CITY OF KIRKLAND
Planning and Community Development Department
123 Fifth Avenue, Kirkland, WA 98033 425.587.3225
www.kirklandwa.gov

MEMORANDUM

To: Eric R. Shields, AICP, SEPA Responsible Official

From: Jon Regala, Senior Planner

Date: November 6, 2012

Subject: ENVIRONMENTAL DETERMINATION
TOTEM LAKE CULVERT REPLACEMENT PROJECT
SEPA FILE NO. SEP12-01257

The City of Kirkland Public Works Department is proposing to repair and replace an existing culvert stormwater conveyance system near Totem Lake Mall (see Attachment 1). The project is needed in order to fix significant flooding problems in the area and to replace deteriorating corrugated metal pipes. The entire system consists of 4 segments. The first segment originates at Totem Lake Park along the north edge of Totem Lake Boulevard NE and continues west along the Bank of America property frontage, crossing 120th Avenue NE and ends at a junction box in front of the Chevron property. Segment 2 continues west from the junction box along the Totem Lake Mall property frontage and ends at an existing detention pond/settling basin that was constructed as part of associated road improvements in the mid 1980's.

Segment 3 is being changed from its current location and the existing culvert on the southwest side of Totem Lake Boulevard NE will eventually be abandoned. The new location of the culvert continues along the Totem Lake Mall property frontage and crosses Totem Lake Boulevard NE at a location further to the northwest. The majority of the work proposed along the Bank of America and Totem Lake Mall frontage will temporarily impact existing parking lot and landscaping improvements. The last segment (segment 4) consists of removing built-up sediment located in an open channel between I-405 and Totem Lake Boulevard. The project plans can be found in Attachment 2. A more detailed written description of the project can be found in the SEPA Checklist in Attachment 3.

The area in which the culvert originates is associated with the Totem Lake wetland (Type 1). In addition, the detention pond/settling basin and open channel between I-405 and Totem Lake Boulevard both are located within a wetland (both Type 3). These wetlands also contain a stream. This stream is an unnamed tributary to Juanita Creek and has been cataloged as Tributary #235 in the Juanita Creek Basin. The stream flows year round and currently does not contain salmonids.

I have had an opportunity to visit the site and reviewed the following information:

1. Project Plans dated October 8, 2012 (see Attachment 2)
2. Environmental Checklist revised October 10, 2012 (see Attachment 3)
3. CH2M Hill Wetland and Stream Assessment dated October 2, 2012 (see Attachment 4)

The SEPA Checklist and project plans were forwarded to the Department of Fish and Wildlife and the Muckleshoot Fisheries Division for early review and comment. Both agencies did not have any concerns at this time.

It will be necessary to further analyze certain aspects of the proposal to determine if the project complies with all of the applicable City codes and policies. That analysis is most appropriately

addressed with the grading permit process for the project. In contrast, State law specifies that this environmental review under the State Environmental Policy Act (SEPA) is to focus only on potential significant impacts to the environment that could not be adequately mitigated through the Kirkland regulations and Comprehensive Plan. [1]

However, because this project is exempt from a grading permit (KMC Section 29.12.010(e) and (g)) and the City's sensitive area regulations (KZC Section 90.20.1, 4, and 5), I am recommending that the proposal be changed or clarified to include the following mitigating measures so that a Mitigated Determination of Nonsignificance (MDNS) may be issued. These conditions are based on my review of all available information and adopted policies of the City.

1. Comply with the Tree Retention requirements found in KZC Section 95.30.
2. Return all disturbed parking lot and landscaping improvements to pre-project condition or better.
3. Restore all affected sensitive areas and/or their buffers to pre-project condition or better.

This recommendation is based on adopted goals and policies of the City as found in the City's Comprehensive Plan. Specifically, the following elements of the 1995 Comprehensive Plan support the recommendations described above:

- *Policy NE-1.4: Proactively pursue restoration or enhancement of the natural environment. In addition, require site restoration if land surface modification violates adopted policy or development does not ensue within a reasonable period of time.*
- *Policy NE-2.2: Protect surface water functions by preserving and enhancing natural drainage systems wherever possible.*
- *Policy NE-3.2: Preserve healthy mature native vegetation whenever feasible.*
- *Policy U-1.4: Ensure that utility services are provided in a manner that is environmentally sensitive, safe and aesthetically compatible with surrounding land uses.*
- *Policy TL-14.1: Enhance the habitat quality of the Juanita Creek corridor.*

SEPA ATTACHMENTS

1. Project Map
2. Project Plans
3. Environmental Checklist dated October 10, 2012
4. CH2M Hill Wetland and Stream Assessment dated October 2, 2012

Review by Responsible Official:

✓ I concur _____ I do not concur

Comments: _____

E. R. S. 11/13/12

Eric R. Shields, Planning Director..... Date

[1] ESHB 1724, adopted April 23, 1995

LEGEND

- Existing Culvert
- Proposed Culvert Replacement
- Stream
- Lakes
- Wetlands (Approximate)

N
0 62.5 125 250
Feet

FIGURE 1
Proposed Project
Totem Lake Twin 42" Culvert Replacement

ATTACHMENT 2
SEP12-01257

OVERALL SITE PLAN

Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
OVERALL SITE PLAN
AND PROJECT LOCATION

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

N
0 150 300 450
Scale In Feet

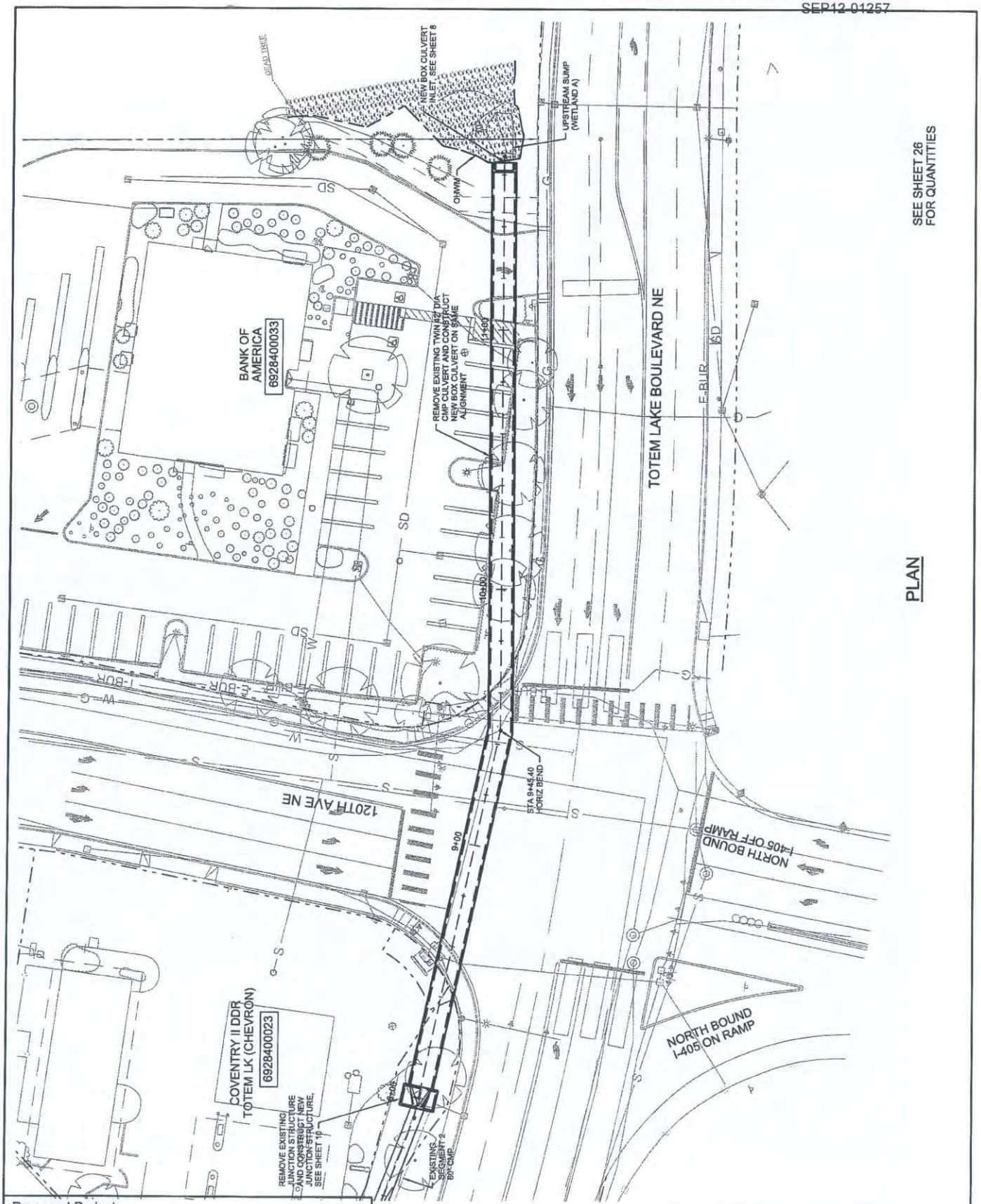
SHEET 1 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM
Lat. 47.710661°, Long. 122.180278°

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\07 PLOT TIME: 6:38:46 AM

ATTACHMENT 2
~~SEP12-01257~~



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 1
PLAN

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

N

0 20 40 80
Scale In Feet

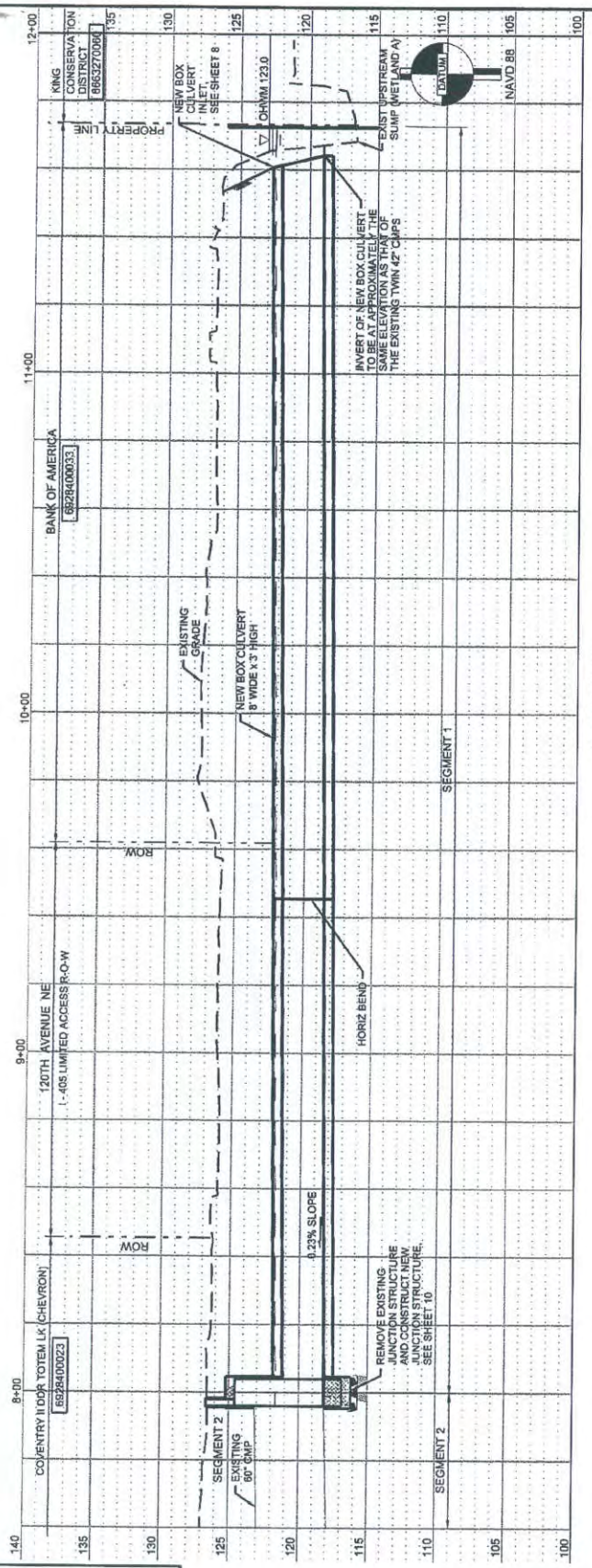
SHEET 2 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\08 PLOT TIME: 4:14:51 PM

ATTACHMENT 2
SEP12-01257



PROFILE
1"=50' HORIZ, 1"=12.5' VERT

Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 1
PROFILE

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 25 50 75
HORIZ: Scale In Feet

0 6.25 12.5 18.75
VERT: Scale In Feet

SHEET 3 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\08 PLOT TIME: 8:18:03 AM

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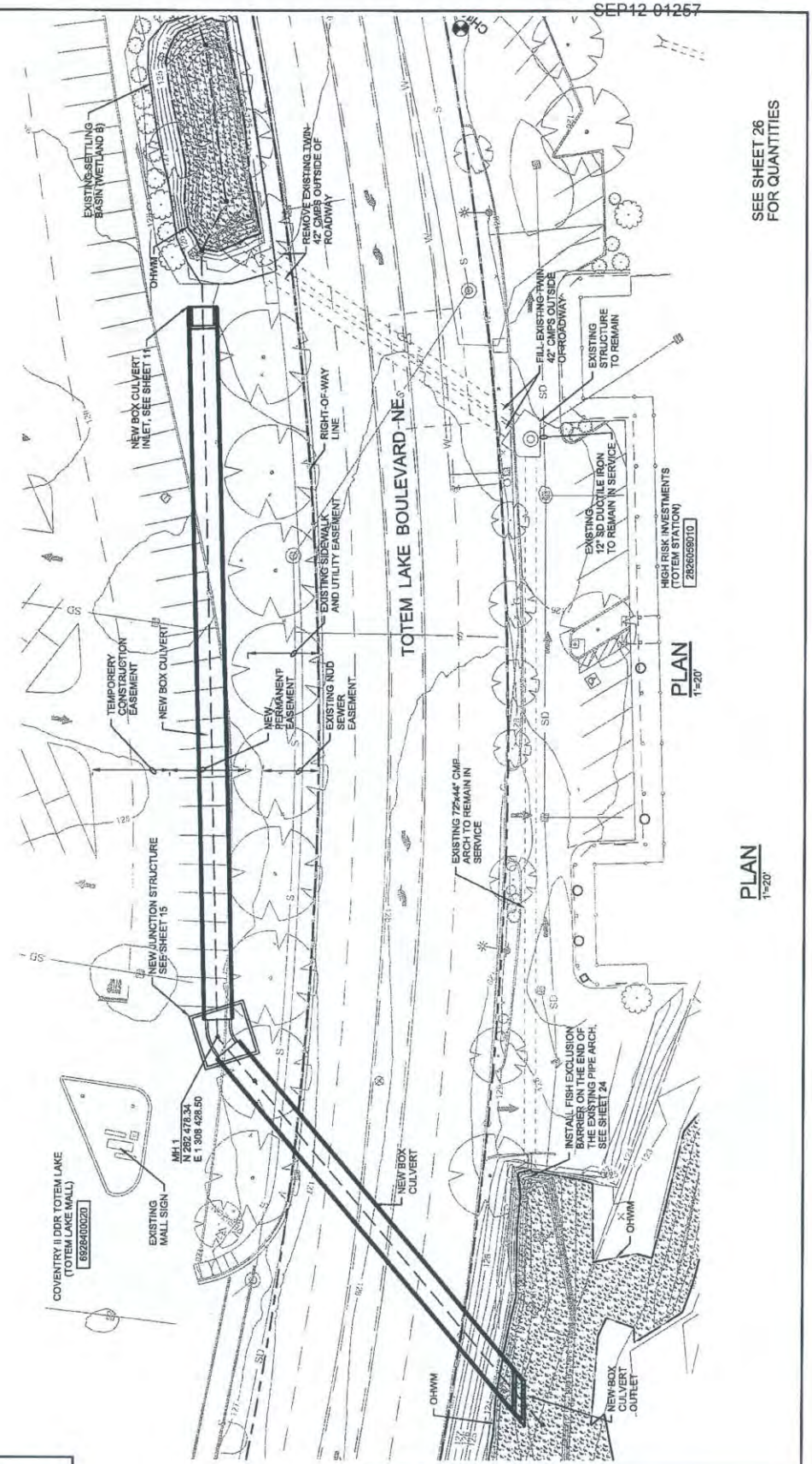
~~SEP12-01257~~



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 3
PLAN

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 20 40 80
Scale In Feet

SHEET 4 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

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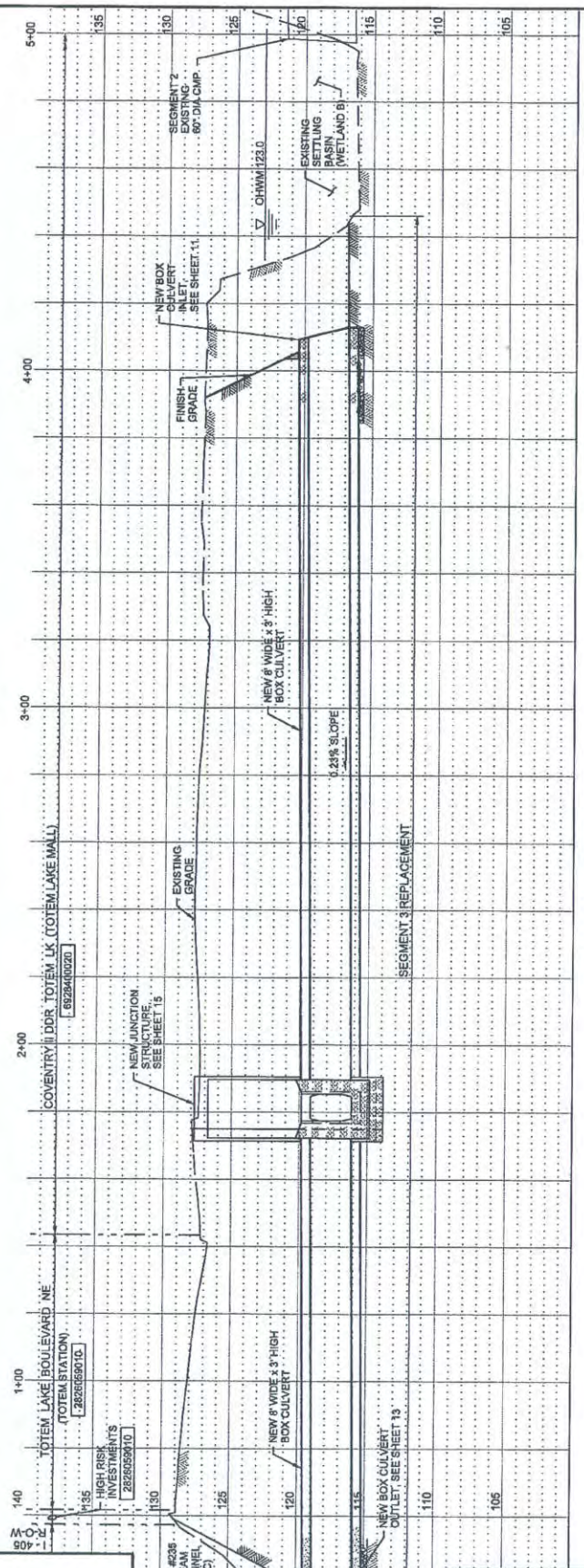
~~SEP12-01257~~



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 3
PROFILE

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

SHEET 5 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

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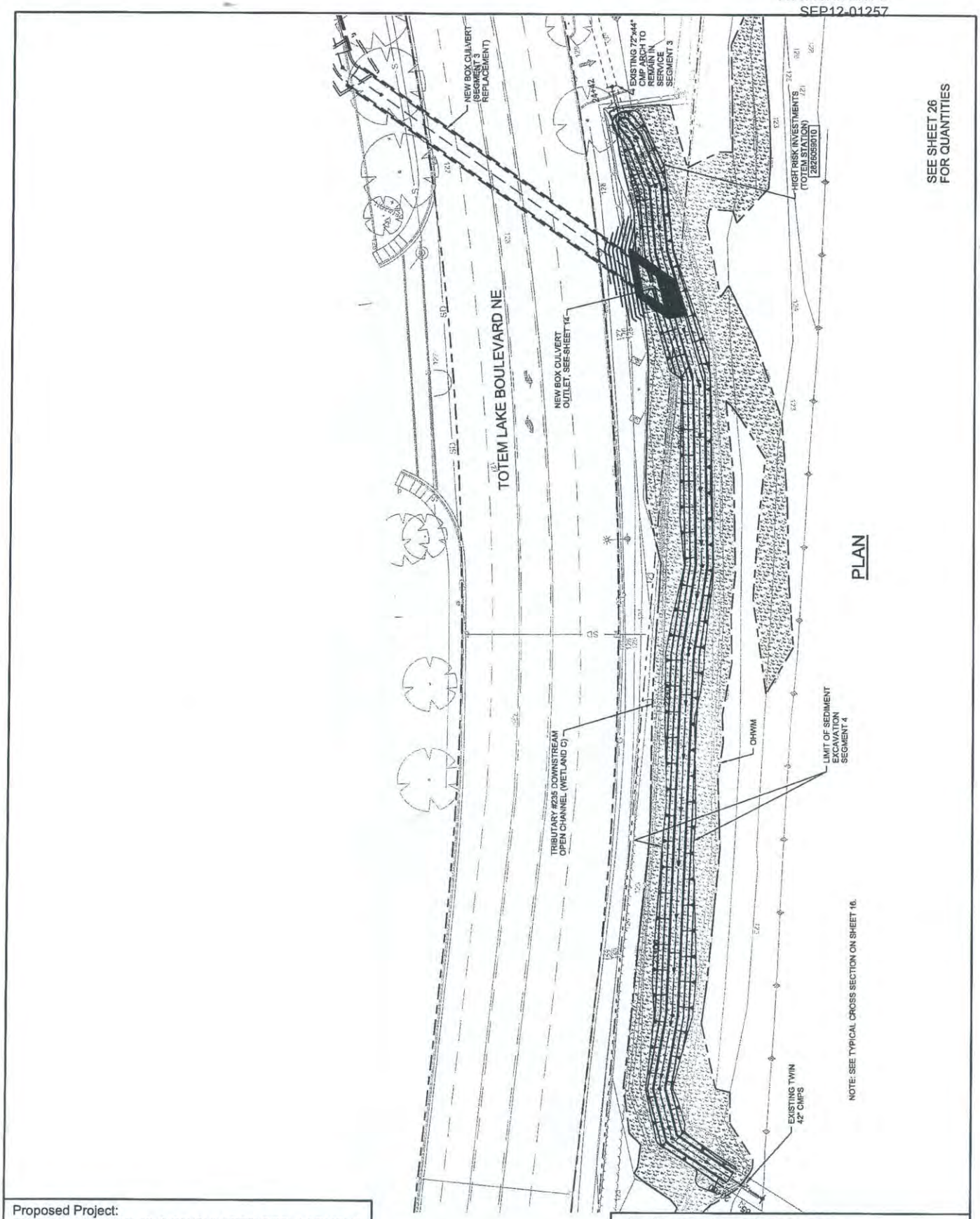
ATTACHMENT 2
SEP12-01257



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 4
PLAN

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

SHEET 6 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

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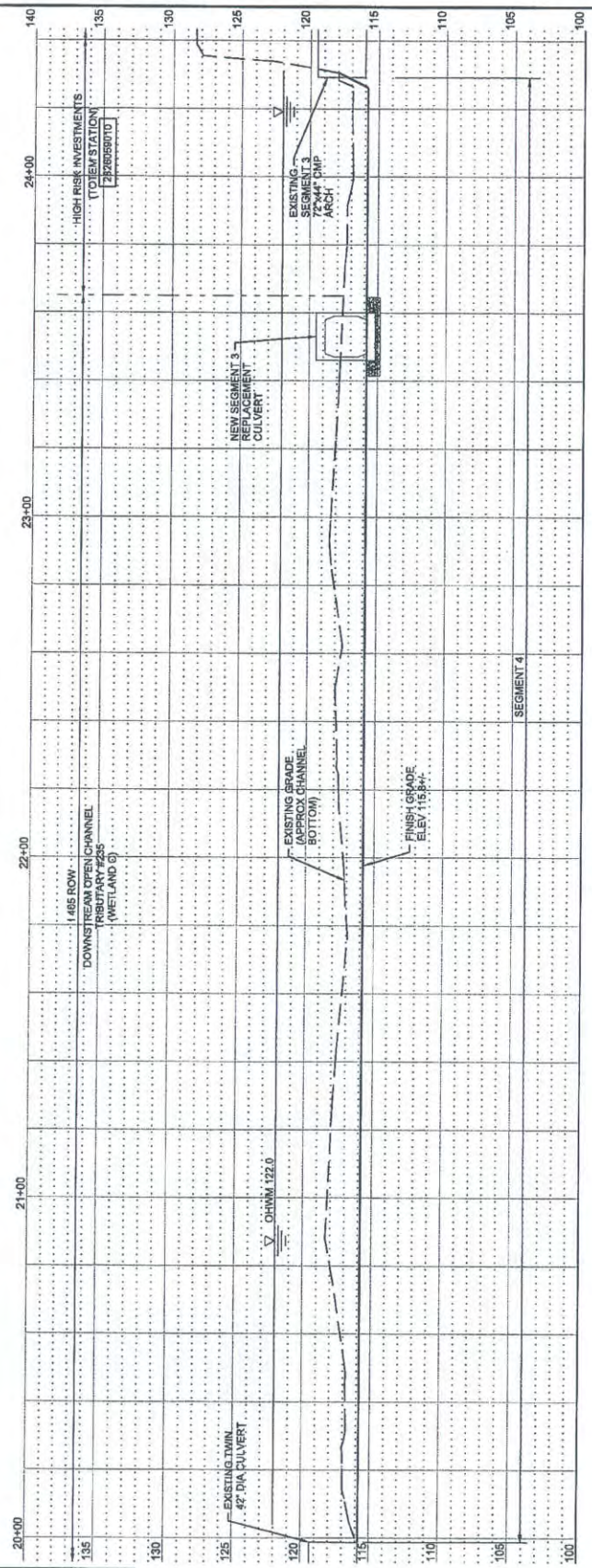

NOTE: SEE TYPICAL CROSS-SECTION ON SHEET 16.

PROFILE

Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 4
PROFILE

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 5 10 15
HORIZ: Scale In Feet

0 20 40 60
VERT: Scale In Feet

SHEET 7 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

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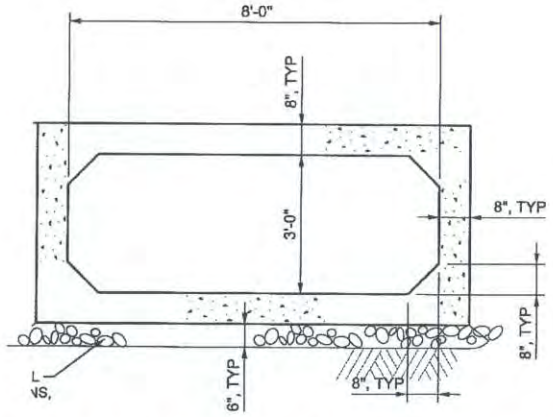
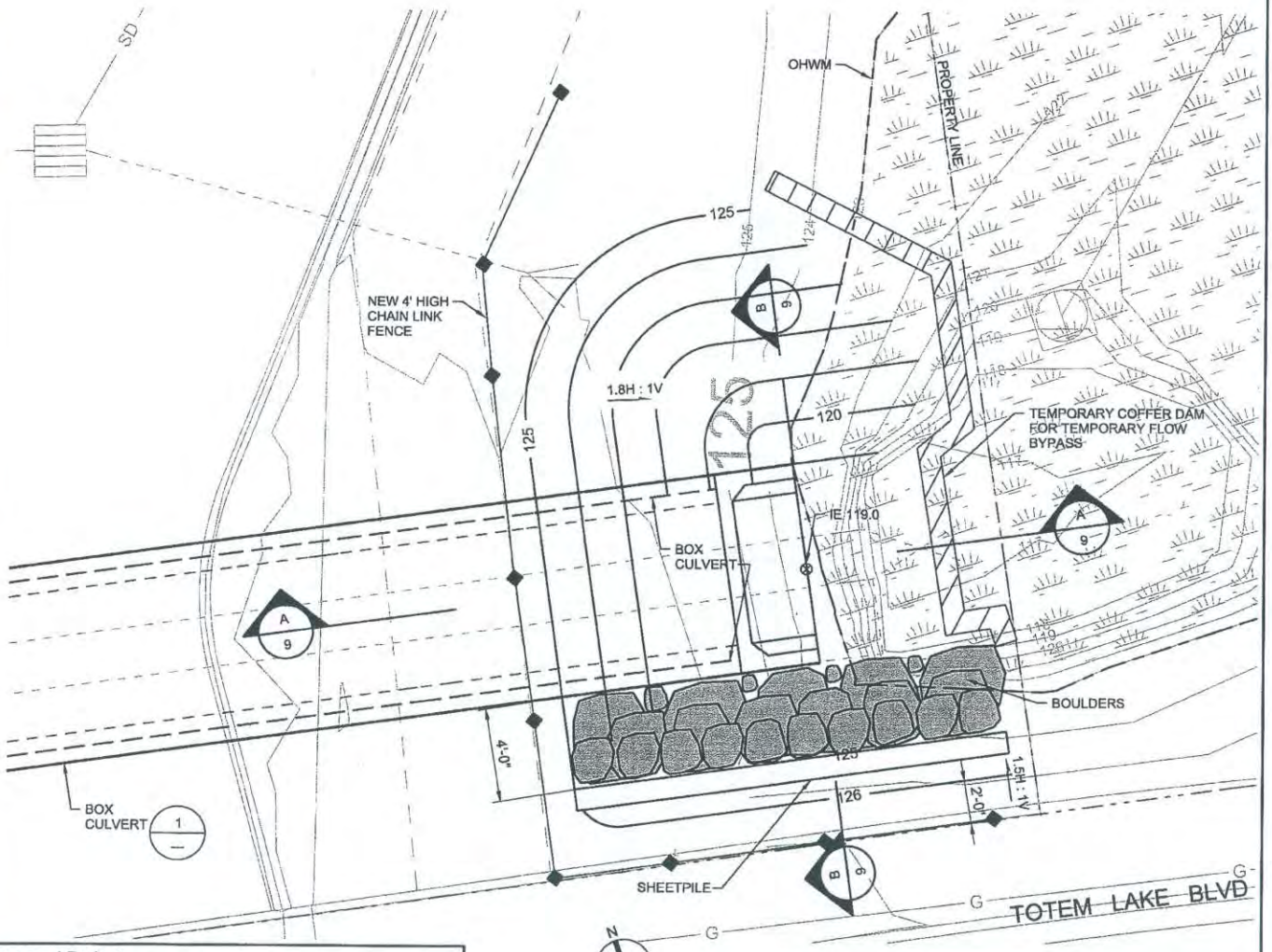


1 TYPICAL BOX CULVERT SECTION
1"=4'



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 1
INLET PLAN AND
TYPICAL SECTION

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 4 8 12
PLAN VIEW: Scale In Feet

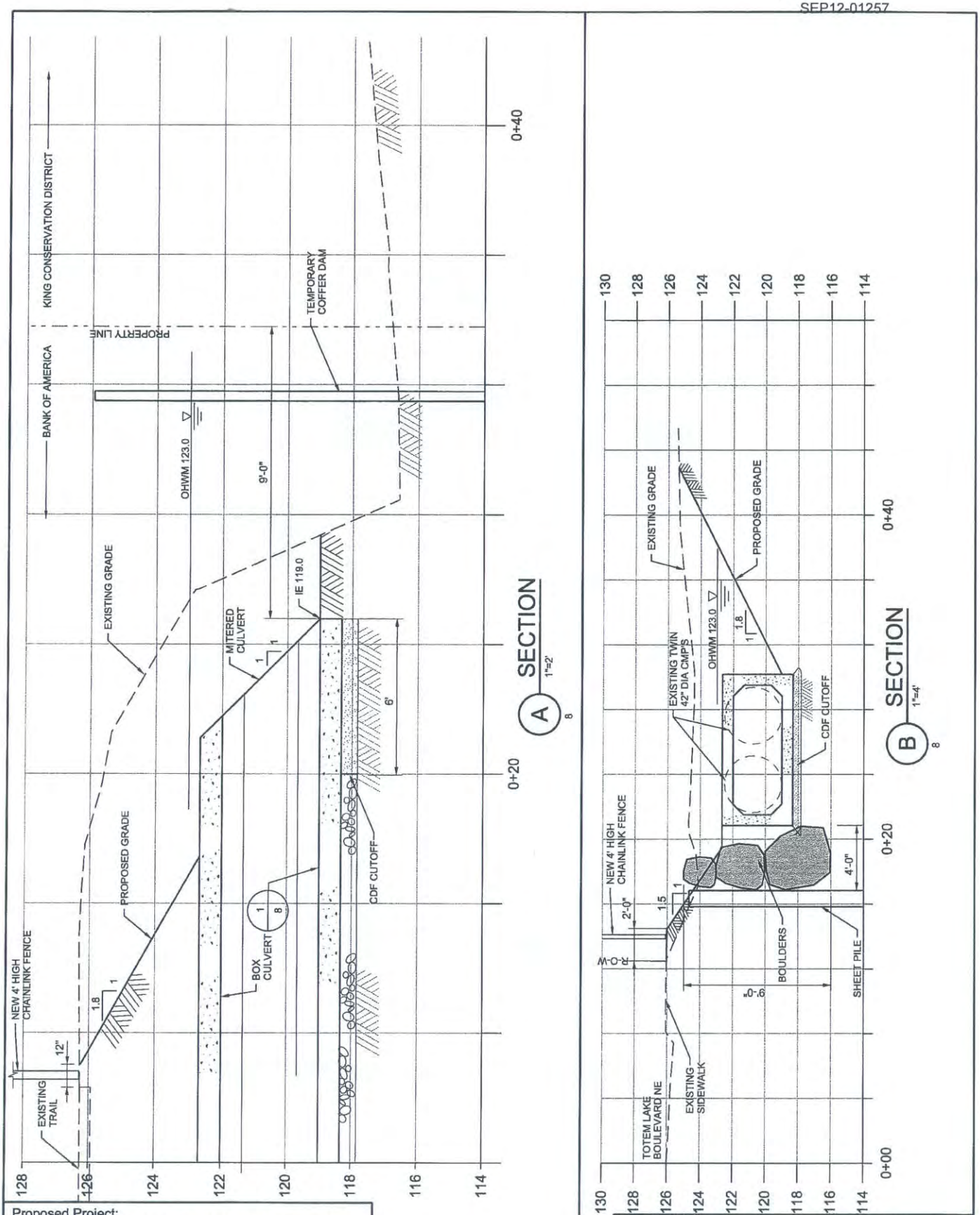
0 2 4 6
SECTION: Scale In Feet

SHEET 8 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\07 PLOT TIME: 11:33:34 AM



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 1
INLET CROSS-SECTIONS

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

SHEET 9 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

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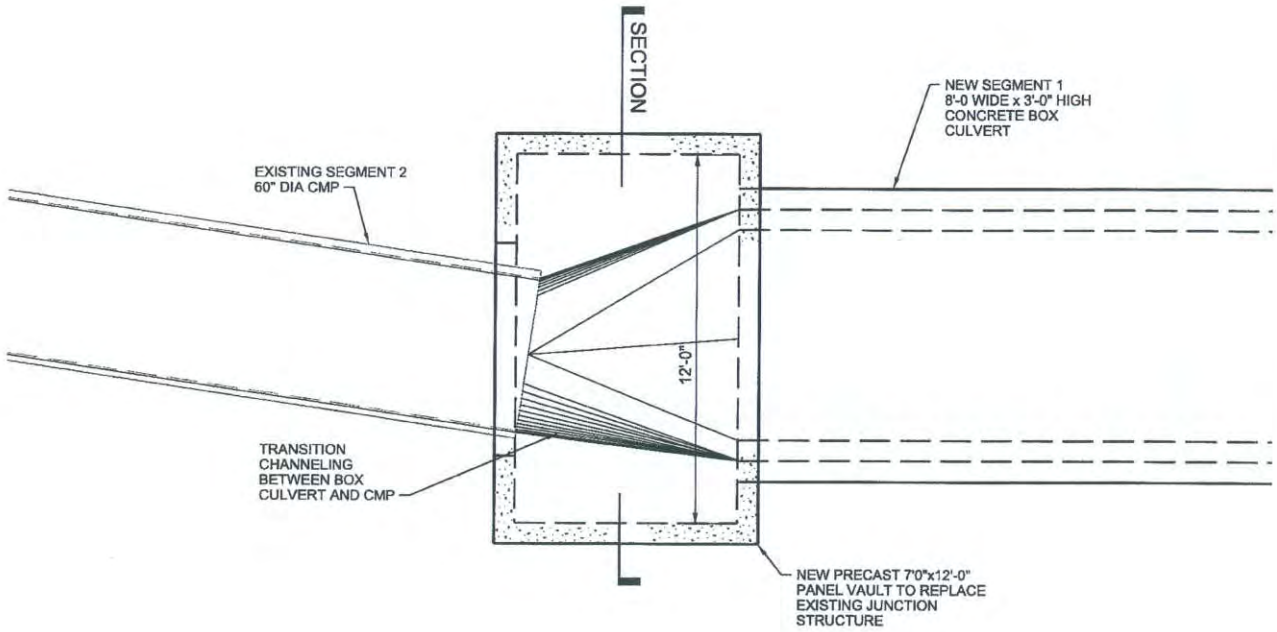
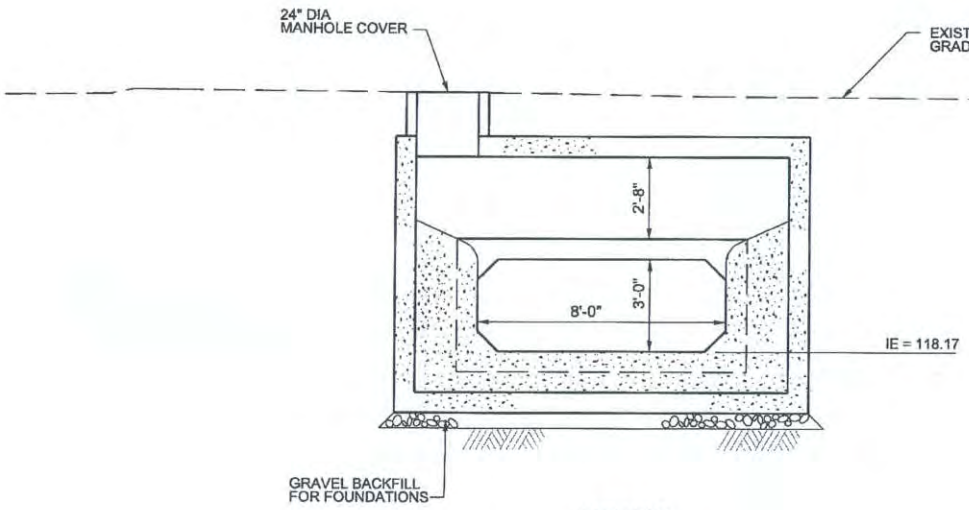


BASE PLAN



SECTION

1 / 2 SEGMENT 1 JUNCTION STRUCTURE
NTS

Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 1
JUNCTION STRUCTURE

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 2.66 5.33 8.00
Scale In Feet

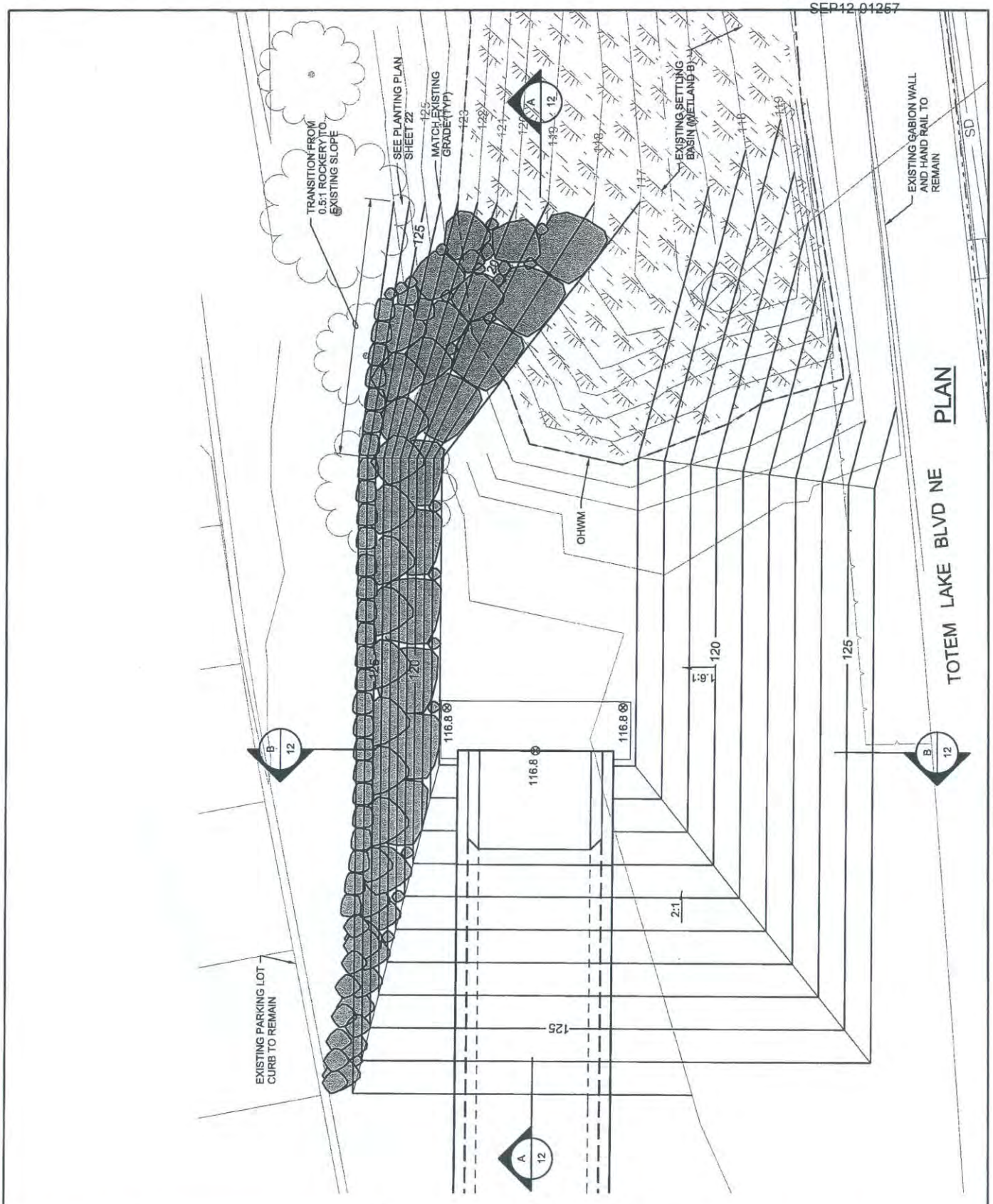
SHEET 10 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\08 PLOT TIME: 1:27:23 PM

ATTACHMENT 2
SEP12-01267



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 3
INLET PLAN

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 4 8 12
Scale In Feet

SHEET 11 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

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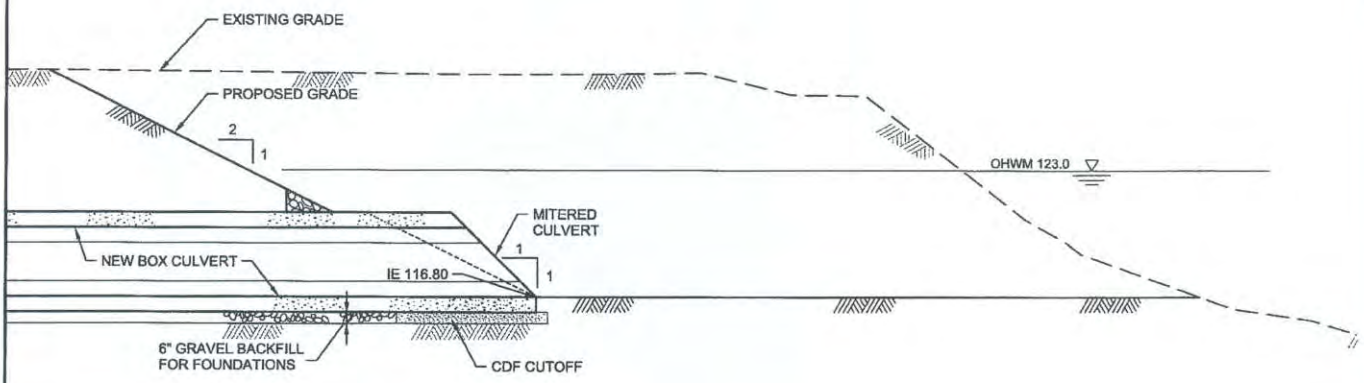
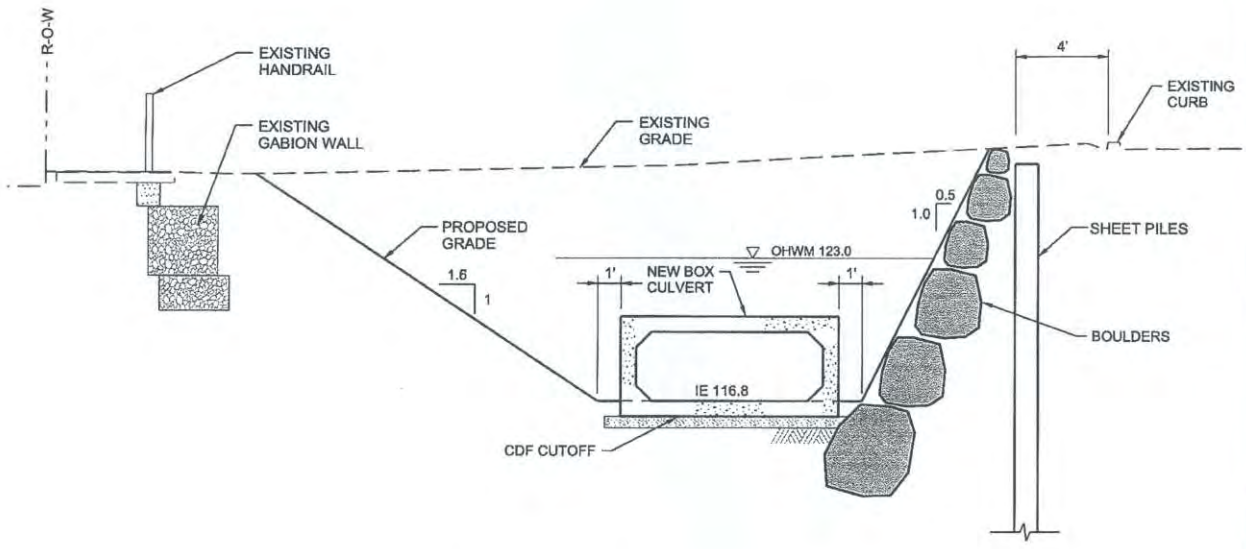


A 11 **INLET SECTION**
1/8"=1'-0"



B 11 **INLET SECTION**
1/8"=1'-0"

Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 3
INLET SECTION

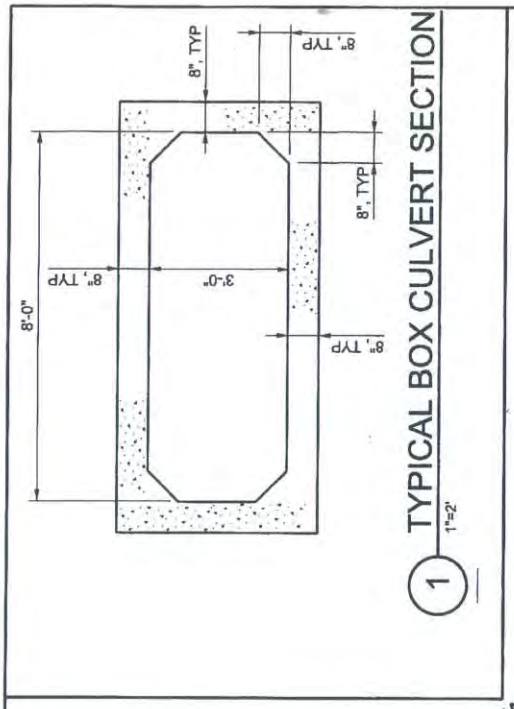
12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 4 8 12
Scale In Feet

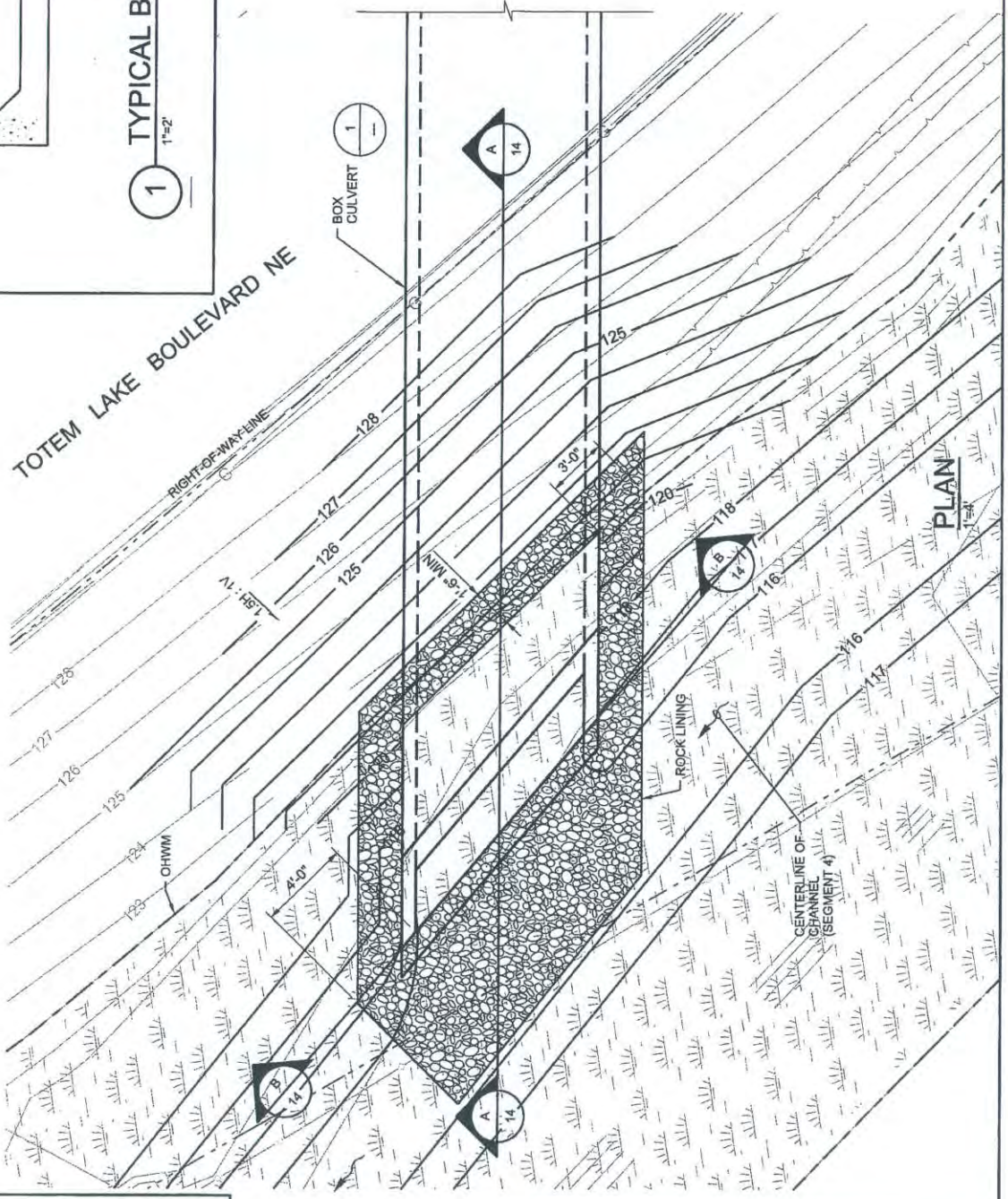
SHEET 12 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012



1 TYPICAL BOX CULVERT SECTION
1"=2'



PLAN
1"=4'

Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 3
OUTLET PLAN AND
TYPICAL SECTION

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

N

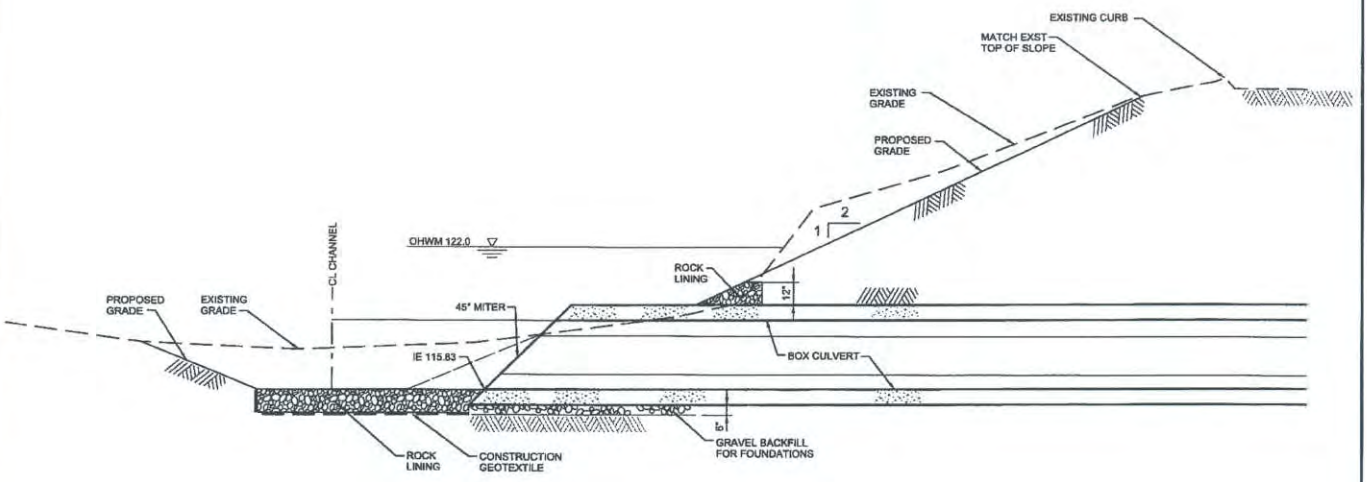
0 4 8 12
Scale In Feet

SHEET 13 of 26

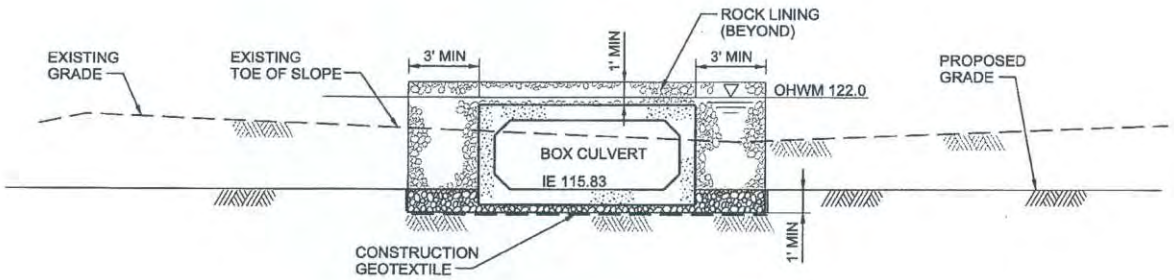
Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\07 PLOT TIME: 2:10:46 PM



A 13 **OUTLET SECTION**
1/8"=1'-0"



B 13 **OUTLET SECTION**
1/8"=1'-0"

Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 3
OUTLET SECTION

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

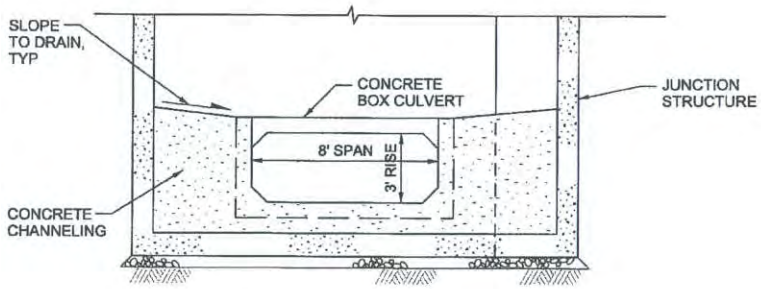
0 4 8 12
Scale In Feet

SHEET 14 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\07 PLOT TIME: 2:20:34 PM



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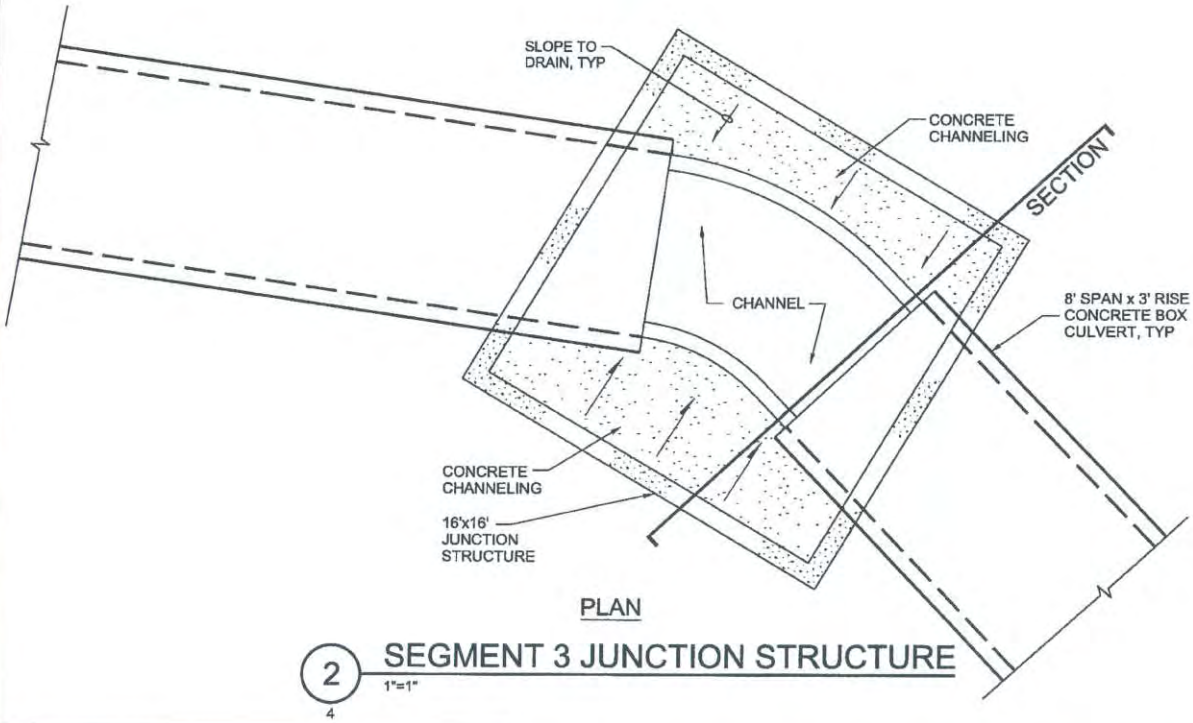

PLAN

2 SEGMENT 3 JUNCTION STRUCTURE
4

1"=1"

Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 3
JUNCTION STRUCTURE

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

N

0 4 8 12
Scale In Feet

SHEET 15 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

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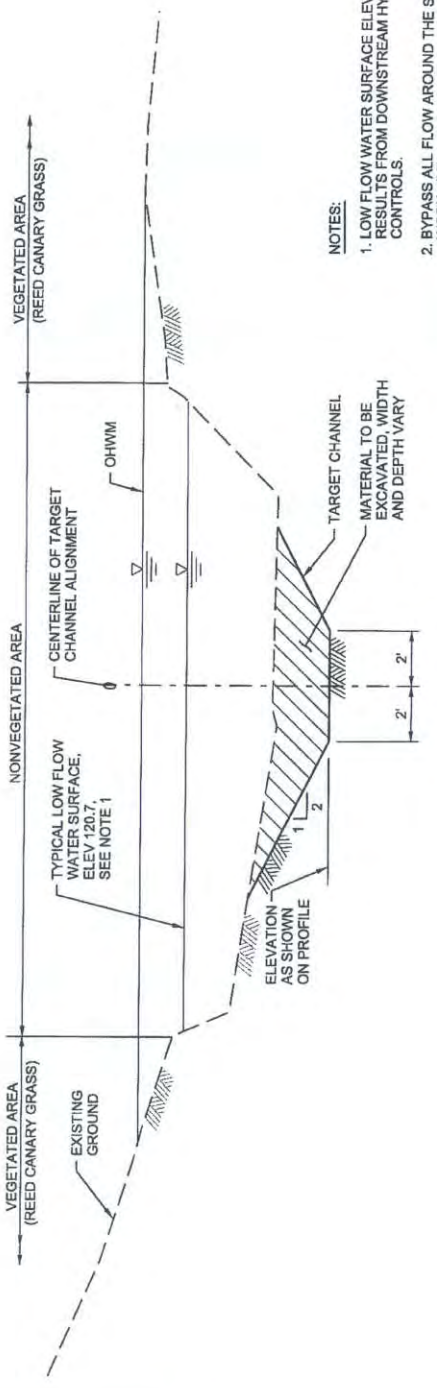

NOTES:

1. LOW FLOW WATER SURFACE ELEVATION RESULTS FROM DOWNSTREAM HYDRAULIC CONTROLS.
2. BYPASS ALL FLOW AROUND THE SEGMENT 4 WORK AREA.
3. STEEPEN EXCAVATION SLOPES AS REQUIRED TO AVOID EXCAVATION IN ADJACENT VEGETATED AREAS.

SEGMENT 4 SCHEMATIC TYPICAL SECTION

NTS

Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT

SEGMENT 4
TYPICAL CROSS SECTION

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 3 6 9
Scale In Feet

SHEET 16 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

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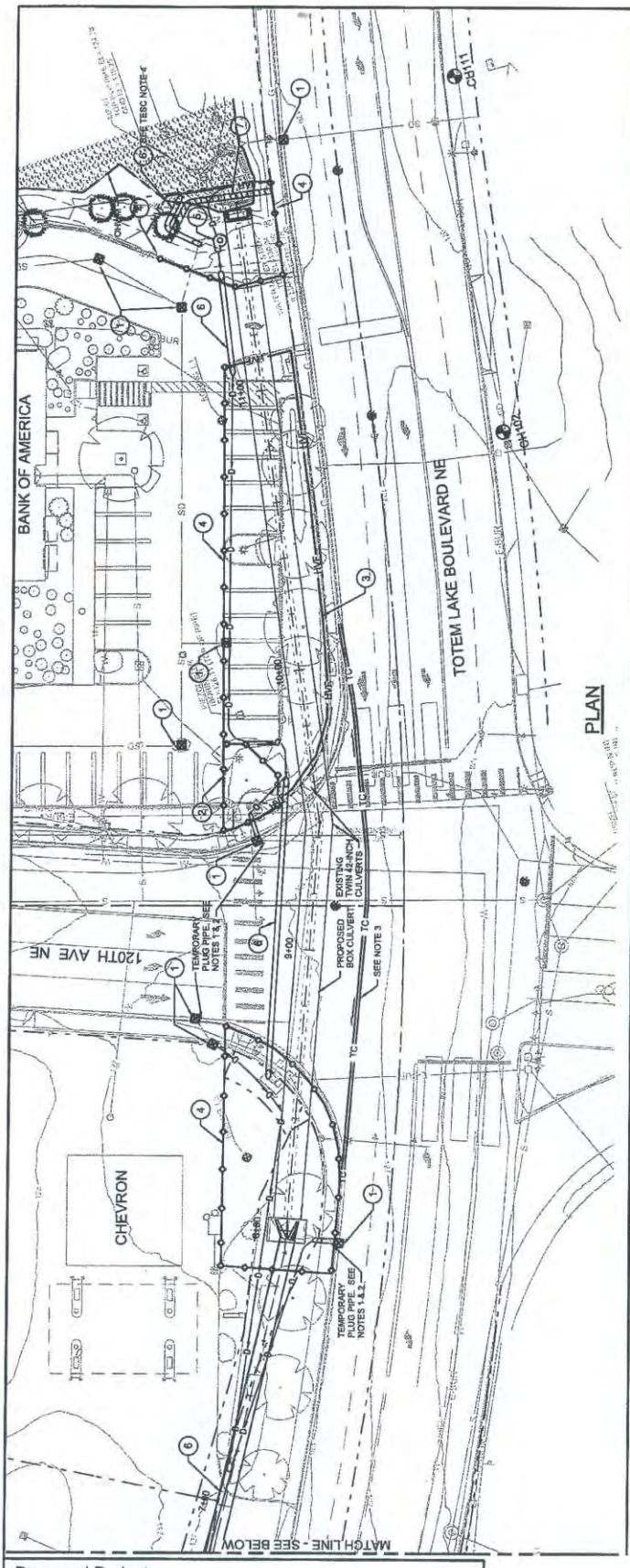
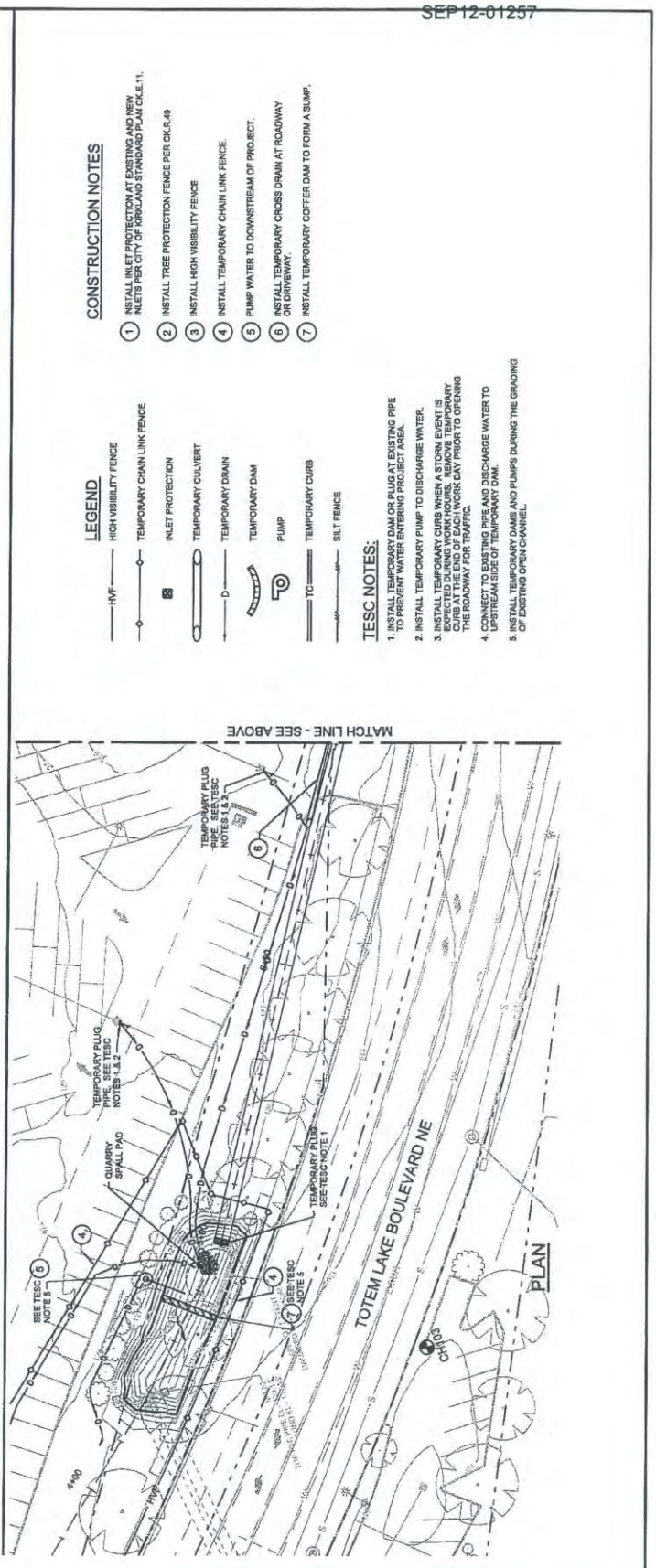




Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 1
TESC AND WATER
BYPASS PLAN

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

N

0 20 40 60
Scale in Feet

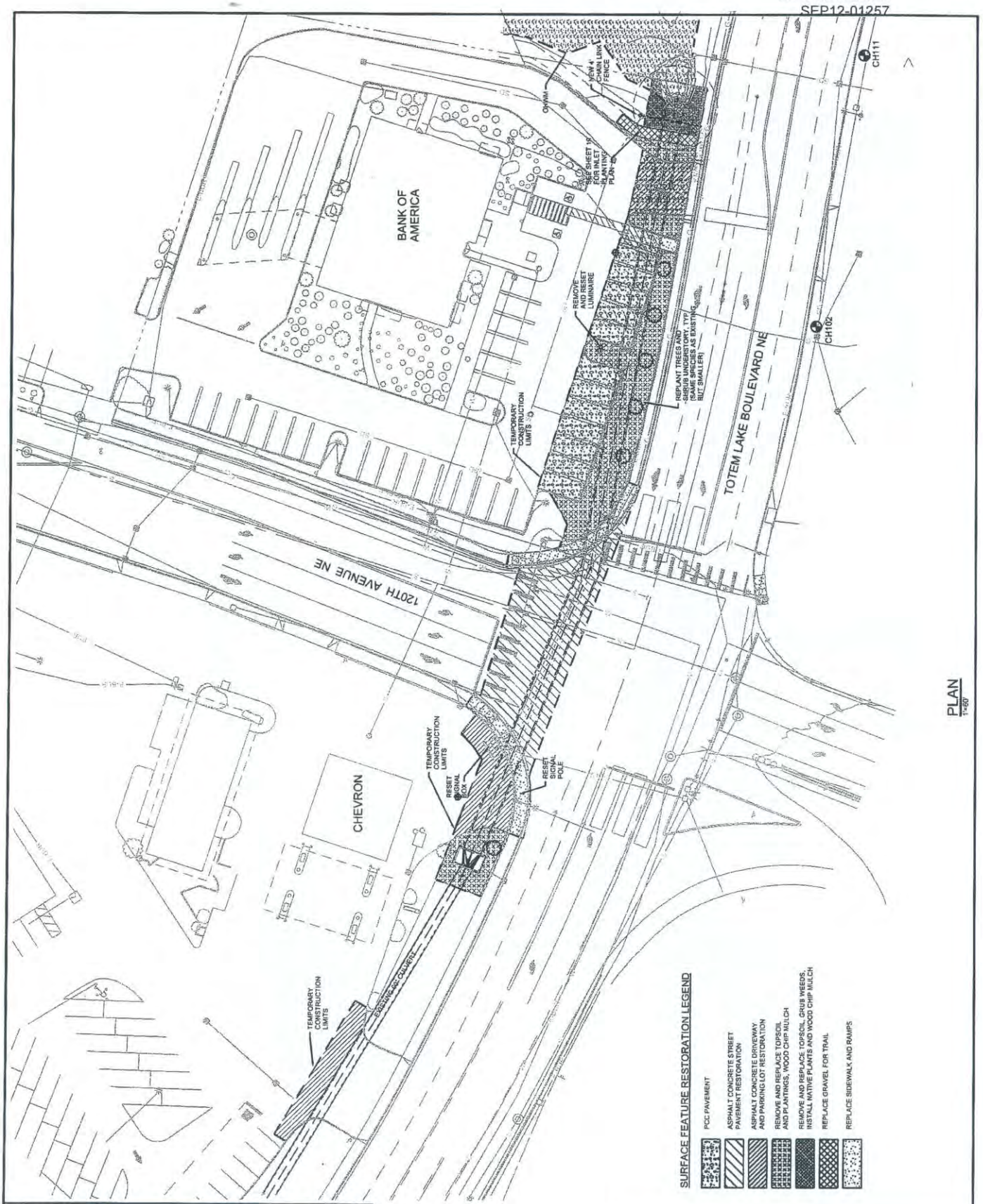
SHEET 17 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\08 PLOT TIME: 12:46:20 PM

ATTACHMENT 2
SEP12-01257



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 1
SITE RESTORATION

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

N

0 20 40 80
Scale in Feet

SHEET 18 of 26

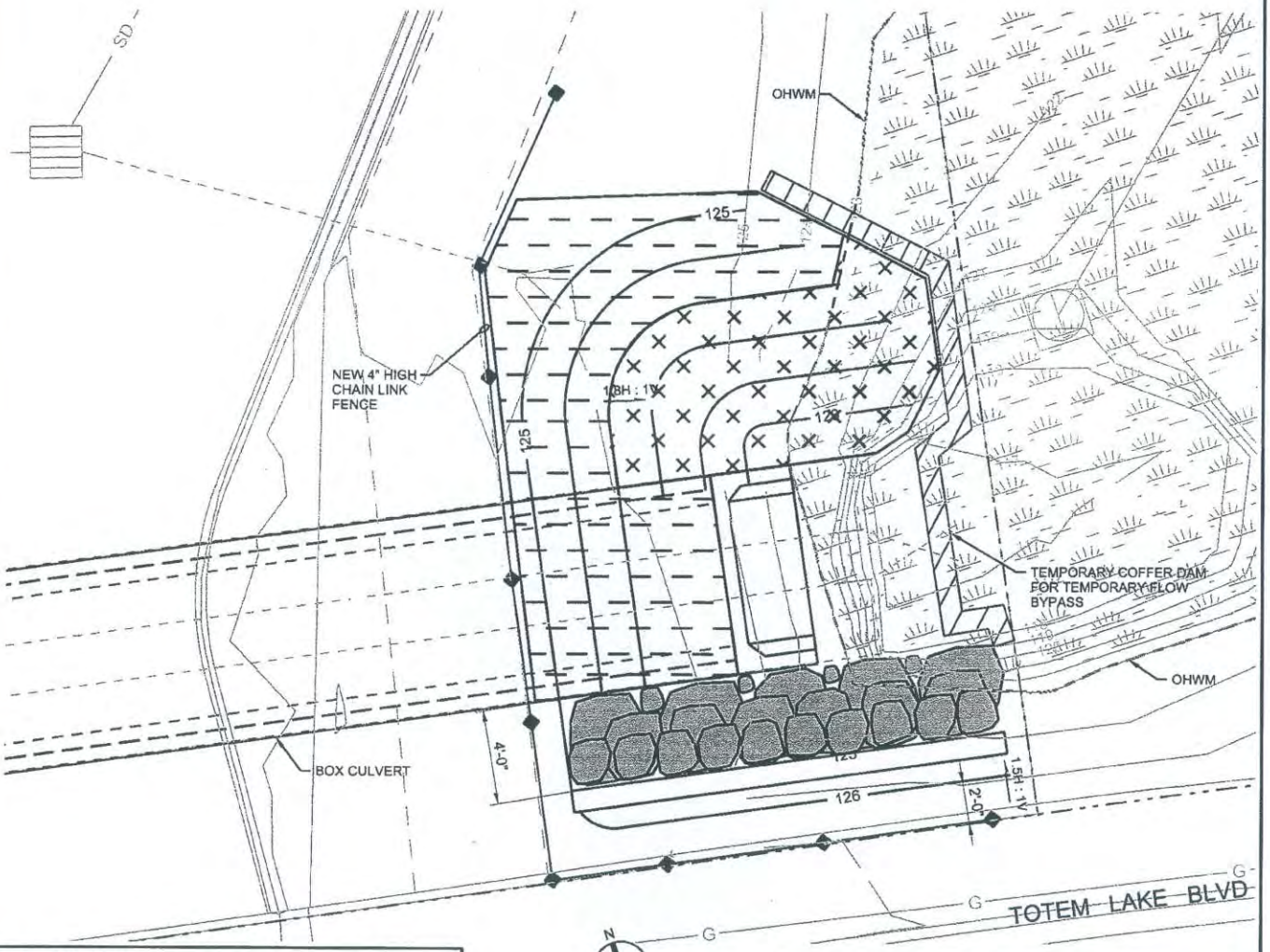
Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\08 PLOT TIME: 11:47:28 AM

Segment 1 Inlet – Planting List

Symbol	Species	Quantity	Area (square feet)
	Beaked hazelnut Indian plum Ocean spray Red elderberry Snowberry Vine maple Western serviceberry	2 2 2 2 2 2 2	200
	Black twinberry Red-osier dogwood Sitka willow	5 5 5	150
TOTAL		**29**	**350**



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 1
BOX CULVERT INLET
PLANTING PLAN

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 4 8 12
PLAN VIEW: Scale In Feet

0 2 4 6
SECTION: Scale In Feet

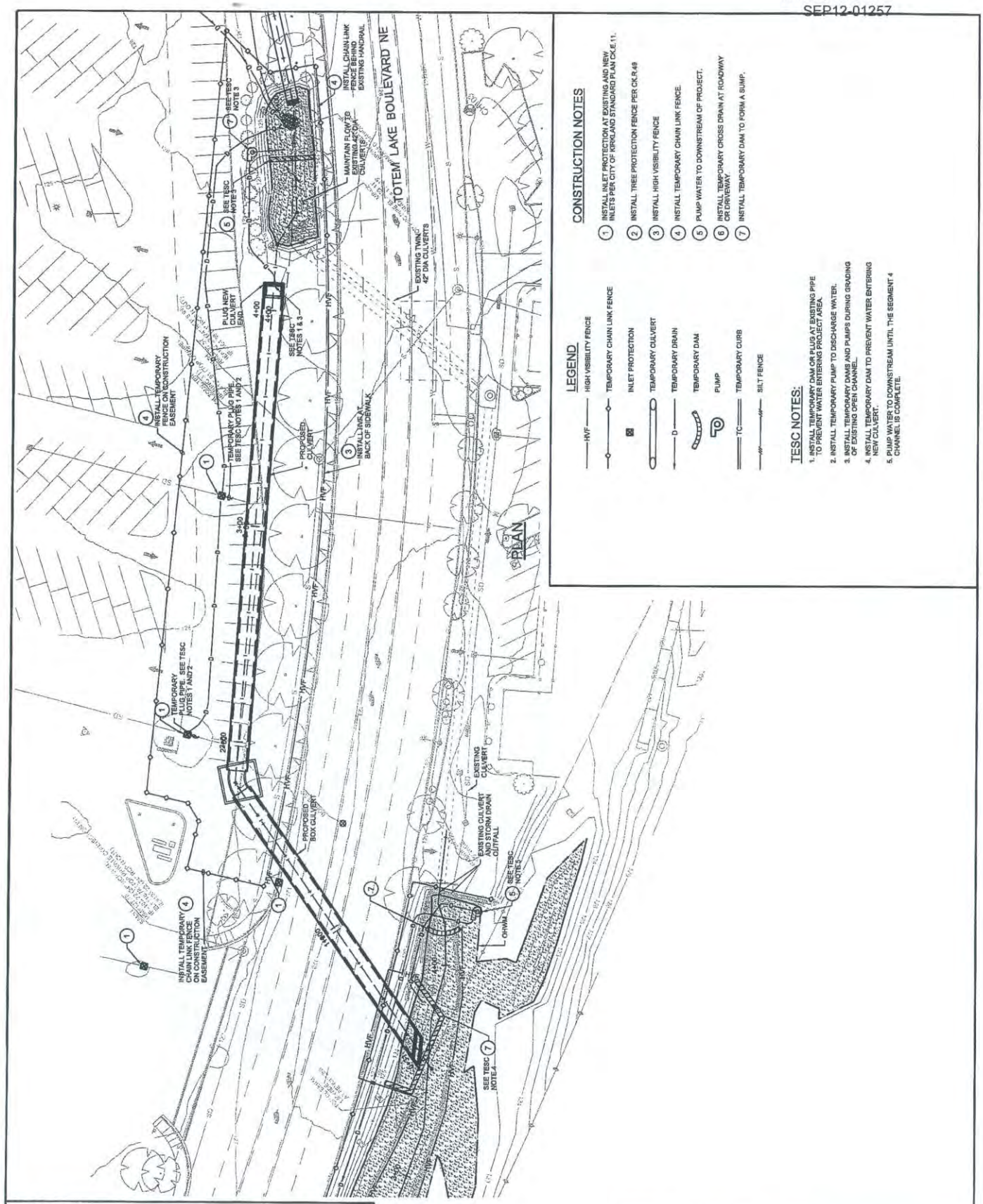
SHEET 19 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\08 PLOT TIME: 1:05:11 PM

ATTACHMENT 2
SEP12-01257



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 3
TESC AND WATER
BYPASS PLAN

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

Scale In Feet: 0 20 40 80

SHEET 20 of 26

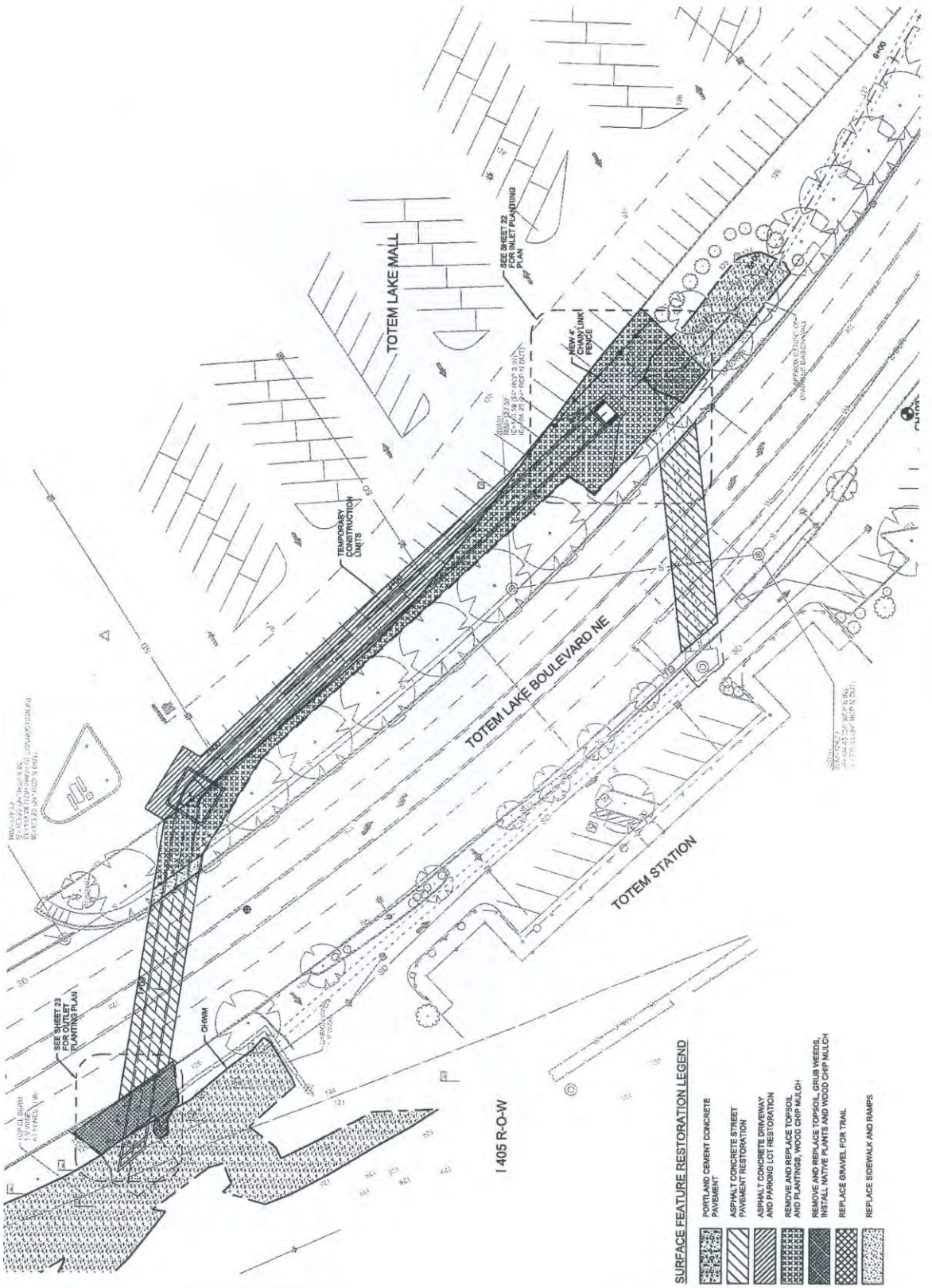
Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME:

PLOT DATE: 2012\10\07

PLOT TIME: 2:53:02 PM



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 3
SITE RESTORATION

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 20 40 60
Scale in Feet

SHEET 21 of 26

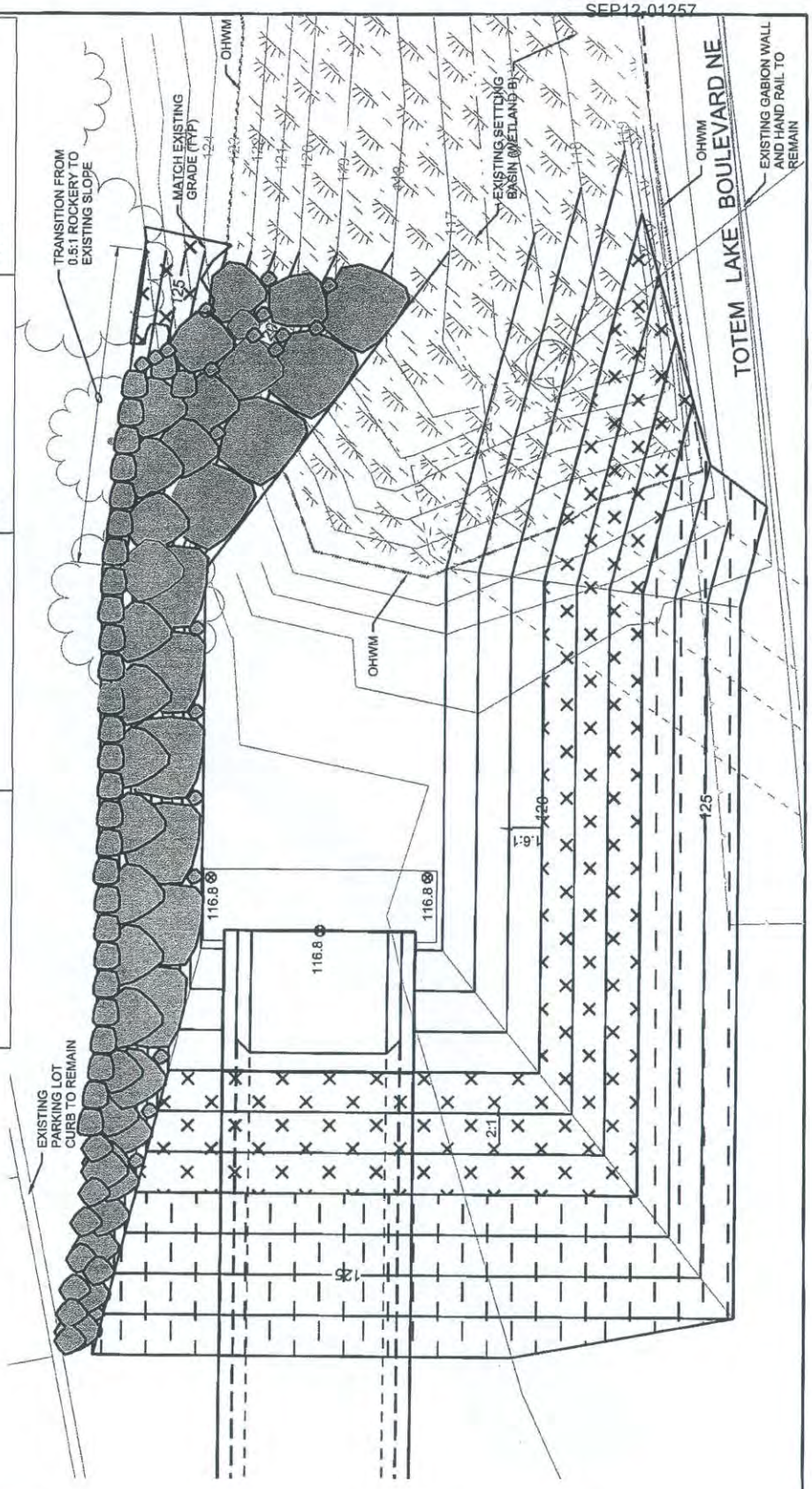
Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\07 PLOT TIME: 2:54:29 PM

Segment 3 Inlet – Planting List

Symbol	Species	Quantity	Area (square feet)
	Beaked hazelnut	6	600
	Indian plum	6	
	Ocean spray	6	
	Red elderberry	6	
	Snowberry	6	
	Vine maple	6	
	Western serviceberry	6	
	Black twinberry	10	600
	Red-osier dogwood	15	
	Sitka willow	15	
TOTAL		82	1200



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 3
BOX CULVERT INLET
PLANTING PLAN

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 4 8 12
Scale In Feet

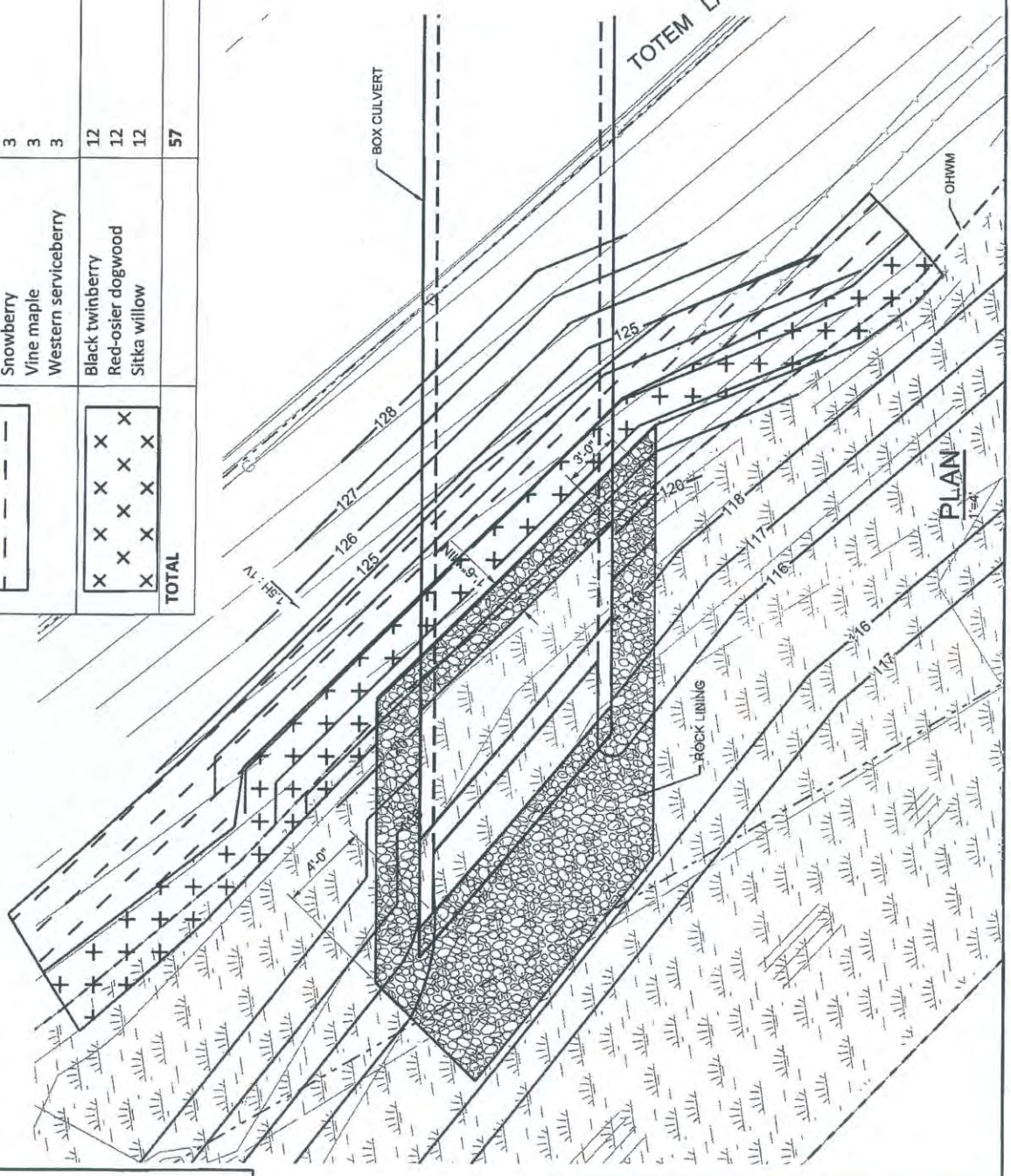
SHEET 22 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

Segment 3 Outlet – Planting List

Symbol	Species	Quantity	Area (square feet)
	Beaked hazelnut	3	200
	Indian plum	3	
	Ocean spray	3	
	Red elderberry	3	
	Snowberry	3	
	Vine maple	3	
	Western serviceberry	3	
	Black twinberry	12	200
	Red-osier dogwood	12	
	Sitka willow	12	
TOTAL		57	400



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 3
OUTLET PLANTING PLAN

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

N

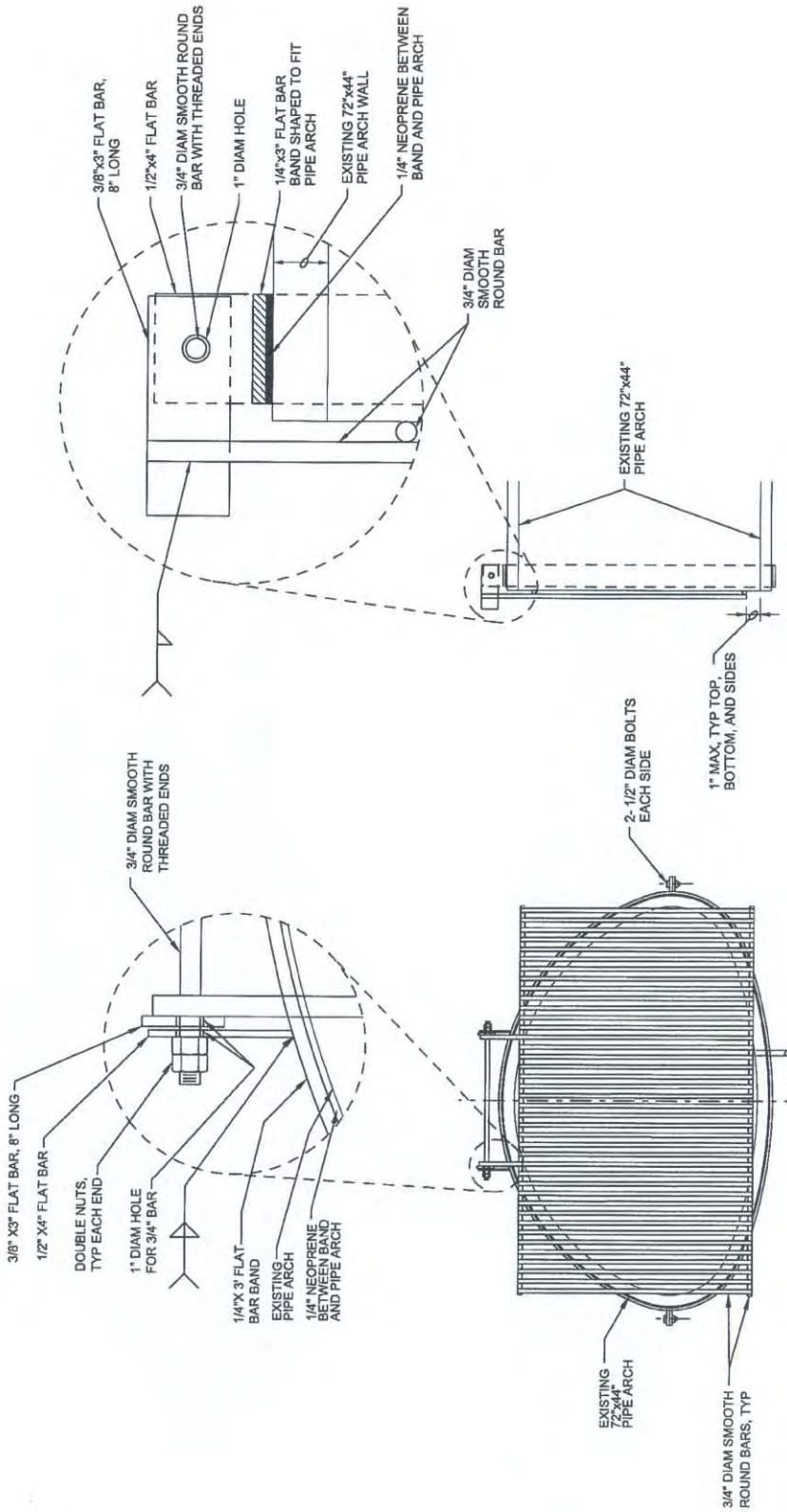
0 4 8 12
Scale In Feet

SHEET 23 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\08 PLOT TIME: 7:25:18 AM



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 4
FISH EXCLUSION
BARRIER

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 1 2 3
Scale In Feet

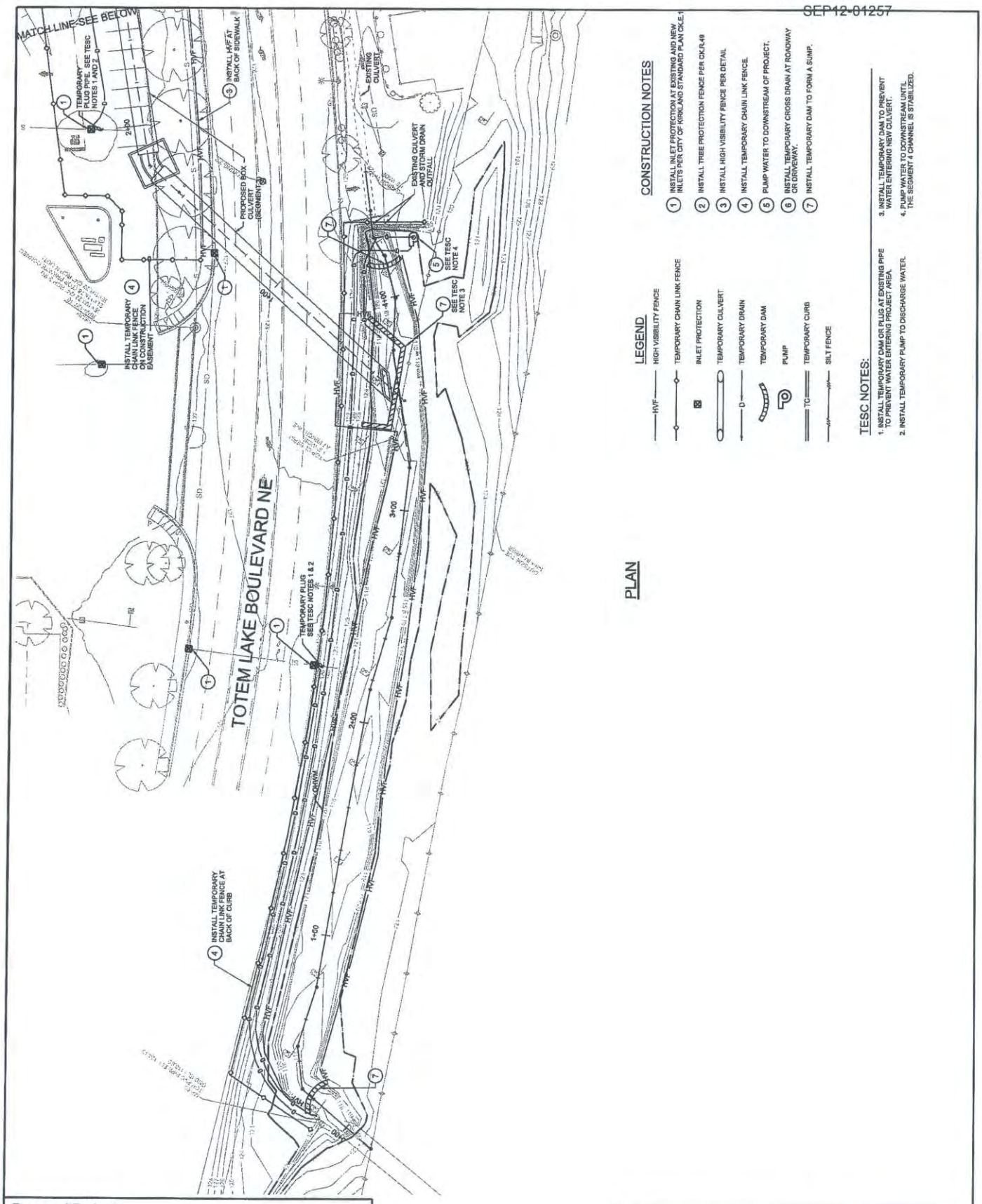
SHEET 24 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME: PLOT DATE: 2012\10\08 PLOT TIME: 2:41:48 PM

ATTACHMENT 2
~~SEP12-01257~~



Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT
SEGMENT 4
TESC AND WATER
BYPASS PLAN

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

0 20 40 60
Scale In Feet

SHEET 25 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

FILENAME:

PLOT DATE: 2012\10\08 PLOT TIME: 1:02:04 PM

Wetland	Permanent Wetland Impacts				Temporary Wetland Impacts		
	Fill Type	Fill Volume (cubic yards)	Area (sq. ft.)	Impact Type	Impact (sq ft.)	Excavation (cubic yards)	Impact Type
A	Rockery	4	20	Remove existing Segment 1 CMPs and construct new Segment 1 box culvert inlet.	Drain/Disturb = 200 Excavation = 34	6	Construction activities for removingexisting Segment 1 CMPs and constructing new Segment 1 box culvert inlet.
B	Clean commercial soil	3	140	Modify existing settling basin to accommodate new replacement Segment 3 box culvert inlet and remove/abandon inlet to existing Segment CMPs.	Drain/Disturb = 400 Excavation = 175	16	Temporary cofferdam for flow bypass for modify existing settling basin to accommodate new replacement Segment 3 box culvert inlet and remove/abandon inlet to existing Segment CMPs.
C	Backfill, bedding, and rock lining.	23	300	Construct new replacement Segment 3 box culvert outlet.	300	40	Construction activities to construct new replacement Segment 3 box culvert outlet.
TOTAL			**460**		**1110**	**62**	

Waterbody	Permanent Waterbody Impacts				Temporary Waterbody Impacts		
	Fill Type	Fill Volume (cubic yards)	Area (sq. ft.)	Impact Type	Impact (sq ft.)	Excavation (cubic yards)	Impact Type
Juanita Creek Tributary #235	None	0	0	None	5700	200	Remove Sediment from Segment 4

Proposed Project:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT

QUANTITIES

12500 Totem Lake Boulevard N. E.
City of Kirkland, King County, Washington, 98034

SHEET 26 of 26

Applicant: City of Kirkland, WA.
Reference #: NWS-2011-1012
Waterway: Juanita Creek Tributary #235
NW 1/4 of SW 1/4, Sec. 28, T. 26 N., R. 5 E., WM

Date: October 8, 2012

WAC 197-11-960 Environmental checklist.

ENVIRONMENTAL CHECKLIST

Purpose of checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. Name of proposed project, if applicable:
TOTEM LAKE TWIN 42-INCH CULVERT REPLACEMENT PROJECT

2. Name of applicant: CITY OF KIRKLAND, WASHINGTON
3. Address and phone number of applicant and contact person:

NOEL HUPPRICH

123 5th Avenue

Kirkland, WA 98033

(425) 587-3829

NHupprich@kirklandwa.gov

4. Date checklist prepared: 10/10/2012
5. Agency requesting checklist: CITY OF KIRKLAND
6. Proposed timing or schedule (including phasing, if applicable):

Culvert replacement to be constructed in Summer/Fall 2013.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR
AGENCY USE ONLY

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

A Wetland and Stream Technical Memorandum was prepared in September 2012.

A Cultural Resources Report was prepared in August 2012.

A Draft Geotechnical Data Report was prepared in September 2012.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

None known.

10. List any government approvals or permits that will be needed for your proposal, if known.

All Segments:

Hydraulic Project Approval (HPA) from Washington Department of Fish and Wildlife

NPDES General Construction Permit from Washington Department of Ecology (if needed)

Segment 1 only:

WSDOT Utility Franchise

Segments 1 and 3 only:

City Right of Way Use Permit

Segment 3 only:

Clean Water Act Section 404 Permit from US Army Corps of Engineers

Clean Water Act Section 401 Water Quality Certification from Washington Department of Ecology

Per Kirkland Zoning Code Chapter 90.20, the project is exempt from a City Critical Areas Permit.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The City of Kirkland has experienced an increasing frequency of flood-related closures of Totem Lake Boulevard in part because of deterioration of the conveyance system that carries flow from the 17-acre Totem Lake Park. Flooding during the major storm in December 2010 caused the City to entirely close Totem Lake Boulevard and the off-ramp from I-405 for several days. This off-ramp is a primary access route to Evergreen Hospital and Medical Center.

The project will include work in three of four segments of the Totem Lake conveyance between Totem Lake Park and I-405. By implementing this culvert replacement project, the City will help reduce the frequency and severity of flooding that has resulted in chronic impacts to public safety and property from closures of Totem Lake Boulevard and the I-405 off ramp. These closures have restricted public access to businesses, homes, and critical facilities such as the Evergreen Hospital and Medical Center in Kirkland. Totem Lake Boulevard has been completely or partially closed for one or more days during at least 8 separate storm events during the last 6 years.

The attached Joint Aquatic Resource Permit Application (JARPA) drawings provide plan, profile, and cross-section views of each segment, along with temporary bypass and site restoration plans. A description of each segment and the project work in it are as follows:

Segment 1

Segment 1 consists of 360 linear feet of existing twin 42-inch-diameter corrugated metal pipes (CMPs) that start at the southwestern corner of the Totem Lake Park (which includes Totem Lake and surrounding wetlands), extend under a Bank

of America parking lot and landscaping strip, continue under 120th Avenue NE (WSDOT limited access), continue under a corner of the Chevron gas station parking lot and landscaping strip, and terminate in an existing 7-foot by 12-foot concrete junction structure. The existing Segment 1 culvert does not meet fish passage criteria. There are visible signs of severe deterioration and failure of the existing culvert pipes. One of the pipes is blocked and the other is partially collapsed. A sinkhole formed at the Chevron gas station on two occasions. The City of Kirkland's efforts to patch the failed culvert pipe have been only partly effective because of the advanced deterioration of the pipe. The sink hole is immediately adjacent to one of the traffic signal poles for the intersection of Totem Lake Boulevard and the northbound I-405 off- and on-ramps.

The existing twin 42-inch-diameter CMPs in Segment 1 will be replaced with 360 linear feet of 8-foot wide by 3-foot high (interior dimensions) concrete box culvert along the same alignment as the existing culvert. The new culvert will meet fish passage criteria. The earthen embankment on both sides of the existing twin culverts at the upstream end will be stabilized with rockery and will be planted with native vegetation to blend in with Totem Lake Park, located to the southeast. No work will occur in the Totem Lake Park. The existing junction structure at the downstream end at the connection to Segment 2 will be replaced to accommodate the new box culvert.

During construction of the new box culvert and junction structure, bypass pumping will be needed for the flows that are normally conveyed through the culvert pipes. This will be achieved by installing a temporary cofferdam at the upstream end of Segment 1 and pumping using properly screened pumps to a downstream discharge point in Segment 2.

Segment 2

Segment 2 consists of 300 linear feet of existing 60-inch-diameter CMP that extends from the junction structure at the Chevron gas station and discharges to an approximately 60-foot-long open settling basin at the Totem Lake Mall. The City has decided not to replace the CMP in Segment 2, which was installed during the Kingsgate Way Improvement project in the mid 1980s. However, the existing junction structure between Segment 1 and Segment 2 will be replaced as described above.

The existing 60-inch-diameter CMP culvert in Segment 2 will continue to be backwatered because of downstream hydraulic controls for its entire length after completion of the proposed Segment 1 and Segment 3 replacement, and Segment 4 sediment removal. Under the backwater condition, the calculated depth and velocity at the upstream end of Segment 2, for a clean culvert, will meet the fish passage criteria for trout in WAC 220-110-0707 (2 feet per second maximum velocity at High Fish Passage Design Flow of 6.4 cubic feet per second and minimum water depth of 0.8 feet).

Segment 3

Segment 3 consists of 116 linear feet of existing twin 42-inch diameter CMPs that start at the settling basin at Totem Lake Mall and extend under Totem Lake Boulevard to an existing junction structure at Totem Station mall. From the junction structure, a 72-inch by 44-inch CMP arch extends 235 linear feet under the Totem Station mall parking lot and discharges to an open channel between I-405 and Totem Lake Boulevard. The existing Segment 3 culverts do not meet fish passage criteria.

In April 2012, a sinkhole formed within one of the eastbound travel lanes of Totem Lake Boulevard because of corrosion failure of one of the twin 42-inch diameter CMPs. The City was able to patch the failed pipe but noted overall deterioration of both pipes and accumulated sediment inside them. Deterioration of the twin 42-inch CMPs is also visible at the settling basin. The existing culvert in Segment 3 will be replaced with an 8-foot-wide by 3-foot-high (interior dimensions) concrete box culvert along a new alignment that is mostly within the Totem Lake Mall property. The new conduit will extend northwesterly from the settling basin approximately 230 feet along the landscaping strip at Totem Lake Mall to a new junction structure, and from there cross approximately 150 linear feet under Totem Lake Boulevard to the open channel reach (Segment 4) between I-405 and Totem Lake Boulevard. The new culvert will meet fish passage criteria. The existing earthen embankment slopes will be stabilized with rockery and will be planted with vegetation at the upstream and downstream ends of the new box culvert in Segment 3. The settling basin at the inlet of Segment 3 would be expanded to allow for the new Segment 3 culvert to be constructed while maintaining flows through the existing culvert pipes during construction. Expanding the settling basin would result in an increase of approximately 825 square feet of created wetland area, which exceeds the combined total permanent impacts to Wetlands A, B and C.

The portions of the existing Segment 3 twin 42-inch-diameter CMPs that are exposed at the settling basin and that are within the Totem Lake Boulevard roadway will be removed and the remaining portions will be filled with a suitable material and abandoned in place. The existing 72-inch by 44-inch CMP arch on the Totem Station mall property must remain in service because it carries stormwater that collects on the back side of Totem Station. However, to prevent fish access into the existing 72-inch by 44-inch CMP arch, Washington Department of Fish and Wildlife has requested that a permanent fish

guard be installed over the outlet of the existing 72-inch by 44-inch CMP arch at the discharge to the open channel between I-405 and Totem Lake Boulevard.

Temporary bypass pumping will be needed for flows that are normally conveyed through the existing Segment 3 culvert while connecting the upstream end of the new box culvert to the settling basin and during removal and abandonment of the upstream portions of the existing Segment 3 twin 42-inch CMPs. This will be achieved by installing a temporary cofferdam in the settling basin and pumping using properly screened pumps to a downstream discharge point. The connection at the downstream end of the new culvert to the open channel between I-405 and Totem Lake Boulevard (Segment 4) will either be constructed concurrently with the Segment 4 work described below while bypass pumping for that work is being done, or a temporary cofferdam will be installed to isolate the Segment 3 connection work from water in Segment 4.

Segment 4

Segment 4 consists of 400 linear feet of existing open channel between I-405 and Totem Lake Boulevard that starts at the outlet of the Segment 3 72-inch by 44-inch CMP arch and terminates at the upstream (eastern) side of the WSDOT culverts that cross under I-405. Survey shows that sediment in this reach is up to 2 feet above the invert elevations of the upstream and downstream culverts. Also, to achieve design performance of the new box culvert, maintenance removal of accumulated sediment will be excavated in Segment 4 using a bucket excavator. A channel would be graded to achieve a uniform slope between the invert elevations of the 72-inch by 44-inch CMP arch and the culverts under I-405 (nearly flat), have a 4-foot-wide channel bottom, and approximately 2:1 side slopes.

Bypass pumping will be needed during excavation of the open channel in Segment 4.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

Intersection of 120th Avenue NE and Totem Lake Boulevard, Kirkland, WA 98034. (See Figure 1)

SECTION 28, TOWNSHIP 26N, RANGE 5E

B. ENVIRONMENTAL ELEMENTS

1. **Earth**

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other . . . . . .

b. What is the steepest slope on the site (approximate percent slope)?

The steepest existing slopes are 1:1 gabbion walls at the inlet and outlet to the existing Segment 3 culvert. The steepest proposed slope will be a 1H:4V rockery wall at the inlet of Segment 1.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

The Natural Resource Conservation Service soil map for this area identifies the soil as Seattle Muck. This area has been substantially filled and developed since the soils were mapped in 1972.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

If suitable, excavated material may be used for backfill around the culvert. Commercial sources of fill will be used as needed during construction. The area of fill for all segments would be approximately 13,000 square feet and the volume would be approximately 4,600 cubic yards.

All fill will be clean material from commercial sources.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

There is low potential for erosion as the construction area is generally flat. Erosion could occur if the earth excavated during construction is stockpiled and not covered properly. Appropriate best management practices (BMPs) would be used to prevent erosion. Most of the construction is anticipated to occur during the summer and early fall, which tend to be the driest times of the year. After construction, areas disturbed by the project would be restored to pre-construction conditions.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

There will be no change to impervious surfaces.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:
To limit the possibility of erosion, construction would be conducted in accordance with the erosion control standards identified in both the Washington State Department of Ecology Stormwater Management Manual For Western Washington and Kirkland's Stormwater Management Standards. Specific erosion/sediment control measures that may be implemented during project construction include:

- No more than 200 feet of trench would be opened at one time.
- When it is anticipated that soils would be exposed to storms, soil would be covered with plastic.
- Temporary erosion control measures in conformance with City of Kirkland standards would be used to control any surface water discharge through the construction site.
- All pipeline trenches would be backfilled promptly after pipes are in place.
- Surface restoration would be completed as soon as practical.

Most of the construction is anticipated to occur during the summer and early fall, which tend to be the driest times of the year. This construction schedule would minimize the potential for erosion.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

During construction, minor exhaust emissions as well as dust could be produced by the operation of construction equipment. No impacts would occur during operation.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

None.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

During construction of the proposed project, dust would be controlled by wetting soils as necessary during dry periods. All construction vehicles and equipment would be fitted with properly maintained pollution control devices as required by applicable laws and regulations. In addition, contractors would be required to follow applicable regulations regarding air pollutant emissions.

3. Water

TO BE COMPLETED BY APPLICANT

EVALUATION FOR
AGENCY USE ONLY

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Totem Lake is located directly east of the culvert inlet. Juanita Creek Tributary #235 flows through the culvert being replaced. Wetlands are associated with the open channel segments: Wetland A is in the vicinity of the Segment 1culvert inlet (Upstream Sump); Wetland B is the settling basin at the outlet of Segment 2 and the inlet of Segment 3, and Wetland C is at the Segment 3 culvert outfall (Downstream Open Channel). Using the Washington State Wetland Rating System for Western Washington, Wetland A is Category II, and Wetlands B and C are Category IV. Using the City of Kirkland's classification system, Wetland A is Type 1, and Wetlands B and C are Type 3.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes. The project will require temporary diversion during construction of the water that flows through the culvert. During construction of the new box culvert and junction structure, bypass pumping will be needed for the flows that are normally conveyed through the culvert pipes. This will be achieved by installing a temporary cofferdam at the upstream end of Segment 1 and pumping using properly screened pumps to a downstream discharge point in Segment 2.

In Segment 3, Temporary bypass pumping will be needed for flows that are normally conveyed through the existing Segment 3 culvert while connecting the upstream end of the new box culvert to the settling basin and during removal and abandonment of the upstream portions of the existing Segment 3 twin 42-inch CMPs. This will be achieved by installing a temporary cofferdam in the settling basin and pumping using properly screened pumps to a downstream discharge point. The connection at the downstream end of the new culvert to the open channel between I-405 and Totem Lake Boulevard (Segment 4) will either be constructed concurrently with the Segment 4 work described below while bypass pumping for that work is being done, or a temporary cofferdam will be installed to isolate the Segment 3 connection work from water in Segment 4. Bypass pumping will be needed during excavation of the open channel in Segment 4.

In-water work will be necessary to construct the new Segment 1culvert inlet, new Segment 3 culvert inlet, new Segment 3 culvert outlet, removal or abandonment of the existing twin 42-inch Segment 1 and Segment 3 culvert inlets, install fish guard on the existing Segment 3 culvert outlet, and removal of sediment from Segment 4. All excavation and fill activities would occur in dewatered areas.

Fill and dredge within wetlands is described below under #3.a.3. Temporary disturbance to 200 square feet of wetlands at the inlet of Segment 1, 400 square feet at the inlet of Segment 3, and 300 square feet at the outlet of Segment 3 would also occur during construction due to placement of cofferdams, BMPs and movement of construction equipment. Construction equipment will operate from uplands to the extent possible.

See attached JARPA permit drawings for additional detail.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Areas and quantities for fill and dredged material in wetlands or below ordinary high water are provided in the table below. All fill will be clean material from a commercial source.

Table 1. Fill and Dredge Quantities

Wetland/ Waterbody	Segment	Fill		Dredge	
		Area (sq. feet)	Quantity (cubic yards)	Area (sq. feet)	Quantity (cubic yards)
Permanent					
A	1	20	4	N/A	N/A
B, C	3	440	26	175	16
Trib #235	4	N/A	N/A	5,700	200
Temporary					
A	1	N/A	N/A	34	6
B, C	3	0	0	300	40
Trib #235	4	N/A	N/A	N/A	N/A

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

Yes. The project will require temporary diversion during construction of the water that flows through the culvert as described above.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

The wetlands associated with Totem Lake are mapped as Zone A on the FEMA floodplain map for the area (Map #53033C0360). Zone A is classified as "Special Flood Hazard Areas Inundated by 100-year Flood: No Base Flood Elevations Determined". The rest of the project area is not mapped as a floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No discharge of waste materials to surface waters would occur.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

Due to high groundwater in the project area, dewatering of the trench may be necessary during construction of the replacement culvert. The approximate quantity is unknown. If turbid, water will be treated in settling tank prior to discharge into sewer system or stormwater system.

No water will be discharged to groundwater.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material will be discharged into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

There would be no change in stormwater runoff with the completed project. Ground surfaces disturbed by the construction will be restored pre-construction conditions and the quantity and quality of water runoff would remain unchanged.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Waste materials would not enter ground or surface waters.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

Section B.1.h describes typical BMPs that would be used during construction to control erosion and sedimentation resulting from stormwater runoff.

Additional construction BMPs that could be implemented to prevent the introduction of contaminants include:

- Maintain spill containment and clean up materials at all active construction areas and where equipment fueling is conducted.
- Conduct fueling operations on paved areas whenever possible.
- Store fuels and other potential contaminants away from excavation sites, in secured, containment areas.
- Conduct regular inspections, maintenance and repairs on fuel hoses, hydraulically operated equipment, lubrication equipment, and chemical/petroleum storage containers.
- Establish a communication protocol for the unlikely event of a spill.

4. **Plants**

a. Check or circle types of vegetation found on the site:

X deciduous tree: alder, maple, aspen, other
X evergreen tree: fir, cedar, pine, other
X shrubs
X grass
____ pasture
____ crop or grain
X wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

The following existing vegetation in Segment 1 would be temporarily removed and replaced with similar vegetation:

- Up to six ornamental crabapple trees and juniper shrub groundcover in the landscaping strip at Bank of America.
- Up to two ornamental maple trees and groundcover in the landscaping strip at the Chevron gas station.

The following existing vegetation in Segment 3 would be temporarily removed and replaced with similar and non-weedy vegetation:

- Up to ten ornamental maple trees and groundcover in the landscaping strip at the Totem Lake Mall.

- Up to three small trees at the settling basin.
- Several ornamental Oregon grape shrubs, some Japanese knotweed (a state-listed Class A noxious weed), and some reed canarygrass (a state-listed Class C noxious weed) within the landscaping area at the western end of the settling basin.

In Segment 4 (which is dominated by reed canarygrass), impacts to vegetation are expected to be minor. All excavation in the dewatered channel (which lacks vegetation) would occur from the road.

c. List threatened or endangered species known to be on or near the site.

None known.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Landscaping for site restoration is described above in Section 4.b.

5. **Animals**

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other:

a. List any threatened or endangered species known to be on or near the site.

None known.

c. Is the site part of a migration route? If so, explain.

No.

b. Proposed measures to preserve or enhance wildlife, if any:

Due to the developed urban setting within the project area, there is minimal wildlife habitat in immediate project site and no measures to preserve or enhance wildlife are proposed. No work would occur in Totem Lake Park, owned by the King Conservation District, and impacts will be avoided to the wildlife habitat on this property.

6. **Energy and natural resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Diesel fuel would be used for heavy equipment during construction. No energy use would occur following construction.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

No energy conservation features are proposed.

7. **Environmental health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

There is a potential for fuel to spill while refueling heavy equipment. BMPs to minimize and avoid impacts related to fuel spills are discussed under 7.a.2 below.

1) Describe special emergency services that might be required.
No special emergency services would be required.

2) Proposed measures to reduce or control environmental health hazards, if any:
Section B.1.h describes typical BMPs that would be used during construction to control erosion and sedimentation resulting from stormwater runoff.

Additional construction BMPs that could be implemented to prevent the introduction of contaminants include:

- Maintain spill containment and clean up materials at all active construction areas and where equipment fueling is conducted.
- Conduct fueling operations on paved areas whenever possible.
- Store fuels and other potential contaminants away from excavation sites, in secured, containment areas.
- Conduct regular inspections, maintenance and repairs on fuel hoses, hydraulically operated equipment, lubrication equipment, and chemical/petroleum storage containers.
- Establish a communication protocol for the unlikely event of a spill.

b. **Noise**

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Road traffic noise from I-405, Totem Lake Boulevard, and 120th Avenue NE. Existing noise sources will not affect the project.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Construction of the proposed project would create noise associated with heavy equipment operation on a short-term basis. Typically, construction activities would occur between 7:00 p.m. to 5:00 a.m., Monday through Friday. Noise levels for construction equipment, including excavators, backhoes, loaders, vibratory equipment and pumps have average maximum noise levels (L_{max}) of between 80 and 93 A-weighted decibels (dBA) at a distance of 50 feet. A doubling of distance reduces generally reduces noise levels by 6 dBA.

Construction noise is exempt from maximum permissible environmental noise levels per Washington Administrative Code (WAC) 173-60-50, except for the reception of noise by Class A EDNAs (Environmental Designation for Noise Abatement). Chapter 115.95 of the Kirkland Zoning Code adopts WAC 173-60-50. The nearest Class A EDNA would be multi-family structures located approximately 1,500 feet away at 125th Lane NE. Maximum noise levels at this distance would be approximately 50 to 63 dBA, which is similar to noise levels in residential areas.

The nearest noise sensitive receptor is the Comfort Inn, on the south side of Totem Lake Boulevard just over 200 feet from the inlet of Segment 1. Per WAC 173-60-030 (1)(b)(i), the Comfort Inn would be a Class B EDNA, and not subject to the maximum permissible environmental noise levels. Work at this location would last between 1 to 2 months. Maximum noise

levels at this distance would be approximately 68 to 81 dBA, which is similar to automobiles and buses cruising at 50 feet away. Due to the proximity of this location to I-405, these noise levels are not expected to have an impact to the hotel.

There would be no operational noise impacts from the project.

3) Proposed measures to reduce or control noise impacts, if any:

All construction equipment would have mufflers installed and properly maintained. In addition, the contractor(s) would adhere to the provisions of the City's noise control ordinance and construction contract documents to keep noise within permissible levels.

8. **Land and shoreline use**

a. What is the current use of the site and adjacent properties?
The project will occur in an area of commercial development.

b. Has the site been used for agriculture? If so, describe.

The site has been used for commercial purposes since at least 1972. Based on historical photos available from the 1940s, agriculture appears to have occurred in the area prior to this development.

c. Describe any structures on the site.

Except for the existing deteriorated twin 42-inch culvert pipes, there are no structures in the area that would be disturbed. A Bank of America and a Chevron gas station are located north of the Segment 1 alignment.

c. Will any structures be demolished? If so, what?

No structures will be demolished, other than the existing deteriorated twin 42-inch culvert pipes.

c. What is the current zoning classification of the site?
The entire project area is zone Commercial-Totem Lake 2.

f. What is the current comprehensive plan designation of the site?

The Comprehensive Plan designation is Commercial.

g. If applicable, what is the current shoreline master program designation of the site?

There is no shoreline designation for this area.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

The area at the inlet of the Segment 1 culverts is classified as a wetland.

i. Approximately how many people would reside or work in the completed project?

None.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not applicable.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Not applicable.

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

Not applicable, the project does not include any housing.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

Not applicable.

c. Proposed measures to reduce or control housing impacts, if any:

Not applicable.

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Not applicable, the project does not include any structures.

b. What views in the immediate vicinity would be altered or obstructed?

No views would be altered or obstructed.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Not applicable.

11. **Light and glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Not applicable, the project will not include any new lighting.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Not applicable.

c. What existing off-site sources of light or glare may affect your proposal?

Not applicable.

d. Proposed measures to reduce or control light and glare impacts, if any:

Not applicable.

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

Totem Lake Park is located immediately east of the project site in Segment 1. The park is a passive use park with a trail through wetlands.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No. No work would occur within Totem Lake Park.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Not applicable.

13. **Historic and cultural preservation**

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

None. A search of the Washington State Department of Archaeological and Historic Preservation's database indentified no site in the project area.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

None known.

c. Proposed measures to reduce or control impacts, if any:

Not applicable.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

14. **Transportation**

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

The project area includes Totem Lake Boulevard and 120th Avenue NE, and the intersection serves an onramp and offramp for I-405.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

The nearest transit stop is at I-405 and NE 128th Street, approximately 0.3 miles away, which serves Sound Transit, King County Metro, and Community Transit.

c. How many parking spaces would the completed project have? How many would the project eliminate?

No. The existing parking spaces will be restored.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No new roads are required. No permanent improvements to the roadways will occur.
Construction of Segment 1 will require disturbance of 120th Avenue NE, and Segment 3 will require disturbance of Totem Lake Boulevard. The 120th Avenue NE roadway will be restored to existing conditions as required by WSDOT. Totem Lake Boulevard will be restored to existing conditions as required by the City of Kirkland.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No, the project would not use or occur in the vicinity of water, rail or air transportation.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

Not applicable.

g. Proposed measures to reduce or control transportation impacts, if any:

Traffic control includes:

- Closure of the westbound curbside lane along Totem Lake Blvd during construction hours.
- Closure of 120th Ave NE to northbound through traffic, detour on Totem Lake Boulevard to 128th
- Hours of construction will be limited to 7pm to 5am.

15. **Public services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No.

b. Proposed measures to reduce or control direct impacts on public services, if any.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR
AGENCY USE ONLY

16. **Utilities**

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

All are present, and also includes stormwater conveyance.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

The project will continue to provide stormwater conveyance by the City of Kirkland Public Works Department.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: .....

Date Submitted: 11/10/12

TECHNICAL MEMORANDUM CH2MHILL

DRAFT

Totem Lake Twin 42-inch Culvert Replacement Project—Wetland and Stream Assessment

PREPARED FOR: Noel Hupprich, P.E./City of Kirkland

PREPARED BY: Mark Mullins/CH2M HILL
Eilean Davis/CH2M HILL
Hans Ehlert, PWS No. 1165/CH2M HILL

DATE: October 2, 2012

PROJECT NUMBER 434855.03.34.10

Purpose

The purpose of this technical memorandum is to conduct an assessment of existing wetland and stream conditions for the design of the Totem Lake Twin 42-inch Culvert Replacement Project. This memorandum also briefly summarizes general historical environmental conditions known in the project vicinity. The project is located immediately west of Totem Lake Park, near Totem Lake Boulevard and 120th Avenue NE in Kirkland, Washington, King County. The project may affect the wetlands, stream, and associated buffers in the vicinity of where the culvert pipes currently drain from Totem Lake, at the existing settling basin at Totem Lake Mall, and at the outlet where the conveyance culvert currently drains into the open channel between I-405 and Totem Lake Boulevard (Figure 1). This technical memorandum does not provide any information on potential impacts to wetlands or wetland buffers, which will be described in the permit application.

Summary

The work completed as part of this assessment did not include a complete delineation of wetlands in the project vicinity. Only the boundaries of the wetlands within the project study area at locations likely to be impacted were identified to help guide project engineers to avoid and minimize potential impacts to wetlands and streams. The study area is defined by an approximately 50-foot-wide radius centered on the existing inlet of the culvert pipes from Totem Lake, the outlet from the Settling Basin at Totem Lake Mall, and the existing culvert outlet to the open channel located between I-405 and Totem Lake Boulevard. This settling basin was constructed as part of the Kingsgate Way Improvement project in mid 1980s, and is a managed facility.

LEGEND

- Existing Culvert
- Proposed Culvert Replacement
- Stream
- Lakes
- Wetlands (Approximate)

N

0 62.5 125 250
Feet

FIGURE 1
Proposed Project
Totem Lake Twin 42" Culvert Replacement

CH2MHILL

On August 6, 2012, biologists from CH2M HILL assessed the streams and wetlands within the project study area. Mark Mullins assessed the streams on July 5, 2012. Hans Ehlert and Eilean Davis assessed the wetlands, and flagged the approximate boundaries of Wetlands A, B, and C. One tributary stream, a Class B stream, and three wetlands (one is Category II/ Type 1, and two are Category IV/Type 3), were identified within the study area. Both wetlands are depressional wetlands that are part of the larger system located on the historical floodplain around and downstream of Totem Lake. Figure 1 shows the stream and wetlands identified in the study area.

Project Stream –Tributary #235

Overview

The stream within the project study area is an unnamed tributary to Juanita Creek. It is cataloged by the Washington State Department of Ecology (Ecology) in its Water Resources Inventory Area (WRIA) reports as Tributary #235 in the Juanita Creek Basin (WRIA Number 8: Lake Washington/Cedar/Lake Sammamish Watersheds). In various reports for the Juanita Creek watershed, the project stream has also been referred to as Totem Lake Creek, Totem Lake Tributary, or East Creek. For the purposes of this memorandum we will use the WRIA stream designation (Tributary #235).

The portion of the stream from Totem Lake Park to I-405 represents the project study area and is described below. Tributary #235 originates at the outlet of Totem Lake and flows generally westward through a series of culverts and two open channel reaches, one on the Totem Lake Mall property and the other within the Washington State Department of Transportation (WSDOT) right-of-way (ROW) along the east side of I-405 (Figure 1).

After the stream passes under I-405 through twin culverts, the stream flows mostly through an extensive wetland complex with beaver ponds and braided channels that are densely vegetated until it reaches Juanita High School. At the southeastern corner of the high school property, the stream enters a constructed channelized ditch that flows around the southern side of the school property. On the downstream (western) side of the high school property, the stream enters a small pond after flowing through a trash rack. The outlet for this small pond is a concrete box stand pipe into which overflow from the pond enters a culvert system that travels several hundred feet downstream to 102nd Avenue NE. At the intersection of 102nd Avenue NE and NE 129th Place, the stream again flows in an open channel after exiting a culvert outfall. The stream then follows NE 129th Place until it flows into Juanita Creek about 200 feet upstream from where Juanita Creek crosses under 100th Avenue NE (Figure 2).

Stream Habitat - Project Study Area

The open channel habitat of Tributary #235 within the project study area consists of three reaches, from east to west:

1) Upstream Sump – a shallow pool area that serves as the outlet of Totem Lake that drains into the twin 42-inch culvert pipes.

2) Settling Basin – a shallow run located in a narrow vegetated reach on the north side of Totem Lake Boulevard just west of the Chevron Station.

3) Downstream Open Channel – A long glide/shallow pool that runs between Totem Lake Boulevard and the east side of I-405.

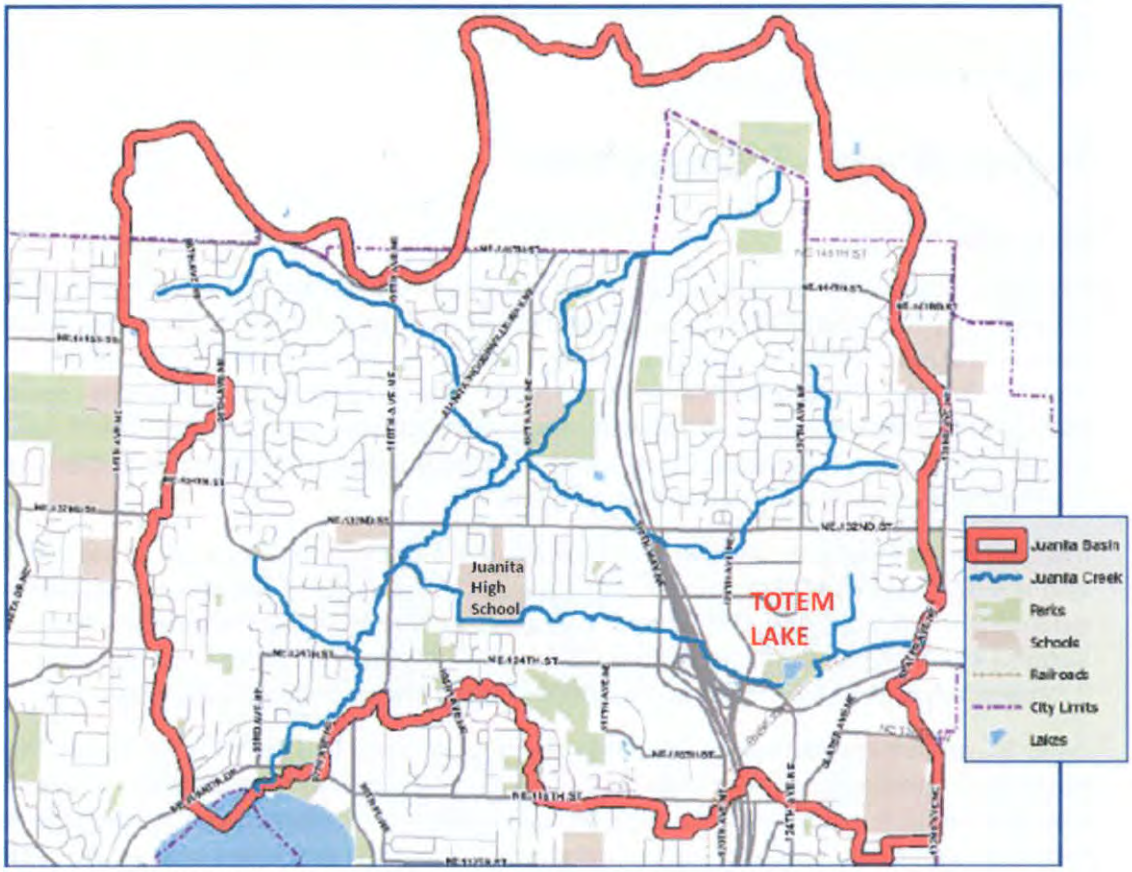


Figure 2. Juanita Creek Watershed

From the Upstream Sump to I-405, there is approximately 450 linear feet of open channel habitat, which represents approximately 30 percent of the total tributary length (approximately 1500 linear feet) within the project study area. Most of the open channel habitat occurs in the Downstream Open Channel, while the remainder flows through pipes or culverts.

The stream classifications and their definitions for each open channel section per the Kirkland Zoning Code (KZC 2012) and the Washington Hydraulic Code are shown in Table 1. All three sections of open channel are considered potentially fish-bearing with perennial flow under normal conditions. Table 1 also lists the associated stream buffer requirements for both the City and the State. None of the segments currently meet the buffer requirements for either set of codes.

It should be noted that the City conducted maintenance sediment removal in the stream channel in August 2011 at all three open channel locations. The habitat descriptions below

for each of the segments reflect the stream conditions after the sediment removal. The removal of sediment/vegetation plugs resulted in a lowering of the water surface elevation in the open channel and culverted sections by approximately 2 feet. This reduced some of the ponding of the stream channel and improved conveyance of the system.

See Appendix A for photos of the open channel reaches of Tributary #235 within the project study area.

TABLE 1
Summary Information for Tributary #235 in the Project Study Area

Stream Segment	Stream Class		Flow Regime	Stream Buffer Width (feet)		Approximate Bankfull Width (feet)
	Kirkland [a]	Washington [b]		Kirkland [a]	Washington [b]	
Upstream Sump	B	Type F	Perennial	60	50	N/A
Settling Basin	B	Type F	Perennial	60	50	20
Downstream Open Channel	B	Type F	Perennial	60	50	20 to 30 (variable)

[a] Per Kirkland Zoning Code 90.85. Type B - Perennial streams (during years of normal precipitation) that are not used by salmonids (KZC 2012).

[b] Per Chapter 222-16 of the Washington Hydraulic Code. Type F – (formerly Type 2/3 Streams) Streams and water bodies that are known to be used by fish, or meet the physical criteria to be potentially used by fish. Fish streams may or may not have flowing water all year; they may be perennial or seasonal

Upstream Sump

The Upstream Sump is located at the upstream eastern end of the project (Figures 1 and 3). The Upstream Sump segment essentially acts as a catch basin for the outlet of Totem Lake before it enters the twin 42-inch culverts that pass under the driveway entrance to the Bank of America parking lot (one of these culverts is blocked and the other is partially collapsed). At the time of the survey, the Upstream Sump was a shallow pool (Table 2) measuring approximately 20 feet wide by 25 feet long. It was located directly next to the sidewalk on the north side of Totem Lake Boulevard. On the embankment between the sidewalk and the sump, there was virtually no native riparian vegetation other than grasses and weeds. Across toward Totem Lake the vegetation was thick willows, some reed canarygrass, cattails, and other wetland vegetation (See Appendix A for photos).

There was very little flow coming from the lake, with a visual estimate of less than 0.5 cfs entering the culvert pipes. The substrate was almost entirely covered in silt with extensive algae growth covering the bottom. There was no in-stream habitat besides heavy algae growth and some overhanging cover on the north side of the pool. The water was clear and the entire pool was observed for about 15 minutes to see if any fish, amphibians, or aquatic insects could be identified. Within that time only surface insects were observed, and no aquatic life in the pool was observed. There had been a period of no rain for about 5 days, so it is suspected that the low flows, coupled with sunny weather, relatively warm air temperatures and heavy algae growth (and decay), that the Upstream Sump area had low dissolved oxygen levels during the night. This is typical with this type of habitat and

conditions and can preclude the use of this type of habitat by all but the most robust species. Dissolved oxygen levels were not measured, and this supposition is based solely on the observed conditions and experience in studying these types of conditions in low gradient streams.

Settling Basin

The Settling Basin is located in a landscape strip on the northeastern side of Totem Lake Boulevard just to the west of the Chevron station (Figures 1 and 4). The Settling Basin was constructed as part of the Kingsgate Way Improvements project in the mid 1980s. The Settling Basin would currently be classified as mid-channel pool in-stream habitat and was about 50 feet long and about 15 feet wide (Table 2). The settling basin receives water directly from the Upstream Sump via the twin 42-inch-diamater and single 60-inch-diameter culverts. No flow was observed moving in the channel the day of the survey. The Settling Basin is located in a fenced area within the maintained landscape strip, and was completely surrounded with riparian vegetation of willows, blackberry, and various grasses and shrubs (See Appendix A for photos). The vegetation did not appear to be maintained on a regular basis and provided considerable shading and overhanging cover. Water exits the Settling Basin via the submerged twin 42-inch-diameter culvert pipes, which carry water westward across Totem Lake Boulevard to the front of the Totem Station mall and then turns northwesterly where it empties into the Downstream Open Channel reach immediately north of the Totem Station mall (Figures 1 and 4). There are also two grated standpipes at the downstream end of the Settling Basin to divert high water levels into the pipe system carrying the stream flow across Totem Lake Boulevard.

The water was clear and the substrate was easily visible. The substrate composition was essentially the same as that observed in the Upstream Sump—silt covered with thick algae growth. However, there were small patches of small woody debris in the channel. The channel was observed for about 20 minutes from different vantage points. As with the Upstream Sump, no aquatic life was observed other than surface insects.

Downstream Open Channel

The Downstream Open Channel constitutes the majority of the open channel habitat of Tributary #235 within the project study area. It is located between Totem Lake Boulevard and I-405 at the downstream western end of the project (Figures 1 and 4). It receives water via the Settling Basin as described above. A 72-inch by 44-inch arch culvert empties into the open channel about 25 feet north of the northwestern end of the small shopping center. The habitat in the Downstream Open Channel is currently glide habitat (See Appendix A for photos). Glide habitat is essentially a long and shallow pool habitat with features such as braided areas and in-stream vegetation that is not usually associated with typical pool habitat. The channel was about 300 feet long and varied in width from 20 to 30 feet (Table 2). Except for a couple of sporadic willows and shrubs along the bank, mostly at the downstream end near the I-405 culvert, the riparian vegetation was mostly grass and blackberries that provided very little overhanging cover. Like the two previous channel sections, the substrate was almost entirely silt and covered in algae growth. There was virtually no in-stream habitat with the exception of a few isolated areas of grassy hummocks along and protruding into the channel.

As with the other channel sections, the water was clear and the substrate was easily visible. The channel was observed for about 30 minutes from different vantage points and no in-stream aquatic life was observed. Four baby mallard ducks feeding on the aquatic vegetation were the only wildlife observed within the Downstream Open Channel.

TABLE 2
Observed Stream Habitat Attributes of Tributary #235 in the Project Study Area

Stream Segment	Habitat Type	Approx. Size (feet)	Riparian Type	Dominate Substrate	Cover Type	Avg. Water Depth (feet)	Water Depth at OHWM (feet)	Aquatic Life Observed
Upstream Sump	Shallow Pool	25 x 20	mixed – grasses and willows	silt/heavy algae	partial overhanging bank cover	2	N/A	no
Settling Basin	Mid-Channel Pool	50 x15	mixed – willows, grasses, and shrubs	silt/heavy algae	overhanging bank/ some instream	2	N/A	no
Downstream Open Channel	Glide	300 x 20-30'	low grasses and shrubs	silt/heavy algae	isolated patches of low bank cover	1	Approx. 2 feet	no

All data reported are visual estimations made in the field.

Water Quality

There is no water quality information available specific to Tributary #235 (Ecology's Environmental Information Management System Data Base). However, because the entire Juanita Creek watershed is relatively small (about 6.5 square miles) and is fairly homogeneous in its land use and topography, it is reasonable to presume that the water quality in Tributary #235 is comparable to that sampled elsewhere in Juanita Creek. There are two Ecology sampling sites in Juanita Creek; one upstream and one downstream of its confluence with Tributary #235. Water that has been sampled at both stations have violated Ecology's 303(d) and 305(b) criteria for dissolved oxygen, temperature, and fecal coliform bacteria standards (King County 2012, Ecology 2008). In addition, Ecology found pesticide levels to be quite high in Juanita Creek during a sampling program conducted in 1997 (Ecology 2000). From the report; *"Pesticide contamination in Juanita Creek was comparable to the most contaminated agricultural drainages in the state that have been sampled, including irrigation returns in the Yakima Valley and Mid-Columbia Basin. The total number of pesticides detected and the average number per sample are among the highest in the state."* The information on water quality is consistent with the information provided by the City of Kirkland in its 2011 *Juanita Creek Watershed Report Card* (City of Kirkland 2011).

Fish Use

Fish use in Tributary #235 appears to be extremely limited. Fish sampling was conducted by the City in 1997 and 1998 throughout the Juanita Creek Basin (The Watershed Company 1998). In Tributary #235, cuthroat trout (*Onchorynchus clarki*) were the only salmonid species found in the stream and in only the lowermost section of the tributary downstream (west) of 102nd Avenue NE. The only other fish captured west of I-405 were a few stickleback species (*Gasterosteus spp.*). There is no mention of sampling or fish species presence east of I-405 in the project study area, but it is reasonable to assume that sticklebacks could be present there as well as some fish moving out from Totem Lake and spending at least a portion of the year in the project study area. Anectodal information from internet fishing reports indicate that largemouth bass (*Micropterus salmoides*), perch (*Perca flavescens*), bluegill (*Lepomis macrochirus*), and carp (*Cyprinus carpio*) are present in Totem Lake.

It should be noted that Tributary #235 is the only stream in the Juanita Creek watershed that is not included in the StreamNet[1] data base. The only water bodies included in this database relative to Tributary #235 is Totem Lake and some wetland/ponded areas west of I-405. There is no specific stream corridor indicated in the database maps. Tributary #235 is also the only stream in the Juanita Creek watershed not inventoried in WDFW's SalmonScape[2] database. The mapping depiction of the stream in the SalmonScape database only shows a corridor on the west side of I-405. There is no stream corridor for the tributary depicted on the east side of I-405 in the project study area. These two databases are the most extensive stream fishery databases available in the Northwest. Failure to show a stream corridor for the tributary nor to provide any evidence of anadromous or resident fish species in either database, coupled with the fish sampling results by the City, are evidence that Tributary #235 in the project study area cannot be considered suitable year-round fish habitat.

Synopsis of Probable Future Habitat Conditions

As stated above, the exposed areas of the stream channel in the project study area were maintained by the City in 2011. This has resulted in less ponding of the open channel areas, improved conveyance, and more stream-like habitat features overall.

Ponded conditions present several problems to aquatic stream life. If low flow conditions persist for any length of time, such as during the summer months, the ponded areas become relatively stagnant and suffer from water quality concerns such as increased pollutant concentrations, fluctuating diurnal dissolved oxygen levels, and increased water temperatures. In-stream habitat conditions become degraded as sedimentation increases and the channel narrows. These conditions are mostly the result from excessive growth (and subsequent die-off) of algae and in-stream vegetation that would not normally occur if

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[1] StreamNet is a cooperative information management and data dissemination project focused on fisheries and aquatic related data and data related services in the Columbia River basin and the Pacific Northwest. It is funded through the Northwest Power and Conservation Council's Fish and Wildlife Program by the Bonneville Power administration and are administered by the Pacific States Marine Fisheries Commission. The project supports staff inside the management agencies to obtain, georeference and standardize data. The data are maintained and disseminated through the Pacific States Marine Fisheries Commission (PSMFC). The project receives data input but from virtually all State and Federal fisheries agencies throughout the Northwest. (http://www.streamnet.org/index.html)

[2] Salmonscape is an interactive mapping application designed by WDFW to display and report a wide range of data related to salmon distribution, status, and habitats. The data sources used by Salmonscape include stream specific fish and habitat data, and information about stock status and recovery evaluations. (http://wdfw.wa.gov/mapping/salmonscape/index.html)

water were flowing. Both the degraded water quality and habitat limit the production of aquatic macroinvertabrates within the stream channel. Macroinvertebrates form the basis for the food-chain in any stream system.

These types of conditions are not conducive for use by native fish, such as salmonids or sculpins, and even limit the use by non-native fish and amphibians due to a lack of food production. Therefore, if downstream fish passage issues are ever resolved, the current state of the stream habitat would not be able to support a native resident or anadromous fishery. Given the topography and urbanization of the area, however, it is likely that a native resident population of trout, sculpins, sticklebacks, and some minnow species would probably be the most likely scenario.

Wetlands

This section describes the assessment of existing wetland conditions in the project study area. The following wetland descriptions are organized geographically, starting from the eastern end of the alignment and proceeding westward. The wetlands are summarized in Table 3, and shown on Figures 1, 3 and 4.

See Appendix A for photos of the wetlands within the project study area. Appendix B includes various wetland data forms (wetland determination data forms, wetland rating forms, and Kirkland wetland field data forms). In addition, the following available information was collected and reviewed prior to visiting the site:

- Soils. Soils mapped onsite are Seattle Muck, which is listed as a hydric soil (USDA SCS 1973).
- Topography. Topography is generally flat. The valley topography slopes (drains) to the west. Steep embankments (fill slopes) occur next to the open channels and wetlands.
- City of Kirkland Zoning Code Chapter 90—Drainage Basins. Chapter 90 provides information on streams and wetlands in the City of Kirkland including classification and buffer requirements.
- City of Kirkland Critical Areas, Map. The map identifies wetlands at Totem Lake. However, no wetlands are identified in the vicinity of the settling basin or the open channel between I-405 and Totem Lake Boulevard.
- Aerial Photography with available basemap (showing project alignment, study area limits, drainage improvements, and previously mapped streams and wetlands).

Wetland A – Totem Lake Wetlands

Wetland A is located at the eastern end of the study area (Figures 1 and 3). It is a relatively large Category II depressional wetland that is located on the floodplain surrounding Totem Lake. Wetland A becomes inundated from late winter through spring and drains via the existing twin 42-inch culvert pipes, one of which is currently plugged and the other which is partially collapsed. Wetland A is dominated by emergent and scrub-shrub vegetation such as reed canarygrass, cattail, and willow (see Appendix A for photos). The portion of the wetland buffer that is within the study area is narrow, disturbed, and is restricted by the

Bank of America parking lot and Totem Lake Boulevard. The buffer is dominated by Himalayan blackberry, reed canarygrass, snowberry, and grasses. Vegetation on the steep embankment along the Totem Lake Boulevard is regularly mowed. In August 2011, the City excavated sediment and vegetation that were blocking the inlet to the twin 42-inch culverts.

Wetland B – Settling Basin

Wetland B is associated with the managed Settling Basin located at the north-central portion of the project study area (Figures 1 and 4). Wetland B is a small, Category IV depressional wetland located in the landscape strip between Totem Lake Boulevard and the parking lot at Totem Lake Mall. The wetland is permanently flooded with water levels that rise during winter and spring storm events. A 60-inch pipe conveys water into the eastern end of the settling basin. Water is conveyed out via twin 42-inch culvert pipes that are located at the western end of the wetland. Wetland B is dominated by emergent and scrub-shrub vegetation such as reed canarygrass and willows. The wetland is narrow, disturbed, and confined by the mall parking lot and Totem Lake Boulevard. The vegetation around the buffer of the wetland consists of landscape vegetation such as Oregon grape and ornamental red maple trees (see Appendix A for photos). In August 2011, the City excavated sediment and vegetation in the Settling Basin that were blocking the outlet to the twin 42-inch culverts.

Wetland C – Downstream Open Channel between I-405 and Totem Lake Boulevard

Wetland C is located at the western end of the study area (Figures 1 and 4). This wetland is a moderately sized, Category IV, depressional wetland located between Totem Lake Boulevard and Interstate 405. The channel in this wetland is permanently flooded with water levels that rise during winter and spring high rain events and drains via an outlet at the western end of the wetland via twin culverts under I-405. Wetland C is dominated by emergent vegetation that consists of mostly reed canary grass (see Appendix A for Photos). The wetland is narrow, disturbed, and confined by Totem Lake Boulevard and I-405. The buffer around Wetland C is dominated by reed canary grass, Himalayan blackberry, and non-native grasses with some scotch broom and several alder trees. Vegetation on the steep embankment along the Totem Lake Boulevard is regularly mowed. In August 2011, the City excavated sediment and vegetation in the open channel that was restricting conveyance and blocking the inlet to the WSDOT culverts under I-405.

LEGEND

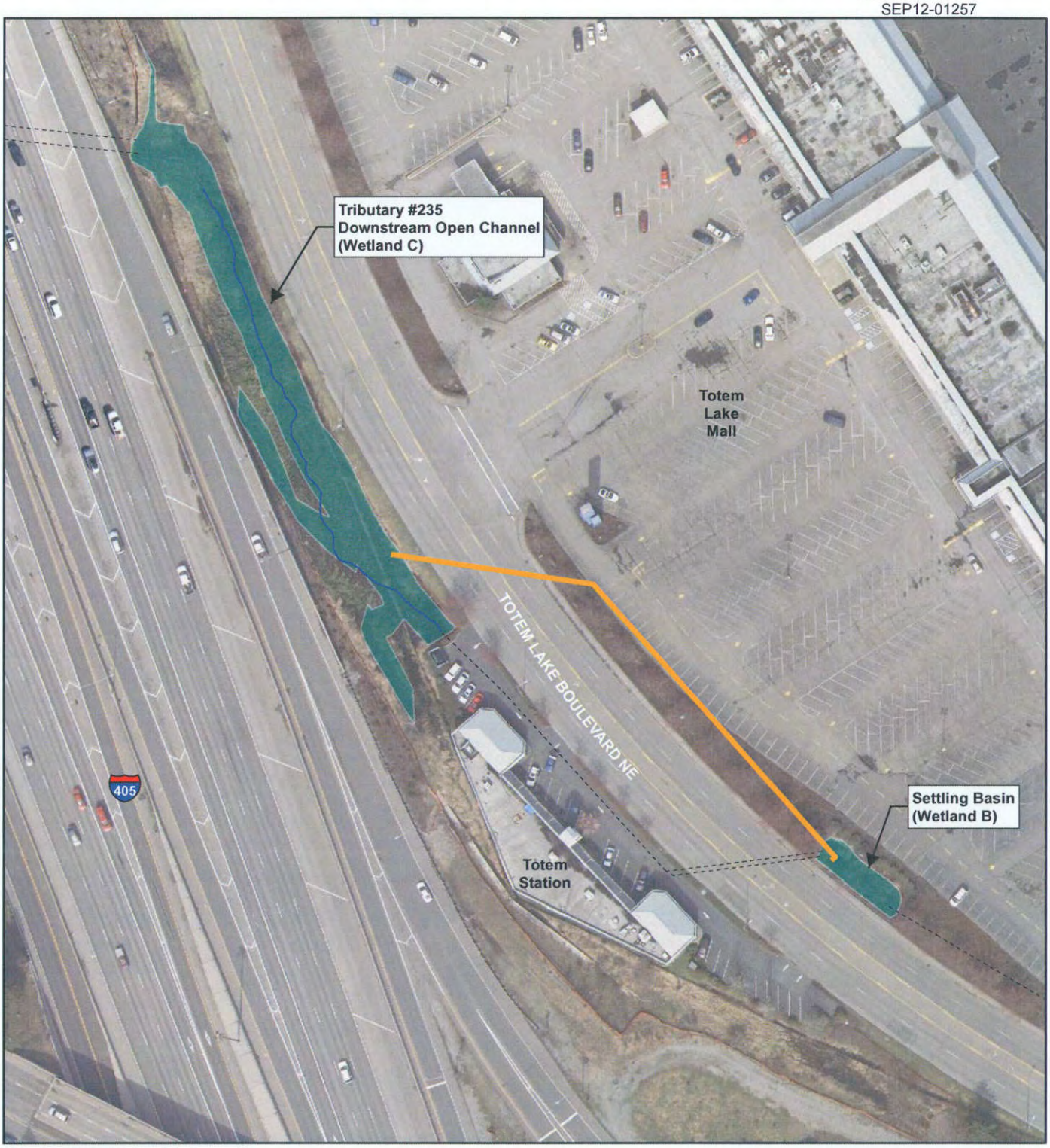
- Existing Culvert
- Proposed Culvert Replacement
- Stream
- Lakes
- Wetlands (Approximate)

N

0 25 50 100
Feet

FIGURE 3
Existing Stream and Wetlands - East
Totem Lake Twin 42" Culvert Replacement

CH2MHILL



LEGEND

- Existing Culvert
- Proposed Culvert Replacement
- Stream
- Lakes
- Wetlands (Approximate)

N

0 25 50 100
Feet

FIGURE 4
Existing Stream and Wetlands - West
Totem Lake Twin 42" Culvert Replacement

CH2MHILL

TABLE 3
Cowardin Class, HGM Class, Category, and Buffer Width of Wetlands Located in the Project Study Area

Wetland ID	Cowardin Class	HGM Class	Ecology		Kirkland		Stream Present
			Wetland Category [a]	Wetland Buffer Width (feet)[b]	Wetland Class [c]	Wetland Buffer Width (feet)[c]	
A	PEM/PSS/PFO/POW	Depressional	II	100	Type 1	100	Yes
B	PEM/PFO	Depressional	IV	50	Type 3	50	Yes
C	PEM	Depressional	IV	50	Type 3	50	Yes

[a] Category is based on Ecology's rating system (Hruby, 2004), which the City of Redmond adopted without modification.
[b] Buffer width based on Ecology et al. (2006). Assumes the existing surrounding land uses are considered a high-impact land, which has the highest buffer width.
[c] Buffer width required by Kirkland Zoning Code Chapter 90—Drainage Basins. Juanita Creek watershed is designated a primary basin.

PEM = palustrine emergent marsh; PSS = palustrine scrub-shrub; PFO = palustrine forested; POW = palustrine open water.

Determination of Ordinary High Water Mark

The ordinary high water mark (OHWM) of the stream and wetlands was identified at each location using a combination of the wetland delineation and comparison with water level monitoring data collected by the City after the sediment removal work was completed in August 2011. The surveyed elevation data for the wetland boundary stakes that were set at key locations in the field were associated with the nearest topographic contour. Because the wetland boundary contours correlated closely with the water level monitoring, the wetland boundary contours were considered to be a reasonable surrogate for the OHWM.

The wetland contours corresponding with the OHWM are defined for the following key locations:

- Upstream Sump – 123-foot elevation.
- Settling Basin – 123-foot elevation.
- Downstream Open Channel – 122-foot elevation.

Historical Conditions

The vicinity around Totem Lake and Tributary #235 has been substantially altered from its historical condition. Figure 5 shows an aerial photo taken in 1936. By that time, the area had already been converted to agriculture and the tributary had been ditched. The aerial shows an overlay with the current parcel and right of way boundaries.

Subsequently, around the 1970s, the area was plated and prepared for development. Shortly before Bank of America (formerly Seattle First National Bank) was constructed in the 1970s, the outlet channel from Totem Lake was relocated into its current alignment and placed within a culvert.

Limitations of Results

CH2M HILL has prepared this technical memorandum for use by the City of Kirkland. The results and conclusions of this technical memorandum represent the professional opinion of CH2M HILL. They are based in part upon: (1) site reconnaissance, and (2) examination of public domain information concerning the project site. Work performed conforms to accepted standards in the field of jurisdictional wetland determination and delineation using the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2010).

However, final determination of jurisdictional wetland boundaries pertinent to Section 404 of the Clean Water Act is the responsibility of the Seattle District of the U.S. Army Corps of Engineers. Various agencies of the State of Washington and local jurisdictions may require review of final site development plans that could potentially affect zoning, buffer requirements, water quality, and/or habitat functions of lands in question. Thus, the findings and conclusions contained in this report should be reviewed by appropriate regulatory agencies prior to any detailed site planning and/or construction activities.

FIGURE 5. 1936 AERIAL OF TOTEM LAKE AREA

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Appendix A: Wetland and Stream Photos

Photo 1A – Upstream Sump (Tributary #235 and Wetland A) looking east, in vicinity of new replacement culvert entrance.

Photo 1B – Upstream Sump (Tribuary #235 and Wetland A) looking west, in vicinity of new replacement culvert entrance.

Photo 2A – Settling Basin (Wetland B) looking southeast, in vicinity of proposed new culvert entrance structure.

Photo 3A – Downstream Open Channel (Tributary #235 and Wetland C) looking north

Photo 3B – Downstream Open Channel (Tributary #235 and Wetland C) looking south, in vicinity of proposed new culvert outfall location.

Appendix B: Wetland Data Forms

Wetland Determination Data Forms

Wetland Rating Forms

Kirkland Wetland Field Data Forms

ATTACHMENT 4
SEP12-01257

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Kirkland / Totem Lake Culvert Replacement - Upstream Sump City/County: Kirkland / King Sampling Date: 8/6/2012

Applicant/Owner: City of Kirkland State: WA Sampling Point: SP-1, Wetland A

Investigator(s): Hans Ehlert, Eilean Davis Section, Township, Range: 28 26N 05E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%):

Subregion (LRR): A Lat: 47.710661 N Long: -122.180278 W Datum: NAD 83

Soil Map Unit Name: Seattle Muck NWI classification: PEM/PSS

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐
Hydric Soil Present?	Yes ☒	No ☐	
Wetland Hydrology Present?	Yes ☒	No ☐	

Remarks:

The City excavated the Upstream Sump in August 2011 to remove sediment and vegetation that were blocking the culvert inlet. As a result of this and other work downstream, the water level in the culverts decreased approximately 2 feet, but the water level was still higher than the design water level constructed during the Kingsgate Way Improvements in the mid 1980s (according to personal communication with City maintenance staff).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix Sitchensis	1	Y	FACW
2.			
3.			
4.			
5.			
	1 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Typha latifolia	60	Y	OBL
2. Phalaris arundinacea	40	Y	FACW
3. Veronica scutellata	1	N	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	101 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	61	x 1 =	61
FACW species	41	x 2 =	82
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	102 (A)		143 (B)

Prevalence Index = B/A = 1.4

Hydrophytic Vegetation Indicators:

- ☐ 1- Rapid Test for Hydrophytic Vegetation
- ☒ 2- Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Dead trees and shrubs within 5 feet of sample point.

SOIL

Sampling Point SP-1, Wetland A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR 2/1	100					Silt Loam	sand layers
10-15	10YR 3/1	100					Silt Loam	sand layers

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Sand deposits in layers; could be caused by storm events.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches): _____
Water Table Present?	Yes ☐	No ☒	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches): 0

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

The City has been monitoring water levels since they conducted the maintenance work in August 2011.

Remarks:

New normal conditions reflect water levels that are approximately 2 feet since the City conducted maintenance in August 2011. However, soils and vegetation conditions reflect water level conditions that existed prior to August 2011.

ATTACHMENT 4
SEP12-01257

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Kirkland / Totem Lake Culvert Replacement - Upstream Sump City/County: Kirkland / King Sampling Date: 8/6/2012

Applicant/Owner: City of Kirkland State: WA Sampling Point: SP-2, Wetland A

Investigator(s): Hans Ehlert, Eilean Davis Section, Township, Range: 28 26N 05E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%):

Subregion (LRR): A Lat: 47.710661 N Long: -122.180278 W Datum: NAD 83

Soil Map Unit Name: Seattle Muck NWI classification: UPLAND

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	

Remarks:

The City excavated the Upstream Sump in August 2011 to remove sediment and vegetation that were blocking the culvert inlet. As a result of this and other work downstream, the water level in the culverts decreased approximately 2 feet, but the water level was still higher than the design water level constructed during the Kingsgate Way Improvements in the mid 1980s (according to personal communication with City maintenance staff).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	70	Y	FACW
2. Typha latifolia	20	Y	OBL
3. Equisetum arvense	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 15')			
1. Rubus procerus (discolor)	5	Y	FACU
2.			
	5 = Total Cover		

% Bare ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20	
FACW species	70	x 2 =	140	
FAC species	5	x 3 =	15	
FACU species	5	x 4 =	20	
UPL species	0	x 5 =	0	
Column Totals:	100	(A)	195	(B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

- ☐ 1- Rapid Test for Hydrophytic Vegetation
- ☒ 2- Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Cattails along the upland fringe are likely relic vegetation from previously higher water levels. New normal water level is approximately 2 feet lower than summer 2011. Area around outer edge of wetland is mowed (next to the sidewalk). Prevelance Index not met; absence of hydric soils and hydrology.

SOIL

Sampling Point SP-2, Wetland A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/3	100					loam	likely fill material

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel

Depth (inches): 12

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

The City has been monitoring water levels since they conducted the maintenance work in August 2011.

Remarks:

New normal conditions reflect water levels that are approximately 2 feet since the City conducted maintenance in August 2011.

However, soils and vegetation conditions reflect water level conditions that existed prior to August 2011.

ATTACHMENT 4
SEP12-01257

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Kirkland / Totem Lake Culvert Replacement - Settling Basin | City/County: Kirkland / King | Sampling Date: 8/6/2012

Applicant/Owner: City of Kirkland | State: WA | Sampling Point: SP-3, Wetland B

Investigator(s): Hans Ehlert, Eilean Davis | Section, Township, Range: 28 26N 05E

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): concave | Slope (%):

Subregion (LRR): A | Lat: 47.7111 N | Long: -122.1811 W | Datum: NAD 83

Soil Map Unit Name: Seattle Muck | NWI classification: PEM/PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐
Hydric Soil Present?	Yes ☒	No ☐	
Wetland Hydrology Present?	Yes ☒	No ☐	

Remarks:

The Settling Basin is located in the landscaping strip between Totem Lake Boulevard and the Totem Lake Mall parking lot. The City excavated the Settling Basin in August 2011 to remove sediment and vegetation that were clogging the culvert inlets. As a result of this and other work up/downstream, the water level in the Settling Basin decreased approximately 2 feet, but the water level was still higher than the design water level constructed during the Kingsgate Way Improvements in the mid 1980s (per record drawings).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer Rubrum	5	Y	NO
2. Salix sitchensis	5	Y	FACW
3.			
4.			
	10	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Spiraea douglasii	5	Y	FACW
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	40	Y	FACW
2. Polygonum cuspidatum	10	N	FACU
3. Lemna minor	15	N	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	65	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	

% Bare ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	50	x 2 =	100
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	75 (A)		155 (B)

Prevalence Index = B/A = 2.1

Hydrophytic Vegetation Indicators:

- ☐ 1- Rapid Test for Hydrophytic Vegetation
- ☒ 2- Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Sample taken on steep embankment/slope.

SOIL

Sampling Point SP-3, Wetland B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-14	10YR 2/1	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Lots of root material and rocks at 1 to 10 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 12

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

The City has been monitoring water levels since they conducted the maintenance work in August 2011.

Remarks:

New normal conditions reflect water levels that are approximately 2 feet since the City conducted maintenance in August 2011.

However, soils and vegetation conditions reflect water level conditions that existed prior to August 2011.

ATTACHMENT 4
SEP12-01257

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Kirkland / Totem Lake Culvert Replacement - Settling Basin City/County: Kirkland / King Sampling Date: 8/6/2012

Applicant/Owner: City of Kirkland State: WA Sampling Point: SP-4, Wetland B

Investigator(s): Hans Ehlert, Eilean Davis Section, Township, Range: 28 26N 05E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%):

Subregion (LRR): A Lat: 47.7111 N Long: -122.1811 W Datum: NAD 83

Soil Map Unit Name: Seattle Muck NWI classification: UPLAND

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	

Remarks:

Settling Basin is located in the landscaping strip between Totem Lake Boulevard and the Totem Lake Mall parking lot.
The City excavated the Settling Basin in August 2011 to remove sediment and vegetation that were clogging the culvert inlets. As a result of this and other work up/downstream, the water level in the Settling Basin decreased approximately 2 feet, but the water level was still higher than the design water level constructed during the Kingsgate Way Improvements in the mid 1980s (per record drawings).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer Rubrum	10	Y	NO
2. Salix sitchensis	5	Y	FACW
3.			
4.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Spiraea douglasii	5	Y	FACW
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	45	Y	FACW
2. Polygonum cuspidatum	10	N	FACU
3. Lemna minor	10	N	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	65	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	
% Bare ground in Herb Stratum 20			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	55	x 2 =	110
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	75 (A)		160 (B)

Prevalence Index = B/A = 2.1

Hydrophytic Vegetation Indicators:

- ☐ 1- Rapid Test for Hydrophytic Vegetation
- ☒ 2- Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Sample taken on steep embankment/slope. Prevalence Index not met; absence of hydric soils and hydrology.

SOIL

Sampling Point SP-4, Wetland B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR 4/3	100					gravelly loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rocks

Depth (inches): 8"

Hydric Soil Present? Yes ☐ No ☒

Remarks:

very sandy soils, likely fill material.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ATTACHMENT 4
SEP12-01257

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Kirkland / Totem Lake Culvert Replacement - Downstream Open Channel City/County: Kirkland / King Sampling Date: 8/6/2012

Applicant/Owner: City of Kirkland State: WA Sampling Point: SP-5, Wetland C

Investigator(s): Hans Ehlert, Eilean Davis Section, Township, Range: 28 26N 05E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%):

Subregion (LRR): A Lat: 47.7111 N Long: -122.1811 W Datum: NAD 83

Soil Map Unit Name: Seattle Muck NWI classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?**	**Yes ☒**	**No ☐**
Hydric Soil Present?	Yes ☒	No ☐			
Wetland Hydrology Present?	Yes ☒	No ☐			

Remarks:

The Downstream Open Channel is located between I-405 and Totem Lake Boulevard. The City excavated the Downstream Open Channel in August 2011 to remove accumulated sediment and vegetation that was backing up water. As a result of this and work upstream, the water level decreased approximately 2 feet, but the water level is still elevated by hydraulic controls likely west of I-405.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cytisus scoparius	5	Y	NO
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	40	Y	FACW
2. Juncus effusus	20	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: 15')			
1. Rubus procerus (discolor)	20	Y	FACU
2.			
	20 = Total Cover		

% Bare ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	60	x 2 =	120
FAC species	0	x 3 =	0
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	80 (A)		200 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

- ☐ 1- Rapid Test for Hydrophytic Vegetation
- ☒ 2- Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☒** **No ☐**

Remarks:

SOIL

Sampling Point SP-5, Wetland C

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	2.5Y 5/1	100					gravelly sand	non-native material

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel/rocks

Depth (inches): 6

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Parent material dark/gray mixed with lots of sand; likely fill material from road construction.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☒ No ☐ Depth (inches): 3

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

The City has been monitoring water levels since they conducted the maintenance work in August 2011.

Remarks:

New normal conditions reflect water levels that are approximately 2 feet since the City conducted maintenance in August 2011.

However, soils and vegetation conditions reflect water level conditions that existed prior to August 2011.

ATTACHMENT 4
SEP12-01257

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Kirkland / Totem Lake Culvert Replacement - Downstream Open Channel City/County: Kirkland / King Sampling Date: 8/6/2012

Applicant/Owner: City of Kirkland State: WA Sampling Point: SP-6, Wetland C

Investigator(s): Hans Ehlert, Eilean Davis Section, Township, Range: 28 26N 05E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%):

Subregion (LRR): A Lat: 47.7111 N Long: -122.1811 W Datum: NAD 83

Soil Map Unit Name: Seattle Muck NWI classification: UPLAND

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	

Remarks:

Location on steep road embankment adjacent to Totem Lake Boulevard. The Downstream Open Channel is located between I-405 and Totem Lake Boulevard. The City excavated the Downstream Open Channel in August 2011 to remove accumulated sediment and vegetation that was backing up water. As a result of this and work upstream, the water level decreased approximately 2 feet, but the water level is still elevated by hydraulic controls likely west of I-405.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cytisus scoparius	25	Y	NO
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	30	Y	FACW
2. Holcus lanatus	5	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: 15')			
1. Rubus procerus (discolor)	25	Y	FACU
2.			
	20 = Total Cover		

% Bare ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	5	x 3 =	15
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	60 (A)		175 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

- ☐ 1- Rapid Test for Hydrophytic Vegetation
- ☐ 2- Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

Prevalence Index not met; absence of hydric soils and hydrology.

SOIL

Sampling Point SP-6, Wetland C

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 5/3	100					gravelly loam	non-native fill material

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel/rocks

Depth (inches): 2

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland name or number Wetland A

ATTACHMENT 4
SEP12-01257

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Wetland A — Date of site visit: 8/6/2012

Rated by: H. Ehlert, E. Davis Trained by Ecology? Yes ☒ No ☐ — Date of training: 10/8/2008

SEC: 28 TOWNSHP: 26N RNGE: 05E — Is S/T/R in Appendix D? Yes ☐ No ☒

Map of wetland unit: Figures 1 and 3 **Estimated size: Approximately 17 acres**

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland: ☐ I ☒ II ☐ III ☐ IV

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	22
Score for Hydrologic Functions	16
Score for Habitat Functions	17
TOTAL Score for Functions	55

Category based on SPECIAL CHARACTERISTCS of Wetland ☐ I ☐ II ☒ **Does not apply**

Final Category (choose the "highest" category from above") **II**

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics	
Estuarine	☐
Natural Heritage Wetland	☐
Bog	☐
Mature Forest	☐
Old Growth Forest	☐
Coastal Lagoon	☐
Interdunal	☐
None of the above	☒

Wetland HGM Class used for Rating	
Depressional	☒
Riverine	☐
Lake-fringe	☐
Slope	☐
Flats	☐
Freshwater Tidal	☐
	☐
Check if unit has multiple HGM classes present	☐

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	☐	☒
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).	☐	☒
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	☐	☒
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	☐	☒

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands in to those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands for Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
   ☒ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   ☐ **YES – Freshwater Tidal Fringe** ☐ **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
   ☒ NO – go to 3 ☐ **YES** – The wetland class is **Flats**
   If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland meet both of the following criteria?
   ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   ☐ At least 30% of the open water area is deeper than 6.6 (2 m)?
   ☒ NO – go to 4 ☐ **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland meet all of the following criteria?
   ☐ The wetland is on a slope *(slope can be very gradual)*.
   ☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   ☐ The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   ☒ NO – go to 5 ☐ **YES** – The wetland class is **Slope**

5. Does the entire wetland meet all of the following criteria?
   ☐ The unit is in a valley or stream channel where it gets inundated by overbank flooding from that stream or river.
   ☐ The overbank flooding occurs at least once every two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   ☒ NO – go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of the year. This means that any outlet, if present is higher than the interior of the wetland.
   ☐ NO – go to 7 ☒ **YES** – The wetland class is **Depressional**

7. Is the entire wetland located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.
   ☒ No – go to 8 ☐ **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ... points = 3 ☐ • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ... points = 2 ☒ • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) .. points = 1 ☐ • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ☐ **2**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) **YES** points = 4 **NO** points = 0	0
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area ... points = 5 ☒ • Wetland has persistent, ungrazed vegetation > = 1/2 of area ... points = 3 ☐ • Wetland has persistent, ungrazed vegetation > = 1/10 of area ... points = 1 ☐ • Wetland has persistent, ungrazed vegetation < 1/10 of area ... points = 0 ☐ **Map of Cowardin vegetation classes**	**Figure** ☐ **5**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ... points = 4 ☐ • Area seasonally ponded is > 1/4 total area of wetland ... points = 2 ☒ • Area seasonally ponded is < 1/4 total area of wetland ... points = 0 ☐ **Map of Hydroperiods**	**Figure** ☐ **4**
	Total for D 1 *Add the points in the boxes above*	**11**
D 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 44)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☒ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft. of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☒ Residential, urban areas, golf courses are within 150 ft. of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other _____ ☒ **YES** multiplier is 2 ☐ **NO** multiplier is 1	Multiplier 2
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	**22**
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ... points = 4 ☐ • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ... points = 2 ☒ • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ... points = 0	2
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ... points = 7 ☐ • The wetland is a "headwater" wetland ... points = 5 ☐ • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ... points = 5 ☐ • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet ... points = 3 ☒ • Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water . points = 1 ☐ • Marks of ponding less than 0.5 ft ... points = 0 ☐	3
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit ... points = 5 ☐ • The area of the basin is 10 to 100 times the area of the unit ... points = 3 ☒ • The area of the basin is more than 100 times the area of the unit ... points = 0 ☐ • Entire unit is in the FLATS class ... points = 5 ☐	3
	Total for D 3 *Add the points in the boxes above*	8

D 4	**Does the wetland have the opportunity to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems. ☒ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other _____ ☒ **YES** multiplier is 2 ☐ **NO** multiplier is 1	*(see p. 49)* Multiplier 2
◆	**TOTAL – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	**16**

Comments: _____

R	Riverine and Freshwater Tidal Fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
R 1	**Does the wetland have the potential to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 ☐ • Depressions cover > 1/2 area of wetland ..... points = 4 ☐ **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 ☐ • No depressions present ..... points = 0 ☐	**Figure** ☐
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 ☐ • Trees or shrubs > 1/3 area of the wetland ..... points = 6 ☐ • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 ☐ • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 ☐ • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 ☐ **Aerial photo or map showing polygons of different vegetation types**	**Figure** ☐
	Add the points in the boxes above	
R 2	**Does the wetland have the opportunity to improve water quality?** *(see p. 53)* Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft. of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☐ Residential, urban areas, golf courses are within 150 ft. of wetland ☐ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ☐ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	Multiplier
◆	**TOTAL – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the potential to reduce flooding and erosion?** *(see p.54)*	
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 ☐ • If the ratio is between 10 – 20 ..... points = 6 ☐ • If the ratio is 5- <10 ..... points = 4 ☐ • If the ratio is 1- <5 ..... points = 2 ☐ • If the ratio is < 1 ..... points = 1 ☐ **Aerial photo or map showing average widths**	**Figure** ☐
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 ☐ • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 ☐ • Vegetation does not meet above criteria ..... points = 0 ☐ **Aerial photo or map showing polygons of different vegetation types**	**Figure** ☐
	Add the points in the boxes above	
R 4	**Does the wetland have the opportunity to reduce flooding and erosion?** *(see p.57)* Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ☐ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ☐ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ☐ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* ☐ **YES** multiplier is 2 ☐ **NO** multiplier is 1	Multiplier
◆	**TOTAL – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	

Comments: _____

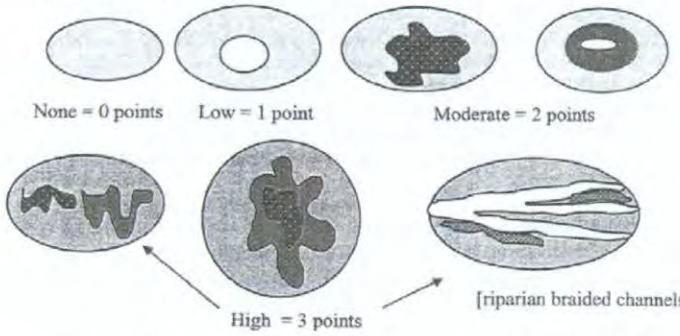
L	Lake-fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality.	(only 1 score per box)
L 1	**Does the wetland unit have the potential to improve water quality?** *(see p.59)*	
	L 1.1 Average width of vegetation along the lakeshore (use polygons of Cowardin classes): • Vegetation is more than 33 ft. (10m) wide ..... points = 6 ☐ • Vegetation is more than 16 ft.(5m) wide and < 33 ft..... points = 3 ☐ • Vegetation is more than 6 ft. (2m) wide and < 16 ft..... points = 1 ☐ • Vegetation is less than 6 ft. wide..... points = 0 ☐ **Map of Cowardin classes with widths marked**	**Figure** ☐
	L 1.2 Characteristics of the vegetation in the wetland: *Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* • Cover of herbaceous plants is > 90% of the vegetated area..... points = 6 ☐ • Cover of herbaceous plants is > 2/3 of the vegetated area..... points = 4 ☐ • Cover of herbaceous plants is > 1/3 of the vegetated area..... points = 3 ☐ • Other vegetation that is not aquatic bed or herbaceous covers > 2/3 of the unit ..... points = 3 ☐ • Other vegetation that is not aquatic bed in > 1/3 vegetated area ..... points = 1 ☐ • Aquatic bed cover and open water > 2/3 of the unit..... points = 0 ☐ **Map with polygons of different vegetation types**	**Figure** ☐
	Add the points in the boxes above	
L 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Wetland is along the shores of a lake or reservoir that does not meet water quality standards ☐ Grazing in the wetland or within 150 ft ☐ Polluted water discharges to wetland along upland edge ☐ Tilled fields or orchards within 150 ft. of wetland ☐ Residential or urban areas are within 150 ft. of wetland ☐ Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) ☐ Power boats with gasoline or diesel engines use the lake ☐ Other ☐ **YES** multiplier is 2 ☐ **NO** multiplier is 1	*(see p.61)* Multiplier
◆	**TOTAL – Water Quality Functions** Multiply the score from L1 by L2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce shoreline erosion.	
L 3	**Does the wetland have the potential to reduce shoreline erosion?**	*(see p.62)*
	L 3 Average width and characteristics of vegetation along the lakeshore *(do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)* • 3/4 of distance is shrubs or forest at least 33 ft. (10m) wide ..... points = 6 ☐ • 3/4 of distance is shrubs or forest at least 6 ft. (2m) wide. ..... points = 4 ☐ • 1/4 of distance is shrubs or forest at least 33 ft. (10m) wide. ..... points = 4 ☐ • Vegetation is at least 6 ft. (2m) wide (any type except aquatic bed)..... points = 2 ☐ • Vegetation is less than 6 ft. (2m) wide (any type except aquatic bed) ..... points = 0 ☐ **Aerial photo or map with Cowardin vegetation classes**	**Figure** ☐
	Record the points in the boxes above	
L 4	**Does the wetland have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* ☐ There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. ☐ There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests, other wetlands) that can be damaged by shoreline erosion. ☐ Other _____ ☐ **YES** multiplier is 2 ☐ **NO** multiplier is 1	*(see p. 64)* Multiplier
◆	**TOTAL – Hydrologic Functions** Multiply the score from L3 by L4; then ***add score to table on p. 1***	

Comments: _____

Wetland name or number Wetland A

S	Slope Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
S 1	**Does the wetland have the potential to improve water quality?**	*(see p.64)*
	S 1.1 Characteristics of average slope of unit: • Slope is 1% or less *(a 1% slope has a 1 ft. vertical drop in elevation for every 100 ft. horizontal distance)*.... points = 3 ☐ • Slope is 1% - 2% ..... points = 2 ☐ • Slope is 2% - 5%. ..... points = 1 ☐ • Slope is greater than 5% ..... points = 0 ☐	
	S 1.2 The soil 2 inches below the surface (or duff layer) is clay, organic *(Use NRCS definitions).* ☐ **YES** = 3 points ☐ **NO** = 0 points	
	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* • Dense, uncut, herbaceous vegetation > 90% of the wetland area..... points = 6 ☐ • Dense, uncut, herbaceous vegetation > 1/2 of area ..... points = 3 ☐ • Dense, woody, vegetation > 1/2 of area..... points = 2 ☐ • Dense, uncut, herbaceous vegetation > 1/4 of area ..... points = 1 ☐ • Does not meet any of the criteria above for vegetation ..... points = 0 ☐ **Aerial photo or map with vegetation polygons**	**Figure** ☐
	Total for S 1 *Add the points in the boxes above*	
S 2	**Does the wetland have the opportunity to improve water quality?** *(see p. 67)* Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields, logging, or orchards within 150 ft. of wetland ☐ Residential, urban areas, or golf courses are within 150 ft. upslope of wetland ☐ Other ☐ **YES** multiplier is 2 ☐ **NO** multiplier is 1	Multiplier
◆	**TOTAL – Water Quality Functions** Multiply the score from S1 by S2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
S 3	**Does the wetland have the potential to reduce flooding and stream erosion?** *(see p.68)*	
	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms: *Choose the points appropriate for the description that best fits conditions in the wetland (stems of plants should be thick enough (usually > 1/8in), or dense enough to remain erect during surface flows).* • Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland ..... points = 6 ☐ • Dense, uncut, **rigid** vegetation> 1/2 area of wetland..... points = 3 ☐ • Dense, uncut, **rigid** vegetation > 1/4 area..... points = 1 ☐ • More than 1/4 of area is grazed, mowed, tilled, or vegetation is not rigid ..... points = 0 ☐	
	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows. The slope has small surface depressions that can retain water over at least 10% of its area. ☐ **YES** = 2 points ☐ **NO** = 0 points	
	Add the points in the boxes above	
S 4	**Does the wetland have the opportunity to reduce flooding and erosion?** *(see p. 70)* Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ☐ Wetland has surface runoff that drains to a river or stream that has flooding problems ☐ Other *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* ☐ **YES** multiplier is 2 ☐ **NO** multiplier is 1	Multiplier
◆	**TOTAL – Hydrologic Functions** Multiply the score from S3 by S4; then ***add score to table on p. 1***	

Comments: _____

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.		**Points** (only 1 score per box)
H 1	**Does the wetland have the potential to provide habitat for many species?**	
	H 1.1 Vegetation structure *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic Bed ☒ Emergent plants ☒ Scrub/shrub (areas where shrubs have > 30% cover) ☒ Forested (areas where trees have > 30% cover) *If the unit has a forested class check if:* ☐ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon. *Add the number of vegetation types that qualify. If you have:* **Map of Cowardin vegetation classes** 4 structures or more..... points = 4 ☐ 3 structures..... points = 2 ☒ 2 structures..... points = 1 ☐ 1 structure ..... points = 0 ☐	**Figure** ☐ **2**
	H 1.2 Hydroperiods *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ☒ Permanently flooded or inundated — 4 or more types present — points = 3 ☐ ☒ Seasonally flooded or inundated — 3 or more types present — points = 2 ☒ ☐ Occasionally flooded or inundated — 2 types present — points = 1 ☐ ☐ Saturated only — 1 type present — points = 0 ☐ ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☒ Seasonally flowing stream in, or adjacent to, the wetland ☐ **Lake-fringe wetland..... = 2 points** ☐ **Freshwater tidal wetland..... = 2 points** **Map of hydroperiods**	**Figure** ☐ **2**
	H 1.3 Richness of Plant Species *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* If you counted: > 19 species ..... points = 2 ☐ 5 – 19 species..... points = 1 ☒ List species below if you want to: < 5 species ..... points = 0 ☐ _____	**1**
	H 1.4 Interspersion of Habitats *(see p. 76)*: Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high". **Use map of Cowardin classes.**	**Figure** ☐ **3**
	H 1.5 Special Habitat Features *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☐ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) ☒ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☒ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	**2**
	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	**10**

H 2	**Does the wetland have the opportunity to provide habitat for many species?**	(only 1 score per box)
	H 2.1 Buffers *(see P. 80)*: *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed".* ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)..... **points = 5** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference..... **points = 4** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference..... **points = 4** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference..... **points = 3** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference..... **points = 3** **If buffer does not meet any of the criteria above:** ☐ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK..... **points = 2** ☐ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK..... **points = 2** ☐ Heavy grazing in buffer..... **points = 1** ☐ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland)..... **points = 0** ☒ Buffer does not meet any of the criteria above..... **points = 1** **Arial photo showing buffers**	**Figure** ☐ **1**
	H 2.2 Corridors and Connections *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? *(Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).* ☐ **YES = 4 points** (go to H 2.3) ☒ **NO** = go to H 2.2.2 H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ☒ **YES = 2 points** (go to H 2.3) ☐ **NO** = go to H 2.2.3 H. 2.2.3 Is the wetland: • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR ☐ **YES** = 1 point • Within 1 mile of a lake greater than 20 acres? ☒ **NO** = 0 points	2

Comments: _____

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*
Which of the following priority habitats are within 330 ft. (100m) of the wetland unit?
NOTE: the connections do not have to be relatively undisturbed.

- ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*).
- ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.
- ☐ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.
- ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).
- ☒ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*).
- ☐ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).*
- ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ☐ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

If wetland has **3 or more** priority habitats **= 4 points**
If wetland has **2** priority habitats = **3 points**
If wetland has **1** priority habitat **= 1 point**
No habitats = 0 points — **1**

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list.
Nearby wetlands are addressed in question H 2.4)

H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.... points = 5 ☐
- The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ..... points = 5 ☐
- There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ..... points = 3 ☒
- The wetland fringe on a lake **with** disturbance and there are 3 other lake-fringe wetlands within 1/2 mile..... points = 3 ☐
- There is at least 1 wetland within 1/2 mile ..... points = 2 ☐
- There are no wetlands within 1/2 mile..... points = 0 ☐

3

H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4* — 7

TOTAL for H 1 from page 8 — 10

◆ **Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1*** — 17

Comments: _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
SC1	**Estuarine wetlands?** *(see p.86)* Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. ☐ **YES** = Go to SC 1.1 ☒ **NO**	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ **YES** = Category I ☐ **NO** = go to SC 1.2	**Cat. 1** ☐
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? ☐ **YES** = Category I ☐ **NO** = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp,. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category 1. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** ☐ **Cat. II** ☐ **Dual Rating I/II** ☐
SC2	**Natural Heritage Wetlands** *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? *(This question is used to screen out most sites before you need to contact WNHP/DNR.)* ☐ S/T/R information from Appendix D ☐ or accessed from WNHP/DNR web site ☐ **YES** Contact WNHP/DNR (see p. 79) and go to SC 2.2 ☒ **NO**	
	SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? ☐ **YES** = Category 1 ☒ **NO** not a Heritage Wetland	**Cat I** ☐
SC3	**Bogs** *(see p. 87)* Does the wetland **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. ***If you answer yes you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? ☐ **YES** = go to question 3 ☒ **NO** = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? ☐ **YES** = go to question 3 ☒ **NO** = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? ☐ **YES** = Is a bog for purpose of rating ☒ **NO** = go to question 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover*)? ☐ **YES** = Category I ☒ **NO** = Is not a bog for purpose of rating	**Cat. I** ☐

SC4	**Forested Wetlands** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its function.* ☐ **Old-growth forests**: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. ☐ **YES** = Category I ☒ **NO** = not a forested wetland with special characteristics	**Cat. I** ☐
SC5	**Wetlands in Coastal Lagoons** *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks. ☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom.)* ☐ **YES** = Go to SC 5.1 ☒ **NO** not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing) and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than 1/10 acre (4350 square ft.) ☐ **YES** = Category I ☒ **NO** = Category II	**Cat. I** ☐ **Cat. II** ☐
SC6	**Interdunal Wetlands** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ **YES** = Go to SC 6.1 ☒ **NO** not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula -- lands west of SR 103 • Grayland-Westport -- lands west of SR 105 • Ocean Shores-Copalis – lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? ☐ **YES** = Category II ☐ **NO** = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ **YES** = Category III	**Cat. II** ☐ **Cat. III** ☐
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered **NO** for all types enter "Not Applicable" on p. 1	_____

Comments: _____

Wetland name or number Wetlands B & C

ATTACHMENT 4
SEP12-01257

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Wetlands B & C — Date of site visit: 8/6/2012

Rated by: H. Ehlert, E.Davis Trained by Ecology? Yes ☒ No ☐ — Date of training: 10/8/2011

SEC: 28 TOWNSHP: 26N RNGE: 05E — Is S/T/R in Appendix D? Yes ☐ No ☒

Map of wetland unit: Figures 1 and 4 **Estimated size: Wetland B = ~750 SF , Wetland C = ~0.4 acre**

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland: ☐ I ☐ II ☐ III ☒ IV

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	12
Score for Hydrologic Functions	6
Score for Habitat Functions	10
TOTAL Score for Functions	28

Category based on SPECIAL CHARACTERISTCS of Wetland ☐ I ☐ II ☒ **Does not apply**

Final Category (choose the "highest" category from above") **IV**

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics	
Estuarine	☐
Natural Heritage Wetland	☐
Bog	☐
Mature Forest	☐
Old Growth Forest	☐
Coastal Lagoon	☐
Interdunal	☐
None of the above	☒

Wetland HGM Class used for Rating	
Depressional	☒
Riverine	☐
Lake-fringe	☐
Slope	☐
Flats	☐
Freshwater Tidal	☐
	☐
Check if unit has multiple HGM classes present	☐

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	☐	☒
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).	☐	☒
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	☐	☒
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	☐	☒

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands in to those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands for Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
   ☒ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   ☐ **YES – Freshwater Tidal Fringe** ☐ **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
   ☒ NO – go to 3 ☐ **YES** – The wetland class is **Flats**
   If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland meet both of the following criteria?
   ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   ☐ At least 30% of the open water area is deeper than 6.6 (2 m)?
   ☒ NO – go to 4 ☐ **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland meet all of the following criteria?
   ☐ The wetland is on a slope *(slope can be very gradual)*.
   ☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   ☐ The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   ☒ NO – go to 5 ☐ **YES** – The wetland class is **Slope**

5. Does the entire wetland meet all of the following criteria?
   ☐ The unit is in a valley or stream channel where it gets inundated by overbank flooding from that stream or river.
   ☐ The overbank flooding occurs at least once every two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   ☒ NO – go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of the year. This means that any outlet, if present is higher than the interior of the wetland.
   ☐ NO – go to 7 ☒ **YES** – The wetland class is **Depressional**

7. Is the entire wetland located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.
   ☒ No – go to 8 ☐ **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ... points = 3 ☐ • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ... points = 2 ☐ • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) .. points = 1 ☒ • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ☐ **1**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) **YES** points = 4 **NO** points = 0	0
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area ... points = 5 ☐ • Wetland has persistent, ungrazed vegetation > = 1/2 of area ... points = 3 ☒ • Wetland has persistent, ungrazed vegetation > = 1/10 of area ... points = 1 ☐ • Wetland has persistent, ungrazed vegetation < 1/10 of area ... points = 0 ☐ **Map of Cowardin vegetation classes**	**Figure** ☐ **3**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ... points = 4 ☐ • Area seasonally ponded is > 1/4 total area of wetland ... points = 2 ☒ • Area seasonally ponded is < 1/4 total area of wetland ... points = 0 ☐ **Map of Hydroperiods**	**Figure** ☐ **2**
	Total for D 1 *Add the points in the boxes above*	**6**
D 2	**Does the wetland have the opportunity to improve water quality?**	*(see p. 44)*
	Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☒ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft. of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☒ Residential, urban areas, golf courses are within 150 ft. of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other _____ ☒ **YES** multiplier is 2 ☐ **NO** multiplier is 1	Multiplier 2
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	**12**
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ... points = 4 ☐ • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet .... points = 2 ☐ • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ... points = 0	0
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ... points = 7 ☐ • The wetland is a "headwater" wetland ... points = 5 ☐ • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet ... points = 5 ☐ • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet ... points = 3 ☒ • Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water . points = 1 ☐ • Marks of ponding less than 0.5 ft ... points = 0 ☐	3
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit ... points = 5 ☐ • The area of the basin is 10 to 100 times the area of the unit ... points = 3 ☐ • The area of the basin is more than 100 times the area of the unit ... points = 0 ☒ • Entire unit is in the FLATS class ... points = 5 ☐	0
	Total for D 3 *Add the points in the boxes above*	**3**

D 4	**Does the wetland have the opportunity to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems. ☒ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other _____ ☒ **YES** multiplier is 2 ☐ **NO** multiplier is 1	*(see p. 49)* Multiplier 2
◆	**TOTAL – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	**6**

Comments: _____

R	Riverine and Freshwater Tidal Fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
R 1	**Does the wetland have the potential to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 ☐ • Depressions cover > 1/2 area of wetland ..... points = 4 ☐ **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 ☐ • No depressions present ..... points = 0 ☐	**Figure** ☐
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 ☐ • Trees or shrubs > 1/3 area of the wetland ..... points = 6 ☐ • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 ☐ • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 ☐ • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 ☐ **Aerial photo or map showing polygons of different vegetation types**	**Figure** ☐
	Add the points in the boxes above	
R 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft. of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☐ Residential, urban areas, golf courses are within 150 ft. of wetland ☐ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ☐ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 53)* Multiplier
◆	**TOTAL – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 ☐ • If the ratio is between 10 – 20 ..... points = 6 ☐ • If the ratio is 5- <10 ..... points = 4 ☐ • If the ratio is 1- <5 ..... points = 2 ☐ • If the ratio is < 1 ..... points = 1 ☐ **Aerial photo or map showing average widths**	**Figure** ☐
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 ☐ • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 ☐ • Vegetation does not meet above criteria ..... points = 0 ☐ **Aerial photo or map showing polygons of different vegetation types**	**Figure** ☐
	Add the points in the boxes above	
R 4	**Does the wetland have the opportunity to reduce flooding and erosion?** Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ☐ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ☐ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ☐ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* ☐ **YES** multiplier is 2 ☐ **NO** multiplier is 1	*(see p.57)* Multiplier
◆	**TOTAL – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	

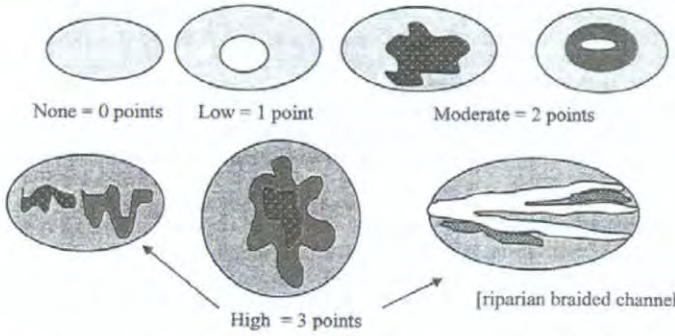
Comments: _____

L	Lake-fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality.	(only 1 score per box)
L 1	**Does the wetland unit have the potential to improve water quality?** *(see p.59)*	
	L 1.1 Average width of vegetation along the lakeshore (use polygons of Cowardin classes): • Vegetation is more than 33 ft. (10m) wide ..... points = 6 ☐ • Vegetation is more than 16 ft.(5m) wide and < 33 ft..... points = 3 ☐ • Vegetation is more than 6 ft. (2m) wide and < 16 ft..... points = 1 ☐ • Vegetation is less than 6 ft. wide..... points = 0 ☐ **Map of Cowardin classes with widths marked**	**Figure** ☐
	L 1.2 Characteristics of the vegetation in the wetland: *Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* • Cover of herbaceous plants is > 90% of the vegetated area..... points = 6 ☐ • Cover of herbaceous plants is > 2/3 of the vegetated area..... points = 4 ☐ • Cover of herbaceous plants is > 1/3 of the vegetated area..... points = 3 ☐ • Other vegetation that is not aquatic bed or herbaceous covers > 2/3 of the unit ..... points = 3 ☐ • Other vegetation that is not aquatic bed in > 1/3 vegetated area ..... points = 1 ☐ • Aquatic bed cover and open water > 2/3 of the unit..... points = 0 ☐ **Map with polygons of different vegetation types**	**Figure** ☐
	Add the points in the boxes above	
L 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Wetland is along the shores of a lake or reservoir that does not meet water quality standards ☐ Grazing in the wetland or within 150 ft ☐ Polluted water discharges to wetland along upland edge ☐ Tilled fields or orchards within 150 ft. of wetland ☐ Residential or urban areas are within 150 ft. of wetland ☐ Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) ☐ Power boats with gasoline or diesel engines use the lake ☐ Other ☐ **YES** multiplier is 2 ☐ **NO** multiplier is 1	*(see p.61)* Multiplier
◆	**TOTAL – Water Quality Functions** Multiply the score from L1 by L2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce shoreline erosion.	
L 3	**Does the wetland have the potential to reduce shoreline erosion?**	*(see p.62)*
	L 3 Average width and characteristics of vegetation along the lakeshore *(do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)* • 3/4 of distance is shrubs or forest at least 33 ft. (10m) wide ..... points = 6 ☐ • 3/4 of distance is shrubs or forest at least 6 ft. (2m) wide. ..... points = 4 ☐ • 1/4 of distance is shrubs or forest at least 33 ft. (10m) wide. ..... points = 4 ☐ • Vegetation is at least 6 ft. (2m) wide (any type except aquatic bed)..... points = 2 ☐ • Vegetation is less than 6 ft. (2m) wide (any type except aquatic bed) ..... points = 0 ☐ **Aerial photo or map with Cowardin vegetation classes**	**Figure** ☐
	Record the points in the boxes above	
L 4	**Does the wetland have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* ☐ There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. ☐ There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests, other wetlands) that can be damaged by shoreline erosion. ☐ Other _____ ☐ **YES** multiplier is 2 ☐ **NO** multiplier is 1	*(see p. 64)* Multiplier
◆	**TOTAL – Hydrologic Functions** Multiply the score from L3 by L4; then ***add score to table on p. 1***	

Comments: _____

S	Slope Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
S 1	**Does the wetland have the potential to improve water quality?**	*(see p.64)*
	S 1.1 Characteristics of average slope of unit: • Slope is 1% or less *(a 1% slope has a 1 ft. vertical drop in elevation for every 100 ft. horizontal distance)*.... points = 3 ☐ • Slope is 1% - 2% ..... points = 2 ☐ • Slope is 2% - 5%. ..... points = 1 ☐ • Slope is greater than 5% ..... points = 0 ☐	
	S 1.2 The soil 2 inches below the surface (or duff layer) is clay, organic *(Use NRCS definitions).* ☐ **YES** = 3 points ☐ **NO** = 0 points	
	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* • Dense, uncut, herbaceous vegetation > 90% of the wetland area..... points = 6 ☐ • Dense, uncut, herbaceous vegetation > 1/2 of area ..... points = 3 ☐ • Dense, woody, vegetation > 1/2 of area..... points = 2 ☐ • Dense, uncut, herbaceous vegetation > 1/4 of area ..... points = 1 ☐ • Does not meet any of the criteria above for vegetation ..... points = 0 ☐ **Aerial photo or map with vegetation polygons**	**Figure** ☐
	Total for S 1 *Add the points in the boxes above*	
S 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields, logging, or orchards within 150 ft. of wetland ☐ Residential, urban areas, or golf courses are within 150 ft. upslope of wetland ☐ Other ☐ **YES** multiplier is 2 ☐ **NO** multiplier is 1	*(see p. 67)* Multiplier
◆	**TOTAL – Water Quality Functions** Multiply the score from S1 by S2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
S 3	**Does the wetland have the potential to reduce flooding and stream erosion?**	*(see p.68)*
	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms: *Choose the points appropriate for the description that best fits conditions in the wetland (stems of plants should be thick enough (usually > 1/8in), or dense enough to remain erect during surface flows).* • Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland ..... points = 6 ☐ • Dense, uncut, **rigid** vegetation> 1/2 area of wetland..... points = 3 ☐ • Dense, uncut, **rigid** vegetation > 1/4 area. ..... points = 1 ☐ • More than 1/4 of area is grazed, mowed, tilled, or vegetation is not rigid ..... points = 0 ☐	
	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows. The slope has small surface depressions that can retain water over at least 10% of its area. ☐ **YES** = 2 points ☐ **NO** = 0 points	
	Add the points in the boxes above	
S 4	**Does the wetland have the opportunity to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ☐ Wetland has surface runoff that drains to a river or stream that has flooding problems ☐ Other *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* ☐ **YES** multiplier is 2 ☐ **NO** multiplier is 1	*(see p. 70)* Multiplier ____
◆	**TOTAL – Hydrologic Functions** Multiply the score from S3 by S4; then ***add score to table on p. 1***	

Comments: _____

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.		**Points** (only 1 score per box)
H 1	**Does the wetland have the <u>potential</u> to provide habitat for many species?**	
	H 1.1 <u>Vegetation structure</u> *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic Bed ☒ Emergent plants ☒ Scrub/shrub (areas where shrubs have > 30% cover) ☐ Forested (areas where trees have > 30% cover) *If the unit has a forested class check if:* ☐ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon. *Add the number of vegetation types that qualify. If you have:* **Map of Cowardin vegetation classes** 4 structures or more..... points = 4 ☐ 3 structures..... points = 2 ☐ 2 structures..... points = 1 ☒ 1 structure ..... points = 0 ☐	**Figure** ☐ **1**
	H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ☒ Permanently flooded or inundated — 4 or more types present — points = 3 ☐ ☐ Seasonally flooded or inundated — 3 or more types present — points = 2 ☒ ☐ Occasionally flooded or inundated — 2 types present — points = 1 ☐ ☒ Saturated only — 1 type present — points = 0 ☐ ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☒ Seasonally flowing stream in, or adjacent to, the wetland ☐ **Lake-fringe wetland..... = 2 points** ☐ **Freshwater tidal wetland..... = 2 points** **Map of hydroperiods**	**Figure** ☐ **2**
	H 1.3 <u>Richness of Plant Species</u> *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* If you counted: > 19 species ..... points = 2 ☐ 5 – 19 species..... points = 1 ☒ List species below if you want to: < 5 species ..... points = 0 ☐ _____	**1**
	H 1.4 Interspersion of Habitats *(see p. 76)*: Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high". **Use map of Cowardin classes.**	**Figure** ☐ **1**
	H 1.5 <u>Special Habitat Features</u> *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☐ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) ☐ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☒ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	**1**
	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	**6**

H 2	**Does the wetland have the opportunity to provide habitat for many species?**	(only 1 score per box)
	H 2.1 Buffers *(see P. 80)*: *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed".* ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)..... **points = 5** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference..... **points = 4** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference..... **points = 4** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference..... **points = 3** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference..... **points = 3** **If buffer does not meet any of the criteria above:** ☐ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK..... **points = 2** ☐ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK..... **points = 2** ☐ Heavy grazing in buffer..... **points = 1** ☐ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland)..... **points = 0** ☒ Buffer does not meet any of the criteria above..... **points = 1** **Arial photo showing buffers**	**Figure** ☐ **1**
	H 2.2 Corridors and Connections *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? *(Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).* ☐ **YES = 4 points** (go to H 2.3) ☒ **NO** = go to H 2.2.2 H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ☐ **YES = 2 points** (go to H 2.3) ☒ **NO** = go to H 2.2.3 H. 2.2.3 Is the wetland: • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR ☐ **YES** = 1 point • Within 1 mile of a lake greater than 20 acres? ☒ **NO** = 0 points	0

Comments: _____

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*

Which of the following priority habitats are within 330 ft. (100m) of the wetland unit?
NOTE: the connections do not have to be relatively undisturbed.

- ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*).
- ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.
- ☐ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.
- ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).
- ☐ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*).
- ☐ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).*
- ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ☐ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

If wetland has **3 or more** priority habitats = **4 points**
If wetland has **2** priority habitats = **3 points**
If wetland has **1** priority habitat = **1 point**
No habitats = 0 points → 0

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)

H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.... points = 5 ☐
- The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ..... points = 5 ☐
- There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ..... points = 3 ☒
- The wetland fringe on a lake **with** disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ..... points = 3 ☐
- There is at least 1 wetland within 1/2 mile ..... points = 2 ☐
- There are no wetlands within 1/2 mile..... points = 0 ☐

→ 3

	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	4
	TOTAL for H 1 from page 8	6
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	**10**

Comments: _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
SC1	**Estuarine wetlands?** *(see p.86)* Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. ☐ **YES** = Go to SC 1.1 ☒ **NO**	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ **YES** = Category I ☐ **NO** = go to SC 1.2	**Cat. 1** ☐
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? ☐ **YES** = Category I ☐ **NO** = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp,. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category 1. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** ☐ **Cat. II** ☐ **Dual Rating I/II** ☐
SC2	**Natural Heritage Wetlands** *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? *(This question is used to screen out most sites before you need to contact WNHP/DNR.)* ☐ S/T/R information from Appendix D ☐ or accessed from WNHP/DNR web site ☐ **YES** Contact WNHP/DNR (see p. 79) and go to SC 2.2 ☒ **NO**	
	SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? ☐ **YES** = Category 1 ☒ **NO** not a Heritage Wetland	**Cat I** ☐
SC3	**Bogs** *(see p. 87)* Does the wetland **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. ***If you answer yes you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? ☐ **YES** = go to question 3 ☒ **NO** = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? ☐ **YES** = go to question 3 ☒ **NO** = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? ☐ **YES** = Is a bog for purpose of rating ☒ **NO** = go to question 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)*? ☐ **YES** = Category I ☒ **NO** = Is not a bog for purpose of rating	**Cat. I** ☐

SC4	**Forested Wetlands** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its function.* ☐ **Old-growth forests**: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. ☐ **YES** = Category I ☒ **NO** = not a forested wetland with special characteristics	**Cat. I** ☐
SC5	**Wetlands in Coastal Lagoons** *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks. ☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom.)* ☐ **YES** = Go to SC 5.1 ☒ **NO** not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing) and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than 1/10 acre (4350 square ft.) ☐ **YES** = Category I ☐ **NO** = Category II	**Cat. I** ☐ **Cat. II** ☐
SC6	**Interdunal Wetlands** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ **YES** = Go to SC 6.1 ☒ **NO** not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula -- lands west of SR 103 • Grayland-Westport -- lands west of SR 105 • Ocean Shores-Copalis – lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? ☐ **YES** = Category II ☐ **NO** = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ **YES** = Category III	**Cat. II** ☐ **Cat. III** ☐
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered **NO** for all types enter "Not Applicable" on p. 1	_____

Comments: _____

ATTACHMENT 4
SEP12-01257

WETLAND A

Plate 26
WETLAND FIELD DATA FORM

(Note: Applicable to Chapter 90 KZC, but not Chapter 83 KZC)

WETLAND FIELD DATA FORM

BEGIN BY CHECKING ANY OF THE FOLLOWING (a. – e.) THAT APPLY:

a. The wetland is contiguous to Lake Washington;

b. The wetland contains at least 1/4 acre of organic soils, such as peat bogs or mucky soils;

c. The wetland is equal to or greater than 10 acres in size and having three or more wetland classes, as defined by the U.S. Fish & Wildlife Service (Cowardin et al., 1979), one of which is open water;

d. The wetland has significant habitat value to state or federally listed threatened or endangered wildlife species; or

e. The wetland contains state or federally listed threatened or endangered plant species.

IF ANY OF THE CRITERIA LISTED ABOVE ARE MET, THEN THE WETLAND IS CONSIDERED TO BE TYPE 1. IF THAT IS THE CASE, PLEASE CONTINUE TO COMPLETE THE ENTIRE FORM, BUT DO NOT ASSIGN POINTS.

IF THE WETLAND DOES NOT MEET THE CRITERIA LISTED ABOVE FOR TYPE 1, COMPLETE THE ENTIRE FORM, USING THE ASSIGNED POINTS TO DETERMINE IF IT IS A TYPE 2 OR TYPE 3 WETLAND.

Type 2 wetlands typically have at least two wetland vegetation classes, are at least partially surrounded by buffers of native vegetation, connected by surface water flow (perennial or intermittent) to other wetlands or streams, and contain or are associated with forested habitat.

1. Total wetland area

Estimate wetland area and score from choices	Acres		Point Value	Points
	>20.00	=	6	
	10-19.99	=	5	

5-9.99	=	4
1-4.99	=	3
0.1-0.99	=	2
<0.1	=	1

2. Wetland classes: Determine the number of wetland classes that qualify, and score according to the table.

	# of Classes		Points
Open Water: if the area of open water is >1/3 acre or >10% of the total wetland area	1	=	1
Aquatic Beds: if the area of aquatic beds is >10% of the **open water** area **or** >1/2 acre	2	=	3
Emergent: if the area of emergent class is >1/2 acre **or** >10% of the total wetland area	3	=	5
Scrub-Shrub: if the area of scrub-shrub class is >1/2 acre **or** >10% of the total wetland area	4	=	7
Forested: if the area of forested class is >1/2 acre or >10% of the total wetland area	5	=	10

3. Plant species diversity.

For all wetland classes which qualified in 2 above, count the number of different plant species and score according to the table below. You do not have to name them.

e.g., if a wetland has an aquatic bed class with 3 species, and emergent class with 4 species and a scrub-shrub class with 2 species, you would circle 2, 2, and 1 in the second column (below).

Class	# of Species		Point Value
Aquatic Bed	1-2	=	1
	3	=	2
	>3	=	3
Emergent	1-2	=	1
	3-4	=	2
	>4	=	3

Class	# of Species		Point Value
Scrub-Shrub	1-2	=	1
	3-4	=	2
	>4	=	3
Forested	1-2	=	1
	3-4	=	2
	>4	=	3

4. Structural diversity.

If the wetland has a forested class, add 1 point for each of the following attributes present:

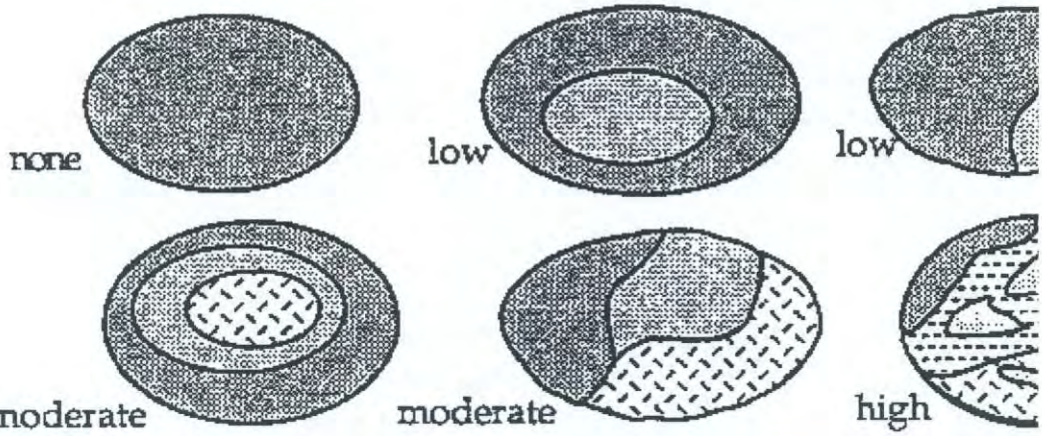
Trees >50′ tall = 1

Trees 20′ to 49′ tall	=	1
shrubs	=	1
Herbaceous ground cover	=	1

5. Interspection between wetland classes.

Decide from the diagrams below whether interspection between wetland classes is high, moderate, low or none

3	=	High
2	=	Moderate
1	=	Low
0	=	None



6. Habitat features

Add points associated with each habitat feature listed:	=	3
Is there evidence of current use by beavers?	=	2
Is a heron rookery located within 300′?	=	1
Are raptor nest(s) located within 300′?	=	1
Are there at least 2 standing dead trees (snags) per acre?2	=	1
Are there any other perches (wires, poles, or posts)?	=	1
Are there at least 3 downed logs per acre?	=	1

7. Connection to streams

Is the wetland connected at any time of the year via surface water? (score one answer only)

Is the wetland connected at any time of the year via surface water?		
To a perennial stream or a seasonal stream *with* fish	=	5
To a seasonal stream *without* fish	=	(3)
Is not connected to any stream	=	0

8. Buffers

Step 1: Estimate (to the nearest 5%) the percentage of each buffer or land-use type (below) that adjoins the wetland boundary. Then multiply these percentages by the factor(s) below and enter result in the column to the right.

	% of Buffer	Step 1	Width Factor	Step 2
Roads, buildings or parking lots	% X 0 =	75	=	150
Lawn, grazed pasture, vineyards or annual crops	% X 1 =		=	
Ungrazed grassland or orchards	% X 2 =		=	
Open water or native grasslands	% X 3 =		=	
Forest or shrub	% X 4 =	25	=	25
			Add buffer total	175

Step 2: Multiply result(s) of step 1:
By 1 if buffer width is 25-50′
By 2 if buffer width is 50-100′
By 3 if buffer width is >100′
Enter results and add subscores

Step 3: Score points according to the following table:
Buffer Total
900-1200 = 4
600-899 = 3
300-599 = 2
100-299 = (1)

9. Connection to other habitat areas:

Is there a riparian corridor to other wetlands within 0.25 of a mile, or a corridor >100′ wide with good forest or shrub cover to any other habitat area?	=	5
Is there a narrow corridor <100′ wide with good cover or a wide corridor >100′ wide with low cover to any other habitat area?	=	3

Is there a narrow corridor <100' wide with low cover or a significant habitat area within 0.25 mile but no corridor? = (1)

Is the wetland and buffer completely isolated by development and/or cultivated agricultural land? = 0

10. Scoring

Add the scores to get a total: Not Applicable - Wetland is Type 1

Question: Is the total greater than or equal to 22 points?

Answer:

Yes = Type 2

No = Type 3

ATTACHMENT 4
SEP12-01257

WETLAND B

Plate 26
WETLAND FIELD DATA FORM

(Note: Applicable to Chapter 90 KZC, but not Chapter 83 KZC)

WETLAND FIELD DATA FORM

BEGIN BY CHECKING ANY OF THE FOLLOWING (a. – e.) THAT APPLY:

a. The wetland is contiguous to Lake Washington;

b. The wetland contains at least 1/4 acre of organic soils, such as peat bogs or mucky soils;

c. The wetland is equal to or greater than 10 acres in size and having three or more wetland classes, as defined by the U.S. Fish & Wildlife Service (Cowardin et al., 1979), one of which is open water;

d. The wetland has significant habitat value to state or federally listed threatened or endangered wildlife species; or

e. The wetland contains state or federally listed threatened or endangered plant species.

IF ANY OF THE CRITERIA LISTED ABOVE ARE MET, THEN THE WETLAND IS CONSIDERED TO BE TYPE 1. IF THAT IS THE CASE, PLEASE CONTINUE TO COMPLETE THE ENTIRE FORM, BUT DO NOT ASSIGN POINTS.

IF THE WETLAND DOES NOT MEET THE CRITERIA LISTED ABOVE FOR TYPE 1, COMPLETE THE ENTIRE FORM, USING THE ASSIGNED POINTS TO DETERMINE IF IT IS A TYPE 2 OR TYPE 3 WETLAND.

Type 2 wetlands typically have at least two wetland vegetation classes, are at least partially surrounded by buffers of native vegetation, connected by surface water flow (perennial or intermittent) to other wetlands or streams, and contain or are associated with forested habitat.

1. Total wetland area

Estimate wetland area and score from choices	Acres		Point Value	Points
	>20.00	=	6	
	10-19.99	=	5	

5-9.99	=	4
1-4.99	=	3
0.1-0.99	=	2
<0.1	=	1

2. **Wetland classes: Determine the number of wetland classes that qualify, and score according to the table.**

	# of Classes		Points
Open Water: if the area of open water is >1/3 acre or >10% of the total wetland area	1	=	1
Aquatic Beds: if the area of aquatic beds is >10% of the **open water** area **or** >1/2 acre	2	=	3
Emergent: if the area of emergent class is >1/2 acre **or** >10% of the total wetland area	3	=	5
Scrub-Shrub: if the area of scrub-shrub class is >1/2 acre **or** >10% of the total wetland area	4	=	7
Forested: if the area of forested class is >1/2 acre or >10% of the total wetland area	5	=	10

3. **Plant species diversity.**

For all wetland classes which qualified in 2 above, count the number of different plant species and score according to the table below. You do not have to name them.

e.g., if a wetland has an aquatic bed class with 3 species, and emergent class with 4 species and a scrub-shrub class with 2 species, you would circle 2, 2, and 1 in the second column (below).

Class	# of Species		Point Value
Aquatic Bed	1-2	=	1
	3	=	2
	>3	=	3
Emergent	1-2	=	1
	3-4	=	2
	>4	=	3

Class	# of Species		Point Value
Scrub-Shrub	1-2	=	1
	3-4	=	2
	>4	=	3
Forested	1-2	=	1
	3-4	=	2
	>4	=	3

4. **Structural diversity.**

If the wetland has a forested class, add 1 point for each of the following attributes present:

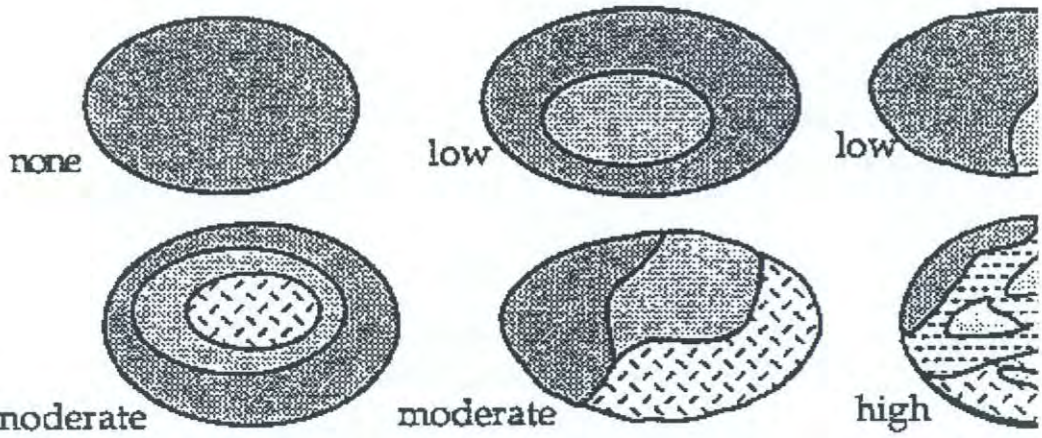
Trees >50′ tall = 1

Trees 20′ to 49′ tall	=	1
shrubs	=	1
Herbaceous ground cover	=	1

5. Interspection between wetland classes.

Decide from the diagrams below whether interspection between wetland classes is high, moderate, low or none

3	=	High
2	=	Moderate
1	=	Low
0	=	None



6. Habitat features

Add points associated with each habitat feature listed:	=	3
Is there evidence of current use by beavers?	=	2
Is a heron rookery located within 300′?	=	1
Are raptor nest(s) located within 300′?	=	1
Are there at least 2 standing dead trees (snags) per acre?2	=	1
Are there any other perches (wires, poles, or posts)?	=	1
Are there at least 3 downed logs per acre?	=	1

7. Connection to streams

Is the wetland connected at any time of the year via surface water? (score one answer only)

Is the wetland connected at any time of the year via surface water?

To a perennial stream or a seasonal stream *with* fish	=	5
To a seasonal stream *without* fish	=	3
Is not connected to any stream	=	0

8. Buffers

Step 1: Estimate (to the nearest 5%) the percentage of each buffer or land-use type (below) that adjoins the wetland boundary. Then multiply these percentages by the factor(s) below and enter result in the column to the right.

	% of Buffer	Step 1	Width Factor	Step 2
Roads, buildings or parking lots	% X 0 =	80 x 1	=	80
Lawn, grazed pasture, vineyards or annual crops	% X 1 =	20 x 1	=	20
Ungrazed grassland or orchards	% X 2 =		=	
Open water or native grasslands	% X 3 =		=	
Forest or shrub	% X 4 =		=	
			Add buffer total	100

Step 2: Multiply result(s) of step 1:

By 1 if buffer width is 25-50′

By 2 if buffer width is 50-100′

By 3 if buffer width is >100′

Enter results and add subscores

Step 3: Score points according to the following table:

Buffer Total

900-1200 = 4

600-899 = 3

300-599 = 2

100-299 = 1

9. Connection to other habitat areas:

Is there a riparian corridor to other wetlands within 0.25 of a mile, or a corridor >100′ wide with good forest or shrub cover to any other habitat area?	=	5
Is there a narrow corridor <100′ wide with good cover or a wide corridor >100′ wide with low cover to any other habitat area?	=	3

Is there a narrow corridor <100' wide with low cover or a significant habitat area within 0.25 mile but no corridor? = 1

Is the wetland and buffer completely isolated by development and/or cultivated agricultural land? = 0

10. Scoring

Add the scores to get a total: 15

Question: Is the total greater than or equal to 22 points?

Answer:

Yes = Type 2

No = Type 3

ATTACHMENT 4
SEP12-01257

WETLAND C

Plate 26
WETLAND FIELD DATA FORM

(Note: Applicable to Chapter 90 KZC, but not Chapter 83 KZC)

WETLAND FIELD DATA FORM

BEGIN BY CHECKING ANY OF THE FOLLOWING (a. – e.) THAT APPLY:

a. The wetland is contiguous to Lake Washington;

b. The wetland contains at least 1/4 acre of organic soils, such as peat bogs or mucky soils;

c. The wetland is equal to or greater than 10 acres in size and having three or more wetland classes, as defined by the U.S. Fish & Wildlife Service (Cowardin et al., 1979), one of which is open water;

d. The wetland has significant habitat value to state or federally listed threatened or endangered wildlife species; or

e. The wetland contains state or federally listed threatened or endangered plant species.

IF ANY OF THE CRITERIA LISTED ABOVE ARE MET, THEN THE WETLAND IS CONSIDERED TO BE TYPE 1. IF THAT IS THE CASE, PLEASE CONTINUE TO COMPLETE THE ENTIRE FORM, BUT DO NOT ASSIGN POINTS.

IF THE WETLAND DOES NOT MEET THE CRITERIA LISTED ABOVE FOR TYPE 1, COMPLETE THE ENTIRE FORM, USING THE ASSIGNED POINTS TO DETERMINE IF IT IS A TYPE 2 OR TYPE 3 WETLAND.

Type 2 wetlands typically have at least two wetland vegetation classes, are at least partially surrounded by buffers of native vegetation, connected by surface water flow (perennial or intermittent) to other wetlands or streams, and contain or are associated with forested habitat.

1. Total wetland area

Estimate wetland area and score from choices	Acres		Point Value	Points
	>20.00	=	6	
	10-19.99	=	5	

5-9.99	=	4
1-4.99	=	3
0.1-0.99	=	2
<0.1	=	1

2. Wetland classes: Determine the number of wetland classes that qualify, and score according to the table.

	# of Classes		Points
Open Water: if the area of open water is >1/3 acre or >10% of the total wetland area	1	=	1
Aquatic Beds: if the area of aquatic beds is >10% of the **open water** area **or** >1/2 acre	2	=	3
Emergent: if the area of emergent class is >1/2 acre **or** >10% of the total wetland area	3	=	5
Scrub-Shrub: if the area of scrub-shrub class is >1/2 acre **or** >10% of the total wetland area	4	=	7
Forested: if the area of forested class is >1/2 acre or >10% of the total wetland area	5	=	10

3. Plant species diversity.

For all wetland classes which qualified in 2 above, count the number of different plant species and score according to the table below. You do not have to name them.

e.g., if a wetland has an aquatic bed class with 3 species, and emergent class with 4 species and a scrub-shrub class with 2 species, you would circle 2, 2, and 1 in the second column (below).

Class	# of Species		Point Value
Aquatic Bed	1-2	=	1
	3	=	2
	>3	=	3
Emergent	1-2	=	1
	3-4	=	2
	>4	=	3

Class	# of Species		Point Value
Scrub-Shrub	1-2	=	1
	3-4	=	2
	>4	=	3
Forested	1-2	=	1
	3-4	=	2
	>4	=	3

4. Structural diversity.

If the wetland has a forested class, add 1 point for each of the following attributes present:

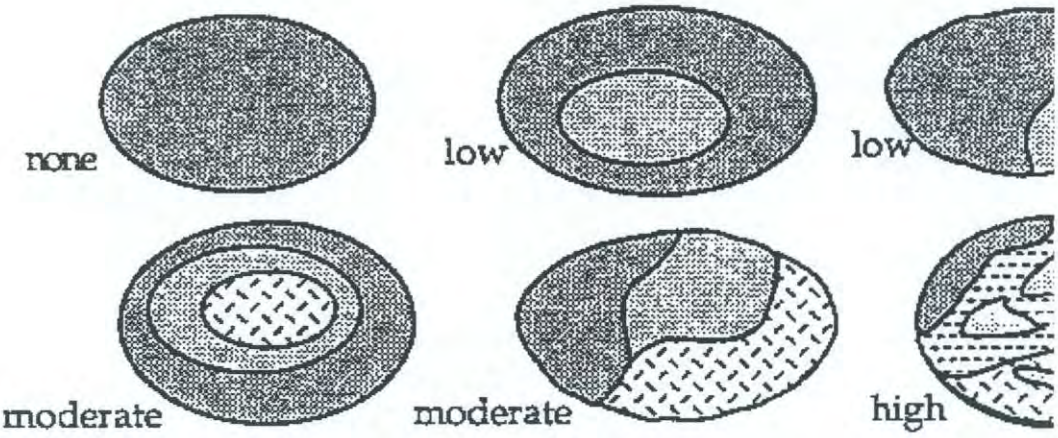
Trees >50′ tall	=	1

Trees 20′ to 49′ tall	=	1
shrubs	=	1
Herbaceous ground cover	=	1

5. Interspection between wetland classes.

Decide from the diagrams below whether interspection between wetland classes is high, moderate, low or none

3	=	High
2	=	Moderate
1	=	Low
0	=	None



6. Habitat features

Add points associated with each habitat feature listed:	=	3
Is there evidence of current use by beavers?	=	2
Is a heron rookery located within 300′?	=	1
Are raptor nest(s) located within 300′?	=	1
Are there at least 2 standing dead trees (snags) per acre?2	=	1
Are there any other perches (wires, poles, or posts)?	=	1
Are there at least 3 downed logs per acre?	=	1

7. Connection to streams

Is the wetland connected at any time of the year via surface water? (score one answer only)

Is the wetland connected at any time of the year via surface water?

To a perennial stream or a seasonal stream *with* fish	=	5
To a seasonal stream *without* fish	=	(3)
Is not connected to any stream	=	0

8. Buffers

Step 1: Estimate (to the nearest 5%) the percentage of each buffer or land-use type (below) that adjoins the wetland boundary. Then multiply these percentages by the factor(s) below and enter result in the column to the right.

	% of Buffer	Step 1	Width Factor	Step 2
Roads, buildings or parking lots	% X 0 =	80 x 1	=	80
Lawn, grazed pasture, vineyards or annual crops	% X 1 =	20 x 1	=	20
Ungrazed grassland or orchards	% X 2 =		=	
Open water or native grasslands	% X 3 =		=	
Forest or shrub	% X 4 =		=	
			Add buffer total	100

Step 2: Multiply result(s) of step 1:

(By 1 if buffer width is 25-50′)

By 2 if buffer width is 50-100′

By 3 if buffer width is >100′

Enter results and add subscores

Step 3: Score points according to the following table:

Buffer Total

900-1200 = 4

600-899 = 3

300-599 = 2

100-299 = (1)

9. Connection to other habitat areas:

Is there a riparian corridor to other wetlands within 0.25 of a mile, or a corridor >100′ wide with good forest or shrub cover to any other habitat area?	=	5
Is there a narrow corridor <100′ wide with good cover or a wide corridor >100′ wide with low cover to any other habitat area?	=	3

Is there a narrow corridor <100' wide with low cover or a significant habitat area within 0.25 mile but no corridor? = 1

Is the wetland and buffer completely isolated by development and/or cultivated agricultural land? = 0

10. Scoring

Add the scores to get a total: 10

Question: Is the total greater than or equal to 22 points?

Answer:

Yes = Type 2

No = Type 3