Quality Assurance Project Plan

Monitoring Fecal Coliform Bacteria in Western Washington Water Bodies

Addendum 1: Bellingham Field Office Sampling Sites for 2017

DEPARTMENT OF ECOLOGY
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May 2017

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Abbreviations:
WQP Water Quality Program
BFO Bellingham Field Office
HQ Department of Ecology Headquarters
EAP Environmental Assessment Program

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This addendum describes ongoing efforts of Ecology's Bellingham Field Office (BFO) water quality inspectors to adapt short-term ambient water quality monitoring stations to meet current needs. It presents sites BFO staff proposes to sample during 2017. The sites focus less on short-term ambient stations and more on collecting source identification samples. It also reflects a greater reliance on data collected by other partners to assess progress. Collectively, all major tributaries to the Nooksack River and Drayton Harbor will be monitored by one of the Whatcom Clean Water partners as part of an ambient program.

This addendum updates Appendix B1 in the original 2014 QAPP:
https://fortress.wa.gov/ecy/publications/SummaryPages/1410004.html

Appendix B1. BFO Watersheds and Sites Chosen for FC Sampling in 2017

303(d) listings addressed

Table B1-1 shows some sites within the geographic purview of Bellingham Field Office water quality inspectors that have been listed as Category 4A and Category 5 in Washington State's 2008 Water Quality Assessment, at least in part because of FC concentrations in water. These sites will be addressed in 2017 by the short-term ambient stations described in this QAPP Addendum.

Table B1-1. Some 303(d) listed water bodies in Whatcom County.

Category 5 Kamm Creek 303(d) Listings – WRIA 1

Site Basis	Township	Range	Section	Parameter	Listing ID#
NWIC-K1	40N	3E	21	Dissolved Oxygen	7091
NWIC-K1	40N	3E	21	pH	7092
Tetra Tech, 1989	40N	3E	11	Dissolved Oxygen	7094
WWU-23,24,25	40N	3E	15	pH	7098
Matthews, 1995	40N	3E	11	pH	7099
NWIC-MD	40N	3E	15	Dissolved Oxygen	7104
NWIC-K2	40N	3E	22	Dissolved Oxygen	7107
WWU-27	40N	3E	22	pH	7108
NWIC-K1	40N	3E	21	Temperature	9118
WWU-29	40N	3E	11	Dissolved Oxygen	39018
WWU-29	40N	3E	11	pH	39325

Category 4A Kamm Creek 303(d) Listings – WRIA 1

Site Basis	Township	Range	Section	Parameter	Listing ID#
NWIC-K1	40N	3E	21	Bacteria	7093
Tetra Tech, 1989	40N	3E	11	Bacteria	7096
NWIC-K2	40N	3E	22	Bacteria	7109

Proposed Short-term Ambient Stations

Table B1-2. Proposed changes to BFO survey sampling sites in the watersheds of Bertrand, Kamm, Scott and Anderson Creeks. (Datum: HARN 1983)

Bertrand Creek Watershed						
	Site ID	**Description**	**Latitude**	**Longitude**	**RM**	**Status**
1	BEJK2.0	Jackman Ditch at upstream side of 0 Ave culvert.	49.002	-122.501	2.0	Remove, covered by others
2	BEJK0.2	Jackman Ditch at downstream side of Jackman RD bridge.	48.97503	-122.502	0.2	Remove, covered by others
3	BEMC1.8	McClellan Creek at mailbox of 8895 Wiedkamp RD	48.96434	-122.53	1.8	Remove
4	BEDF2.2	Duffner Ditch west of Flynn RD at Lynden detention pond pullout, downstream of Flynn RD tributary confluence.	48.92793	-122.497	2.2	Remove, covered by others
5	BE9.1	Bertrand Creek at Canadian border, upstream side of 0 Ave bridge.	49.00231	-122.523	9.1	Remove, covered by others
6	BECC0.2	Cave Creek at border, upstream side of 0 Ave culvert.	49.00222	-122.527	0.2	Remove, covered by others
Kamm Creek Watershed						
7	K2	Kamm Creek at downstream side of Northwood RD bridge	48.949685	-122.40813	2.47	Continue
8	K3	Kamm Creek at upstream side of Kamm RD culvert	48.956678	-122.402317	3.22	Continue
9	MD1	Mormon Ditch at downstream side of Northwood RD culvert	48.945852	-122.408155	0.55	Continue
10	MD2	Mormon Ditch at 5th berry row west of 1956 Hampton RD	48.942094	-122.386339	1.78	Continue
11	MD3	Trib from South of Hampton RD, upstream side of Hampton RD culvert.	48.941993	-122.402702	0.04	Continue

Scott Ditch Watershed						
	Site ID	**Description**	**Latitude**	**Longitude**	**RM**	**Status**
12	SD3	Mouth of trib flowing south on north side of Hannegan RD.	48.92084	-122.441754	3.04	Remove
13	SD4	Western trib to Elder Ditch at upstream side of Van Dyk RD	48.913365	-122.428277	0.42	Remove
14	SD5	Elder ditch at upstream side of culvert under Van Dyk RD.	48.913253	-122.421996	0.32	Remove
15	SD7	Elder Ditch at upstream side of culvert at Noon RD.	48.918045	-122.397711	4.13	Remove
16	SD8	Scott Ditch at upstream side of culvert at Nolte RD.	48.914862	-122.386433	5.25	Remove
Anderson Creek Watershed						
17	AND1	Anderson Creek at downstream side of Roberts RD bridge.	48.85755	-122.337354	1.76	Remove, covered by others
18	AND2	Anderson Creek downstream of E Smith RD on west Bank	48.832654	-122.339051	3.69	Remove
19	AND3	Anderson Creek downstream side of E Kelly RD bridge, west bank.	48.818172	-122.3398	4.87	Remove

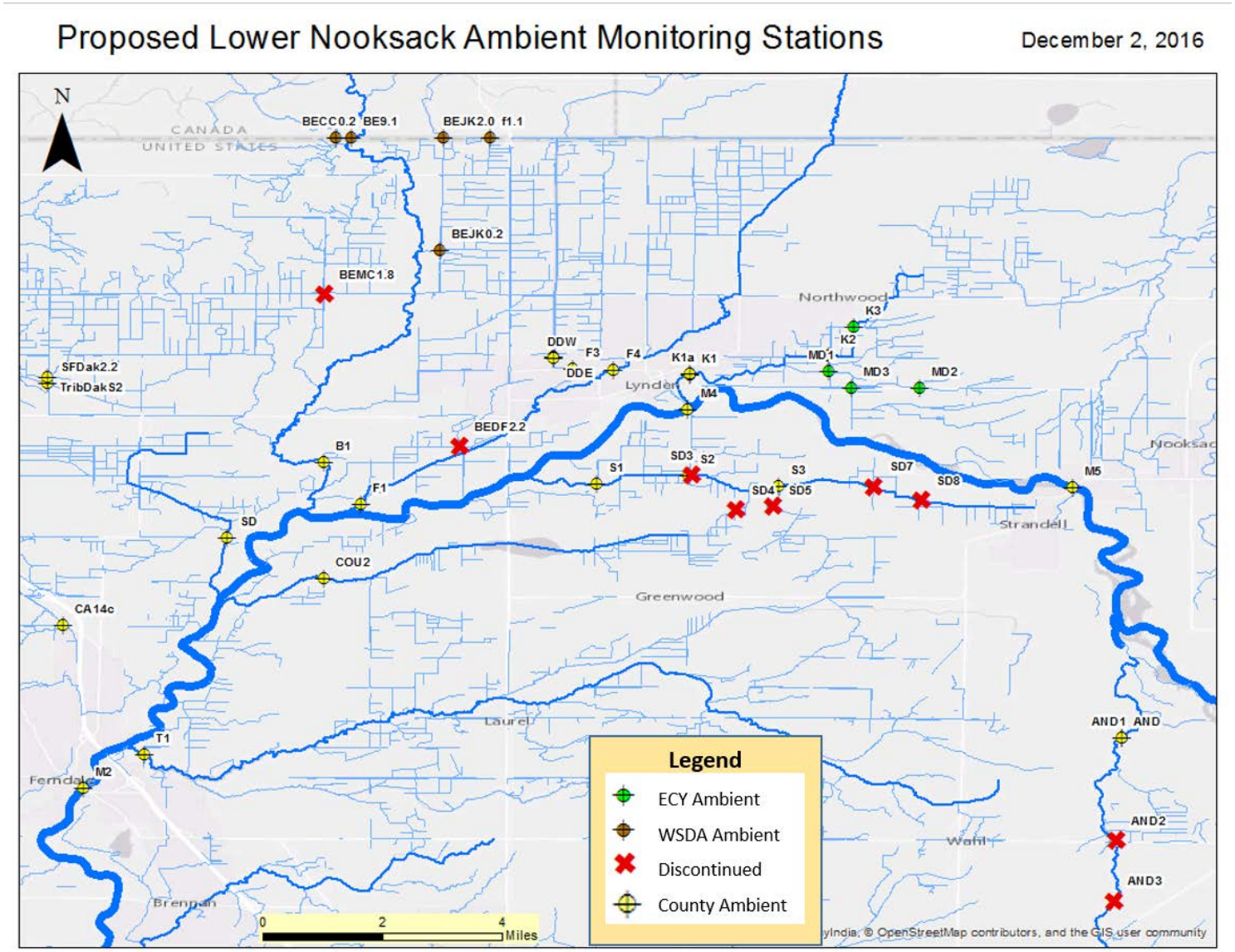

Figure B1-1. FC sampling stations in the Lower Nooksack basin. Proposed to be continued short-term stations to be addressed in this project in green. Short-term stations to be dropped in red "x".

Budget

Table B1-3 shows the estimated total number of FC samples that will be collected at short-term ambient stations and the approximate laboratory budget associated with their analysis.

Table B1-3. Proposed number of short-term ambient monitoring samples submitted for FC analysis and monthly analytical costs, 2017.

Month	FC (MF) Samples	Field Duplicates	Lab Replicates	Cost [1] ($)
January	5	1	0	150
February	5	1	0	150
March	5	0	1	150
April	5	0	0	125
May	5	1	0	150
June	5	0	0	125
July	5	0	1	150
August	5	1	0	150
September	5	0	0	125
October	5	1	0	150
November	5	0	1	150
December	5	1	0	150
Totals	60	6	3	1725

FC = fecal coliform, MF = membrane filtered
Field Replicates = 10% of the preceding column
Lab Replicates = 5% of field sample number
Cost[1] = estimated cost assumes $25 / sample covered by NEP funds

The budget shown in Table B1-4 is for analysis of FC in source identification samples, compliance samples and field duplicates. It is based on average monthly sampling by the two staff working with Whatcom Clean Water Program over the last four years. Fifty percent has been added to address the staff person who works with Clean Samish Initiative and other Skagit county sites. Also in the budget is one field duplicate for each 10 samples. Not in the cost is the expected number of laboratory replicates at one per 20 as we do not pay to have those results sent to us. Approximately two-thirds of the samples will be collected in the Portage Bay and Drayton Harbor watersheds, with most of the remaining samples collected from in the Samish Watershed. Some samples may be collected in response to complaints outside of the Samish, Portage Bay, and Drayton Harbor Watersheds.

Costs associated with collection and analysis of all 2017 FC samples will be covered by NEP funds.

Table B1-4. Estimated number of monthly source identification samples and lab replicates collected by BFO staff for analysis of FC / MF and approximate analytical costs in 2017.

Month	FC (MF) Samples	Field Duplicates	Lab Replicates	Cost [1] ($)
January	33	4	2	999
February	12	2	1	378
March	41	5	2	1242
April	21	3	1	648
May	14	2	1	432
June	15	2	1	459
July	8	1	0	243
August	6	1	0	189
September	11	2	1	351
October	29	3	1	864
November	18	2	1	540
December	23	3	1	702
Totals	231	30	12	7047

FC = fecal coliform
MF = membrane filtered
Field Reps. = replicates for 10% of the preceding column
Lab Replicates = 5% of field sample number
Cost[1] = estimated cost assumes $27 / sample covered by NEP funds