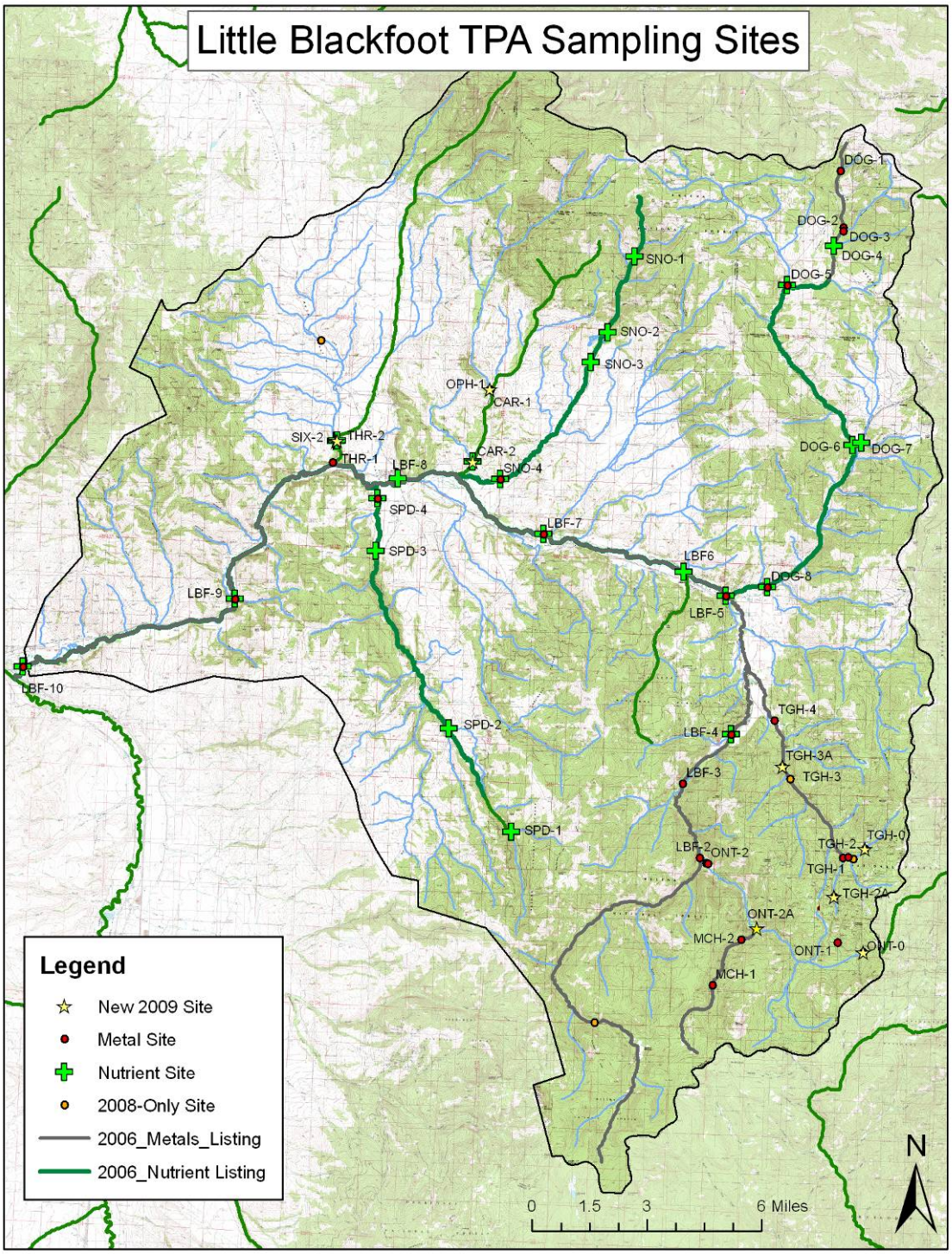
Appendix B


Little Blackfoot TPA Sampling Sites
DOG-1
DOG-2
DOG-3
DOG-4
DOG-5
DOG-6
DOG-7
DOG-8
SNO-1
SNO-2
SNO-3
SNO-4
OPH-1
CAR-1
CAR-2
SIX-2
THR-2
THR-1
LBF-8
SPD-4
SPD-3
SPD-2
SPD-1
LBF-7
LBF6
LBF-5
LBF-4
LBF-3
LBF-2
LBF-9
LBF-10
TGH-4
TGH-3A
TGH-3
TGH-0
TGH-2
TGH-1
TGH-2A
ONT-2
ONT-2A
ONT-1
ONT-0
MCH-2
MCH-1
Legend
New 2009 Site
Metal Site
Nutrient Site
2008-Only Site
2006_Metals_Listing
2006_Nutrient Listing
0
1.5
3
6 Miles
N

Appendix C

Analyte Checklist with Analytical Method, Required Reporting Limit, Collection Container, Preservation Method, and Holding Time

Analysis	Parameter	Preferred Method	Alternate Method	Req. Report Limit ug/L	Holding Time Days	Bottle	Preservative
	Water Sample - Common Ions and Physical Parameters						
☒	Total Suspended Solids (TSS)	EPA 160.2		4000	7	1L HDPE	≤ 6°C
☐	Total Dissolved Solids (TDS)	EPA 160.1		4000	7		
☐	Alkalinity, Bicarbonate as CaCO3	EPA 310.2	SM 2320 B	1000	14		
☐	Alkalinity, Carbonate as CaCO3						
☐	Total Alkalinity						
☐	Sulfate	EPA 300.0	SM 4110 B	50	28		
☐	Chloride	EPA 300.0		50	28		
☐	Dissolved Organic Carbon (DOC)	SM 5310 B			28	125ml Glass	Filt. 0.45 um, H_2SO_4, ≤6°C
☐	Sulfide	SM 4500-S2 D			7	250 ml. HDPE	Zinc Acetate + NaOH to pH >9, ≤ 6°C
	Water Sample - Calculated Results						
☒	Total Hardness as $CaCO_3$	Calc	EPA 130.1 A2340B	1000			
☐	Sodium Absorption Ratio (SAR)	Calc					
	Water Sample - Nutrients						
☒	Total Persulfate Nitrogen (TPN)	SM 4500-N C		50	30	250ml HDPE	≤ 6°C
☐	Dissolved Orthophosphate as P	EPA 365.1	SM 4500-P F	5	2 (28 if frozen)	125ml HDPE	Filt. 0.45 um, ≤ 6°C or frozen
☒	Total Phosphorus as P	EPA 365.1	SM 4500-P F	5	28	500ml HDPE	H_2SO_4, ≤ 6°C
☒	Nitrate-Nitrite as N	EPA 353.2	SM4500-NO3 F	10			
☐	Total Ammonia as N	EPA 350.1	SM4500-NH3 G	50			
	Water Sample - Dissolved Metals (0.45 um filtered)						
☒	Aluminum	EPA 200.7	EPA 200.8	30	180	250ml HDPE[1]	Filt. 0.45 um, HNO_3
☐	Cadmium	EPA 200.8		0.08			
☐	Chromium	EPA 200.8	EPA 200.7	1			
☐	Copper	EPA 200.8	EPA 200.7	1			
☒	Iron (only for limited sites indicated in SAP)	EPA 200.7		50			
☐	Lead	EPA 200.8		0.5			
☐	Silver	EPA 200.8	EPA 200.7	0.5			
☐	Zinc	EPA 200.7		10			
☐	Antimony	EPA 200.8		3			
☐	Barium	EPA 200.7	EPA 200.8	5			
☐	Beryllium	EPA 200.7	EPA 200.8	1			
☐	Boron	EPA 200.7	EPA 200.8	10			
☐	Manganese	EPA 200.7	EPA 200.8	5			
☐	Nickel	EPA 200.7	EPA 200.8	10			
☐	Thallium	EPA 200.8		0.2			
☐	Uranium, Natural	200.8		30			

Analysis	Parameter	Preferred Method	Alternate Method	Req. Report Limit ug/L	Holding Time Days	Bottle	Preservative
☐	Chromium VI	EPA 218.6	SM 3500-Cr E	10	28	125ml HDPE	Filt. 0.45 um, ≤ 6°C, pH 9.3-9.7 with Ammonium Sulfate buffer solution added per EPA 218.6
	Water Sample - Total Recoverable Metals						
☒	*Total Recoverable Metals Digestion*	EPA 200.2		N/A	180	500ml HDPE	HNO_3
☒	Arsenic	EPA 200.8		3			
☒	Cadmium	EPA 200.8		0.08			
☒	Calcium	EPA 200.7		1000			
☐	Chromium	EPA 200.8	EPA 200.7	1			
☒	Copper	EPA 200.8	EPA 200.7	1			
☒	Iron (only for limited sites indicated in SAP)	EPA 200.7		50			
☒	Lead	EPA 200.8		0.5			
☒	Magnesium	EPA 200.7		1000			
☐	Potassium	EPA 200.7		1000			
☒	Selenium (only for limited sites indicated in SAP)	EPA 200.8		1			
☐	Silver	EPA 200.8	EPA 200.7/200.9	0.5			
☐	Sodium	EPA 200.7		1000			
☒	Zinc	EPA 200.7		10			
☐	Antimony	EPA 200.8		3			
☐	Barium	EPA 200.7	EPA 200.8	5			
☒	Beryllium (only for limited sites indicated in SAP)	EPA 200.7	EPA 200.8	1			
☐	Boron	EPA 200.7	EPA 200.8	10			
☐	Manganese	EPA 200.7	EPA 200.8	5			
☐	Nickel	EPA 200.7	EPA 200.8	10			
	Water Sample – Total Metals						
☒	Mercury (only for limited sites indicated in SAP)	EPA 245.1		0.05	28	HDPE, Glass	HNO_3
☐	Mercury, Ultra low level **Note2**	EPA 245.7		0.005	28	100mL Glass	0.5 ml 12N HCL
☐	Mercury, Ultra low level	EPA 1631		0.005	90	100mL Glass	0.5 ml 12N HCL
	Water Sample – Non-Metals						
☒	Cyanide (only for limited sites indicated in SAP)	EPA 335.4 Rev. 1	SM4500CN (C,D,E)	5	14		NaOH to pH≥12

Note 1: If aluminum is the only dissolved metal collected, the collection container is a 60 cm^3 syringe. Then, 50 mL of the sample is field-filtered into a 50 mL centrifuge tube.
Note 2: For Ultra low-level mercury by method 245.7, both a trip blank and field blank are required for each set of samples. Both the trip blank and field blank will be analyzed and charged at $50 each.

Analysis	Parameter	Preferred Method	Alternate Method	Req. Report Limit mg/kg (dry weight)	Holding Time Days	Bottle	Preservative
	Sediment Sample - Total Recoverable Metals						
☒	*Total Recoverable Metals Digestion*	EPA 200.2		N/A	180	500ml HDPE Widemouth	≤ 6°C
☒	Arsenic	EPA 200.8	EPA 200.9	1			
☒	Cadmium	EPA 200.8	EPA 200.9	0.2			
☐	Chromium	EPA 200.8	EPA 200.9	9			
☒	Copper	EPA 200.8	EPA 200.9	15			
☐	Iron	EPA 200.7	EPA 200.9	10,000			
☒	Lead	EPA 200.8	EPA 200.9	5			
☒	Zinc	EPA 200.7	EPA 200.9	20			
☒	Selenium (only for limited sites indicated in SAP)	EPA		5			
☒	Mercury (only for limited sites indicated in SAP)	EPA 7471B		0.05	28		
	Chlorophyll-a						
☒	Chlorophyll-a (in water)	SM 10200 H			21 (pH ≥ 7) ASAP (ph ≤7)[3]	Variable	Cool or frozen[4]
☒	Ash Free Dry Weight	SM 10300C-5					

Note 3: Solid/filter samples taken from water having a pH 7 or higher will be placed in airtight plastic freezer bags and stored frozen for not more than 21 days. Samples from acidic water must be processed promptly to prevent chlorophyll-a degradation.
Note 4: Freeze samples only if filtered or hoop sample. Samples requiring filtration will not be frozen until filtered.

Adapted from Title 40 Code of Federal Regulations, Parts 136-149. 2007 ed.

Appendix D

QA/QC Checklist and Data Qualifiers

Quality Control Checklist

___Condition of samples upon receipt
__Cooler/sample temperature
__Proper collection containers
__All containers intact
__Sample pH of acidified samples <2

___All field documentation complete. If incomplete areas cannot be completed, document the issue.

___Holding times met

___Field duplicates collected at the proper frequency (specified in SAP)

___Field blanks collected at the proper frequency (specified in SAP)

___All sample IDs match those provided in the SAP. Field duplicates are clearly marked on samples and noted as such in lab results.

___Analyses carried out as described within the SAP (e.g. analytical methods, photo documentation, field protocols)

___Reporting detection limit met the project-required detection limit

___All blanks were less than the project-required detection limit

___If any blanks exceeded the project-required detection limit, associated data is flagged

___Laboratory blanks/duplicates/matrix spikes/lab control samples were analyzed at a 10% frequency

___Laboratory blanks/duplicates/matrix spikes/lab control samples were all within the required control limits defined within the SAP

___Project DQOs and DQIs were met (as described in SAP)

___Summary of results of QC analysis, issues encountered, and how issues were addressed (corrective action)

___Completed QC checklist and approved by DEQ project manager before STORET upload

Table D-1. Data qualifiers and descriptions.

Result Qualifier	Result Qualifier Description
B	Detection in field and/or trip blank
D	Reporting limit (RL) increased due to sample matrix interference (sample dilution)
H	EPA Holding Time Exceeded
J	Estimated: The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
R	Rejected: The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
U	Not Detected: The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method.
UJ	Not Detected/Estimated: The analyte was not detected at a level greater than or equal to the adjusted CRQL or the reported adjusted CRQL is approximate and may be inaccurate or imprecise.

Table D-2. Quality control terminology and descriptions.

FIELD QC		
Term	**Description**	**Purpose/Usage**
Trip Blanks	Used only for VOC (Volatile Organic Chemicals). Alias VOA (volatile organic analysis)	To determine if cross contamination occurs between samples.
Field Blank	Reagent water exposed to field sampling conditions	Monitors contamination resulting from field activities and or ambient levels of analytes present at time of sampling.
Field Duplicate	Two independent samples taken under the same conditions. For solids; two samples which are co-located (taken side by side.) Water samples would be two independent samples taken at the same location at the same time.	To determine the homogeneity of the samples collected.
Field Replicate	A single sample is obtained, homogenized, then slit into multiple samples	Monitors laboratory precision independent of laboratory operations.
LABORATORY BATCH QC		
Acronym	**Description**	**Definition**
LRB/Method Blank	Laboratory Reagent Blank	An aliquot of reagent water or other blank matrices that are treated exactly as a sample including exposure to all glassware, equipment, solvents, reagents, and internal standards that are used with other samples. The LRB is used to determine if method analytes or other interferences are present.
LFB/LCS	Laboratory Fortified Blank; Laboratory Control Sample	Reagent water spiked with a known amount of analyte. Ideally treated exactly like a MS/LFM. Control used to determine bias in sample spikes.

MS/LFM	Matrix Spike/Laboratory Fortified Matrix .	An aliquot of an environmental sample to which known quantities of the method analytes are added in the laboratory. The LFM is analyzed exactly like a sample, and its purpose is to determine whether the sample matrix contributes bias to the analytical results. The background concentrations of the analytes in the sample matrix must be determined in a separate aliquot and the measured values in the LFM corrected for background concentrations
MSD/LFMD	Matrix Spike Duplicate/Laboratory Fortified Matrix Duplicate	Determine method precision in sample concentrations are < 5X the RL.
DUP	Duplicate	Determine method precision in sample concentrations are > 5X the RL.
QCS	Quality Control Sample	A solution of method analytes of known concentrations which is used to fortify an aliquot of reagent water or sample matrix. The QCS is obtained from a source external to the laboratory and different from the source of calibration standards. It is used to check either laboratory or instrument performance
SRM	Standard Reference Material	Primarily used as a QCS to verify instrument calibration.
LABORATORY ANALYSIS QC		
Acronym	**Description**	**Definition**
ICB	Initial Calibration Blank	Monitors instrument drift at low end of cal curve.
CCB	Continuing Calibration Blank	Monitors instrument drift at low end of cal curve.
ICV	Initial Calibration Blank	Monitors instrument drift at a defined concentration near the mid range of cal curve.
CCV	Continuing Calibration Blank	Monitors instrument drift at a defined concentration near the mid range of cal curve.
IPC	Instrument Performance Check	Monitors instrument drift at a defined concentration near the mid range of cal curve.
MS/LFM	Matrix Spike/Laboratory Fortified Matrix .	An aliquot of an environmental sample to which known quantities of the method analytes are added in the laboratory. The LFM is analyzed exactly like a sample, and its purpose is to determine whether the sample matrix contributes bias to the analytical results. The background concentrations of the analytes in the sample matrix must be determined in a separate aliquot and the measured values in the LFM corrected for background concentrations
MSD/LFMD	Matrix Spike Duplicate/Laboratory Fortified Matrix Duplicate	Determine method precision in sample concentrations are < 5X the RL.
DUP	Duplicate	Determine method precision in sample concentrations are > 5X the RL.

QCS	Quality Control Sample	A solution of method analytes of known concentrations which is used to fortify an aliquot of reagent water or sample matrix. The QCS is obtained from a source external to the laboratory and different from the source of calibration standards. It is used to check either laboratory or instrument performance
SRM	Standard Reference Material	Primarily used as a QCS to verify instrument calibration.
IDL	Instrument detection limit	Signal just above baseline. 3-5x the STD DEV of 7 replicates of a blank. Not used for quantification.
MDL	Method detection limit	Statistical determination of the lowest concentration of an analyte with 95% certainty the analyte is present.
PQL	Practical Quantitation Limit	3-5x the MDL. Lowest level that quantification is determined
RL	Reporting Limit	Value a Laboratory reports results. Usually the PQL.