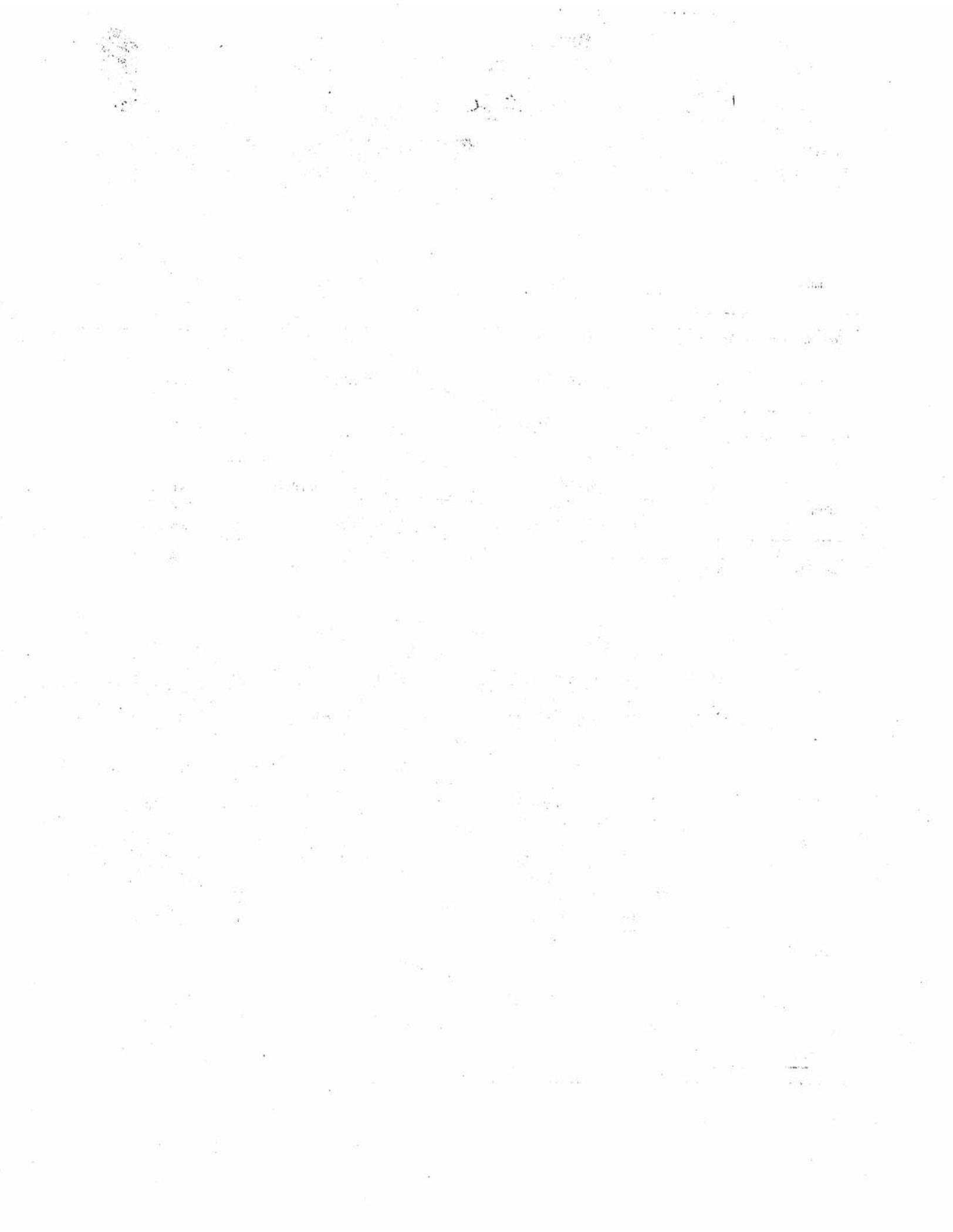


Sammamish Basin Plans

Rapid Qualitative Function Assessment Form

Wetland No. 1511 Observer(s): CH, FC Date: Dec 4/18

FUNCTION	CRITERIA		
	LOW RATING	MODERATE RATING	HIGH RATING
Water Quality Improvement	rapid flow through wetland	<input checked="" type="checkbox"/> moderate flow through wetland	little or no flow present
	<input type="checkbox"/> <50% vegetation density	<input type="checkbox"/> 50-80% vegetation density	<input checked="" type="checkbox"/> >80% vegetation density
	<input type="checkbox"/> no proximity to pollutants	<input checked="" type="checkbox"/> downstream from non-point pollutants	<input type="checkbox"/> downstream from point discharges
Evaluation:	<input type="checkbox"/> detains <25% overland runoff	<input checked="" type="checkbox"/> detains 25-50% overland runoff	<input type="checkbox"/> detains >50% overland runoff
Flood/Storm Water Control	size <5 acres	<input checked="" type="checkbox"/> size 5-10 acres	size >10 acres
Evaluation:	<input type="checkbox"/> <u>riverine</u> shallow depression	<input type="checkbox"/> mid-sloped wetland	<input type="checkbox"/> lake, depressions, headwaters, bogs
Groundwater Recharge	size <5 acres	<input checked="" type="checkbox"/> size 5-10 acres	size >10 acres
	<input type="checkbox"/> temporarily saturated/inundated	<input type="checkbox"/> seasonally saturated/inundated	<input type="checkbox"/> permanently inundated
Evaluation:	<input type="checkbox"/> springs present outflow>inflow	<input type="checkbox"/> outflow=inflow	<input type="checkbox"/> outflow<inflow
Natural Biological Support	size <5 acres	<input checked="" type="checkbox"/> size 5-10 acres	size >10 acres
	<input type="checkbox"/> isolated systems associated with ephemeral surface water	<input checked="" type="checkbox"/> associated with permanent surface water	<input type="checkbox"/> associated with permanent open water
	<input type="checkbox"/> one habitat type	<input type="checkbox"/> two habitat types	<input checked="" type="checkbox"/> three or more habitat types
	<input type="checkbox"/> little or no interspersion of habitats	<input type="checkbox"/> some habitat interspersion	<input checked="" type="checkbox"/> habitats highly interspersed
	<input type="checkbox"/> low plant diversity	<input checked="" type="checkbox"/> moderate plant diversity	<input type="checkbox"/> high plant diversity
	<input type="checkbox"/> few, if any habitat features present	<input checked="" type="checkbox"/> some habitat features present	<input type="checkbox"/> several habitat features present
	<input type="checkbox"/> adjacent buffers primarily disturbed and/or developed	<input checked="" type="checkbox"/> buffers somewhat disturbed and/or developed	<input type="checkbox"/> buffers generally undisturbed native vegetation and undeveloped
	<input type="checkbox"/> few connections to other habitat types	<input type="checkbox"/> some connection to other habitat types	<input checked="" type="checkbox"/> significant connections to high quality habitat types
Evaluation:	<input type="checkbox"/> Agricultural land or low vegetation structure	<input type="checkbox"/> moderate vegetation structure	<input checked="" type="checkbox"/> high vegetation structure
Erosion/Shoreline Protection	sparse grass/forbs or not vegetation	sparse woody vegetation or dense herb vegetation	<input checked="" type="checkbox"/> dense woody vegetation
Evaluation:			



Sammamish Basin Plans Wetland Field Data Form

Wetland No: 1559 Location: Monte S.F. NE 8th Date: Dec 4/08
 Sub-basin: Inglewood Cowardin Class: PSS HGM Class: PSS
 Estimated Wetland Size (ac): <0.1 _____ 0.1-1 _____ 1-5 5-10 _____ >10 _____
 Identified by: CHCF Photo No. _____

Wetland Condition

Evidence of hydrologic alterations? If yes, indicate type. Yes No

- | | |
|--------------------------------------|---|
| <input type="checkbox"/> a. dredging | <input type="checkbox"/> e. drainage ditches/diversions |
| <input type="checkbox"/> b. filling | <input type="checkbox"/> f. crop production |
| <input type="checkbox"/> c. draining | <input type="checkbox"/> g. other _____ |
| <input type="checkbox"/> d. clearing | |

Apparent impacts/threats to wetland from human use? If yes, indicate type. Yes No

- | | |
|---|--|
| <input type="checkbox"/> a. clearing | <input type="checkbox"/> d. recreational overuse |
| <input type="checkbox"/> b. grazing/agriculture | <input checked="" type="checkbox"/> e. residential development |
| <input type="checkbox"/> c. litter | <input type="checkbox"/> f. other _____ |

Hydrology

Water sources and hydroperiod:

- | | |
|--|--|
| <input type="checkbox"/> Ground water (perched water table, through flow...) | <input checked="" type="checkbox"/> Seasonally flooded/saturated |
| <input type="checkbox"/> Surface water | <input type="checkbox"/> Permanently flooded/saturated |
| <input checked="" type="checkbox"/> Seep | <input type="checkbox"/> Other _____ |

Inlet/outlet:

- | | |
|---|---|
| <input type="checkbox"/> a. constrained, size _____ | <input type="checkbox"/> d. none |
| <input type="checkbox"/> b. unconstrained | <input checked="" type="checkbox"/> e. could not locate |
| <input type="checkbox"/> c. natural channel | |

Hydrologic connectivity to other wetlands and streams? Yes No

Indicators of wetland hydrology:

- | | |
|--|---|
| <input type="checkbox"/> a. inundation | <input type="checkbox"/> e. sediment deposits |
| <input type="checkbox"/> b. saturated in upper 12" | <input type="checkbox"/> f. drainage patterns in wetlands |
| <input type="checkbox"/> c. water marks | <input type="checkbox"/> h. water-stained leaves |
| <input type="checkbox"/> d. drift lines | <input type="checkbox"/> i. other _____ |

Soil

Is the wetland mapped on hydric soil? Yes No

Soil profile: _____

Sammamish Basin Plans Rapid Qualitative Function Assessment Form

Wetland No. 1559

Observer(s): CH, EC

Date: Dec 4/08

FUNCTION	CRITERIA		
	LOW RATING	MODERATE RATING	HIGH RATING
Water Quality Improvement	rapid flow through wetland	moderate flow through wetland	<input checked="" type="checkbox"/> little or no flow present
	<input type="checkbox"/> <50% vegetation density	<input type="checkbox"/> 50-80% vegetation density	<input checked="" type="checkbox"/> >80% vegetation density
	<input type="checkbox"/> no proximity to pollutants	<input checked="" type="checkbox"/> downstream from non-point pollutants	<input type="checkbox"/> downstream from point discharges
Evaluation:	<input checked="" type="checkbox"/> detains <25% overland runoff	<input type="checkbox"/> detains 25-50% overland runoff	<input type="checkbox"/> detains >50% overland runoff
Flood/Storm Water Control	<input checked="" type="checkbox"/> size <5 acres	size 5-10 acres	size >10 acres
Evaluation:	<input checked="" type="checkbox"/> riverine <u>shallow depression</u>	mid-sloped wetland	lake, depressions, headwaters, bogs
Groundwater Recharge	<input checked="" type="checkbox"/> size <5 acres	size 5-10 acres	size >10 acres
	<input checked="" type="checkbox"/> temporarily saturated/inundated	seasonally saturated/inundated	permanently inundated
Evaluation:	<input type="checkbox"/> springs present outflow>inflow	<input checked="" type="checkbox"/> outflow=inflow	<input type="checkbox"/> outflow<inflow
Natural Biological Support	size <5 acres	size 5-10 acres	size >10 acres
	<input checked="" type="checkbox"/> isolated systems associated with ephemeral surface water	associated with permanent surface water	associated with permanent open water
	<input checked="" type="checkbox"/> one habitat type	two habitat types	three or more habitat types
	<input checked="" type="checkbox"/> little or no interspersions of habitats	some habitat interspersions	habitats highly interspersed
	<input checked="" type="checkbox"/> low plant diversity	moderate plant diversity	high plant diversity
	<input checked="" type="checkbox"/> few, if any habitat features present	some habitat features present	several habitat features present
	adjacent buffers primarily disturbed and/or developed	<input checked="" type="checkbox"/> buffers somewhat disturbed and/or developed	buffers generally undisturbed native vegetation and undeveloped
	<input checked="" type="checkbox"/> few connections to other habitat types	some connection to other habitat types	significant connections to high quality habitat types
Evaluation:	<input type="checkbox"/> Agricultural land or low vegetation structure	<input checked="" type="checkbox"/> moderate vegetation structure	<input type="checkbox"/> high vegetation structure
Erosion/Shoreline Protection	sparse grass/forbs or not vegetation	sparse woody vegetation or dense herb vegetation	<input checked="" type="checkbox"/> dense woody vegetation
Evaluation:			

8:

51-3

171

100-1000

100-1000

100-1000

100-1000

100-1000

100-1000

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100-1000

100-1000

100-1000

100-1000

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100-1000

100-1000

100-1000

Sammamish Basin Plans Wetland Field Data Form

Wetland No: 1577 Location: east of 228 Date: Nov. 4/08
 Sub-basin: Inglewood Cowardin Class: PEM, PSS HGM Class: Riverine, Depress
 Estimated Wetland Size (ac): <0.1 _____ 0.1-1 _____ 1-5 5-10 _____ >10 _____
 Identified by: CH, EC Photo No. _____

Wetland Condition

Evidence of hydrologic alterations? If yes, indicate type. Yes No

- | | |
|--------------------------------------|---|
| <input type="checkbox"/> a. dredging | <input type="checkbox"/> e. drainage ditches/diversions |
| <input type="checkbox"/> b. filling | <input type="checkbox"/> f. crop production |
| <input type="checkbox"/> c. draining | <input type="checkbox"/> g. other <u>road edge</u> |
| <input type="checkbox"/> d. clearing | |

Apparent impacts/threats to wetland from human use? If yes, indicate type. Yes No

- | | |
|---|--|
| <input type="checkbox"/> a. clearing | <input type="checkbox"/> d. recreational overuse |
| <input type="checkbox"/> b. grazing/agriculture | <input checked="" type="checkbox"/> e. residential development |
| <input type="checkbox"/> c. litter | <input checked="" type="checkbox"/> f. other <u>road</u> |

Hydrology

Water sources and hydroperiod:

- | | |
|--|--|
| <input type="checkbox"/> Ground water (perched water table, through flow...) | <input checked="" type="checkbox"/> Seasonally flooded/saturated |
| <input checked="" type="checkbox"/> Surface water | <input type="checkbox"/> Permanently flooded/saturated |
| <input type="checkbox"/> Seep | <input type="checkbox"/> Other <u>may also be ground water fed</u> |

Inlet/outlet:

- | | |
|---|--|
| <input type="checkbox"/> a. constrained, size _____ | <input type="checkbox"/> d. none |
| <input type="checkbox"/> b. unconstrained | <input type="checkbox"/> e. could not locate |
| <input type="checkbox"/> c. natural channel | |

Hydrologic connectivity to other wetlands and streams? Yes No

Indicators of wetland hydrology:

- | | |
|---|---|
| <input type="checkbox"/> a. inundation | <input type="checkbox"/> e. sediment deposits |
| <input checked="" type="checkbox"/> b. saturated in upper 12" | <input type="checkbox"/> f. drainage patterns in wetlands |
| <input type="checkbox"/> c. water marks | <input type="checkbox"/> h. water-stained leaves |
| <input type="checkbox"/> d. drift lines | <input type="checkbox"/> i. other _____ |

Soil

Is the wetland mapped on hydric soil? Yes No

Soil profile: _____

Sammamish Basin Plans Wetland Field Data Form

Vegetation

Dominant Species: _____

Invasive Species? Yes (%) 30 No _____

Bracken fern, ALRU, POBA, PHAR, RUAR, SALV, SP, TRPL

Sword fern (hummocks)

(-holly)

Approximate age of dominant woody vegetation (years)?

<50

50-80

>80

of habitat types:

1

2

≥ 3

Degree of interspersion:

Low

Mod

High

Vegetation connectivity to other habitats? _____

Food sources or habitat features for wildlife? Some

Buffer

Does the wetland have a buffer anywhere along its perimeter? Yes No

a. grass-lawn

d. forested

b. herbaceous-native

f. other _____

c. scrub-shrub

If yes, what percentage of the wetland edge is protected by buffers of the width categories listed below? (Note: total should add to 100%)

a. % no buffer

d. % 50-100 ft

b. % <25 ft

e. % >100 ft

95 c. % 25-50 ft

Mitigation Opportunities

Are any mitigation opportunities present nearby? Yes No

a. restoration

c. enhancement

b. creation

d. preservation

Notes: borderline wetland; could only see end from road, likely already delineated

Sammamish Basin Plans

Rapid Qualitative Function Assessment Form

Wetland No. 1577

Observer(s): CH, EC

Date: Dec 4/00

FUNCTION	CRITERIA		
	LOW RATING	MODERATE RATING	HIGH RATING
Water Quality Improvement Evaluation:	<input type="checkbox"/> rapid flow through wetland <input type="checkbox"/> <50% vegetation density <input type="checkbox"/> no proximity to pollutants <input checked="" type="checkbox"/> detains <25% overland runoff	<input type="checkbox"/> moderate flow through wetland <input type="checkbox"/> 50-80% vegetation density <input checked="" type="checkbox"/> downstream from non-point pollutants <input type="checkbox"/> detains 25-50% overland runoff	<input checked="" type="checkbox"/> little or no flow present <input checked="" type="checkbox"/> >80% vegetation density <input type="checkbox"/> downstream from point discharges <input type="checkbox"/> detains >50% overland runoff
Flood/Storm Water Control Evaluation:	<input type="checkbox"/> size <5 acres <input checked="" type="checkbox"/> <u>riverine, shallow depression</u>	<input checked="" type="checkbox"/> size 5-10 acres <input type="checkbox"/> mid-sloped wetland	<input type="checkbox"/> size >10 acres <input type="checkbox"/> lake, depressions, headwaters, bogs
Groundwater Recharge Evaluation:	<input type="checkbox"/> size <5 acres <input checked="" type="checkbox"/> temporarily saturated/inundated <input type="checkbox"/> springs present outflow>inflow	<input type="checkbox"/> size 5-10 acres <input type="checkbox"/> seasonally saturated/inundated <input checked="" type="checkbox"/> outflow=inflow	<input type="checkbox"/> size >10 acres <input type="checkbox"/> permanently inundated <input type="checkbox"/> outflow<inflow
Natural Biological Support Evaluation:	<input type="checkbox"/> size <5 acres <input type="checkbox"/> isolated systems associated with ephemeral surface water <input type="checkbox"/> one habitat type <input type="checkbox"/> little or no interspersion of habitats <input type="checkbox"/> low plant diversity <input type="checkbox"/> few, if any habitat features present <input type="checkbox"/> adjacent buffers primarily disturbed and/or developed <input type="checkbox"/> few connections to other habitat types <input type="checkbox"/> Agricultural land or low vegetation structure	<input checked="" type="checkbox"/> size 5-10 acres <input checked="" type="checkbox"/> associated with permanent surface water <input checked="" type="checkbox"/> two habitat types <input checked="" type="checkbox"/> some habitat interspersion <input checked="" type="checkbox"/> moderate plant diversity <input type="checkbox"/> some habitat features present <input checked="" type="checkbox"/> buffers somewhat disturbed and/or developed <input checked="" type="checkbox"/> some connection to other habitat types <input checked="" type="checkbox"/> moderate vegetation structure	<input type="checkbox"/> size >10 acres <input type="checkbox"/> associated with permanent open water <input type="checkbox"/> three or more habitat types <input type="checkbox"/> habitats highly interspersed <input type="checkbox"/> high plant diversity <input checked="" type="checkbox"/> several habitat features present <input type="checkbox"/> buffers generally undisturbed native vegetation and undeveloped <input type="checkbox"/> significant connections to high quality habitat types <input type="checkbox"/> high vegetation structure
Erosion/Shoreline Protection Evaluation:	<input type="checkbox"/> sparse grass/forbs or not vegetation	<input type="checkbox"/> sparse woody vegetation or dense herb vegetation	<input checked="" type="checkbox"/> dense woody vegetation



Sammamish Basin Plans Wetland Field Data Form

Wetland No: 15803 Location: between 224th Ave SE's Date: Dec 4/08
 Sub-basin: B Inglewood Cowardin Class: PEM HGM Class: Riverine
 Estimated Wetland Size (ac): <0.1 _____ 0.1-1 1-5 _____ 5-10 _____ >10 _____
 Identified by: _____ Photo No. _____

Wetland Condition

Evidence of hydrologic alterations? If yes, indicate type. Yes No

- | | |
|---|--|
| <input type="checkbox"/> a. dredging | <input checked="" type="checkbox"/> e. drainage ditches/diversions |
| <input type="checkbox"/> b. filling | <input checked="" type="checkbox"/> f. crop production |
| <input type="checkbox"/> c. draining | <input type="checkbox"/> g. other _____ |
| <input checked="" type="checkbox"/> d. clearing | |

Apparent impacts/threats to wetland from human use? If yes, indicate type. Yes No

- | | |
|--|--|
| <input type="checkbox"/> a. clearing | <input type="checkbox"/> d. recreational overuse |
| <input checked="" type="checkbox"/> b. grazing/agriculture | <input checked="" type="checkbox"/> e. residential development |
| <input type="checkbox"/> c. litter | <input type="checkbox"/> f. other _____ |

Hydrology

Water sources and hydroperiod:

- | | |
|--|--|
| <input type="checkbox"/> Ground water (perched water table, through flow...) | <input type="checkbox"/> Seasonally flooded/saturated |
| <input checked="" type="checkbox"/> Surface water | <input type="checkbox"/> Permanently flooded/saturated |
| <input type="checkbox"/> Seep | <input type="checkbox"/> Other _____ |

Inlet/outlet:

- | | |
|---|---|
| <input type="checkbox"/> a. constrained, size _____ | <input type="checkbox"/> d. none |
| <input type="checkbox"/> b. unconstrained | <input checked="" type="checkbox"/> e. could not locate |
| <input type="checkbox"/> c. natural channel | |

Hydrologic connectivity to other wetlands and streams? Yes No

Indicators of wetland hydrology:

- | | |
|--|--|
| <input type="checkbox"/> a. inundation | <input type="checkbox"/> e. sediment deposits |
| <input type="checkbox"/> b. saturated in upper 12" | <input type="checkbox"/> f. drainage patterns in wetlands |
| <input type="checkbox"/> c. water marks | <input type="checkbox"/> h. water-stained leaves |
| <input type="checkbox"/> d. drift lines | <input checked="" type="checkbox"/> i. other <u>vegetation</u> |

Soil

Is the wetland mapped on hydric soil? Yes No

Soil profile: _____

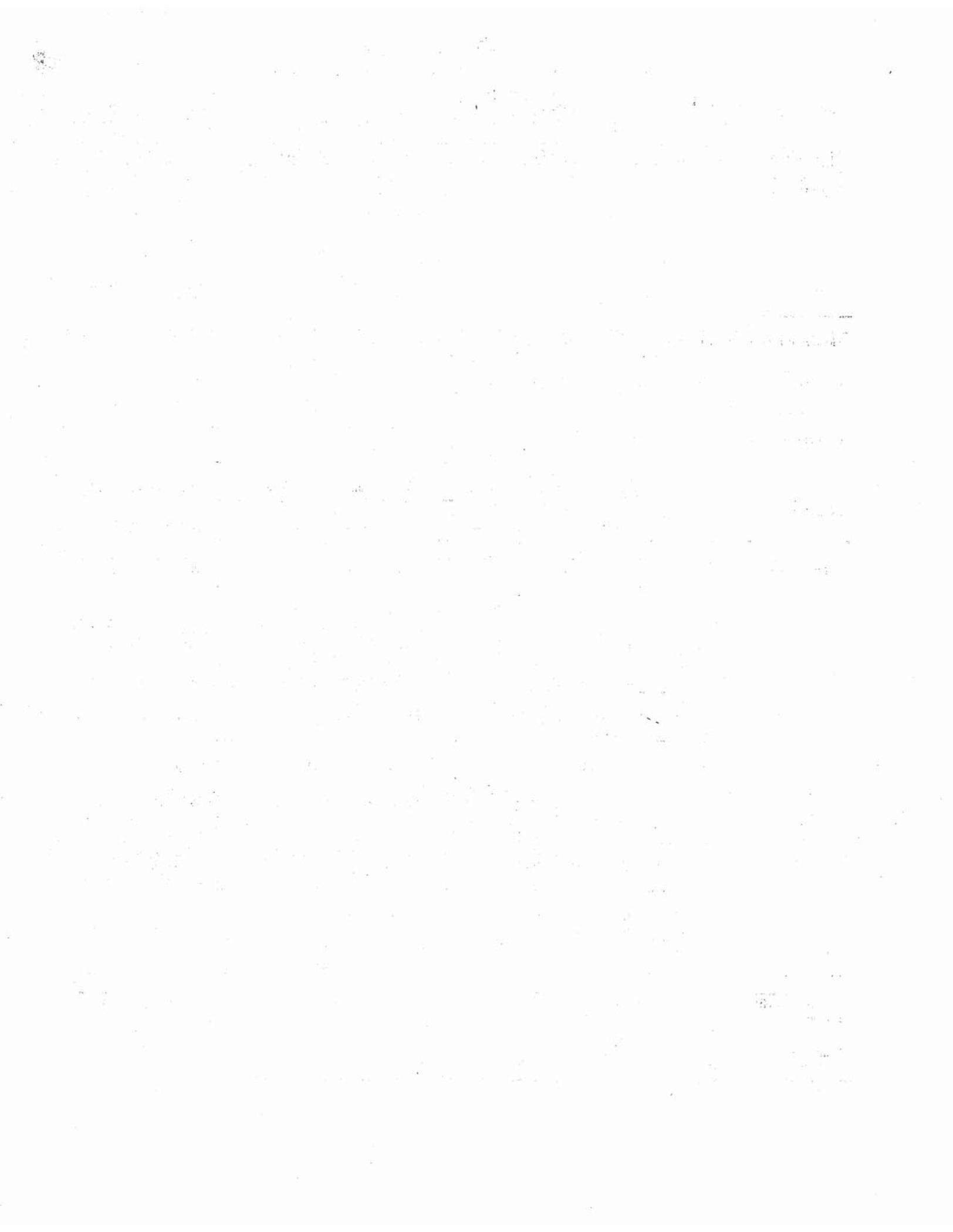
Sammamish Basin Plans Rapid Qualitative Function Assessment Form

Wetland No. 1580B

Observer(s): CH, EC

Date: Dec 4/08

FUNCTION	CRITERIA		
	LOW RATING	MODERATE RATING	HIGH RATING
Water Quality Improvement	rapid flow through wetland	moderate flow through wetland	<input checked="" type="checkbox"/> little or no flow present
	<input type="checkbox"/> <50% vegetation density	<input checked="" type="checkbox"/> 50-80% vegetation density	<input type="checkbox"/> >80% vegetation density
	<input type="checkbox"/> no proximity to pollutants	<input checked="" type="checkbox"/> downstream from non-point pollutants	<input type="checkbox"/> downstream from point discharges
Evaluation:	<input checked="" type="checkbox"/> detains <25% overland runoff	<input type="checkbox"/> detains 25-50% overland runoff	<input type="checkbox"/> detains >50% overland runoff
Flood/Storm Water Control	<input checked="" type="checkbox"/> size <5 acres	size 5-10 acres	size >10 acres
Evaluation:	<input type="checkbox"/> riverine, <u>shallow depression</u>	<input type="checkbox"/> mid-sloped wetland	<input checked="" type="checkbox"/> <u>lake depressions, headwaters, bogs</u>
Groundwater Recharge	<input checked="" type="checkbox"/> size <5 acres	size 5-10 acres	size >10 acres
	<input checked="" type="checkbox"/> temporarily saturated/inundated	seasonally saturated/inundated	permanently inundated
Evaluation:	<input type="checkbox"/> springs present outflow>inflow	<input type="checkbox"/> outflow=inflow	<input type="checkbox"/> outflow<inflow
Natural Biological Support	<input checked="" type="checkbox"/> size <5 acres	size 5-10 acres	size >10 acres
	<input type="checkbox"/> isolated systems associated with ephemeral surface water	<input checked="" type="checkbox"/> associated with permanent surface water	<input type="checkbox"/> associated with permanent open water
	<input checked="" type="checkbox"/> one habitat type	two habitat types	three or more habitat types
	<input checked="" type="checkbox"/> little or no interspersion of habitats	some habitat interspersion	habitats highly interspersed
	<input checked="" type="checkbox"/> low plant diversity	moderate plant diversity	high plant diversity
	<input checked="" type="checkbox"/> few, if any habitat features present	some habitat features present	several habitat features present
	<input checked="" type="checkbox"/> adjacent buffers primarily disturbed and/or developed	buffers somewhat disturbed and/or developed	buffers generally undisturbed native vegetation and undeveloped
	<input type="checkbox"/> few connections to other habitat types	<input checked="" type="checkbox"/> some connection to other habitat types	significant connections to high quality habitat types
Evaluation:	<input checked="" type="checkbox"/> Agricultural land or low vegetation structure	<input type="checkbox"/> moderate vegetation structure	<input type="checkbox"/> high vegetation structure
Erosion/Shoreline Protection	<input checked="" type="checkbox"/> sparse grass/forbs or not vegetation	sparse woody vegetation or dense herb vegetation	dense woody vegetation
Evaluation:			



APPENDIX C

Field Data Comparison – 1990 and 2008

Table C-1. Comparison of Existing Conditions (2008) to 1990 Conditions

George Davis Creek Existing Conditions (2008) compared to 1990 King County Documented Conditions
 George Davis Creek is referred to as Tributary 0144 in King County Existing Conditions Report

KC Subcatchment	Approx. RM	1990 Description of Conditions	2008 Description of Conditions
I-1	0.0- 0.2	Culvert system from Lake Sammamish shore upstream under single family home and driveway. Culvert capacity insufficient to accommodate sediment load. Barrier to fish.	Stream is still in a culvert system under a single family residence. Currently stream flow is being diverted from ELSP around the house as it is being rebuilt. Stream will be partially daylighted in new configuration, but will still be under the house.
I-1	0.0- 0.2	Channel realignment and culvert placements are inadequate for peak storm flows at E. Lake Sammamish Parkway and under the single family resident lot adjacent to Lake Sammamish.	Several large stormwater control structures upstream of ELSP that lead to culvert under road. Bypass structures located here- ponding in this area.
I-1	0.0-0.2	Culverts and channelization are restricting flow capacity and sediment transport.	
I-1	0.05	Stream flows and sediment load exceeded culvert and channel capacity at E. lake Sammamish Parkway, R/R berm culvert, and culvert under single family residence. Flows and sediment deposition caused closure of E. Lake Sammamish Parkway on January 11, 1990 and two homes received flood flow in the basement.	Incised channel just upstream of ELSP, becomes more incised upstream from 2.5 to 6 feet deep. Unstable left bank adjacent to yard.
	0.08		Fence across channel, stream enters steep forested ravine. Entrenched channel, mass-wasting deposits.
	0.09		Valley widens, stream channel spilt into two separate channels. Lots of cobbles, some boulders, not entrenched.
I-1	0.1	Bank erosion probably due to recent high flows.	

Table C-1. Comparison of Existing Conditions (2008) to 1990 Conditions

KC Subcatchment	Approx. RM	1990 Description of Conditions	2008 Description of Conditions
I-1	0.17 - 0.37	A concrete weir is located at approximately RM 0.17. The weir filled with sediments and storm flows breached the dam around the left abutment. Channel has incised through the sediments.	Concrete weir spans full valley (3.5' high). Large rusted tank downstream of weir. Small hole in weir wall allows water to pass through. Check dams with filter fabric and logs located downstream of weir.
I-1	0.2	Potential fish blockage from water supply diversion dam. Dam failure during 1/90 storm.	
	0.18		Upstream of weir, 12- 18' dia solid black stormpipe with energy dissipation about 20 feet above valley floor on right bank slope.
I-1	0.08- 0.75	High velocity flows causing ditch erosion along Inglewood Hill Road.	
I-1	0.5	Water supply check dam was breached at left bank abutment at RM 0.5 mile. Sediment source for future storm flows.	
I-1	0.2 - 0.8	Channel sedimentation. Due to local channel incision and channel scouring within RM 6.8 - 1.2. (???)	Rootwad structures every 50- 100' along stream channel
I-1	0.3- 0.4	Extensive historic and recent slide/slump topography including eroding banks.	Evidence of slumping and sliding particularly on right bank. Old road bench?? Present on right bank. No evidence of recent landslides.
	0.5		Very large landslide left bank (60-100' x 60'x10") Vegetated with salmonberries, sword ferns
	0.6		landslide on left bank (40'x40'x5'), saturated side slopes in clay unit at the base
	0.62		Ravine on left bank, slides in this area, more sloughing on both banks
	0.7		Left bank landslide (60'x40'x8'), saturated at bottom. Braided reach, wide valley (~100 feet), lots of cobbles, seeps coming in on left bank.

Table C-1. Comparison of Existing Conditions (2008) to 1990 Conditions

KC Subcatchment	Approx. RM	1990 Description of Conditions	2008 Description of Conditions
I-1	0.37 - 0.8	Steep-sloped ravine is currently heavily forested. Increased flows evident in recent channel incision. Debris jams and boulder armoring of channel are retaining sediments and reducing incision. Lateral erosion and bank cutting has resulted in several slides and slumping.	
I-1	0.8	Fish blockage due to long culvert with no light	Two rusted culverts, stream is partially in culverts, but mostly not. Metal conduit pipe (1 1/2") in channel.
I-1	0.8	On 214th Ave NE at the end of the road (a dead end), there is an overgrazed pasture, and an adjacent pasture which was noted as having bedding material spread across the field.	landslide on left bank (25'x20'x5')
	0.82		End of wetted channel. Smaller gravel/cobbles in dry channel.
	1		3.5'x5' squashed culverts at road crossing.
I-1, I-2	0.8- 1.2	Manmade trapezoid channel through single family development. Channel soils highly erodible sands and gravels.	
I-2	0.81- 1.27	Soils in this reach are very gravelly and appear to have a high rate of infiltration. These highly infiltrative soils have helped to mitigate flows that have been generated by current levels of development.	
I-2	0.9	Flooding of NE 4th Street approximately 6" water depth over roadway. Roadway partially washed out. Observed January 11, 1990.	

Table C-1. Comparison of Existing Conditions (2008) to 1990 Conditions

KC Subcatchment	Approx. RM	1990 Description of Conditions	2008 Description of Conditions
I-2	1	At NE 4th Street and 219th Ave NE, there exists the remains of two yard scrap (lawn clipping, sticks, and twigs) burns in the channel (on the east side). On the west side of the channel, a pile of gravel, soil, debris, and lawn clipping along the side of the channel was observed.	
I-1, I-2	0.8 - 1.2	Manmade trapezoid channel through single family development. Channel soils highly erodible sands and gravels.	
I-3	1.2	Water over the roadway. Channel flowing full. Observed January 11, 1990.	
I-3	1.7	West of 228th Ave SE and north of SE 1st Street, there is a llama farm. This field was noted as being over-used.	
I-4	1.8	Sampling site ELSWQ2: TSS, turbidity, TP, fecal coliform, and zinc concentrations were elevated in the 4/34/90 storm. TP was 0.09 mg/L. Agricultural and land use are the likely source of these contaminants.	
I-5	1.88- 2	Stream outletting from wetland exhibits signs of channel dredging and debris removal. The right bank has been cleared of all riparian vegetation outward from the stream . An HPA violation has likely occurred.	

Table C-1. Comparison of Existing Conditions (2008) to 1990 Conditions

KC Subcatchment	Approx. RM	1990 Description of Conditions	2008 Description of Conditions
I-5	2	Sampling site ELSWQ3: TSS, turbidity, TP, fecal coliform, copper, and zinc concentrations were elevated in the 4/34/90 storm. TP and fecal coliform concentrations were 0.096 mg/L and 2100 organisms/100 mL, respectively. Agricultural activity is the likely source of these contaminants.	
I-5	2- 2.2	Forested wetland provides attenuation for increased flows from a development upstream (approx. RM 2.5)	
I-5, I-6	2.2- 2.3	Horse pasture. Stream is confined to a gully which outlets a pond just upstream of a private road.	
I-7	2.5- 2.63	Development has cleared and filled a forested wetland and installed a pond (trout), not designed for R/D use. Cleared area around pond has no TESC. SEPA DNS posted for area adjacent to wetland.	
I-7	2.63- 3.2	Forested wetland contributes to attenuate flows from increased development in headwater region.	
I-7	2.63	Wetland is contributing to mitigation of increased runoff from current developments	
I-7	2.63	Forested stream corridor	
I-7	Wetland 18	Recent clearing and gradient buffers. Recent logging in the wetlands.	
I-7	Wetland 66	Some evidence of fill and yard waste.	
I-3	Trib 0144C, RM 0.25	Water over roadway at 222nd Pl NE. Water depth approx. 4 - 6". Observed January 11, 1990.	

Table C-1. Comparison of Existing Conditions (2008) to 1990 Conditions

KC Subcatchment	Approx. RM	1990 Description of Conditions	2008 Description of Conditions
I-3	Wetland 11	Recent clearing and gradient buffers. Recent logging in the wetlands.	
I-3	Trib 0144E, RM 0.2	Commercial development has occurred on the south side of the intersection of Inglewood Hill Road and 228th Ave SE. The area hosts a variety of businesses including neighborhood commercial activities, dry cleaning, and two gas stations. Potential pollutants associated with commercial development, particularly dry cleaning and gas stations, are cleaning chemicals, detergents, oil, grease, fuel, and other petroleum by-products.	
I-3	0.4	Near 8th Ave NE on 231st PI NE, a small hobby farm was noted with a single horse in an overgrazed pasture.	
I-3	0.4/Wetland 39	Triple J Farms (23404 8th NE) is a llama farm. One field was under water with animals using the pasture area during site visits on April 14, 1990 and may 15, 1990.	
I-3	0.1	Sampling site ELSWQ1: TSS, turbidity, TP, fecal coliform, copper and zince concentrations were elevation in the 4/34/1990 storm. Fecal colifroms were 3400 organisms/100 mL. TP was 0.14 mg/L. Agricultural activity is the likely source of these pollutants.	
I-3	Wetland 59	Lumber trimmings and other debris in wetland.	

APPENDIX D

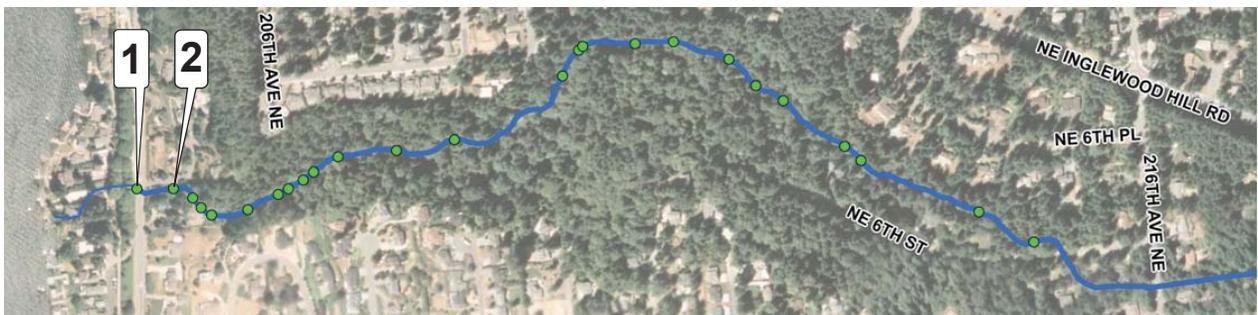
Photo Logs



Station 1. George Davis Creek 150 feet upstream from East Lake Sammamish Parkway.



Station 2. George Davis Creek 250 feet upstream of East Lake Sammamish Parkway.



Parametrix 558-3847-002/01(07) 5/09 (B)



Station 3. Bank erosion and stream downcutting on George Davis Creek 300 feet upstream of East Lake Sammamish Parkway.



Station 4. George Davis Creek 350 feet upstream from Lake Sammamish Parkway.



Parametrix 558-3847-002/01(07) 5/09 (B)



Station 5. George Davis Creek 500 feet upstream from Lake Sammamish Parkway.



Station 6. George Davis Creek 635 feet upstream from East Lake Sammamish Parkway.
(note: old water supply dam)



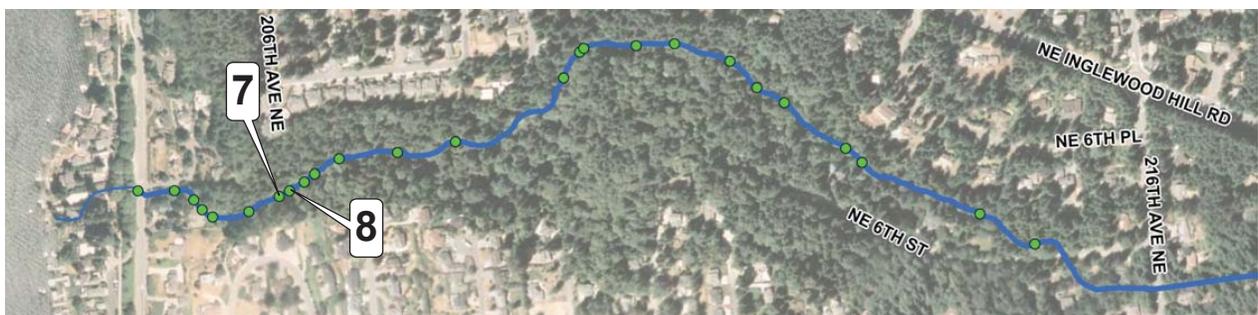
Parametrix 558-3847-002/01(07) 5/09 (B)



Station 7. Stormwater pipe and outfall on right bank of George Davis Creek 680 feet upstream of East Lake Sammamish Parkway.



Station 8. George Davis Creek 750 feet upstream from Lake Sammamish Parkway.



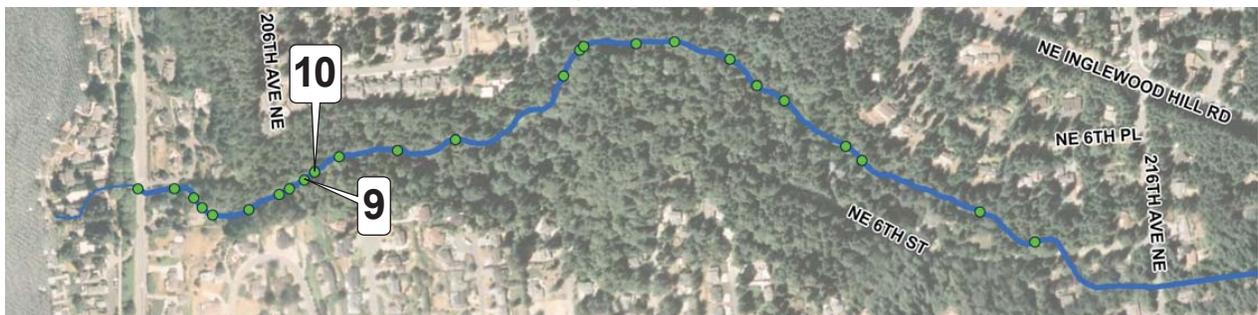
Parametrix 558-3847-002/01(07) 5/09 (B)



Station 9. Old road bed on right bank of George Davis Creek 800 feet upstream of East Lake Sammamish Parkway.



Station 10. Landslide on left bank of George Davis Creek 915 feet upstream from East Lake Sammamish Parkway.



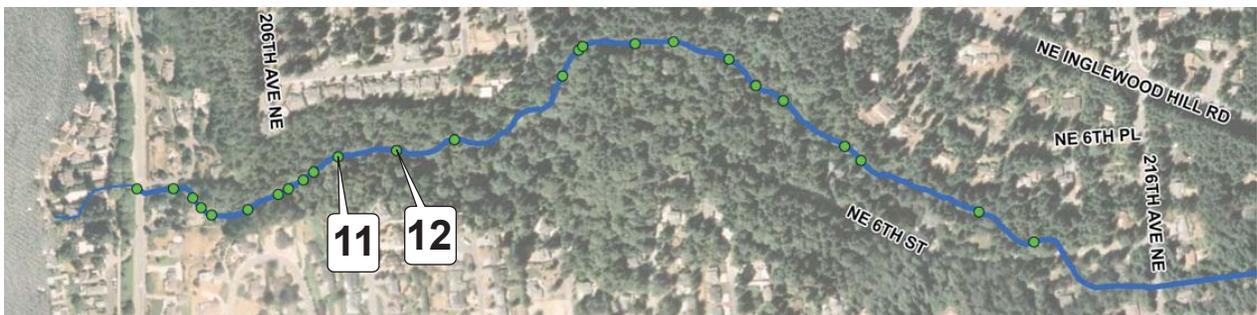
Parametrix 558-3847-002/01(07) 5/09 (B)



Station 11. George Davis Creek 1150 feet upstream from Lake Sammamish Parkway.



Station 12. George Davis Creek 1400 feet upstream from Lake Sammamish Parkway.



Parametrix 558-3847-002/01(07) 5/09 (B)



Station 13. George Davis Creek 1960 feet upstream of East Lake Sammamish Parkway.



Station 14. George Davis Creek 2080 feet upstream from Lake Sammamish Parkway.



Parametrix 558-3847-002/01(07) 5/09 (B)



Station 15. George Davis Creek in old culverts 1200 feet upstream of East Lake Sammamish Parkway.



Station 16. Left bank slump on George Davis Creek 2315 feet upstream from Lake Sammamish Parkway.



Parametrix 558-3847-002/01(07) 5/09 (B)



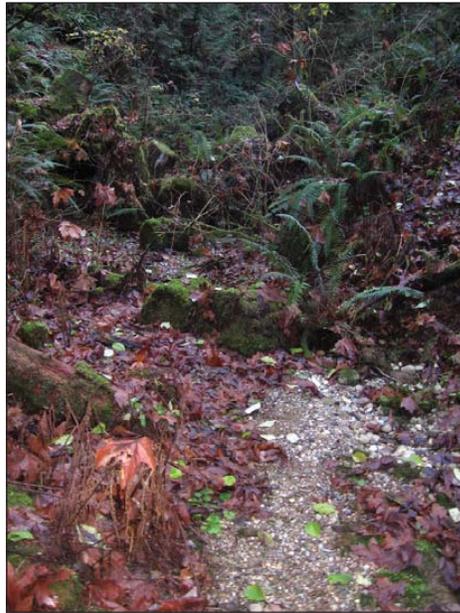
Station 17. George Davis Creek 2465 feet upstream from Lake Sammamish Parkway.



Station 18. George Davis Creek 2700 feet upstream from Lake Sammamish Parkway.



Parametrix 558-3847-002/01(07) 5/09 (B)



Station 19. George Davis Creek 2700 feet upstream from Lake Sammamish Parkway.
(note: the stream was dry upstream of this location)



Station 20. George Davis Creek 2850 feet upstream from Lake Sammamish Parkway.
(note: one of a number of root-wad flow control structures in the creek)



Parametrix 558-3847-002/01(07) 5/09 (B)



Station 21. George Davis Creek 2975 feet upstream from Lake Sammamish Parkway.



Station 22. George Davis Creek 3285 feet upstream from Lake Sammamish Parkway.



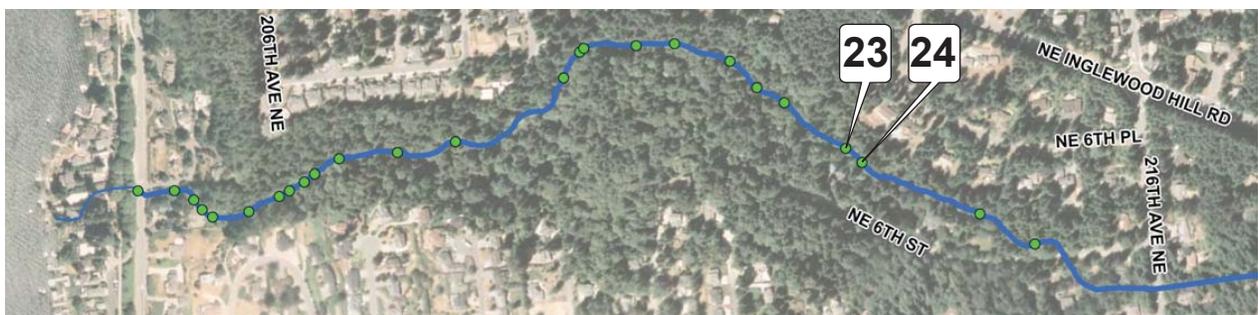
Parametrix 558-3847-002/01(07) 5/09 (B)



Station 23. Left bank stormwater outfall 3370 feet upstream from East Lake Sammamish Parkway.



Station 24. George Davis Creek 3885 feet upstream from Lake Sammamish Parkway.



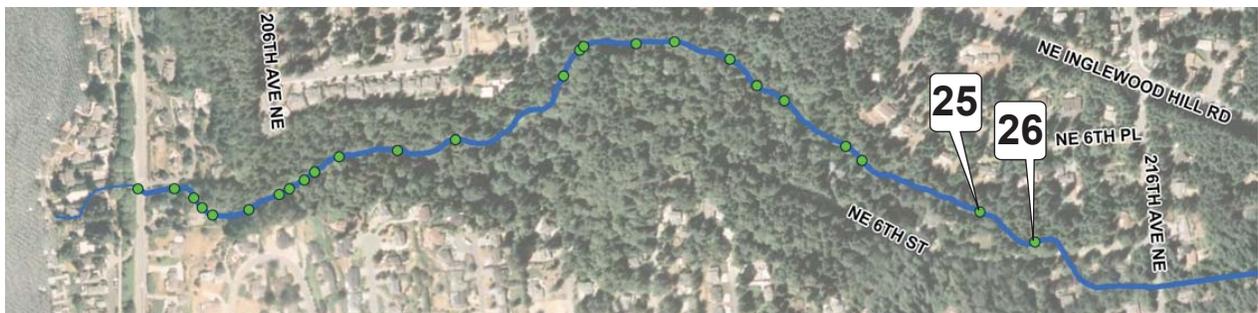
Parametrix 558-3847-002/01(07) 5/09 (B)



Station 25. George Davis Creek 4150 feet upstream from Lake Sammamish Parkway.



Station 26. George Davis Creek 4200 feet upstream from Lake Sammamish Parkway.
(note: dual 5-foot diameter culverts under NE 6th Street)



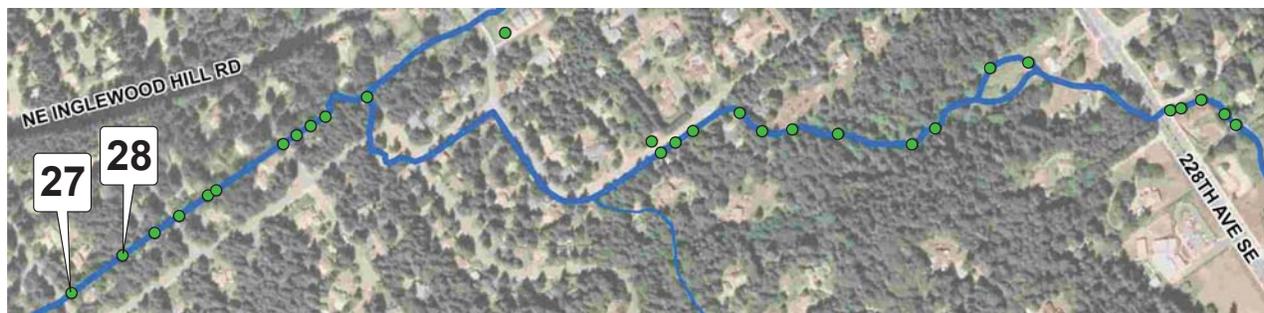
Parametrix 558-3847-002/01(07) 5/09 (B)



Station 27. George Davis Creek 4800 feet upstream from Lake Sammamish Parkway
(note dual 6-foot wide by 3-foot tall culverts under 216th Ave NE)



Station 28. George Davis Creek 4800 feet upstream from Lake Sammamish Parkway



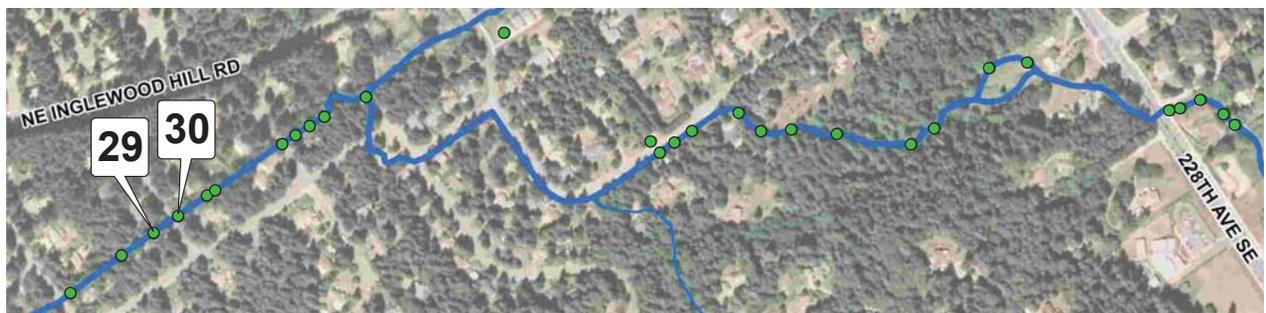
Parametrix 558-3847-002/01(07) 6/10 (B)



Station 29. George Davis Creek 5000 feet upstream from Lake Sammamish Parkway
(note dual 6-foot wide by 3-foot tall culverts under 218th Ave NE)



Station 30. George Davis Creek 5050 feet upstream from Lake Sammamish Parkway



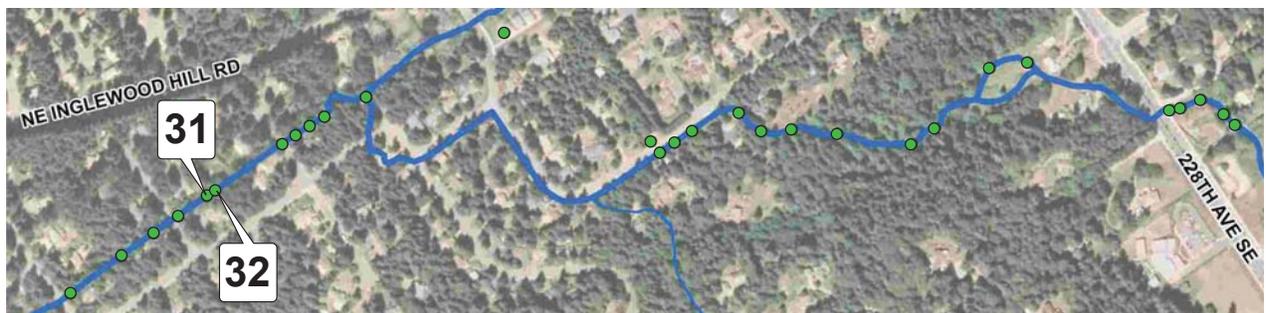
Parametrix 558-3847-002/01(07) 6/10 (B)



Station 31. George Davis Creek 5300 feet upstream from Lake Sammamish Parkway



Station 32. Right bank stormwater outfall 5375 feet upstream from Lake Sammamish Parkway



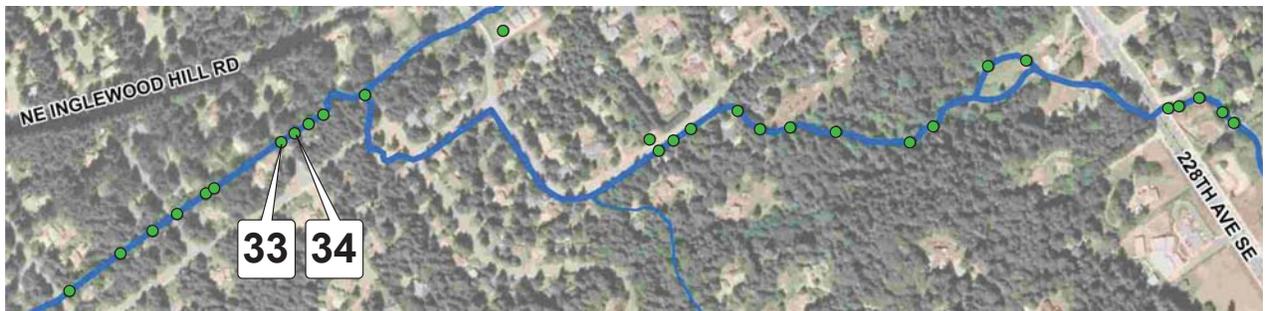
Parametrix 558-3847-002/01(07) 6/10 (B)



Station 33. George Davis Creek 5530 feet upstream from Lake Sammamish Parkway
(note dual 6-foot wide by 3-foot tall culverts under 219th Ave NE)



Station 34. George Davis Creek 5600 feet upstream from Lake Sammamish Parkway



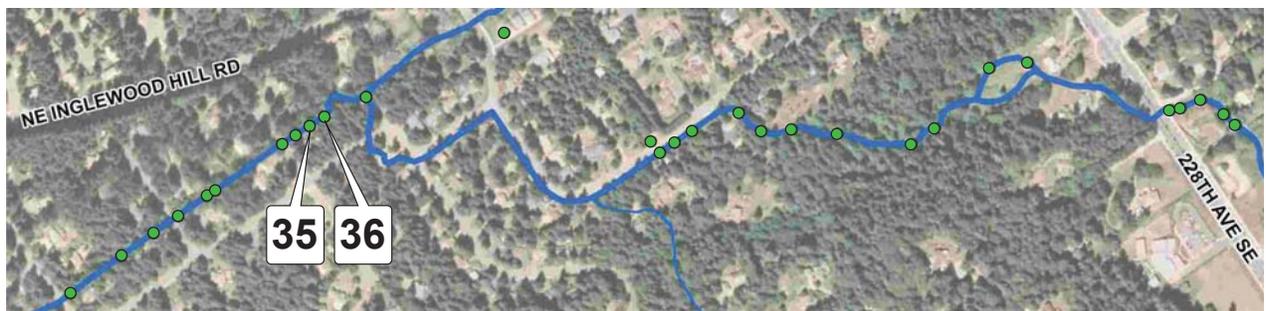
Parametrix 558-3847-002/01(07) 6/10 (B)



Station 35. Scour at tree roots 5660 feet upstream from Lake Sammamish Parkway



Station 36. Four foot head-cut on George Davis creek 5715 feet upstream of East Lake Sammamish Parkway



Parametrix 558-3847-002/01(07) 6/10 (B)



Station 37. George Davis Creek 5910 feet upstream from Lake Sammamish Parkway



Station 38. George Davis Creek 6500 feet upstream from Lake Sammamish Parkway
(36" CMP outfall of South Branch of George Davis Creek on 222nd Ave NE)



Parametrix 558-3847-002/01(07) 6/10 (B)



Station 39. George Davis Creek 7215 feet upstream from Lake Sammamish Parkway
(South Branch of George Davis Creek in storm drain)



Station 40. George Davis Creek 8000 feet upstream from Lake Sammamish Parkway (inlet to 36" culvert for South Branch of George Davis Creek on NE 2st Street)



Parametrix 558-3847-002/01(07) 6/10 (B)



Station 41. George Davis Creek 8800 feet upstream from Lake Sammamish Parkway (culvert for South Branch of George Davis Creek on NE 2nd St)



Station 42. George Davis Creek 9800 feet upstream from Lake Sammamish Parkway (Culverts in South Branch of George Davis Creek on NE 2nd St)



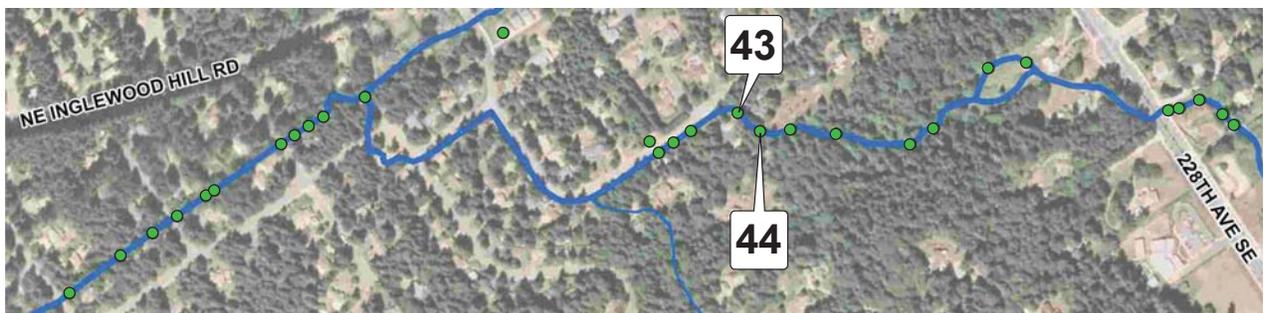
Parametrix 558-3847-002/01(07) 6/10 (B)



Station 43. South Branch of George Davis Creek 9960 feet upstream from Lake Sammamish Parkway



Station 44. South Branch of George Davis Creek 10,085 feet upstream from Lake Sammamish Parkway



Parametrix 558-3847-002/01(07) 6/10 (B)



Station 45. South Branch of George Davis Creek 10,185 feet upstream from Lake Sammamish Parkway (100 feet downstream of wetland)



Station 46. South Branch of George Davis Creek 10,385 feet upstream from Lake Sammamish Parkway (in wetland)



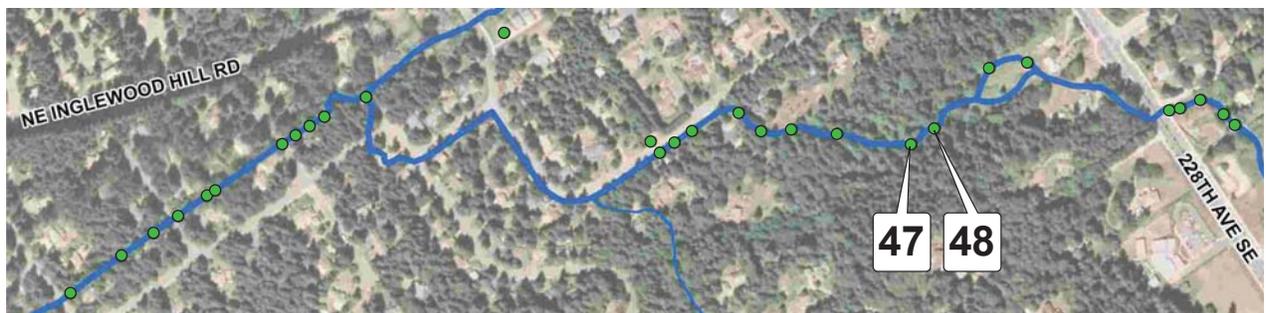
Parametrix 558-3847-002/01(07) 6/10 (B)



Station 47. Left bank possible tributary to South Branch of George Davis Creek
10,685 feet upstream from Lake Sammamish Parkway (in wetland)



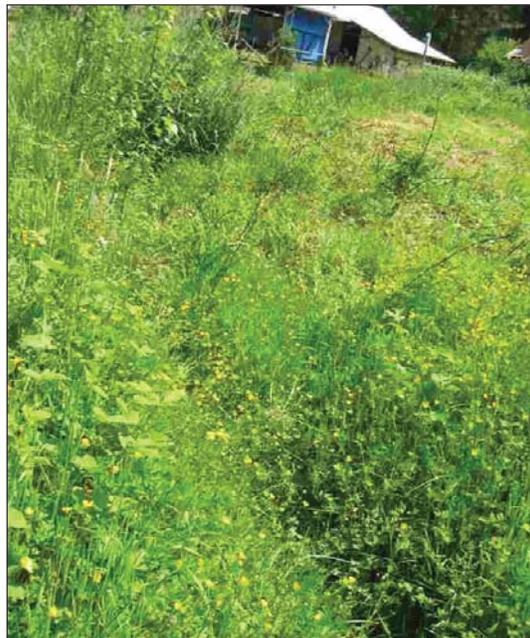
Station 48. South Branch of George Davis Creek 10,750 feet
upstream from Lake Sammamish Parkway (in wetland)



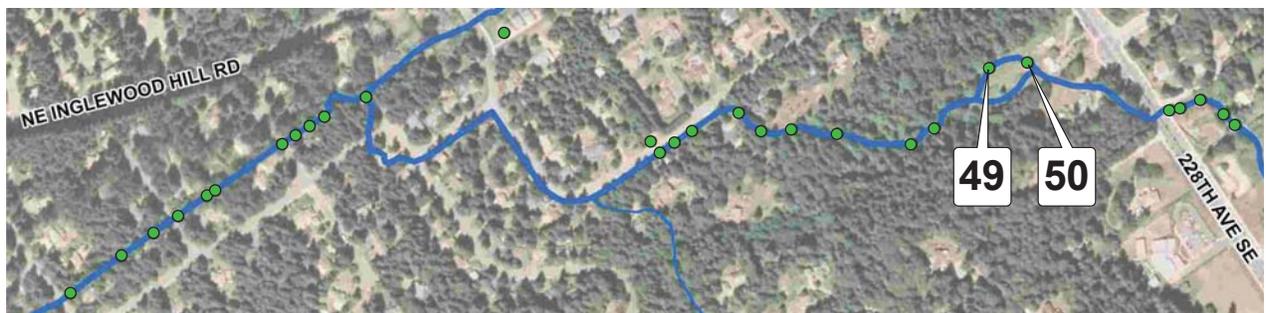
Parametrix 558-3847-002/01(07) 6/10 (B)



Station 49. South Branch of George Davis Creek 11,075 feet upstream from Lake Sammamish Parkway (upstream of forested wetland section)



Station 50. South Branch of George Davis Creek 11,925 feet upstream from Lake Sammamish Parkway



Parametrix 558-3847-002/01(07) 6/10 (B)



Station 51. South Branch of George Davis Creek 13,000 feet upstream from Lake Sammamish Parkway (Culvert inlet at 228th Ave SE)



Station 52. South Branch of George Davis Creek 13,050 feet upstream from Lake Sammamish Parkway



Parametrix 558-3847-002/01(07) 6/10 (B)



Station 53. South Branch of George Davis Creek 13,150 feet upstream from Lake Sammamish Parkway



Station 54. South Branch of George Davis Creek 13,240 feet upstream from Lake Sammamish Parkway



Parametrix 558-3847-002/01 (07) 6/10 (B)



Station 55. South Branch of George Davis Creek 13,300 feet upstream from Lake Sammamish Parkway



Station 56. South Branch of George Davis Creek 13,775 feet upstream from Lake Sammamish Parkway (36" culvert inlet in wetland; 12" culvert from pond)



Parametrix 558-3847-002/01(07) 6/10 (B)



Station 57. South Branch of George Davis Creek 13,775 feet upstream from Lake Sammamish Parkway (in wetland from inlet of culvert)



Station 58. South Branch of George Davis Creek 14,075 feet upstream from Lake Sammamish Parkway (36" culvert outlet looking downstream at Eastside Catholic driveway and 228th Ave)



Parametrix 558-3847-002/01(07) 6/10 (B)



Station 59. South Branch of George Davis Creek 14,275 feet upstream from Lake Sammamish Parkway (36" culvert inlet; SW corner of 8th ST and 228th Ave)



Station 60. South Branch of George Davis Creek 14,325 feet upstream from Lake Sammamish Parkway (upstream of culvert, no defined channel)



Parametrix 558-3847-002/01(07) 6/10 (B)



Station 61. South Branch of George Davis Creek 14,825 feet upstream from Lake Sammamish Parkway (looking DS from pond edge; uprooted trees fall uphill)



Station 62. South Branch of George Davis Creek 14,925 feet upstream from Lake Sammamish Parkway (east shore of pond, under tree canopy)



Parametrix 558-3847-002/01(07) 6/10 (B)



Station 63. South Branch of George Davis Creek 15,065 feet upstream from Lake Sammamish Parkway (deep rill 2.5' wide by 2' deep; off shore of pond)



Station 64. South Branch of George Davis Creek 15,065 feet upstream from Lake Sammamish Parkway (looking uphill of rill)



Parametrix 558-3847-002/01(07) 6/10 (B)

APPENDIX E

Specific Conceptual Project Alternatives

Inglewood Basin Plan Project Description

Project Number:	Ed-1
Project Name:	Conduct Wetland Tours
Description:	Organize and invite residents to participate in 1/2 day walking tours of Sammamish wetlands to learn more about wetland functions, and aquatic and terrestrial life in the wetlands.
Purpose:	Better stewardship through better understanding.
Project Benefits:	Support for wetland preservation.
Assumptions:	City or volunteer wetland scientists/ecologists would lead the tours.
Estimated Cost:	\$10,000
Project Partners:	Audubon Society, Community Groups, Sammamish Parks Department, Private Citizens
Priority:	Low

Inglewood Basin Plan Project Description

Project Number:	CIP-1
Project Name:	217th Ave NE Drainage Improvement
Description:	Modify road drainage on 217th Avenue NE by adding curbs and catch basins to convey flow away from adjacent residence that experiences flooding due to road runoff.
Purpose:	Eliminate flooding at local residence.
Project Benefits:	Better road drainage, less impacts to homeowners.
Assumptions:	City maintenance staff will construct project.
Estimated Cost:	\$59,000
Project Partners:	None
Priority:	Low

**CITY OF SAMMAMISH
CIP IMPROVEMENTS
Preliminary Opinion of Probable Cost**

PROJECT DESCRIPTION: Construct a curb along the east side of the road with an enclosed collection and conveyance system. Clean existing ditch along west side of road.

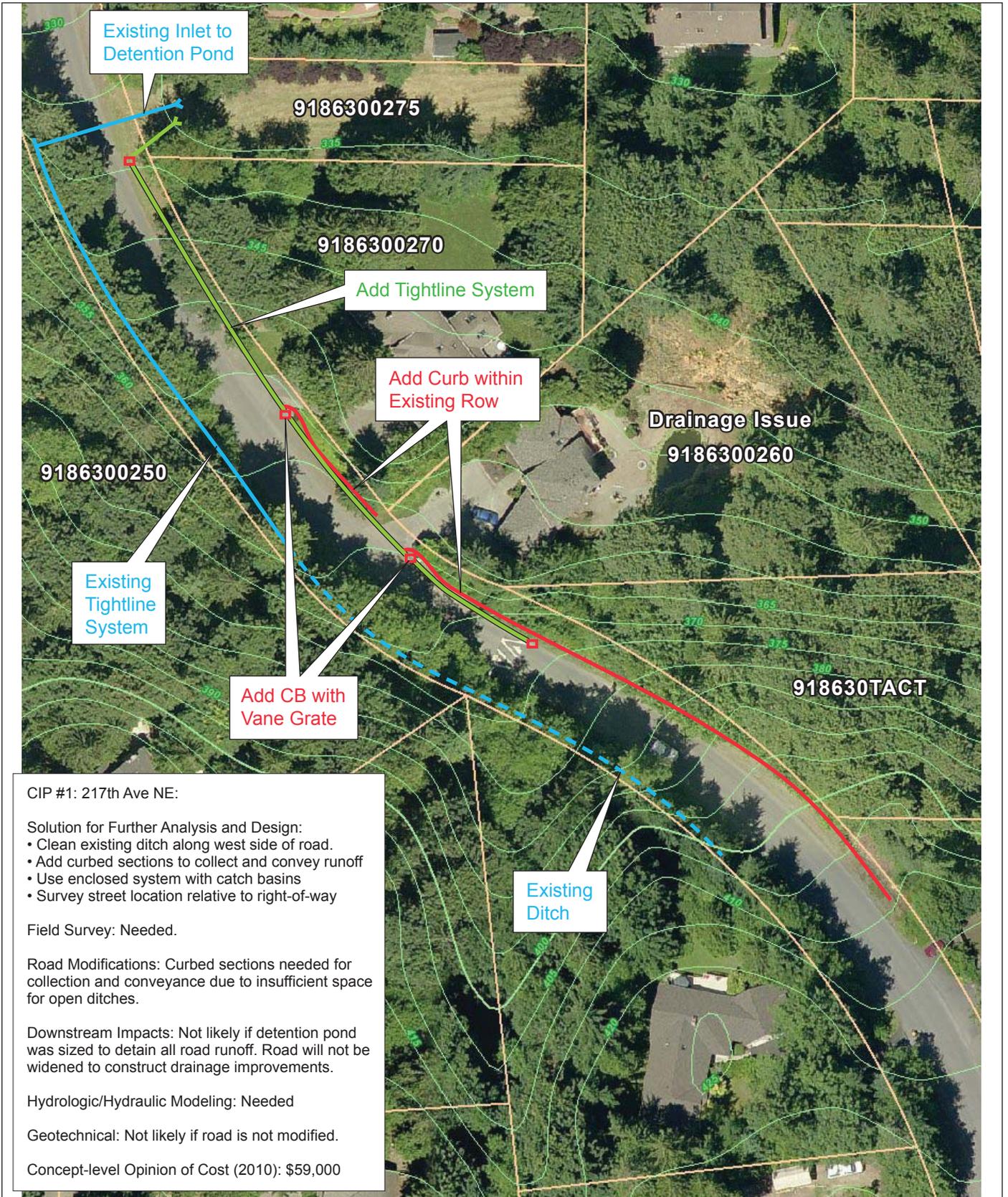
CIP #: 1
Project Name: 217th Ave NE Drainage Improvement
Prepared By: Chad Wiggins

Checked By:

Item No.	Estimated		Description	Unit Cost	Amount	Percent of Construction Cost
	Quantity	Unit				
1	1	LS	Mobilization	\$1,800.00	\$1,800	6.57%
2	1	LS	Traffic Control	\$500.00	\$500	1.83%
3	1	LS	Restoration	\$200.00	\$200	0.73%
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500	1.83%
5	0.1	ACRE	Ditch Cleaning	\$10,000.00	\$1,000	3.65%
6	460	LF	Extruded Curb (Item 6727)	\$8.00	\$3,680	13.44%
7	3	EA	Rectangular Frame and Grate(1052)	\$300.00	\$900.00	3.29%
8	1	EA	Locking Solid Metal Cover and Frame For CB(3110	\$400.00	\$400.00	1.46%
9	300	LF	Schedule A Storm Sewer Pipe 12-inch Diam.(1180'	\$30.00	\$9,000.00	32.86%
10	4	EA	Catch Basin Type 1(3091)	\$1,500.00	\$6,000.00	21.91%
11	155	SY	AC Road, 2", 4" rock, First 2500 SY	\$22.00	\$3,410.00	12.45%
				Subtotal =	\$27,390	100.00%
				Contingency 30.0%	\$8,217	
				Sales Tax 9.5%	\$2,602	
				Planning Level Construction Cost =	\$38,200	
				Property Acquisition	\$0.00	
				Environmental Permitting and Documentation 10.0%	\$3,820	
				Surveying 10.2%	\$3,882	
				Administration 5.0%	\$1,910	
				Preliminary Engineering, PS&E Engineering and Construction Management 30.0%	\$11,460	
				TOTAL =	\$59,000	

ASSUMPTIONS:

Mobilization equals approximately 7 percent of Subtotal
Restoration equals approximately 1 percent of Subtotal
Traffic equals approximately 2 percent of Subtotal
Pipe size and length is estimated only
Erosion/Sedimentation Control equals approximately 1 percent of Subtotal (\$500 minimum)
Estimate does not include obtaining land or easements



CIP #1: 217th Ave NE:

Solution for Further Analysis and Design:

- Clean existing ditch along west side of road.
- Add curbed sections to collect and convey runoff
- Use enclosed system with catch basins
- Survey street location relative to right-of-way

Field Survey: Needed.

Road Modifications: Curbed sections needed for collection and conveyance due to insufficient space for open ditches.

Downstream Impacts: Not likely if detention pond was sized to detain all road runoff. Road will not be widened to construct drainage improvements.

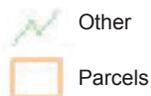
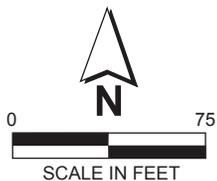
Hydrologic/Hydraulic Modeling: Needed

Geotechnical: Not likely if road is not modified.

Concept-level Opinion of Cost (2010): \$59,000

Parametrix 558-3847-002/02(05) 6/10 (B)

Source: King County iMAP - Stormwater (<http://www.metrokc.gov/GIS/iMAP>)



**Capital Improvement Project
217th Ave NE**

Inglewood Basin Plan Project Description

Project Number:	CIP-2
Project Name:	228th Ave NE Drainage Improvement
Description:	Modify discharge from road runoff to prevent downstream erosion and damage to natural resources.
Purpose:	Reduce impacts to natural resources and prevent slope failure.
Project Benefits:	Reduced erosion and damage to trees.
Assumptions:	Existing flow will be conveyed to the base of the slope with a tightline pipe.
Estimated Cost:	\$55,000
Project Partners:	None
Priority:	Medium

**CITY OF SAMMAMISH
CIP IMPROVEMENTS
Preliminary Opinion of Probable Cost**

PROJECT DESCRIPTION: Connect and construct a conveyance pipe along the west side of the road within the ROW to convey the water to the existing channel at SE 4th St and 228th AVE SE

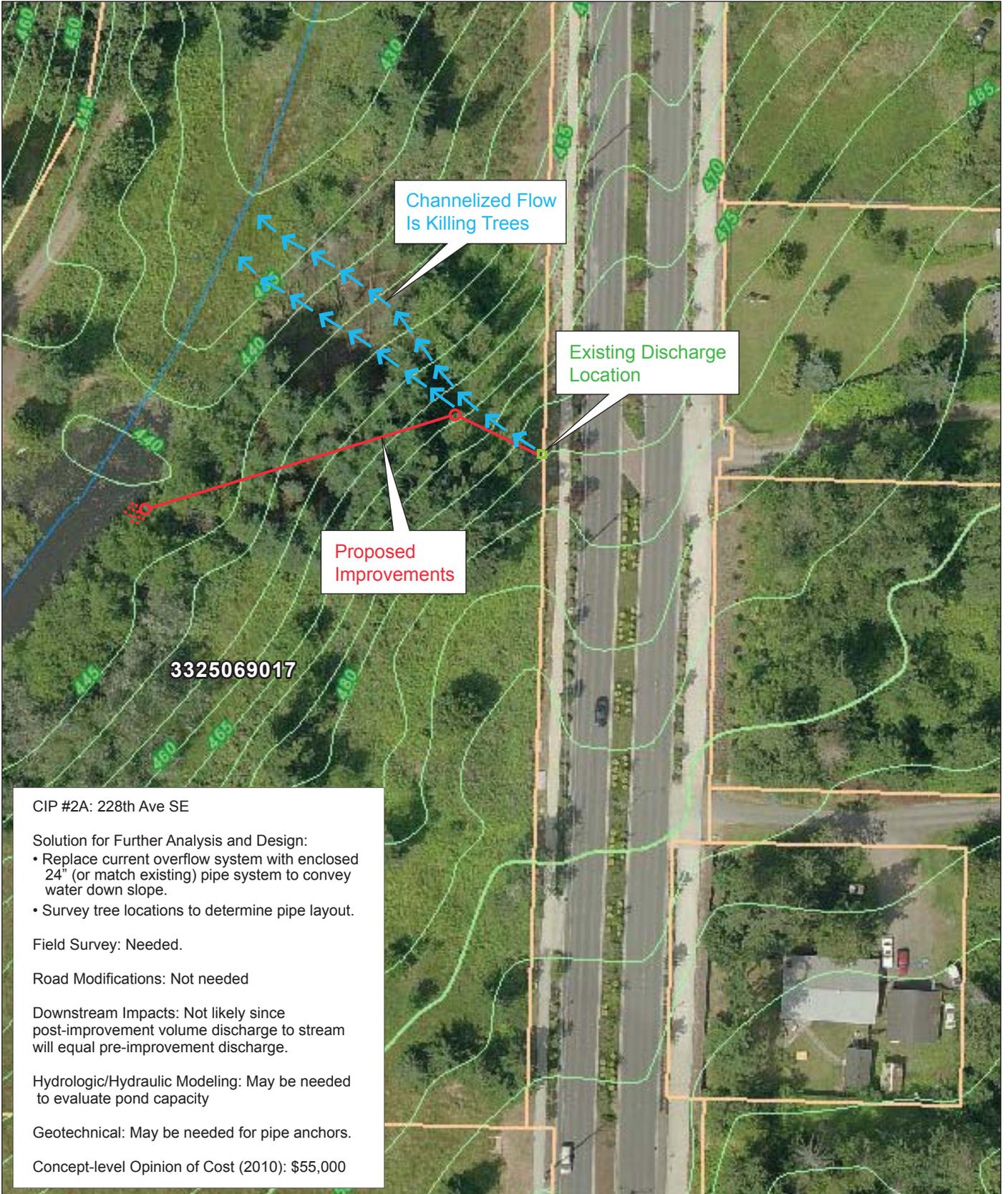
CIP #: 2
Project Name: 228th Ave SE Drainage Improvement
Prepared By: Chad Wiggins

Checked By: R. Cushman

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost
1	1	LS	Mobilization	\$1,600.00	\$1,600	6.37%
2	1	LS	Traffic Control	\$700.00	\$700	2.79%
3	1	LS	Restoration	\$400.00	\$400	1.59%
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500	1.99%
5	0.3	ACRE	Clearing And Grubbing (0025)	\$10,000.00	\$3,000	11.95%
6	3	EA	Pipe Anchor	\$300.00	\$900.00	3.59%
7	2	EA	Locking Solid Metal Cover and Frame For CB(3110)	\$400.00	\$800.00	3.19%
8	225	LF	Corrugated Polyethylene Storm Sewer Pipe 24"	\$40.00	\$9,000.00	35.86%
9	1	EA	Catch Basin Type 2 - 48-inch Diam. With Bird Cage	\$3,200.00	\$3,200.00	12.75%
10	1	EA	Catch Basin Type 2 - 48-inch Diam.(3105)	\$3,000.00	\$3,000.00	11.95%
11	1	EA	Connect to drainage structure	\$2,000.00	\$2,000.00	7.97%
				Subtotal =	\$25,100	100.00%
				Contingency	30.0%	\$7,530
				Sales Tax	9.5%	\$2,385
				Planning Level Construction Cost =	\$35,000	
				Property Acquisition		\$0.00
				Environmental Permitting and Documentation	10.0%	\$3,500
				Surveying	10.9%	\$3,805
				Administration	5.0%	\$1,750
				Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	\$10,500
				TOTAL =	\$55,000	

ASSUMPTIONS:

Mobilization equals approximately 7 percent of Subtotal
Restoration equals approximately 2 percent of Subtotal
Traffic equals approximately 3 percent of Subtotal
Pipe size and length is estimated only
Erosion/Sedimentation Control equals approximately 2 percent of Subtotal (\$500 minimum)
Estimate does not include obtaining land or easements



CIP #2A: 228th Ave SE

Solution for Further Analysis and Design:

- Replace current overflow system with enclosed 24" (or match existing) pipe system to convey water down slope.
- Survey tree locations to determine pipe layout.

Field Survey: Needed.

Road Modifications: Not needed

Downstream Impacts: Not likely since post-improvement volume discharge to stream will equal pre-improvement discharge.

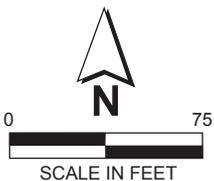
Hydrologic/Hydraulic Modeling: May be needed to evaluate pond capacity

Geotechnical: May be needed for pipe anchors.

Concept-level Opinion of Cost (2010): \$55,000

Parametrix 558-3847-002/02(05) 6/10 (B)

Source: King County iMAP - Stormwater (<http://www.metrokc.gov/GIS/iMAP>)



**Capital Improvement Project
228th Ave SE**

Inglewood Basin Plan Project Description

Project Number:	CIP-3
Project Name:	NE 2nd Avenue Culvert Replacement
Description:	Replace damaged culverts at NE 2nd Avenue driveway
Purpose:	Minimize potential road flooding.
Project Benefits:	Better conveyance, less impacts to homeowners.
Assumptions:	City maintenance staff will construct project.
Estimated Cost:	\$40,000
Project Partners:	None
Priority:	Medium

**CITY OF SAMMAMISH
CIP IMPROVEMENTS
Preliminary Opinion of Probable Cost**

PROJECT DESCRIPTION: Remove three existing culverts beneath the driveway at NE 2nd St and 223rd Place. Install a precast concrete box culvert with stream bed. Replace the driveway.

CIP #: 3
Project Name: NE 2nd Drainage Improvement
Prepared By: Craig Buitrago

Checked By:

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost
1	1	LS	Mobilization	\$1,200.00	\$1,200	6.67%
2	1	LS	Traffic Control	\$500.00	\$500	2.78%
3	1	LS	Restoration	\$300.00	\$300	1.67%
4	1	LS	Erosion/Sedimentation Control	\$500.00	\$500	2.78%
5	25	LF	CL. II RIENF. CONC. CULV. PIPE 48 IN.	\$200.00	\$5,000.00	27.78% WDOT Unit Bid analysis
6	6	TON	Streambed Cobbles	\$30.00	\$180.00	1.00% Back up Calcs, WDOT Unit Bid analysis
7	195	CY	Structure Excavation Class B Incl Haul	\$50.00	\$9,750.00	54.17% Back up Calcs, WDOT Unit Bid analysis
8	19	TON	Crushed Surfacing Base Coarse	\$30.00	\$570.00	3.17% Back up Calcs, WDOT Unit Bid analysis
Subtotal =				\$18,000	\$18,000	100.00%
Contingency				30.0%	\$5,400	
Sales Tax				9.5%	\$1,710	
Planning Level Construction Cost =				\$25,100		
Property Acquisition					\$0.00	
Environmental Permitting and Documentation				10.0%	\$2,510	
Surveying				14.0%	\$3,525	
Administration				5.0%	\$1,255	
Preliminary Engineering, PS&E Engineering and Construction Management				30.0%	\$7,530	
TOTAL =				\$40,000		

ASSUMPTIONS:
 Mobilization equals approximately 7 percent of Subtotal
 Restoration equals approximately 2 percent of Subtotal
 Traffic equals approximately 3 percent of Subtotal
 Pipe size and length is estimated only
 Pipe will be partially buried and have open streambed
 Erosion/Sedimentation Control equals approximately 2 percent of Subtotal (\$500 minimum)
 Estimate does not include obtaining land or easements
 Estimate assumes streambed will be use only cobbles
 Estimate assumes driveway will be restored back to crushed surfacing base coarse; not upgraded to pavement



CIP #3: NE 2nd Street Driveway Culvert

Solution for Further Analysis and Design:

- Remove 3 existing culverts
- Install new culvert
 - There are two culvert options: 1) partially buried 48" culvert, or 2) 4' x 4' box culvert
 - Both options have natural streambed gravel
- Restore driveway

Field Survey: Needed.

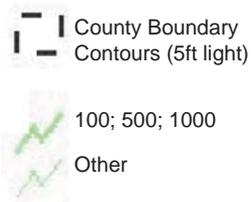
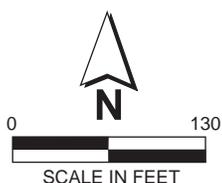
Road Modifications: Driveway will be restored to existing conditions.

Downstream Impacts: Not likely. New culvert sized to convey the 100-yr design storm.

Hydrologic/Hydraulic Modeling: Needed. Only preliminary modeling completed.

Geotechnical: Not likely if road is not modified.

Concept-level Opinion of Cost (2010): \$40,000 or \$54,000



**Capital Improvement Project
NE 2nd Street**

