St.
PS11	NW 95th St. @ 26th Ave. NW	2515 NW 95th St.
PS12	NW 92nd St. @ 25th Ave. NW	9220 25th Ave. NW
PS13	NW Golden Dr. @ 31st Ave. NW	2855 NW Golden Dr.
PS14	NW 95th St. @ 26th Pl. NW	2639 NW 95th St.
PS15	NW 95th St. @ 28th Ave. NW	9404 28th Ave. NW
PS16	View Dr. NW @ 32nd Ave. NW	9300 View Ave. NW
LO1	SW Andover St. @ Longfellow Creek	2629 SW Andover St.
LO2	SW Nevada St. @ Longfellow Creek	2641 SW Nevada St.
LO4	SW Brandon St. @ Longfellow Creek	2607 SW Brandon St.
LO7	SW Juneau St. @ Longfellow Creek	2519 SW Juneau St.
LO8	24th Ave. SW Mid Block	6331 24th Ave. SW
LO9	24th Ave. SW @ 25th Ave. SW	6504 24th Ave. SW
LO10	SW Willow St. @ Longfellow Creek	6747 24th Ave. SW
LO12	SW Holden @ Longfellow Creek	SW Holden @ Longfellow Creek
SP1	31st Ave. SW @ SW 104th St.	10262 31st Ave. SW
DU1	2nd Ave. SW @ W. Marginal Way	7245 W. Marginal Way SW
DU2	S. Norfolk St. Treatment Swale	9892 40th Ave. S.
MC1	S. Cloverdale @ Grattan Pl. S.	5401 S. Henderson St.

Exhibit B-2: Enclosed Drainage System Facilities Addresses

WDFW Site #	Site Name	Street Address
TH2	49th Ave. NE @ NE 51st St.	9029 49th Ave. NE
TH6	NE 92nd St. @ Sand Point Way	9253 Sand Point Way NE
TH7	Matthews Ave. NE @ Sand Point Way	9223 Matthews Av. NE
TH8	Matthews Ave. NE Mid-Block	9209 Matthews Av. NE
TH9	Matthew Ave. NE South Block	9101 Matthews Av. NE
TH12	NE 96th St. @ 39th Ave. NE	3823 NE 96th St.
TH20	30th Ave. NE @ NE 107th St. Kramer Culvert	10703 30th Ave. NE
TH22	31st Ave. NE @ NE 110th St.	3024 NE 110th St.
TH26	NE 100th St. @ Ravenna Ave. NE	2511 NE 100th St.
TH27	NE 86th St @ Ravenna Ave. NE	NE 86th St @ Ravenna Ave. NE
TH28	NE 89th St. @ Ravenna Ave.	NE 89th St. @ Ravenna Ave
TH41	35th Ave. NE @ NE 115th St.	3422 NE 115th St.
TH42	33rd Ave. NE @ NE 117th St.	11537 34th Av. NE
TH47	15th Ave. NE @ NE 130th Pl.	1511 NE 130th Pl.
TH48	10th Ave. NE @ Thornton Creek	13000 10th Av. NE
TH55	33rd Ave. NE @ NE 127th St.	12562 33rd Av. NE
TH56	NE Northgate Way @ Victory Creek	1060 NE Northgate Way
TH57	Ravenna Ave. NE @ Lake City Way NE	2201 NE 92nd St.
TH58	NE 97th St. @ 20th Ave. NE	9701 20th Ave. NE
TH59	2407 NE 98th St.	2407 NE 98th St.
TH60	NE 117th St @ 12th Ave NE	1040 NE 117th St.
TH61	NE 120th St @ 12th Ave NE	1034 NE 120th St.
TH62	NE 115th @ 12th Ave NE	11519 B 12th Ave NE
TH 63	Pinehurst Way NE @ Victory Creek	11420 Pinehurst Way NE
TH 64	NE 114th St @ 12th Ave NE	1050 NE 114th St.

WDFW Site #	Site Name	Street Address
TH 65	NE 113th St @ 12th Ave NE	11305 12th Ave NE
TH66	NE 95th St @ 27th Ave NE	2545 NE 95th St.
TH 67	NE 94th St @ 27th Ave NE	9223 27th Ave NE
TH 68	NE 96th @ 35th Ave NE	3259 NE 97th St.
TH 69	NE 93rd St @ 45th Ave NE	9223 45th Ave NE
LU2	Licton Springs @ Woodlawn Ave. N.	9241 Woodlawn Ave. N.
PS2	NW Culbertson Dr @ Sherwood Rd. NW	1204 NW Culbertson Drive
PS3	7th Ave. NW @ Holman Rd NW	9722 8th Av. NW
PS4	8th Ave. NW @ Holman Rd. NW	9704 Holman Rd NW
LO5	26th Av. SW @ Longfellow Creek	5624 26th Av. SW
TA1	Rainier Ave. S. @ Taylor Creek	10005 Rainier Av. S
TA2	68th Ave. S. @ Taylor Creek	10050 68th Av. S.
TA3	SE Holyoke Way @ Taylor Creek	10250 Holyoke Way S.
FA1	Fauntleroy Way SW @ Fauntleroy Creek	9108 Fauntleroy Way SW
FA2	45th Ave. SW @ Fauntleroy Creek	9144 45th Av. SW
FA3	California Way SW @ Fauntleroy Creek	9140 California Av. SW
SC1	SW Tieg Pl. @ Schmitz Creek	5639 SW Tieg Pl.
PC1	SW Puget Way @ Puget Creek	4860 14th Av. SW
PC2	SW Dawson @ 19th Ave SW	1823 SW Dawson St.
PC3	SW Brandon @ 19th Ave SW	1821 SW Brandon St.
MC2	Sturtevant Ave S @ S. Roxbury St.	5140 S Roxbury St.
MC3	Sturtevent Ave S. @ Renton Ave S.	9650 Renton Ave S.
YC1	NE 65th St @ 39th Ave NE	6053 39th Ave NE
YC2	NE 62nd St @ 40th Ave NE	6203 40th Ave NE
YC3	NE 60th St. @ 40th Ave NE	5756 39th Ave NE

Exhibit B-3: Pond Drainage System Facilities Addresses

Site Name	Nearest Street Address
Highland Park Basin	Highland Park Way SW / West Marginal Way SW
Norfolk Pond	Interstate 5 SB exit 158
Jackson Park Ponds (on Golf Course)	1000 NE 135th St. (Jackson Park Golf Course)
Jackson Park Ponds- Diversion Structure & Forebay (WDFW Site #TH49)	1000 NE 135th St. (Jackson Park Golf Course)
NSC Stormwater Structures & Outfalls	9600 College Way N
Thornton Creek Water Quality Channel	10005 5th Ave NE
Littles Creek Pond (on Golf Course)	1000 NE 135th St. (Jackson Park Golf Course)
Webster Pond	7501 Delridge Way SW
Genesee Pond: Inlet Culvert	4405 26th Ave SW
Genesee Pond: Outlet Structure	2629 SW Nevada St.
Olson Pond	9220 Olson Place SW
Becker's Pond	777 NW Carkeek Park Road
Outfall to Bitter Lake	317 N 137th St
Green Lake – Densmore Outfall	7801 West Green Lake Drive N
Outfall to Haller Lake	12555 Meridian Ave N

Exhibit C – Routine Maintenance & Repair Activities

To simplify the maintenance process, seven primary routine maintenance and repair activities are identified and described below. These seven activities include:

1. Sediment and Debris Removal
2. Vactoring and Jetting
3. Vegetation Control
4. Anchoring Large Woody Debris (LWD)/Habitat Restoration
5. Mechanical Improvements and Repairs/Replacements
6. Safety Improvements
7. Monitoring Equipment Installation, Repair/Replacement

For these maintenance activities, specific BMP's are identified to accomplish the task with minimal impacts on the surrounding environment. The methods and associated BMP's are listed and explained in Exhibit E: Maintenance & Repair Methods.

1. Sediment and Debris Removal

Sediment and Debris Removal consists of the removal of excess sediment and vegetative matter which compromises the performance of the facility. This work is often demand work (e.g., as a result of storm events or requirements in the City's municipal separate storm sewer system NPDES permit) and not on a regular schedule. The goal of sediment and debris removal is to maintain the capacity or function of the facility by removing excess sediments and returning the facility to its original design capacity or to provide continuous flow through to reduce flood risk. The work may be accomplished by hand or by utilizing either vactor trucks or heavy equipment such as excavators and backhoes. Pumps and in-creek/pond water-tight structures or silt fence may be employed for isolation and dewatering of the work area if needed. Environmental buckets or other erosion and sediment control BMPs may be employed to prevent discharge of fill or deleterious materials downstream. Fish exclusion measures and other protection measures may also be employed.

Sediment and debris removal are required most commonly in:

- Catch basin and stormwater structures to maintain their capacity and function.
- Conveyance facilities to maintain their capacity:
    - Piped stormwater infrastructure.
    - Culvert and ditch systems.
    - Instream infrastructure may require sediment/debris removal near or in water at culvert inflows/outfalls and trash racks.
- Stormwater Facilities to maintain their capacity and treatment:
    - Treatment Ponds
    - Detention Ponds
    - Engineered Wetlands

BMPs for sediment and debris removal include:

- Delineation of Work Areas
- Temporary Bypass of Stream Flow

- Vactoring and Jetting
- Excavating and use of environmental buckets
- Habitat Addition or Maintenance
- Site Restoration/Landscaping
- Temporary Erosion Control
- Temporary Dewatering

2. Vactoring and Jetting

Vactoring and jetting is the removal of excess sediment and vegetative matter which compromises the ditch and culvert or pipe facility. This work is often scheduled and is required on a regular basis. The goal of vactoring and jetting is to remove excess material to reduce flooding impacts and maintain capacity. Vactoring and jetting is accomplished utilizing a combination vactor truck and is most commonly required in pipes and culvert systems and ditches.

BMPs for vactoring and jetting include:

- Delineation of Work Areas
- Temporary Bypass of Stream Flow
- Vactoring and Jetting
- Excavating and use of environmental buckets
- Habitat Addition or Maintenance
- Site Restoration/Landscaping

3. Vegetation Control

Vegetation control is the removal of excess or obstructing vegetation from a facility and its appurtenances such as ponds, trash racks, ditches, inside of and around structures, pipes and culverts. The goal is to maintain accessibility and capacity of the facility and all appurtenances. This involves cutting back live vegetation or removing and replacing trees. This work is often scheduled work and is required on a consistent basis and is accomplished utilizing a variety of hand tools including rakes, weed eaters and machetes.

Vegetation control is required most commonly in:

- Ditches
- Culvert inflows and outflows
- Ponds
- Maintenance Hole Lids/Access Hatches

BMPs for vegetation control include:

- Delineation of Work Areas
- Temporary Bypass of Stream Flow
- Habitat Addition or Maintenance
- Site Restoration/Landscaping

4. Anchoring LWM/Habitat Restoration

Anchoring LWM/Habitat Restoration is the anchoring of existing woody material from previously constructed habitat improvement projects to prevent the migration and blockage of infrastructure. It also applies to naturally occurring LWM that may need to be redistributed and anchored to restore the conveyance capacity of the stormwater facility or may be deemed necessary and beneficial for habitat within the stormwater facility. This work is often demand work (storm event driven) and not on a regular schedule. The goal of anchoring LWM and habitat restoration is to maintain stormwater facility capacity and function, replace and improved damaged habitat to benefit fish and wildlife.

This work required most commonly in:

- Ditches
- Habitat projects where woody debris has destabilized and needs to be anchored such as engineered wetland areas or creeks
- Trash racks
- Ponds

BMPs for Anchoring LWM/Habitat Restoration include:

- Delineation of Work Areas
- Temporary Bypass of Stream Flow
- Habitat Addition or Maintenance
- Site Restoration/Landscaping

5. Mechanical Improvements and Repairs/Replacements

Mechanical improvements refer to adding new gates, valves, trash racks, access hatches and their components when necessary to maintain functionality of the structure and facility. Mechanical repairs/replacements refer to maintaining structural components such as slide or sluice gates, orifice plates, hinges, trash racks, valves, etc. The goal of this activity is to maintain the operability and function of the structural components of drainage system facilities. This work is often conducted on-demand and not on a regular schedule.

Mechanical improvements are required most commonly in:

- Flow control structures
- Culverts or pipes fitted with trash racks or gates
- Diversion structures
- Overflow maintenance holes fitted with debris cages

BMPs for mechanical repairs include:

- Delineation of work areas
- Temporary Bypass of Stream Flow (if needed)
- Site Restoration/Landscaping (if needed)

6. Safety Improvements

Safety Improvements refer to improving safe accessibility for crew and emergency response at stormwater facilities. For example, steep slopes may be furnished with a stairwell and platform for safer access to a structure. Fencing and security improvements fall under this activity.

Improvements to access roads and boat ramps also fall under this activity. The goal of this activity is to maintain the safety and accessibility of stormwater facilities. This work is often demand work and not on a regular schedule.

BMPs for Safety Improvements:

- Delineation of work areas
- Temporary Bypass of Stream Flow
- Habitat Addition or Maintenance
- Site Restoration/Landscaping

7. Monitoring Equipment Installation, Repair/Replacement

Monitoring equipment installation refers to installing monitors and associated equipment in creeks, ponds, pipes and structures. Monitoring equipment repair/replacement refers to the maintenance of existing monitoring equipment at various locations. The goal of this activity is to track level, flow, sediment, and water quality data to better understand and evaluate our drainage sites and facilities.

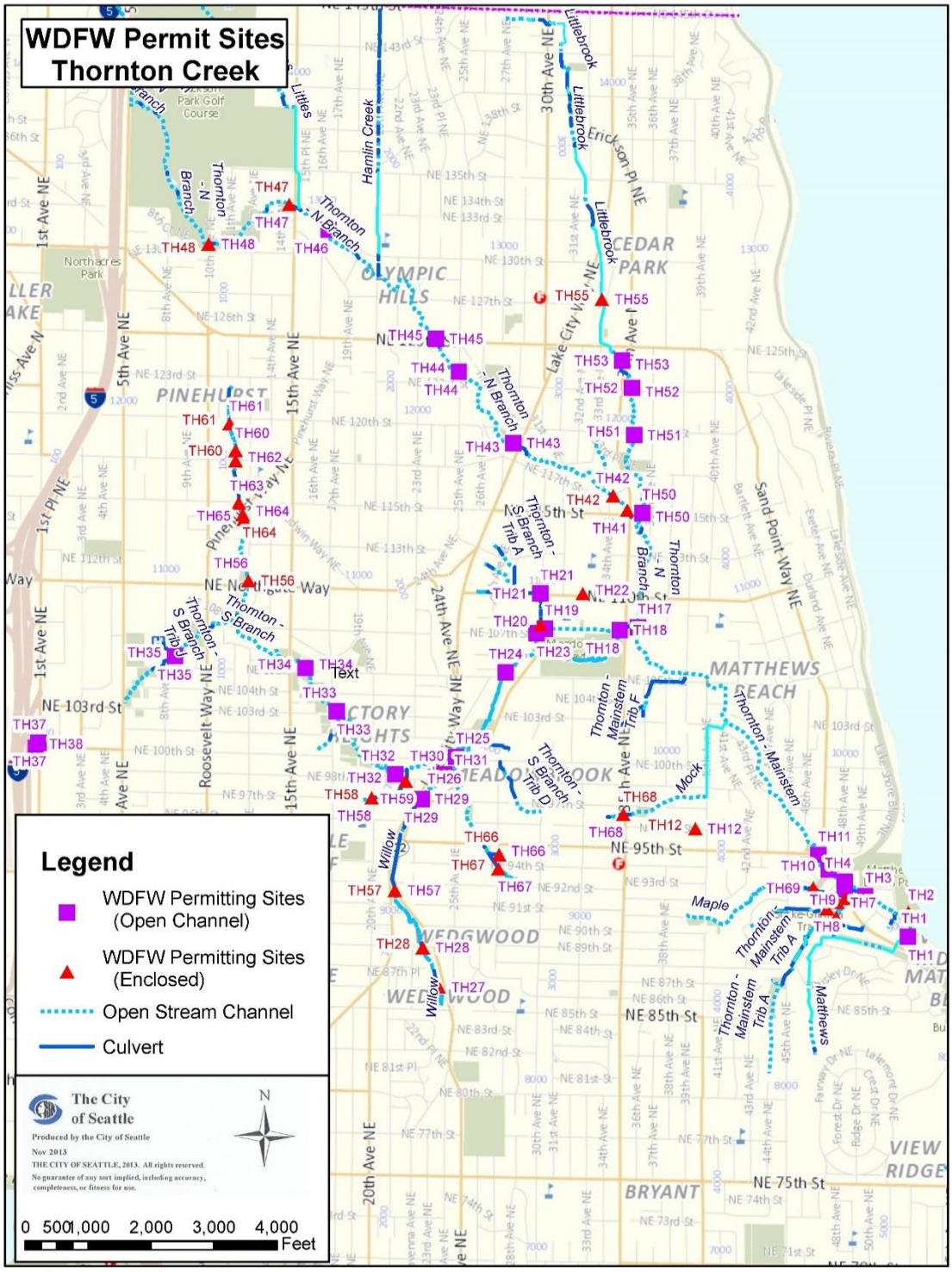
BMPs for safety improvements include:

- Delineation of work areas
- Temporary Bypass of Stream Flow (if needed)
- Site Restoration/Landscaping

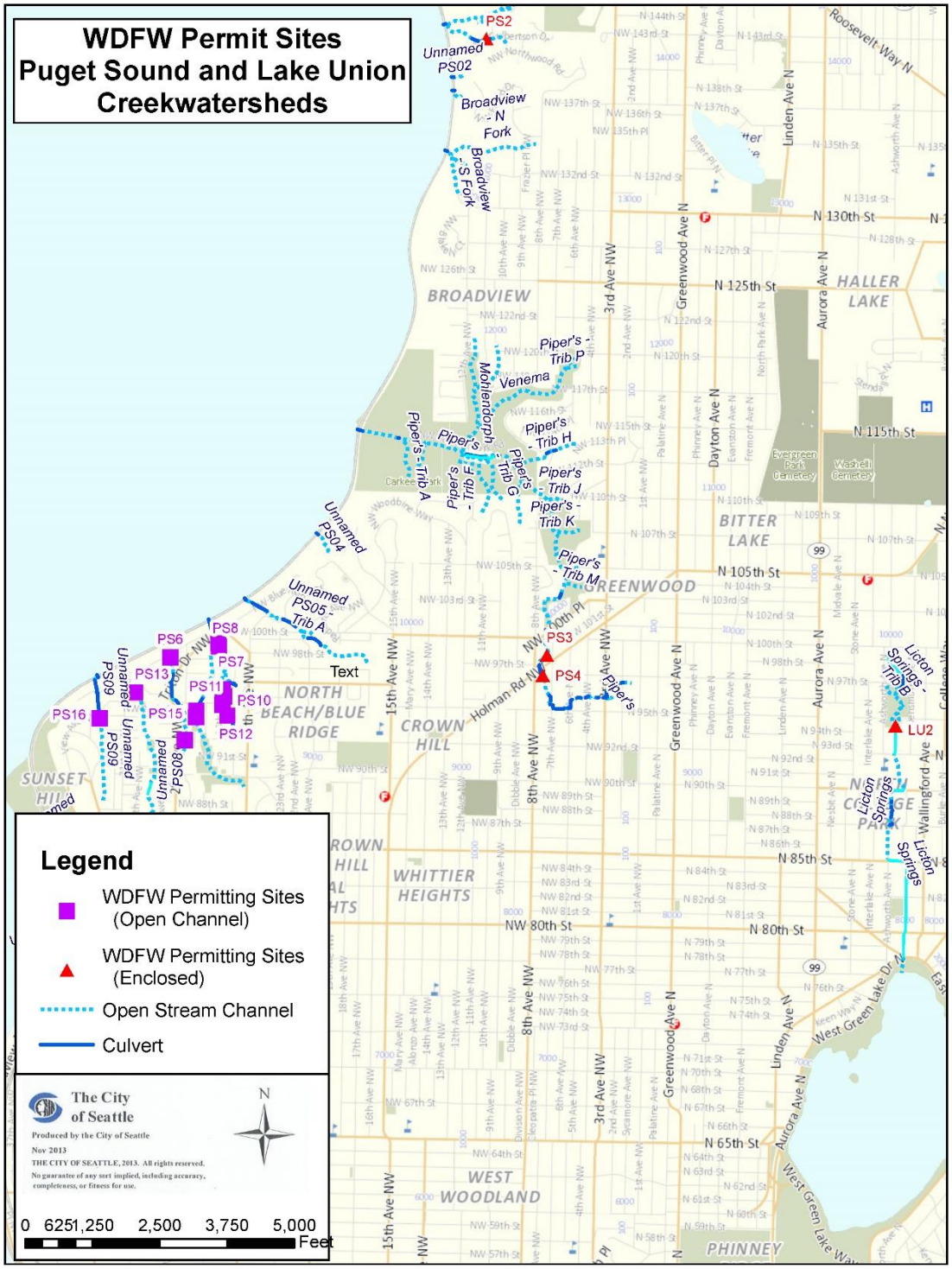
Exhibit D – Overview Location Maps & Representative Facility Data Sheets

Exhibit D-1: Open Channel and Enclosed Drainage System Facility Overview Location Maps

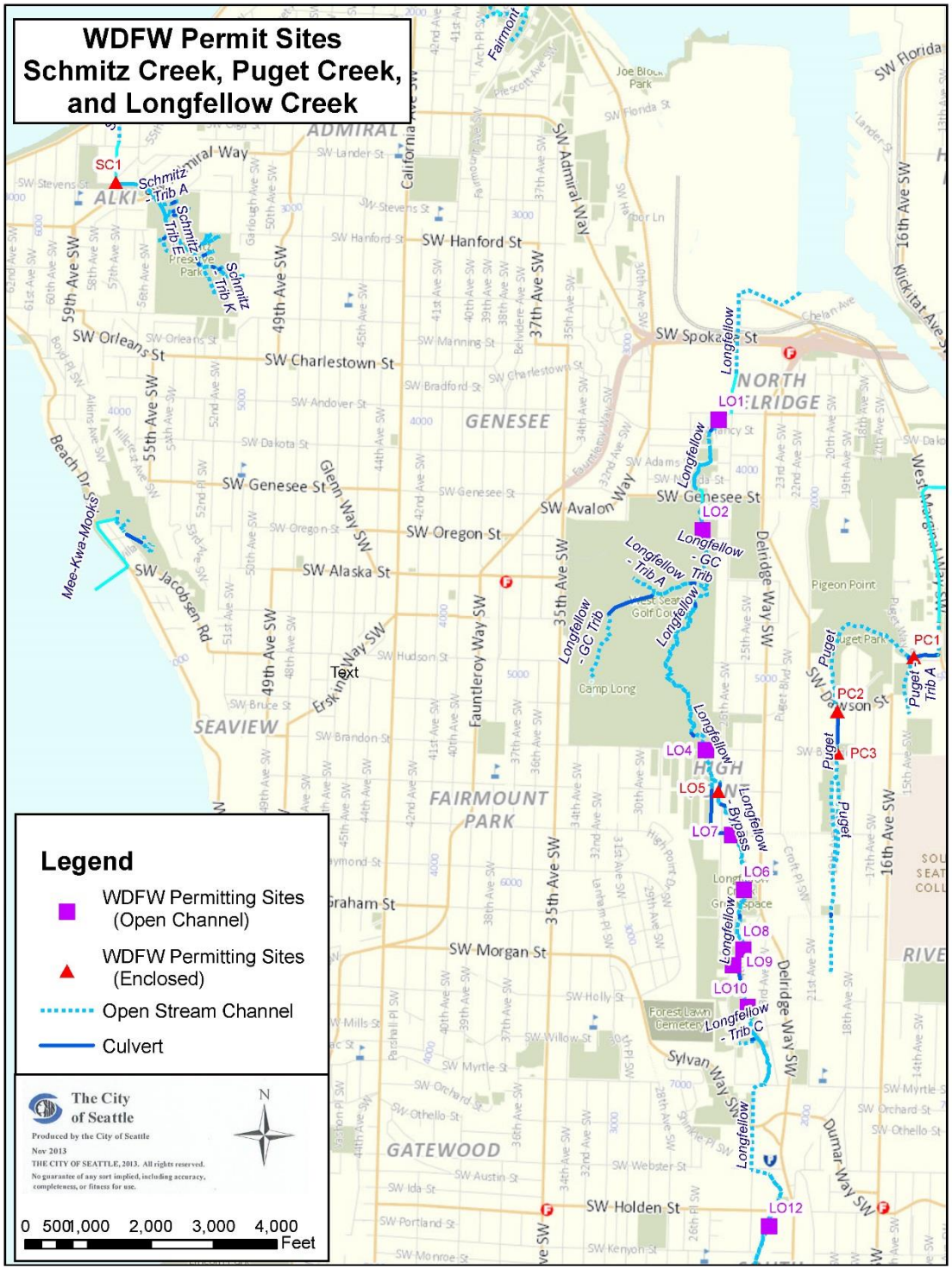
Thornton Creek WDFW Sites



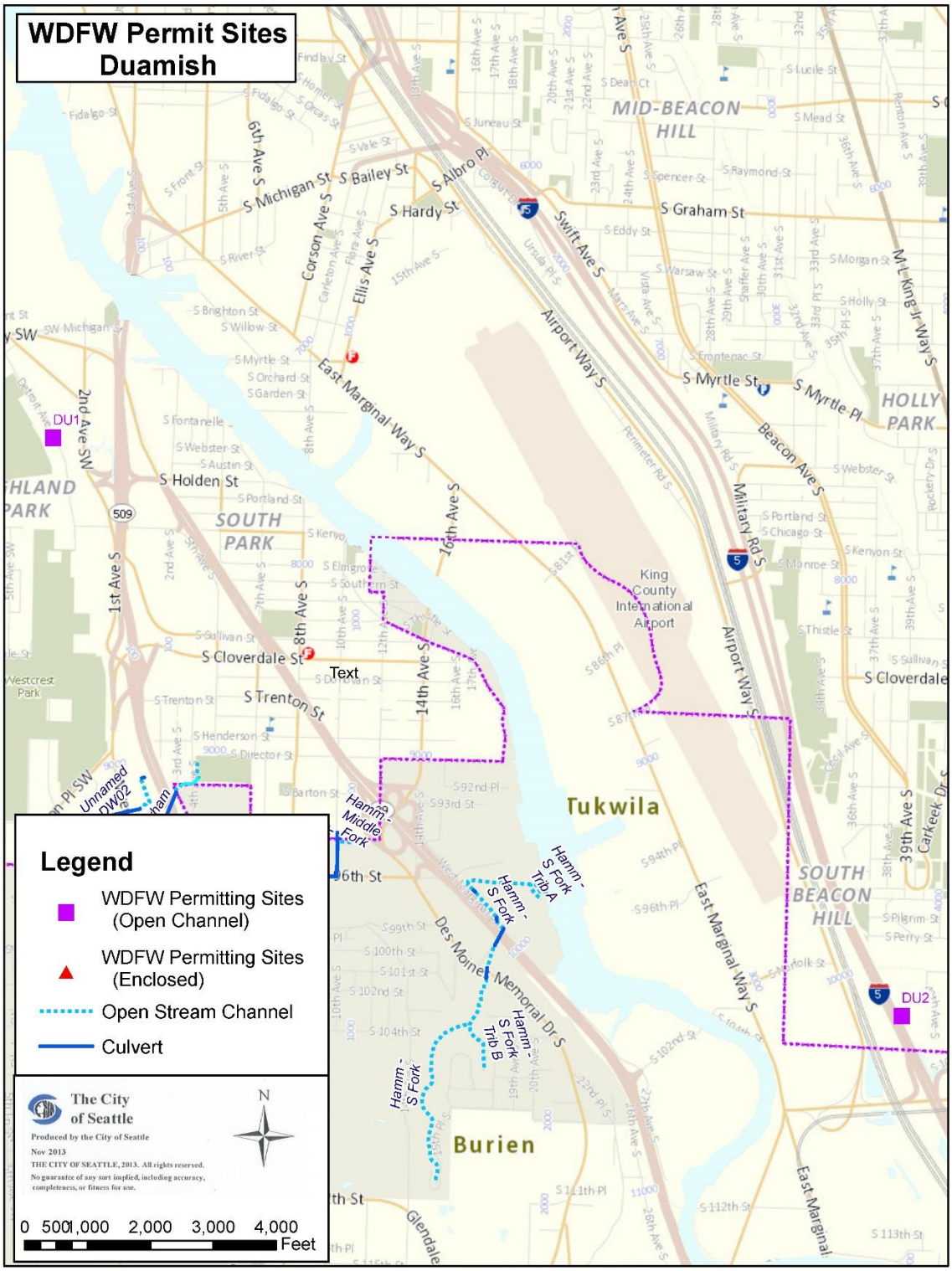
Puget Sound and Lake Union Creek Watersheds WDFW Sites



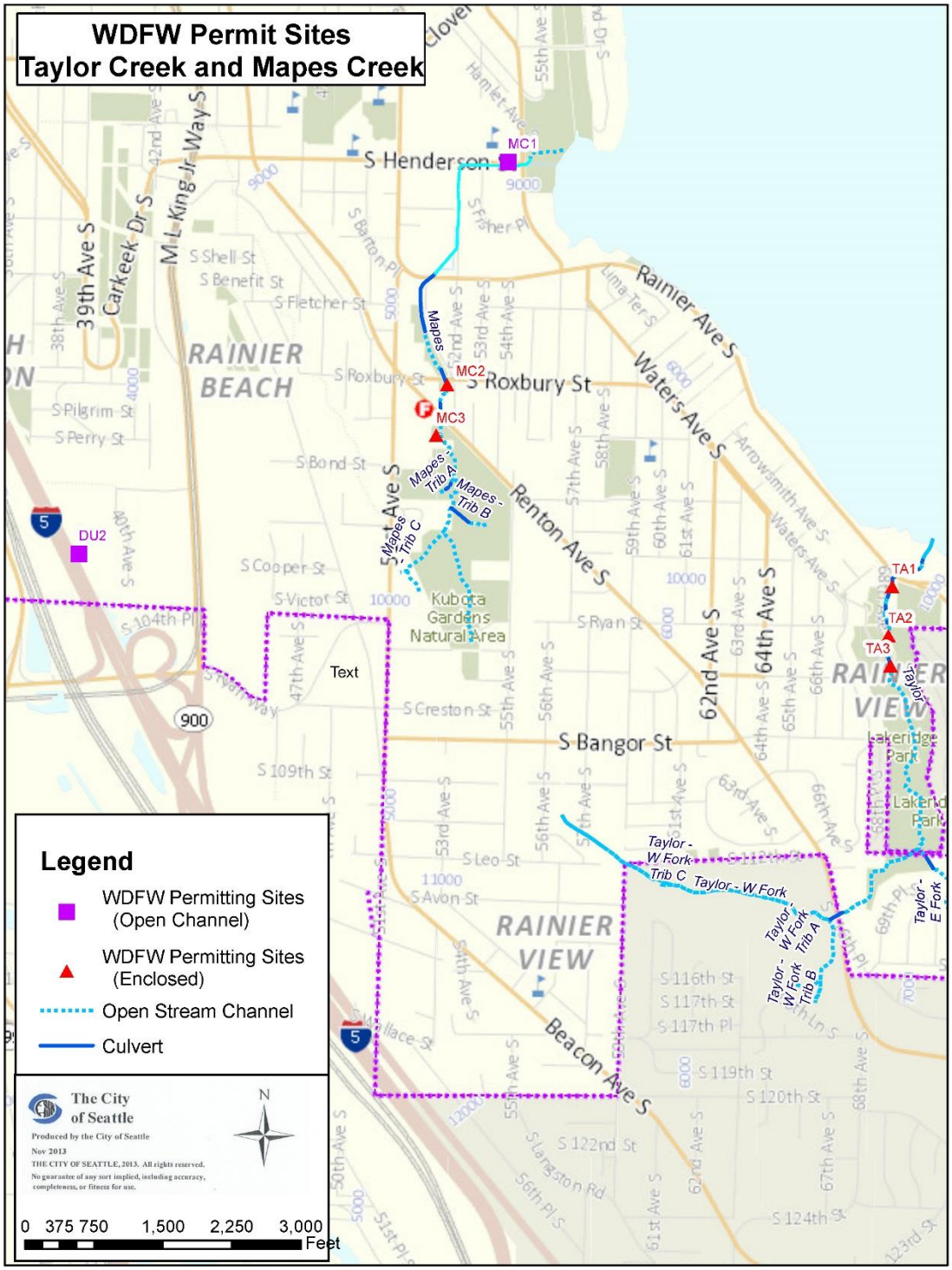
Schmitz Creek, Puget Creek, and Longfellow Creek WDFW Sites



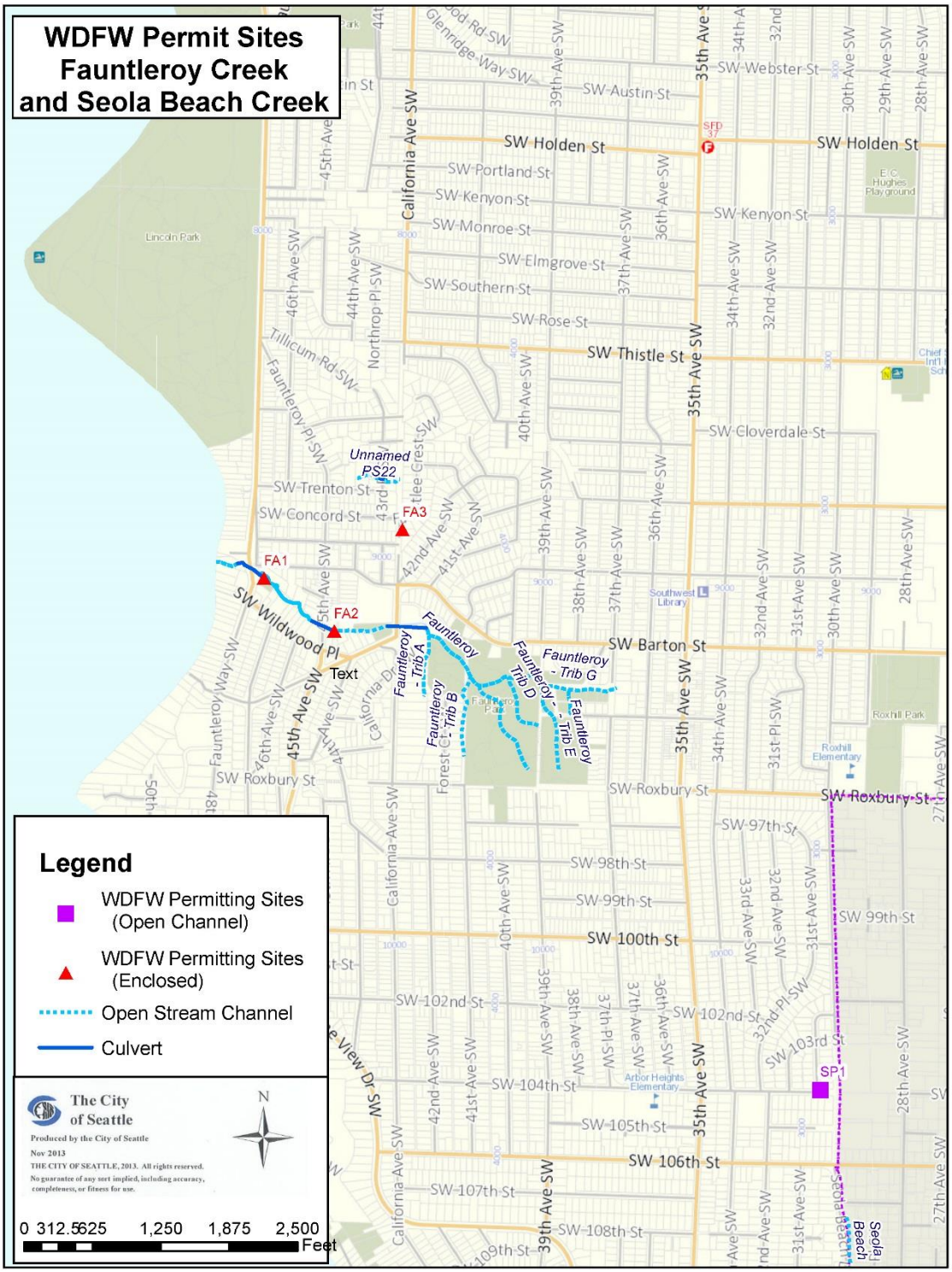
Duwamish WDFW Sites



Taylor Creek and Mapes Creek WDFW Sites



Fauntleroy Creek and Seola Beach Creek WDFW Sites



Yesler Creek WDFW Sites

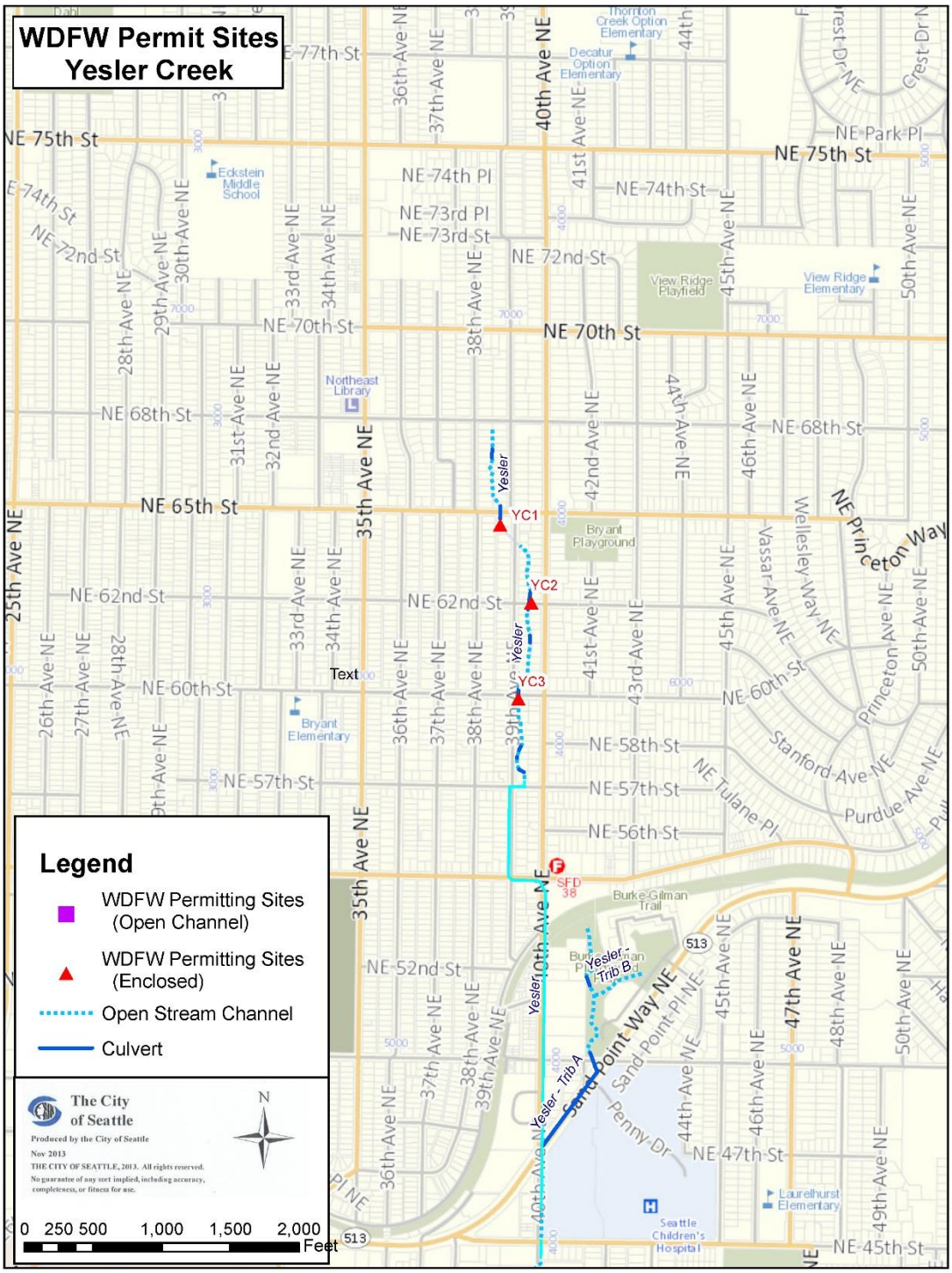
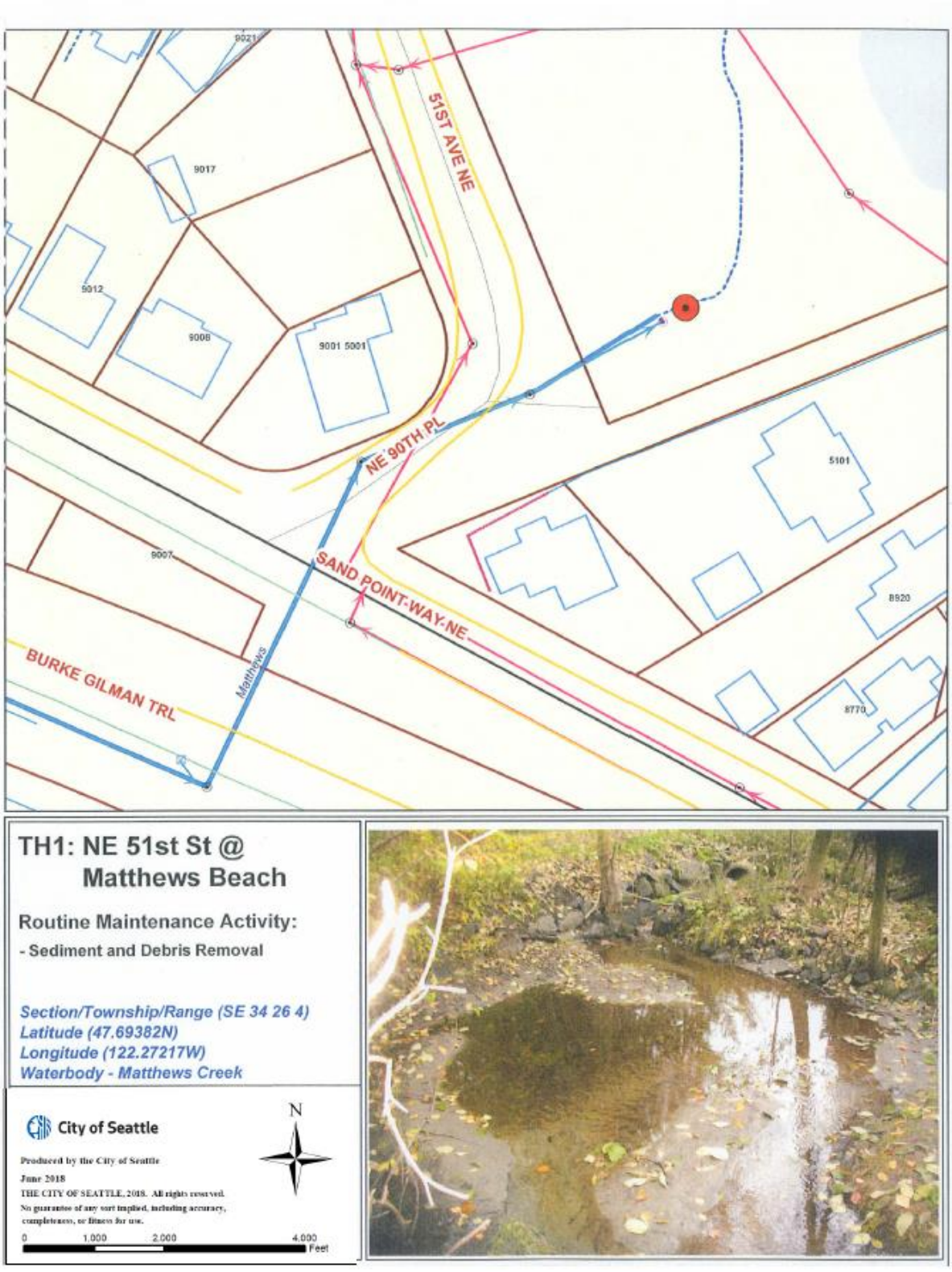
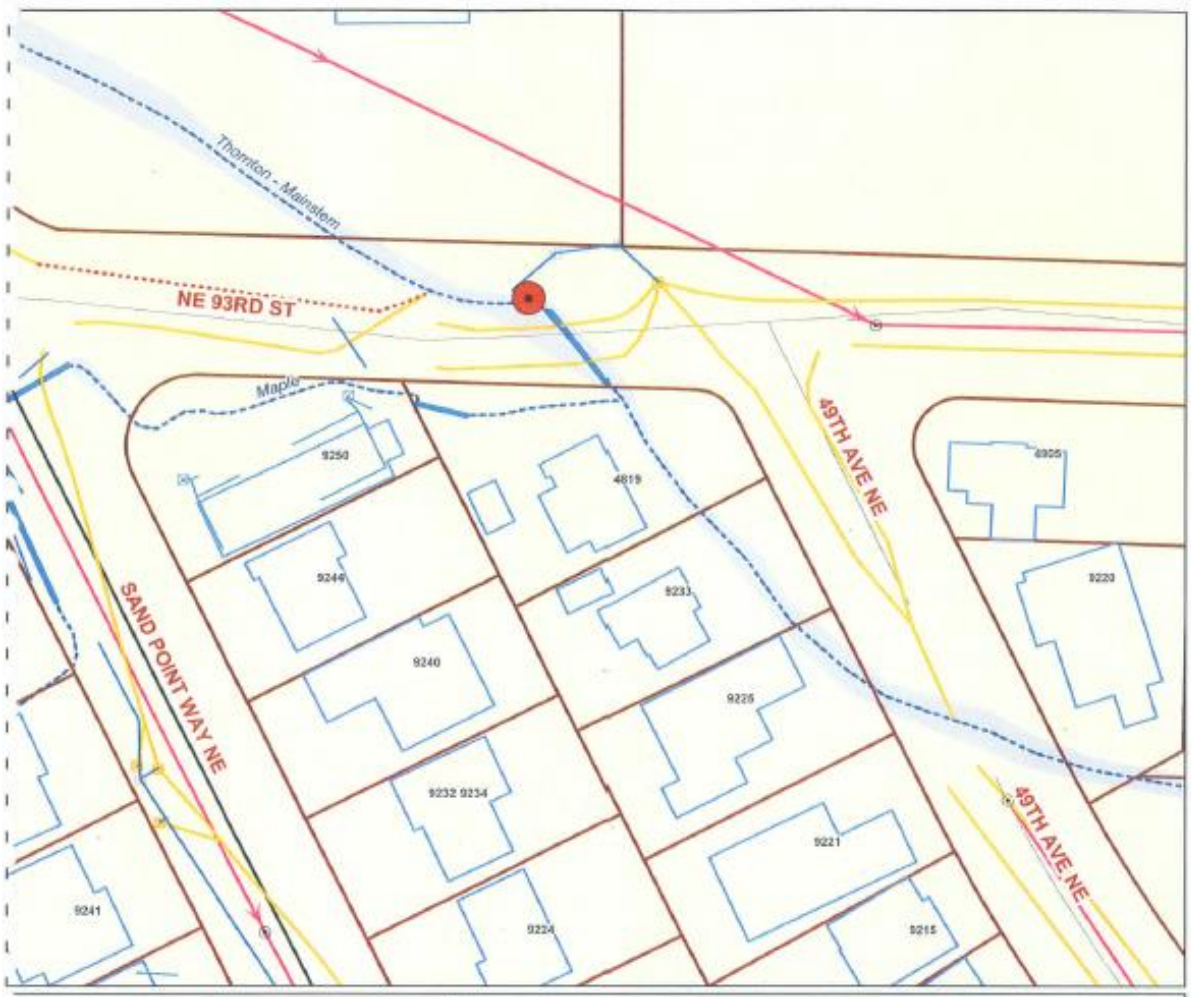


Exhibit D-2: Open Channel Drainage System Facility Representative Facility Data Sheets

TH1: NE 51st St @ Matthews Beach



TH3: Thornton Creek @NE 93rd St



TH3: Thornton Creek @ NE 93rd St

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (E 34 26 4)
Latitude (47.69587N)
Longitude (122.27543W)
Waterbody - Thornton Creek

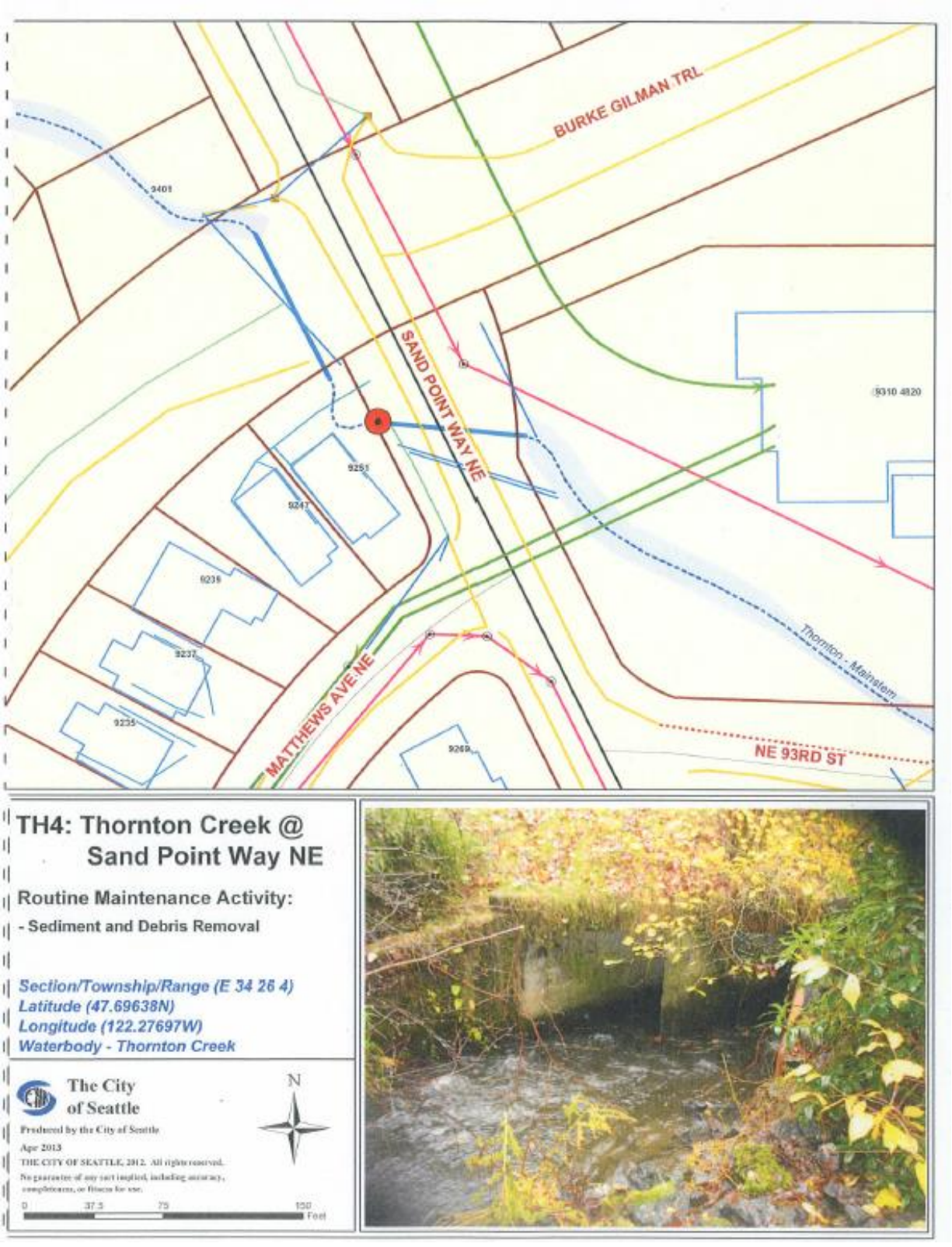
The City of Seattle

Produced by the City of Seattle
Apr 2013

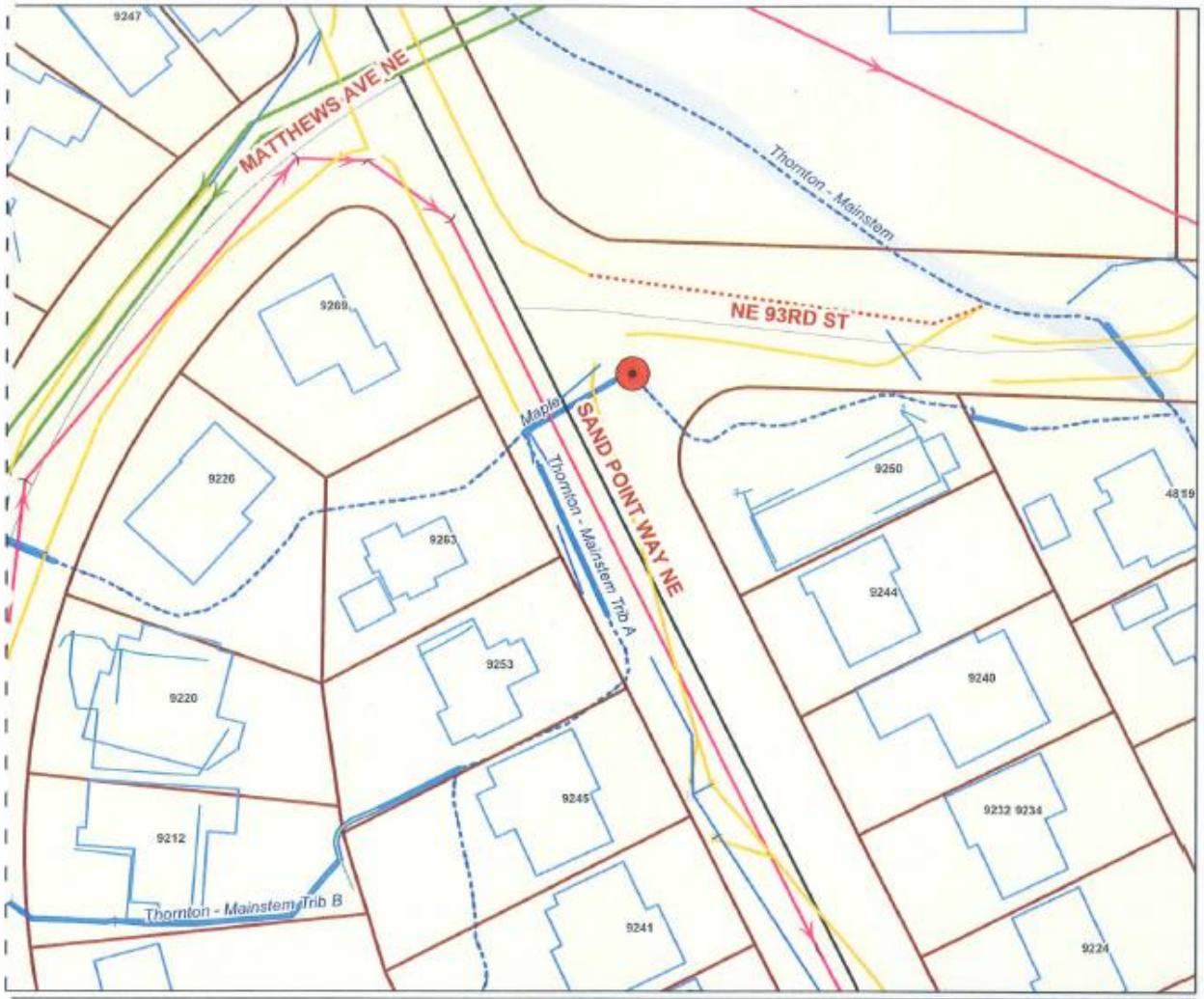
N

0 37.5 75 150 Feet

TH4: Thornton Creek @Sand Point Way NE



TH5: NE 93rd St @ Sand Point Way NE



TH5: NE 93rd St @ Sand Point Way NE

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (SE 34 26 4)
Latitude (47.69580N)
Longitude (122.27640W)
Waterbody - Maple Creek

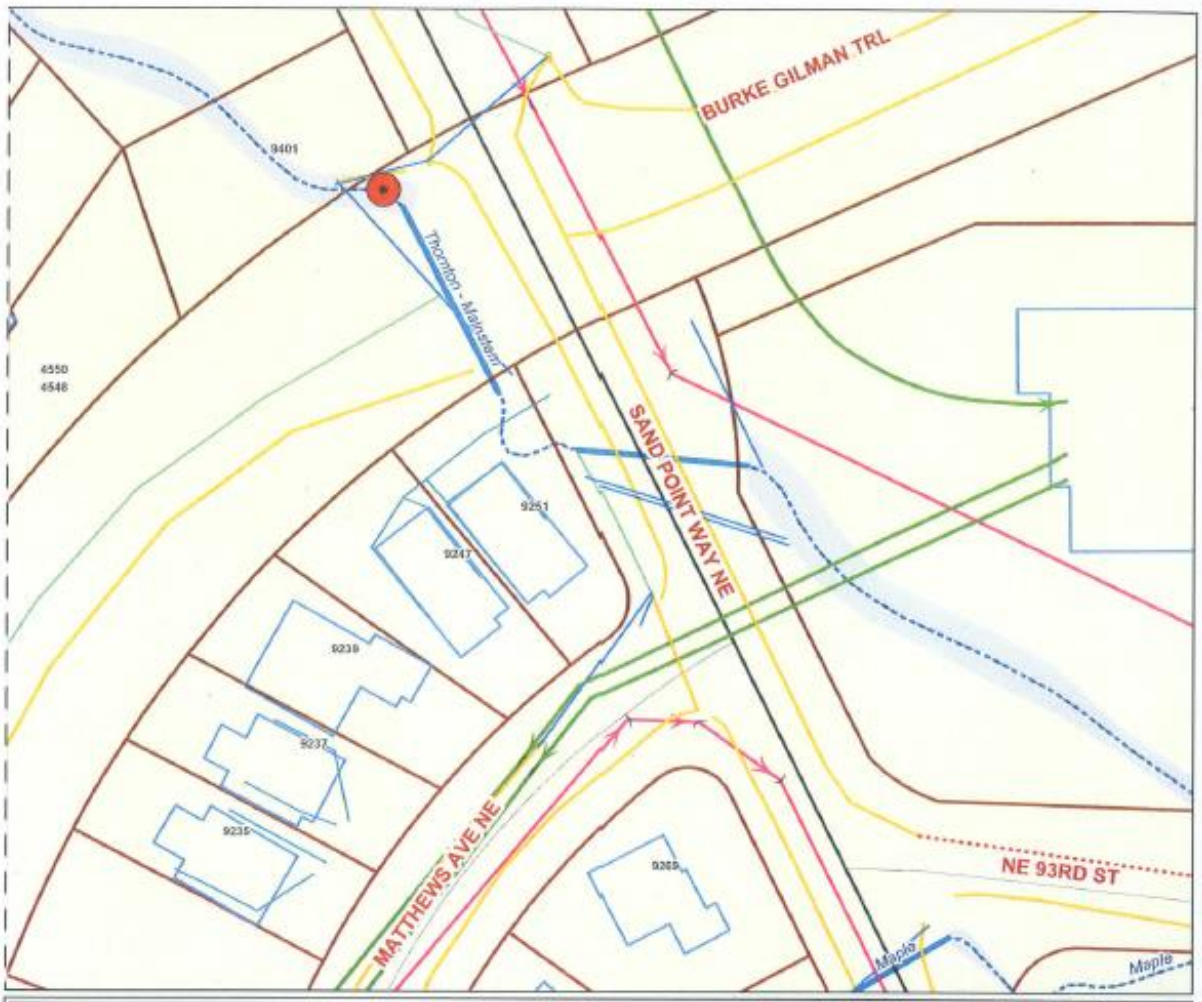
City of Seattle

Produced by the City of Seattle
June 2018

N

0 1,000 2,000 4,000 Feet

TH10: Thornton Creek@ Burke Gilman Trail



TH10: Thornton Creek @ Burke Gilman Trail

Routine Maintenance Activity:

-Sediment and Debris Removal

Section/Township/Range (E 34 26 4)
Latitude (47.69660N)
Longitude (122.27722W)
Waterbody - Thornton Creek

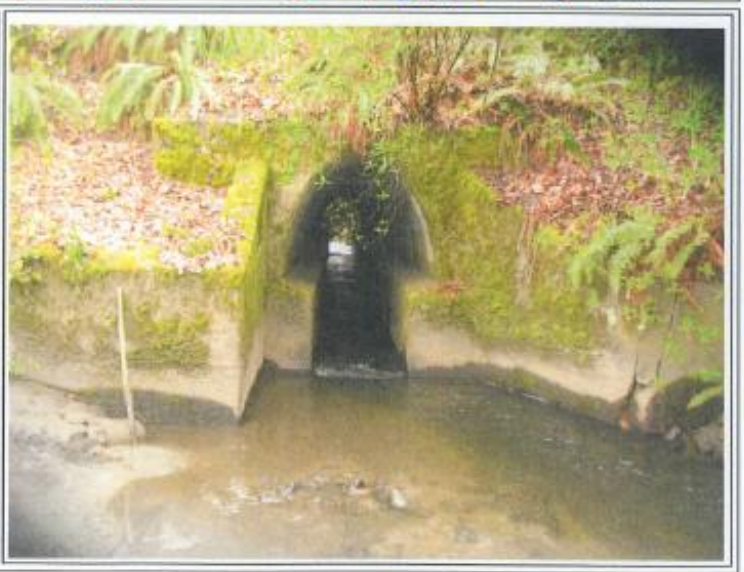
The City of Seattle

Produced by the City of Seattle

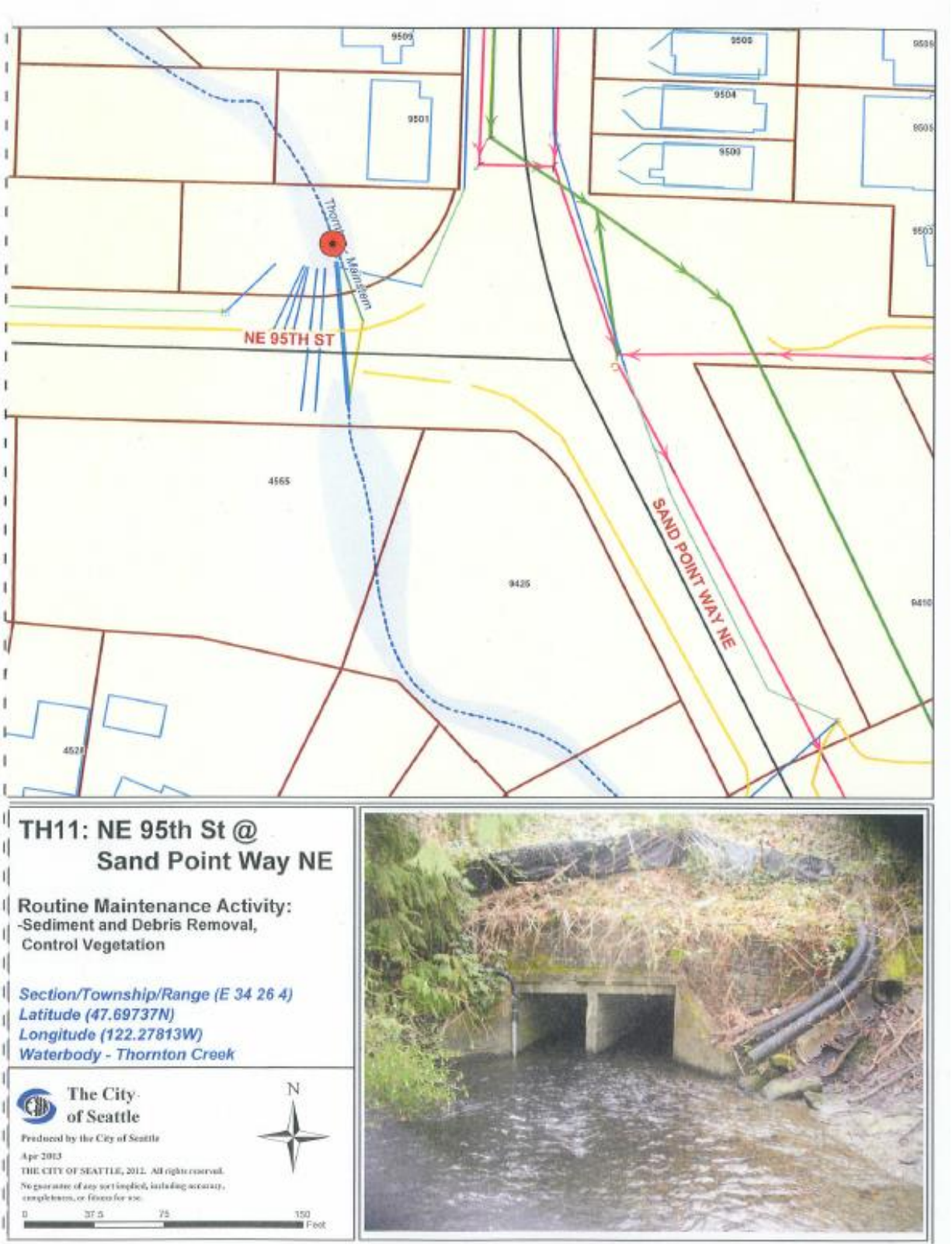
Apr 2013

N

0 37.5 75 150 Feet



TH11: NE 95th St@ Sand Point Way NE



TH17: N & S Branch Thornton Creek Confluence

TH17: N & S Branch Thornton Creek Confluence

Routine Maintenance Activity:
-Anchoring LWM/Habitat rehabilitation, Sediment and debris removal, Control Vegetation

Section/Township/Range (SW 27 26 4)
Latitude (47.70692N)
Longitude (122.29000W)
Waterbody - Thornton Creek

City of Seattle

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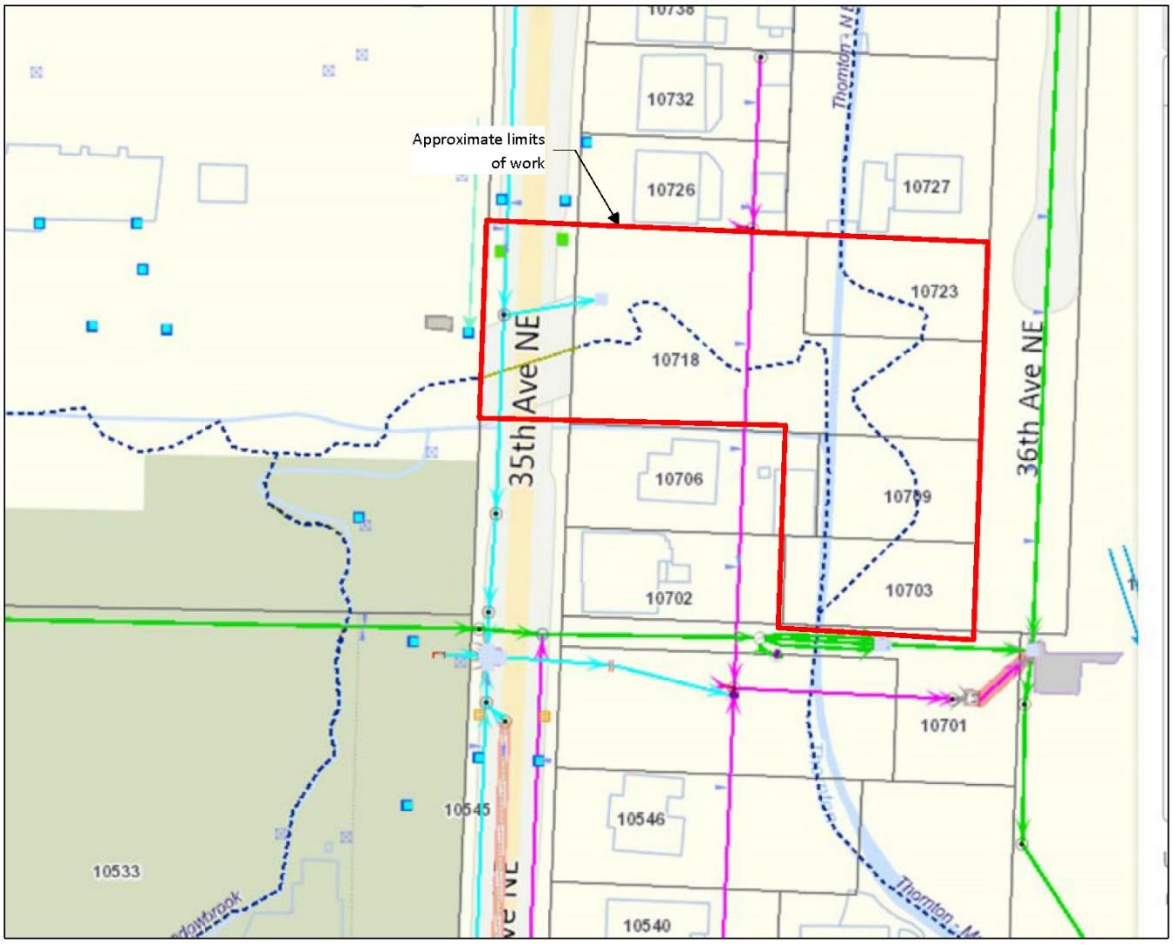
June 2018

N

0 1,000 2,000 4,000 Feet

TH18: 35th Ave NE @ S Fork Thornton Culvert



TH18: Thornton Creek confluence Floodplain @ 35th Ave NE

Routine Maintenance Activity:
-Sediment and Debris Removal

Section/Township/Range (SE 27 26 4)
Latitude (47.70692N)
Longitude (122.29082W)
Waterbody – Thornton Creek

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Mar 2013

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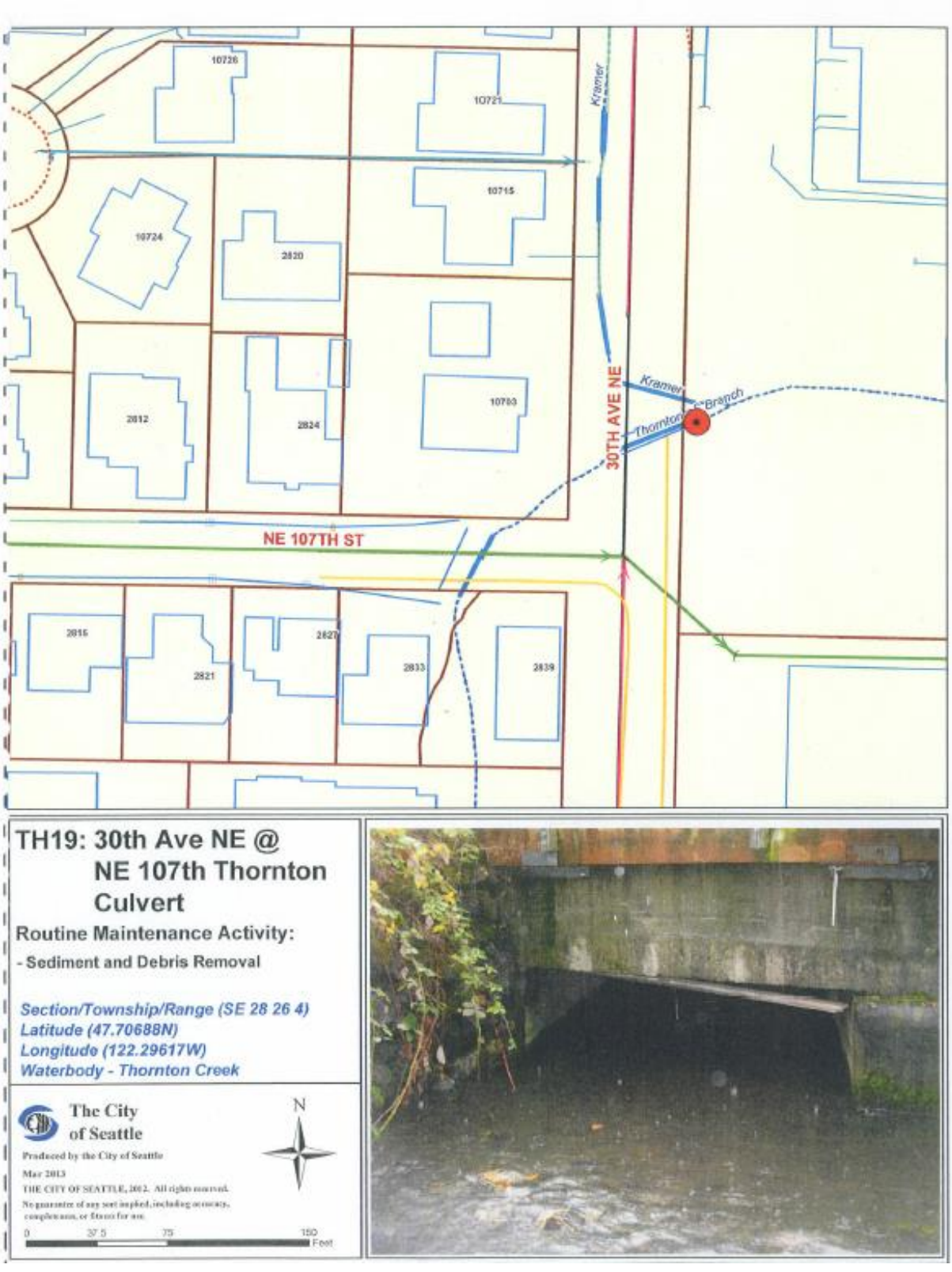
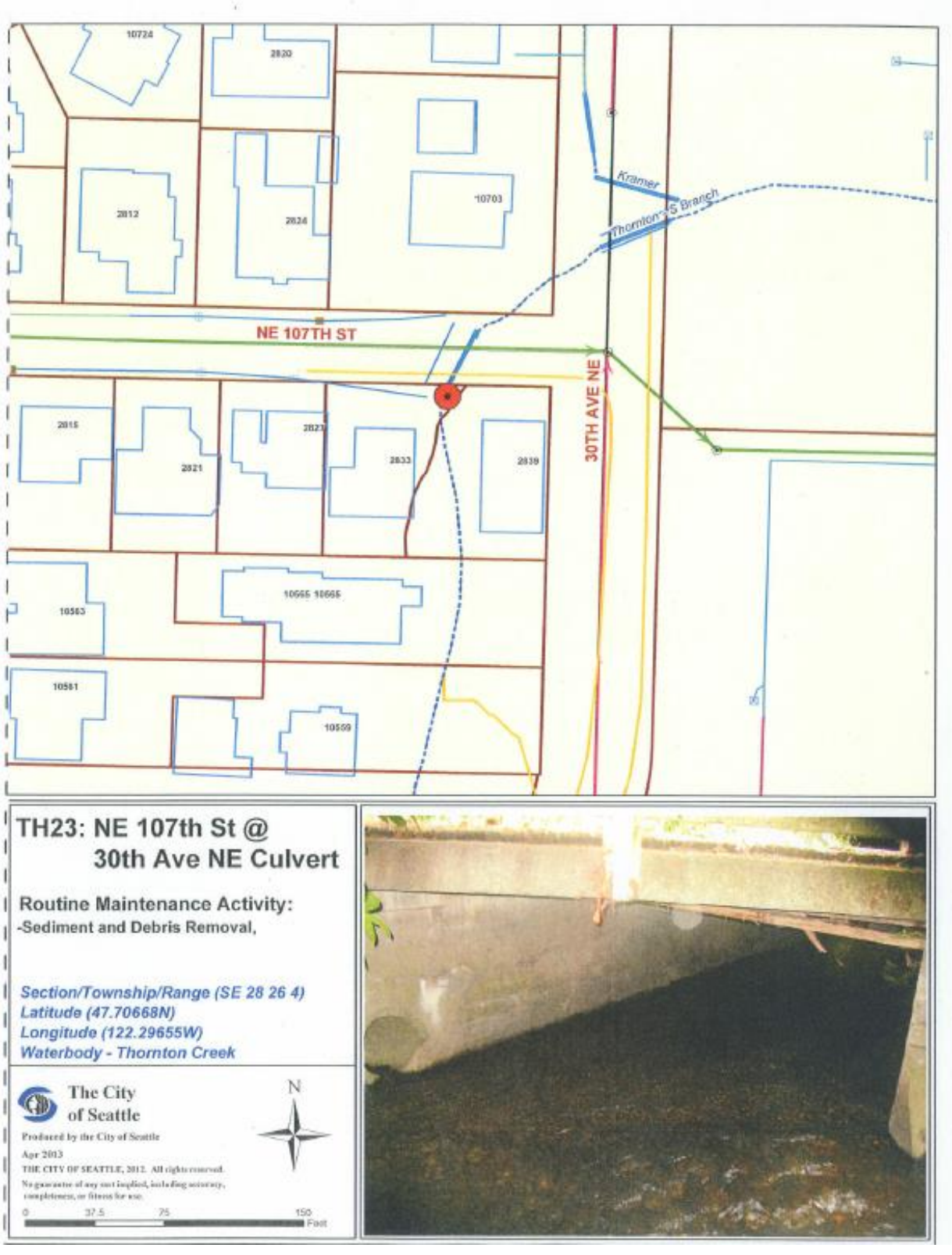
TH19: 30th Ave NE @ NE 107th Thornton Culvert

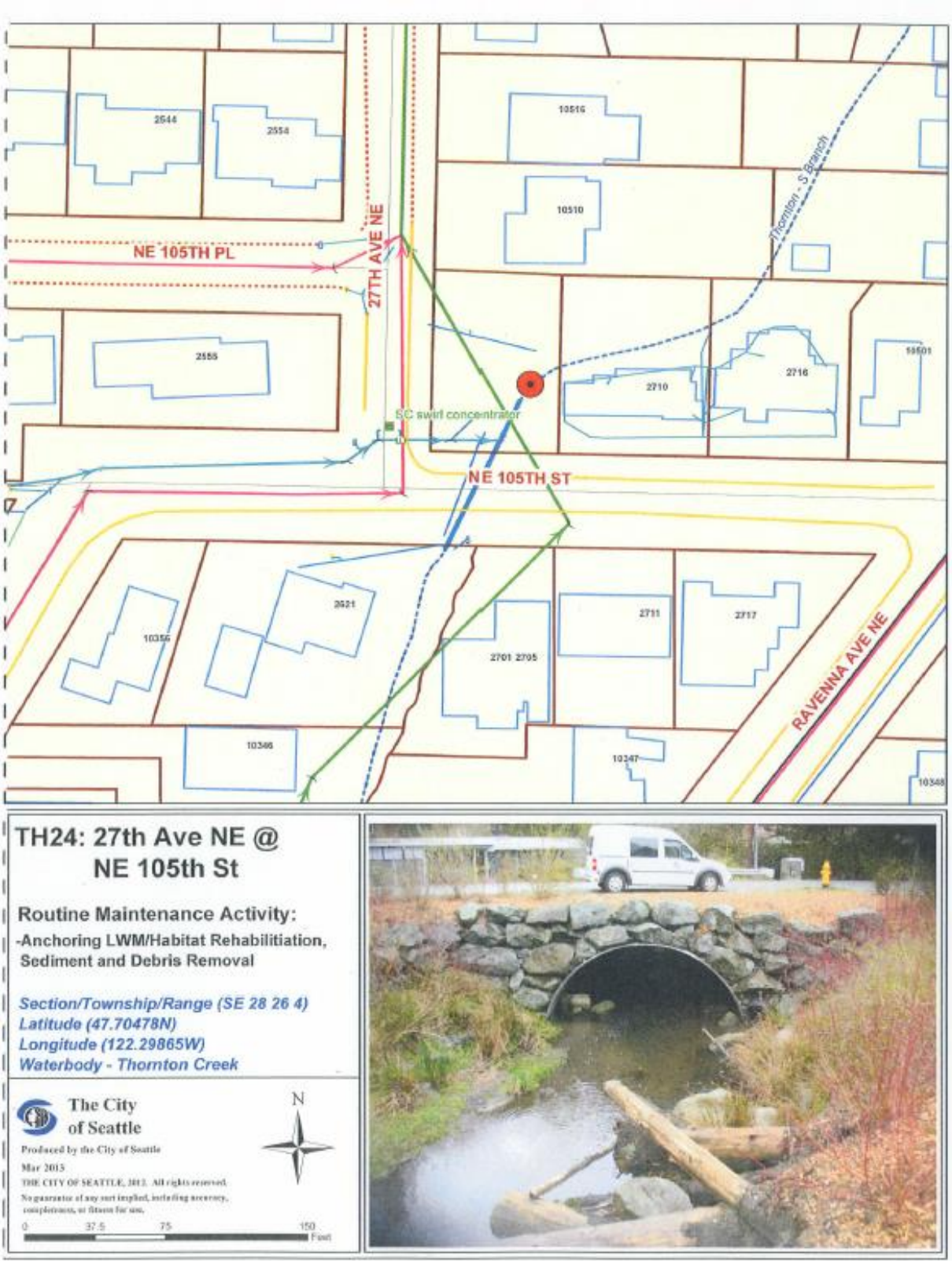


TH21: 30th Ave NE @ NE 110th St

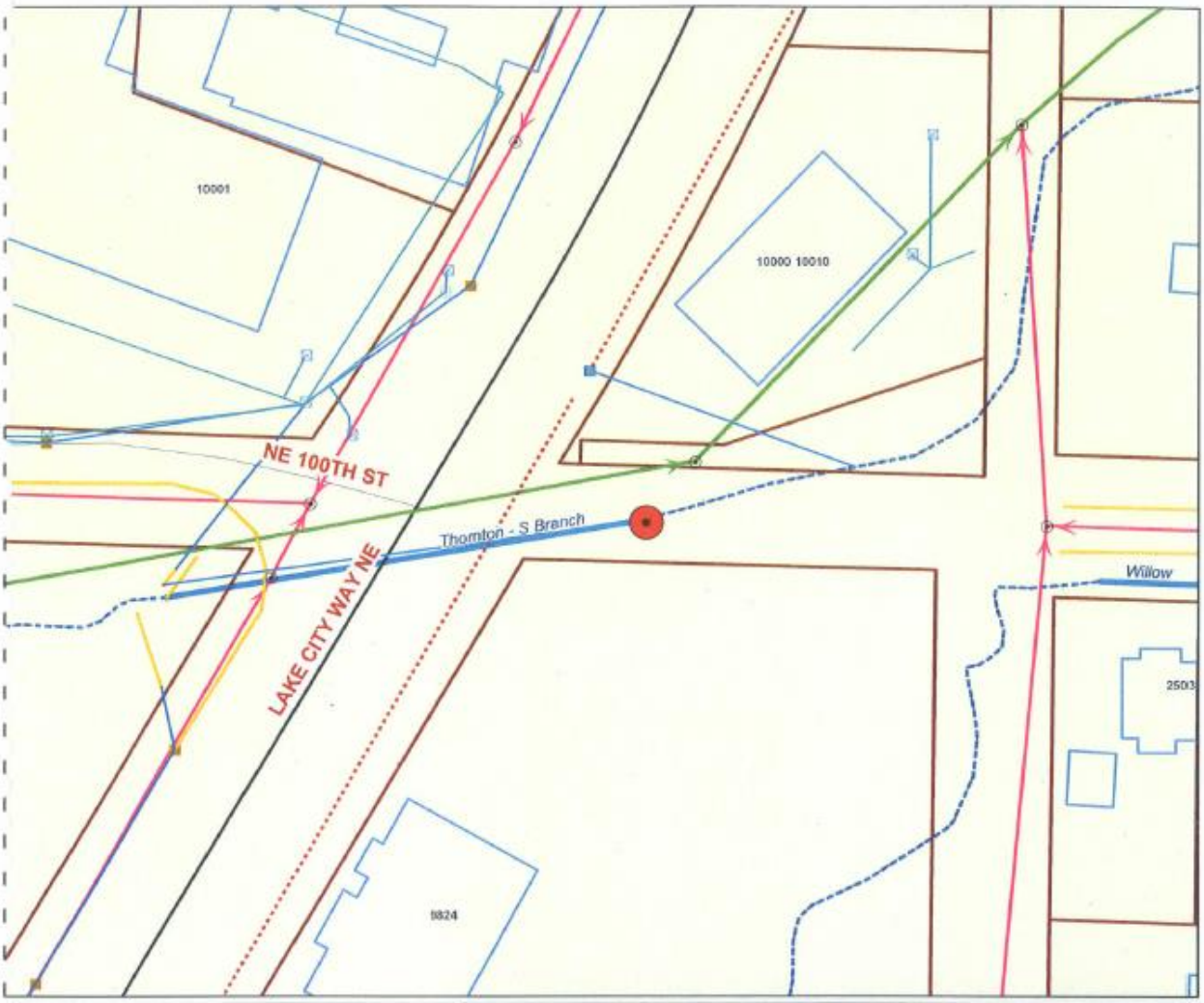
TH23: NE 107th St @ 30th Ave NE Culvert



TH24: 27th Ave NE @ NE 105th St



TH25: Lake City Fish Ladder



TH25: Lake City Fish Ladder

Routine Maintenance Activity:
- Anchoring LWM/Habitat Rehabilitation, Sediment and Debris Removal

Section/Township/Range (NW 33 26 4)
Latitude (47.70112N)
Longitude (122.30262W)
Waterbody - Thornton Creek

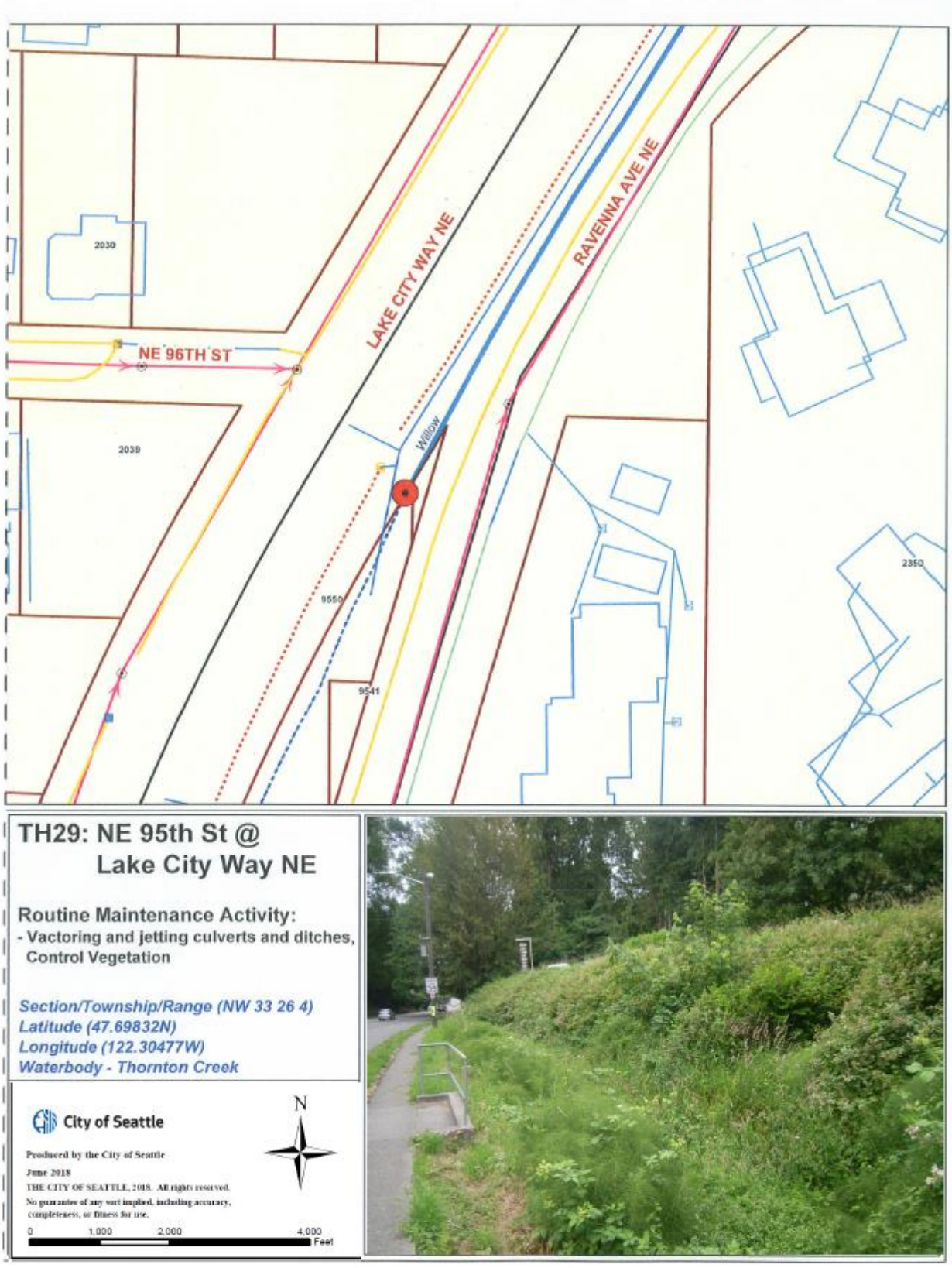
City of Seattle

Produced by the City of Seattle
June 2018

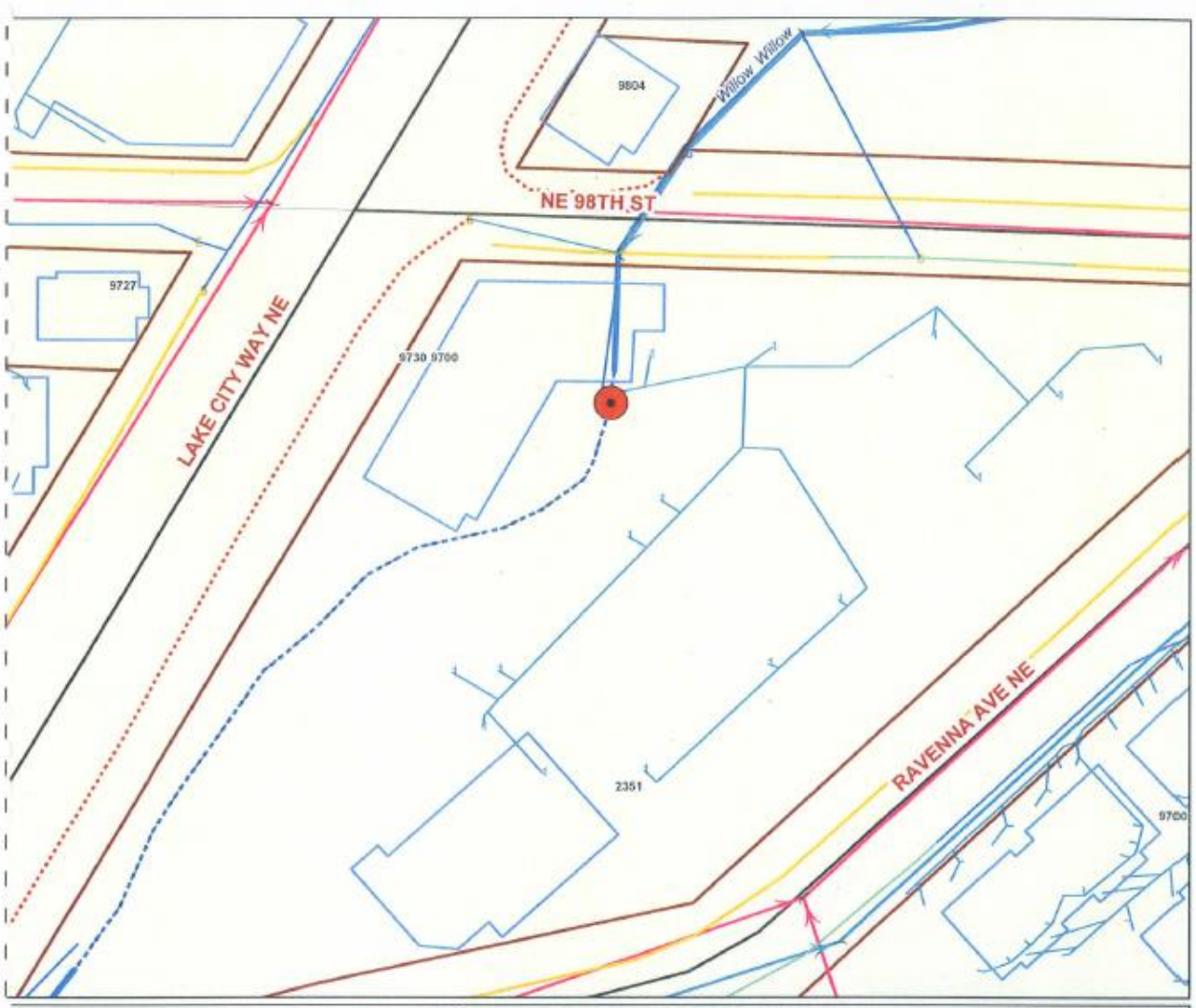
N

0 1,000 2,000 4,000 Feet

TH29: NE 95th St @ Lake city Way NE



TH30: NE 98th St @ Lake City Way NE



TH30: NE 98th St @ Lake City Way NE

Routine Maintenance Activity:

- Vactoring and Jetting culverts and ditches

Section/Township/Range (NW 33 26 4)
Latitude (47.70007N)
Longitude (122.30287W)
Waterbody - Willow Creek

City of Seattle

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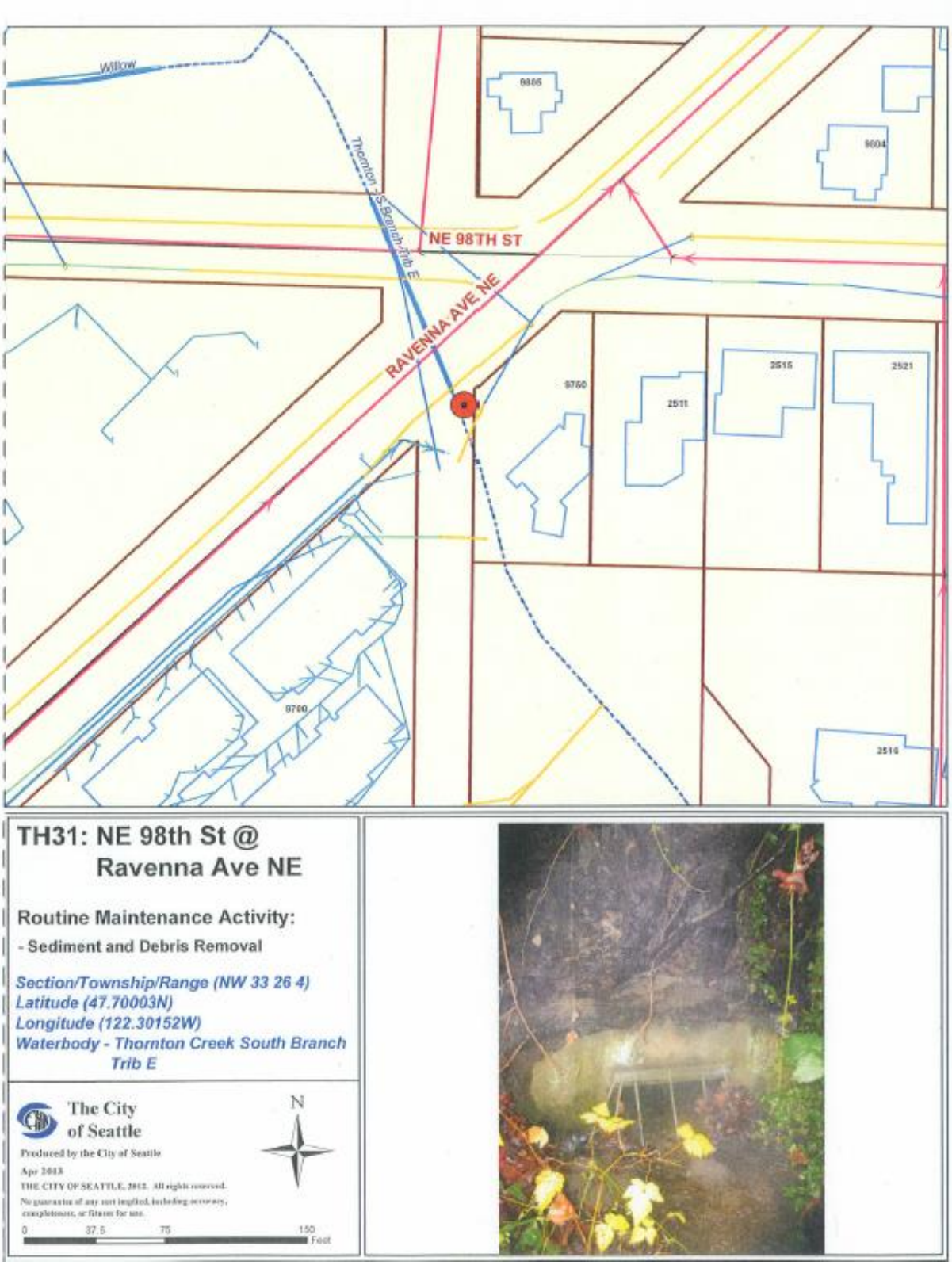
June 2018

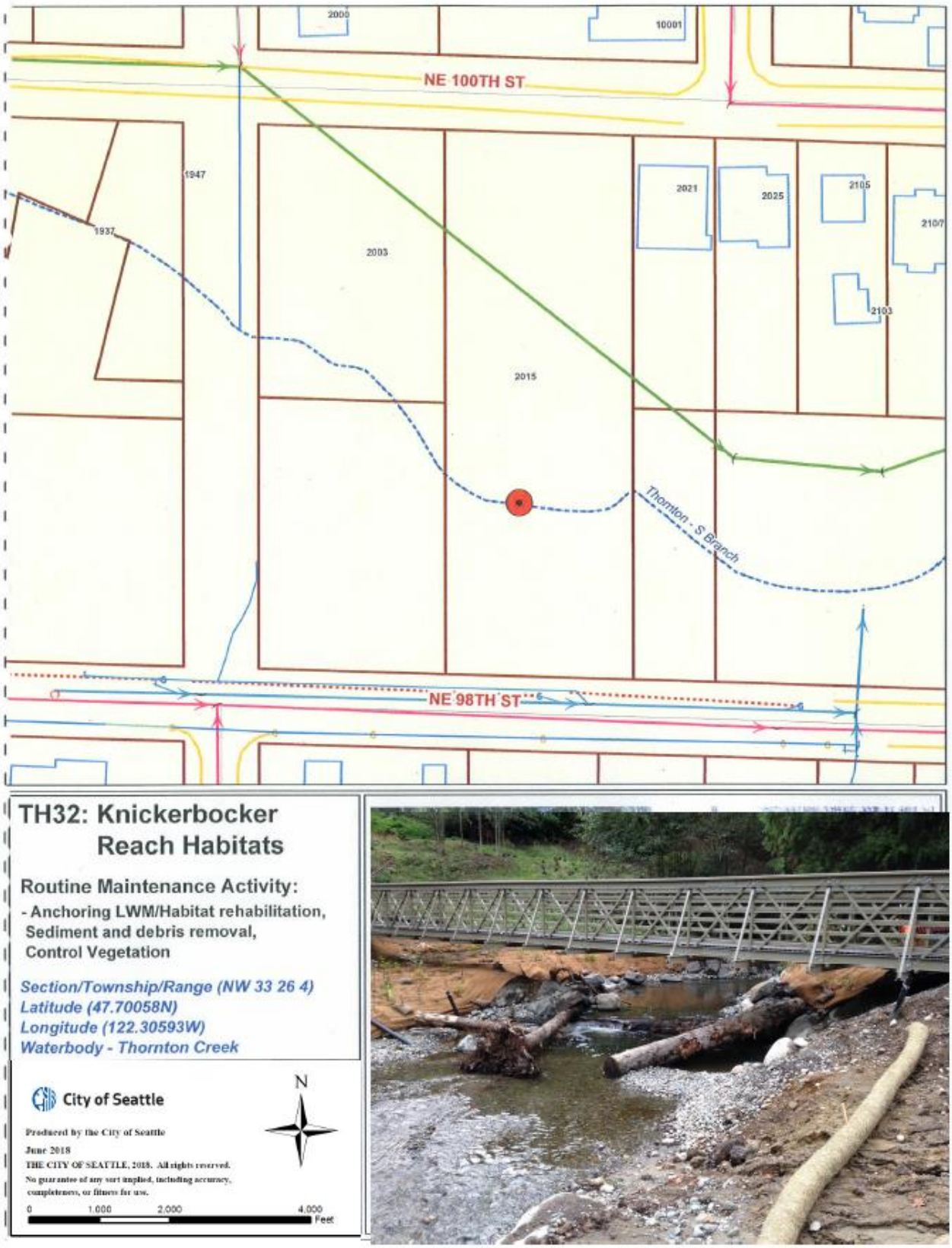
N

0 1,000 2,000 4,000 Feet

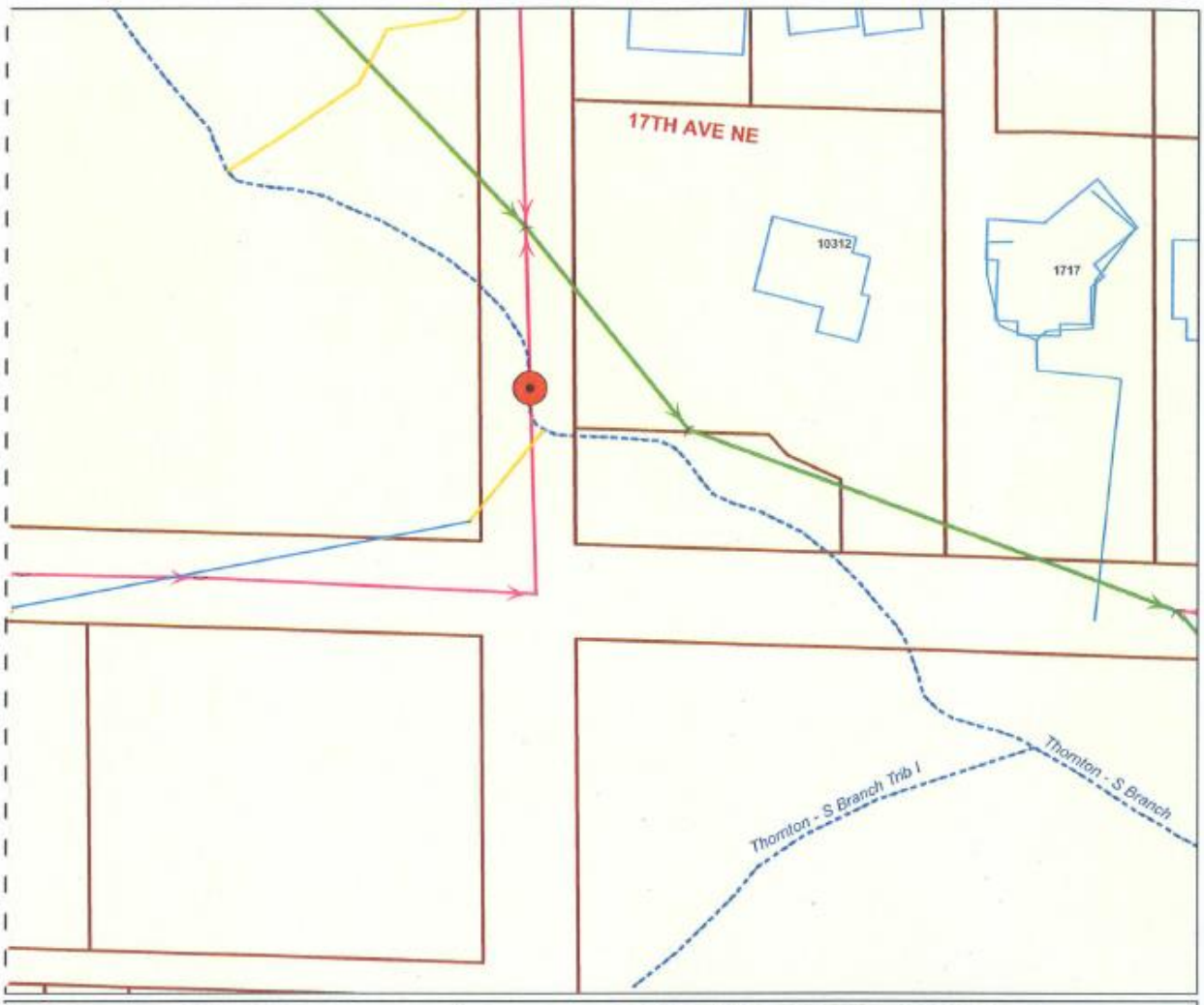
TH31: NE 98th St @ Ravenna Ave NE



TH32: Knickerbocker Reach Habitats



TH33: NE 103rd St Sewer Crossing



TH33: NE 103rd St Sewer Crossing

Routine Maintenance Activity:
- Anchoring LWM/Habitat rehabilitation, Sediment and debris removal, Control Vegetation

Section/Township/Range (NW 33 26 4)
Latitude (47.70327N)
Longitude (122.30967W)
Waterbody - Thornton Creek

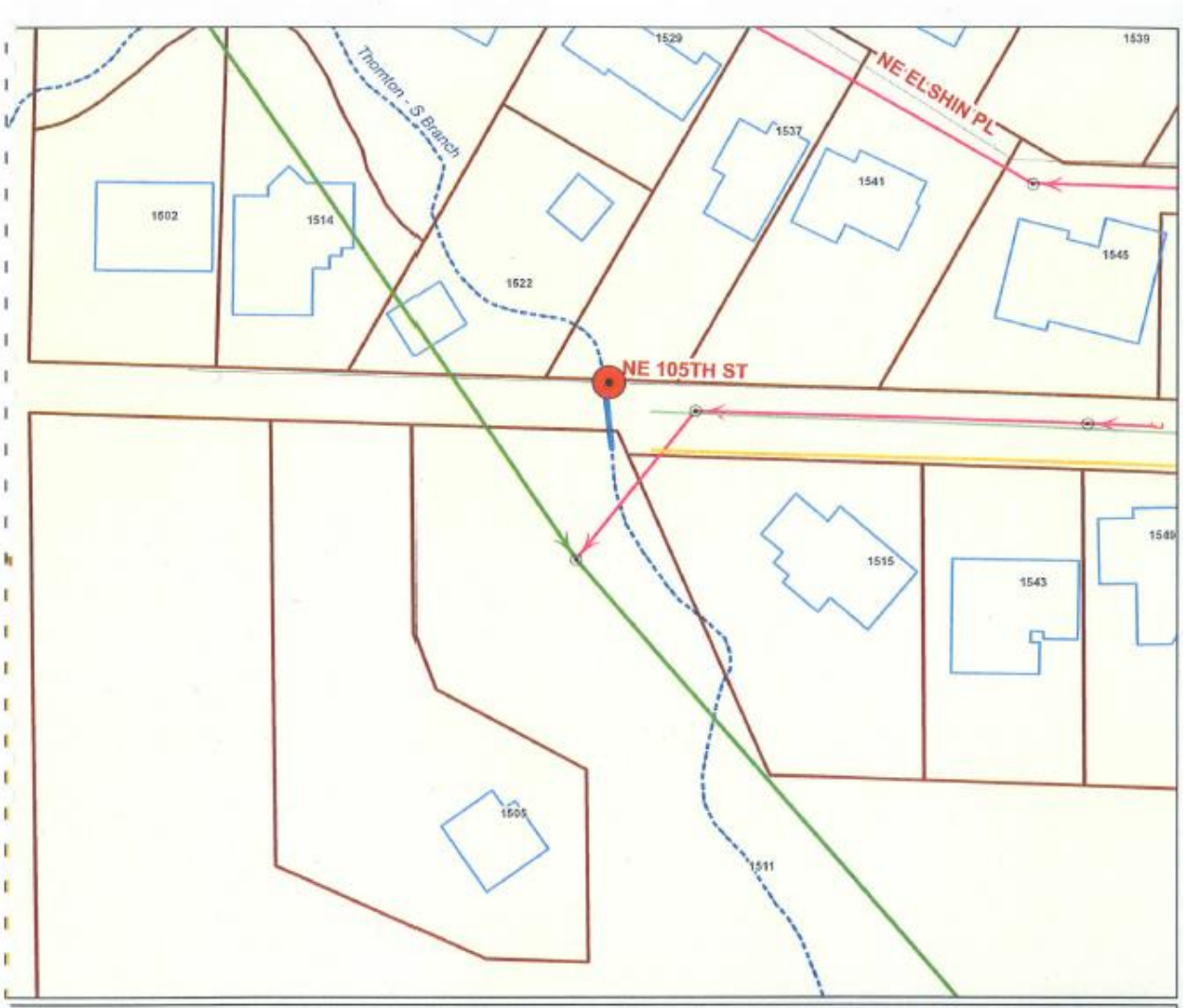
City of Seattle

Produced by the City of Seattle
June 2018

N

0 1,000 2,000 4,000 Feet

TH34: NE 105th St @ 17th Ave NE



TH34: NE 105th St @ 17th Ave NE

Routine Maintenance Activity:

- Anchoring LWM/Habitat rehabilitation, Sediment and debris removal

Section/Township/Range (E 34 26 4)
Latitude (47.70485N)
Longitude (122.31132W)
Waterbody - Thornton Creek

City of Seattle

Produced by the City of Seattle
June 2018

N

0 1,000 2,000 4,000 Feet

TH35: NE 108th St @ 8th Ave NE (Beaver Lodge)

TH35: NE 105th St @ 8th Ave NE (Beaver Lodge)

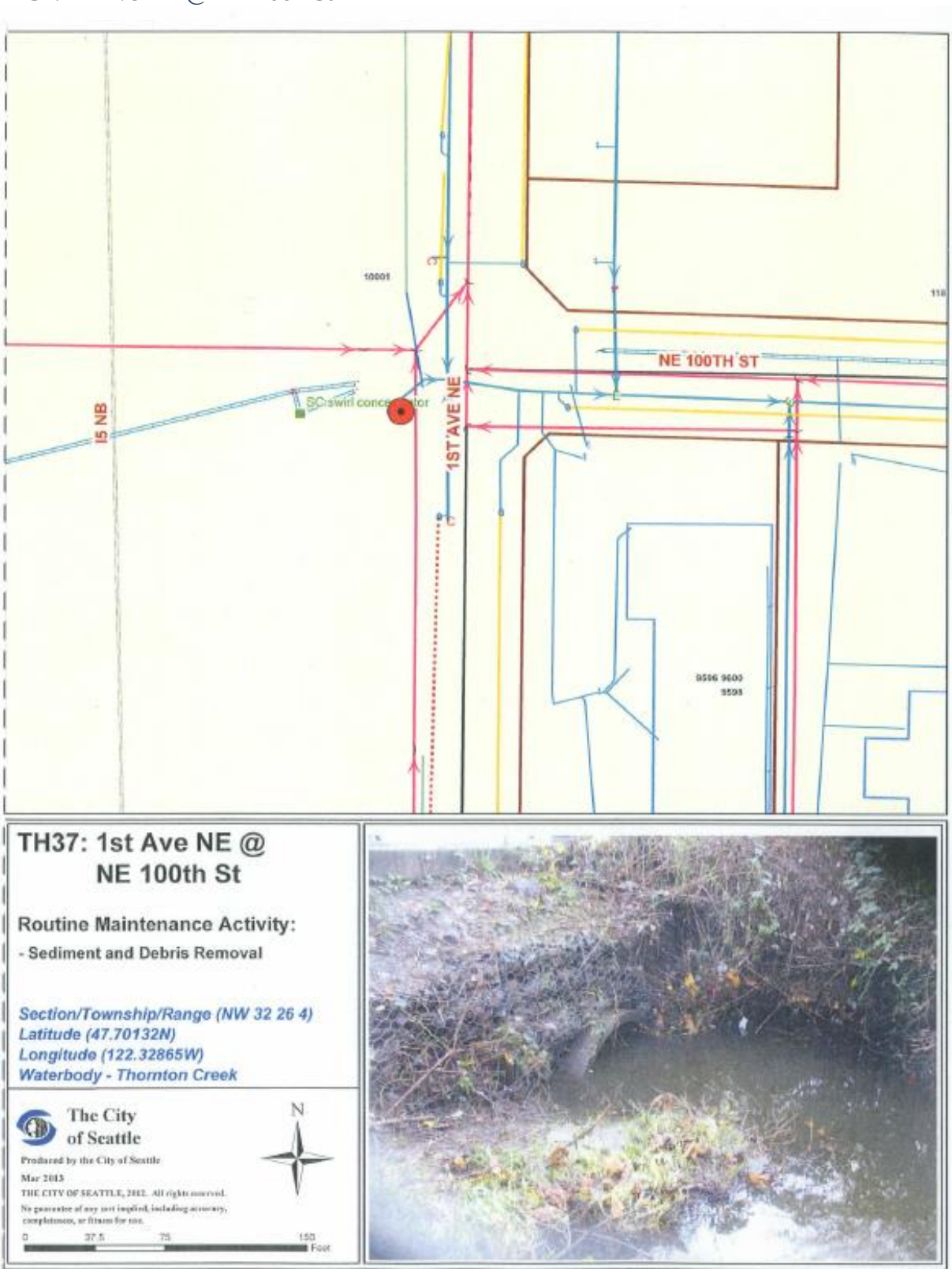
Routine Maintenance Activity:
Sediment and Debris Removal

Section/Township/Range (SE 29 26 4)
Latitude (47.705587N)
Longitude (122.31977W)
Waterbody – Thornton Creek

The City of Seattle
Produced by the City of Seattle
Mar 2013

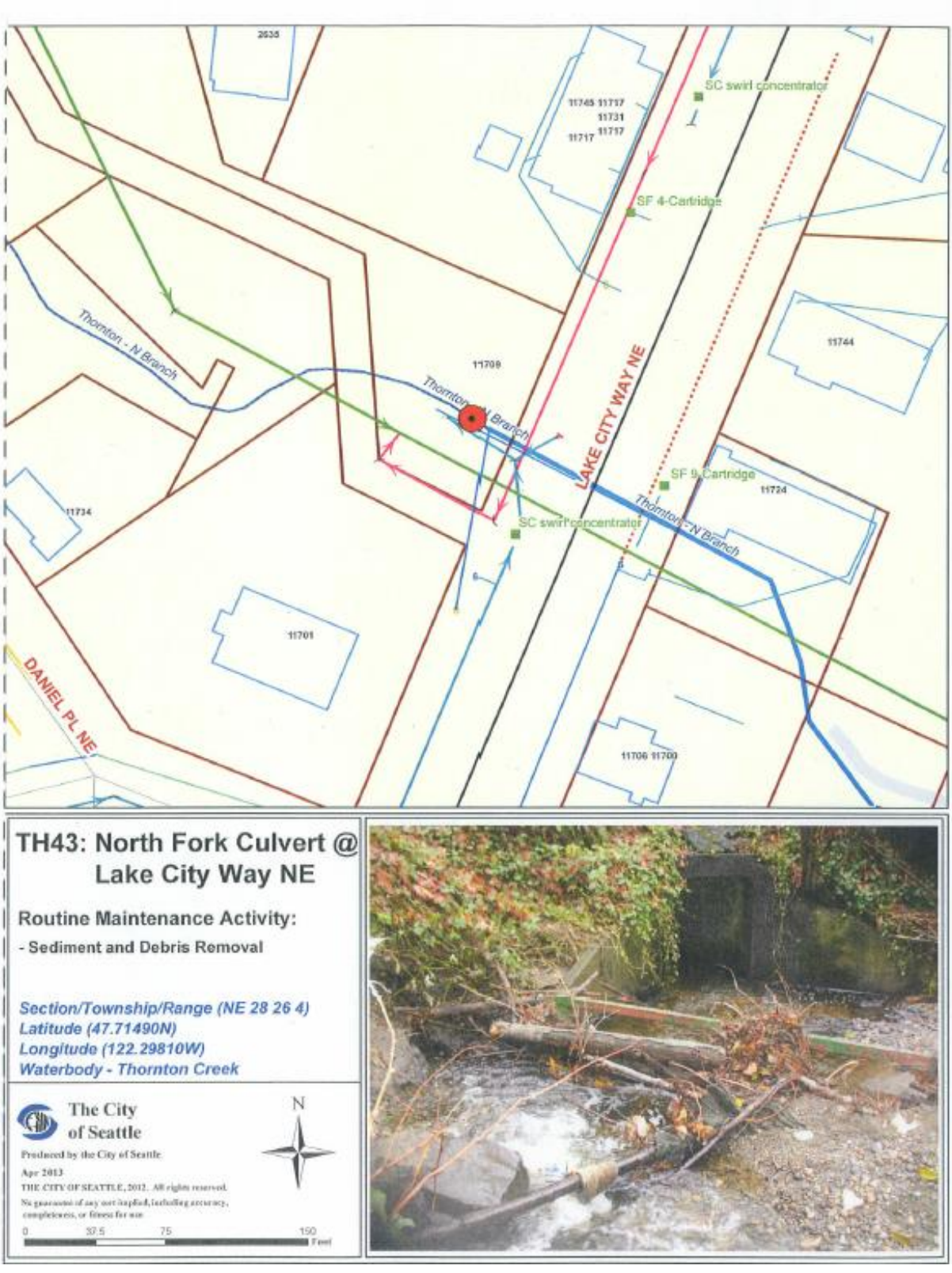
N

TH37: 1st Ave NE @ NE 100th St

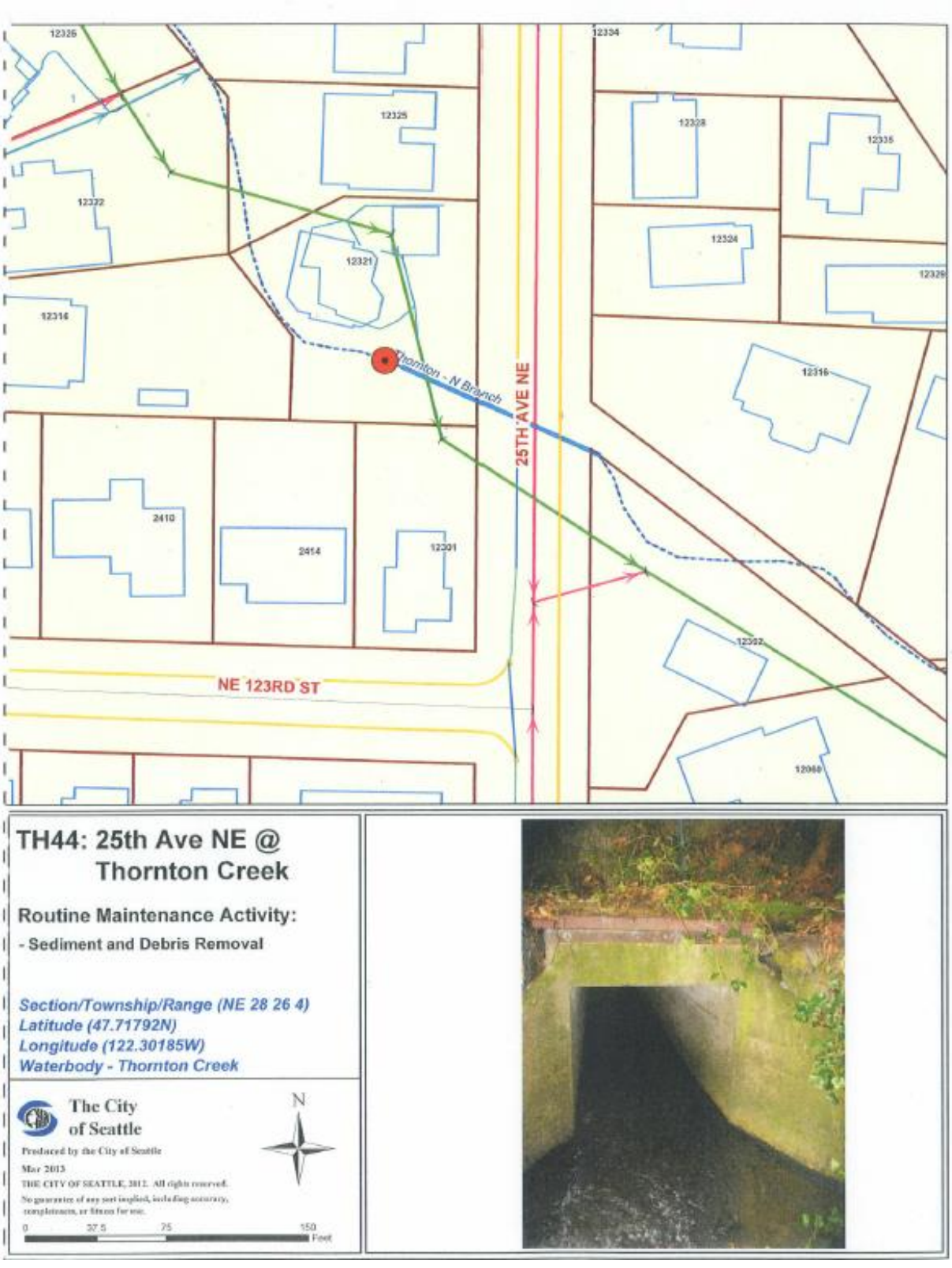


TH38: 1st Ave NE @ NE 100th St Ditch

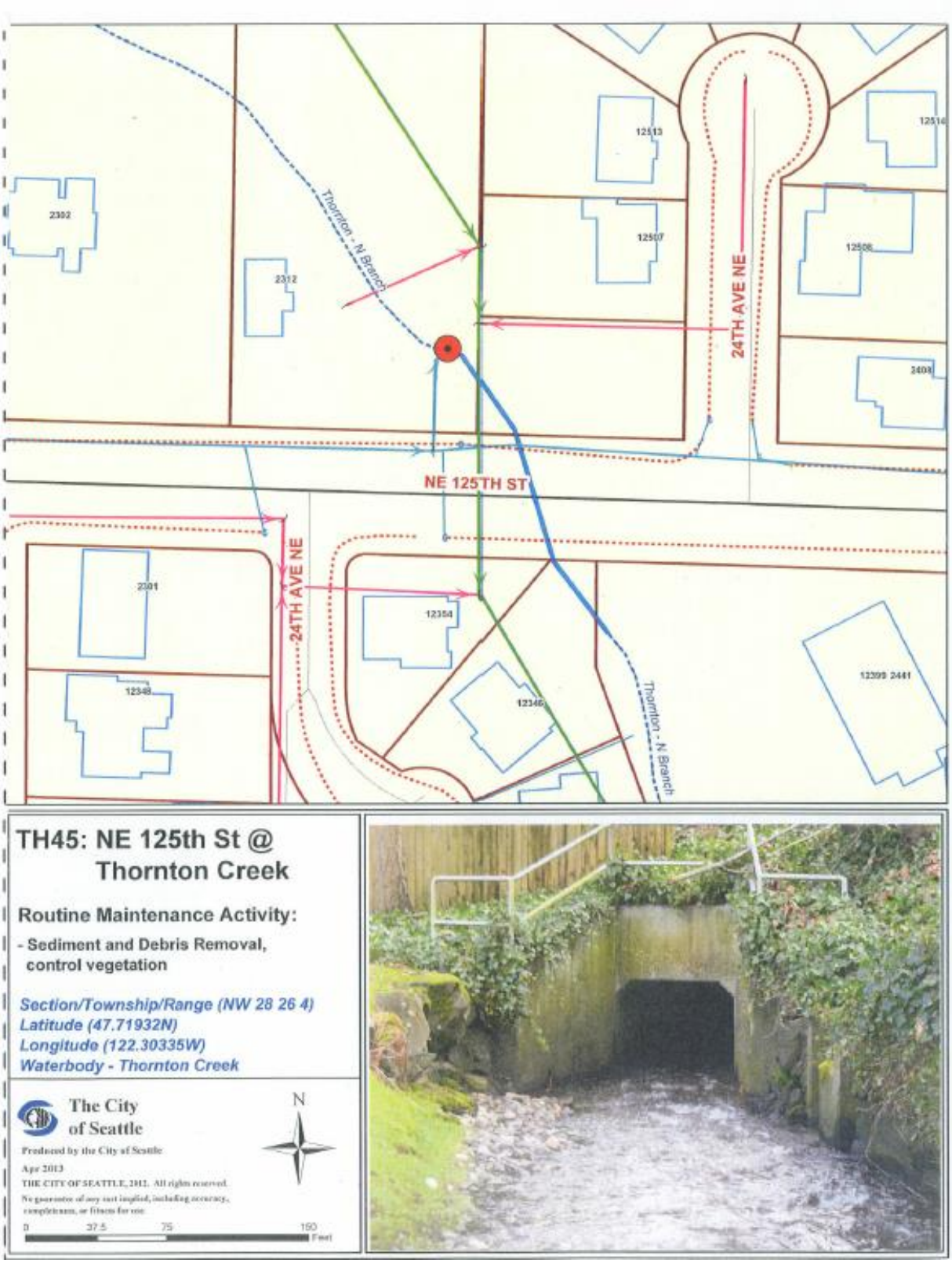
TH43: North Fork Culvert @ Lake City Way NE



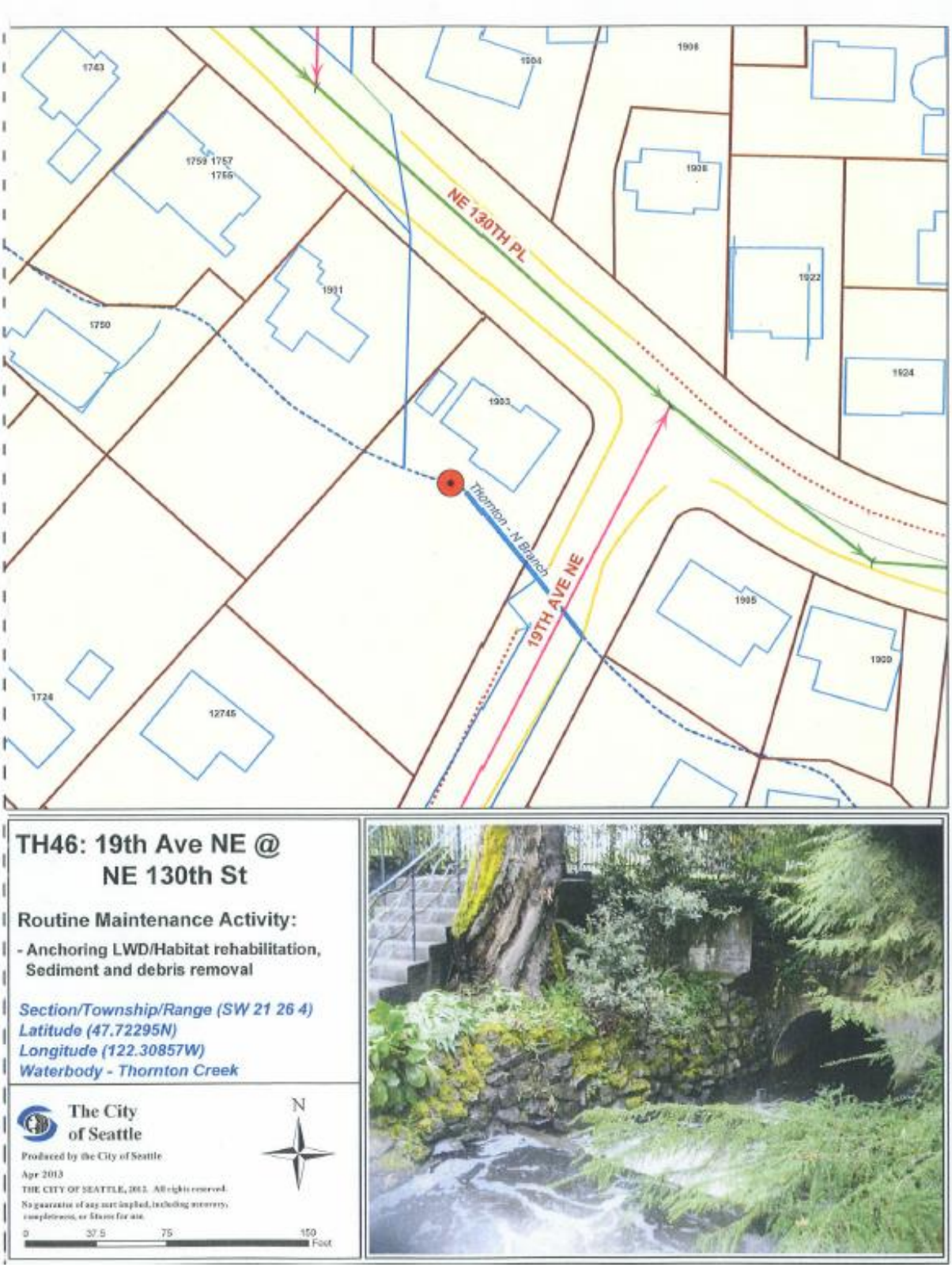
TH44: 25th Ave NE @ Thornton Creek



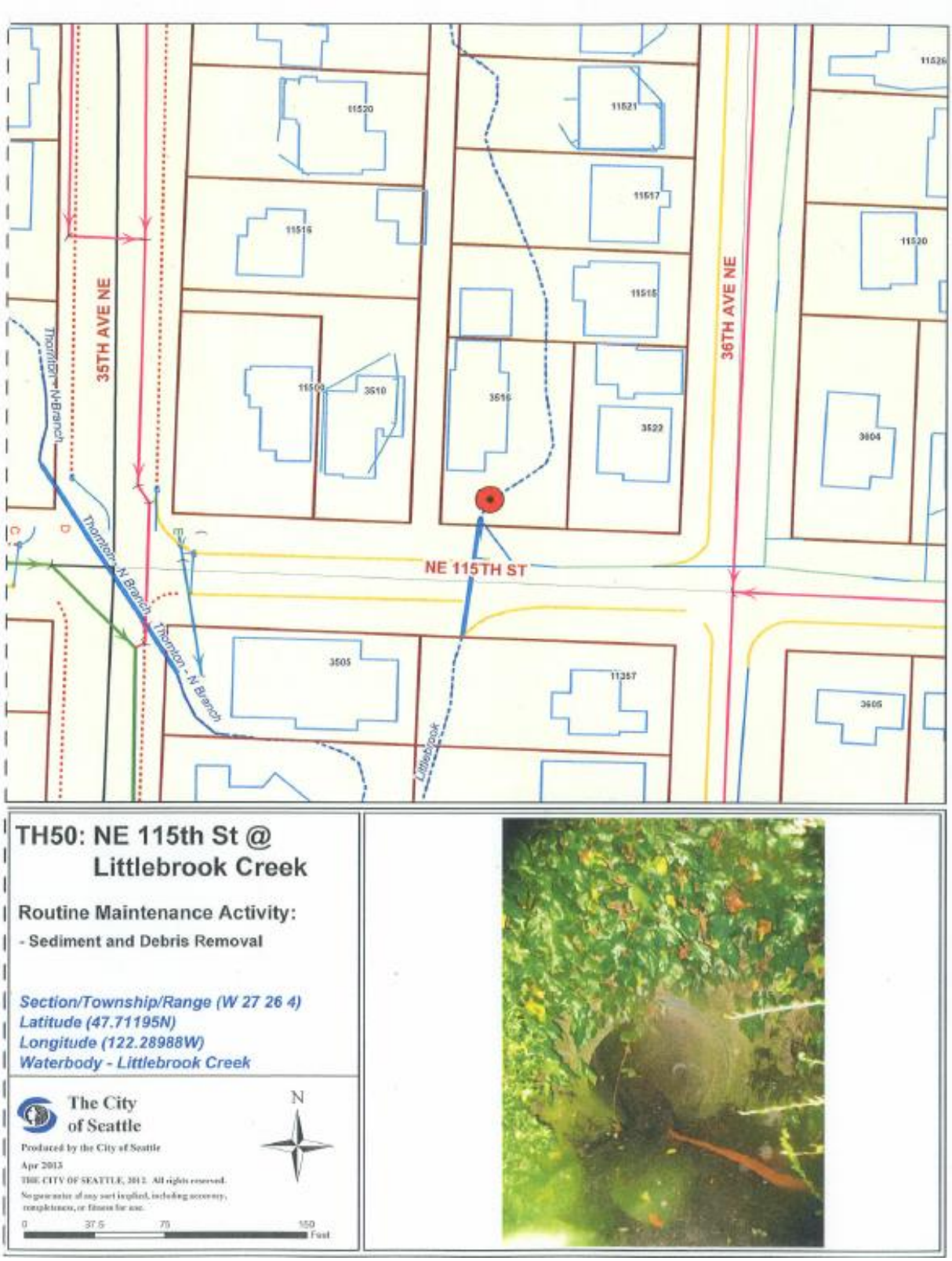
TH45: NE 125th St @ Thornton Creek



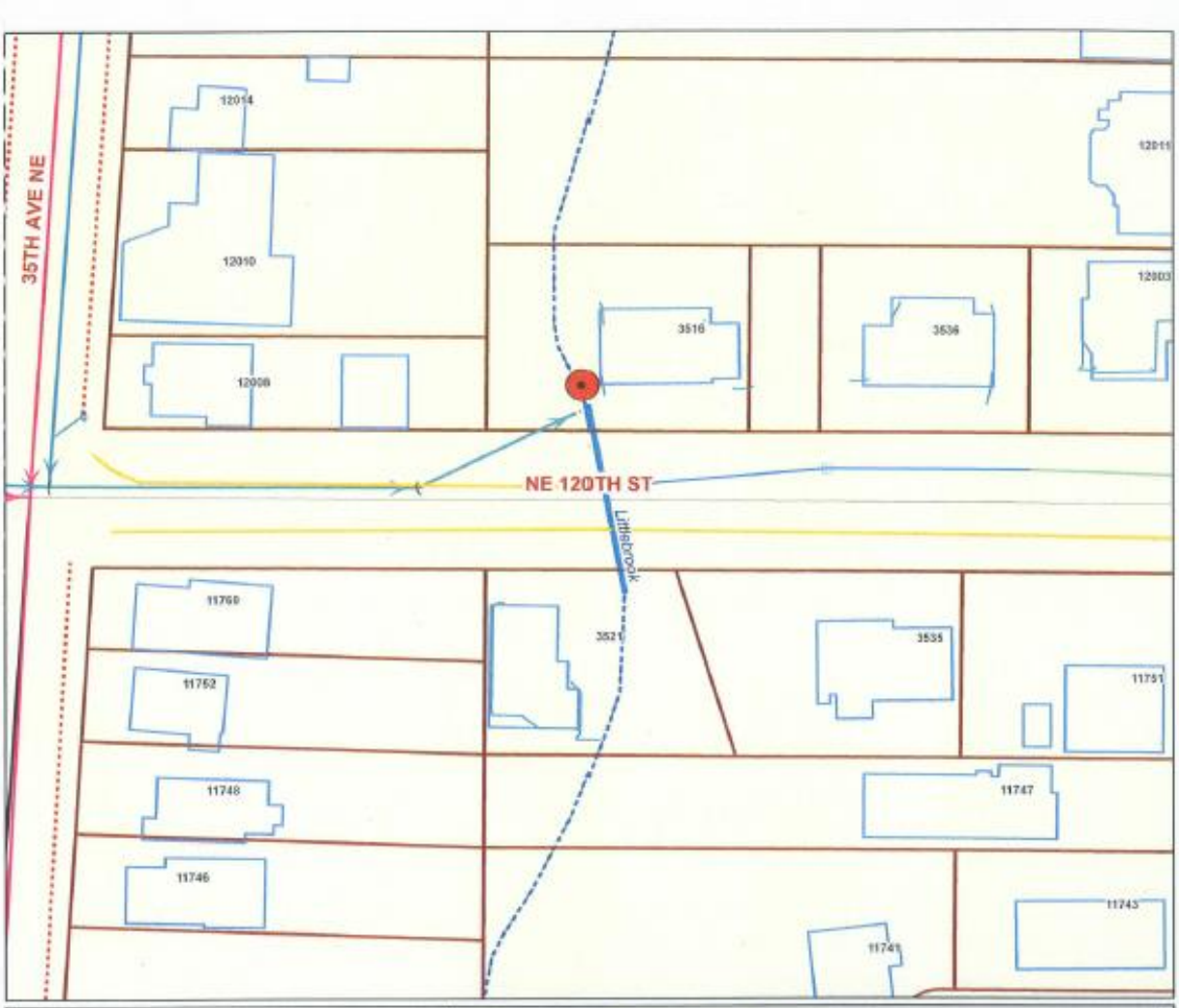
TH46: 19th Ave NE @ NE 130th St



TH50: NE 115th St @ Littlebrook Creek



TH51: NE 120th St @ Littlebrook Creek



TH51: NE 120th St @ Littlebrook Creek

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (NW 27 26 4)
Latitude (47.71550N)
Longitude (122.29050W)
Waterbody - Littlebrook Creek

The City of Seattle

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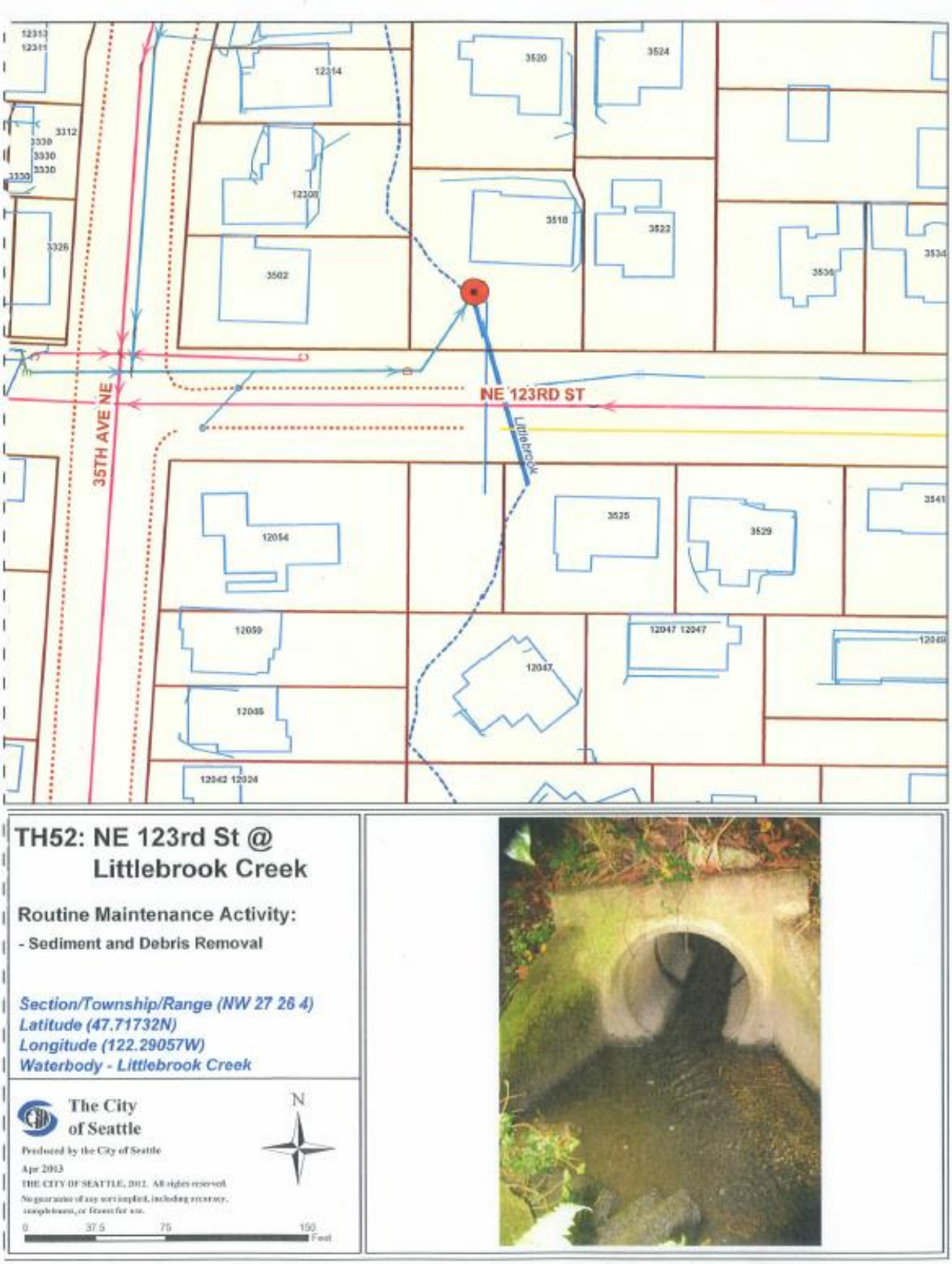
Apr 2013

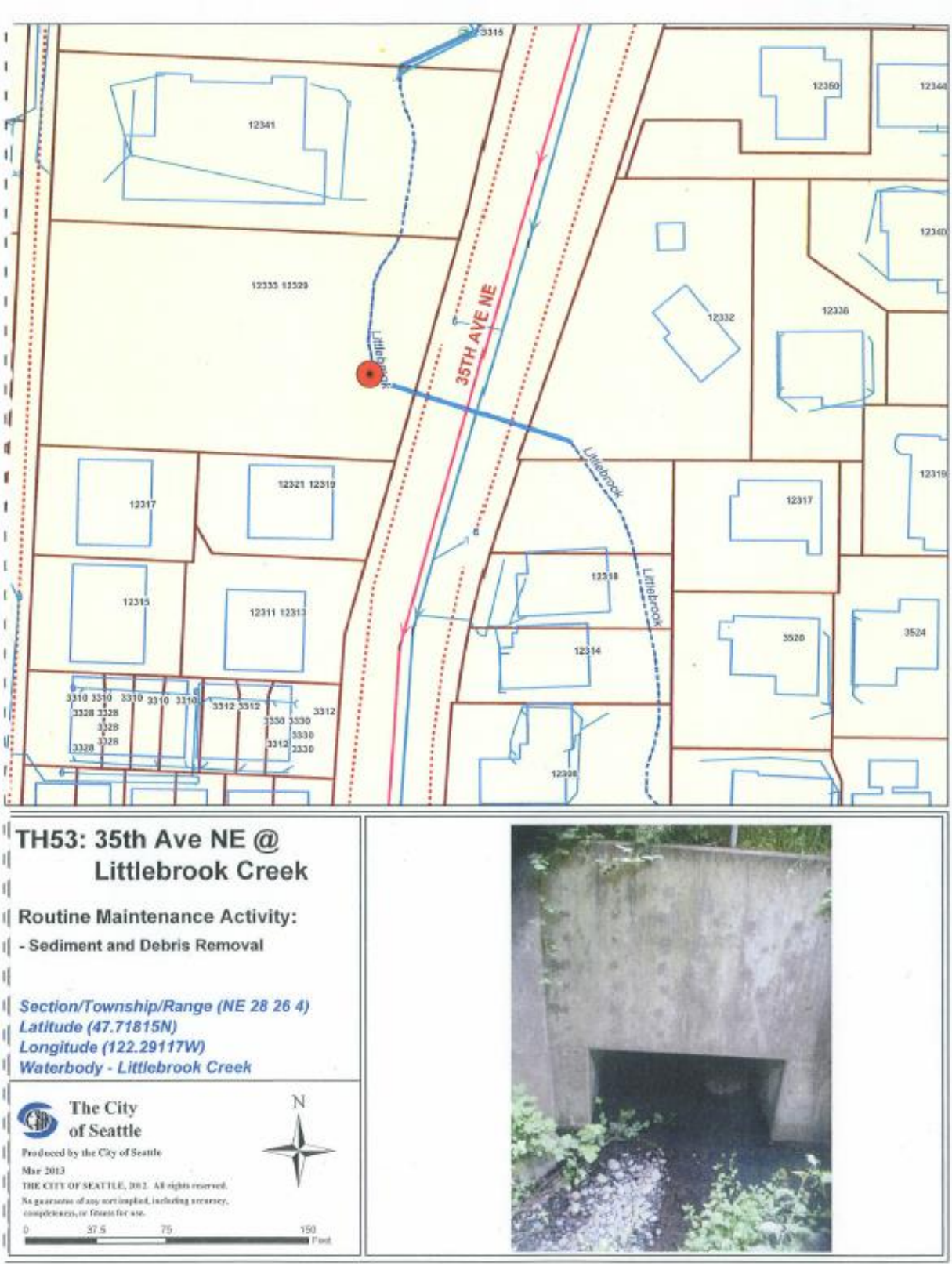
N

0 37.5 75 150 Feet

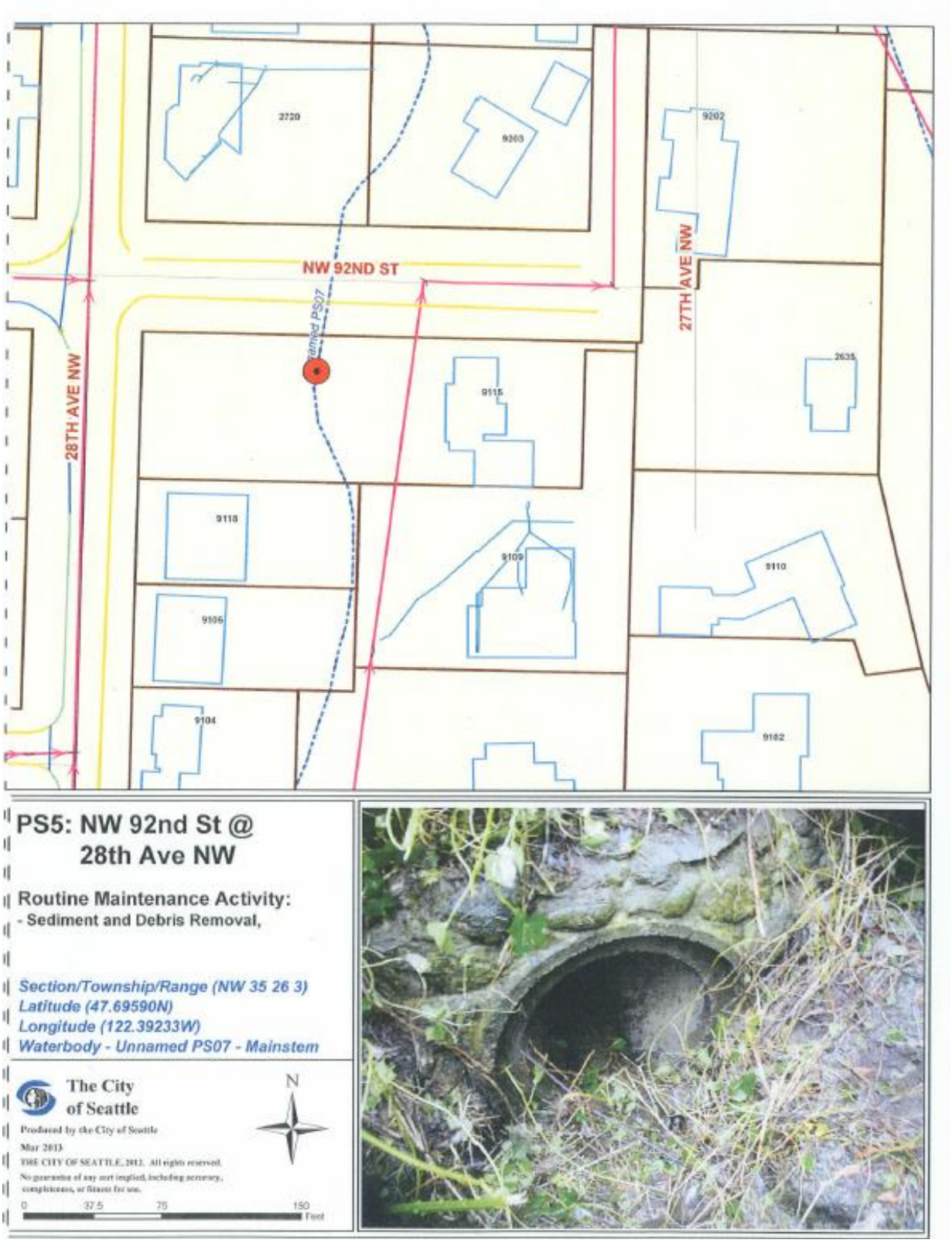
TH52: NE 123rd St @ Littlebrook Creek



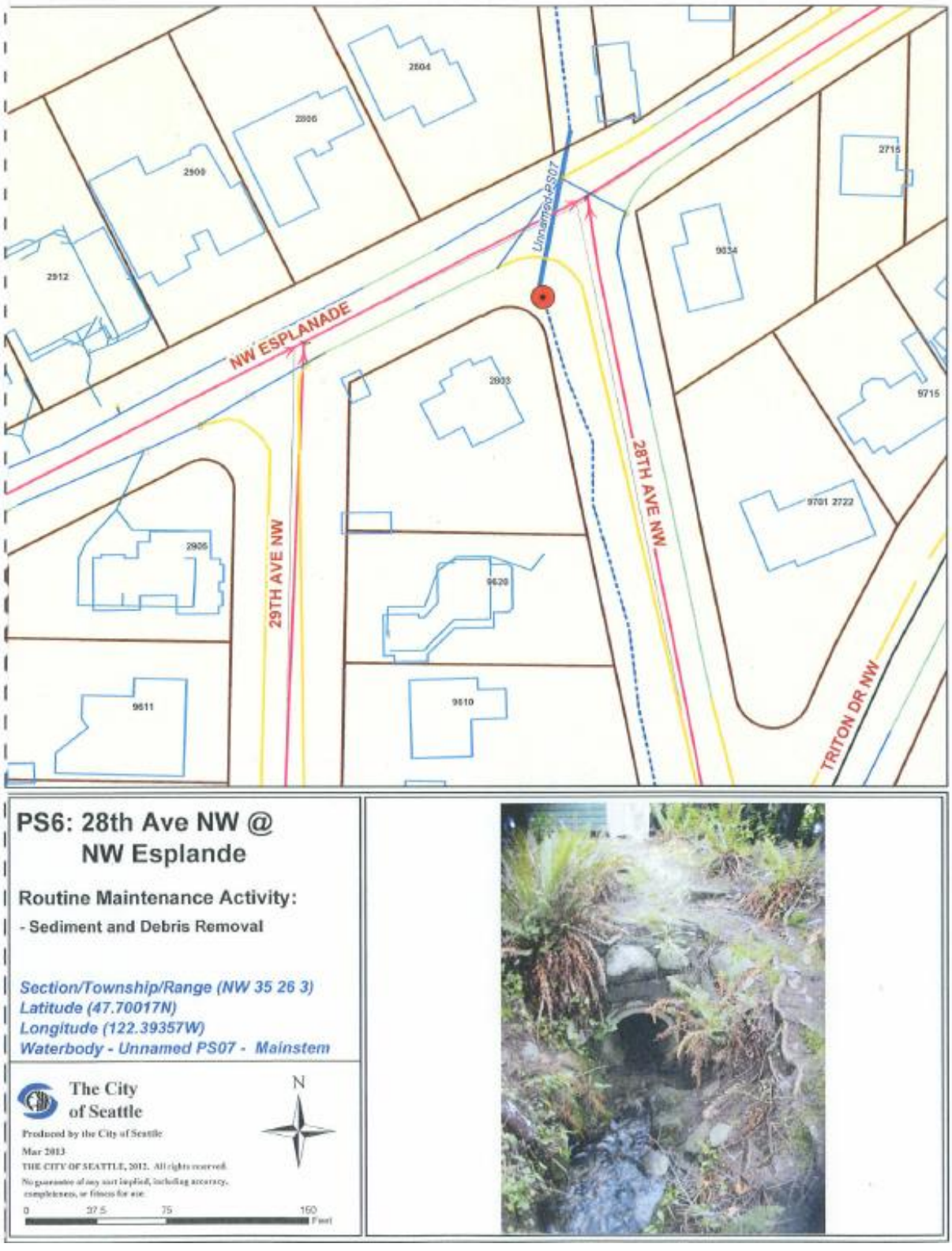
TH53: 35th Ave NE @ Littlebrook Creek



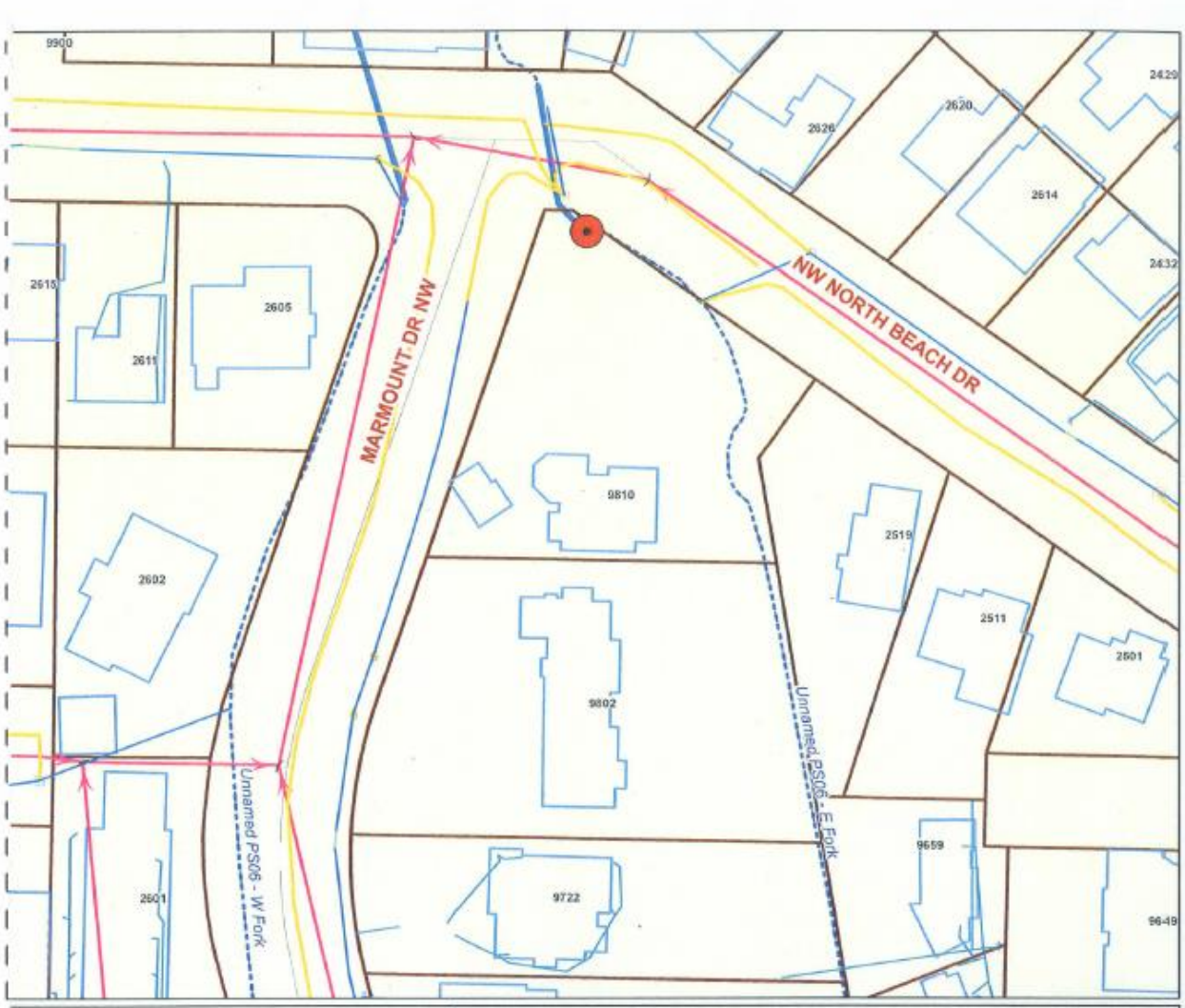
PS5: NW 92nd St @ 28th Ave NW



PS6: 28th Ave NW @ NW Esplande



PS7: Marmount Dr. NW @ NW North Beach Dr.



PS7: Marmount Dr. NW @ NW North Beach Dr.

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (E 34 26 4)
Latitude (47.70080N)
Longitude (122.38995W)
Waterbody - Unnamed PS06 - E. Fork

City of Seattle

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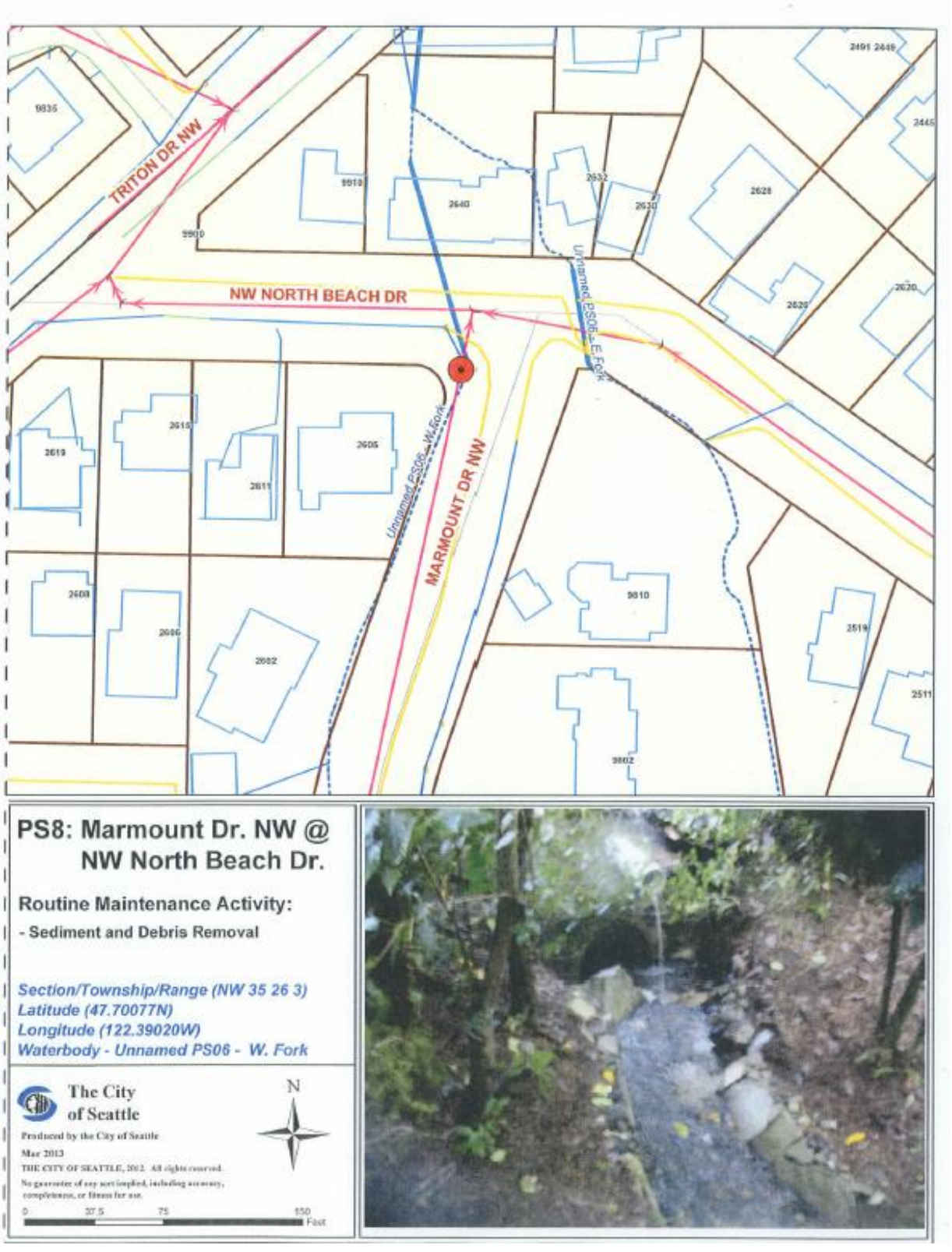
June 2018

N

0 1,000 2,000 4,000 Feet

PS8: Marmount Dr. NW @ NW North Beach Dr.



PS9: NW 96th St @ 26th Ave NW

PS9: NW 96th St @ 26th Ave NW

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (NW 34 26 3)
Latitude (47.69862N)
Longitude (122.38962W)
Waterbody - Unnamed PS06 - E. Fork

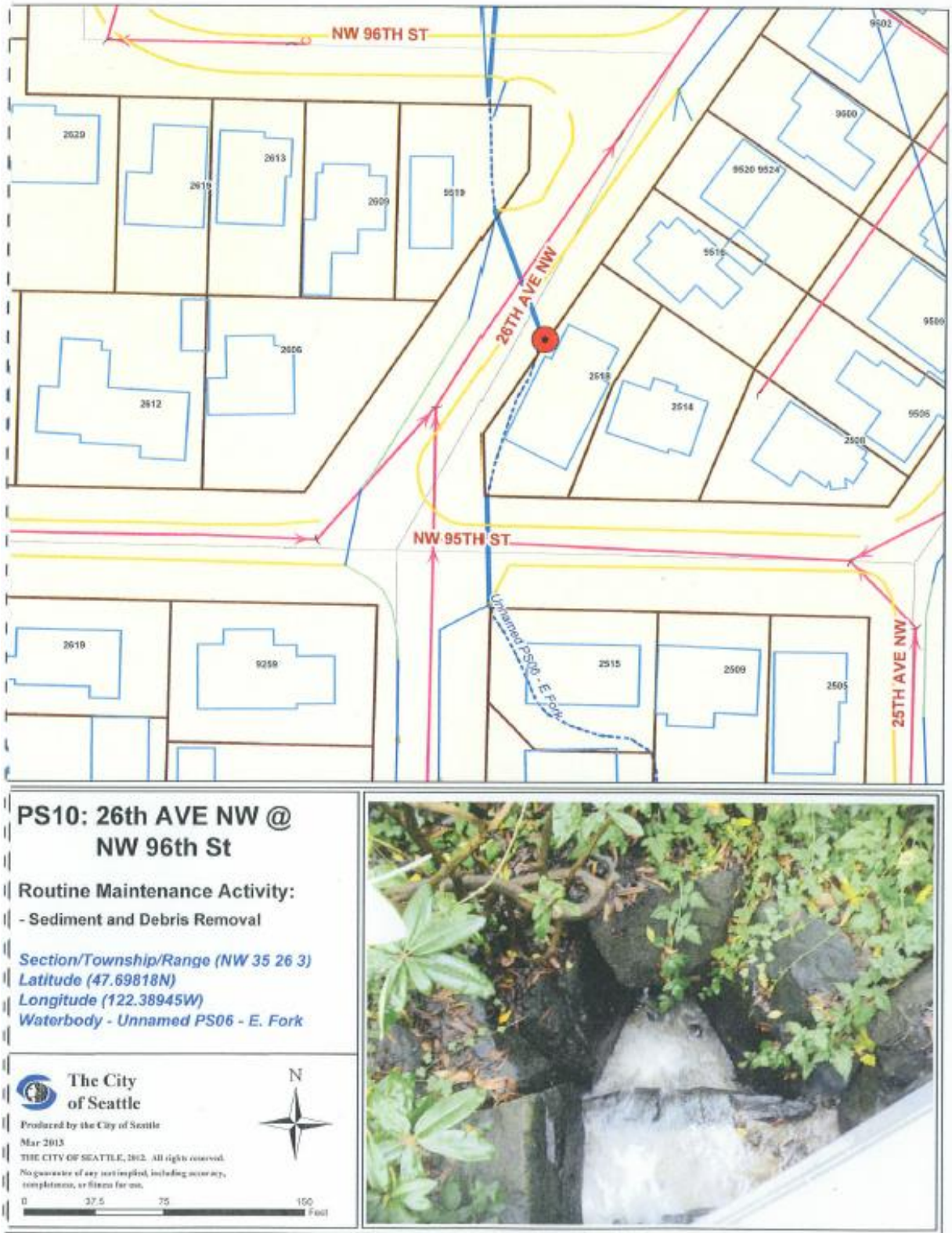
The City of Seattle

Produced by the City of Seattle
Mar 2013

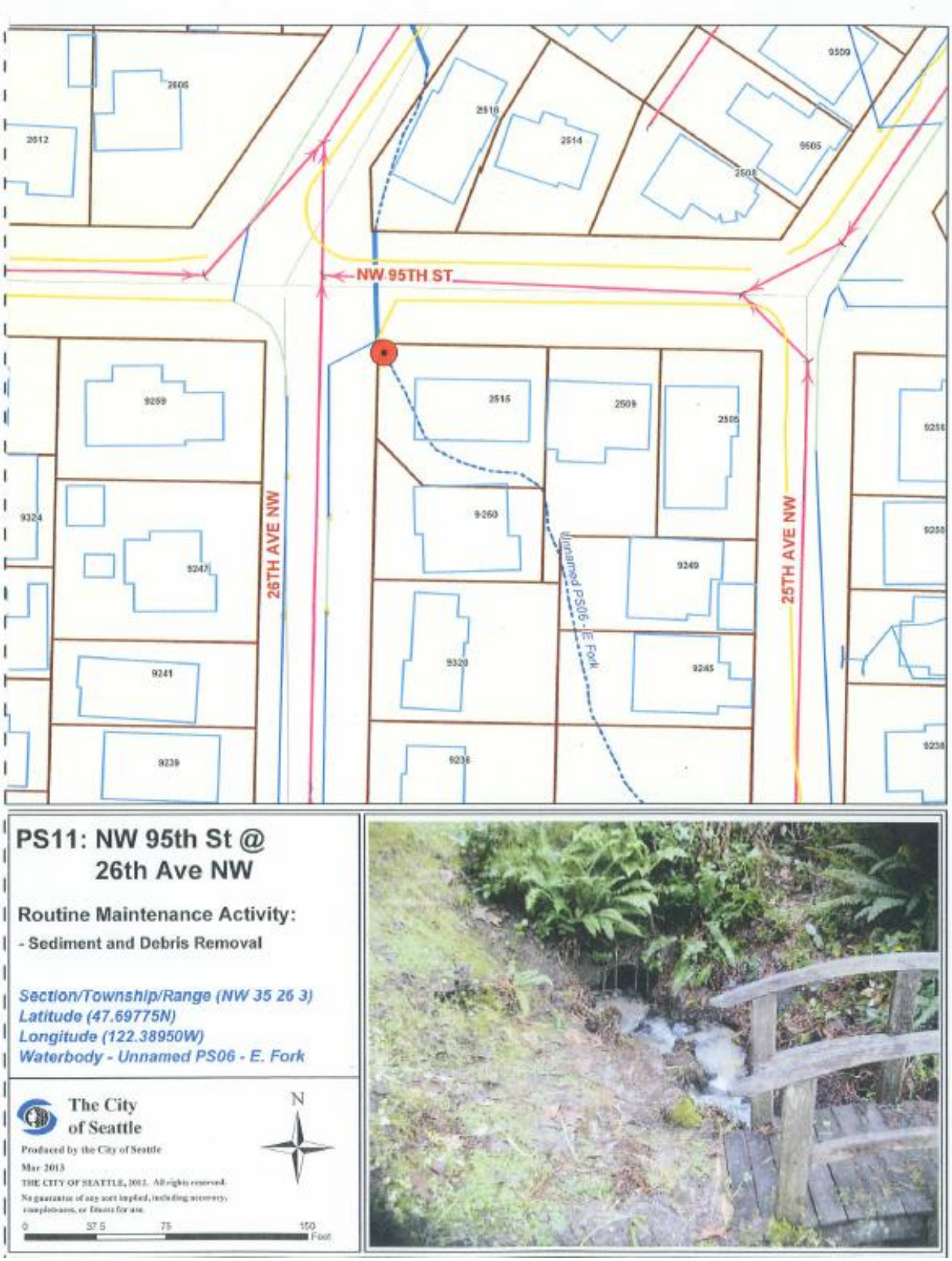
N

0 37.5 75 150 Feet

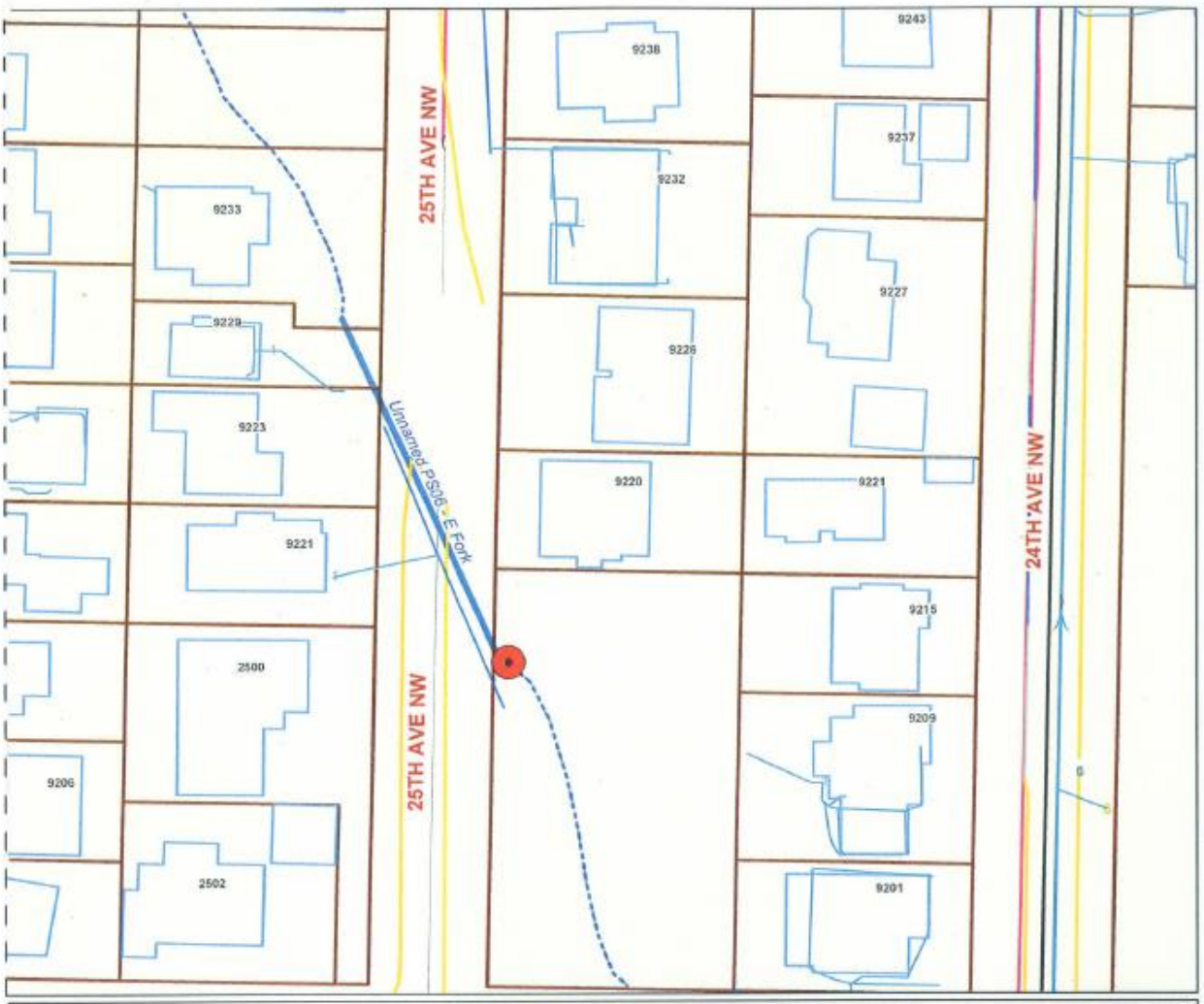
PS10: 26th Ave NW @ NW 96th St



PS11: NW 95th St @ 26th Ave NW



PS12: NW 92nd St @ 25th Ave NW



PS12: NW 92nd St @ 25th Ave NW

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (NW 35 26 3)
Latitude (47.69650N)
Longitude (122.38850W)
Waterbody - Unnamed PS06 - E. Fork

City of Seattle

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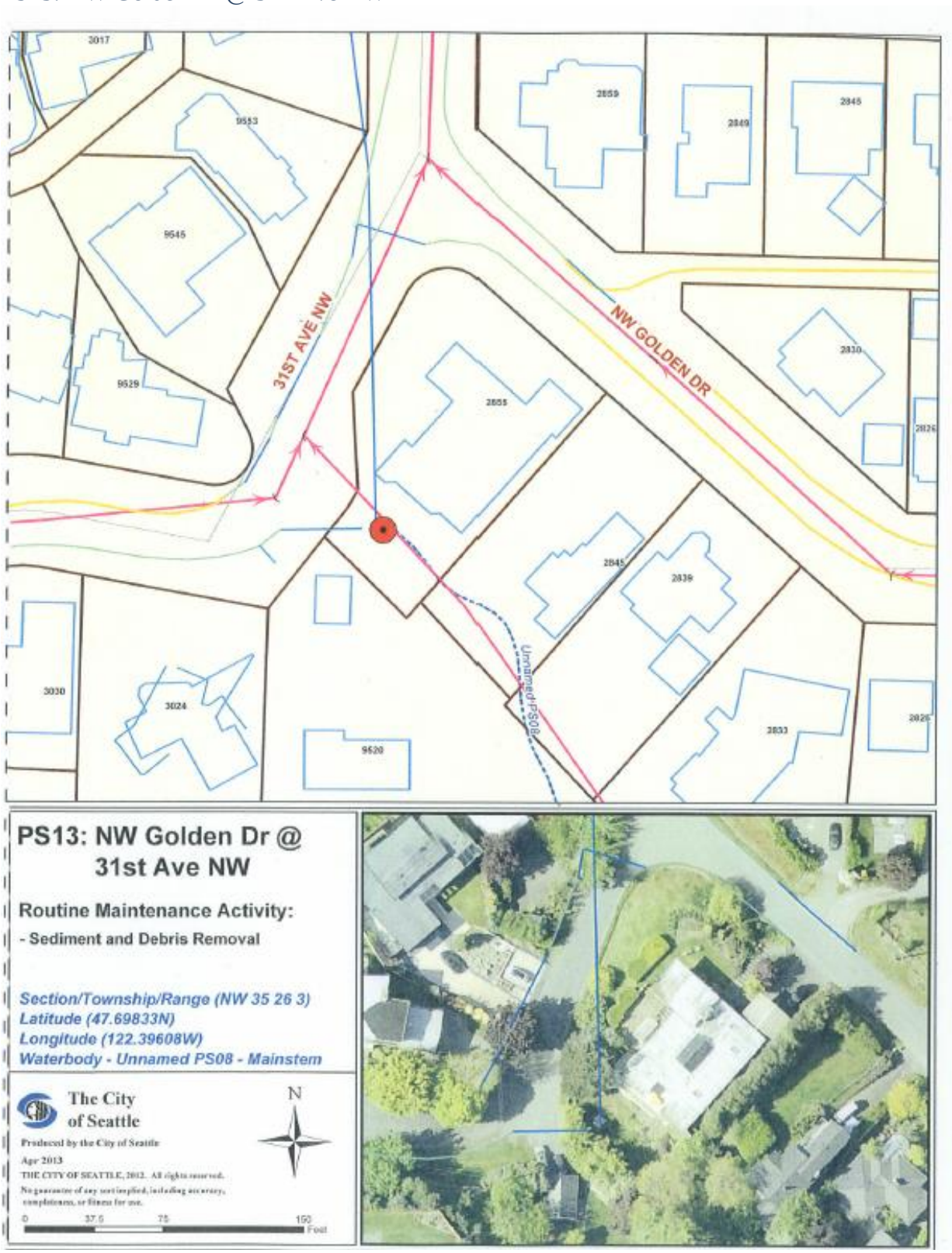
June 2018

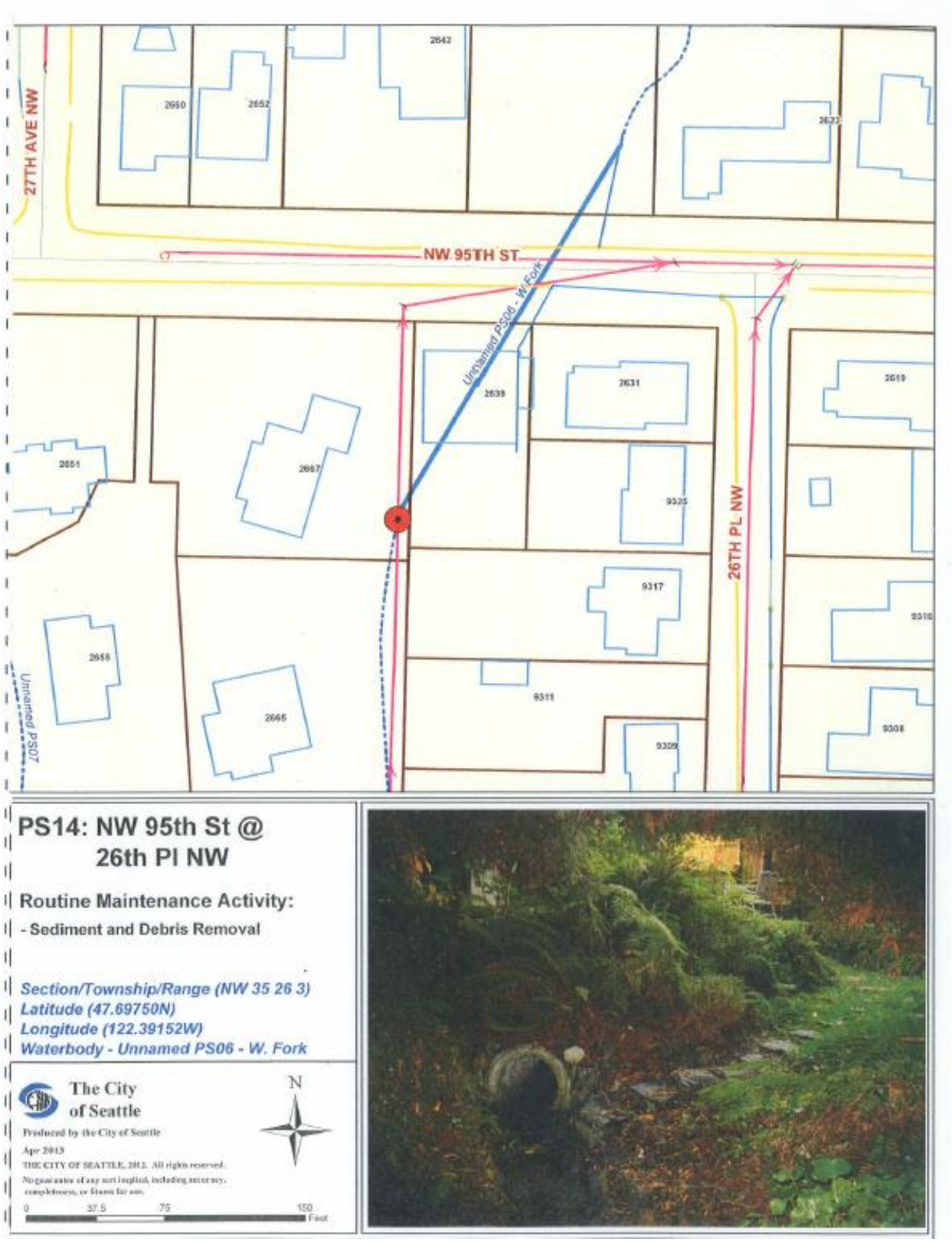
N

0 1,000 2,000 4,000 Feet

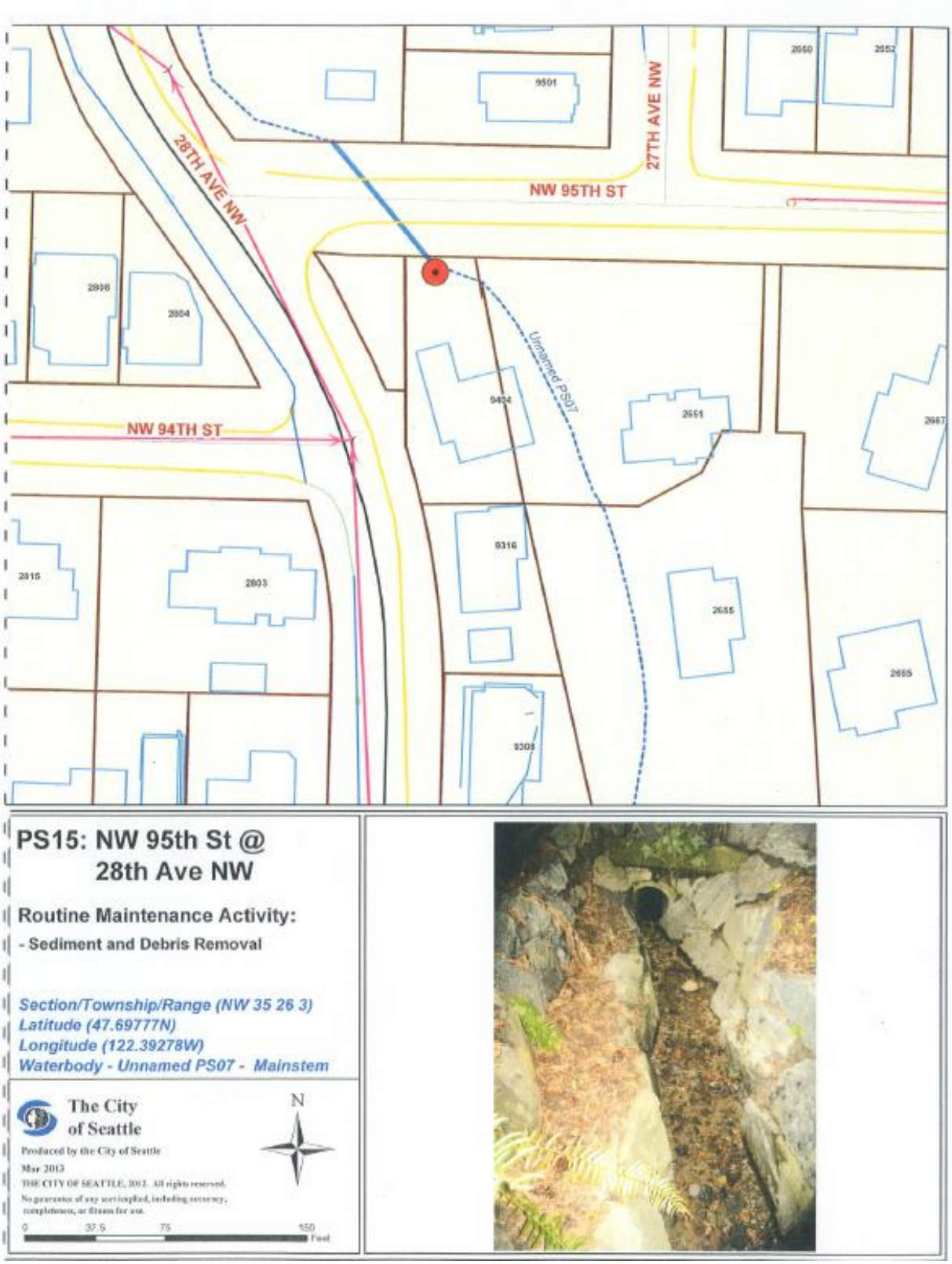
PS13: NW Golden Dr @ 31st Ave NW



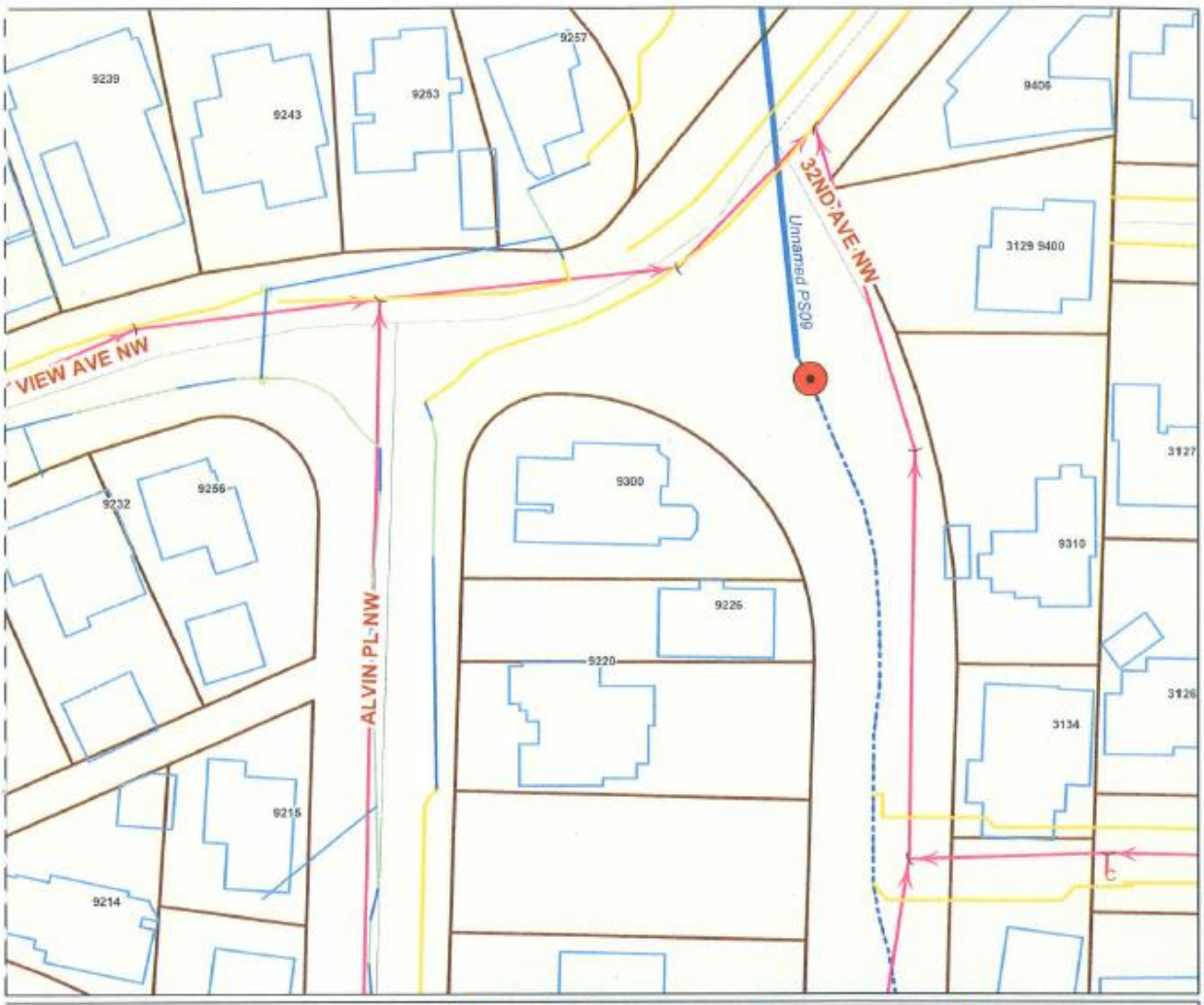
PS14: NW 95th St @ 26th Pl NW



PS15: NW 95th St @ 28th Ave NW



PS16: View Dr @ 32nd Ave NW



PS16: View Dr @ 32nd Ave NW

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (NW 35 26 3)
Latitude (47.69698N)
Longitude (122.39877W)
Waterbody - Unnamed PS09 - Mainstem

City of Seattle

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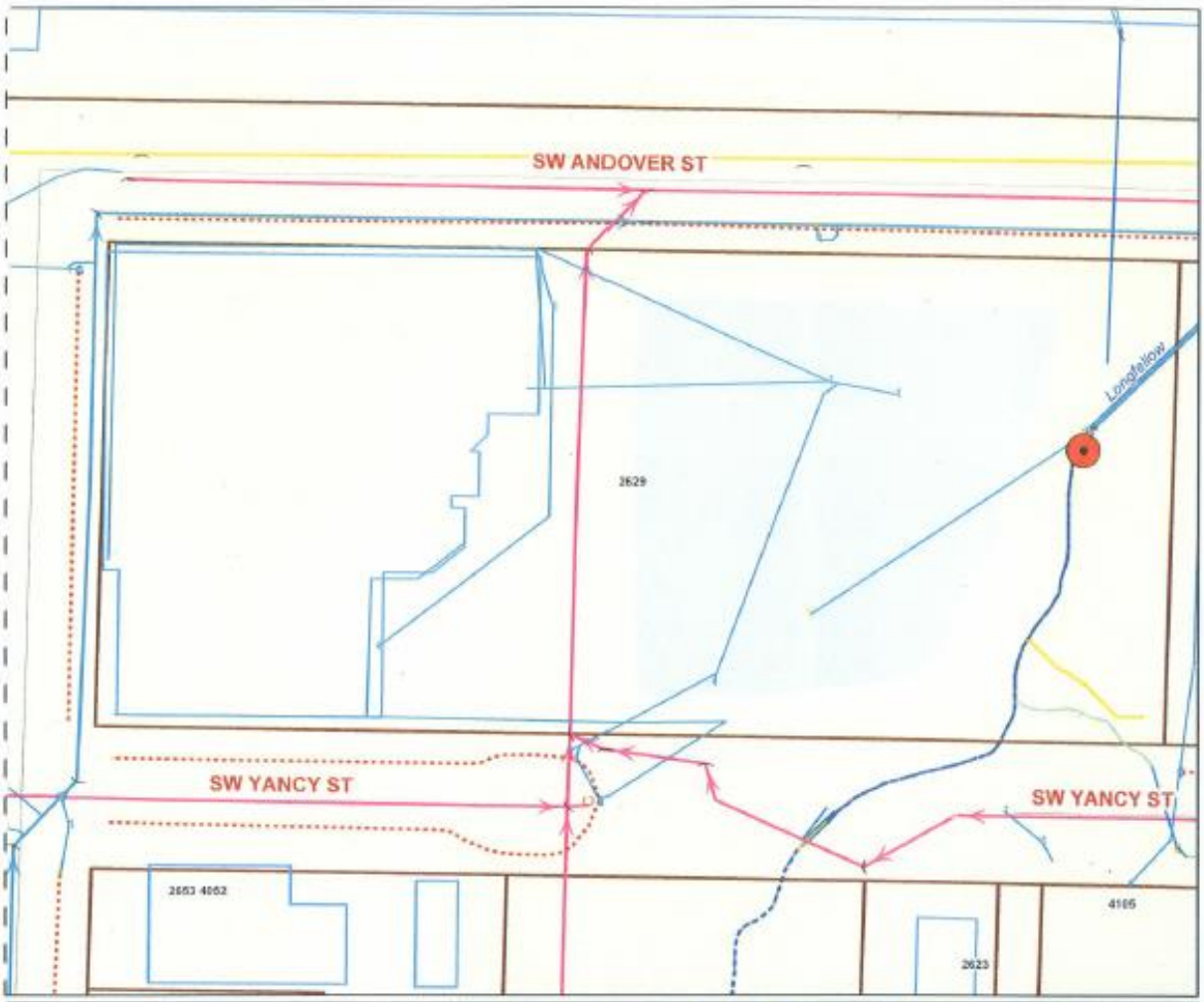
June 2018

N

0 1,000 2,000 4,000 Feet

LO1: SW Andover St @ Longfellow Creek



LO1: SW Andover St @ Longfellow Creek

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (W 13 24 3)
Latitude (47.56807N)
Longitude (122.36630W)
Waterbody - Longfellow Creek

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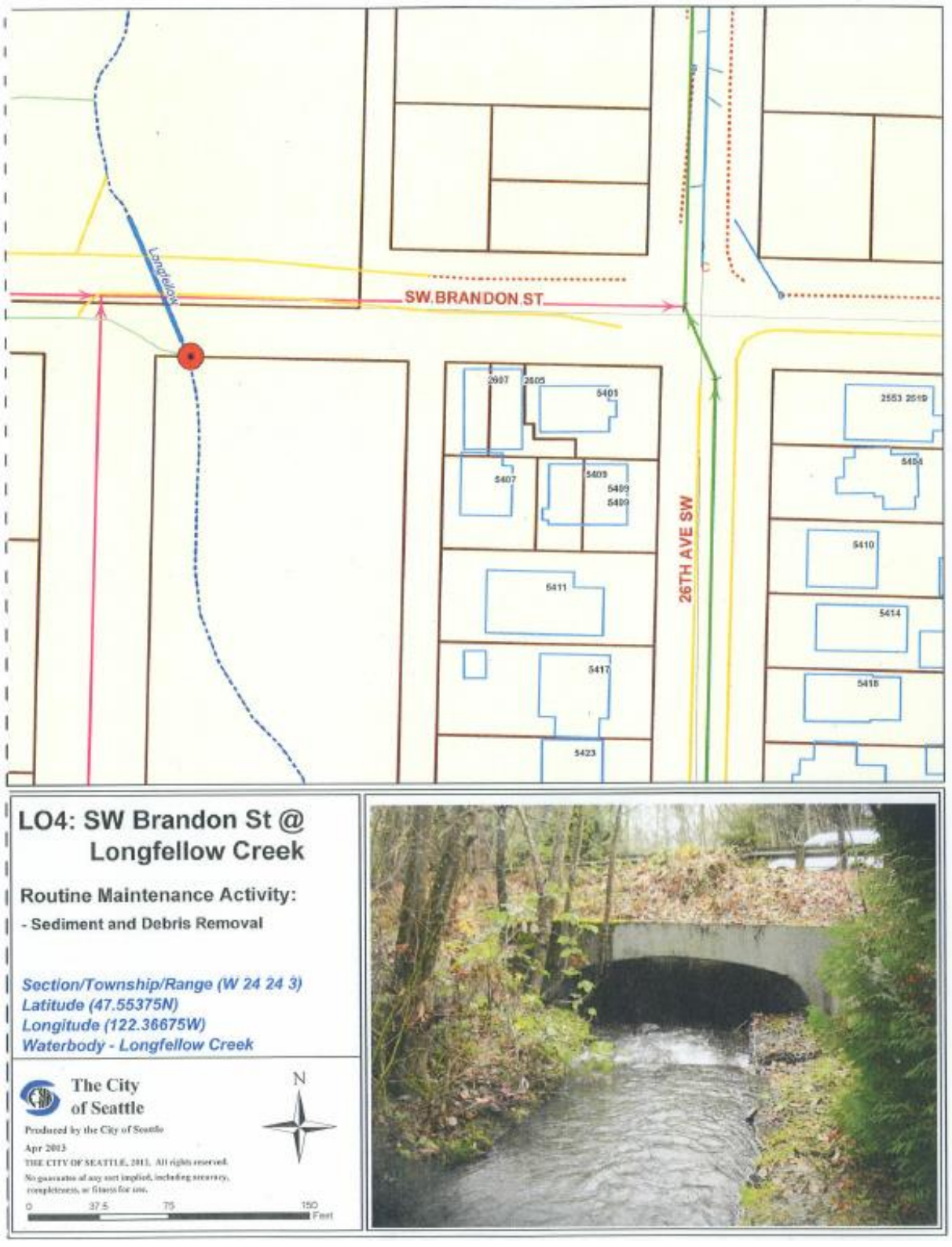
N

0 37.5 75 150 Feet

LO2: SW Nevada St @ Longfellow Creek

LO4: SW Brandon St @ Longfellow Creek



LO7: SW Juneau St @ Longfellow Creek

LO7: SW Juneau St @ Longfellow Creek

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (SW 24 24 3)
Latitude (47.54998N)
Longitude (122.36493N)
Waterbody - Longfellow Creek

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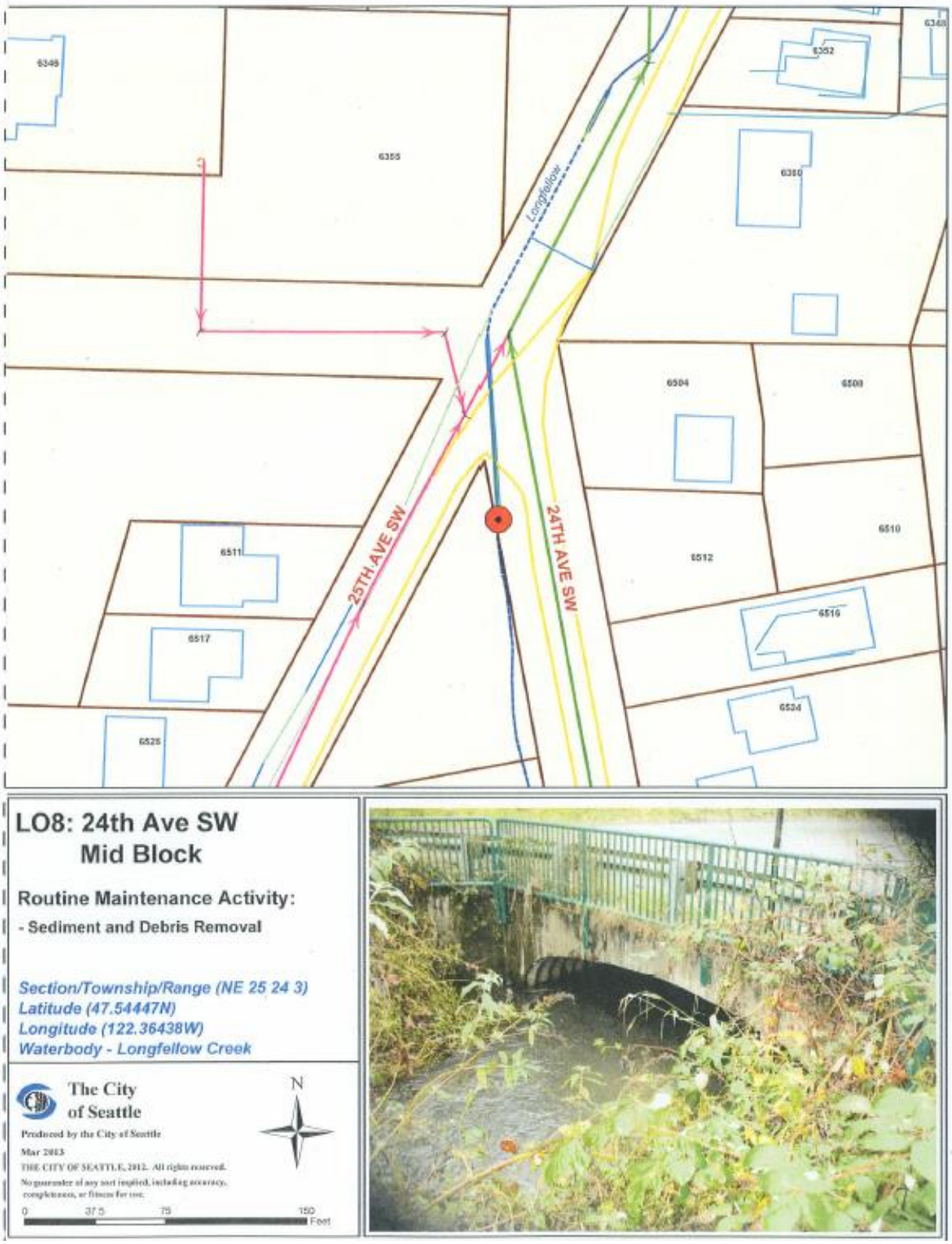
Mar 2013

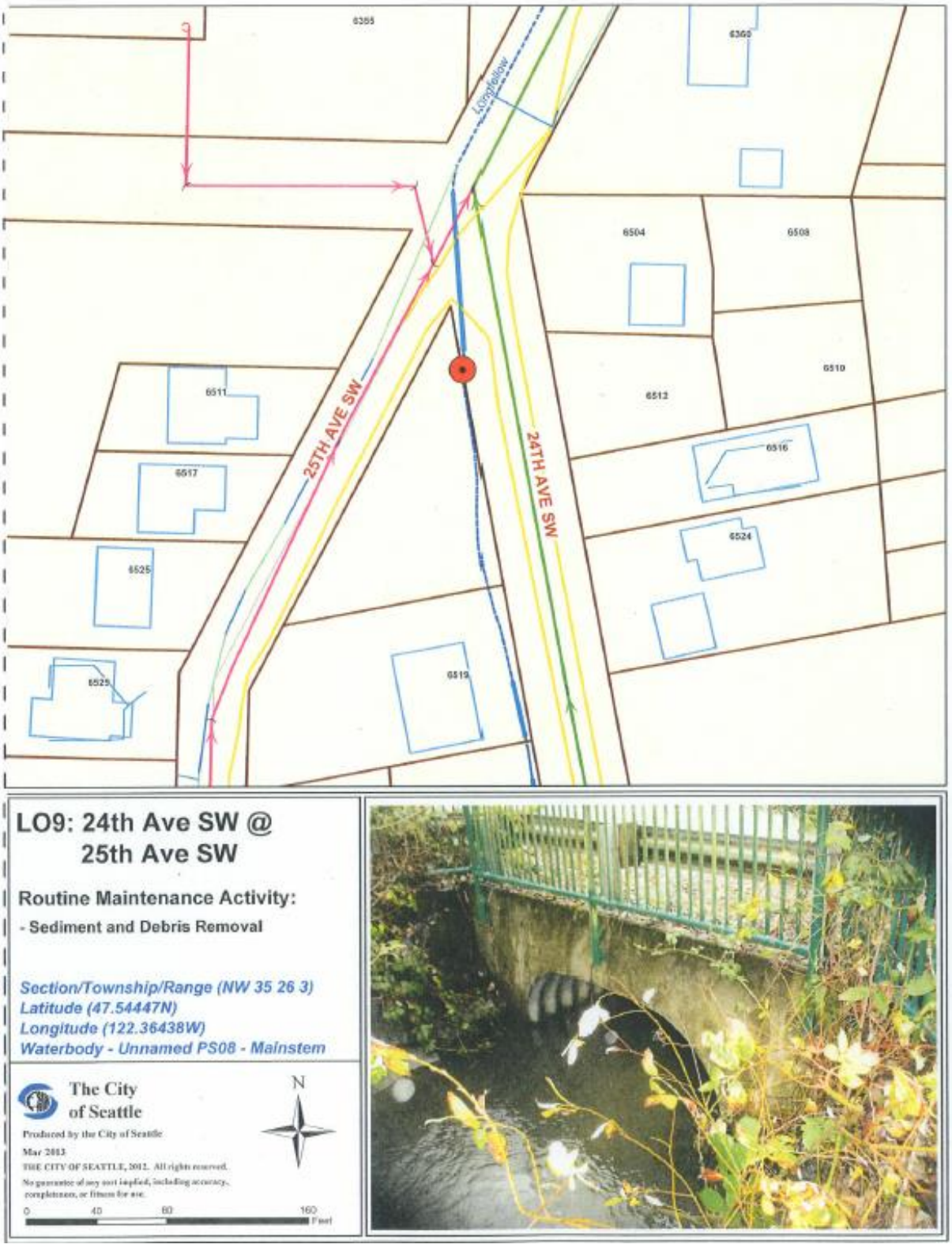
N

0 37.5 75 150 Feet

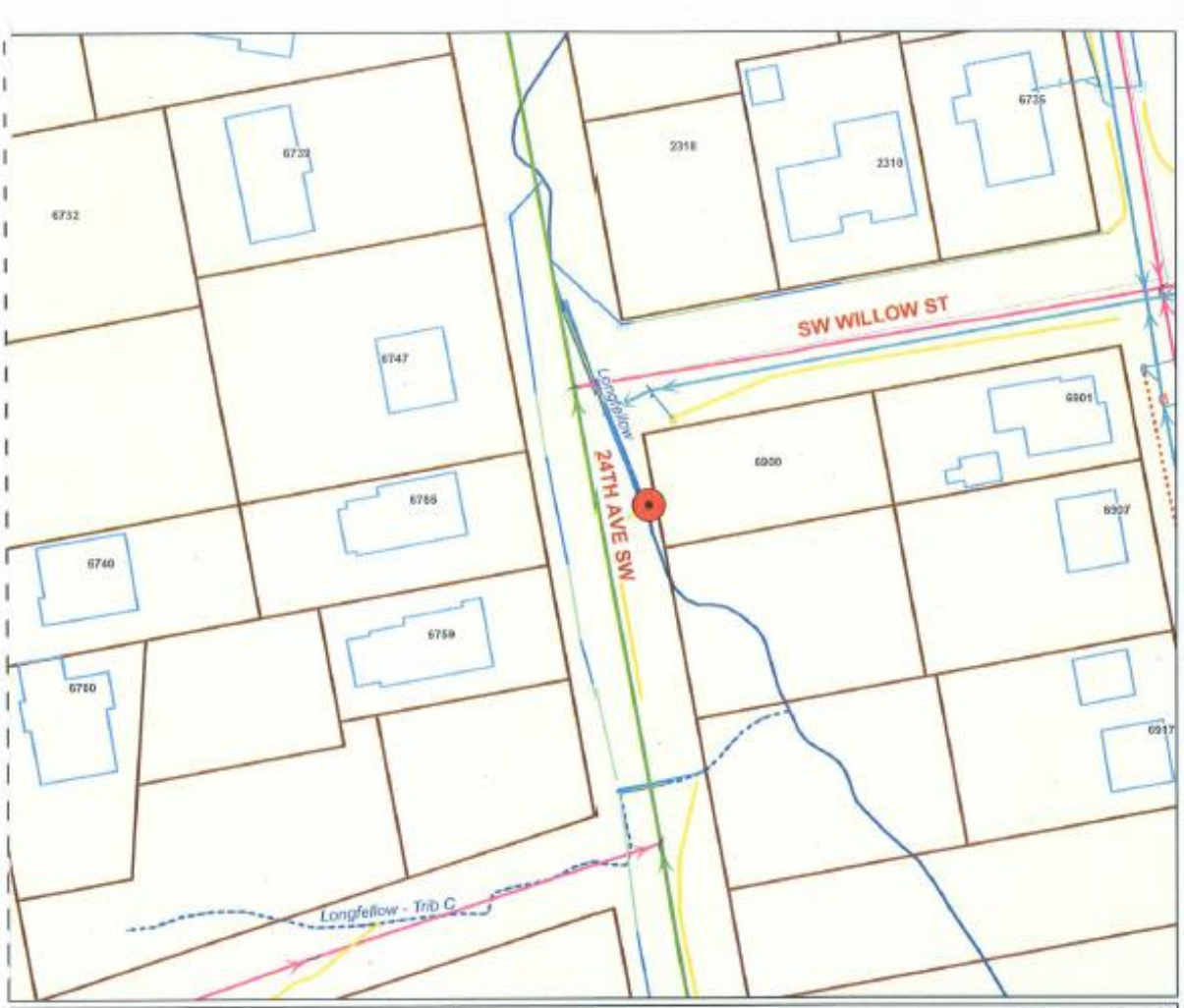
LO8: 24th Ave SW Mid Block



LO9: 24th Ave SW @ 25th Ave SW



LO10: SW Willow St @ Longfellow Creek



LO10: SW Willow St @ Longfellow Creek

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (NE 25 24 3)
Latitude (47.54187N)
Longitude (122.36353W)
Waterbody - Longfellow Creek

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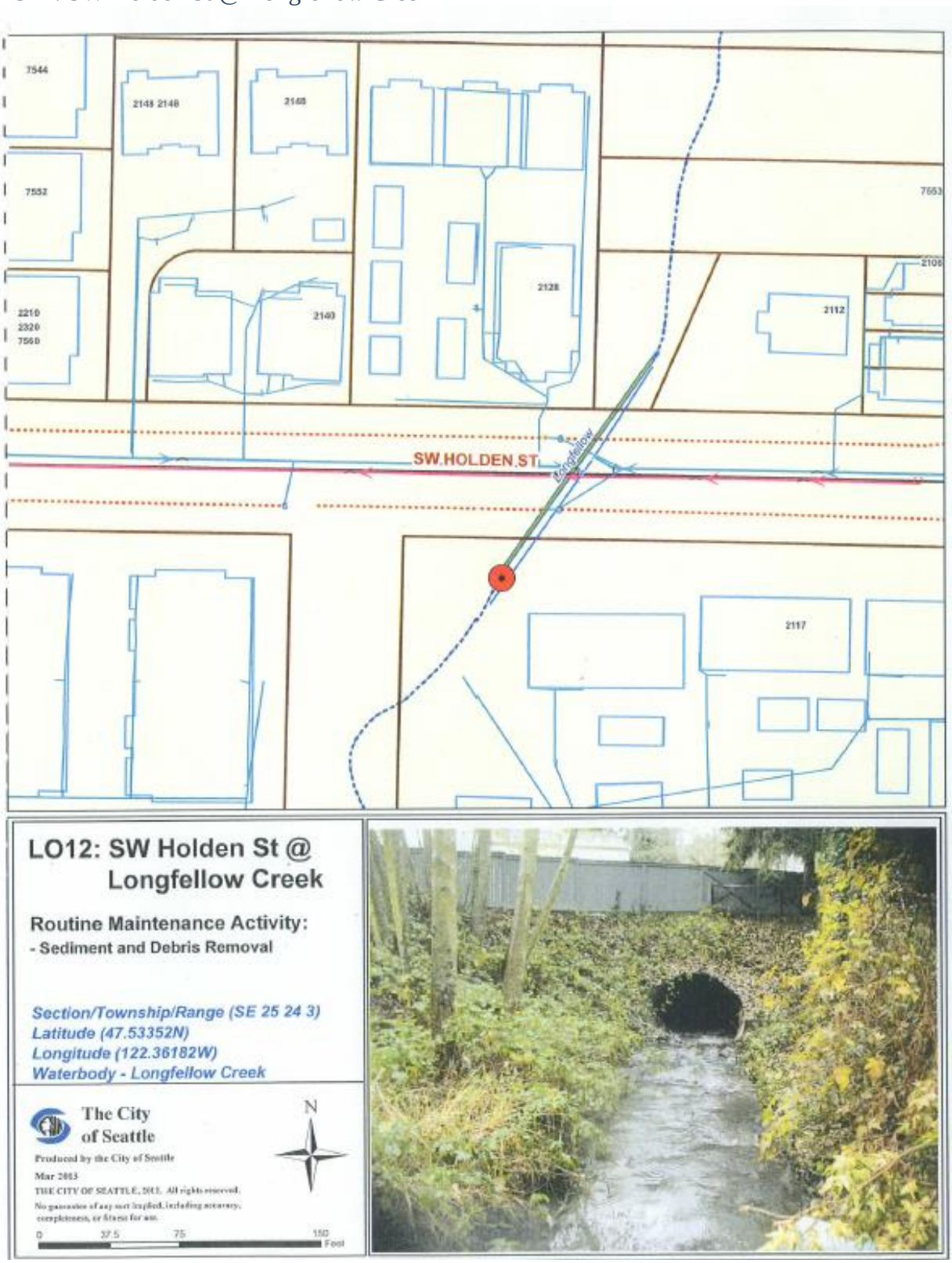
Mar 2013

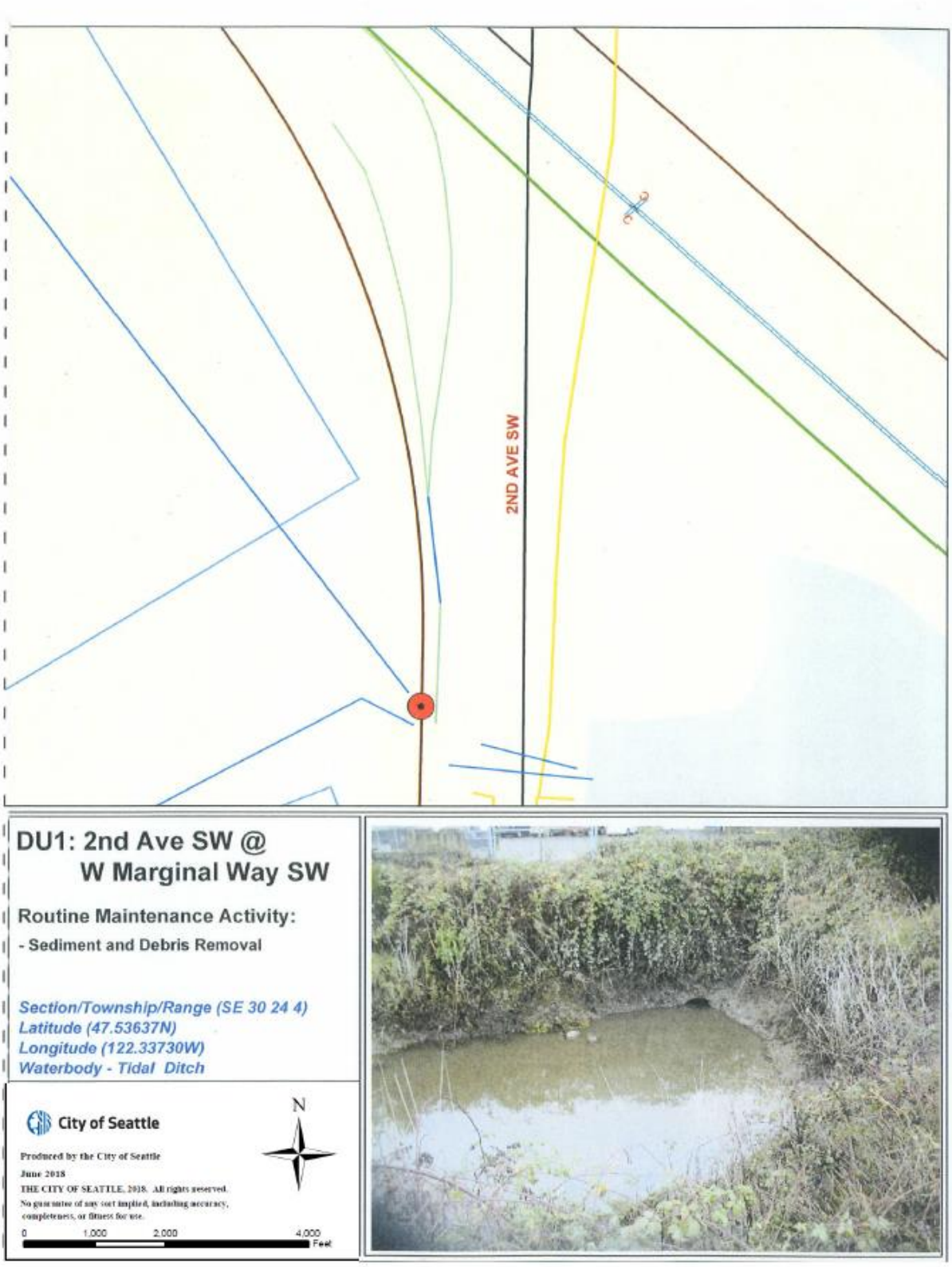
N

0 37.5 75 150 Feet

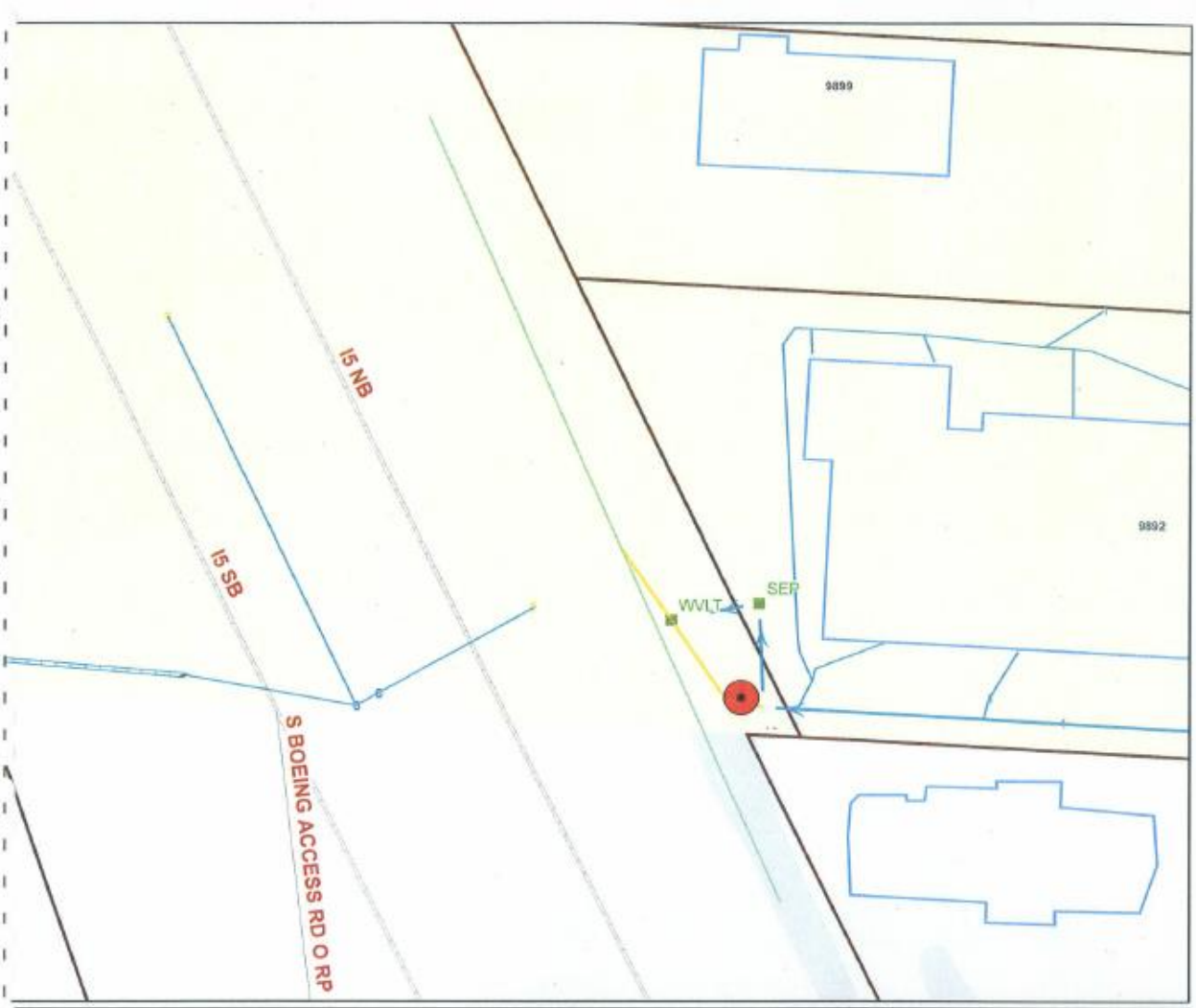
LO12: SW Holden St @ Longfellow Creek



DU1: 2nd Ave SW @ W Marginal Way SW



DU2: South Norfolk Treatment Swale



DU2: South Norfolk Treatment Swale

Routine Maintenance Activity:

- Sediment and Debris Removal, Control Vegetation

Section/Township/Range (W 3 23 4)
Latitude (47.50998N)
Longitude (122.28253W)
Waterbody - Engineered Swale

City of Seattle

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June 2018
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N

0 1,000 2,000 4,000 Feet

MC1: S Cloverdale St @ Grattan Pl S

SP1: 31st Ave SW @ SW 104th St

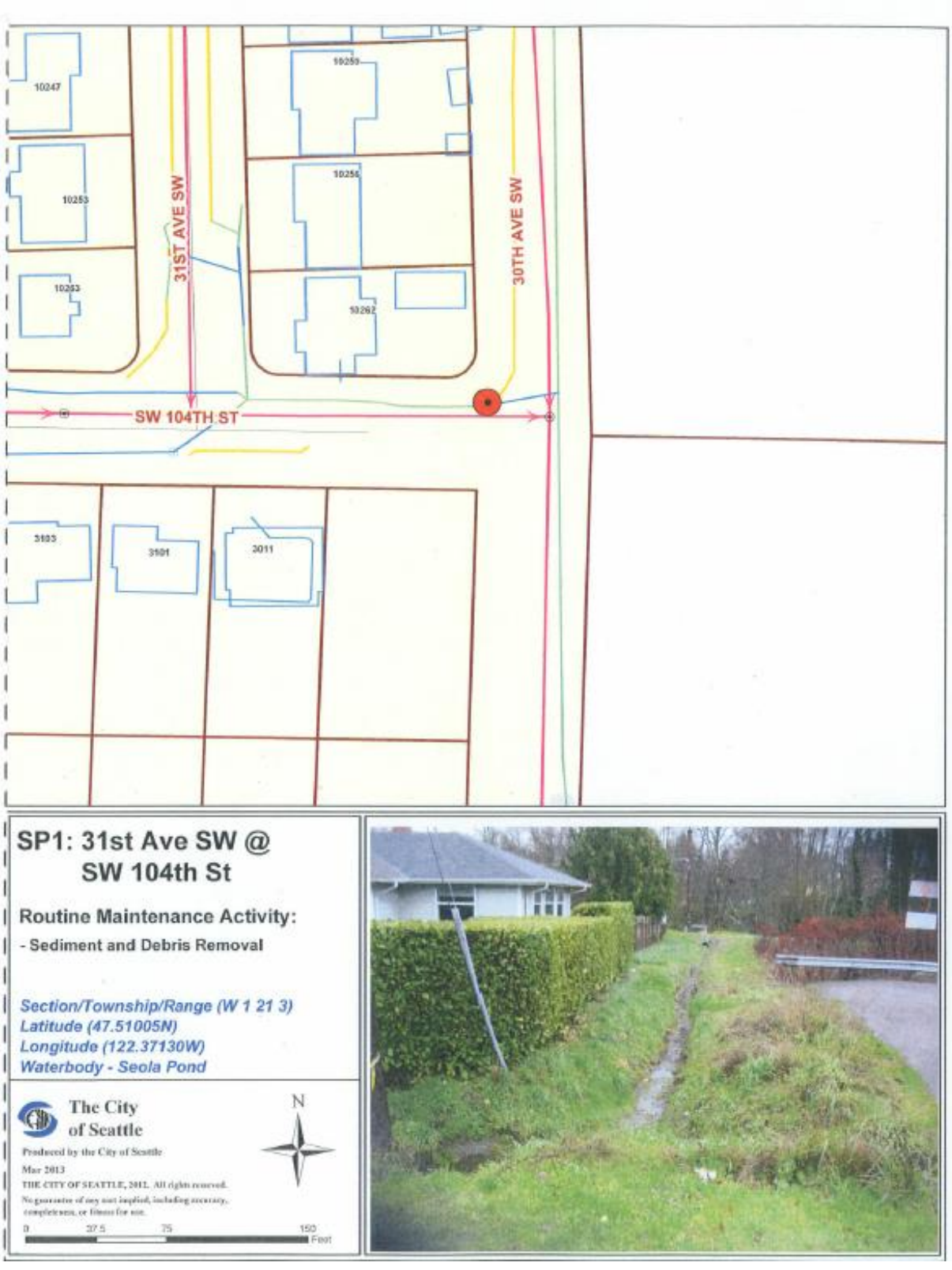
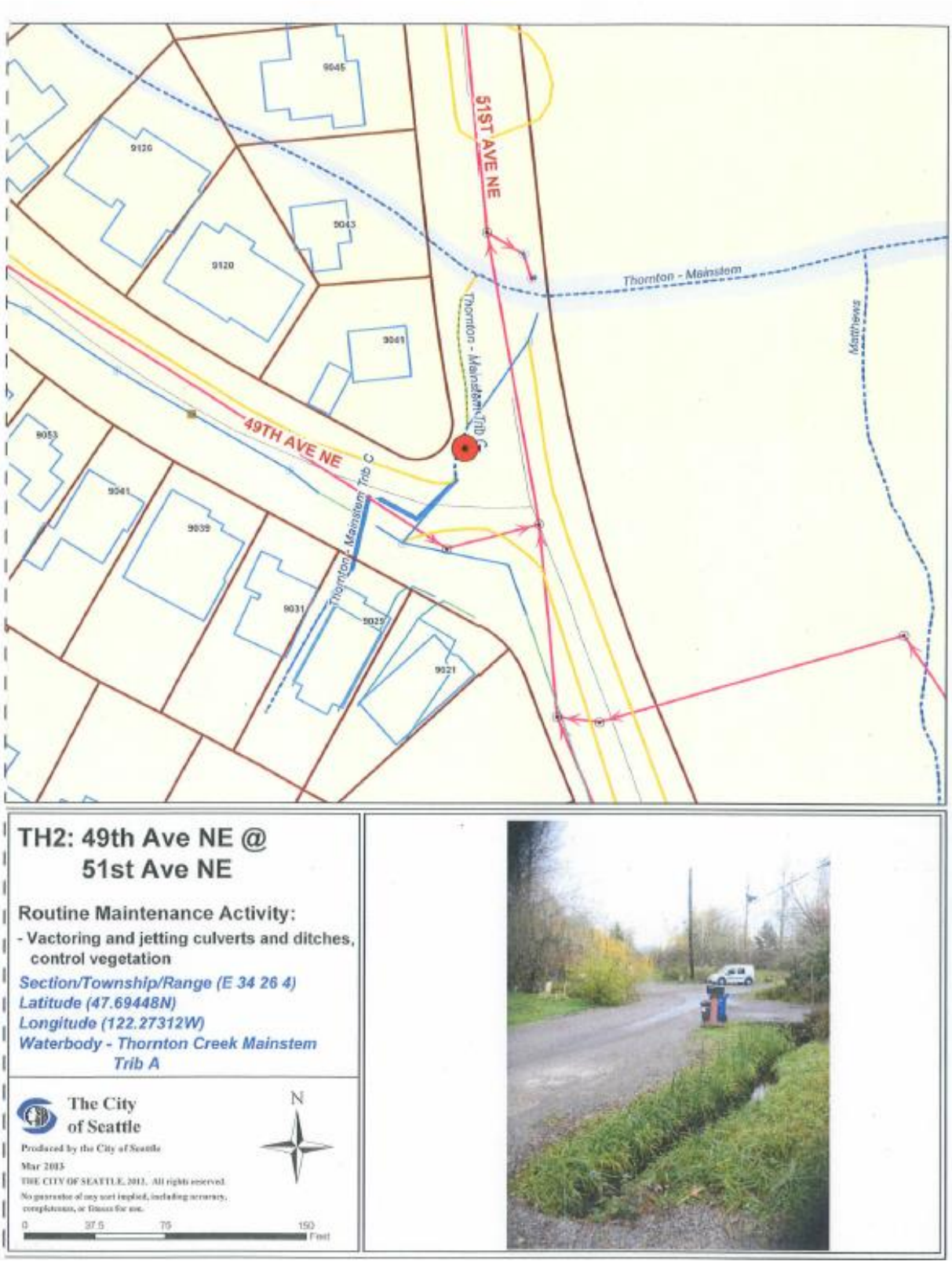
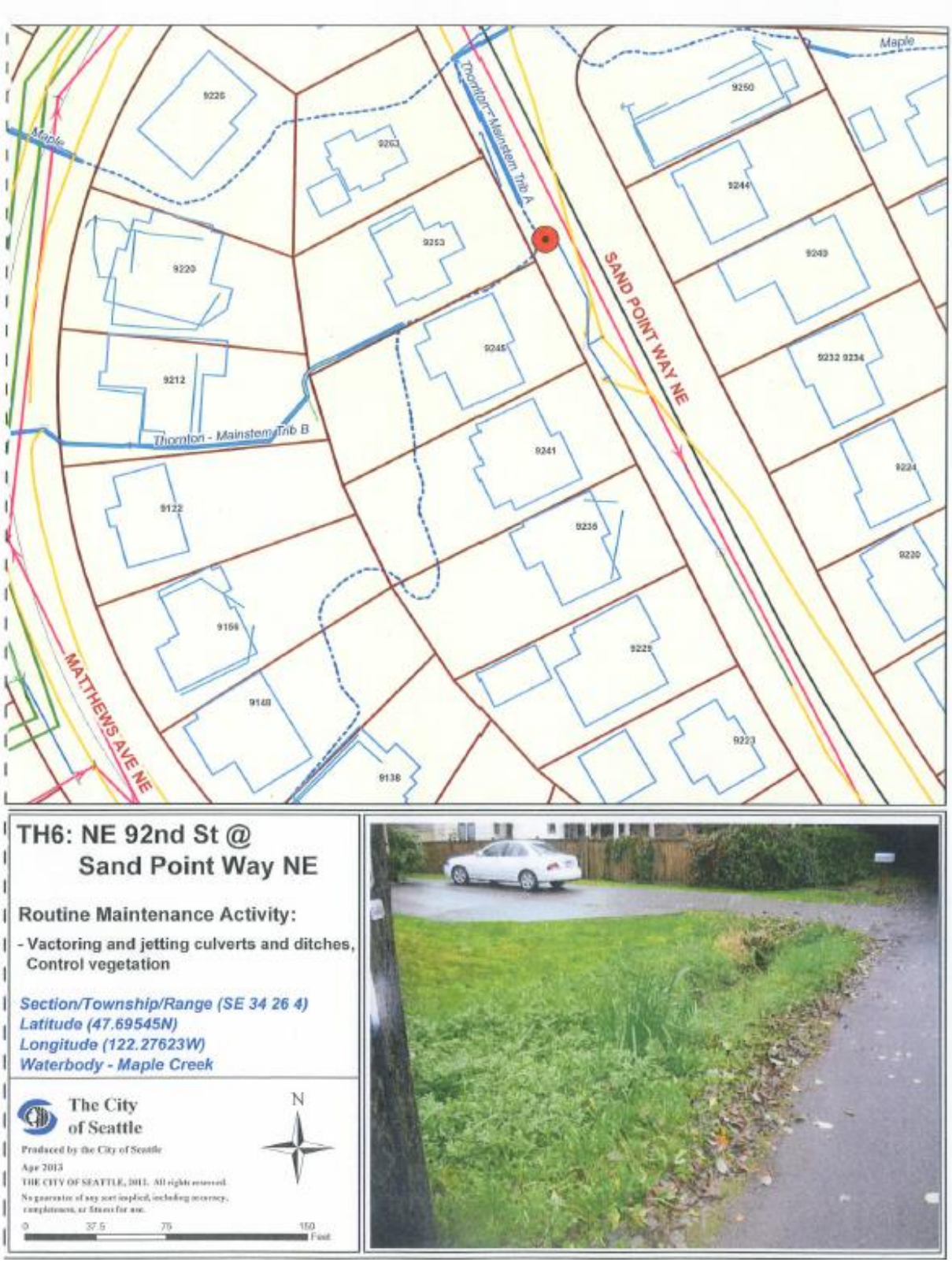


Exhibit D-3: Enclosed Drainage System Representative Facility Data Sheet

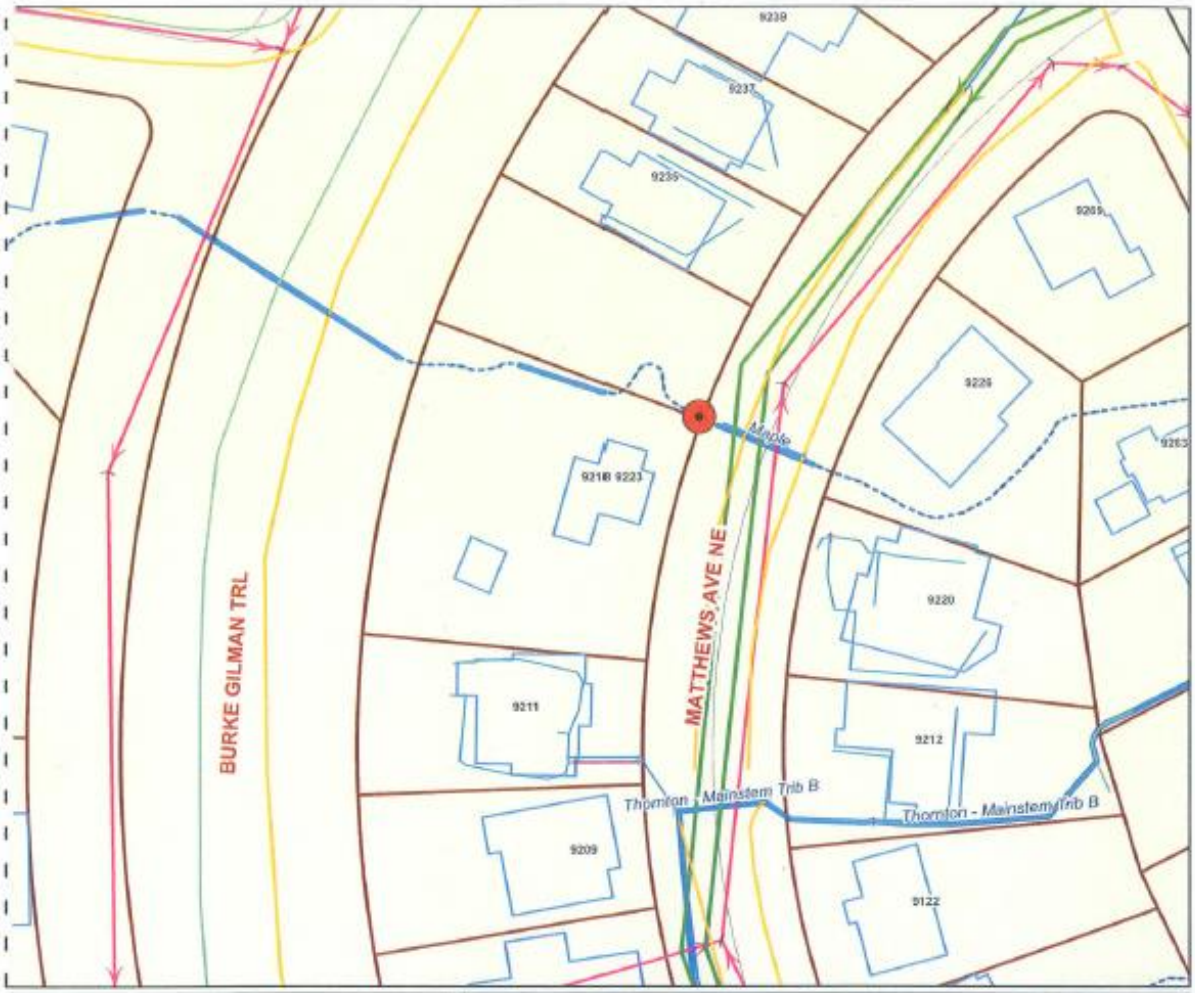
TH2: 49th Ave. NE @ NE 51st St.



TH6: NE 92nd St @ Sand Point Way NE



TH7: NE 92nd St @ Sand Point Way NE



TH7: Matthews Ave NE @ Sand Point Way NE

Routine Maintenance Activity:

- Vactoring and jetting culverts and ditches

Section/Township/Range (E 34 26 4)
Latitude (47.69563N)
Longitude (122.27743W)
Waterbody - Maple Creek

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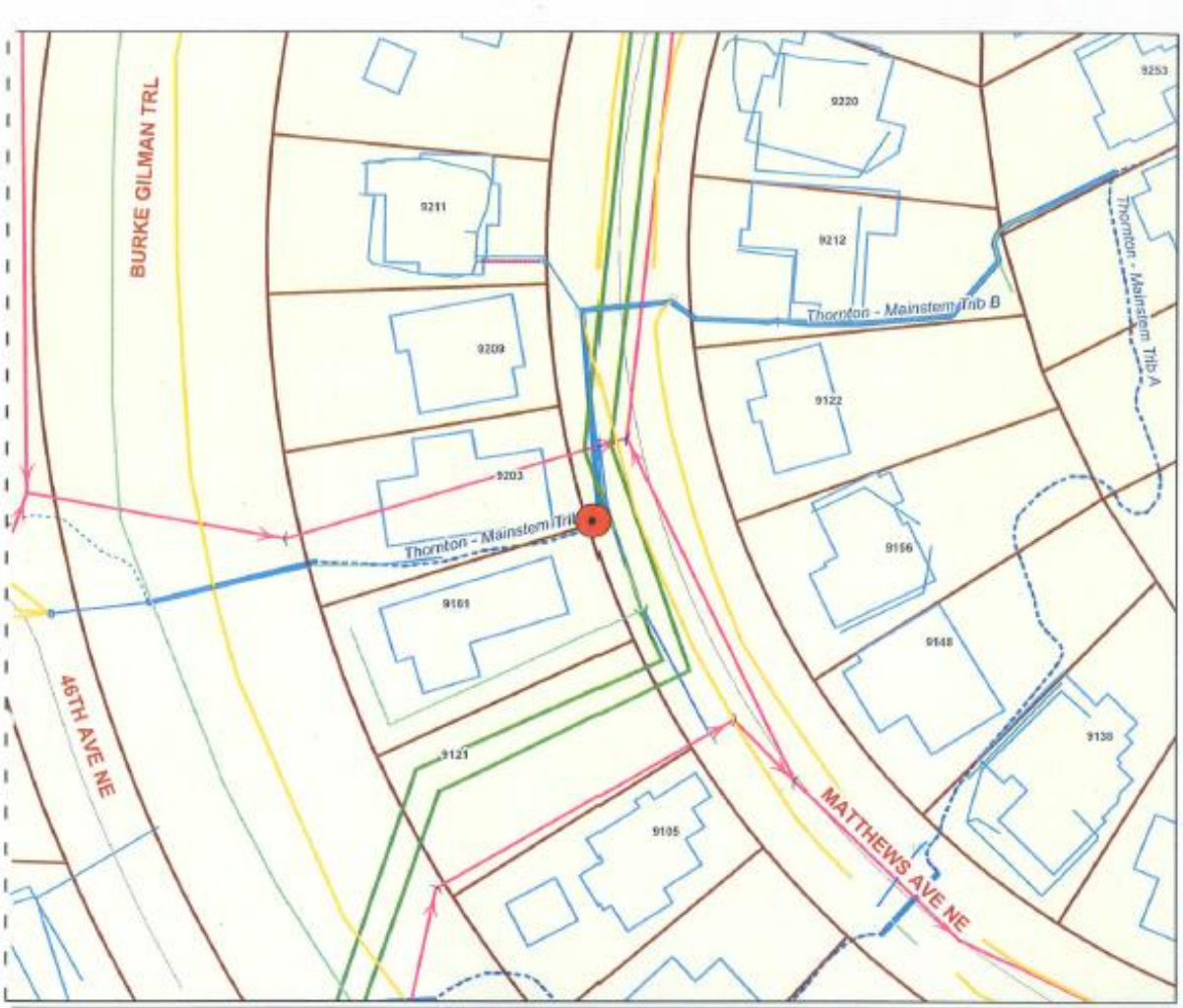
N

0 37.5 75 150 Feet

TH8: Matthews Ave NE Mid - Block



TH8: Matthews Ave NE Mid - Block

Routine Maintenance Activity:

-Vactoring and jetting culverts and ditches

Section/Township/Range (E 34 26 4)
Latitude (47.69518N)
Longitude (122.27742W)
Waterbody - Maple Creek

The City of Seattle

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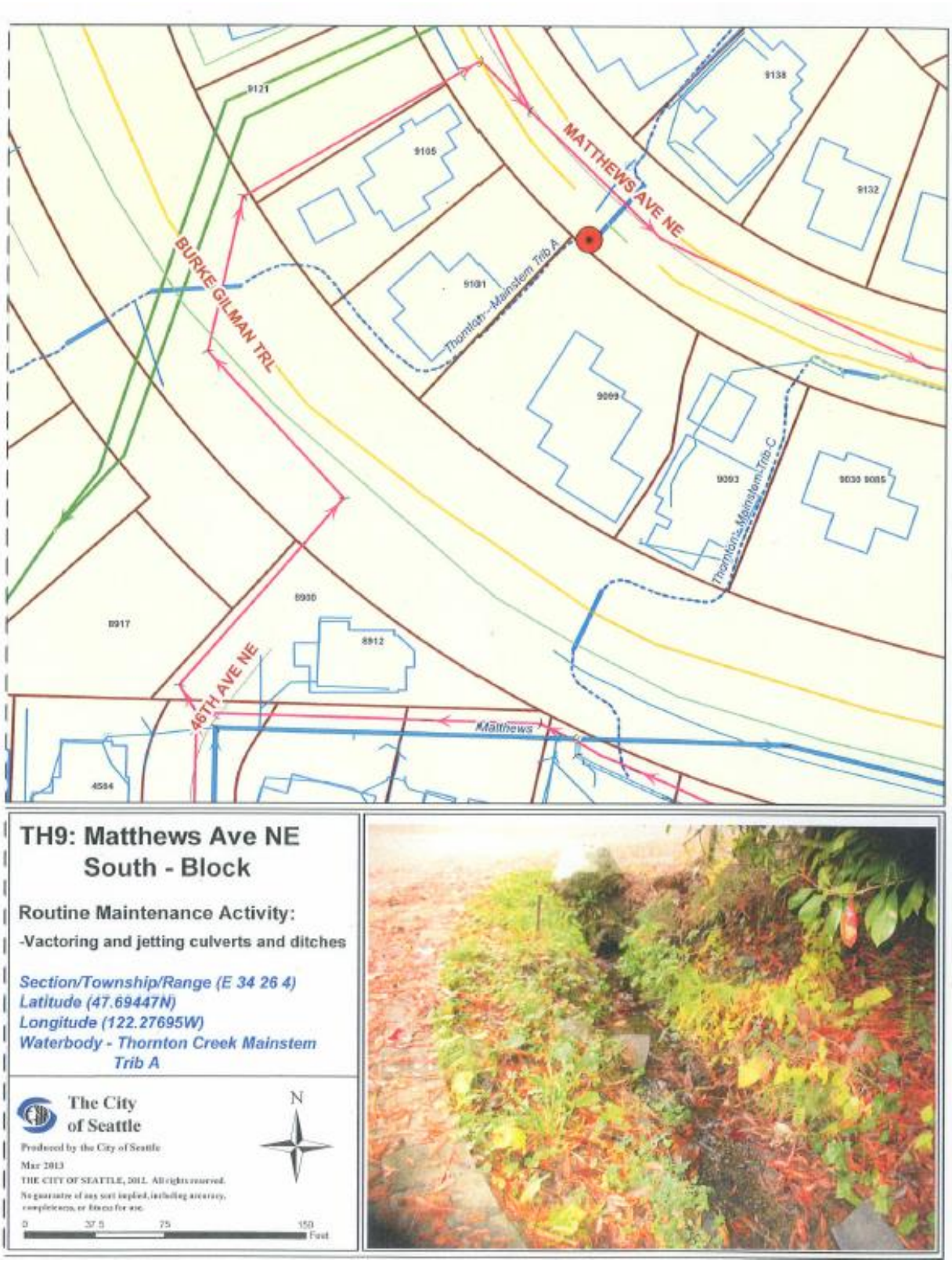
Apr 2013

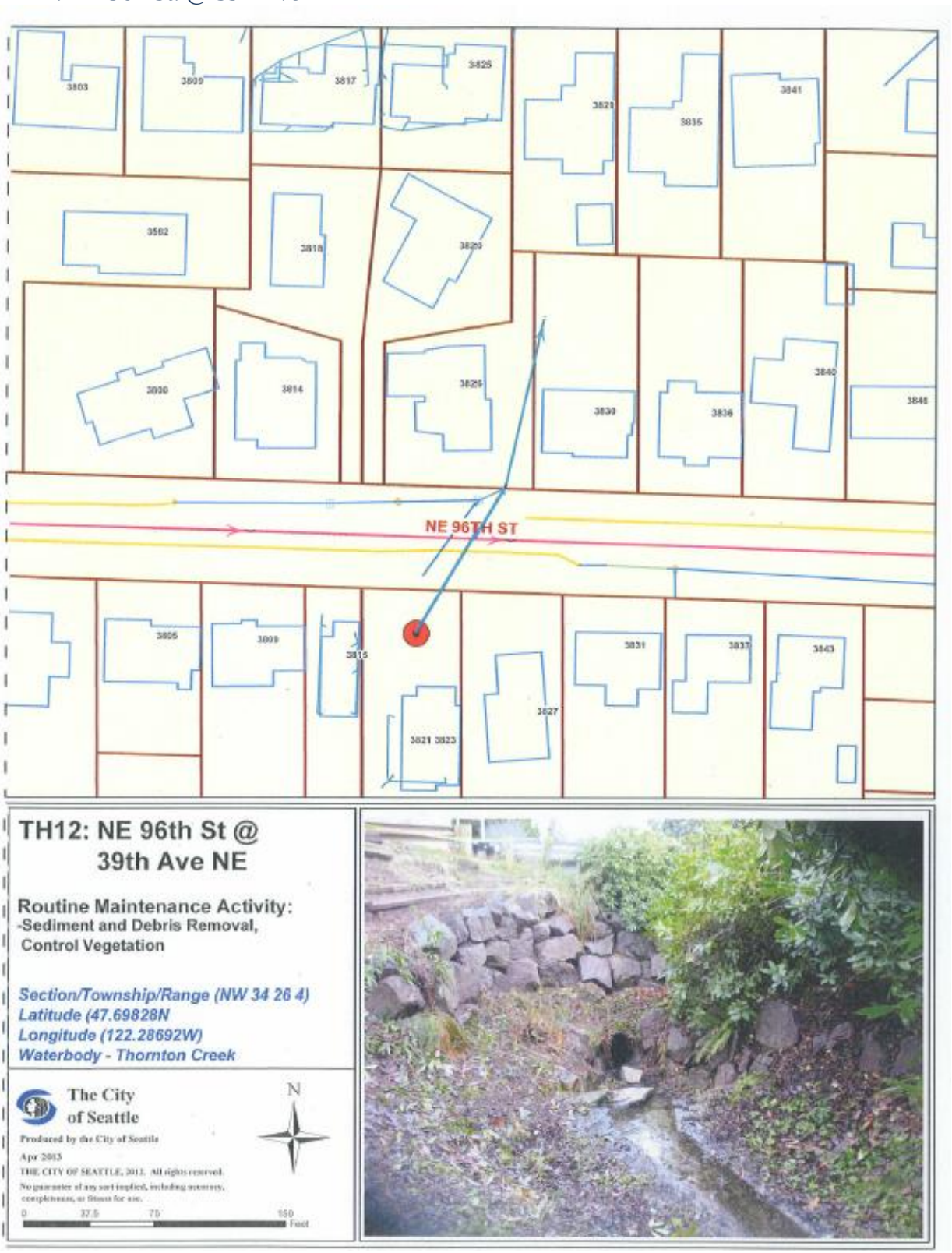
N

0 37.5 75 150 Feet

TH9: Matthews Ave NE South - Block



TH12: NE 96th St. @ 39th Ave NE



TH20: 30th Ave NE @ NE 107th St Kramer

TH20: 30th Ave NE @ NE 107th St Kramer Culvert

Routine Maintenance Activity:

- Sediment and Debris Removal

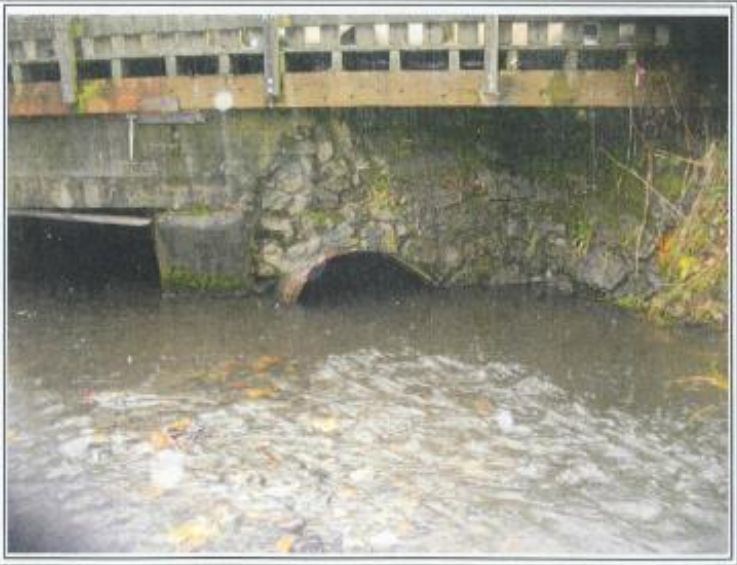
Section/Township/Range (E 34 26 4)
Latitude (47.70693N)
Longitude (122.29618W)
Waterbody - Kramer Creek

The City of Seattle

Produced by the City of Seattle
Mar 2013

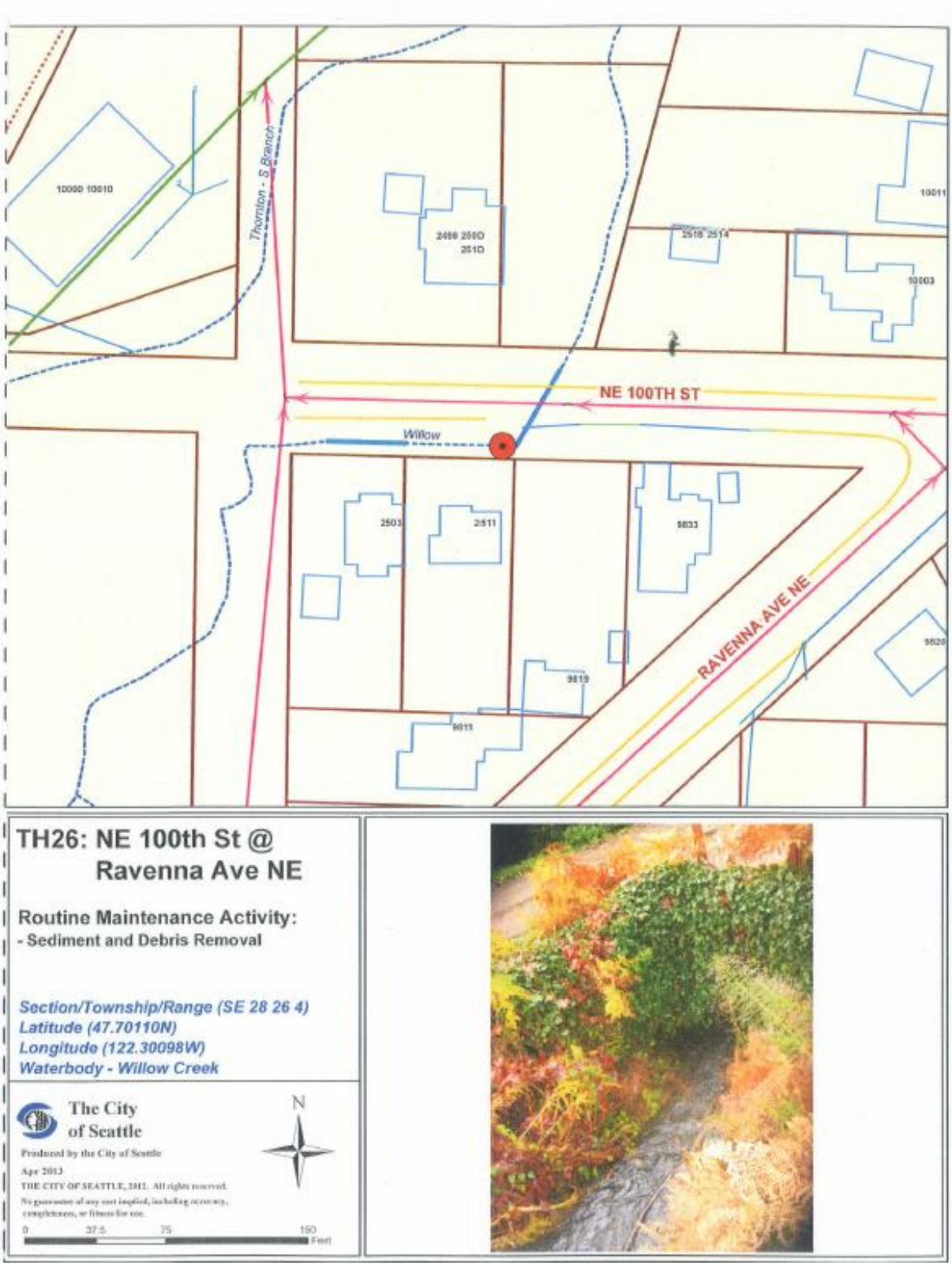
N

0 37.5 75 150 Feet

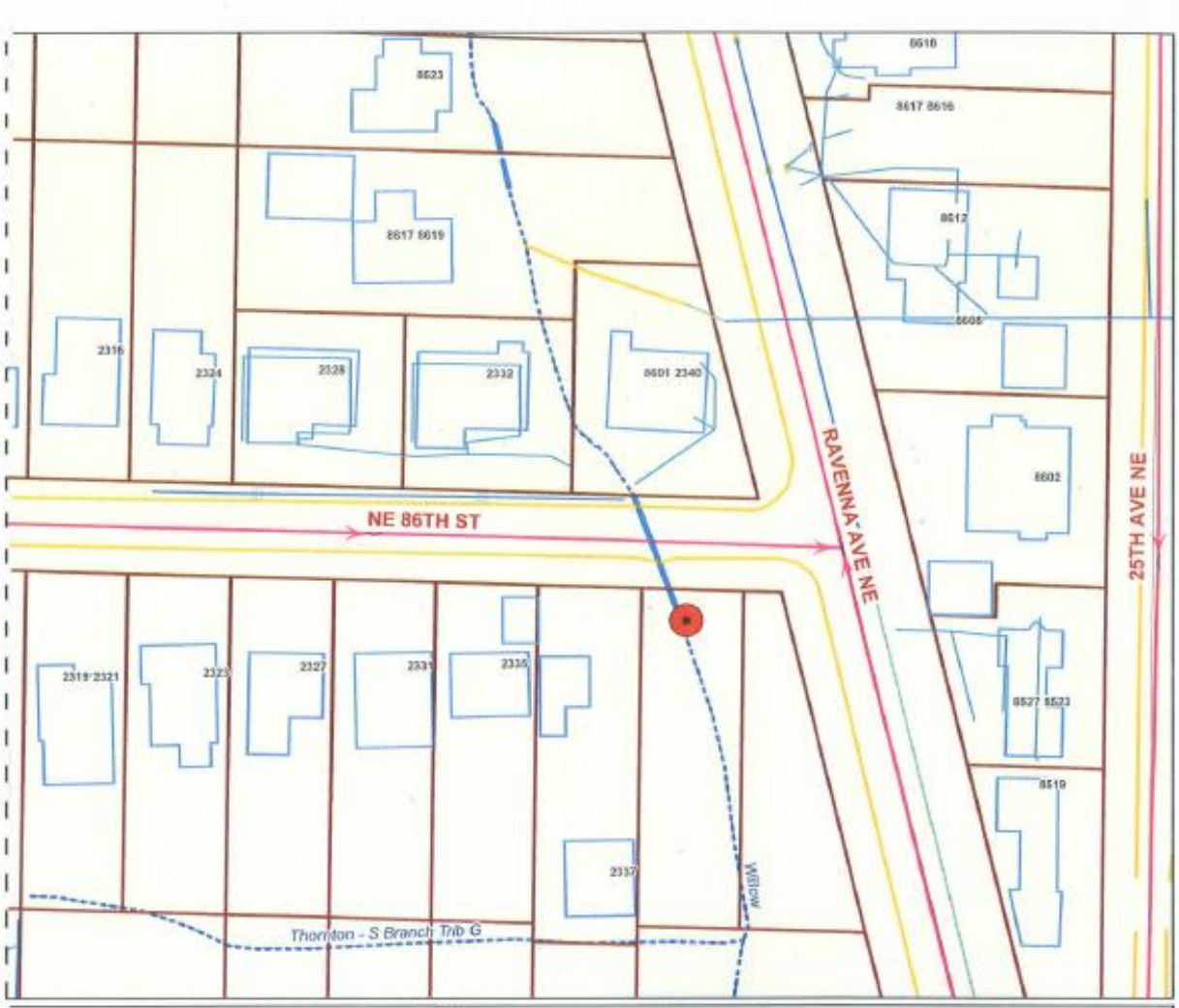


TH22: 31st Ave NE @ NE 110th St

TH26: NE 100th St @ Ravenna Ave NE



TH27: NE 86th St @ Ravenna Ave NE



TH27: NE 86th St @ Ravenna Ave NE

Routine Maintenance Activity:

- Vactoring and Jetting culverts and ditches

Section/Township/Range (SW 33 26 4)
Latitude (47.69118N)
Longitude (122.30237W)
Waterbody - Willow Creek

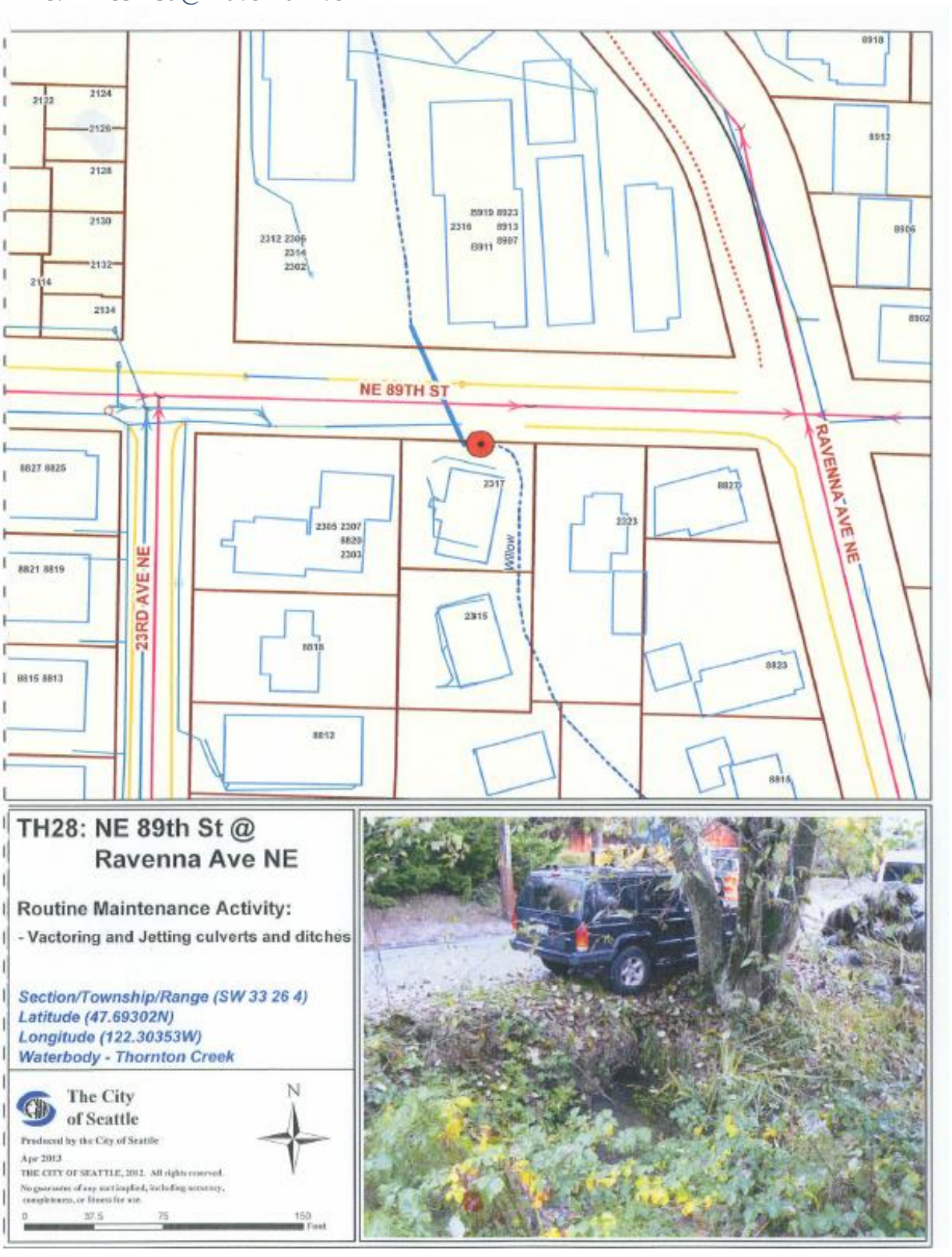
The City of Seattle

Produced by the City of Seattle
Apr 2013

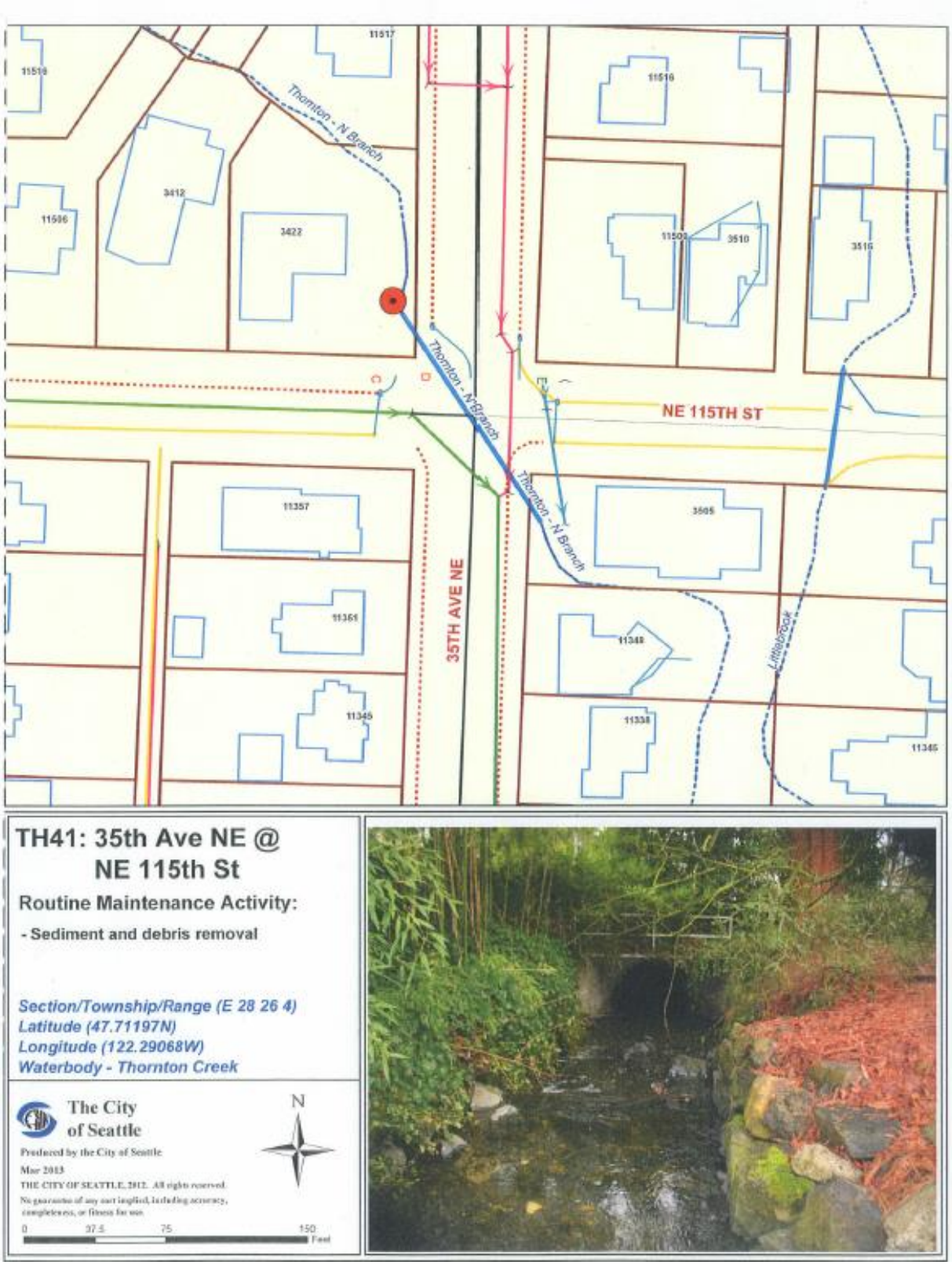
N

0 37.5 75 150 Feet

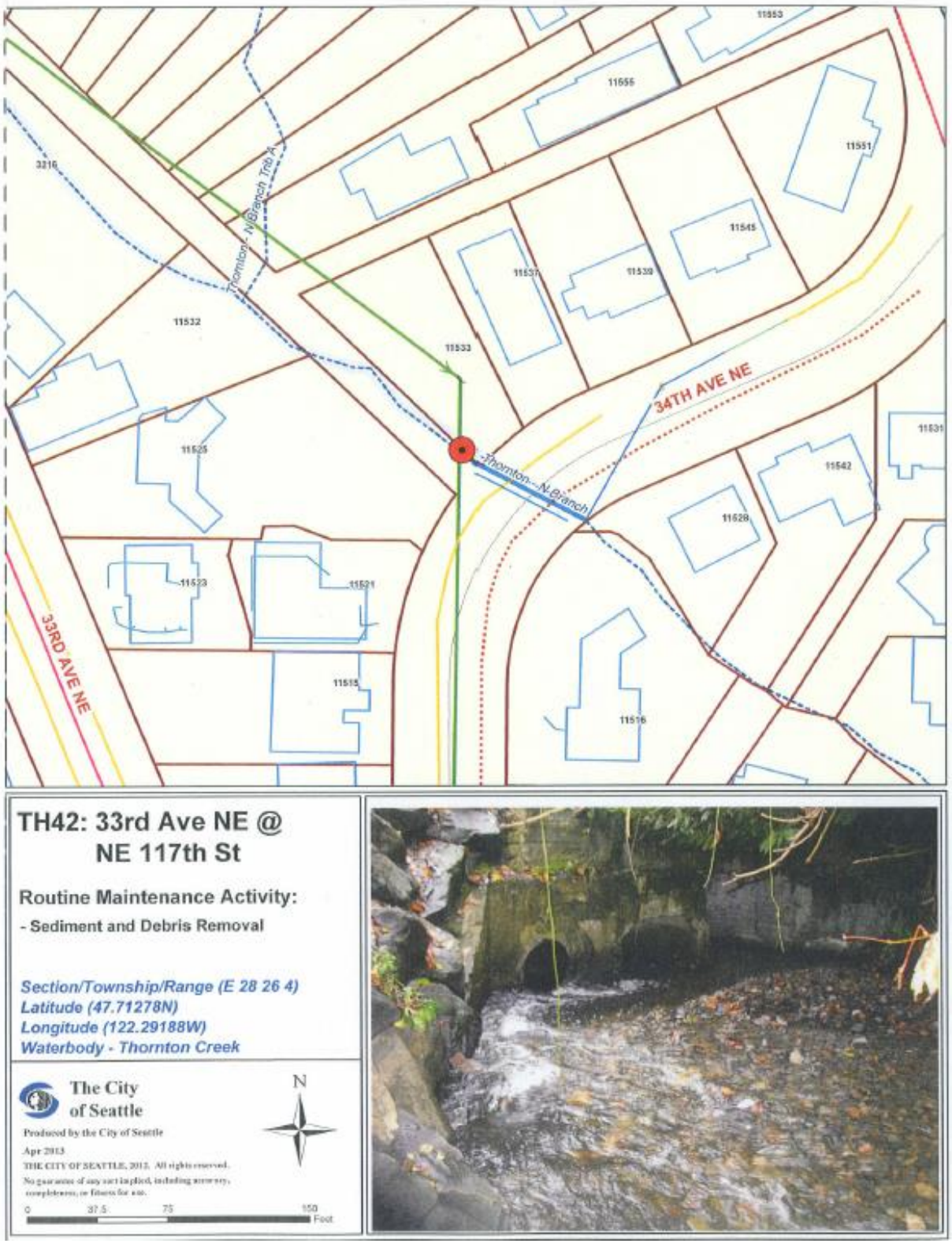
TH28: NE 89th St @ Ravenna Ave NE



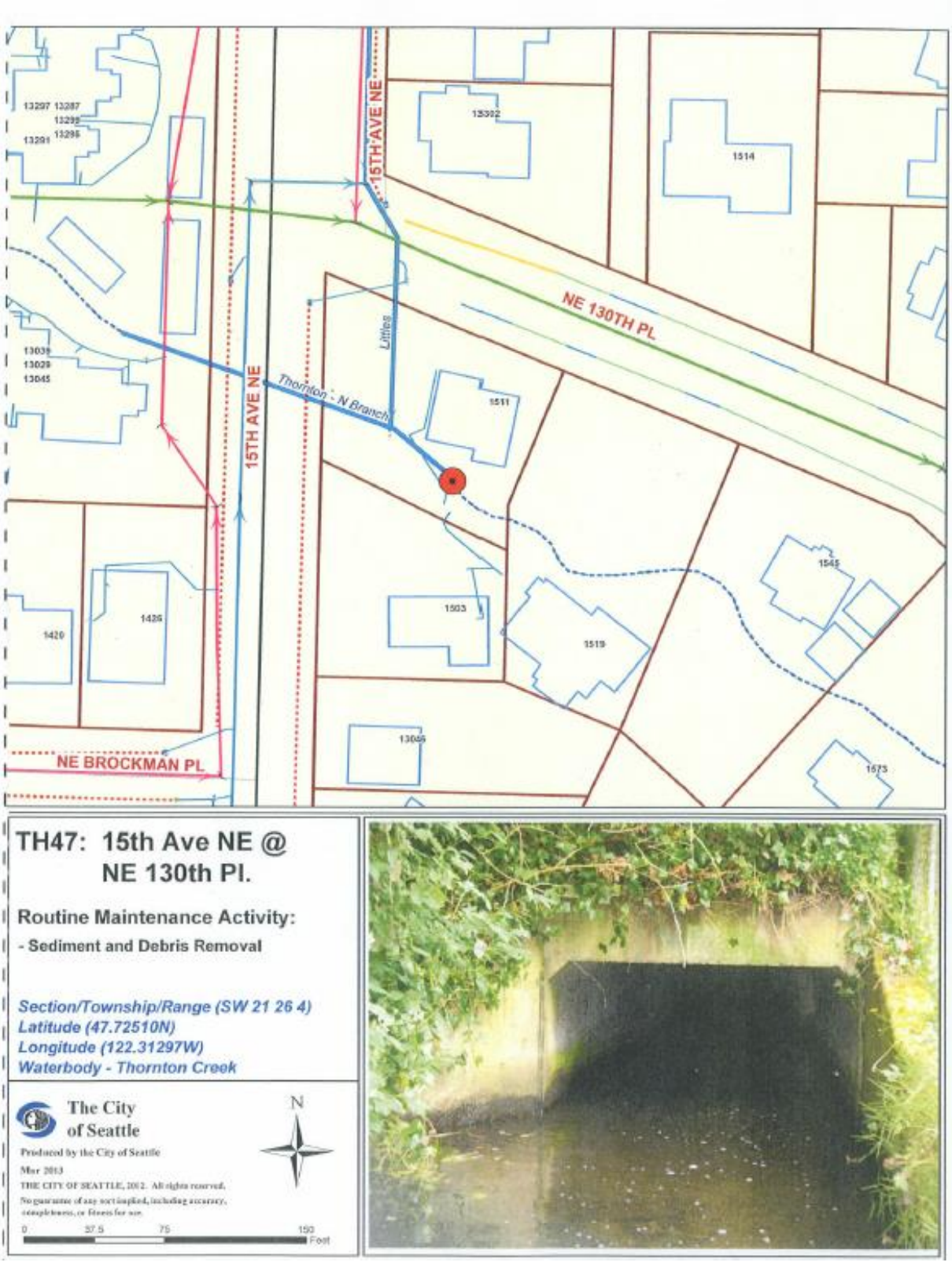
TH41: 35th Ave NE @ NE 115th St



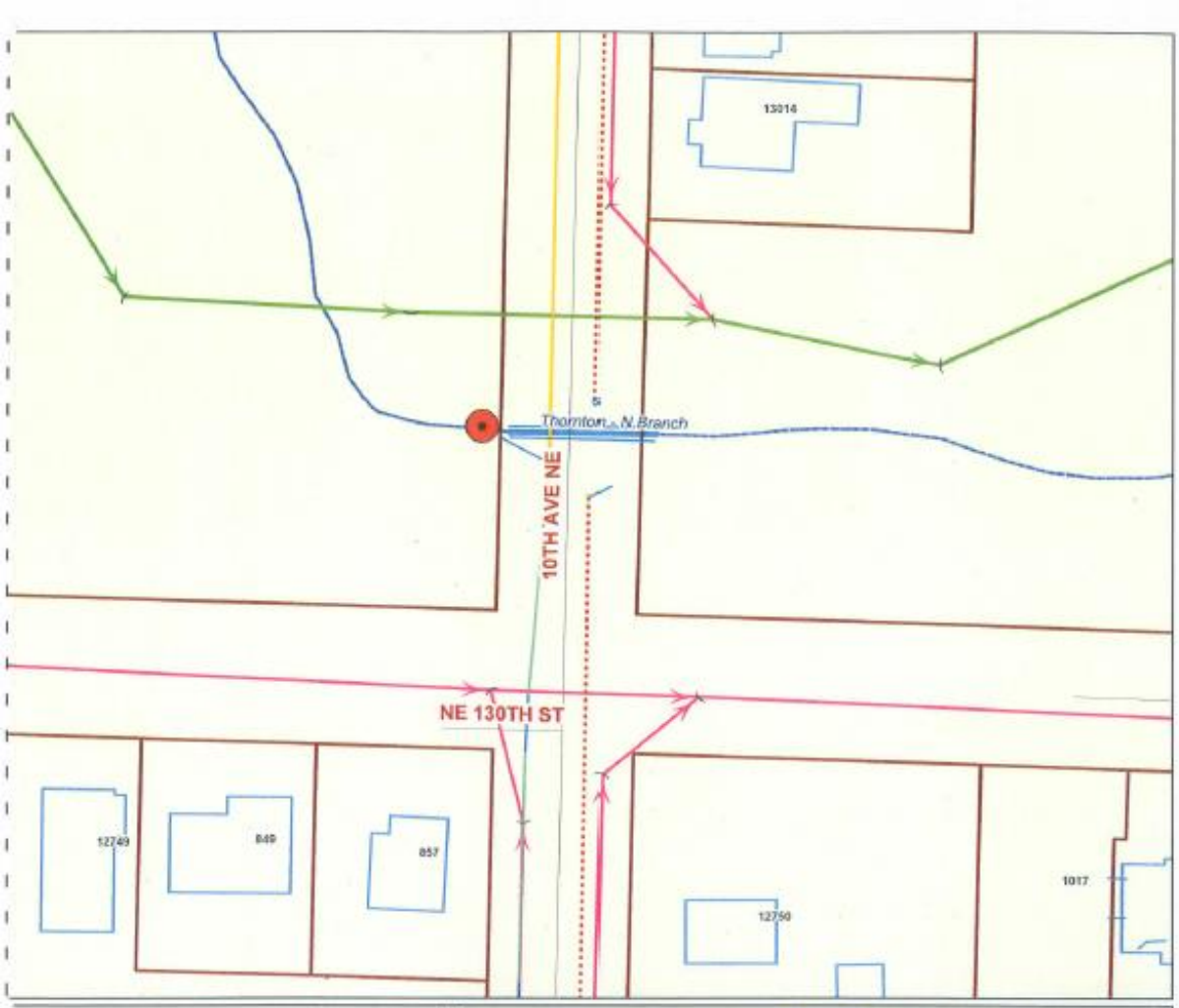
TH42: 33rd Ave NE @ NE 117th St



TH47: 15th Ave NE @ NE 130th Pl.



TH48: 10th Ave NE @ Thornton Creek



TH48: 10th Ave NE @ Thornton Creek

Routine Maintenance Activity:
- Vactoring and Jetting culverts and ditches, control Vegetation

Section/Township/Range (SE 20 26 4)
Latitude (47.72337N)
Longitude (122.31812W)
Waterbody - Thornton Creek

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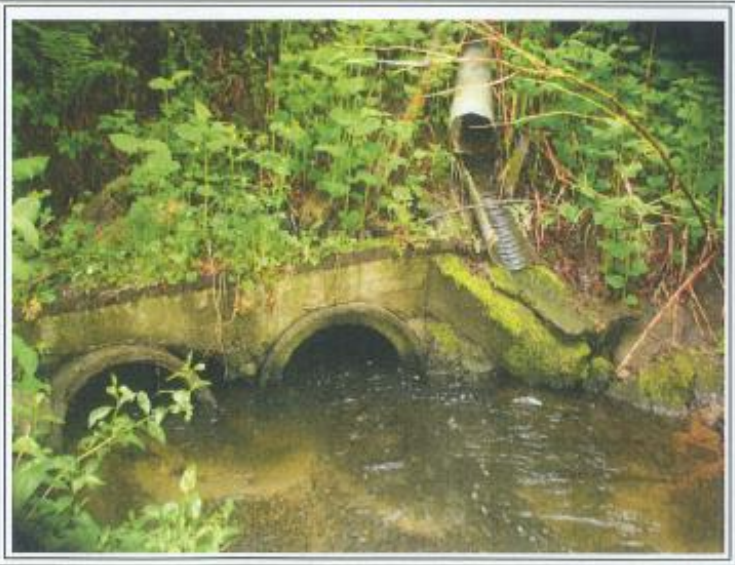
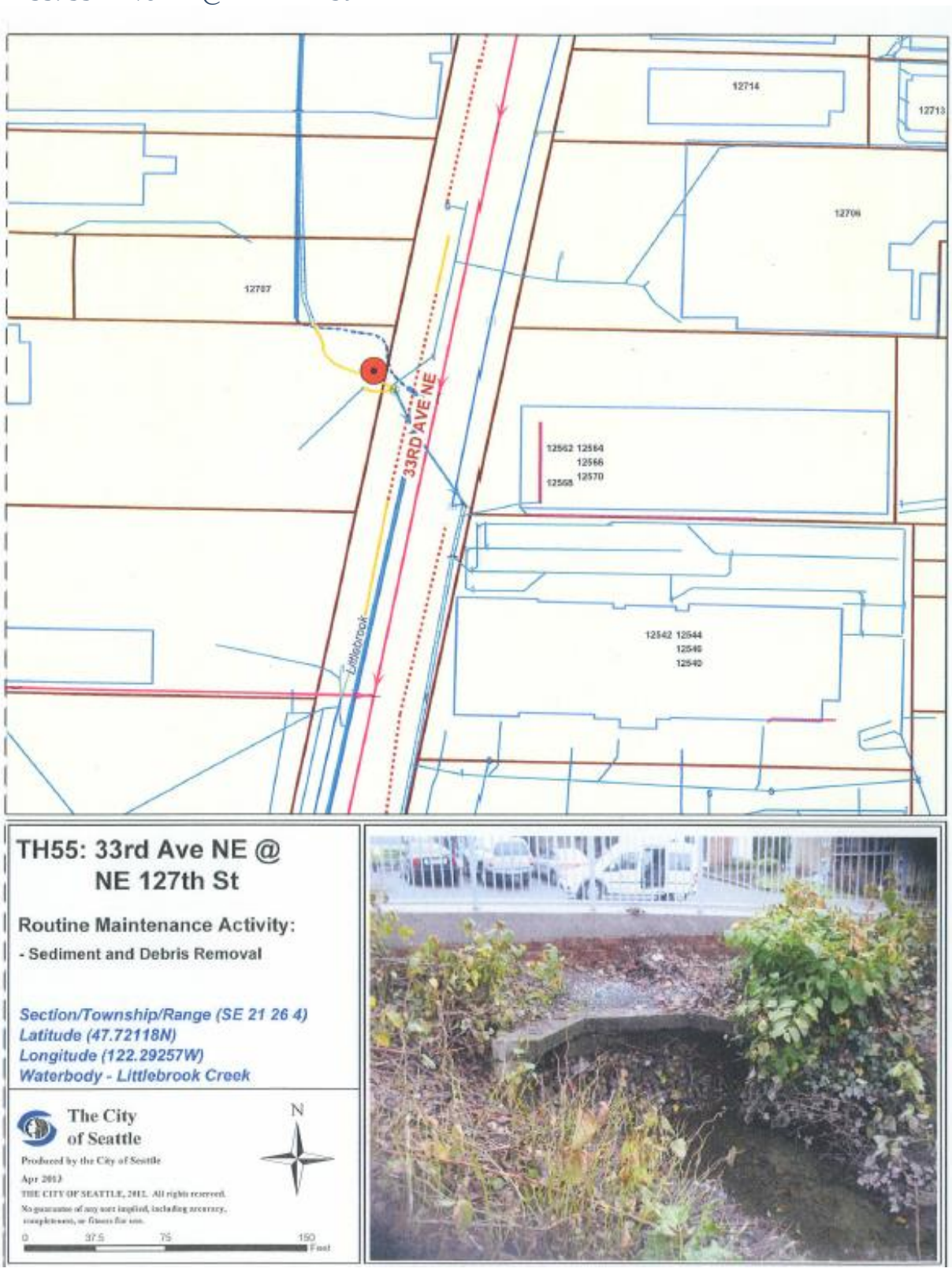
Mar 2013

N

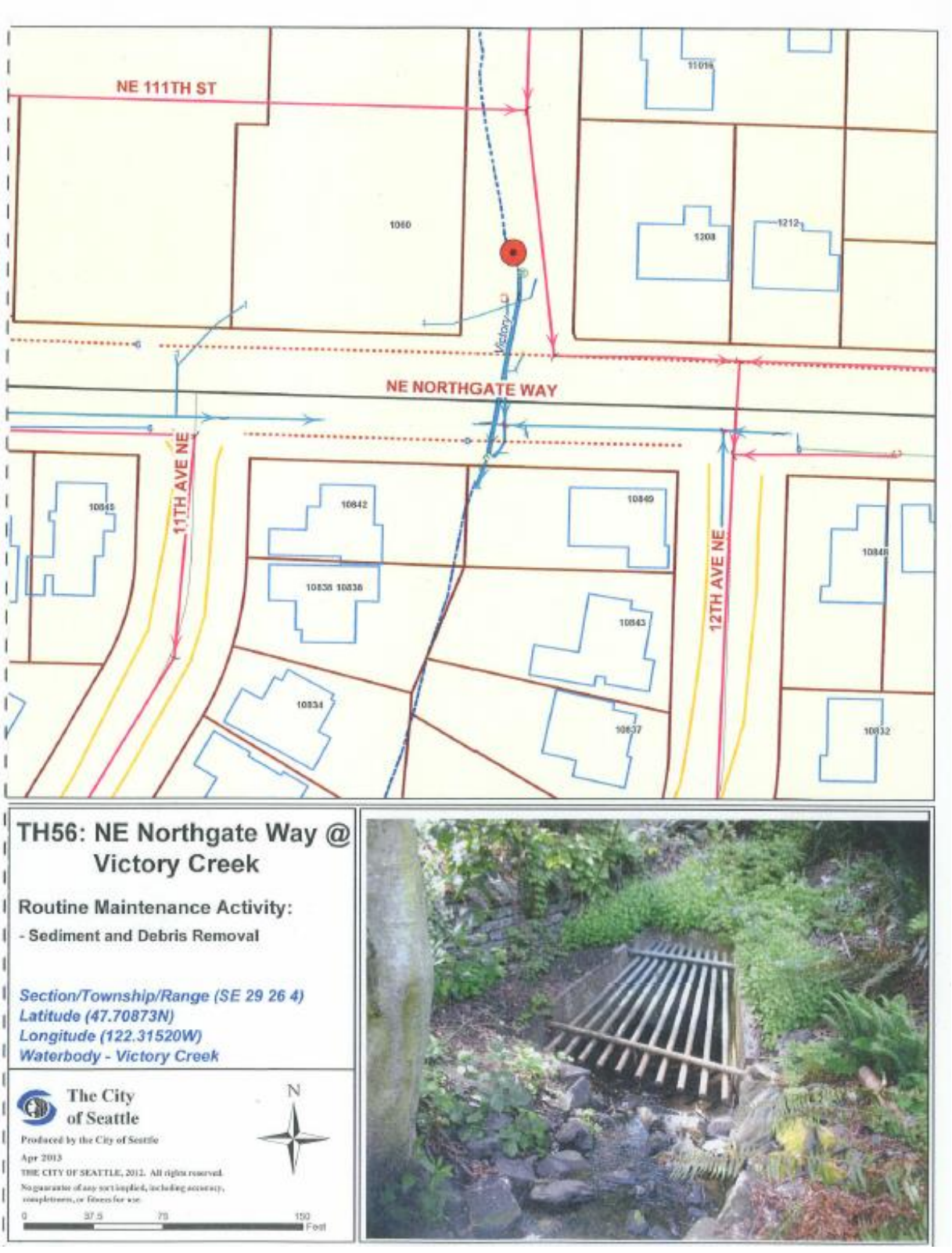
0 37.5 75 150 Feet



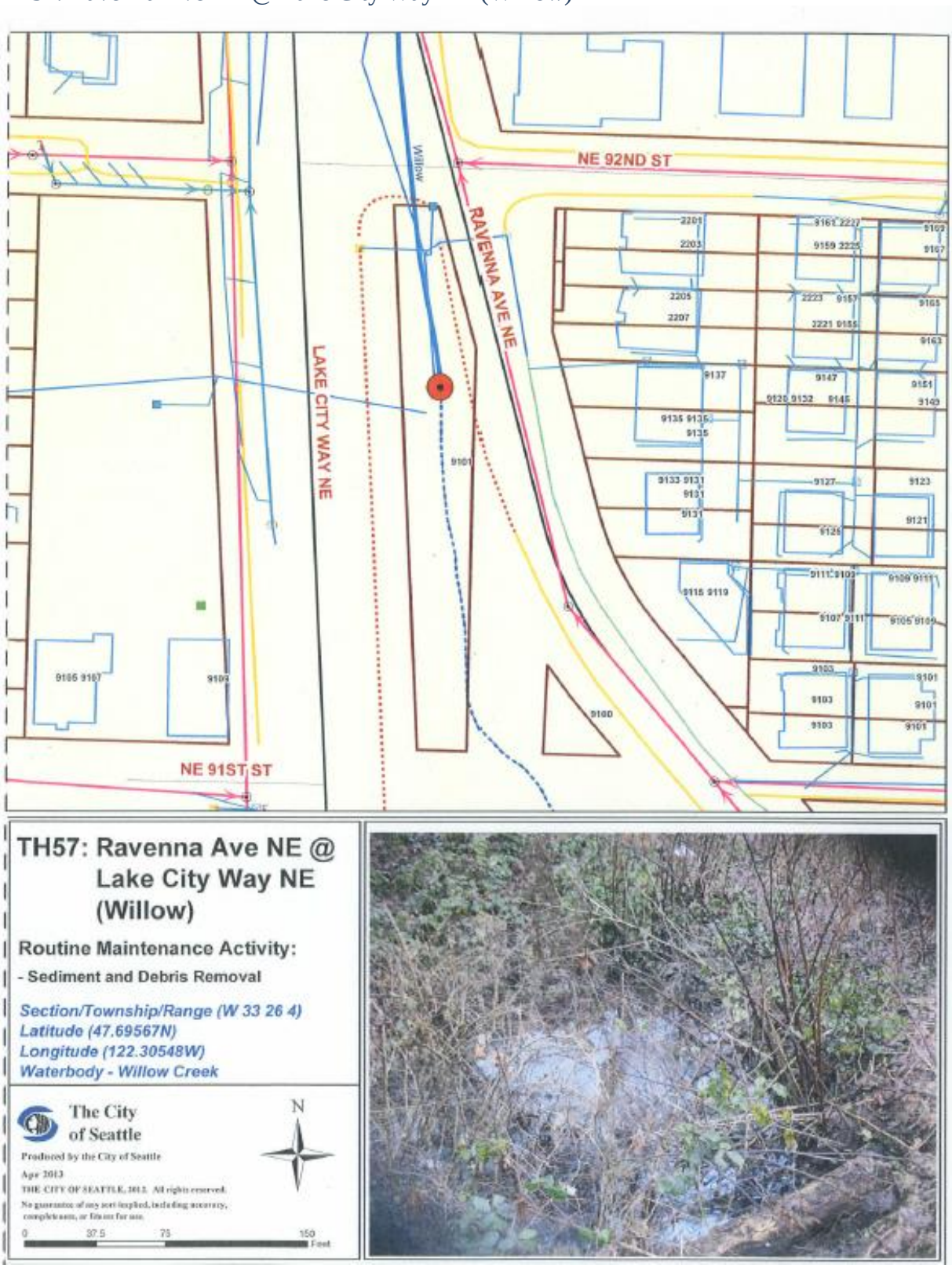
TH55: 33rd Ave NE @ NE 127th St



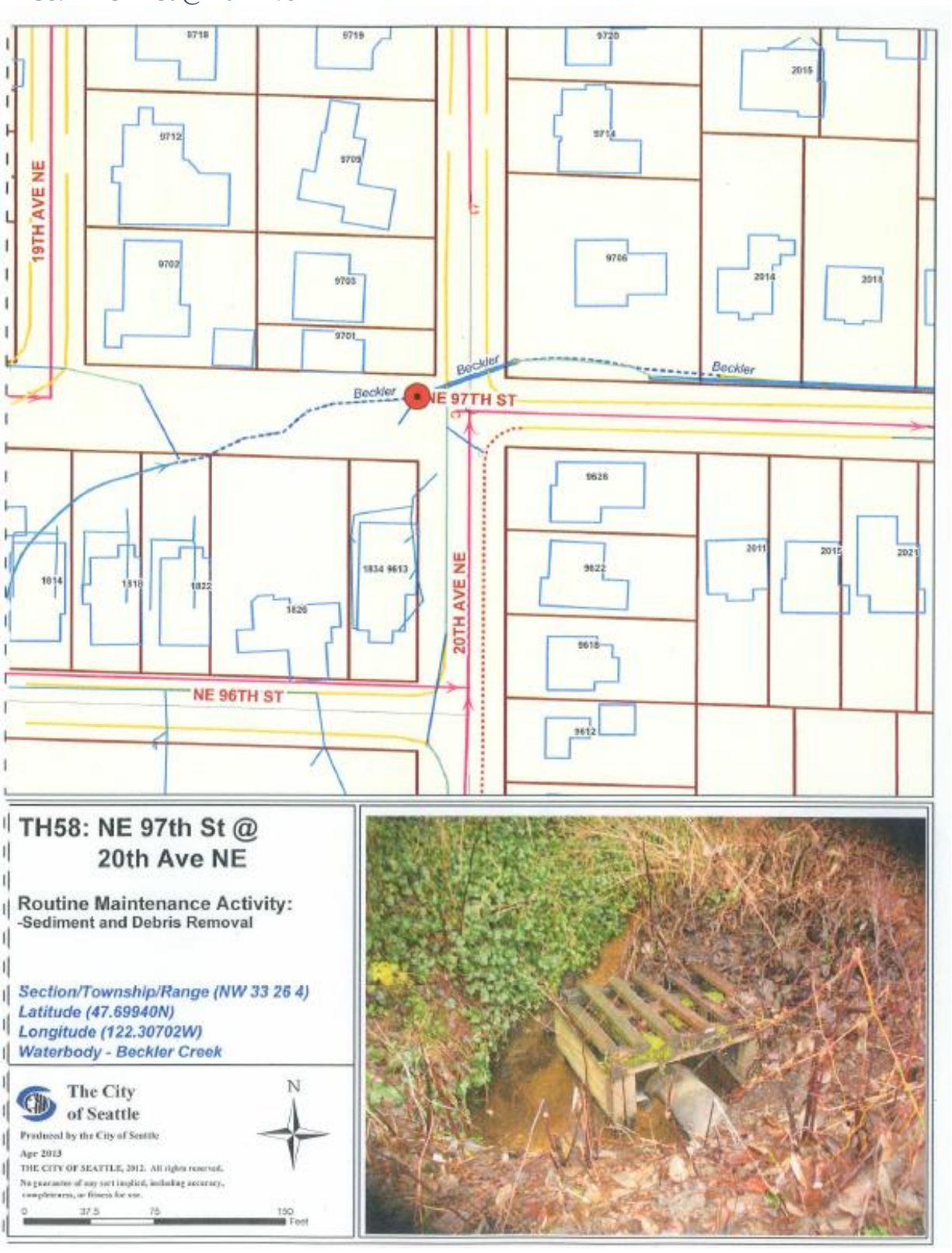
TH56: NE Northgate Way @ Victory Creek



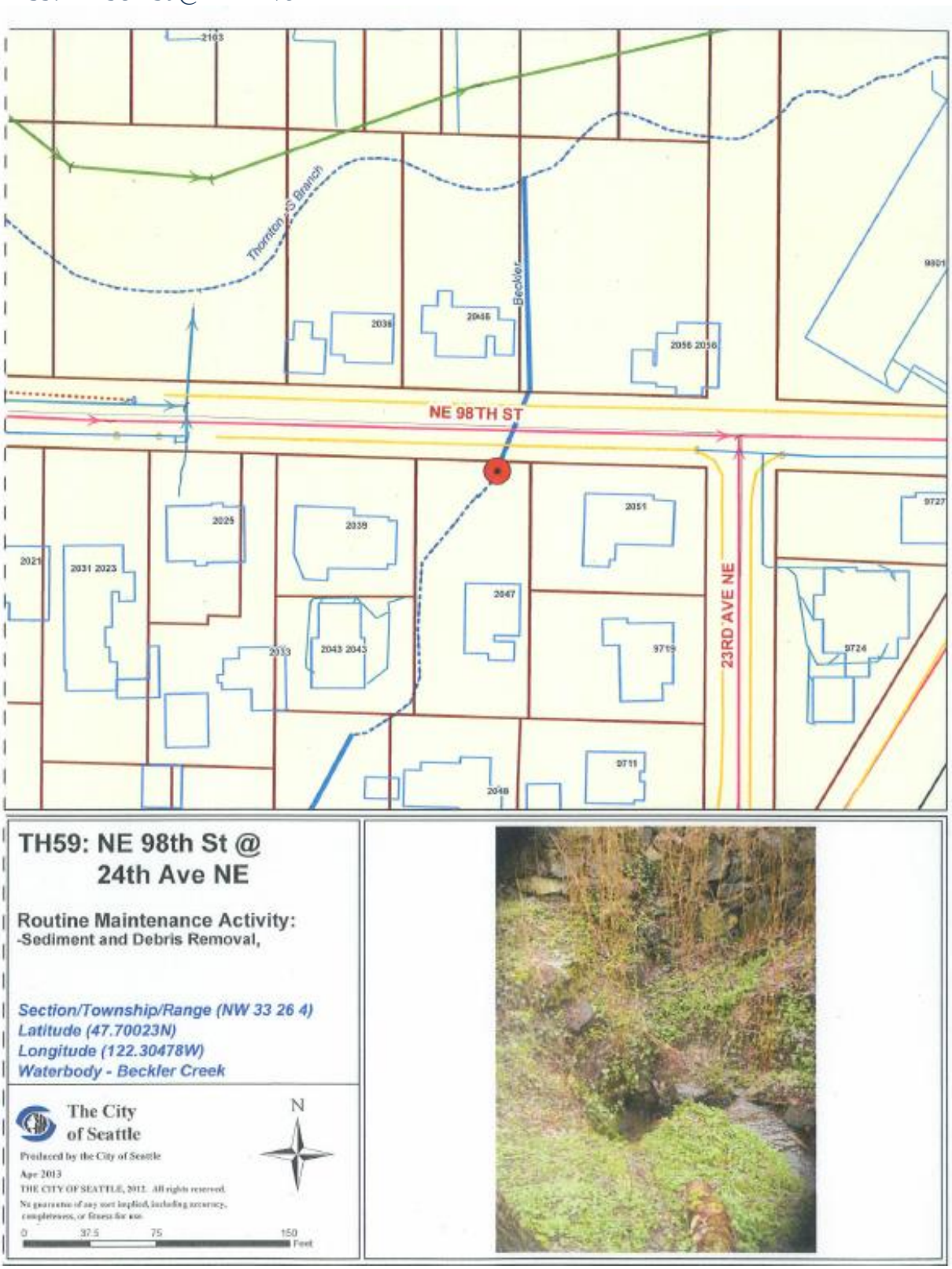
TH57: Ravenna Ave NE @ Lake City Way NE (Willow)



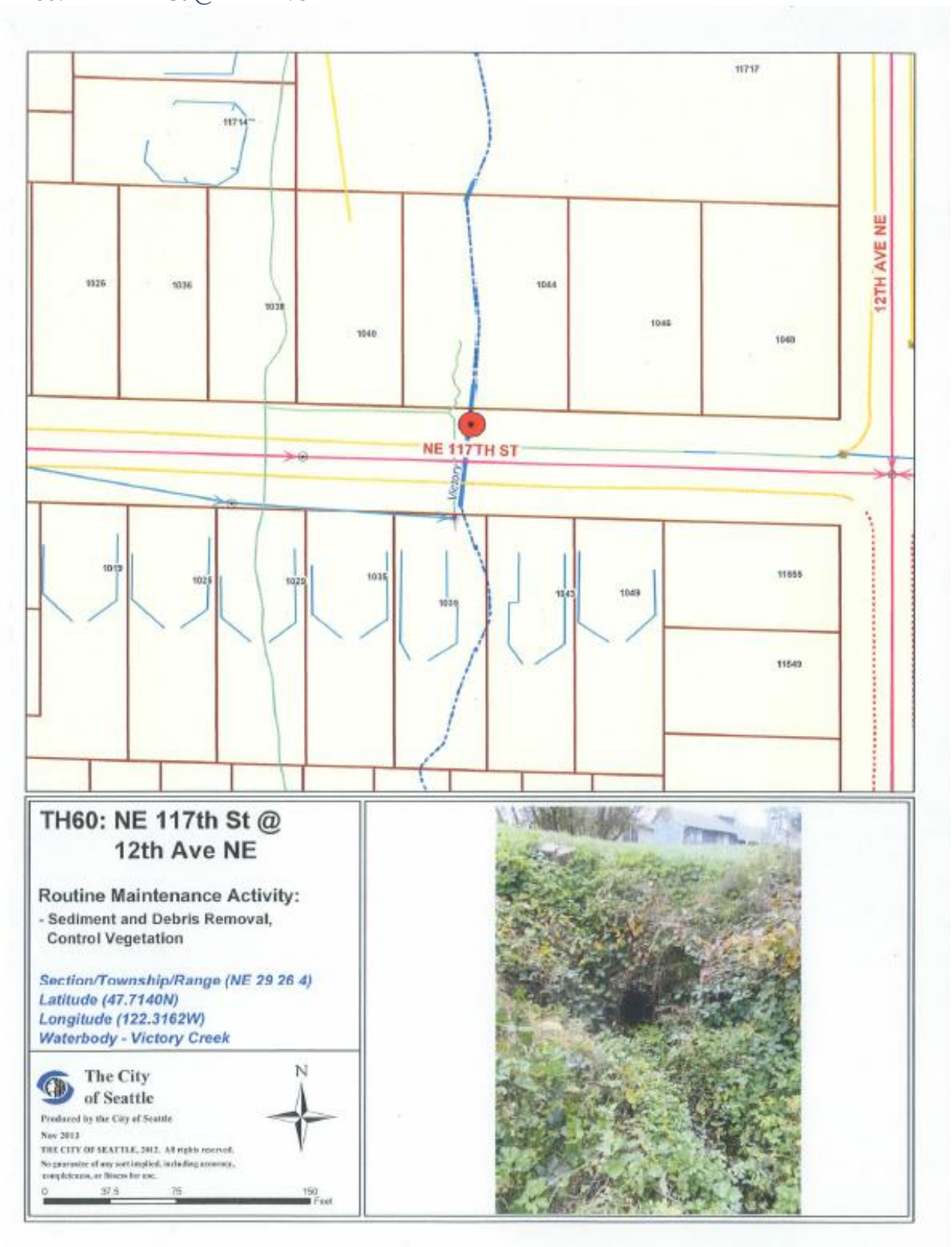
TH58: NE 97th St @ 20th Ave NE



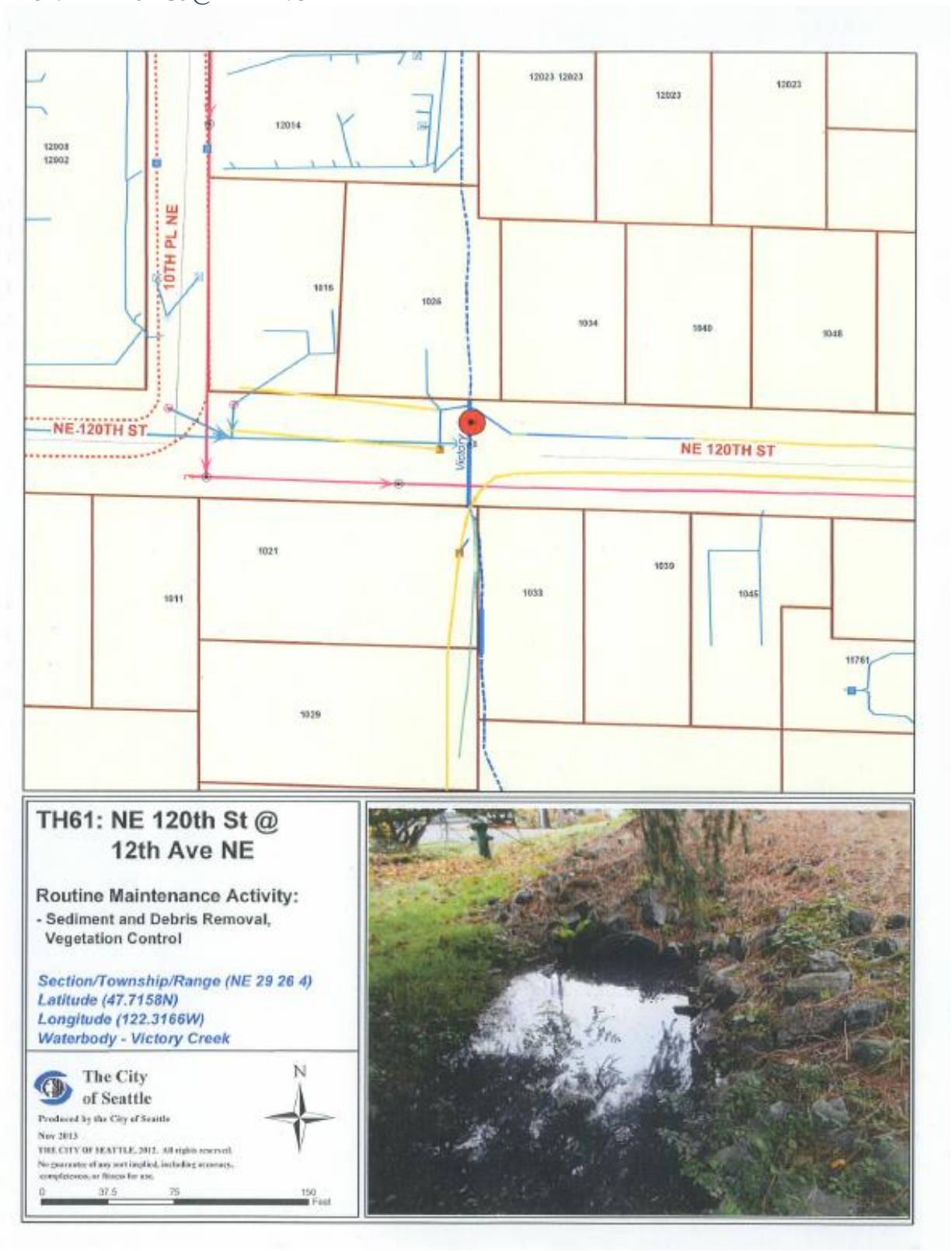
TH59: NE 98th St @ 24th Ave NE



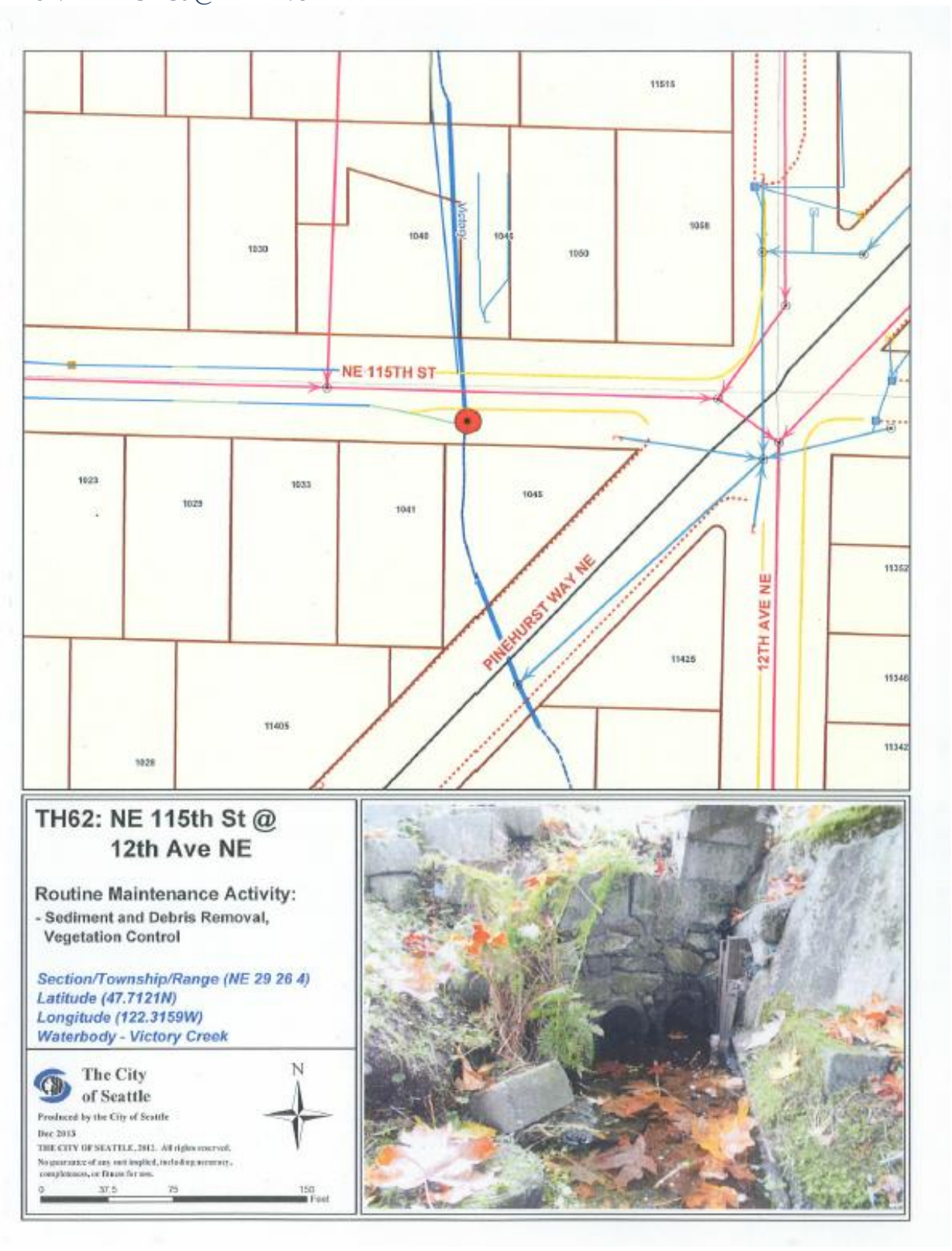
TH60: NE 117th St @ 12th Ave NE



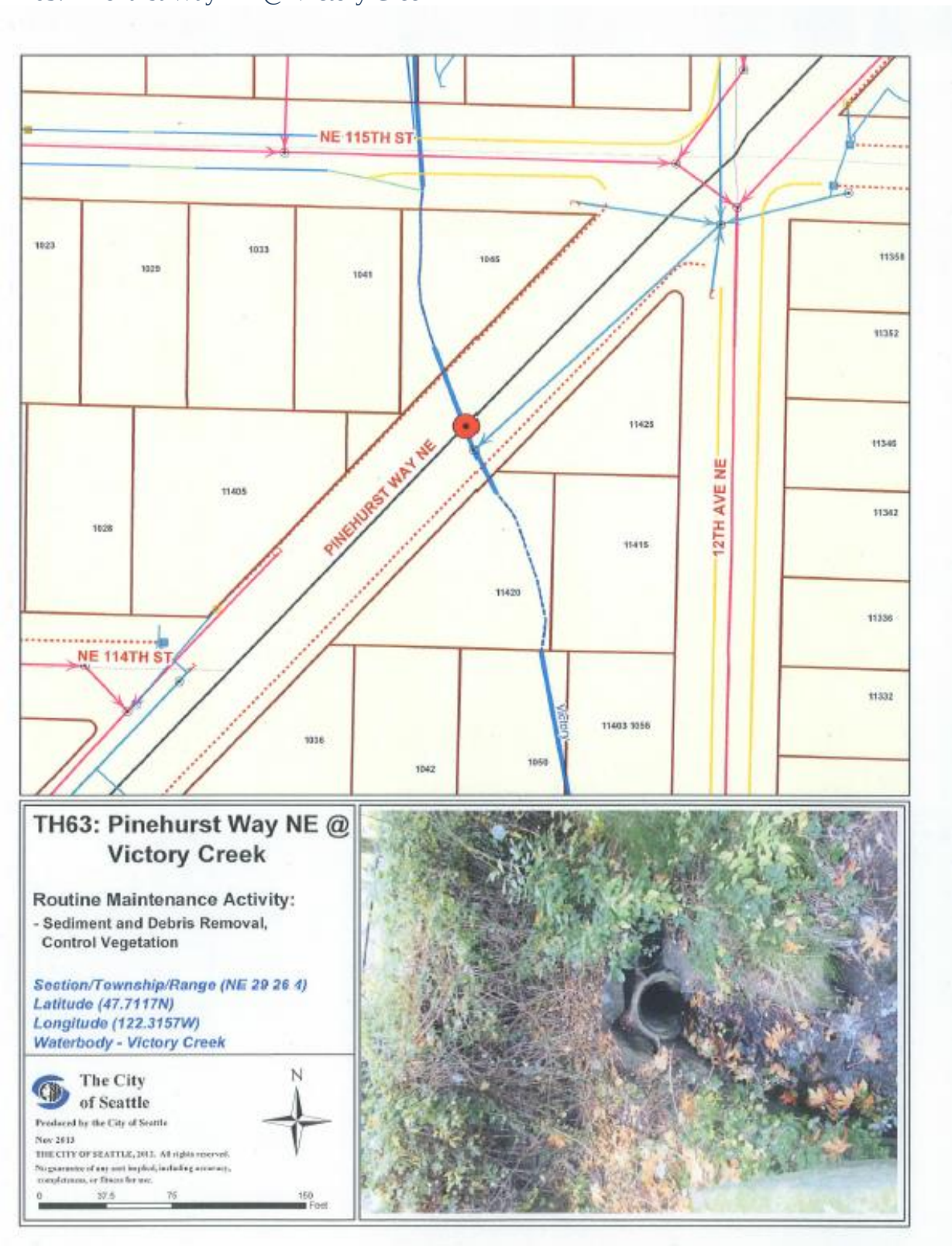
TH61: NE 120th St @ 12th Ave NE



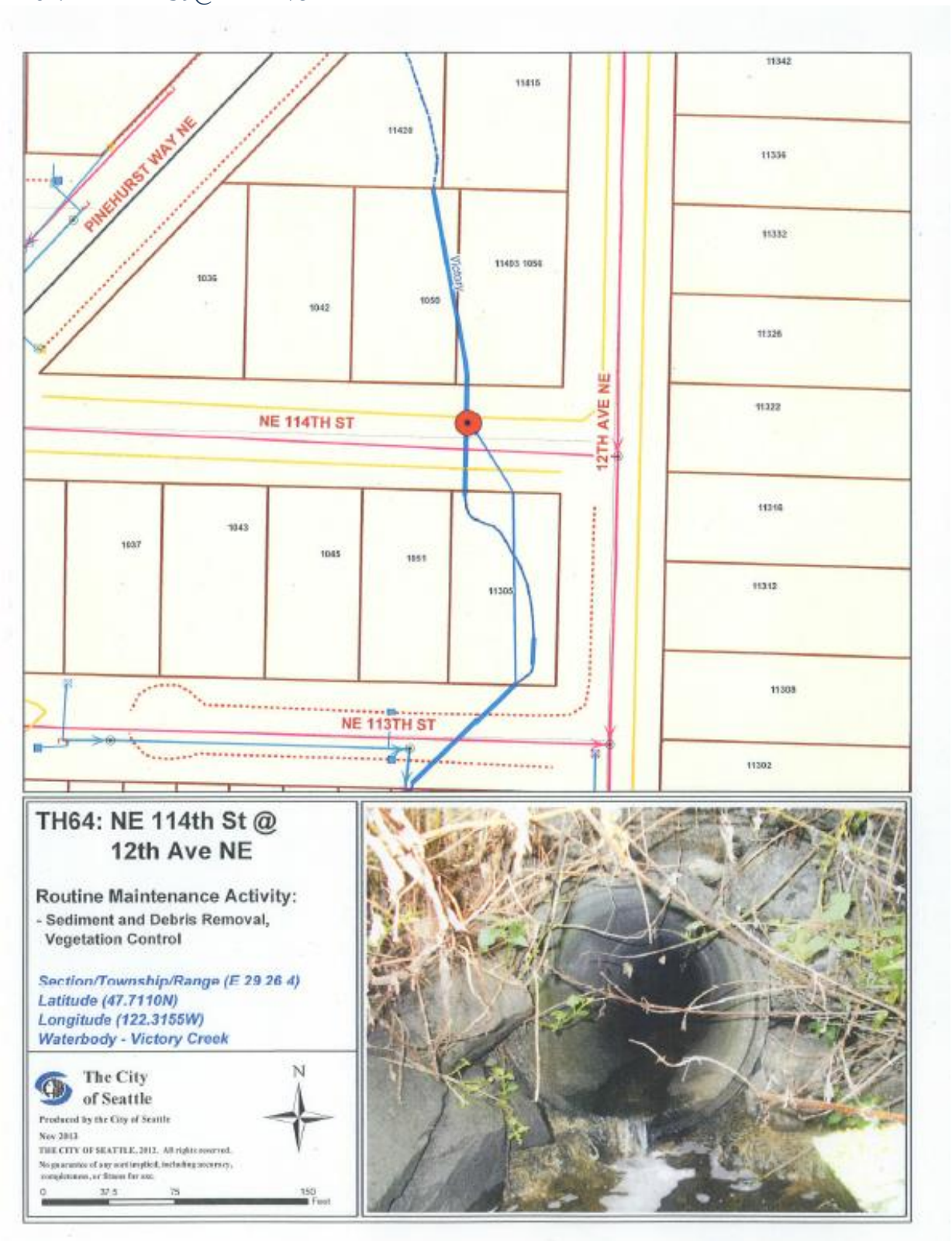
TH62: NE 115th St @ 12th Ave NE



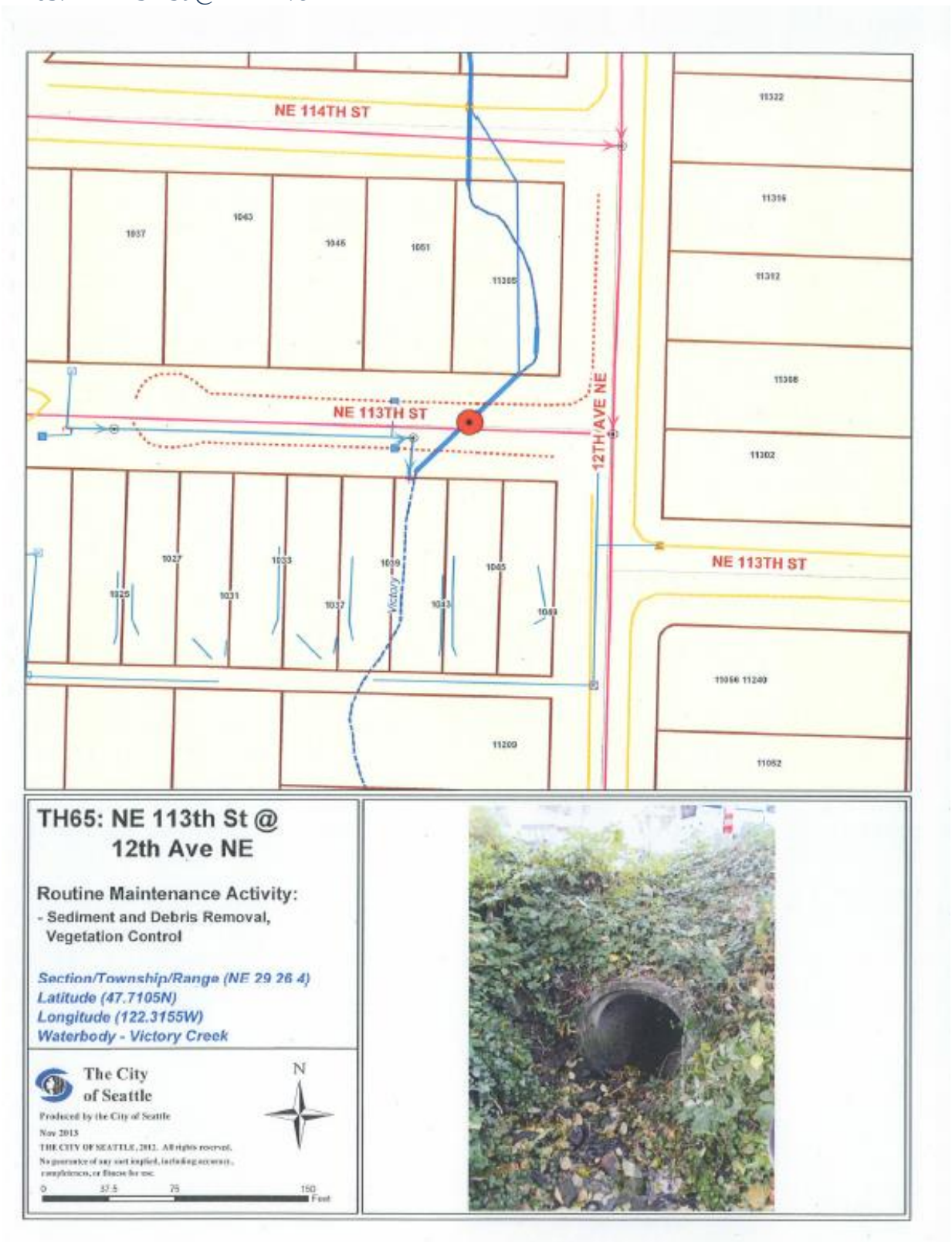
TH63: Pinehurst Way NE @ Victory Creek



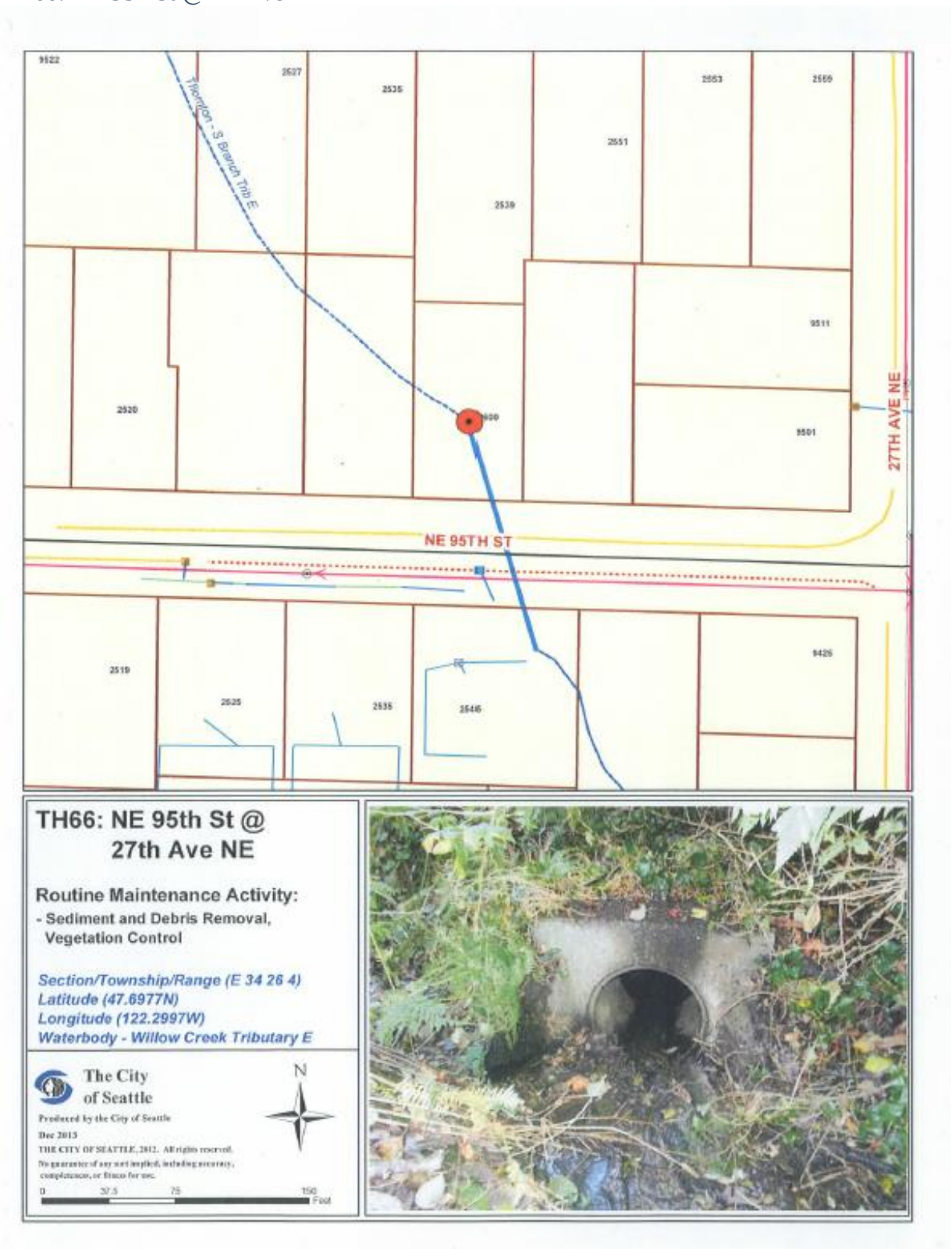
TH64: NE 114th St @ 12th Ave NE



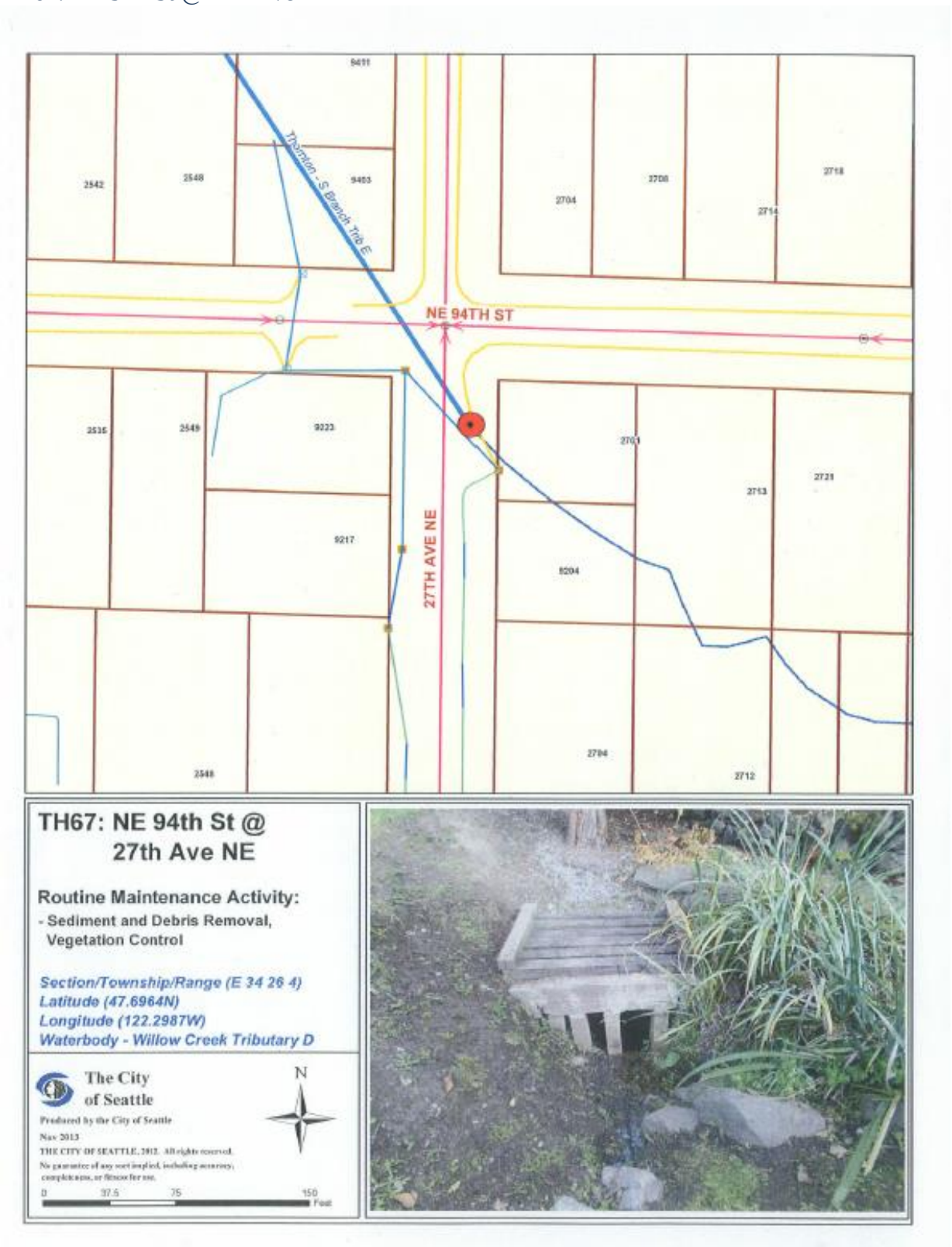
TH65: NE 113th St @ 12th Ave NE



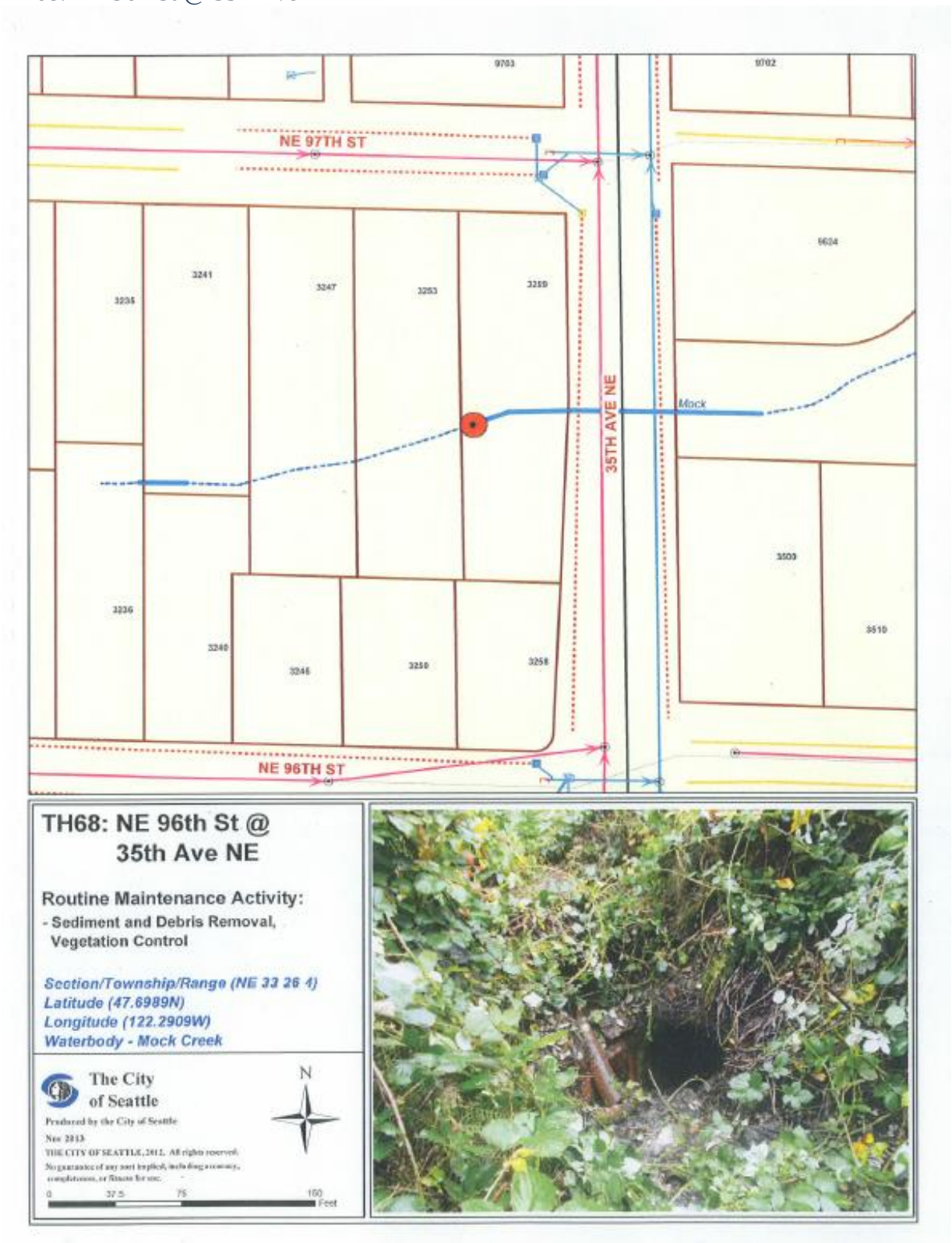
TH66: NE 95th St @ 7th Ave NE



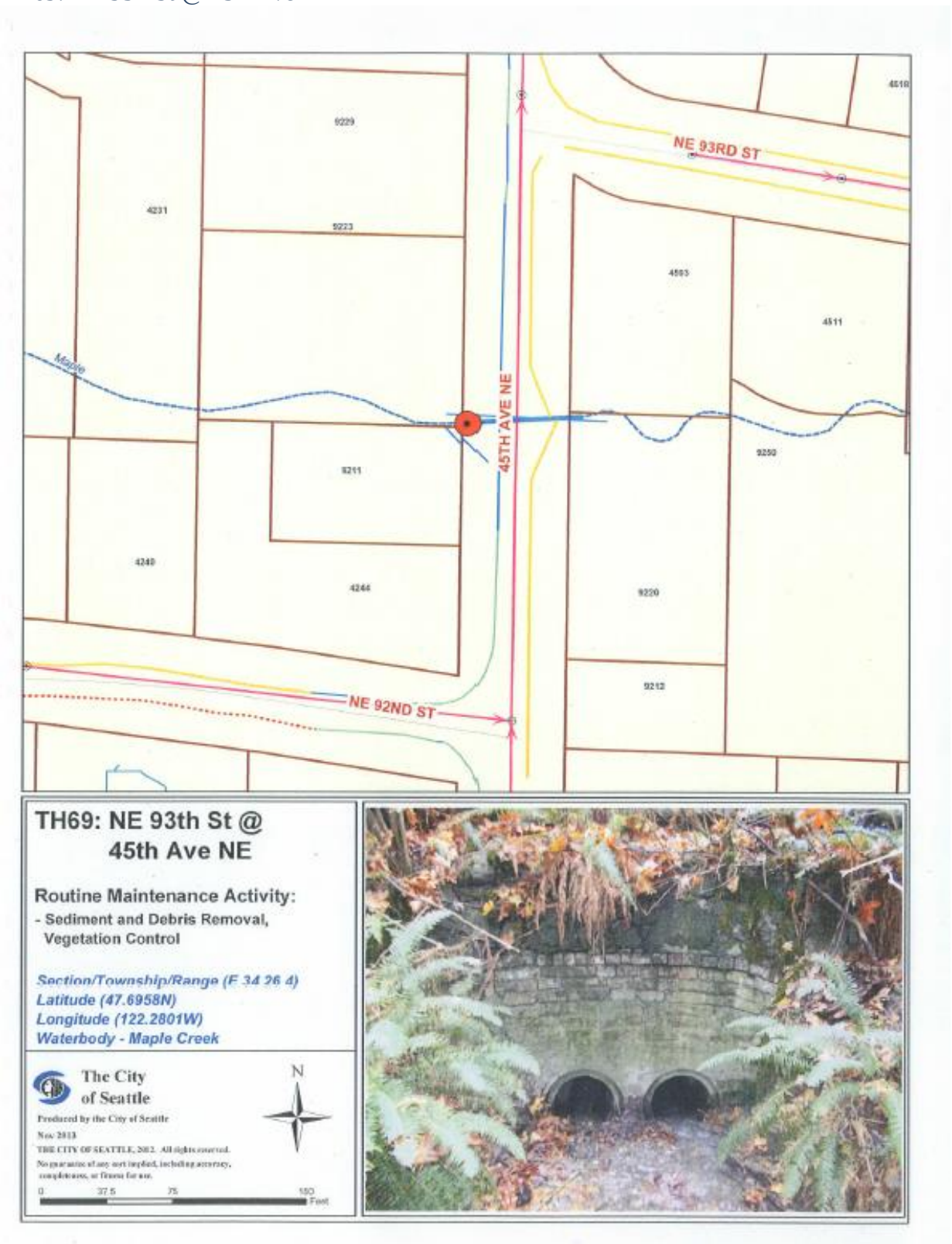
TH67: NE 94th St @ 27th Ave NE



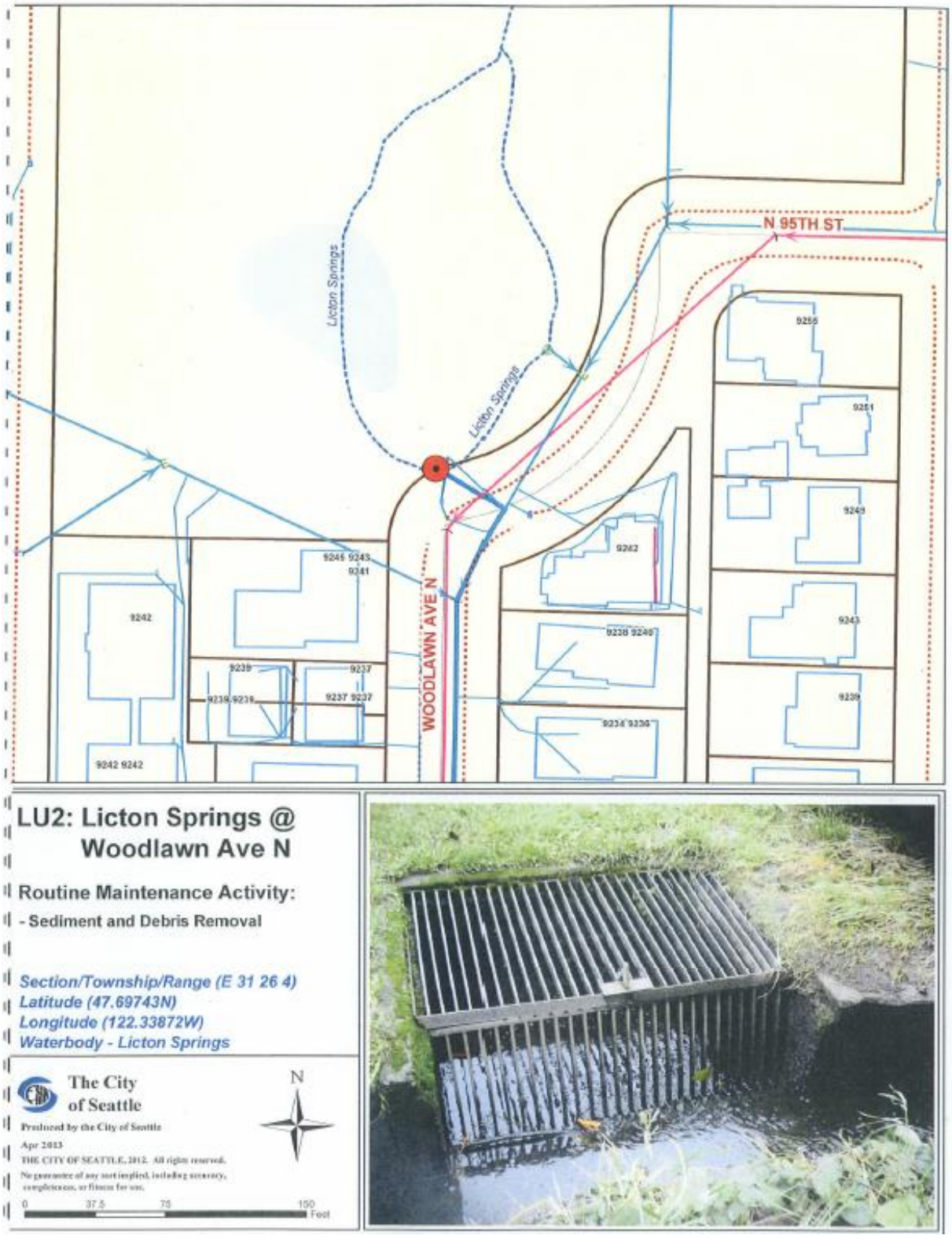
TH68: NE 96th St @ 35th Ave NE



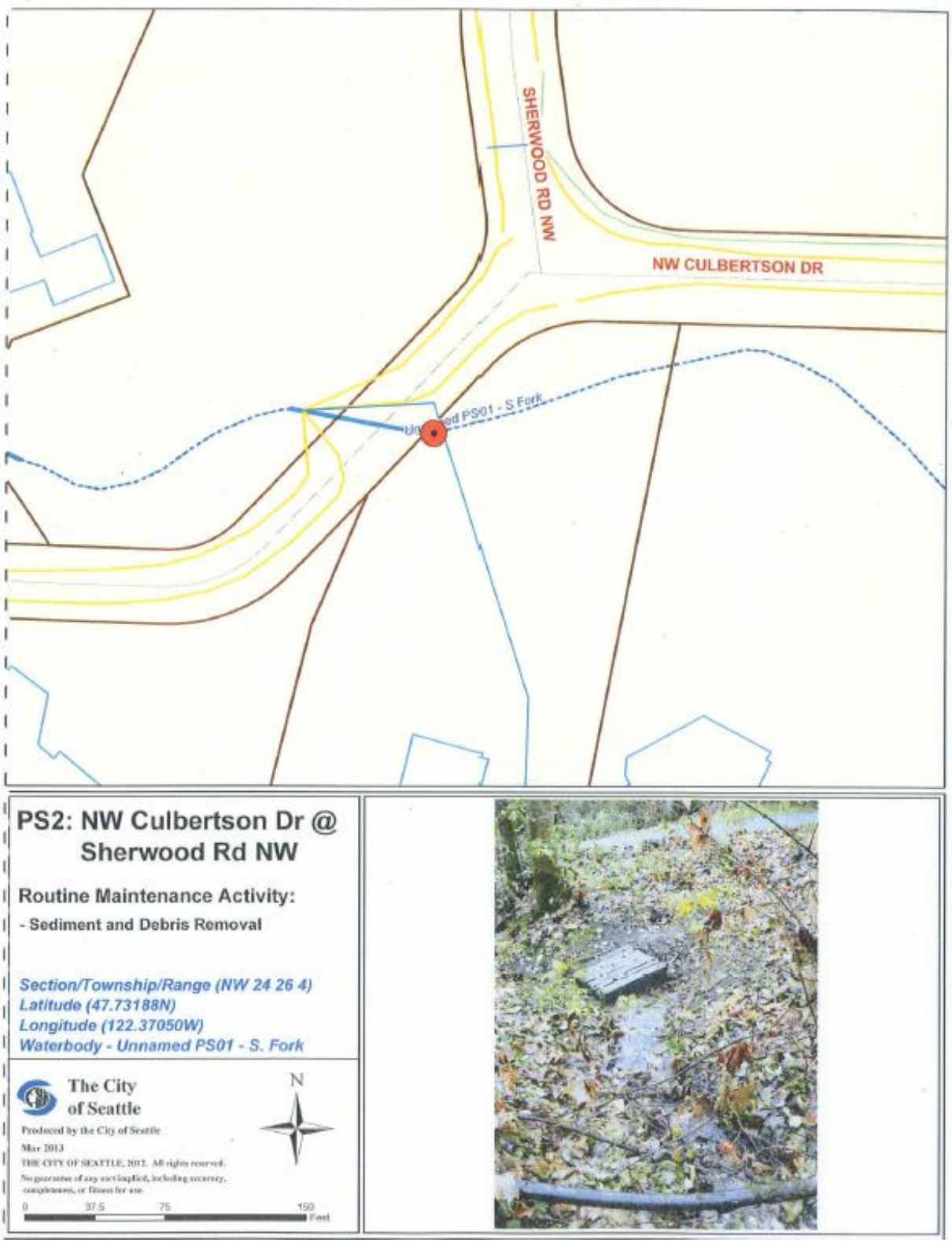
TH69: NE 93rd St @ 45th Ave NE



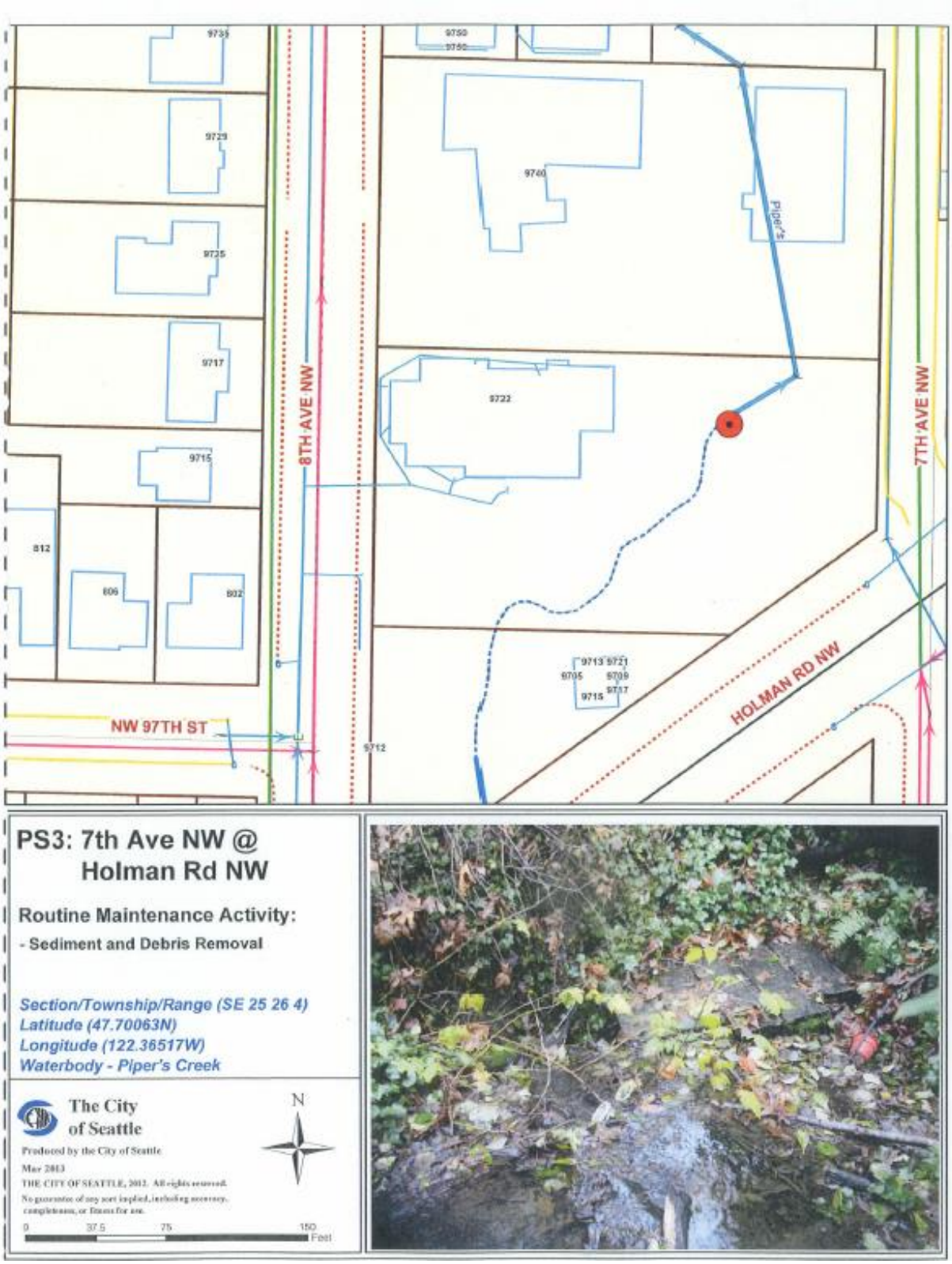
LU2: Licton Springs @ Woodlawn Ave N



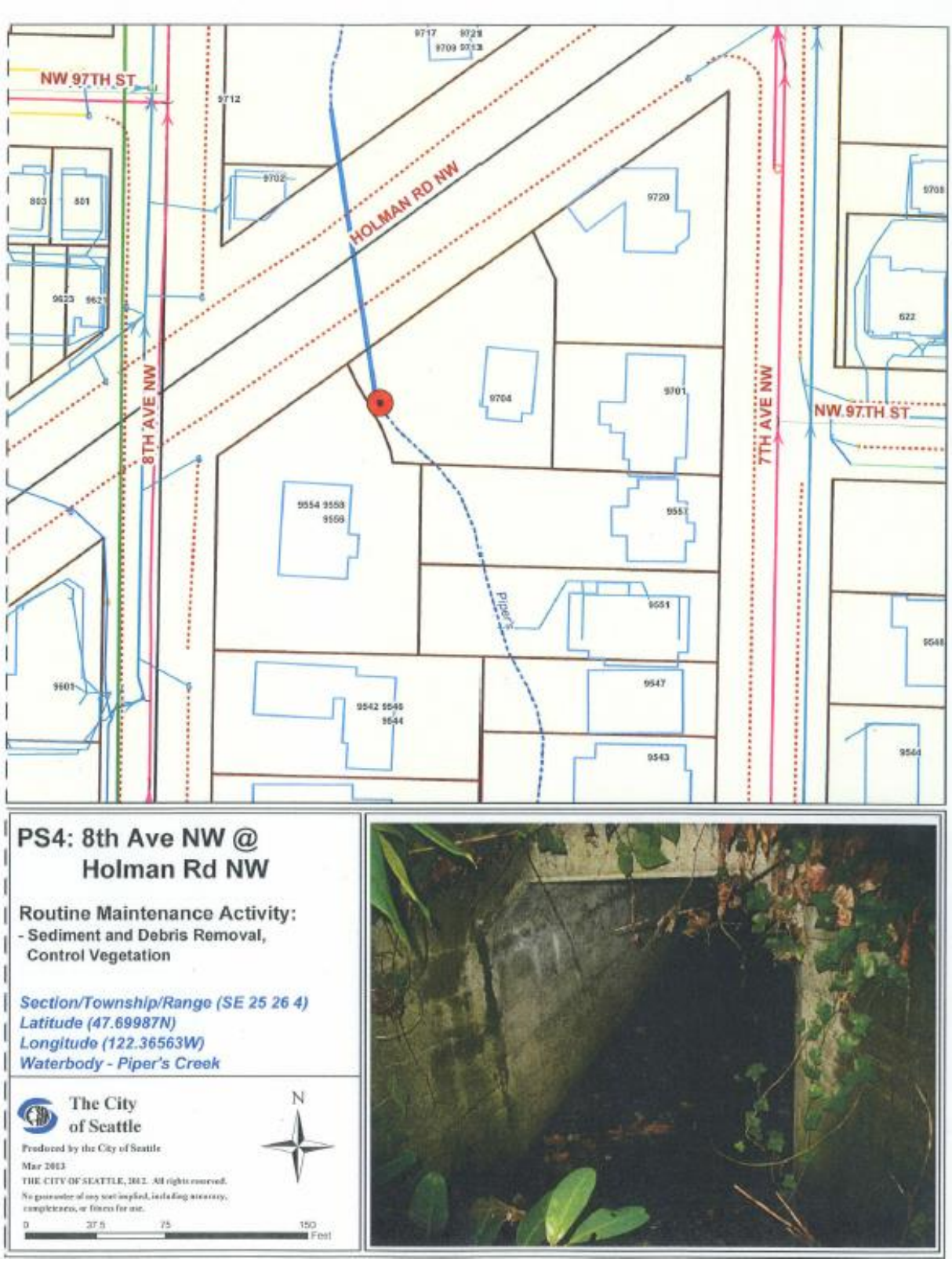
PS2: NW Culbertson Dr @ Sherwood Rd NW



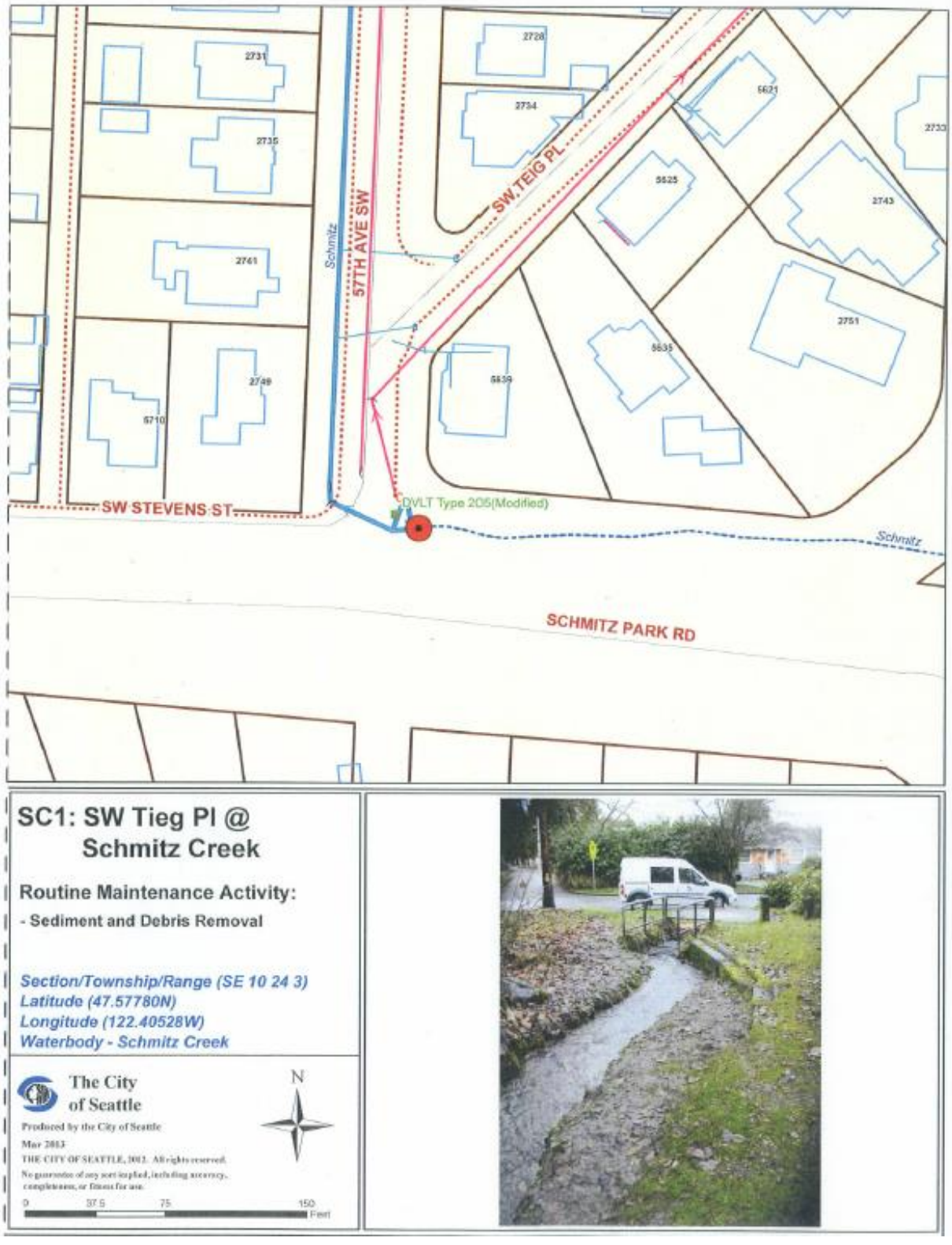
PS3: 7th Ave NE @ Holman Rd NW



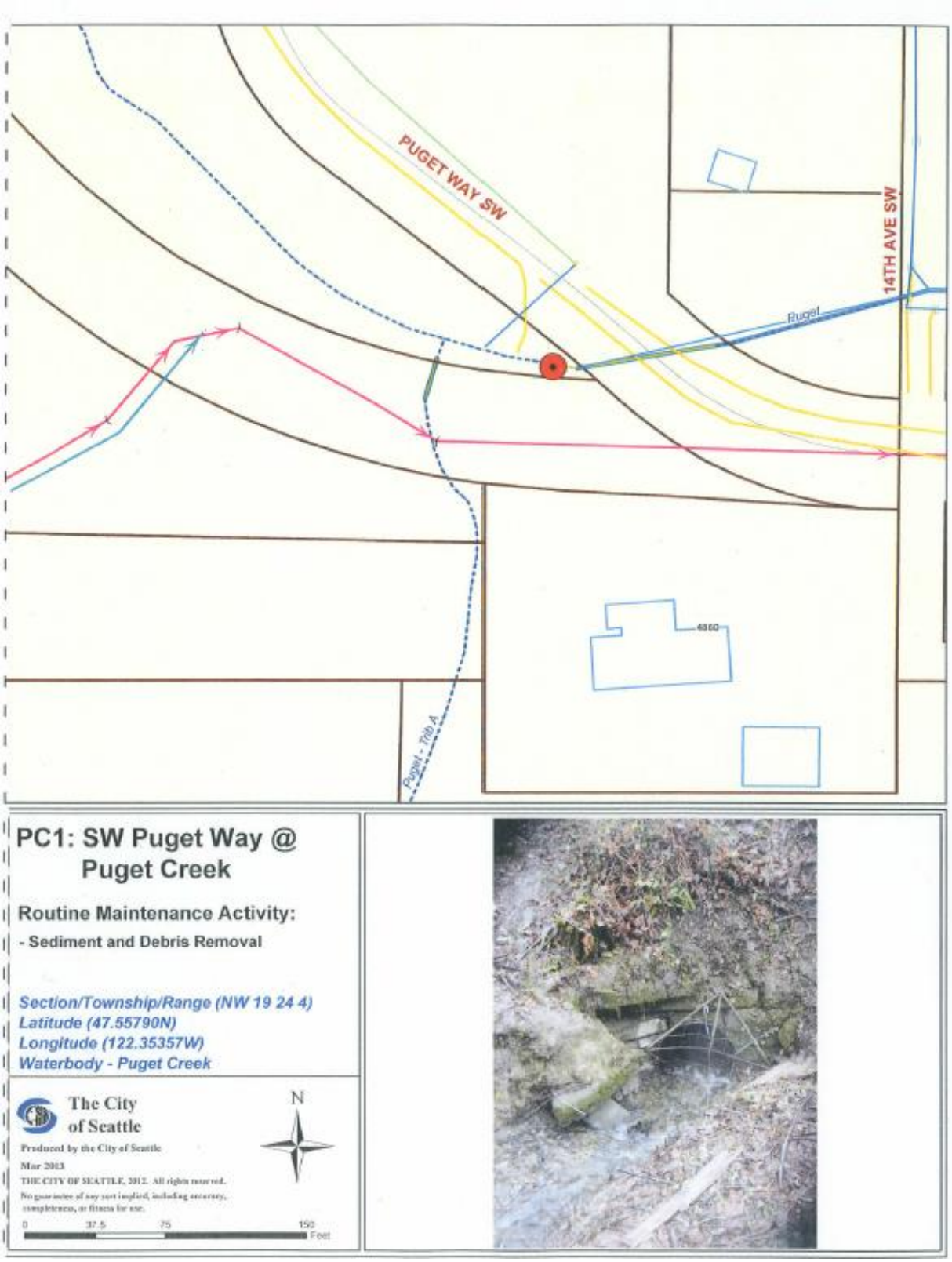
PS4: 8th Ave NW @ Holman Rd NW



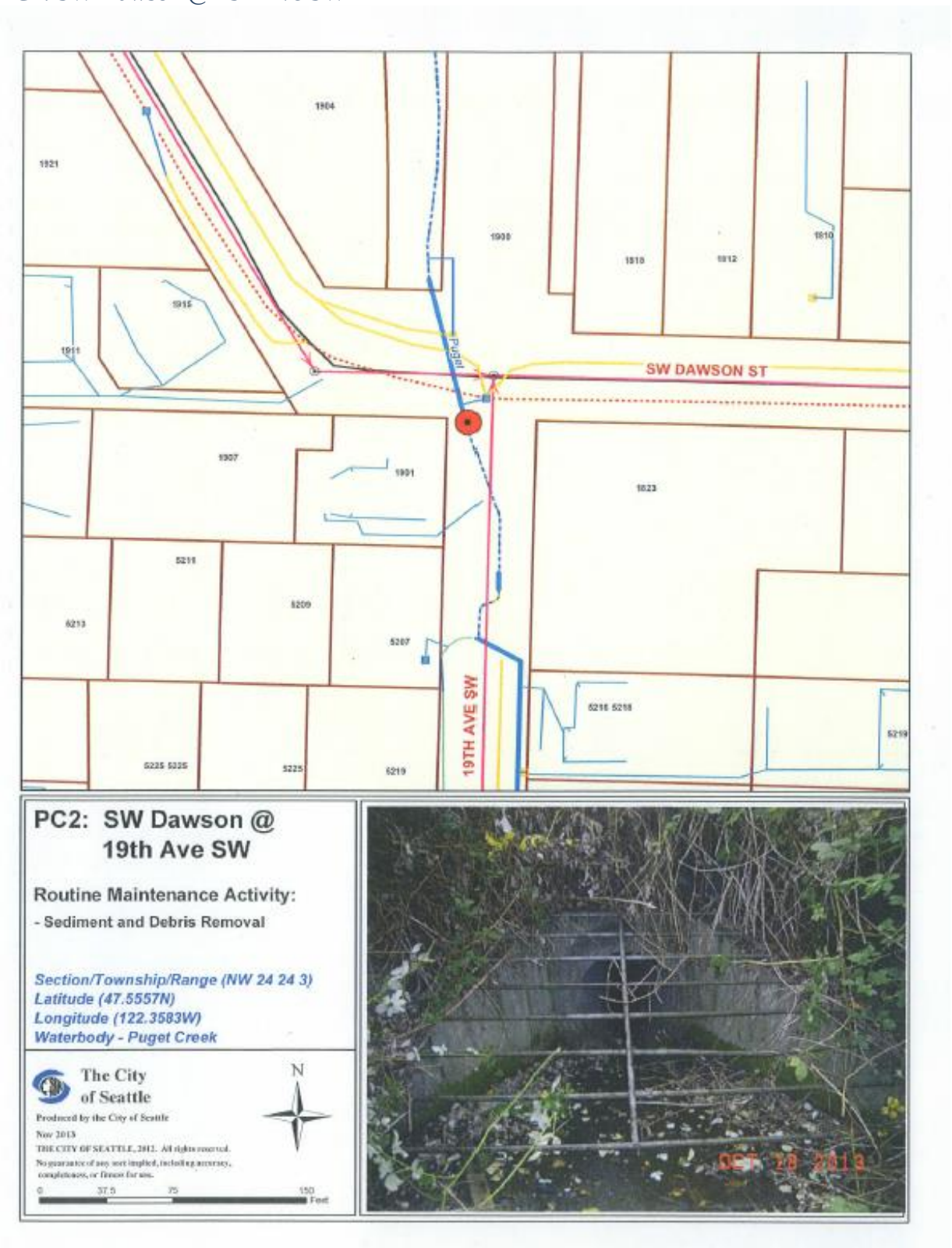
SC1: SW Tieg Pl @ Schmitz Creek



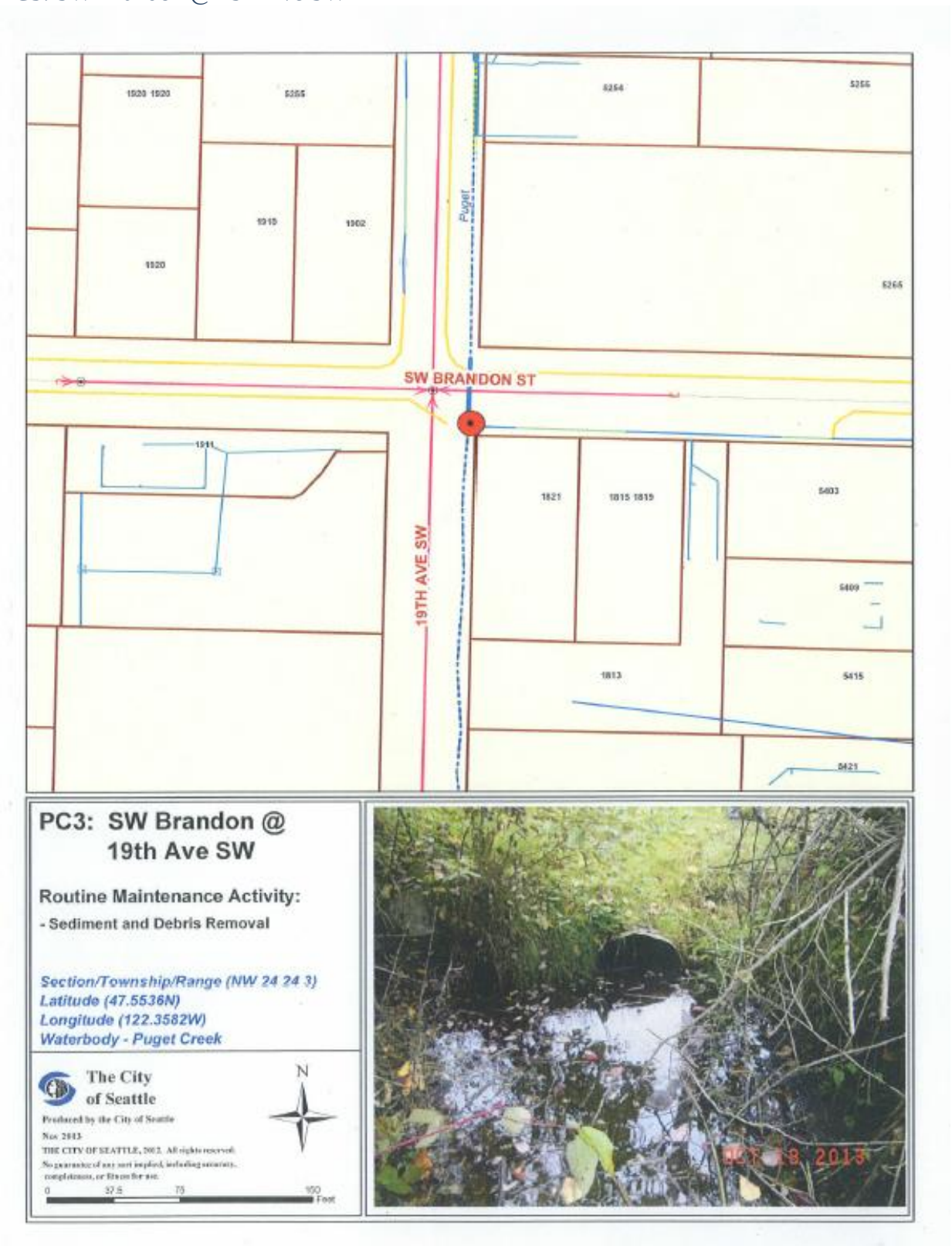
PC1: SW Puget Way @ Puget Creek



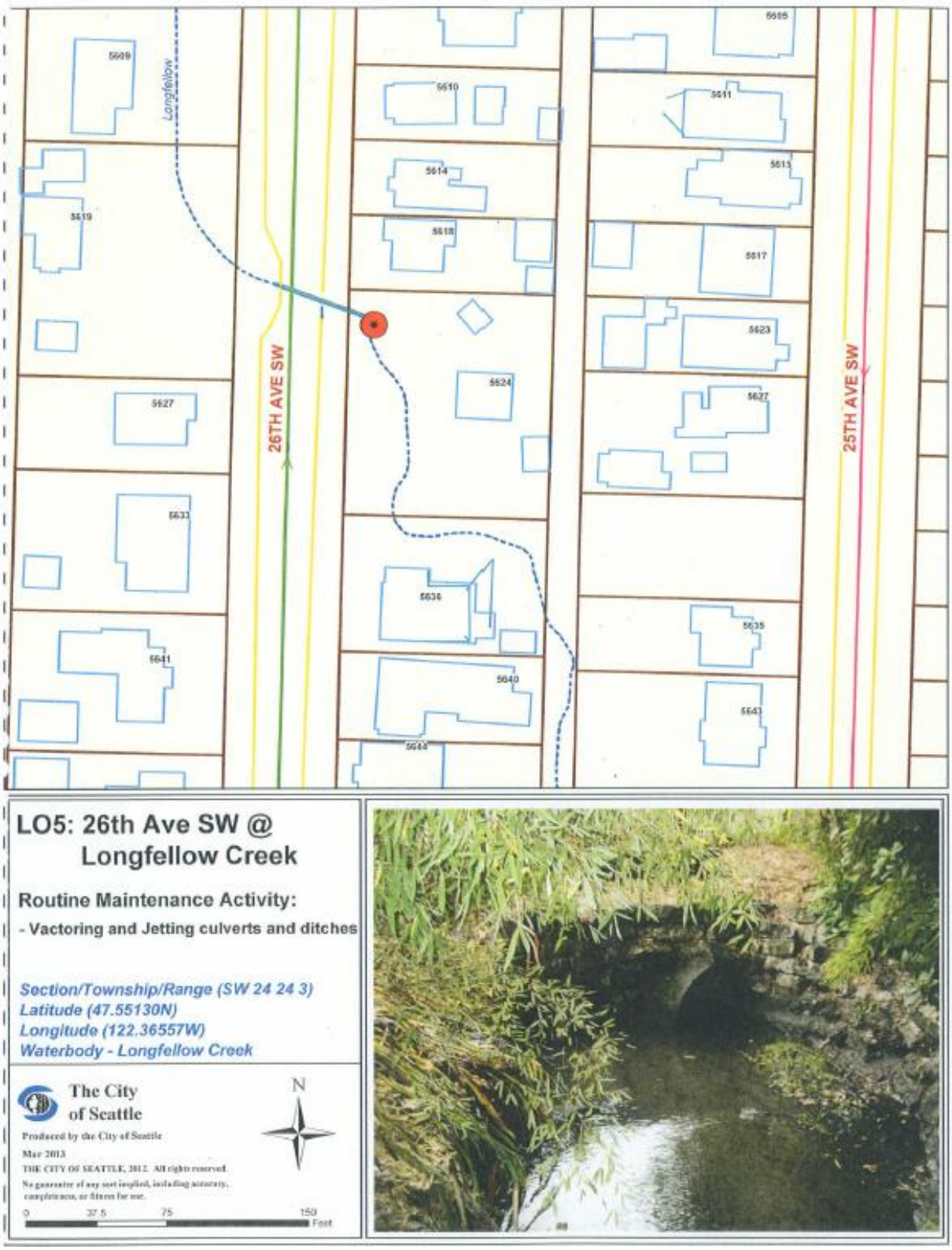
PC2: SW Dawson @ 19th Ave SW



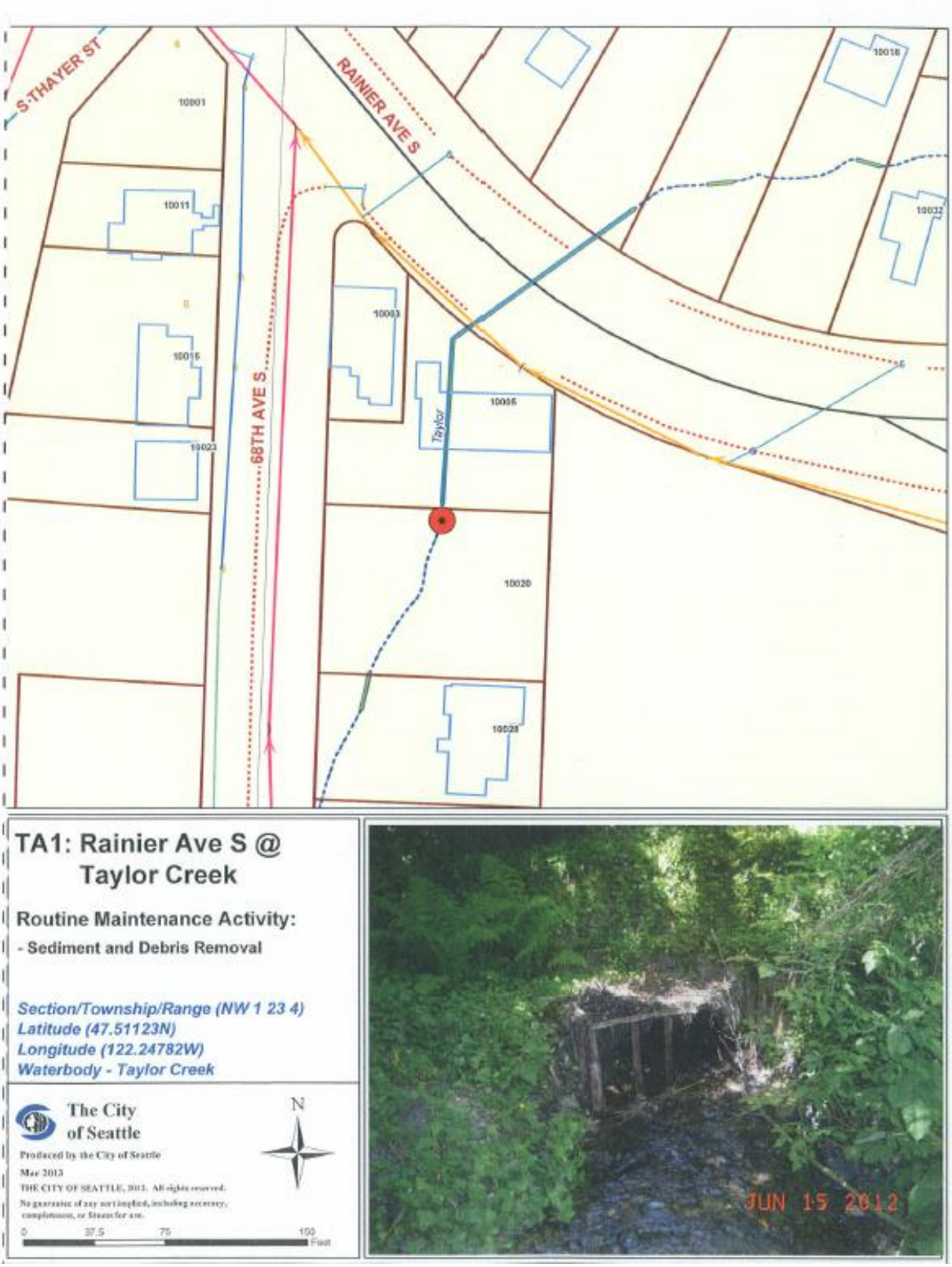
PC3: SW Brandon @ 19th Ave SW



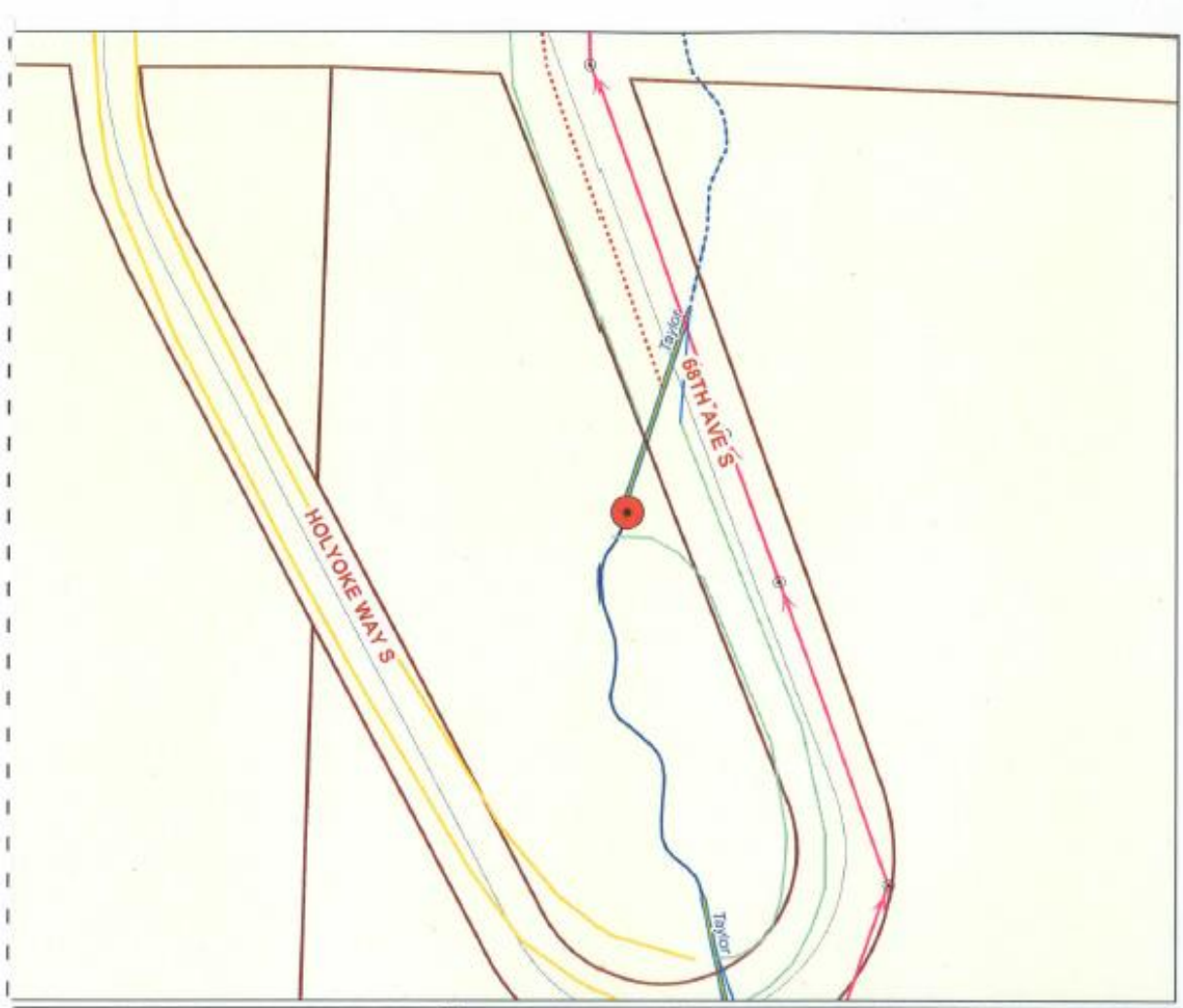
LO5: 26th Ave SW @ Longfellow Creek



TA1: Rainier Ave S @ Taylor Creek



TA2: 68th Ave S @ Taylor Creek



TA2: 68th Ave S @ Taylor Creek

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (W 1 24 3)
Latitude (47.50938N)
Longitude (122.24810W)
Waterbody - Taylor Creek

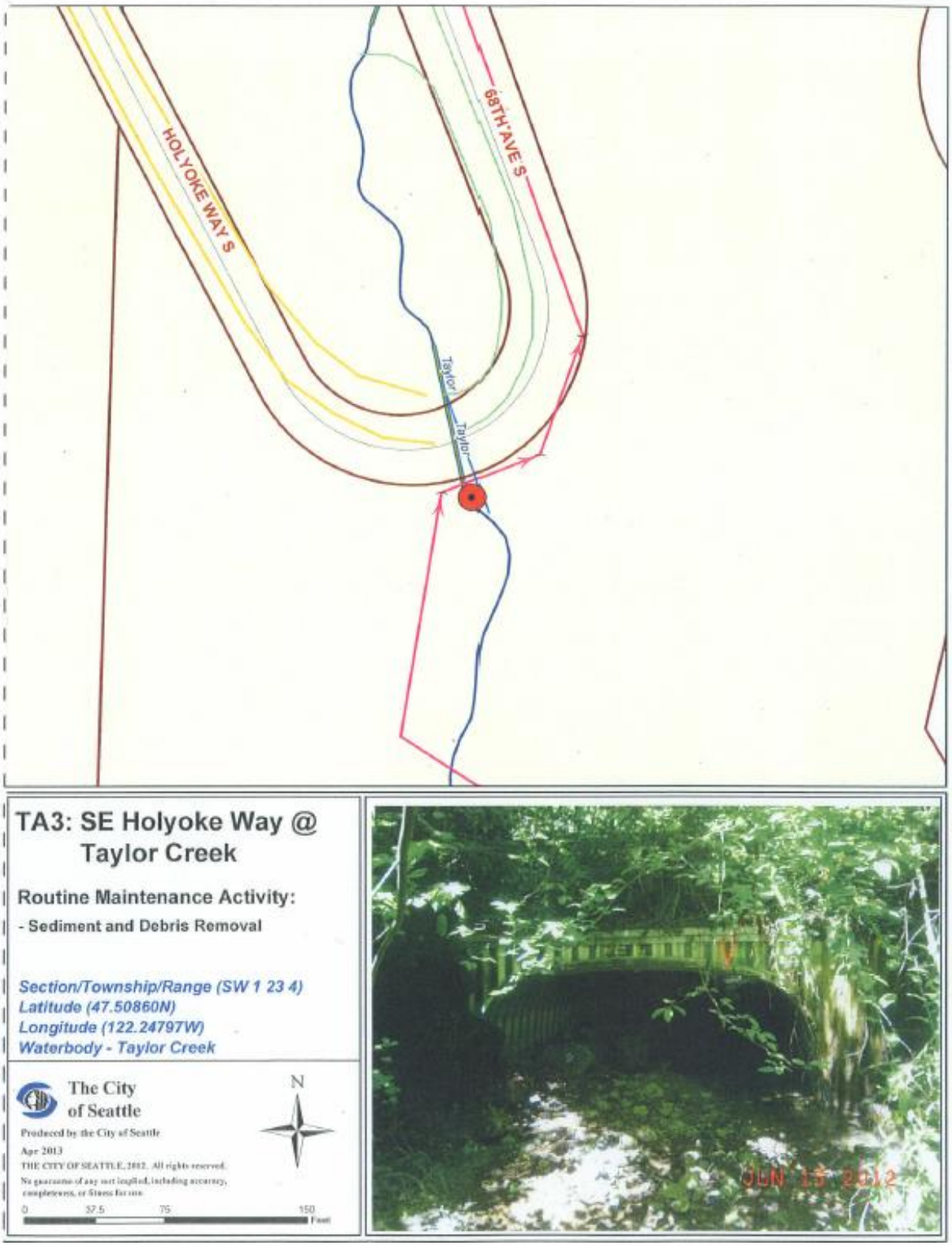
The City of Seattle

Produced by the City of Seattle
May 2013

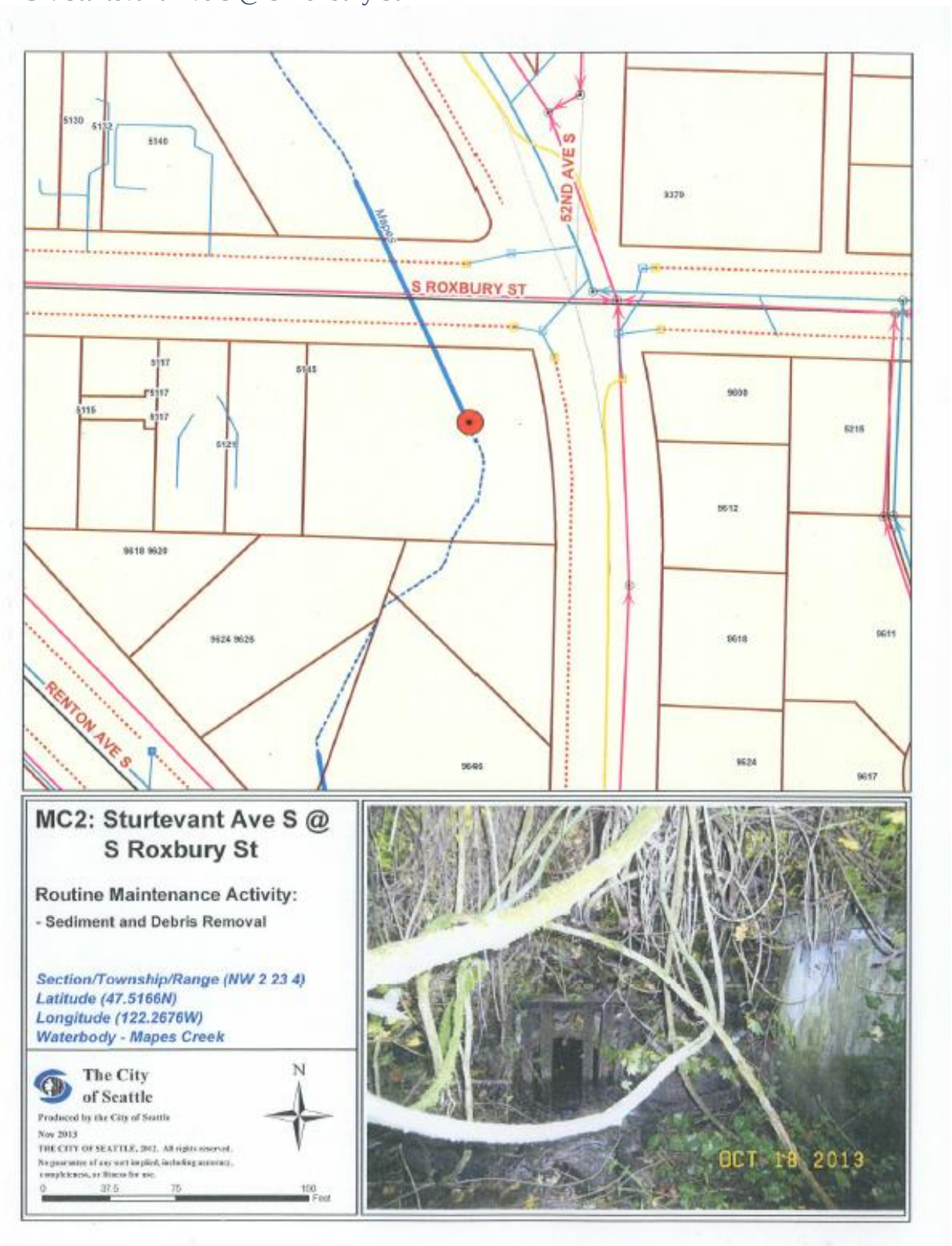
N

0 37.5 75 150 Feet

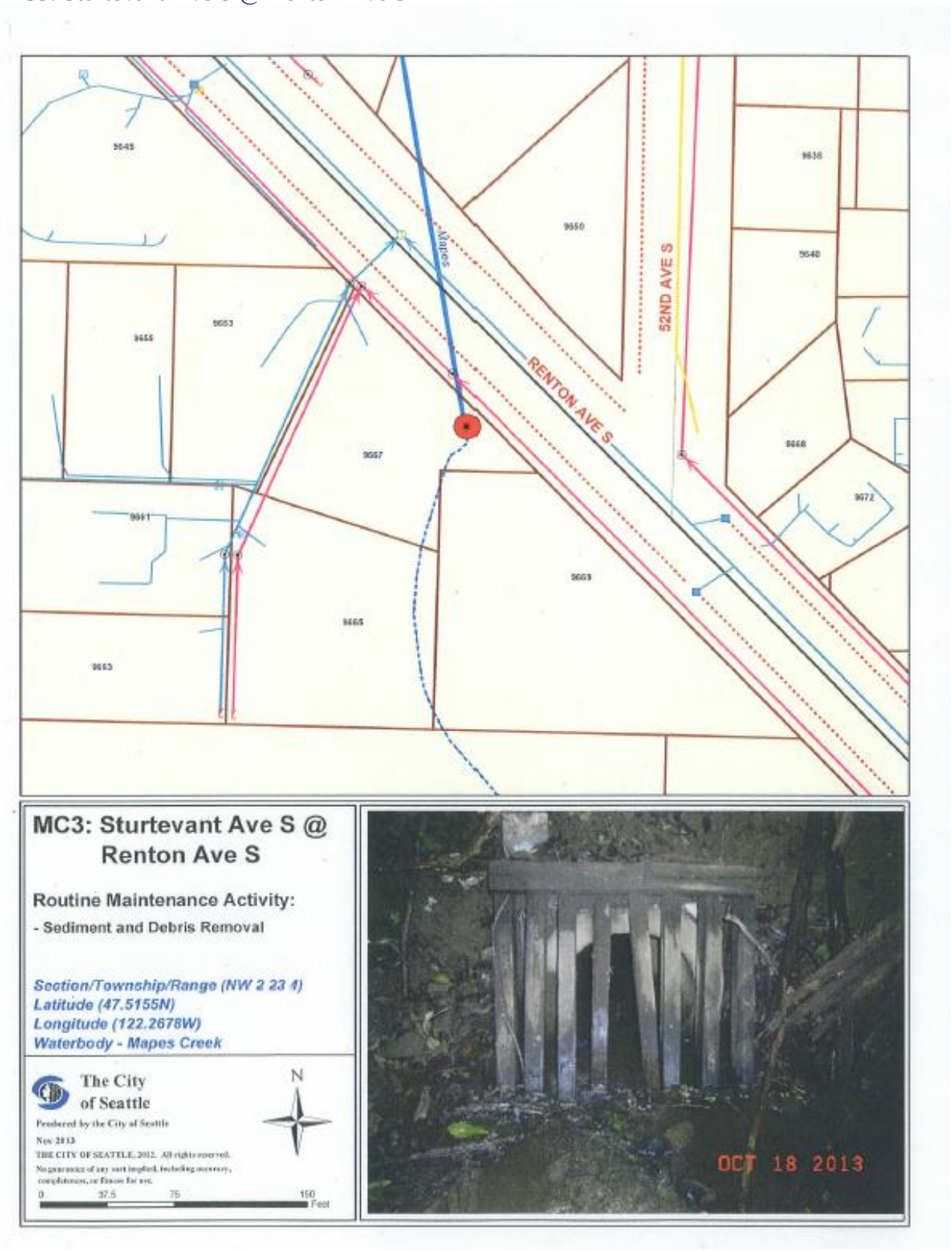
TA3: SE Holyoke Way @ Taylor Creek



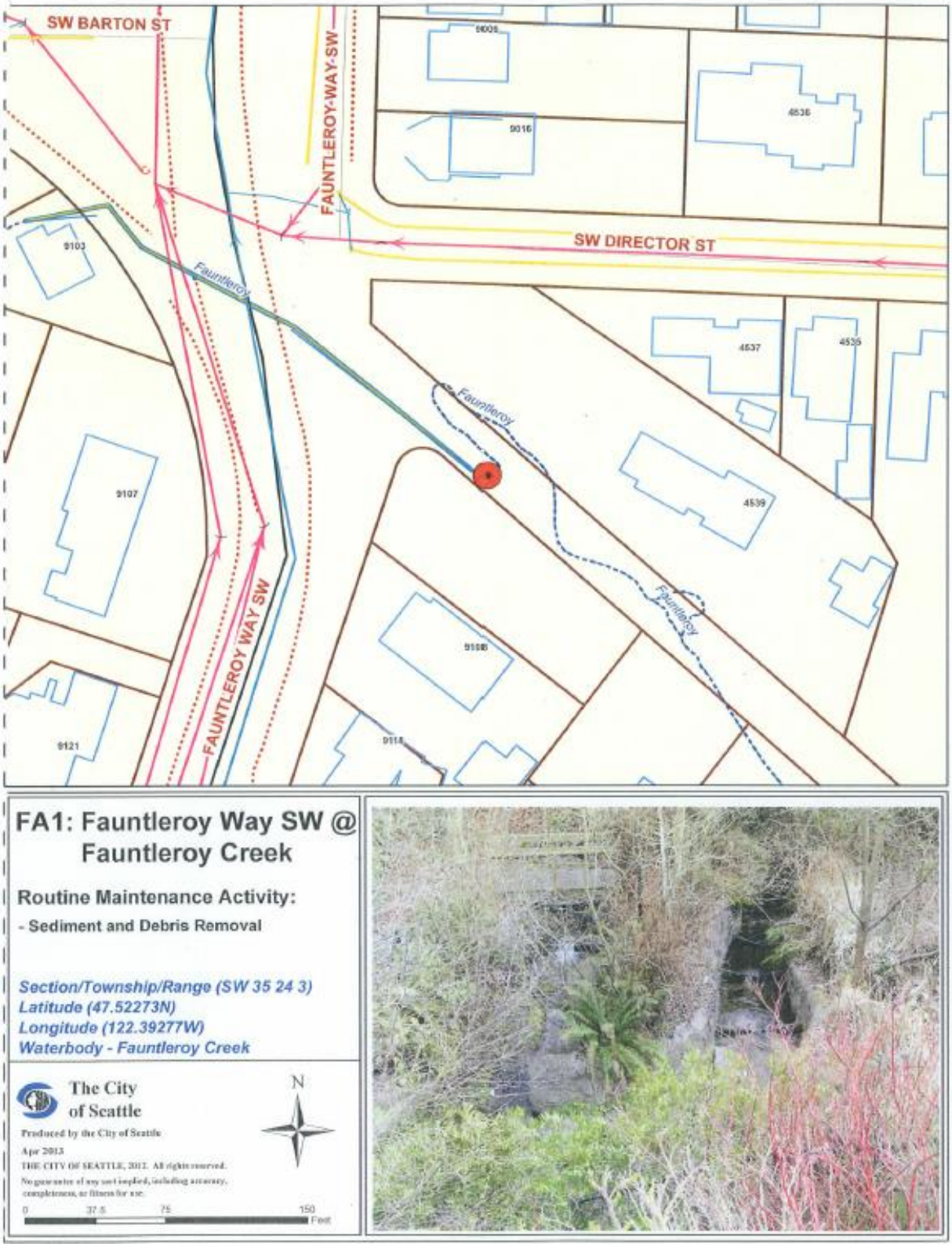
MC2: Sturtevant Ave S @ S Roxbury St



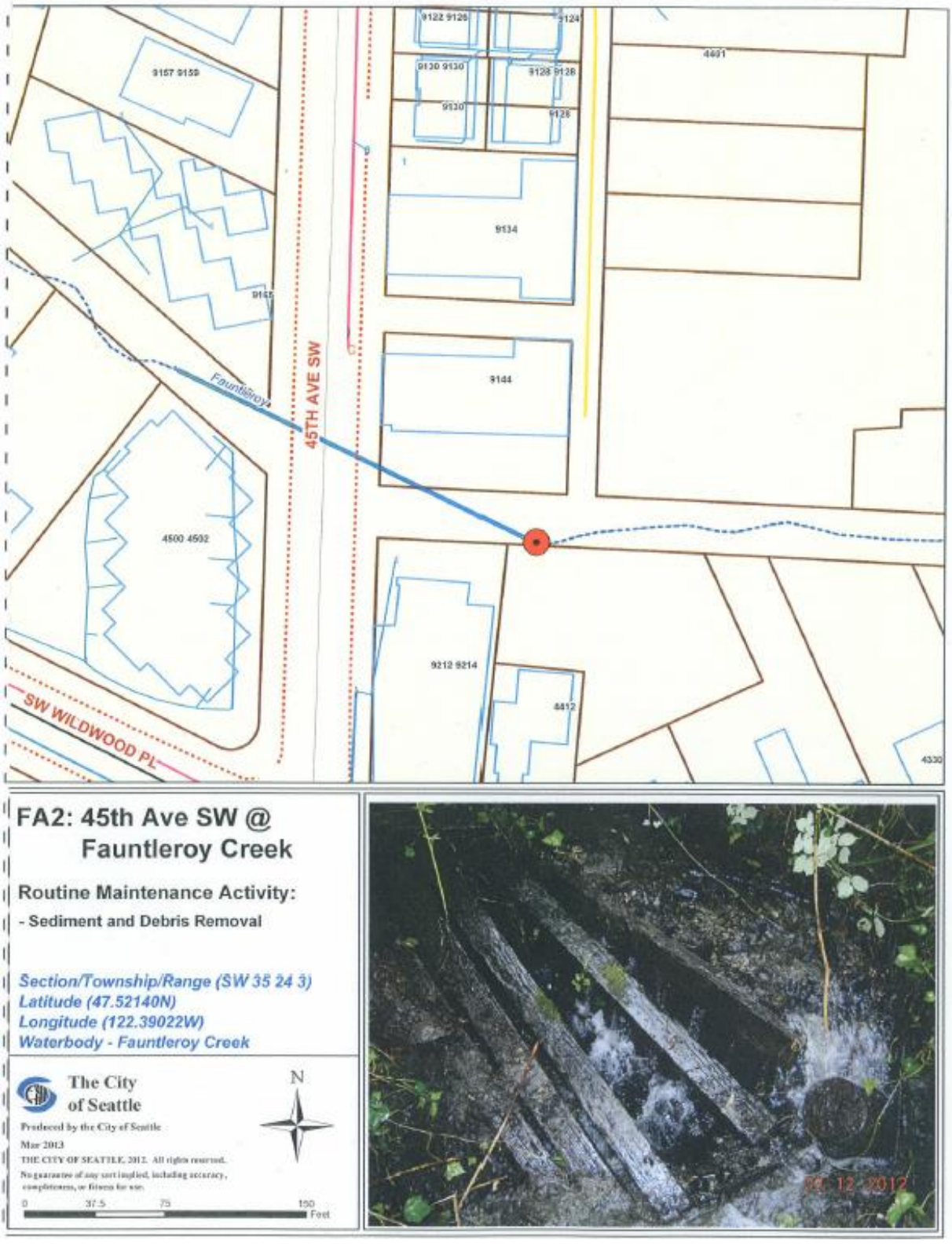
MC3: Sturtevant Ave S @ Renton Ave S



FA1: Fauntleroy Way SW @ Fauntleroy Creek

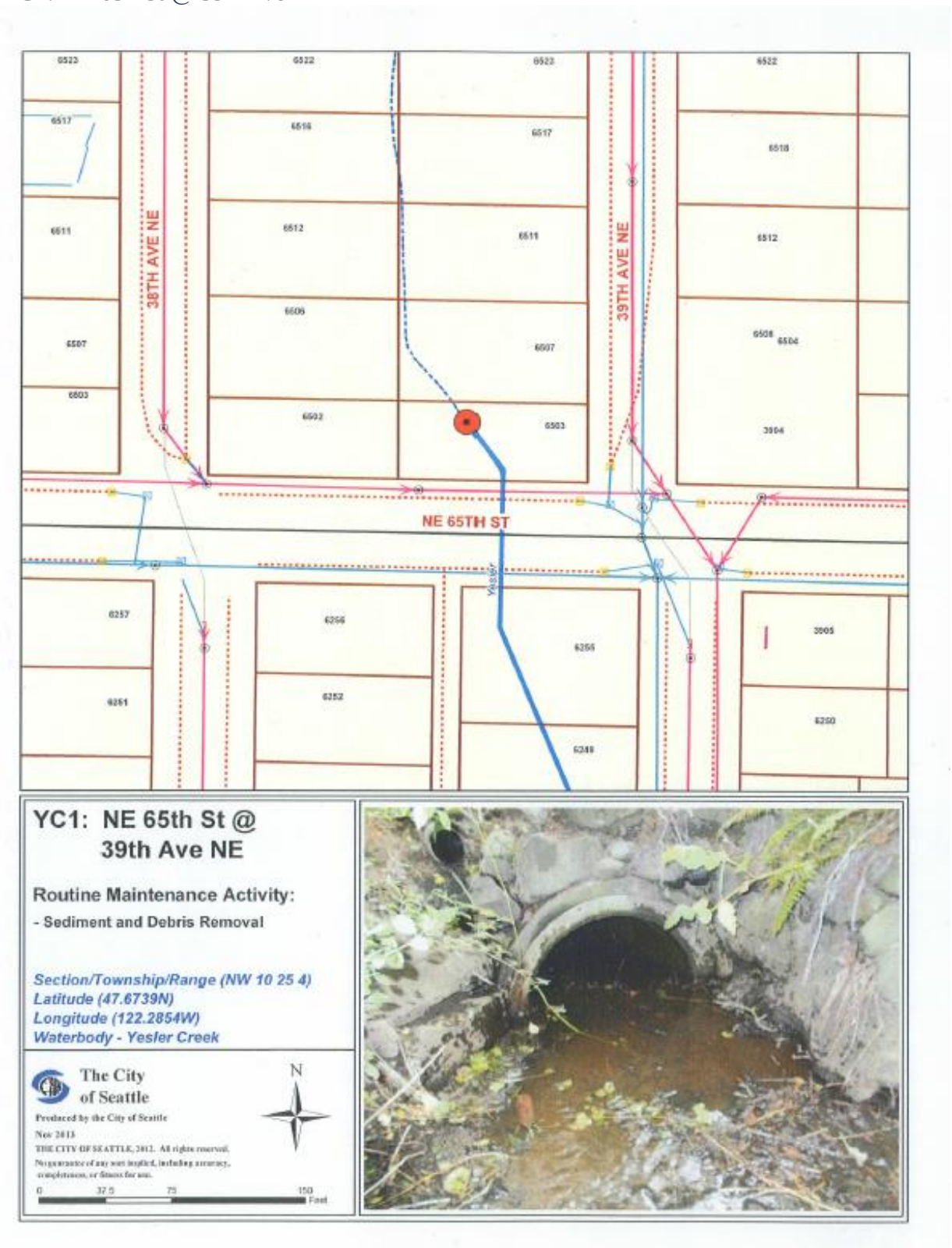


FA2: 45th Ave SE @ Fauntleroy Creek

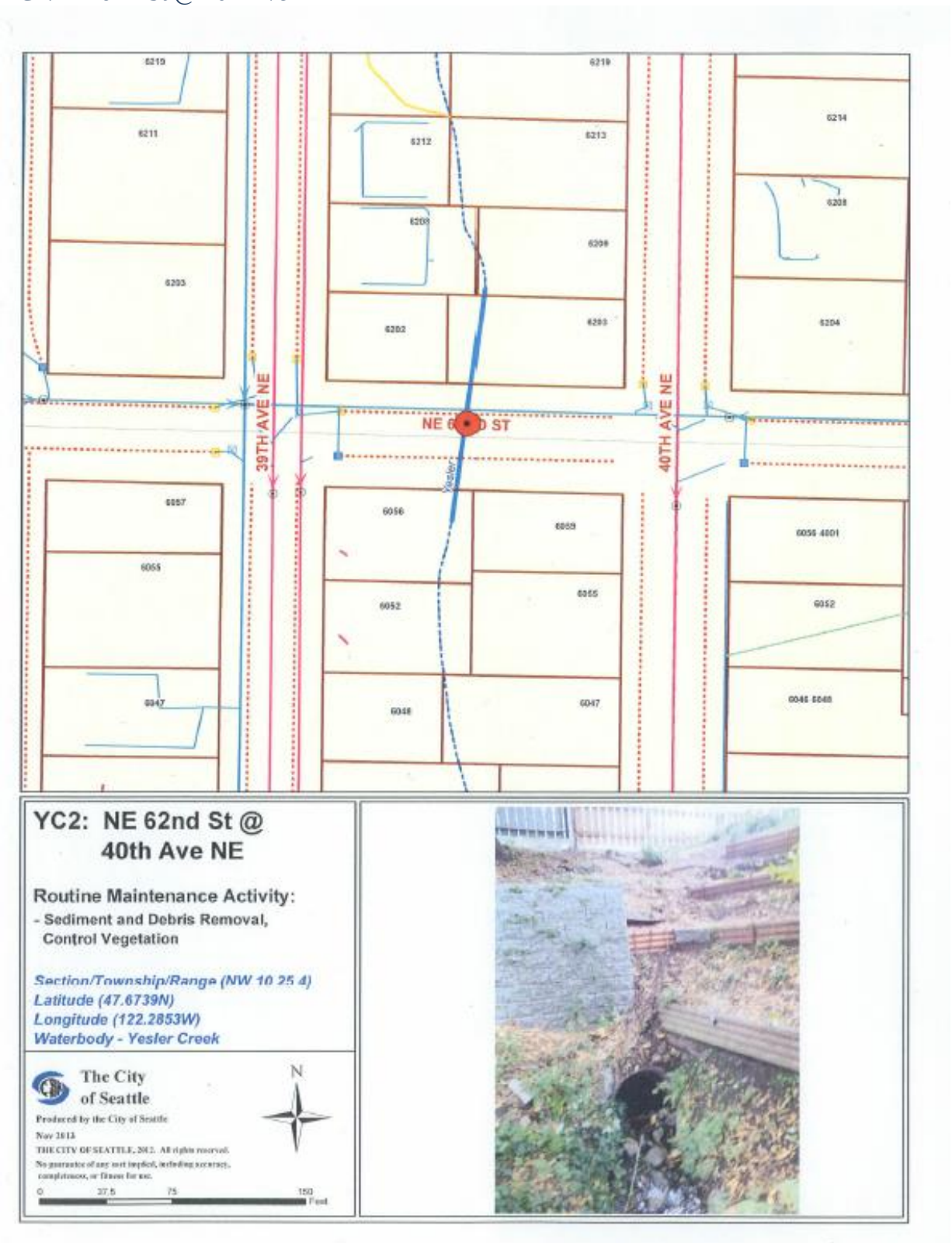


FA3: California Way SW @ Fauntleroy Creek

YC1: NE 65th St @ 39th Ave NE



YC2: NE 62nd St @ 40th Ave NE



YC3: NE 60th St @ 40th Ave NE

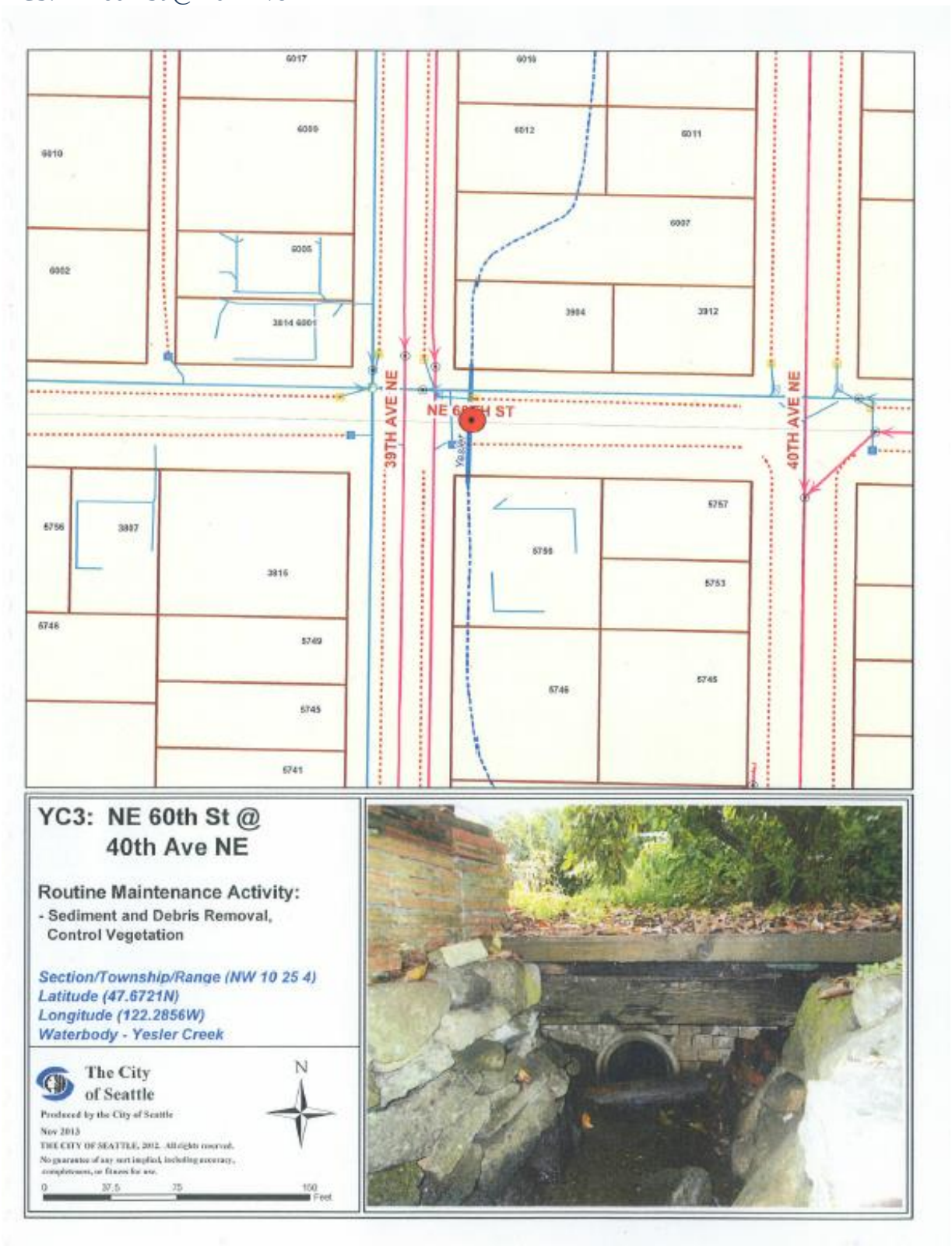
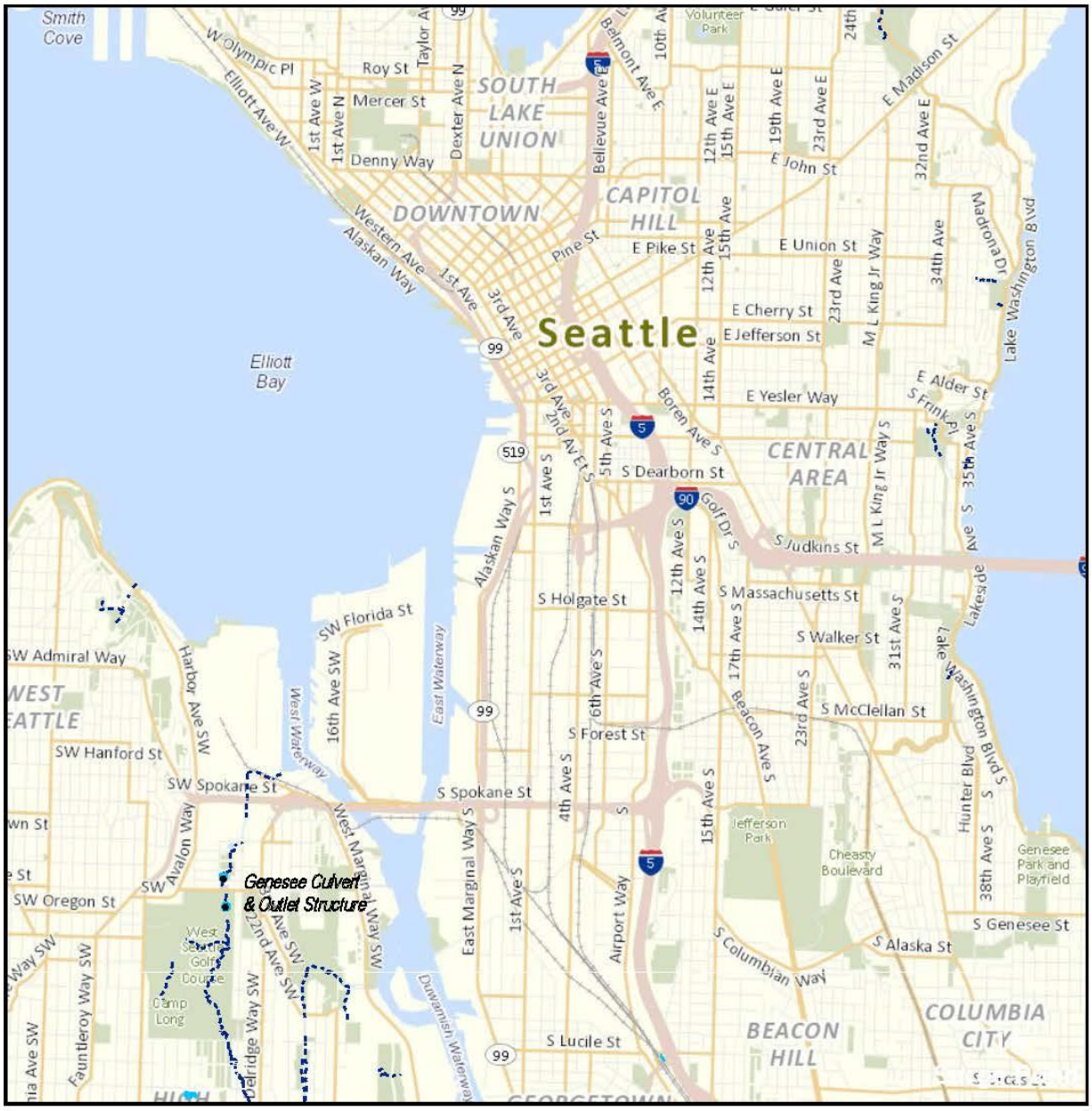


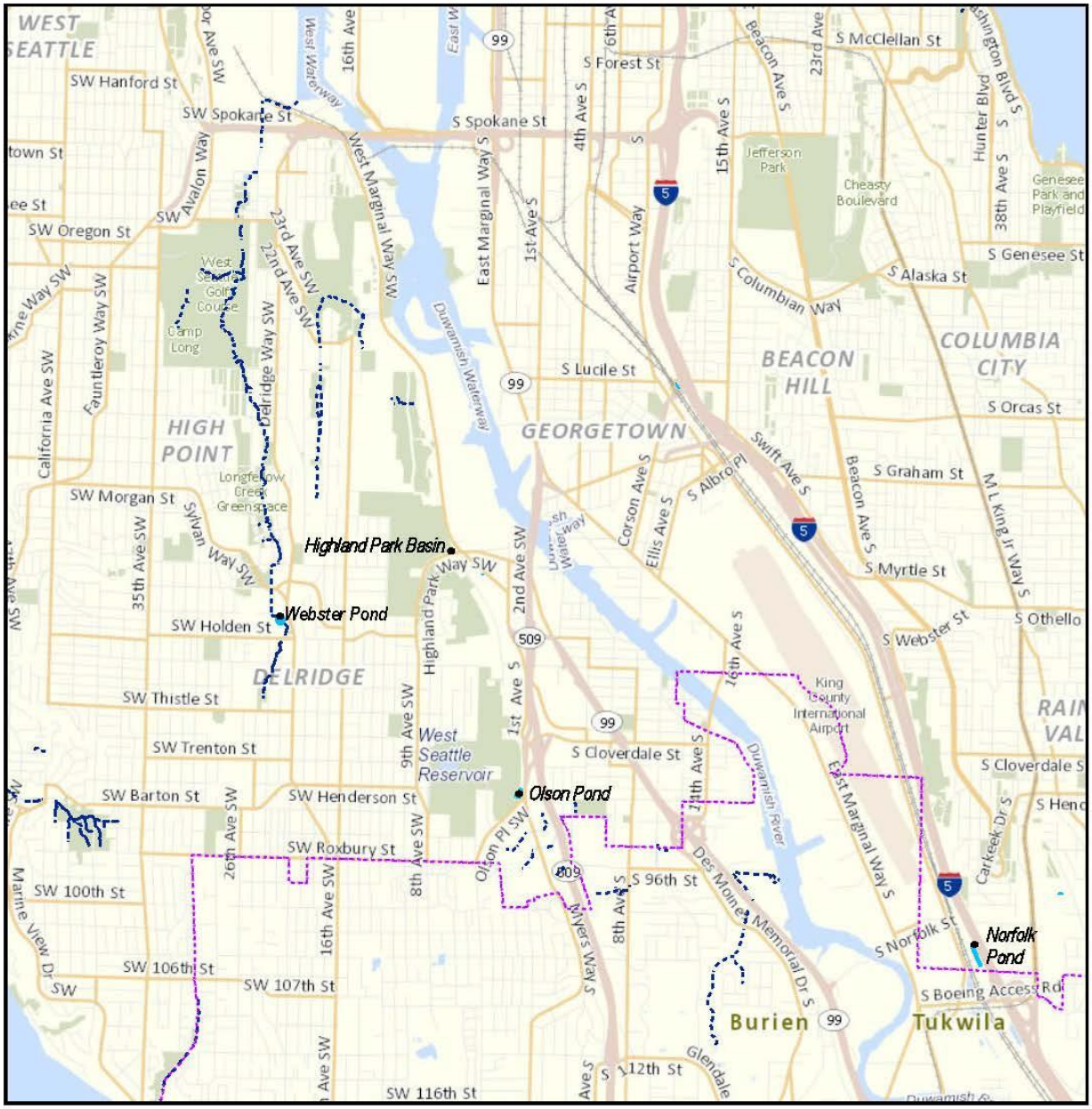
Exhibit D-4: Pond Drainage System Facility Overview Location Maps & Representative Facility Data Sheets

North Area Pond Facilities Overview Location Map

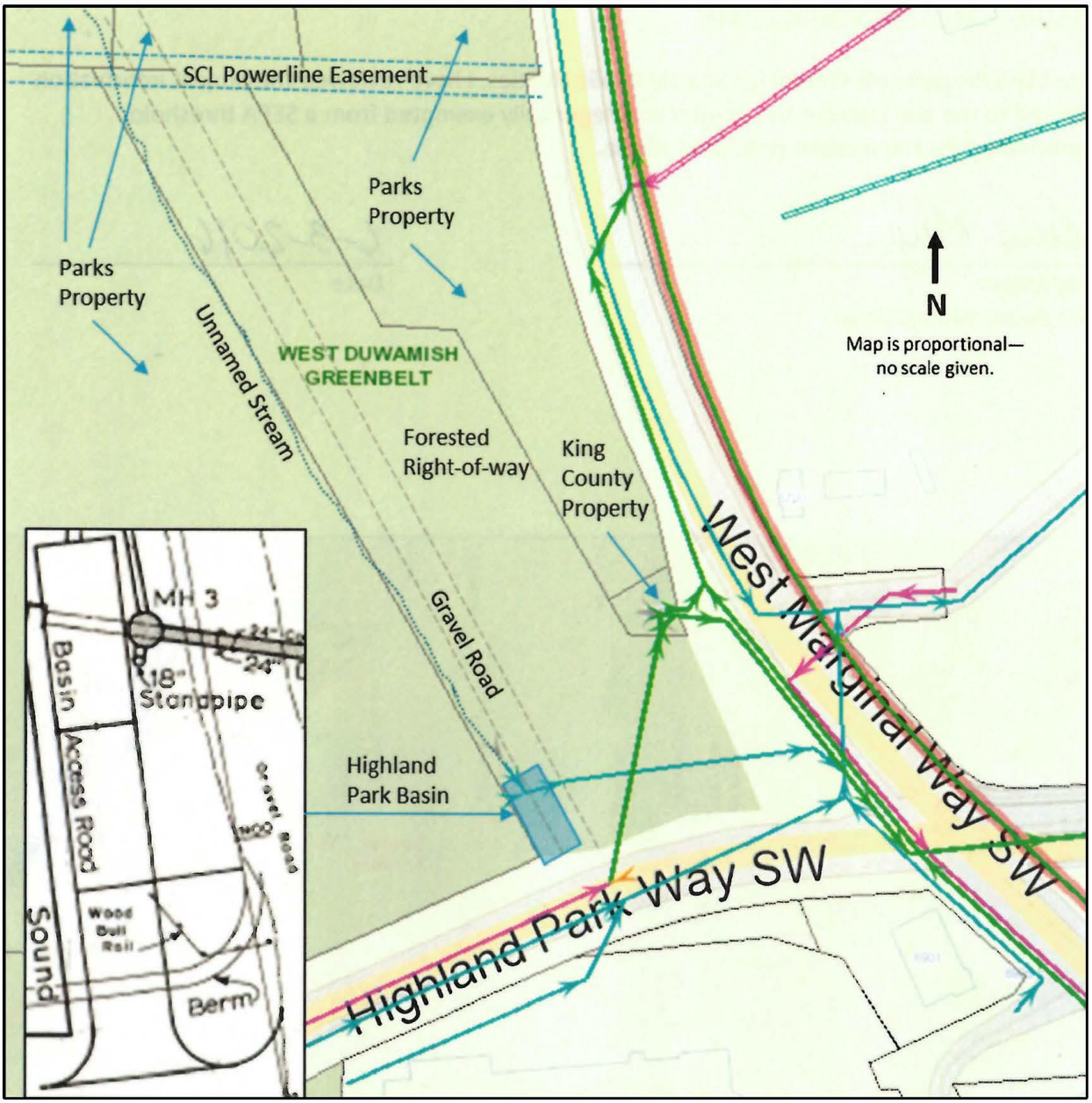
Central Area Pond Facilities Overview Location Map



South Area Pond Facilities Overview Location Map


WEST SEATTLE
HIGH POINT
DELRIDGE
GEORGETOWN
BEACON HILL
COLUMBIA CITY
Burien
Tukwila
Highland Park Basin
Webster Pond
Olson Pond
Norfolk Pond
West Seattle Reservoir
SW Hanford St
SW Spokane St
S Spokane St
SW Oregon St
SW Morgan St
SW Holden St
SW Thistle St
SW Trenton St
SW Barton St
SW Henderson St
SW Roxbury St
SW 100th St
SW 106th St
SW 107th St
SW 116th St
S Forest St
S Lucile St
S Cloverdale St
S 96th St
S 112th St
S McClellan St
S Genesee St
S Alaska St
S Orcas St
S Graham St
S Myrtle St
S Webster St
S Othello
S Norfolk St
S Boeing Access Rd
Columbian Way
Cheasty Boulevard
Jefferson Park
King County International Airport
Duwamish Waterway
Duwamish River
West Marginal Way SW
East Marginal Way S
Des Moines Memorial Dr S
Seattle Public Utilities
Exhibit D-Overview Location Map:
Pond Facilities (South Area)
0
0.75
1.5
Miles
N
Legend
DWW Ponds
Open Stream Channel

Highland Park Basin: Highland Park Way SW / West Marginal Way SW

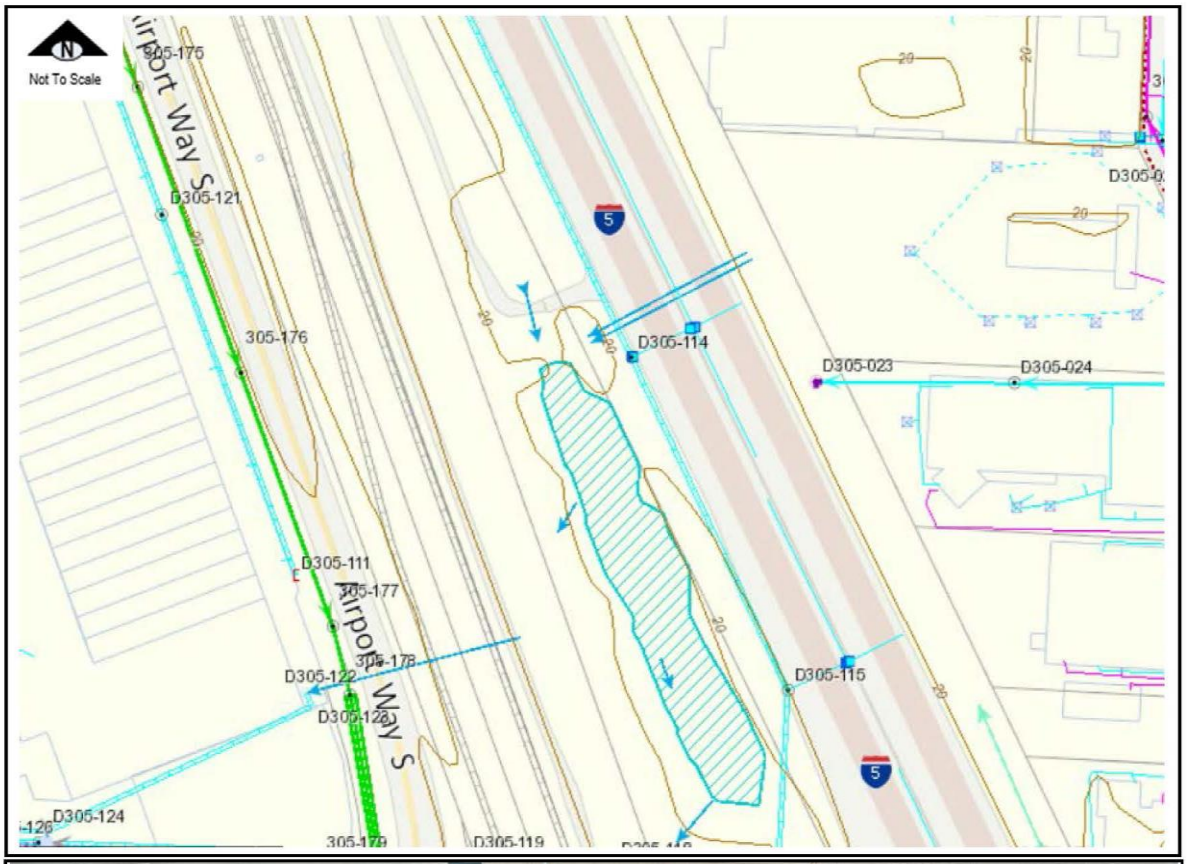


Highland Park Basin: Highland Park Way SW / West Marginal Way SW

Routine Maintenance Activity:
Remove sediment/debris and thin noxious vegetation. Repair erosion damage to road, parking area, and berm separating settling basin from the road.

Section/Township/Range (NE 30 24 4)
Latitude (47.540450N)
Longitude (122.344280W)
Waterbody - Unknown Tributary

Norfolk Pond: Interstate 5 SB @ Exit 158

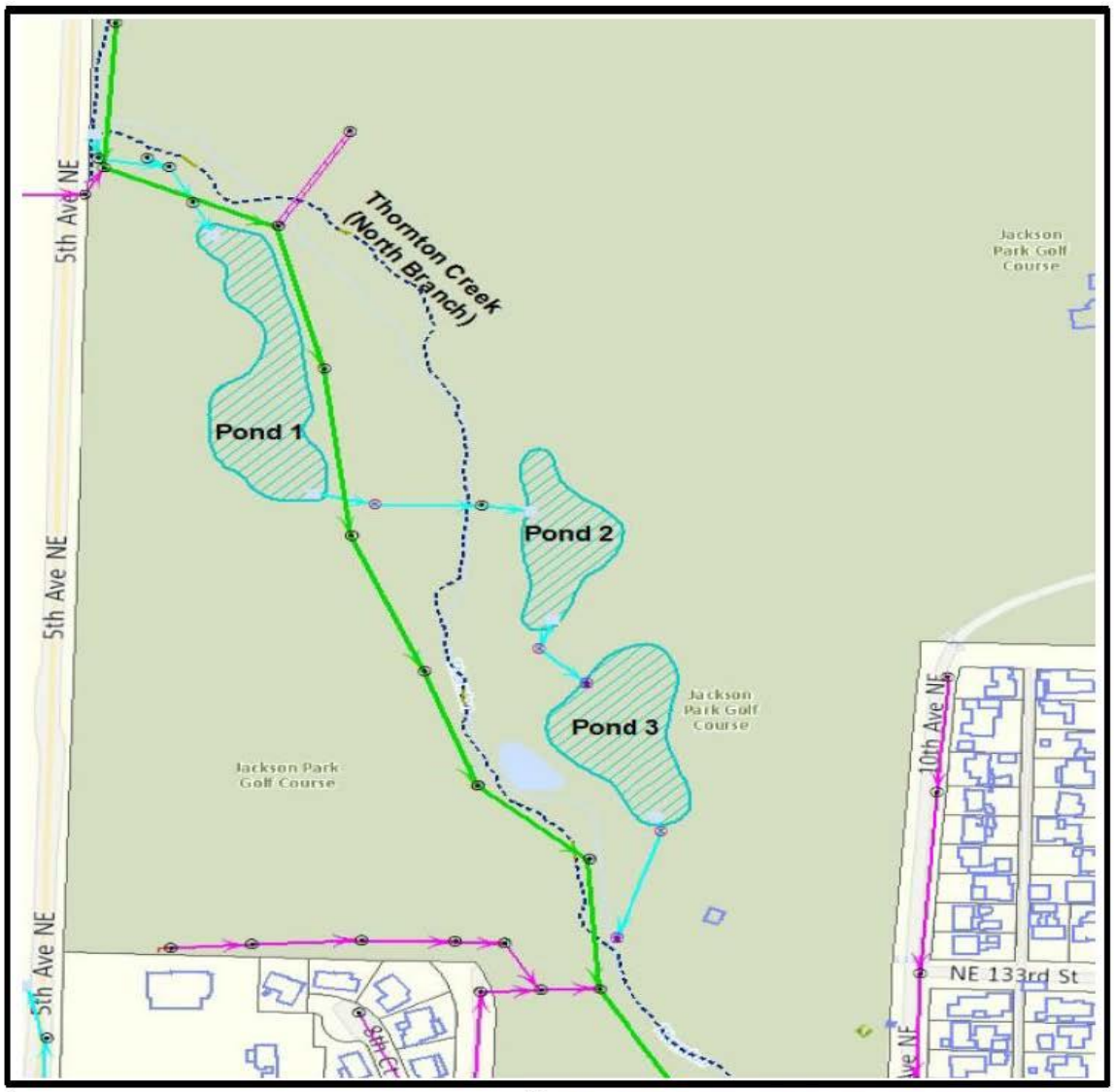


Norfolk Pond: Interstate 5 SB @ Exit 158

Routine Maintenance Activity:
Sediment and debris removal. Control vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.Access road and boat ramp surface restoration work to include repair of pothole depressions, rutting, and replacement of surface fill.

Section/Township/Range (NE 3 23 4)
Latitude (47.510584N)
Longitude (122.284773W)

Jackson Park Detention Ponds 1000 NE 135th St. (Jackson Park Golf Course)



Jackson Park Detention Ponds

Routine Maintenance Activity:

Sediment and debris removal from ponds and pipes. Thin obstructing and noxious vegetation around ponds and fish return channel. Maintenance/repair of fish screen and aerators.

Section/Township/Range (NE 20 26 4) Latitude (47.729138N)
Longitude (122.319084W)
Waterbody – Thornton Creek

Jackson Park Ponds- Diversion Structure & Forebay 1000 NE 135th St. (Jackson Park Golf Course)

TH49: Jackson Park Detention Pond Diversion Structure

Routine Maintenance Activity:
- Sediment and Debris Removal,
- Control Vegetation

Section/Township/Range (NE 20 26 4)
Latitude (47.72942N)
Longitude (122.32303W)
Waterbody - Thornton Creek

The City of Seattle

Produced by the City of Seattle
Mar 2013

N

0 37.5 75 150 Feet

NSC Stormwater Structures & Outfalls: 9600 College Way N

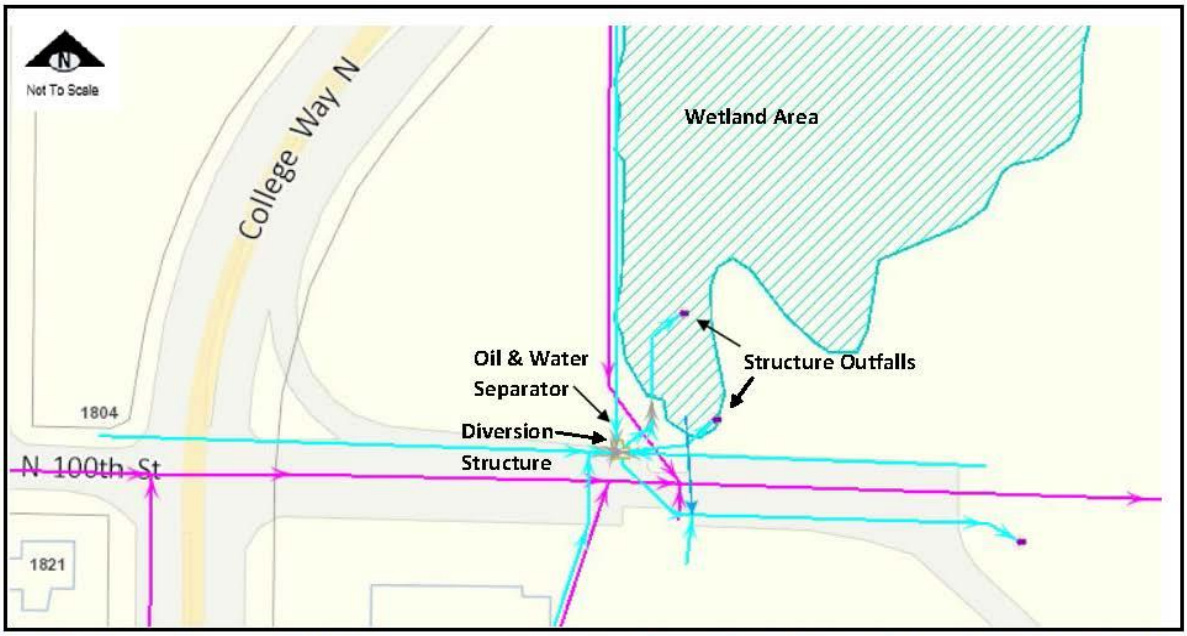


Photo at right shows the view of the underground diversion structure and the oil & water separator locations.
Photo at left shows the sluice gate on the 24-inch outfall from the diversion structure

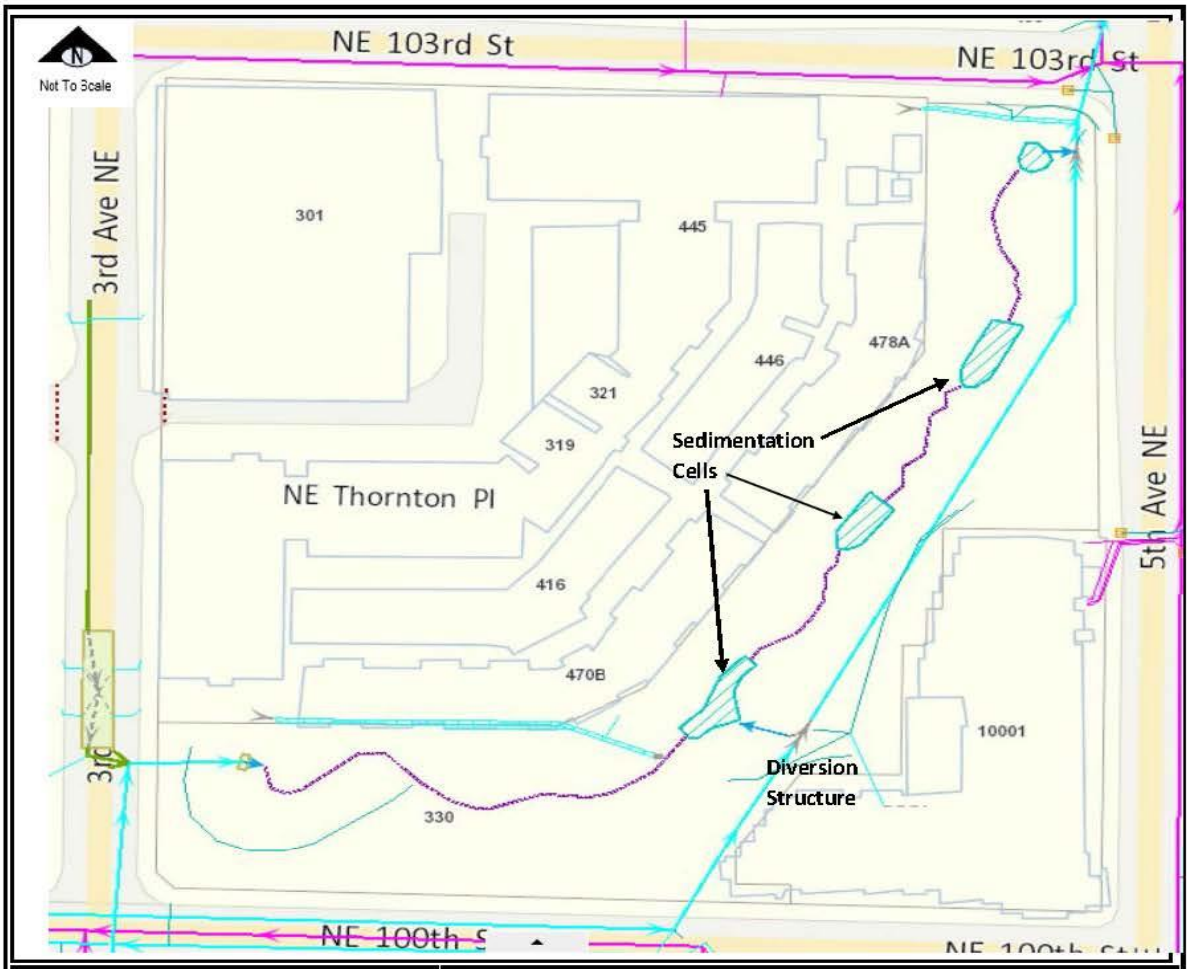
North Seattle College Structures & Outfalls: 9600 College Way N

Routine Maintenance Activity:

Vegetation thinning around outfalls. Accumulated sediment and debris removal inside of structures and around outfalls. Maintain sluice gate on outfall. Maintain Oil & Water Separator. Sediment and debris removal is limited to encourage flow into engineered wetland area from SPU structure outfalls.

Section/Township/Range (NE 32 26 4)
Latitude (47.70162N)
Longitude (122.33377W)
Waterbody - Thornton Creek

Thornton Creek Water Quality Channel: 10005 5th Avenue NE



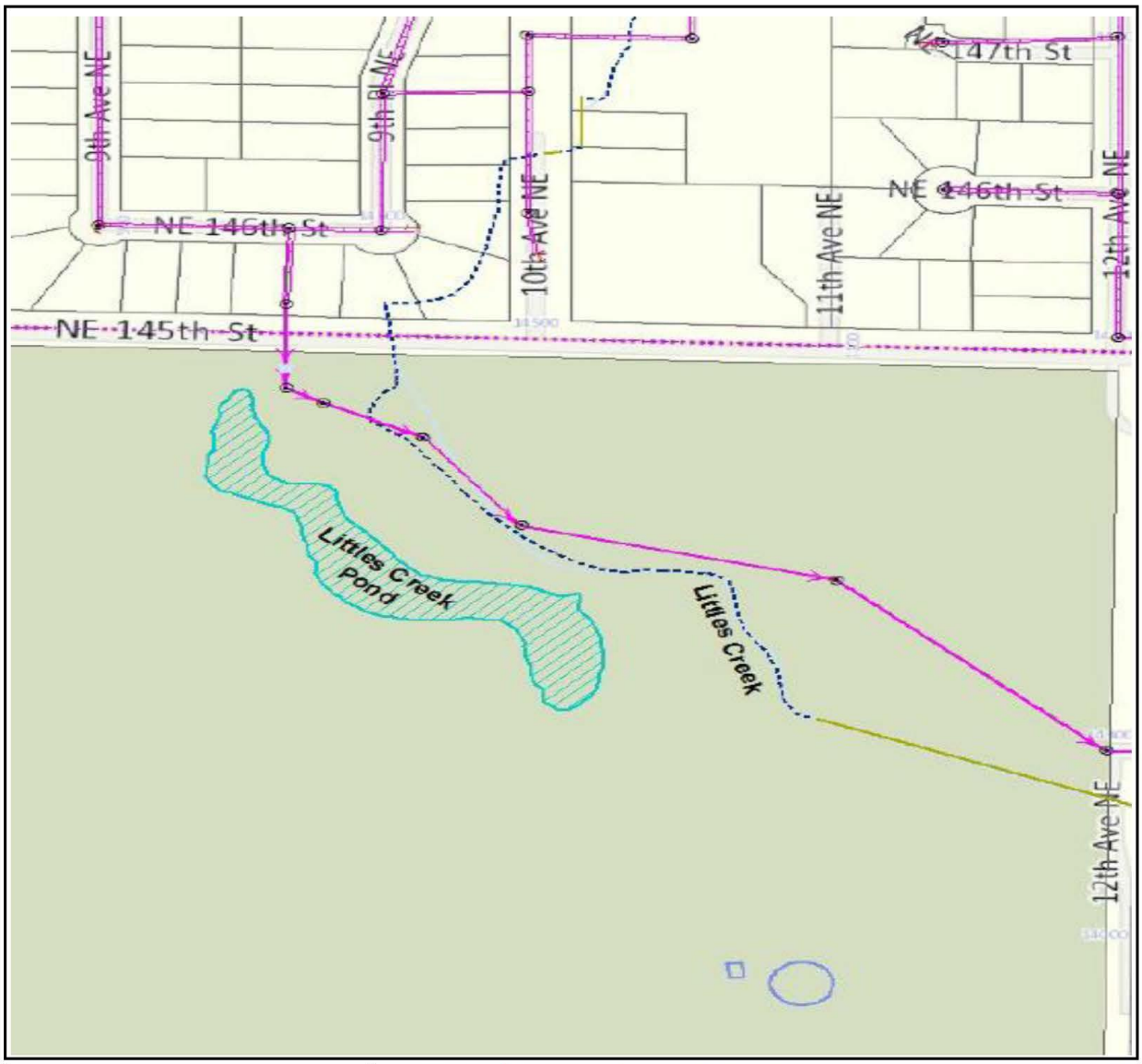
Thornton Creek Water Quality Channel: 10005 5TH Avenue NE

Routine Maintenance Activity:

Sediment and debris removal. Control vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/ replacement.

Section/Township/Range (NE 32 26 4)
Latitude (47.70182N)
Longitude (122.32424W)
Waterbody - Thornton Creek

Littles Creek Pond 1000 NE 135th St. (Jackson Park Golf Course)

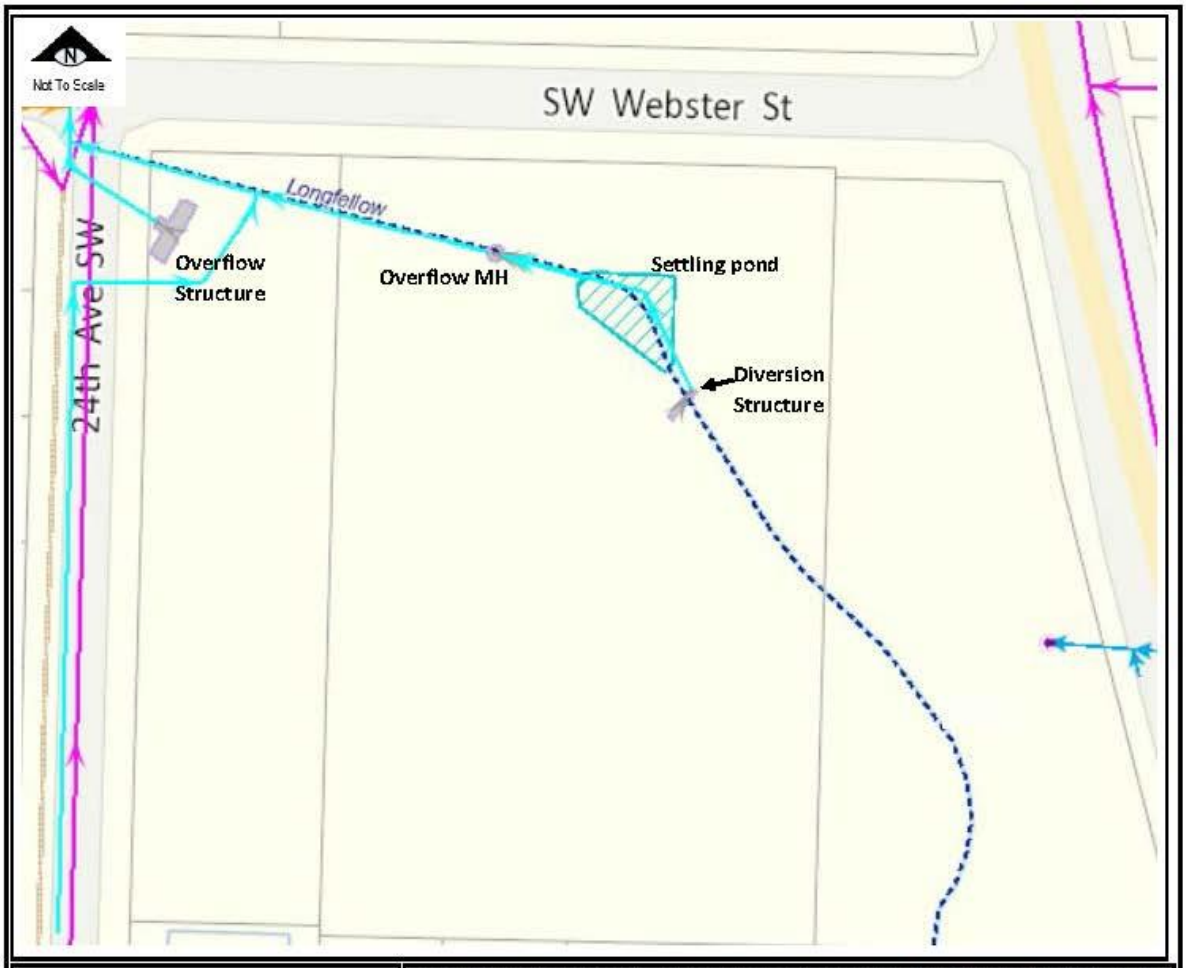


Littles Creek Pond

Routine Maintenance Activity:
Remove sediment and debris in pond, channel and around outflow structures. Thin obstructing and noxious vegetation around berm, channel, pond and 12-inch outfall pipe.

Section/Township/Range (NE 20 26 4)
Latitude (47.73286N)
Longitude (122.31870W)
Waterbody – Littles Creek

Webster Pond: 7501 Delridge Way SW



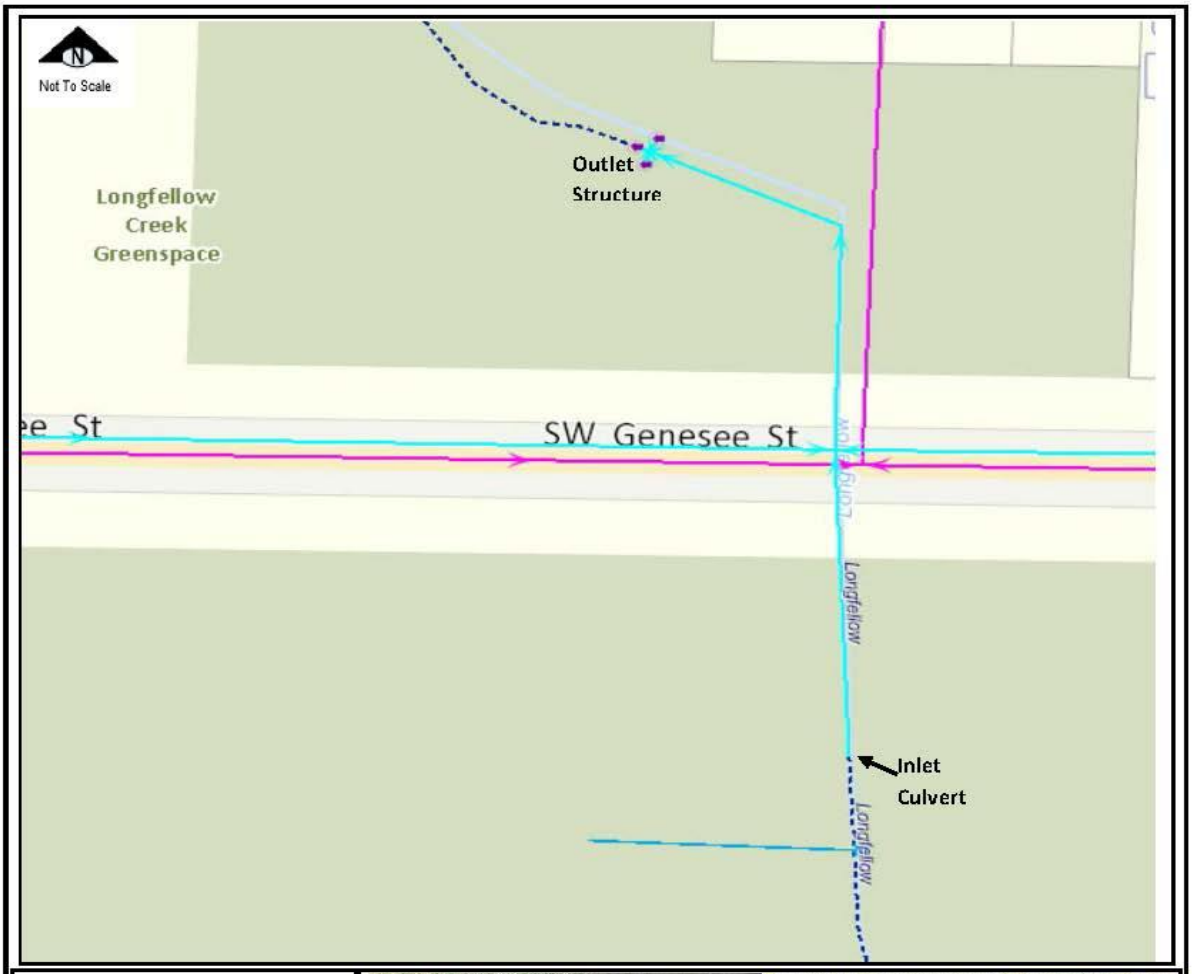
Webster Pond:
7501 Delridge Way SW

Routine Maintenance Activity:

Vegetation thinning. Accumulated sediment and debris removal from settling pond. Trash removal. Vactor inside of structures. Maintain access road.

Section/Township/Range (NE 25 24 3)
Latitude (47.53510N)
Longitude (122.36190W)
Waterbody - Longfellow Creek

Genesee Pond: Inlet Culvert and Outlet Structure



Inlet Culvert & Outlet Structure at SW Genesee St. @ Longfellow Creek: West Seattle Golf Course

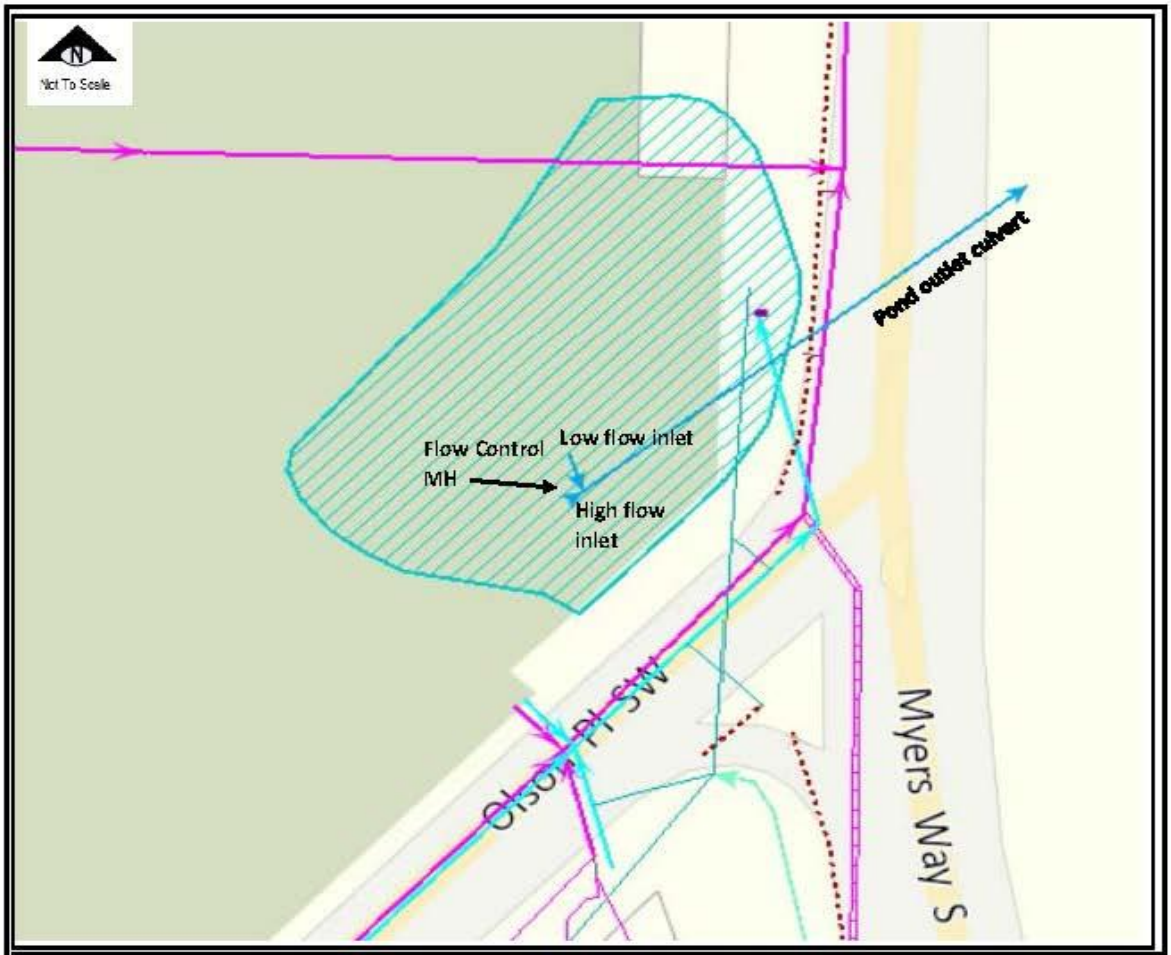
Routine Maintenance Activity: Vegetation thinning. Accumulated sediment and debris removal from inlet culvert & outlet structure. Trash removal. Jet clean inside of culvert pipe. Beaver dam maintenance upstream of inlet culvert as needed.

Section/Township Range (NE 13 24 3)
Latitude (47.56449N)
Longitude (122.36722W)
Waterbody - Longfellow Creek

Inlet Culvert

Outlet Structure

Olson Pond: 9220 Olson Place SW

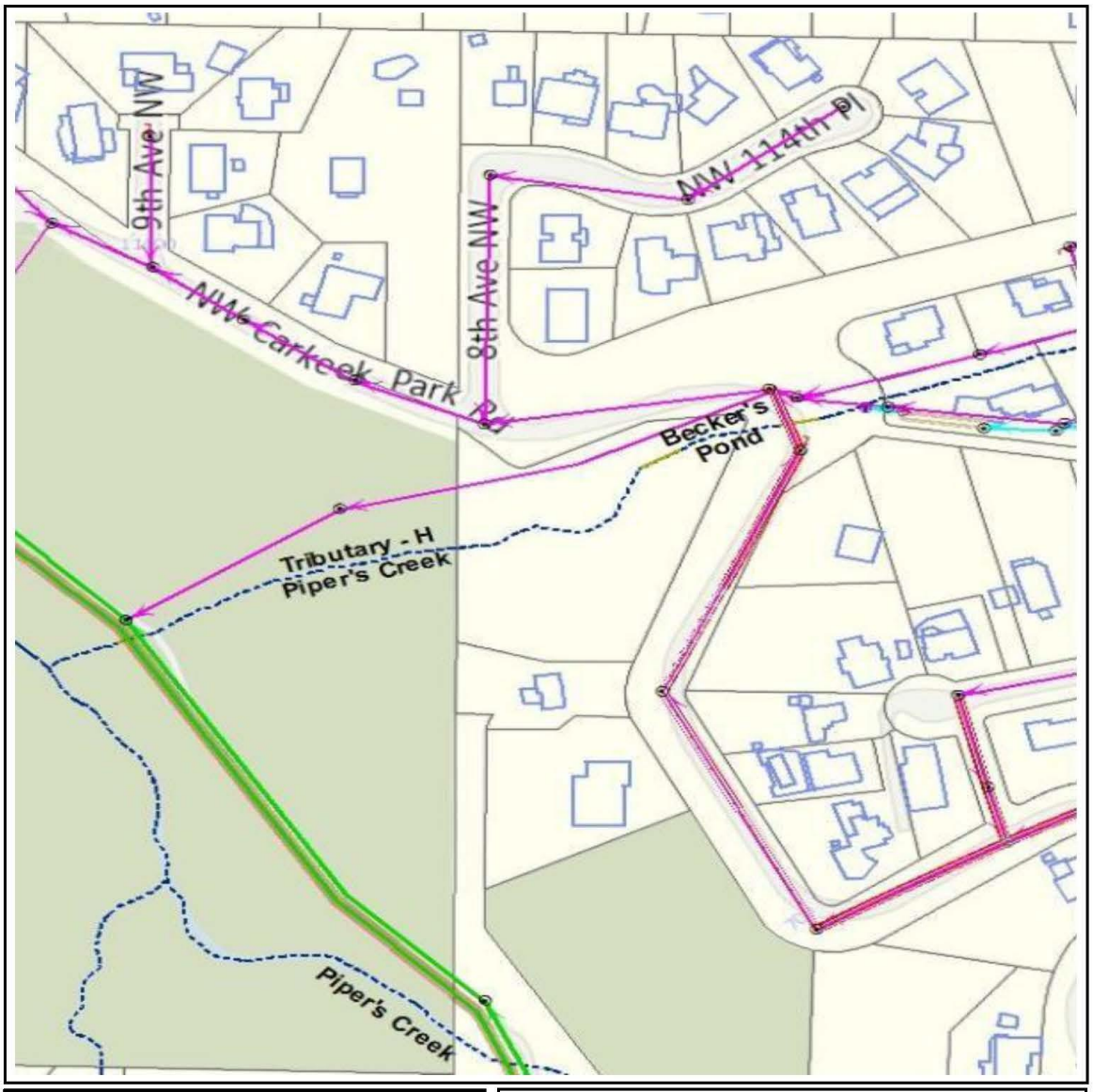


Olson Pond:
9220 Olson Place SW

Routine Maintenance Activity: Vegetation thinning on flow control MH berm and around toe of berm. Accumulated sediment and debris removal around toe of berm to expose low flow inlet. Trash removal as needed.

Section/Township/Range (NE 31 24 4)
Latitude (47.52252N)
Longitude (122.33502W)
Waterbody - Unnamed Creek

Becker's Pond: 777 NW Carkeek Park Road



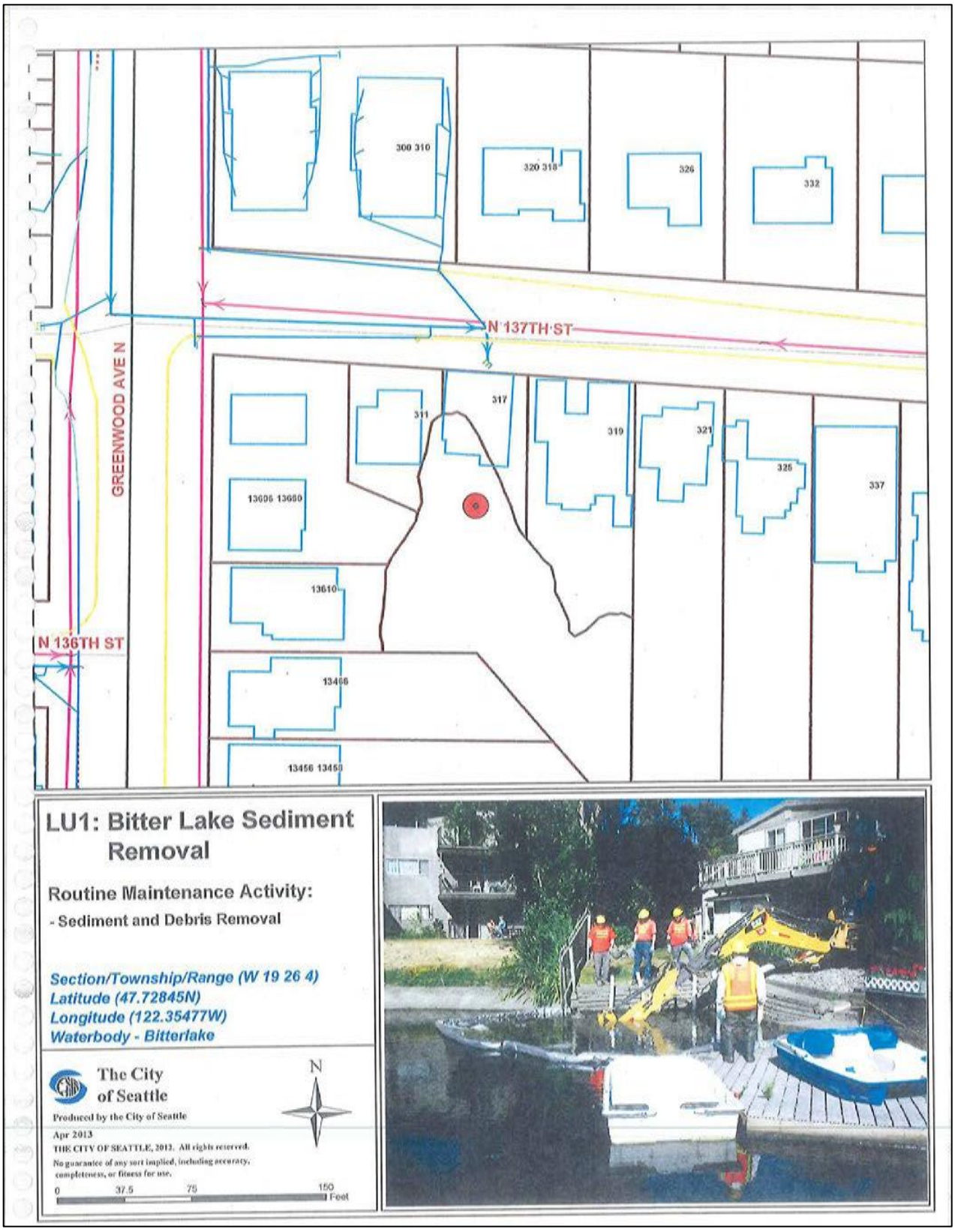
Becker's Ponds

Routine Maintenance Activity:

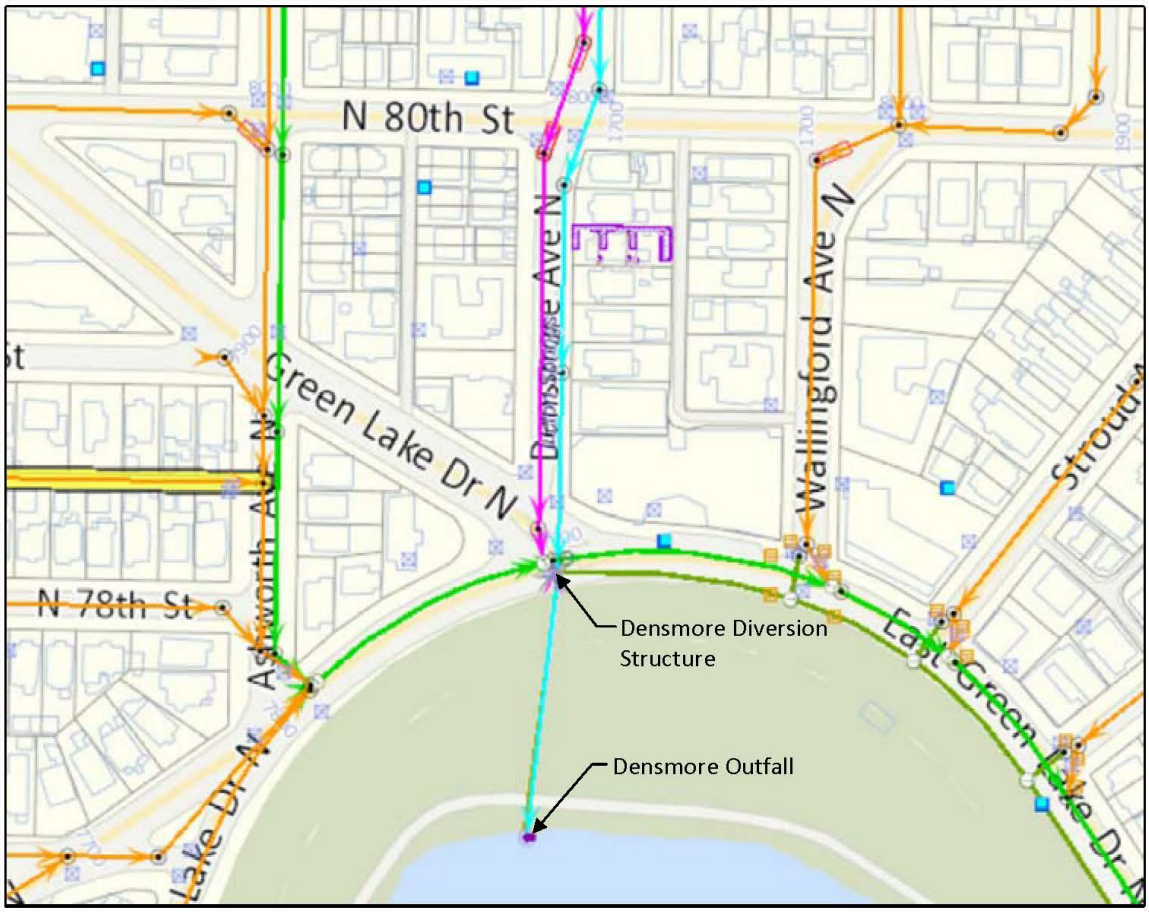
Trash and Vegetation Removal

Section / Township / Range (NE 25 26 3)
Latitude (47.71095N)
Longitude (122.36531W)
Waterbody - Pipers Creek (Tributary H)

Outfall to Bitter Lake: 317 N 137th St


300 310
320 318
326
332
N 137TH ST
GREENWOOD AVE N
311
317
319
321
325
337
13606 13600
13610
13466
13456 13450
N 136TH ST
LU1: Bitter Lake Sediment Removal
Routine Maintenance Activity:
- Sediment and Debris Removal
Section/Township/Range (W 19 26 4)
Latitude (47.72845N)
Longitude (122.35477W)
Waterbody - Bitterlake
The City of Seattle
Produced by the City of Seattle
Apr 2013
THE CITY OF SEATTLE, 2013. All rights reserved.
No guarantee of any sort implied, including accuracy, completeness, or fitness for use.
N
0
37.5
75
150
Feet

Green Lake – Densmore Outfall: 7801 West Green Lake Drive N



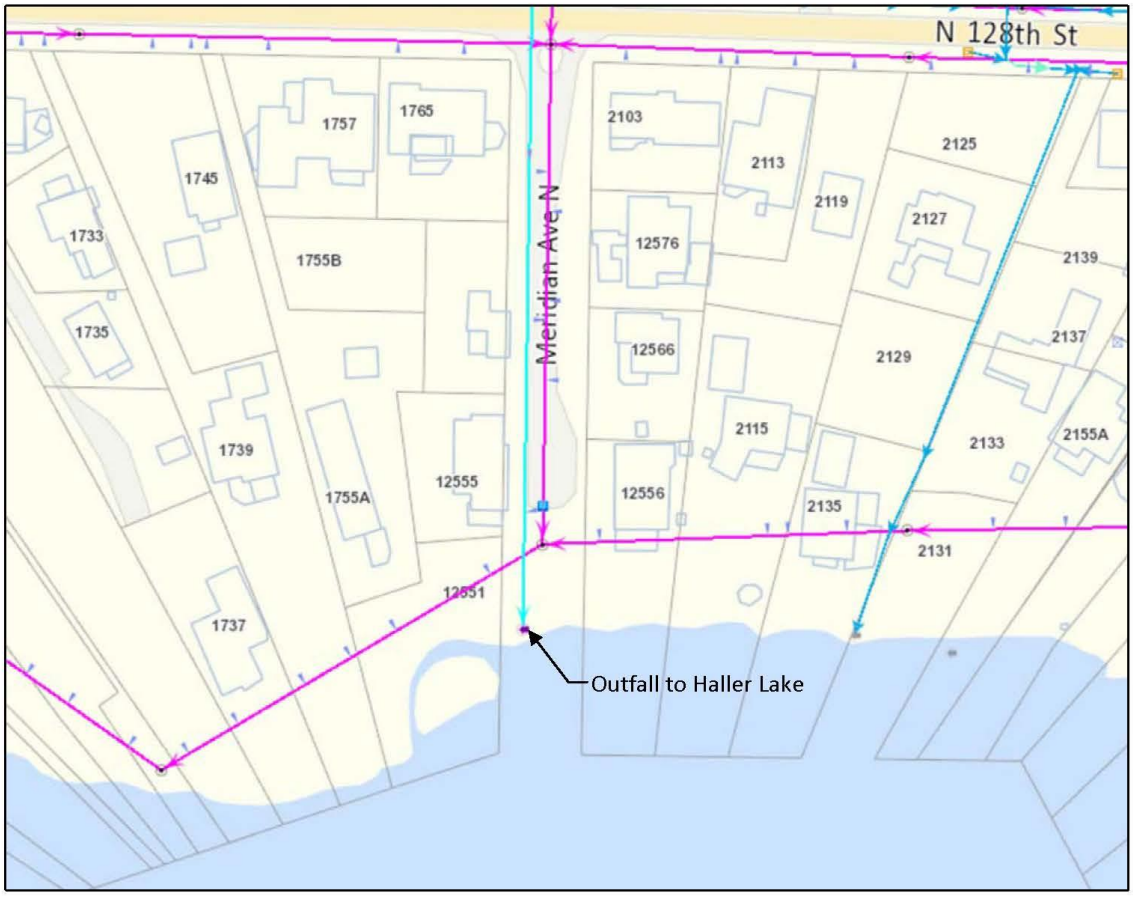
Green Lake – Densmore Outfall

Routine Maintenance Activity:

Sediment and Debris Removal

Section/Township/Range (NE 6 25 4)
Latitude (47.68485N)
Longitude (122.33793W)
Waterbody - Green Lake

Outfall to Haller Lake: 12555 Meridian Ave N



Outfall to Haller Lake

Routine Maintenance Activity:

Sediment and Debris Removal

Section/Township/Range
(SE 19 26 4)
Latitude (47.72080N)
Longitude (122.33423W)
Waterbody - Haller Lake

Exhibit E – Routine Maintenance & Repair Methods

This document lists all the Maintenance Methods utilized in the field to complete projects. These maintenance methods include stormwater Best Management Practices (BMP's) which may be utilized to minimize the adverse effects of routine maintenance activities. These Maintenance Methods and associated BMP's are listed under seven distinct categories. Some or all maintenance methods may be utilized in order to accomplish the maintenance activities listed in Exhibit C – Routine Maintenance Activities. The seven maintenance methods are:

1. Delineation of Work Areas
2. Temporary Bypass of Stream Flow & Fish Removal
3. Vactoring and Jetting
4. Excavating
5. Maintenance of Habitat Elements
6. Site Restoration/Landscaping

1. *Delineation of Work Areas*

Environmentally sensitive areas are identified and protected to keep people and equipment out of them (unless the project area lies within a sensitive area) and to limit the impact of construction activities on the site. Staging areas are used to secure materials and equipment. Identifying staging areas is necessary to initiate project site work. Other work areas may include temporary access roads or stream access points. The extent of the project needs to be established and actions taken to limit any soil disturbing activities outside of the established project area. Delineation of these areas may include use of flagging, fencing, mulch, coir rolls, or other appropriate materials that must be maintained throughout construction.

2. *Temporary Bypass of Stream Flow & Fish Removal*

Dewatering work areas and fish removal are standard practices to minimize impacts to aquatic species. To reduce turbidity, construction areas that occur within natural drainage systems and shorelines or pipe infrastructure are isolated before and during project work to prevent scour and eliminate the transport of sediment downstream. This method includes removing all fish from the isolated area using methods approved by WDFW and initiated by a qualified fisheries biologist. Isolation nets are installed and several attempts to relocate fish are completed before bypass operations begin.

The following bypass scenarios may be utilized during routine maintenance activities:

- **Temporary bypass for stream flow in a partial channel***:* Occurs when a full bypass is not required because work occurs in a limited area of a stream. This method requires fish removal before installation of the bypass.

- **Temporary bypass for stream flow in a full channel.** Occurs when a full bypass is required because work occurs within a full channel. This method requires that fish be removed before installation of the bypass.

- **Isolating the work area in large waterbodies**. Typically, this method involves using a silt curtain to isolate the work area and contain any turbidity created during

maintenance. This method usually requires curtains to remain in place until turbidity has subsided which may take several days.

- **Isolation/dewatering of piped infrastructure**. This method involves bypassing stormwater that discharge to a creek or other waterbody from piped stormwater infrastructure. It can also require removal and treatment of wastewater resulting from maintenance activities.

In most cases, a gravity or pump system will bypass stream flow from an upstream containment berm or dam around the project site to a location immediately downstream of the construction zone. The length of the isolated stream channel can vary, depending on project size. All projects will have a method to dissipate flow at the downstream end of the diversion. Upon project completion water flow back into the work area is regulated to minimize turbidity.

3. *Vactoring and Jetting*

Vactoring is removal of sediment and turbid water using vactor trucks with suction hoses. Jet cleaning (jetting water into a culvert) is occasionally required to loosen sediment in a pipe or culvert. Typically, material is flushed down to a catch basin or sump where it can be captured and vactored out. Vehicles are staged adjacent to the work area, typically in an upland area. Vactored material is stored in trucks and disposed of at one of the City's vactor waste facilities.

To prevent the migration of sediment and turbid waters downstream, the system being cleaned is isolated or plugged at the downstream end. The vactor truck stages at this location and captures all sediment and debris entering the structure. A temporary bypass of stream flow may be required to manage the water before it enters the work area.

4. *Excavating*

This method is used to remove accumulated sediments and other debris from around culverts or outfalls, within creek channels, in-line/off-line sedimentation ponds, fish ladders and habitat restoration areas. Excavation removes accumulated sediment below the OHW line - or wetted perimeter where no OHW exists - that impedes conveyance and increases flooding risk.

As sediments accumulate in and adjacent to ponds, culverts, outfalls, ditches and drainage structures, these sediments are periodically removed. Work is typically done when the water level is low to minimize the amount of work required within the wetted perimeter. For work that occurs in the dry, a tractor or backhoe is operated directly from upland staging areas. Sediments are excavated and hauled to an upland disposal site. If work in the wetted perimeter is necessary, sediments are removed with hand tools or, if mechanized equipment is used, only an extension arm and bucket operate in the water. A temporary bypass of stream flow may be required to manage the water before it enters the work area. If deemed necessary, an environmental bucket may be employed to reduce incidental sediment fall back into the wetted area. Large quantities of excavated sediment (larger quantities are typical for ponds) must often be staged on site to dewater before removal to a disposal site. The location must be selected to avoid incidental draining back into the pond.

5. *Maintenance of Habitat Elements*

Habitat elements are organic or inorganic objects that—when placed in or near aquatic areas—increase fish and wildlife habitat and protect infrastructure. Habitat elements include large wood, root wad, baffles, boulders, rock, and weirs. When placed into waterbodies, these objects can slow or alter flow directions and provide complex habitat including riffles, pools and appropriate substrate that create food and hiding places for fish and wildlife. Habitat restoration and maintenance also protect infrastructure and drainage lines.

Habitat restoration or maintenance work may require using heavy or light equipment, hand labor or a combination of these methods. Many projects including those in parks require establishing a temporary construction access. The following is the construction technique for habitat restoration or maintenance:

- Select design and installation of habitat elements in accordance with the WDFW *Integrated Streambank Protection Guidelines* (WDFW et al. 2003).

- Instream or floodplain restoration materials (e.g. large wood and boulders) shall mimic as much as possible those found in a natural environment. Such materials may be salvaged or reused from the project site or hauled in from offsite but cannot be taken from streams, wetlands, or other sensitive areas.

- Various anchoring techniques are sometimes required to prevent the movement of structures when their movement could damage downstream infrastructure or channel integrity. If anchoring is required, bury the habitat element—such as woody debris or boulders—into the banks. Use chain or concrete blocks only sparingly in project design and only when conditions do not exist to anchor woody debris naturally between riparian trees or into the banks. Use concrete sparingly when necessary to anchor boulders to concrete weirs to create a more natural effect.

6. *Site Restoration/Landscaping*

Site restoration stabilizes the site after maintenance is complete and the staging and access areas are vacated. This prepares the site for replanting and protects disturbed soil from erosion and invasive weeds.

Inspect rough grading to ensure final slopes will not generate erosive energy affecting sensitive areas. When necessary, loosen compacted access roads, staging, and stockpile areas. Scatter and place stockpiled woody debris. Coir logs or jute matting with mulch can be utilized to stabilize surfaces while native vegetation is established.

Upon project completion, spread or remove stockpiled materials. All imported soil or rock must be removed, and the covered surface regraded and replanted to original conditions upon project completion.