Monitoring Plan for Fivemile, Tenmile, and Fifteenmile Creeks in the Lower Boise Watershed

Summer and Fall 2011

Hawk Stone, Idaho DEQ

Introduction

DEQ is currently working on a subbasin assessment, which may lead to Total Maximum Daily Loads (TMDLs) for the following assessment units:

Assessment Unit	Representative Stream(s)
ID17050114SW007_04	Fifteenmile Creek
ID17050114SW008_03	Tenmile Creek (downstream of Blacks Creek Reservoir)
ID17050114SW010_03	Fivemile Creek (downstream of New York Canal)
ID17050114SW010_02	Ninemile Creek

Each of these assessment units has preliminary data that indicate a potential E. coli impairment, but the Idaho Water Quality Standards require a very specific sampling regime to confirm this:

> Waters designated for primary or secondary contact recreation are not to contain E. coli bacteria in concentrations exceeding a geometric mean of one hundred twenty-six (126) E. coli organisms per one hundred (100) ml based on a minimum of five (5) samples taken every three (3) to seven (7) days over a thirty (30) day period. **(IDAPA 58.01.02.251.01a)**

The existing bacteria data are not sufficient to address this criterion.

In addition, each of these assessment units, with the exception of ...010_02, are found on the draft 2010 303(d) list for impairment by sediment. Although sediment data have been collected throughout the watershed, they are often sparse or more than five years old, thereby not meeting DEQ's threshold for 'Tier I' data. The exception is Fifteenmile Creek, which has a robust dataset collected in 2008. There are insufficient data to determine whether Fivemile and Tenmile Creeks meet the Lower Boise River TMDL target of 50mg/L, averaged over a 60-day period.

At its June 6 meeting, the Technical Advisory Committee instructed DEQ to prepare a monitoring plan for any data gaps that must be filled before the TMDLs could be written.

Goals

1. Collect geometric mean bacteria data from Fivemile, Ninemile, Tenmile, and Fifteenmile Creeks in irrigation and non-irrigation seasons (July and November, respectively).
2. Collect biweekly sediment data from Fivemile and Tenmile Creeks in irrigation and non-irrigation seasons (between June and November).

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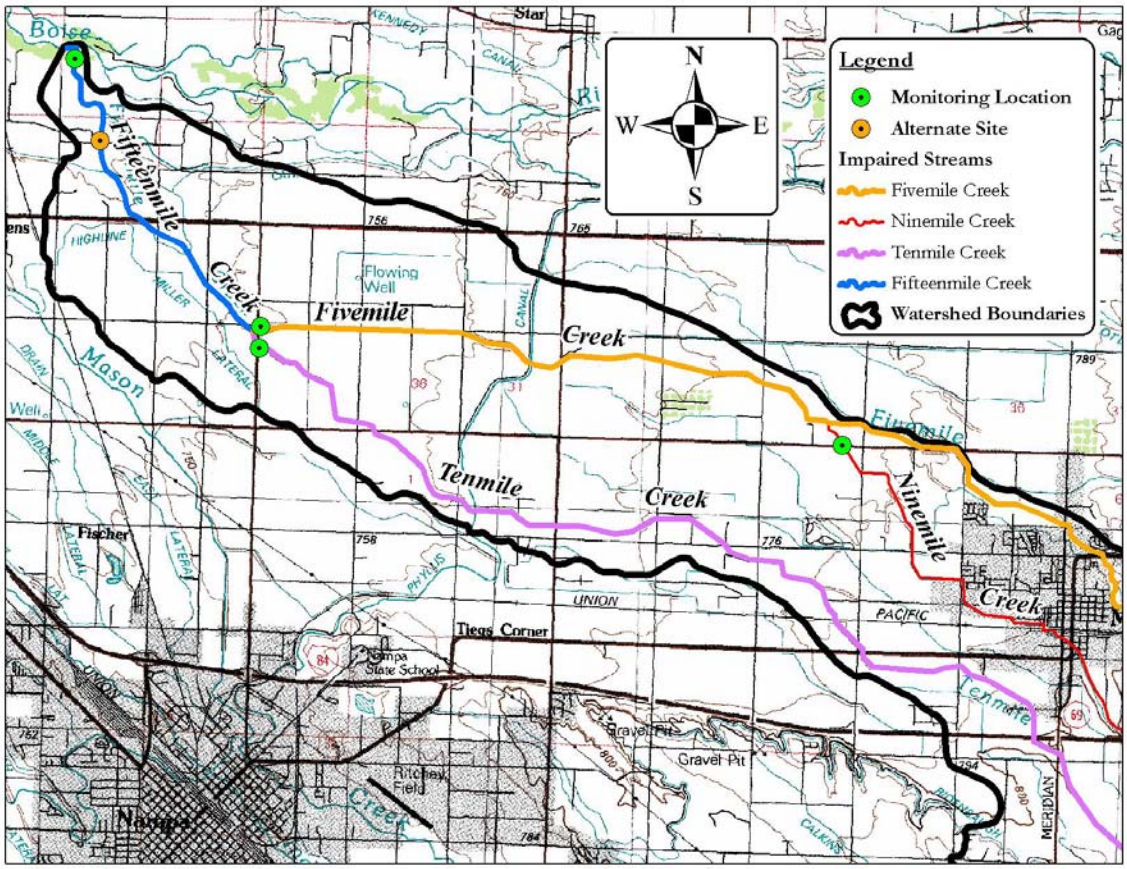
Sites

The Technical Advisory Committee recommended the following monitoring locations:

- Fivemile Creek at the mouth (i.e. Franklin Road crossing)
- Ninemile Creek at the mouth (i.e. Ustick Road crossing)
- Tenmile Creek at the mouth (i.e. Franklin Road crossing)
- Fifteenmile Creek at the mouth (i.e. upstream from the Boise River)

If the recommended site at Fifteenmile Creek were inaccessible, the Lincoln Road crossing could be used as an alternate.



Method - Bacteria

Every three to seven days, collect a bacteria sample from each site.

1. Sanitize your hands
2. Mark the sample bottle with the site, date and time
3. Fill a sample bottle from a flowing, well-mixed portion of the stream.
4. Cap the bottle and immediately put onto ice in cooler
5. Take to the laboratory within 24 hours. Avoid dropping a sample off on Friday
6. Collect a total of five samples in July and five samples in November

Method – Sediment

Preliminary data (May 2011) indicate that the Total Suspended Solids (TSS) concentration does not vary across the width of the culvert; therefore a simple depth-integrated sample in the center of the culvert will properly represent the overall stream.

Once every two weeks, between June 15 and November 15, collect a sediment sample and discharge measurement from Fivemile and Tenmile Creeks. At each site:

1. Triple-rinse all sampling equipment with creek water.
2. Use a DH-49 device to collect a depth-integrated sample from the middle of the culvert. If the sampler touches the streambed, discard and try again.
3. Pour into a cubitainer, marked with the site, date and time. For a blank sample, add 'B'
4. Triple-rinse the sampler with deionized water.

5. String a measuring tape across the bridge, and divide the wetted width into at least ten increments.
6. Attach the Marsh-McBirney Flowmate to the Hartman rod and collect velocity measurements in each cell.
7. Calculate discharge using a field computer or field form and calculator.

Quality Assurance

Duplicate samples demonstrate the repeatability of measurements.
Blank samples show that there is no equipment contamination.
Collect one blank and one duplicate *E. coli* sample from one of the creeks in July and again in November.
Collect one blank and one duplicate sediment sample from one of the creeks.
The results will be reported alongside the main findings.

Equipment

- ☐ Bacteria bottles (5)
- ☐ Ice
- ☐ Cooler
- ☐ DH-49 with 12' rope
- ☐ Spare nozzle
- ☐ Heavy gloves
- ☐ Deionized water (1 gallon)
- ☐ Cubitainers (3)
- ☐ Paper towels
- ☐ Sharpie
- ☐ Sample scoop ('cup on a stick')
- ☐ Field computer or notebook
- ☐ Flow meter
- ☐ D-cell batteries (2)
- ☐ Measuring tape
- ☐ Spring clip and stakes
- ☐ Hartman rod
- ☐ Hand sanitizer
- ☐ Hand lotion
- ☐ This monitoring plan

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Cost Estimate

Bacteria Analysis (44 samples, at $26 per sample):	$1144
Sediment Analysis (26 samples, at $14 per sample):	$364
Total:	*$1508*

Bacteria staff time (1 person, 10 x 4 hour visits)	40 hours
Sediment staff time (2 people, 12 x 4 hour visits)	96 hours
Total:	*136 hours*

Reports

A final report will be presented to the DEQ surface water manager, and to the Technical Advisory Committee, before December 31, 2011.

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ENVIRONMENTAL ANALYSIS REQUEST FORM (Non-Drinking Water)

PLEASE COMPLETE ALL APPLICABLE INFORMATION

Customer / Agency Name: Idaho DEQ			
Mailing Address: 1445 N. Orchard			
City: Boise	State: ID	Zip: 83706	
Attention: Hawk Stone	Phone: 208-373-0588		
Email: hawk.stone@deq.idaho.gov	Fax: 208-373-0287		
Collector (if different than above):	Contact Phone #:		
Date Collected:	Time Collected: (24 hour clock)		
Additional copy of report sent to: n/a			
Address: n/a	City: n/a	State: n/a	Zip: n/a
Sample ID: Fivemile	Sample Location: (Project Name/ Code/ Site): Lower Boise TMDL - Monitoring		

State of Idaho
Bureau of Laboratories
2220 Old Penitentiary Rd.
Boise, ID 83712
208-334-2235
EPA No. ID00018

SAMPLE MATRIX

- [x] Surface Water
- [ ] Waste Water
- [ ] Ground Water
- [ ] Water, Unknown
- [ ] Product / Formulation
- [ ] Biological Tissue
- [ ] Soil
- [ ] Solid
- [ ] Sludge
- [ ] Other_____

METALS

	T = Total	D = Dissolved
Aluminum	T	D
Antimony	T	D
Arsenic	T	D
Barium	T	D
Beryllium	T	D
Cadmium	T	D
Cobalt	T	D
Chromium	T	D
Copper	T	D
Iron	T	D
Lead	T	D
Manganese	T	D
Mercury	T	D
Molybdenum	T	D
Nickel	T	D
Selenium	T	D
Silver	T	D
Strontium	T	D
Thallium	T	D
Tin	T	D
Vanadium	T	D
Zinc	T	D

- [ ] Calcium
- [ ] Magnesium
- [ ] Potassium
- [ ] Sodium

INORGANIC CHEMISTRY

- [ ] Alkalinity
- [ ] Ammonia
- [ ] Biochemical Oxygen (B.O.D.)
- [ ] Chemical Oxygen (C.O.D.)
- [ ] Chlorophyll A / Pheophytin
- [ ] Chloride
- [ ] Conductivity
- [ ] Corrosivity (Langelier Index)
- [ ] Cyanide, Total
- [ ] Cyanide, Weak Acid Dissociable
- [ ] Fluoride
- [ ] Hardness
- [ ] Hydrogen Sulfide
- [ ] Nitrate as N
- [ ] Nitrite as N
- [ ] Nitrate + Nitrite, Total
- [ ] Total Kjeldahl Nitrogen (TKN)
- [ ] Orthophosphate as P
- [ ] Orthophosphate as P, Dissolved
- [ ] pH
- [ ] Phosphorous, Total
- [ ] Silica
- [ ] Settleable Solids (SS)
- [ ] Sulfate
- [ ] Total Dissolved Solids (TDS)
- [x] Total Suspended Solids (TSS)
- [ ] Total Suspended Sediment (TSSC)
- [ ] Total Solids (TS)
- [ ] Turbidity
- [ ] Volatile Solids

RADIOLOGICAL

- [ ] Gross Alpha
- [ ] Gross Beta
- [ ] Uranium

ORGANIC CHEMISTRY

- [ ] VOC – EPA 8260 / EPA 524
- [ ] Semi-Volatiles – EPA 525
- [ ] TPH – Dx - NWTPH
- [ ] Pesticides
- [ ] Herbicides
- [ ] PAH's
- [ ] Oil and Grease

Other Analysis Requested:

n/a

CHAIN-OF-CUSTODY INFORMATION (When Required)

Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Received with Seal Intact? ☐ Yes ☐ No Label Tag, COC Agree? ☐ Yes ☐ No

Get your forms on the web at: http://www.statelab.idaho.gov; select 'Environmental Analysis'

Updated 2/8/2011

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PLEASE COMPLETE ALL APPLICABLE INFORMATION

Customer / Agency Name: Idaho DEQ			
Mailing Address: 1445 N. Orchard			
City: Boise	State: ID	Zip: 83706	
Attention: Hawk Stone	Phone: 208-373-0588		
Email: hawk.stone@deq.idaho.gov	Fax: 208-373-0287		
Collector (if different than above):	Contact Phone #:		
Date Collected:	Time Collected: (24 hour clock)		
Additional copy of report sent to: n/a			
Address: n/a	City: n/a	State: n/a	Zip: n/a
Sample ID: Tenmile	Sample Location: (Project Name/ Code/ Site): Lower Boise TMDL - Monitoring		

State of Idaho
Bureau of Laboratories
2220 Old Penitentiary Rd.
Boise, ID 83712
208-334-2235
EPA No. ID00018

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Copper	T	D
Iron	T	D
Lead	T	D
Manganese	T	D
Mercury	T	D
Molybdenum	T	D
Nickel	T	D
Selenium	T	D
Silver	T	D
Strontium	T	D
Thallium	T	D
Tin	T	D
Vanadium	T	D
Zinc	T	D

- [ ] Calcium
- [ ] Magnesium
- [ ] Potassium
- [ ] Sodium

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- [ ] Hydrogen Sulfide
- [ ] Nitrate as N
- [ ] Nitrite as N
- [ ] Nitrate + Nitrite, Total
- [ ] Total Kjeldahl Nitrogen (TKN)
- [ ] Orthophosphate as P
- [ ] Orthophosphate as P, Dissolved
- [ ] pH
- [ ] Phosphorous, Total
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- [ ] Settleable Solids (SS)
- [ ] Sulfate
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- [x] Total Suspended Solids (TSS)
- [ ] Total Suspended Sediment (TSSC)
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- [ ] Turbidity
- [ ] Volatile Solids

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- [ ] Gross Beta
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- [ ] Herbicides
- [ ] PAH's
- [ ] Oil and Grease

Other Analysis Requested:

n/a

CHAIN-OF-CUSTODY INFORMATION (When Required)

Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Received with Seal Intact? ☐ Yes ☐ No Label Tag, COC Agree? ☐ Yes ☐ No

Get your forms on the web at: http://www.statelab.idaho.gov; select 'Environmental Analysis'

Bacterial Density Request Form

Please fill in all of the gray areas.

CUSTOMER NAME / AGENCY: Idaho DEQ		
Address: 1445 N. Orchard		
City: Boise	State: ID	Zip: 83706
Attention: Hawk Stone	Contact Phone: 208-373-0588	
Additional copy of report sent to: Name: n/a	Agency, If Applicable n/a	
Address: City, State, Zip Code n/a		
Collected by	Date Submitted (Mo, Day, Yr)	DEQ Project # TM53

State of Idaho
Bureau of Laboratories
2220 Old Penitentiary Rd.
Boise, ID 83712
208-334-2235
EPA ID00018

SAMPLE TYPE (Check Appropriate Boxes)
- ☐ Wastewater
  - ☐ Raw
  - ☐ Final
  - ☐ Chlorinated
- ☑ Surface Water (Recreational)
  - ☐ Cross Composite
  - ☐ Depth Integrated
  - ☑ Grab
- ☐ Drinking Water
- ☐ Ground Water (Monitoring)
- ☐ Sludge
- ☐ Soil
- ☐ Other

PURPOSE OF SURVEY (Check one box) ☑ Intensive Survey ☐ Trend ☐ Compliance ☐ Other

SAMPLE TAKEN FROM (Check appropriate Boxes) ☐ Spring ☑ Creek ☐ River ☐ Reservoir ☐ Lake ☐ STP ☐ Industrial ☐ Drain ☐ Lagoon ☐ Other

PRESERVATION METHOD (Check appropriate boxes) ☐ Cooled 4C ☐ Sodium Thiosulfate ☑ Both ☐ Other

TEST REQUESTED (Check appropriate boxes) ☐ Total Coliform ☐ Fecal Coliform ☑ E.coli ☐ Other (See Directions on Back of Form)

LABORATORY Sample Number (LAB USE ONLY)	Customer Sample ID	Sample Location	Date Collected (Mo/Day/Yr)	Time Collected (Military)
	5mile	Fivemile Creek at Mouth		
	10mile	Tenmile Creek at Mouth		
	PICK ONE 15mile	Fifteenmile Creek at Mouth		
	15mile Alt	Fifteenmile Creek at Lincoln Road		
	9mile	Ninemile Creek at Ustick Road		

Chain-of-Custody Information

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:

Special Instructions:

Get your forms on the web at: http://www.statelab.idaho.gov; select 'Environmental Analysis'

Updated 11/1//06